DEVELOPMENT OF 2020 NEHRP RECOMMENDED SEISMIC PROVISIONS AND SUPPORT TO IMPROVE NATIONAL CODES AND STANDARDS

Annual Report (September 2015 – December 2016)

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Under DHS/FEMA Contract HSFE60-15-D-0022

Task Order HSFE60-J-0039, Technical Monitoring of New and Existing Seismic Building Codes and Related Training

December 14, 2016

Developed by the National Institute of Building Sciences for the Federal Emergency Management Agency
The National Institute of Building Sciences’ with the Building Seismic Safety Council (BSSC) under a contract with the Federal Emergency Management Agency monitored the 2018 ICC code update cycle, which included code changes in IBS, IEBC, and IRC. The BSSC through its Code Resource Support Committee (CRSC) monitored the code change process of the IBC, IEBC and IRC between September 2015 and December 2016 to ensure the codes’ equivalency to FEMA’s seismic design guidance for new buildings, included in the latest edition of the 2015 NEHRP Recommended Provisions, as well as FEMA’s design guidance publications for seismic protection of existing buildings included in ASCE 31 and ASCE 41. CRSC provided testimony at ICC hearings on inconsistencies where necessary.

This report summarizes the work performed under this task, which includes three parts: the proposals that were submitted directly by CRSC; code changes for which CRSC provided testimony; and a summary of the CRSC’s achievements in this performance period.

1. CRSC PROPOSALS

The CRSC submitted a total of six proposals, three for IBC (International Building Code) and three for IRC (International Residential Building Code). Out of the six proposals, five were successfully approved to be adopted by IBC and IRC correspondingly; one failed. The six proposals are presented in detail Appendix 1 and briefly summarized below:

- **S119-** A proposal to incorporate the new USGS maps into the IBC and the IRC.
- **S147-** A proposal for 1705.12.6 to provide 3” of clearance around sprinkler heads to prevent pipes and other nearby nonstructural components from striking the heads and initiating a discharge.
- **S242-** A proposal to modify 1613.1 to not exclude ASCE Chapter 14.2.4 after an alternative seismic design force level for diaphragms was included in new Section 12.10.3 of ASCE 7-16.
- **RB17-** A proposal for R301.2.2.1 to address determining SDC with alternative maps.
- **RB239-** A proposal for R602.10.6.5 that would allow brick veneer to be applied to a second story of a residence without going to more stringent requirements for structural ties.
- **RB372-** A proposal for Appendix U for seismic repair and retrofit of masonry chimneys to be applied on a voluntary basis.

After the proposal submission, CRSC representatives and BSSC project managers followed closely and participated in each stage of the code development process. A general description of the code development process and the corresponding reports at each stage related to the six CRSC proposals is summarized below:

- **COMMITTEE HEARING ACTION (CHA):** Code Change Committee actions at the Code Change Hearings that were held in Louisville between April 17-27, 2016
recommended either approved as submitted (AS), approved as modified (AM), or disapproved (D) each code change proposal submitted. Following the CHA, a report was provided that included the recommendations of the code development committee and the committee’s reasons on each proposed item. The detailed report for the six CRSC proposals is presented in Appendix 2 and the CHA actions are summarized in Table 1.

- **Public Comment**: Proposals on which there was a successful assembly action were included on the Public Comment Agenda for Individual Consideration and voting by eligible voting members. Persons recommending an action other than that taken at the Committee Action Hearing (CAH) submitted a public comment. Out of the six CRSC proposals, four received public comments, which are detailed in Appendix 3.

- **Public Comment Hearings (PCH)**: Proposals which received a public comment were included on the Public Comment Hearing Agenda, and PCH held in Kansas City between October 19-25, 2016 at which the ICC voted for resolution of the code change proposals, with the options: approved as submitted (AS), approved as modified (AM), approved as modified by public comment (AMPC), and disapproved (D). The PCH results for the six CRSC proposals are summarized in Table 1.

- **Online Governmental Consensus Vote (OGCV)**: The OGCV was the final action which determined if the proposed code changes were adopted or not. The 2016 Group B OGCV was conducted during the period of November 8-27, 2016. The OGCV results for the six CRSC proposals are summarized in Table 1.

### Table 1 Summary of the Voting Results for the Six CRSC Proposals

<table>
<thead>
<tr>
<th>ID #</th>
<th>CHA (Louisville)</th>
<th>PCH (Kansas City)</th>
<th>OGCV Vote</th>
<th>Final Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>S119-16</td>
<td>AM</td>
<td>--*</td>
<td>Success</td>
<td></td>
</tr>
<tr>
<td>S147-16</td>
<td>AS</td>
<td>CA</td>
<td>Success</td>
<td></td>
</tr>
<tr>
<td>S242-16</td>
<td>AM</td>
<td>AM</td>
<td>AM</td>
<td>Success</td>
</tr>
<tr>
<td>RB17</td>
<td>AS</td>
<td>AS</td>
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<td>Success</td>
</tr>
<tr>
<td>RB239</td>
<td>AS</td>
<td>--*</td>
<td></td>
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</tr>
<tr>
<td>RB372</td>
<td>D</td>
<td>AMPC1</td>
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<td>Fail</td>
</tr>
</tbody>
</table>

AS: Approved as Submitted; AM: Approved as Modified at the Committee Action Hearing; AMPC: Approved as Modified by Public Comment; D: Disapproved; WP: Withdrawn by Proponent; and CA: Moved to Consent Agenda

*: No public comments.

2. **CRSC TESTIMONY ON CODE CHANGES**

Besides the proposals that CRSC submitted, CRSC also monitored proposed code changes and provided testimony on those changes where necessary. The CRSC evaluated 151 proposals (Appendix 4) before the Committee Hearing Actions in Louisville, KY and looked at public
comments for 59 proposals (Appendix 6) before the Public Comment Hearing in Kansas City, MO. Overall, the CRSC representatives provided testimony on 58 proposals, either to support or oppose, as summarized in Table 2. Following each hearing, CRSC advocated its voting positions for the proposed changes among the CRSC, BSSC, and the Institute membership (see Appendixes 5 and 7). CRSC was successful in conveying its positions in 52 out of the 58 proposals.

Table 2 Summary of Proposals on Which CRSC Testified.

<table>
<thead>
<tr>
<th>ID #</th>
<th>CRSC Position on Initial Proposal</th>
<th>CHA (Louisville)</th>
<th>CRSC Position on Public Comments</th>
<th>PCH (Kansas City)</th>
<th>OGCV VOTE</th>
<th>Outcome</th>
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<tbody>
<tr>
<td>ADM63-16</td>
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<tr>
<td>ADM94-16</td>
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</tbody>
</table>

INTERNATIONAL ADMINISTRATIVE PROVISIONS CODE

<table>
<thead>
<tr>
<th>ID #</th>
<th>CRSC Position on Initial Proposal</th>
<th>CHA (Louisville)</th>
<th>CRSC Position on Public Comments</th>
<th>PCH (Kansas City)</th>
<th>OGCV VOTE</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>S53-16</td>
<td>support</td>
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<td>AS</td>
<td>AS</td>
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<tr>
<td>S61-16</td>
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<tr>
<td>S63-16</td>
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<td>AM</td>
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</tr>
<tr>
<td>S71-16</td>
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<td>SUCCESS</td>
</tr>
</tbody>
</table>

INTERNATIONAL BUILDING CODE-STRUCTURAL
| S285-16 | oppose | AS | --* | -- | -- | FAIL |
| S286-16 | support | AS | AS | -- | -- | SUCCESS |
| S290-16 | oppose | D | --* | -- | -- | SUCCESS |
| S291-16 | support | AS | --* | -- | -- | SUCCESS |
| S293-16 | oppose | D | --* | -- | -- | SUCCESS |
| S313-16 | oppose | D | D | D | D | SUCCESS |
| S314-16 | oppose | D | D | D | D | SUCCESS |
| S315-16 | support | AS | AS | AS | AS | SUCCESS |
| S316-16 | oppose | D | D | D | D | SUCCESS |
| S317-16 | oppose | D | D | D | D | SUCCESS |
| S318-16 | oppose | D | D | D | D | SUCCESS |
| G25-16 | oppose | D | --* | -- | -- | SUCCESS |

**INTERNATIONAL EXISTING BUILDING CODE-STRUCTURAL**

| EB 8-16 | support | AS | --* | -- | -- | SUCCESS |
| EB 9-16 | support | AM | --* | -- | -- | SUCCESS |
| EB58-16 | support | AM | AMPC1 | AMPC1 | AMPC1 | SUCCESS |
| EB61-16 | support | AM | -- | -- | -- | SUCCESS |

**INTERNATIONAL RESIDENTIAL CODE-BUILDING**

| RB17-16 | support | AS | AS | AS | AS | SUCCESS |
| RB18-16 | oppose | D | D | D | D | SUCCESS |
| RB22-16 | oppose | D | D | D | D | SUCCESS |
| RB23-16 | oppose | AM | --* | -- | -- | FAIL |
| RB199-16 | oppose | D | D | D | D | SUCCESS |
| RB214-16 | oppose | AS | --* | -- | -- | FAIL |
| RB230-16 | support | AM | --* | -- | -- | SUCCESS |
| RB 235-16 | neutral | AS | AMPC2 | AMPC2 | AMPC2 | SUCCESS |
| RB239-16 | support | AS | --* | -- | -- | SUCCESS |
| RB245-16 | support | AS | --* | -- | -- | SUCCESS |
| RB250-16 | oppose | D | --* | -- | -- | SUCCESS |
| RB366-16 | oppose | AS | --* | -- | -- | FAIL |
| RB372-16 | support | D | AMPC1 | AMPC1 | D | FAIL |

AS: Approved as Submitted; AM: Approved as Modified at the Committee Action Hearing; AMPC: Approved as Modified by Public Comment; D: Disapproved; WP: Withdrawn by Proponent; and CA: Moved to Consent Agenda

*: No public comments.

### 3. CRSC ACCOMPLISHMENTS

The CRSC accomplishments are presented below on a quarterly basis.

**October – December 2015**

- Assembly of the 20-member Code Resource Support Committee (CRSC).
- A CRSC in–person meeting on November 12-13, 2015.
- Development of six proposals to be submitted to the International Code Council (ICC).
- Conduct a teleconference on December 18, 2015 to finalize proposals for 1613.3, to be co-sponsored by ASCE, R602.10.6.5, IRC Appendix U, 1705.12.6, and R301.2.2.1.
- Establishment of a CRSC secretariat for ASCE 41. A BSSC secretariat was established to facilitate the update to ASCE 41: Seismic Evaluation and Retrofit of Existing Buildings, and act as a liaison between the ASCE-41 committee and the CRSC.

January – March 2016
- Submission of six proposals to the International Code Council (ICC); see Appendix 1.
- Identification of 151 proposed changes to the IBC, IEBC, and the IRC that might pertain to the 2015 NEHRP Provisions. The detailed list of the 151 proposed changes is provided in Appendix 4.
- Preparation of subcontracts for CRSC participants at the Committee Action Hearings in Louisville, KY, April 17-27, 2016.
- A CRSC teleconference on January 8, 2016 to discuss proposal submissions.
- A CRSC dinner meeting on March 9, 2017 to discuss proposed code changes.

April – June 2016
- CRSC teleconferences on April 7, 8 and 14, 2016 to discuss positions on proposed changes to the IBC, IEBC, and the IRC that pertain to the 2015 NEHRP Provisions.
- CRSC participation at the Committee Action Hearings in Louisville, KY, April 17-27, 2016. Six CRSC representatives and the FEMA PO conveyed positions and were successful with nearly all.
- CRSC and BSSC membership participation in the Online Assembly Motion Vote Open for Group B I-Codes that closed on May 26. CRSC developed and distributed the recommendations (Appendix 5) for floor motion items relevant to the Provisions that were developed based on the outcome of the Committee Action Hearings.
- Preparations for the July 15, 2016 CRSC Meeting in Burlingame, CA and the online public comment submittal on July 22, 2016.
- Deliberations on the public comments on the CRSC chimney retrofit proposal.
- Monitoring a code change in Arkansas.
- Preparation of a subcontract to develop an update to the 2006 CodeMaster.

July – September 2016
- July 15, 2016 CRSC Meeting in Burlingame, CA and the online public comment submittal on July 22, 2016.
- CRSC teleconferences on September 16 and 23, 2016 to discuss positions (Appendix 6) on public comments to proposed changes to the IBC, IEBC, and the IRC that pertain to the 2015 NEHRP Provisions.
- Submittal of public comments on the CRSC fire protection sprinkler clearance (subsequently withdrawn) and chimney retrofit proposals.
- Finalization of the 2015 CodeMaster, an update to the 2006 CodeMaster.

**October – December 2016**

- CRSC advocacy (Appendix 7) for positions for over 60 public comments to the IBC, IEBC and the IRC for the ICC on-line voting that occurred November 7 – 22, 2016.
APPENDIX 1
S119-16

IBC: 1613.3.1.


2015 International Building Code

Revise as follows:

FIGURE 1613.3.1 1613.3.1(1)-1 (1)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE_R) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 0.2-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

(Existing code change figure not shown for clarity)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE_R) GROUND MOTION RESPONSE
ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 0.2-SECOND SPECTRAL RESPONSE
ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

(Existing code change figure not shown for clarity)
Figure 1613.3.1(1)-continued Risk-Targeted Maximum Considered Earthquake (MCE\textsubscript{R}) Ground Motion Response Accelerations for the Contiguous United States of 0.2-Second Spectral Response Acceleration (5\% of Critical Damping), Site Class B

**FIGURE 1613.3.1 1613.3.1(2)-1 (2)**

ICC COMMITTEE ACTION HEARINGS ::: April, 2016
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE\textsubscript{R}) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 1-SECOND SPECTRAL RESPONSE ACCELERATION (5\% OF CRITICAL DAMPING), SITE CLASS B

(Existing code change figure not shown for clarity)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE$_R$) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTERMINOUS UNITED STATES OF 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

(Existing code change figure not shown for clarity)
Figure 1613.3.1(2)-continued Risk-Targeted Maximum Considered Earthquake (MCE) Ground Motion Response Accelerations for the Conterminous United States of 1-Second Spectral Response Acceleration (5% of Critical Damping), Site Class B

**FIGURE 1613.3.1 1613.3.1(8) (8)**
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCE$_R$) GROUND MOTION RESPONSE ACCELERATIONS FOR AMERICAN SAMOA OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

(Existing code change figure not shown for clarity)
Figure 1613.3.1(3) Risk-Targeted Maximum Considered Earthquake (MCE) Ground Motion Response Accelerations for American Samoa of 0.2- and 1-Second Spectral Response Acceleration (5% of Critical Damping), Site Class B

**Reason:** This proposal incorporates the most recent seismic design maps prepared by the U.S. Geological Survey
(USGS) in collaboration with the Federal Emergency Management Agency (FEMA) and the Building Seismic Safety Council (BSSC). The proposed maps are consistent with those incorporated into the NEHRP Provisions (FEMA P-1050-1, 2015) and ASCE 7-16. The proposed maps incorporate significant new information on earthquake faults and ground motion attenuation, and are more consistent with the site-specific ground motion procedures of ASCE 7-16 Chapter 21. Technical reasons behind the changes are documented in FEMA P-1050-1, Section C22. Further documentation is provided in Luco et al. (2015) and companion papers in a special issue of Earthquake Spectra (2015).

**Bibliography:** [NEHRP Recommended Seismic Provisions for New Buildings and Other Structures] [FEMA P-1050-1] [Building Seismic Safety Council] [2015] [483-495] [https://www.fema.gov/media-library/assets/documents/107646] [Earthquake Spectra] [Updates to Building-Code Maps for the 2015 NEHRP Recommended Seismic Provisions] [Luco, N, Bachman, R.e., Crouse, C.B., Harris, J.R., Hooper, J.D., Kircher, C.A., Caldwell, P.J., and Rukstales, K.S.] [2015] [Volume 31, pages S245-S271]

**Cost Impact:** Will increase the cost of construction

Use of the proposed maps can result in modest increases OR decreases in overall construction cost depending on the geographic location. Because the cost of structural systems is generally a small portion of the overall construction cost, the overall impact, whether increase or decrease, is thought to be quite modest.

**Analysis:** Coordinated code change proposal for the IRC is RB17-16.
S147-16
IBC: 1705.12.6.
Proponent: John Gillengarten (johng5155@live.com); Henry Green, John D. Gillengarten, representing National Institute of Building Sciences Building Seismic Safety Council Code Resource Support Committee

2015 International Building Code
Revise as follows:

1705.12.6 Plumbing, mechanical and electrical components. *Periodic special inspection* of plumbing, mechanical and electrical components shall be required for the following:

1. Anchorage of electrical equipment for emergency and standby power systems in structures assigned to *Seismic Design Category C, D, E or F.*
2. Anchorage of other electrical equipment in structures assigned to *Seismic Design Category E or F.*
3. Installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to *Seismic Design Category C, D, E or F.*
4. Installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to *Seismic Design Category C, D, E or F.*
5. Installation and anchorage of vibration isolation systems in structures assigned to *Seismic Design Category C, D, E or F* where the approved construction documents require a nominal clearance of $\frac{1}{4}$ inch (6.4 mm) or less between the equipment support frame and restraint.

6. *Installation of mechanical and electrical equipment including duct work, piping systems and their structural supports where automatic fire sprinkler systems are installed in structures assigned to Seismic Design Category C, D E or F* to verify either of the following:

   6.1. Minimum clearances have been provided as required by Section 13.2.3 ASCE/SEI 7; or

   6.2. That a nominal clearance of at least 3 inches (76 mm) has been been provided between fire protection sprinkler system drops and sprigs and structural members not used collectively or independently to support the sprinklers, or from equipment attached to the building structure, or from other systems' piping.

*Where flexible sprinkler hose fittings are used, special inspection of minimum clearances is not required.*

**Reason:** Experience in recent earthquakes has shown that pounding between sprinkler piping drops and sprigs and adjacent nonstructural components such as pipes and ducts has resulted in pipe connection failures and accidental activation, which resulted in flooding and potentially compromising the operability of the system should fire followng earthquake occur. ASCE/SEI 7-16 identifies fire protection sprinkler systems as components that are required to function for life-safety purposes after an earthquake, classifying them as a Designated Seismic System. Section 13.2.3 ASCE/SEI 7-16 requires that interaction between Designated Seismic Systems and adjacent components be avoided. The intent is described in Section C13.2.3 of the ASCE/SEI 7-16 commentary, which states in part:

... It is the intent of the standard that the seismic displacements considered include both relative displacement between multiple points of support (addressed in Section 13.3.2) and, for mechanical and electrical components, displacement within the component assemblies. Impact of components must be avoided, unless the components are fabricated of ductile materials that have been shown to be capable of accommodating the expected impact loads. ... It further cites specific examples using fire protection sprinkler systems to illustrate the types of interactions to be
avoided.

...Consequential damage may occur because of displacement of components and systems between support points. For example, in older suspended ceiling installations, excessive lateral displacement of a ceiling system may fracture sprinkler heads that project through the ceiling. A similar situation may arise if sprinkler heads projecting from a small-diameter branch line pass through a rigid ceiling system. Although the branch line may be properly restrained, it may still displace sufficiently between lateral support points to affect other components or systems. ...

Maintaining adequate clearances is critical to good seismic performance of fire protection sprinkler systems, and Section 13.2.3 ASCE/SEI 7-16 requires that interaction between Designated Seismic Systems and adjacent components be avoided.

This proposal provides periodic special inspection to verify that adequate clearance is provided between sprinkler drops and sprigs and adjacent structural and nonstructural components. In some cases, an evaluation of the required clearance to avoid interaction is not provided by the registered design professionals. In such cases, a nominal 3 inch clearance from adjacent items is permitted, which is the same as the NFPA 13 clearance requirement from structural members to pounding. Due to their inherent flexibility, clearance between listed flexible sprinkler hose fittings and other components, equipment, or structural members is not required.

**Cost Impact:** Will increase the cost of construction
This change might have a very minor impact on the cost of installation of electrical, mechanical and plumbing installations and their inspection.

S147-16 : 1705.12.6-GISSERTEN12294
S242-16

IBC: 1613.1, 1901.2.

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2015 International Building Code

Revise as follows:

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, excluding Chapters 11, 12, 13, 15, 17, and Appendix 11A. The seismic design category for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7.

Exceptions:
1. Detached one- and two-family dwellings, assigned to Seismic Design Category A, B or C, or located where the mapped short-period spectral response acceleration, $S_S$, is less than 0.4 g.
2. The seismic force-resisting system of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.

1901.2 Plain and reinforced concrete. Structural concrete shall be designed and constructed in accordance with the requirements of this chapter and ACI 318 as amended in Section 1905 of this code. Except for the provisions of Sections 1904 and 1907, the design and construction of slabs on grade shall not be governed by this chapter unless they transmit vertical loads or lateral forces from other parts of the structure to the soil. Precast concrete diaphragms in buildings assigned to Seismic Design Category C, D, E, or F shall be designed in accordance with the requirements of ASCE 7 Section 14.2.4.

Reason: Seismic design of diaphragms is addressed in Sections 12.10.1 and 12.10.2 of ASCE 7-16. These sections are essentially the same as Sections 12.10.1 and 12.10.2 of ASCE 7-10. Based on significant work done by Issue Team 6 on Diaphragms of the Building Seismic Safety Council (BSSC) Provisions Update Committee (PUC), an alternative seismic design force level for diaphragms has been included in new Section 12.10.3 of ASCE 7-16. The alternative design force level is mandated for precast concrete diaphragms in buildings assigned to Seismic Design Category (SDC) C and above. It is permitted for other precast concrete diaphragms, cast-in-place concrete diaphragms, and wood diaphragms. At the same time, new precast diaphragm design provisions have been included in new Section 14.2.4 of ASCE 7-16, which goes hand-in-hand with the alternative diaphragm design force level in Section 12.10.3 of ASCE 7-16. The Section 14.2.4 requirements are based on multi-year, multi-million-dollar research, known as DDSM (Diaphragm Seismic Design Methodology) research, sponsored by the National Science Foundation (NSF), the Precast/Prestressed Concrete Institute (PCI), and the Pankow Foundation.

An integral part of the precast diaphragm design procedure of ASCE 7-16 Section 14.2.4 is a connector qualification.
methodology that was also developed in the course of DSDM research. ASCE 7-16 Section 12.10.3 will automatically be part of the 2018 IBC, presuming it adopts ASCE 7-16; however, Section 14.2.4 will not be, because 2015 IBC Section 1613 excludes Section 14.2 from the adoption of ASCE 7. This code change is meant to take care of this problem and make ASCE 7-16 Section 14.2.4 a part of the 2018 IBC.

Appendix 11A is no longer part of ASCE 7-16. Instead of excluding any particular chapter(s), this proposed change calls out the primary ASCE 7 chapters that charge specific parts of the design process. These chapters, in turn, reference other ASCE 7 sections, other ASCE 7 chapters and other standards for portions of the requirements. All needed parts of ASCE 7 are therefore incorporated, including the ground motions.

**Cost Impact:** Will increase the cost of construction
The cost of precast concrete diaphragms will go up - not so much because of this proposal, but because the higher design force level for precast concrete diaphragms in Section 12.10.3 of ACE 7-16, which is mandated to be used with the proposed design procedure. The required use of high-deformability connectors with the Reduced Design Option may also contribute to an increase in cost. Finally, the required use of moderate-deformability connectors with the Basic Design Option may result in modest cost increases.
RB17-16
IRC: , R301.2, R301.2(3) (New), R301.2(3)-continued (New), R301.2.2.1.1, R301.2.2.1.2.

2015 International Residential Code
Delete and substitute as follows:

FIGURE R301.2(2)
SEISMIC DESIGN CATEGORIES—SITE CLASS D

(Existing code figure not shown for clarity)
FIGURE R301.2(2)-continued
SEISMIC DESIGN CATEGORIES—SITE CLASS D

(Existing code figure not shown for clarity)
FIGURE R301.2(2) - continued
SEISMIC DESIGN CATEGORIES

(Existing code figure not shown for clarity)
REFERENCES


FIGURE R301.2(2)
SEISMIC DESIGN CATEGORIES

FIGURE R301.2(2)-continued
SEISMIC DESIGN CATEGORIES—SITE CLASS D

(Existing code figure not shown for clarity)
R301.2.2.1.1 Alternate determination of seismic design category. The seismic design categories and corresponding short-period design spectral response accelerations, $S_{DS}$, shown in Figure R301.2(2) are based on soil Site Class D, used as an assumed default, as defined in Section 1613.3.2 of the International Building Code. If soil conditions are other than determined by the building official to be Site Class A, B, or D, the short-period seismic design category and short-period design spectral response accelerations, $S_{DS}$, for a site can shall be allowed to be determined in accordance with Figure R301.2(3) or Section 1613.3 of the International Building Code. The value of $S_{DS}$ determined in accordance with Section 1613.3 of the International Building Code is permitted to be used to set the seismic design category in accordance with Table R301.2.2.1.1, and to interpolate between values in Tables R602.10.3(3), R603.9.2(1) and other seismic design requirements of this code.

R301.2.2.1.2 Alternative determination of Seismic Design Category E. Buildings located in Seismic Design Category E in accordance with Figure R301.2(2), or Figure R301.2(3) where applicable, are permitted to be reclassified as being in Seismic Design Category $D_2$ provided that one of the following is done:

1. A more detailed evaluation of the seismic design category is made in accordance with the provisions and maps of the International Building Code. Buildings located in Seismic Design Category E in accordance with Table R301.2.2.1.1, but located in Seismic Design Category $D_2$ in accordance with the International Building Code, shall be permitted to be designed using the Seismic Design Category $D_2$ requirements of this code.

2. Buildings located in Seismic Design Category E that conform to the following additional restrictions are permitted to be constructed in accordance with the provisions for Seismic Design Category $D_2$ of this code:
   2.1. All exterior shear wall lines or braced wall panels are in one plane vertically from the foundation to the uppermost story.
   2.2. Floors shall not cantilever past the exterior walls.
   2.3. The building is within the requirements of Section R301.2.2.2.5 for being considered as regular.

Add new text as follows:

**FIGURE R301.2(3)**
Alternate Seismic Design Categories
FIGURE R301.2(3)-continued
Alternate Seismic Design Categories
FIGURE R301.2(3)-continued
Alternate Seismic Design Categories
FIGURE R301.2(3)-continued
Alternate Seismic Design Categories
REFERENCES


FIGURE R301.2(3)-continued
Alternate Seismic Design Categories
**Reason:** This proposal incorporates the most current seismic design maps prepared by the U.S. Geological Survey (USGS) in collaboration with the Federal Emergency Management Agency (FEMA) and the Building Seismic Safety Council (BSSC). A separate coordinated code change updates the seismic design maps in the IBC to be consistent with these IRC maps and the maps incorporated into ASCE 7-16. In addition to incorporating updated information on...
faults and ground motion attenuation, these maps incorporate revisions to site coefficients $F_a$ and $F_v$. Technical reasons behind the revisions are documented in FEMA P-1050-1, 2015 Edition, Sections C11.4.2 (site classes), C11.4.3 (site coefficients), and C22 (seismic maps). Further documentation is provided in Seyhan and Stewart (2012, 2014) and Luco et al. (2015). As excerpted from FEMA P-1050-1, 2015 Edition, Section C11.4.3: "Motivation for the revisions to site factors includes (Seyhan and Stewart, 2012): (1) updating the reference site condition used for the factors to match the condition on the national maps, which in $V_s = 760$ m/s (2500 ft/s); (2) incorporating into the factors the substantial knowledge gains (stemming in large part from an enormous increase in available data) on site response over the past two decades."

As in past versions, the IRC seismic design maps directly indicate Seismic Design Category for a given location. Development of the maps in the past incorporated a default assumption of a Site (soil) Class D, which provided the most conservative assignment of Seismic Design Category. For this update, (1) changes made to the site coefficients resulted in Site Class D no longer being the most critical site class at all spectral response acceleration levels, and (2) spectral response accelerations and resulting Seismic Design Categories increased at a number of locations when the most critical site coefficients were used. Because of these two effects, it is proposed that two sets of maps be adopted into the IRC. The updated R301.2(2) Seismic Design Category maps will provide the most conservative assignment of Seismic Design Category and can be used with any site/soil type within the limits of current IRC provisions. The new R301.2(3) Alternate Seismic Design Category maps will provide less conservative assignments of Seismic Design Category, permitted to be used when it can be determined that Site Class A, B or D is applicable. The building official may make a determination that use of the alternate maps is permitted, provided adequate information is available to determine site class, either on a community-wide basis or site-by-site basis. As in the past, alternate determination in accordance with the IBC is still permitted.

Maps have been developed by USGS to illustrate locations where Seismic Design Categories increase and decrease when comparing the 2015 IRC maps to the R301.2(2) default maps. These are included as an attachment to this code change proposal. Seyhan and Stewart (2014) and Luco et al. (2015) provide discussion of maps changes at some specific locations, including a region near Charleston, South Carolina where Seismic Design Category increased from D_2 to E. This increase is due to changes in both site coefficients and mapped ground motions, the latter due to an improved earthquake source model for the Central and Eastern United States developed through a three and one-half year collaboration of approximately 35 experts (http://www.ceusssc.com).
Seismic Design Category Change

B →
IRC 2012 → IRC 2018

- B → C
- B → D0
Seismic Design Category Change

C →
IRC 2012 → IRC 2018

- C → D0
- C → D1
- C → D2
Seismic Design Category Change

D0 →
IRC 2012 → IRC 2018

- D0 → D1
- D0 → D2
- D0 → E
Seismic Design Category Change

D1 →
IRC 2012 → IRC 2018

- D1 → D2
- D1 → E
Seismic Design Category Change
IRC 2012 → IRC 2018
D2 → E
Seismic Design Category Change
IRC 2012 → IRC 2018
C → B
Seismic Design Category Change

D0 →
IRC 2012 → IRC 2018

- D0 → C
- D0 → B
Seismic Design Category Change

D1 → D1
IRC 2012 → IRC 2018

D1 → D0
D1 → C
Seismic Design Category Change
IRC 2012 → IRC 2018
E → D2

Bibliography: [NEHRP Recommended Seismic Provisions for New Buildings and Other Structures] [FEMA P-1050-1] [Building Seismic Safety Council] [2015] [Pages 189-194] [https://www.fema.gov/media-library/assets/documents/107646]
[Geotechnical Engineering State of the Art and Practice, Keynote Lectures from GeoCongress 2012] [Site Response in NEHRP Provisions and NGA Models] [Seyahn, E. and Stew art, J.P.] [2012] [Pages 359-379]
[Earthquake Spectra] [Semi-empirical Nonlinear Site Amplification from NGA West2 Data and Simulations] [Seyhan, E. and Stew art, J.] [2014] [Volume 30, pages 1241-1256]

Cost Impact: Will increase the cost of construction
This code change can result in modest increases OR decreases in construction cost depending on geographic region. Where the R301.2(2) Seismic Design Category maps are used, limited locations as illustrated by the attached USGS maps, will increase or decrease in Seismic Design Category, increasing or decreasing seismic bracing requirements and cost a modest amount. The amount of increase will vary depending on the specific change in Seismic Design Category, the wind bracing requirements, and the particulars of the dwelling and its construction. In some cases increases in Seismic Design Category and resulting cost can be reduced if not eliminated where the site soils allow the use of the Alternate Seismic Design Category maps. NIST GCR 14-917-26, Cost Analyses and Benefits for Earthquake-Resistant Construction in Memphis, Tennessee, provides one example of the magnitude of seismic design cost impact; the increment in cost for apartment building construction between design for code-
required wind loads and national seismic design provisions is on the order of one percent of construction cost.

**Analysis:** Colored images will be converted to gray scale for printed codes. Coordinated code change proposal for the IBC is S119-16.
# 2015 International Residential Code

## TABLE R602.10.3 (4)

<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>ADJUSTMENT BASED ON:</th>
<th>STORY</th>
<th>CONDITION</th>
<th>ADJUSTMENT FACTOR&lt;sup&gt;a, b&lt;/sup&gt; [Multiply length from Table R602.10.3(3) by this factor]</th>
<th>APPLICABLE METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Story height (Section 301.3)</td>
<td>Any story</td>
<td>≤ 10 feet</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt; 10 feet and ≤ 12 feet</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Braced wall line spacing, townhouses in SDC C</td>
<td>Any story</td>
<td>≤ 35 feet</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt; 35 feet and ≤ 50 feet</td>
<td>1.43</td>
<td>All methods</td>
</tr>
<tr>
<td>3</td>
<td>Braced wall line spacing, in SDC D&lt;sub&gt;0&lt;/sub&gt;, D&lt;sub&gt;1&lt;/sub&gt;, D&lt;sub&gt;2&lt;/sub&gt;</td>
<td>Any story</td>
<td>&gt; 25 feet and ≤ 30 feet</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt; 30 feet and ≤ 35 feet</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Wall dead load</td>
<td>Any story</td>
<td>&gt; 8 psf and &lt; 15 psf</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt; 8 psf</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Roof/ceiling dead load</td>
<td>1-, 2- or 3-story building</td>
<td>≤ 15 psf</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2- or 3-story</td>
<td>&gt; 15 psf and ≤ 25 psf</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for wall supporting building</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Walls with stone or masonry veneer, townhouses in SDC C\textsuperscript{d}, \textsuperscript{e}</td>
<td>1.0</td>
<td>All methods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Walls with stone or masonry veneer, detached one- and two-family dwellings in SDC D\textsubscript{0} – D\textsubscript{2}\textsuperscript{d}, \textsuperscript{f}</td>
<td>Any story</td>
<td>See Table R602.10.6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Walls with stone or masonry veneer, detached one- and two-family dwellings in SDC D\textsubscript{0} – D\textsubscript{2}\textsuperscript{d}, \textsuperscript{f}</td>
<td>First and second story of two-story dwelling</td>
<td>See R602.10.6.5</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Interior gypsum board finish (or equivalent)</td>
<td>Any story</td>
<td>Omitted from inside face of braced wall panels</td>
<td>1.5</td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

a. Linear interpolation shall be permitted.

b. The total length of bracing required for a given wall line is the product of all applicable adjustment factors.

c. The length-to-width ratio for the floor/roof diaphragm shall not exceed 3:1. The top plate lap splice nailing shall be in accordance with Table R602.3(1), Item 13.

d. Applies to stone or masonry veneer exceeding the first story height.

e. The adjustment factor for stone or masonry veneer shall be applied to all exterior braced wall lines and all braced wall lines on the interior of the building, backing or perpendicular to and laterally supported veneered walls.

f. See Section R602.10.6.5 for requirements where stone or masonry veneer does not exceed the first-story height.
Revise as follows:

R602.10.6.5 Wall bracing for dwellings with stone and masonry veneer in Seismic Design Categories D₀, D₁ and D₂. Where stone and masonry veneer are installed in accordance with Section R703.8, wall bracing on exterior braced wall lines and braced wall lines on the interior of the building, backing or perpendicular to and laterally supporting veneered walls shall comply with this section.

Where dwellings in Seismic Design Categories D₀, D₁ and D₂ have stone or masonry veneer installed in accordance with Section R703.8, and the veneer does not exceed the first-story height, wall bracing shall be in accordance with Section R602.10.3.

Where detached one- or two-family dwellings in Seismic Design Categories D₀, D₁ and D₂ have stone or masonry veneer installed in accordance with Section R703.7, and the veneer exceeds the first-story height, wall bracing at exterior braced wall lines and braced wall lines on the interior of the building shall be constructed using Method BV-WSP in accordance with this section and Figure R602.10.6.5. Cripple walls shall not be permitted, and required interior braced wall lines shall be supported on continuous foundations.

Townhouses: Where detached one- or two-family dwellings in Seismic Design Categories D₀, D₁ and D₂ have exterior veneer installed in accordance with Section R703.8 and are braced in accordance with methods WSP or CS-WSP, veneer shall be permitted in the second story in accordance with Items 1 or 2 below, provided the dwelling does not extend more than two stories above grade plane, the veneer does not exceed 5 inches in thickness, the height of veneer on gable-end walls does not extend more than eight feet above the bearing wall top plate elevation, and the total length of braced wall panel specified by Table R602.10.3 is multiplied by 1.2 for each first and second story braced wall line.

1. The total area of the veneer on the second-story exterior walls shall be permitted to extend up to 25 percent of the occupied second floor area, or
2. The veneer on the second-story exterior walls shall be permitted to cover one side of the dwelling, including walls on bay windows and similar appurtenances within the one dwelling side.

Townhouses in Seismic Design Categories D₀, D₁ and D₂ with stone or masonry veneer exceeding the first-story height shall be designed in accordance with accepted engineering practice.

Reason: In some regions with high seismicity, home builders are commonly installing a limited area of veneer on the second story of two-story dwellings, particularly on the street side of the dwelling. In Seismic Design Categories D₀, D₁ and D₂ when any veneer extends above the first story, the 2015 IRC requires the use of BV-WSP bracing, with a complete set of tie-downs in exterior walls over all stories. This current IRC requirement can be cost-prohibitive. The intent of this code change is to provide another alternative in which a moderate amount of second story veneer is permitted with a moderate increase in the bracing wall length, while maintaining a similar level of seismic safety.

Cost impact: Will not increase the cost of construction
This proposal will notably reduce the cost of construction by removing the cost of most or all tie-downs hardware. For one example dwelling the cost savings is estimated to be approximately $3,500.00, including $3,000 for materials and labor to install tie-downs, and $500.00 in design costs.

RB239-16 : TABLE R602.10.3(4)
COBEEEN11670
RB372-16
IRC: , AV101 (New), AV101.1 (New), AV101.2 (New), AV101.3 (New), AV101.4 (New), AV102 (New), AV102.1 (New), AV103 (New), AV103.1 (New), AV103.2 (New), AV103.3 (New), AV104 (New), AV104.1 (New), AV104.2 (New), AV104.3 (New), AV104.4 (New), AV104.5 (New), AV104.6 (New), AV105 (New), AV105.1 (New), AV105.2 (New), AV105.3 (New), AV105.4 (New), AV105.5 (New), AV106 (New), AV106.1 (New), AV106.2 (New), AV106.3 (New), AV106.4 (New).


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Add new text as follows:

APPENDIX V  Seismic Repair and Seismic Retrofit of Masonry Chimneys in Existing One- and Two-Family Detached Dwellings.

SECTION  AV101  General

AV101.1 Scope. This appendix chapter provides prescriptive methods for repair of earthquake-damaged chimneys and fireboxes in one- and two-family detached dwellings. The provisions of this chapter are also allowed to be used for pre-earthquake seismic retrofit of existing masonry chimneys. The use of these provisions is limited to one- and two-family dwellings of wood or cold-formed steel light-frame construction.

AV101.2 Intent. The provisions of this chapter are intended to promote public safety and welfare by reducing the risk of earthquake-induced damage, but will not necessarily prevent damage.

AV101.3 Repair and retrofit methods. Repair or seismic retrofit of existing masonry chimneys and fireboxes shall be in accordance with one of the following methods:

1. Capping of the chimney at the roof level in accordance with Section AV103.
2. Reconstruction of the chimney from the top of the smoke chamber up in accordance with Section AV104.
3. Reconstruction of the chimney from the top of the smoke chamber up and installation of a fireplace insert in accordance with Section AV105, or
4. Full reconstruction of the firebox and chimney in accordance with Section AV106.

AV101.4 General Requirements. Other items of repair, retrofit, or reconstruction not specifically addressed in this chapter shall be in accordance with applicable requirements of this code.

SECTION  AV102  Definition

AV102.1 General. The following word and term shall, for purposes of this appendix, have the meaning shown herein.

CHIMNEY CHASE. A light-frame weather enclosure surrounding a factory-built metal chimney.

SECTION  AV103  Capping of Chimney at Roof Level

AV103.1 Scope. This section provides prescriptive methods for partial removal and capping of masonry chimneys at the roof level.
**AV103.2 Limitations.** The following limitations apply to this section:

1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the roof level. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.
2. Access to the interior of the firebox shall be completely closed off from the dwelling interior with an infill of gypsum wallboard or wood structural panel sheathing, masonry, or other material permanently affixed.

**AV103.3 Chimney partial removal and capping.** The chimney shall be removed to a distance of eight inches above the highest adjacent roofing, leaving existing roof flashing undisturbed. A sheet metal cap of galvanized steel or stainless steel shall be provided for weather protection. The cap shall extend not less than three inches down each side of the chimney. The cap shall be secured to the chimney with corrosion-resistant fasteners.

**SECTION AV104 Reconstruction From Top of Smoke Chamber**

**AV104.1 Scope.** This section provides prescriptive methods for partial removal of the masonry chimney above the smoke chamber-to-chimney transition, and reconstruction using a factory-built metal chimney enclosed in a chimney chase.

**AV104.2 Limitations.** The following limitations apply to this section:

1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the transition from smoke chamber to chimney. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.
2. Use of these provisions is limited to chimneys occurring at the exterior walls of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this appendix.
3. Where the exterior walls adjacent to the chimney are required to be fire-rated, chimney chase construction shall confirm to the requirements of Section R302.

**AV104.3 Chimney partial removal.** The chimney shall be removed down to the top of the smoke chamber-to-chimney transition, as shown in Figure AV104.3.

**FIGURE AV104.3**
Components of masonry fireplace with chimney reconstruction from top of smoke chamber up.
See Section AV104.4 for numbered items.

**AV104.4 Reconstruction.** Reconstruction shall be in accordance with the following requirements and Figure AV104.3. Item numbers below correspond to Figure AV104.3.

1. Masonry firebox. The existing masonry firebox shall remain up to the top of the smoke chamber as shown in Figure AV104.3.
2. Existing framing. Existing roof, wall, and ceiling framing shall remain. Existing framing shall be re-supported in accordance with applicable requirements of this code where existing support is disrupted.
3. Masonry veneer. Where existing masonry veneer is disrupted, re-support and anchorage of masonry veneer shall be provided in accordance with the requirements of this code.

4. Smoke chamber-to-chimney transition. The transition from the smoke chamber to the metal chimney shall be in accordance with Section AV104.5.

5. Track or sill plate. Cold-formed steel track sections matching the thickness of the studs shall be provided at the bottom of cold-formed steel chimney chase walls. Wood sill or bottom (sole) plates, having a width not less than the supported studs, shall be provided at the bottom of wood chimney chase walls. Wood sill or bottom plates shall be protected against decay in accordance with Section R317.1. Fasteners in contact with wood sill or bottom plates shall be in accordance with Section R317.3. Tracks and sill plates shall be anchored to the concrete beam in accordance with Section AV104.5

6. Chimney chase stud wall. Chimney chases shall be constructed of full-height wood studs in accordance with Section R602 or full-height cold-formed steel studs in accordance with Section R603. Studs shall be selected based on story clear height, but not less than eight feet, and applicable Section R301.2 wind criteria. Wood studs shall be not less than 2 by 3 and spaced not more than 12 inches on center. Cold-formed steel studs shall be not less than 43 mil thickness by 2-1/2 inch deep and spaced not more than 12 inches on center. The top of the chimney shall extend not less than three feet above the edge of roof and not less than two feet above the maximum roof elevation, or maximum elevation of other construction located within a ten foot horizontal dimension in any direction from the chimney. Where this requires that the chimney chase extend more than four feet above the highest roof elevation immediately adjacent to the chimney, bracing of the chimney chase shall be provided in accordance with Section AV104.6.

7. Chimney chase connection to dwelling. The chimney chase studs shall be fastened to the existing dwelling exterior wall with minimum No. 8 wood screws at 12 inches on center. The chimney chase framing shall be strapped to existing floor, ceiling and roof framing with not less than two steel straps not less than 1-1/4 inches in width and 33 mil in thickness, on two opposing sides of the chimney. The steel straps shall be fastened to steel blocking between steel studs with minimum four No. 8 sheet metal screws, or to wood blocking between wood studs with not less than four 8d common nails. The steel straps shall be fastened to existing wood floor, ceiling or roof framing with not less than four 8d common nails, or to existing steel framing with not less than four No. 8 sheet metal screws.

8. Factory-built metal chimney. Factory-built metal chimneys shall be in accordance with Section R1005.

9. Flue cap. Where required by the metal chimney manufacturer, a flue cap shall be installed, complying with the metal chimney's listing.

10. Fireblocking. Fireblocking between the chimney chase and the attic shall be installed as required by Section R302.11.

**AV104.5 Smoke chamber-to-chimney transition.** The transition from the masonry smoke chamber to the factory-built metal chimney and chimney chase shall be in accordance with the following requirements and Figure AV104.5.

1. A 12 gauge (97 mil) minimum thickness sheet steel transition cone shall be provided, as shown in Figure AV104.5. The transition cone shall have minimum 12 gauge (97 mil) thickness sheet steel top and bottom plates, and shall provide a smooth-surfaced transition between the flue opening at the top of the firebox and the anchor plate and
metal flue. The bottom plate geometry shall match the opening geometry at the top of the smoke chamber, and the top plate geometry shall be coordinated with the UL listed anchor plate. The transition cone shall be set in cementitious grout, and all transition cone seams shall be continuously welded.

2. The transition cone base plate shall be anchored to the firebox masonry with not less than four 1/2-inch diameter galvanized threaded rod anchors, as shown in Figure AV104.5. The threaded rods shall be extended to one inch below the top of the concrete beam, shall be embedded six inches into masonry at the firebox, and shall be set in cementitious grout.

3. Reinforcing steel (rebar) and a concrete beam shall be constructed around the transition cone, using the cone as the inside form in accordance with Figure AV104.5. Not less than a 1-1/2-inch clear distance shall be provided between the rebar and outside face of concrete.

4. Mineral insulation shall be installed on top of the transition cone top plate as shown in Figure AV104.5 where required by the anchor plate manufacturer.

5. A fireplace adapter (chimney anchor plate), tested in accordance with UL 103a, shall be installed in accordance with the manufacturer's installation instructions.

**FIGURE AV104.5**
Masonry smoke chamber to chimney and chimney chase transition.

**AV104.6 Chimney chase bracing to roof.** Where bracing of the chimney chase is required by Section AV104.4, Item 6, the bracing shall be connected to the chimney chase in the upper third of the chimney chase clear height above the roof (H), in accordance with Figures AV104.6(1) and AV104.6(2). Bracing steel angles not less than 2-1/2x2-1/2x1/4-inch shall be provided at not less
than two locations. The bracing slope shall be no less than 30 degrees and not more than 60
degrees from vertical.

FIGURE AV104.6
(1) Bracing of chimney chase to roof.

FIGURE AV104.6
(2) Details of chimney chase roof bracing.
SECTION AV105 Reconstruction From Top of Smoke Chamber Using a Facotry-Built Fireplace Insert

AV105.1 Scope. This section provides prescriptive methods for partial removal of the masonry chimney above the smoke chamber-to-chimney transition, and reconstruction using a factory-built fireplace insert enclosed in a chimney chase.

AV105.2 Limitations. The following limitations apply to this section:

1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the transition from smoke chamber to chimney. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.
2. Use of these provisions is limited to chimneys occurring at the exterior wall of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this chapter.
3. Where the exterior walls adjacent to the chimney are required to be fire-rated, chimney chase construction shall confirm to the requirements of Section R302.

AV105.3 Chimney partial removal. The chimney shall be removed in accordance with Section AV104.3.
AV105.4 Reconstruction. Reconstruction shall be in accordance with Section AV104.4 and the following:

1. The factory-built fireplace insert shall conform to UL 1482.
2. The factory-built chimney liner shall conform to UL 1777.
3. A hearth extension, where required by the fireplace insert listing, shall conform to UL 1618.
4. The transition from masonry firebox and chimney liner to the factory-built chimney and chimney chase shall be constructed in accordance with Section AV105.5.

AV105.5 Smoke chamber-to-chimney transition. The transition from the masonry smoke chamber to the metal chimney and chimney chase shall be in accordance with the following requirements and Figure AV105.5.

1. A 12 gauge (97 mil) thickness sheet steel transition cone shall be provided as shown in Figure AV105.5. The transition cone shall have minimum 12 gauge (97 mil) thickness sheet steel top and bottom plates, and shall provide a smooth-surfaced transition between the flue opening at the top of the firebox and the anchor plate and metal flue. The bottom plate geometry shall match and allow for attachment of the factory-built insert chimney liner. The top plate geometry shall be coordinated with the UL listed anchor plate. The transition cone shall be set in cementitious grout, and all transition cone seams shall be continuously welded.
2. The transition cone base plate shall be anchored to the firebox masonry with not less than four 1.2-inch diameter galvanized threaded rod anchors, as shown in Figure AV104.5. The threaded rods shall be extended to one inch below the top of the concrete beam, shall be embedded six inches into the masonry at the firebox, and shall be set in cementitious grout.
3. Reinforcing steel (rebar) and a concrete beam shall be constructed around the transition cone, using the cone as the inside form in accordance with Figure AV104.5. Not less than a 1-1/2 inch clear distance shall be maintained between rebar and the outside face of concrete.
4. The listed insert, chimney liner, chimney, and accessories shall be installed in accordance with the manufacturer's instructions and the listing. Clearances required by the manufacturer and the listing shall be maintained.

**FIGURE AV105.5**

Transition from masonry smoke chamber to factory-built chimney where factory-built fireplace insert is used.
SECTION AV106 Full Reconstruction of Firebox and Chimney Using a Factory-Built Fireplace

AV106.1 Scope. This section provides prescriptive methods for complete removal of the masonry chimney and firebox, and for reconstruction using a factory-built fireplace enclosed in a chimney chase.

AV106.2 Limitations. The following limitations apply to this section:

1. Use of these provisions is limited to chimneys occurring at the exterior walls of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this chapter.

2. Where the exterior walls adjacent to the chimney are required to be fire-rated, chimney chase construction shall confirm to the requirements of Section R302.

AV106.3 Chimney and firebox removal. The chimney and firebox shall be completely removed.

AV106.4 Reconstruction. Reconstruction shall be in accordance with the following requirements and Figure AV106.4. Item numbers below correspond to Figure AV106.4.

1. Existing foundation. Where a concrete footing exists, use of the concrete footing shall not be prohibited. Where the existing footing is other than concrete, the footing shall be removed and replaced in accordance with Chapter 4.

2. Extension of existing foundation. Where required to meet dimensional requirements specified by the fireplace manufacturer, the existing concrete footing shall be extended as shown in Figure AV106.4. Where footing extension is required, the
depth of the new footing shall match the depth of the existing foundation, however the bottom of the footing extension shall not be less than 12 inches below grade. The foundation extension shall be reinforced with one No. 4 bar at the top and bottom of new concrete, and adhesive dowels to the existing footing at not more than 12 inches on center. See the applicable provisions of this code for additional requirements.

3. Non-combustible hearth extension. Where required to meet the manufacturer's requirements or fireplace listing, a hearth extension confirming to UL 1618 shall be installed.

4. Factory-built fireplace. The factory-built fireplace shall comply with Section R1004.

5. Chimney chase stud walls. In single-story dwellings the studs shall extend full height from the foundation to the top of the chimney chase. In two-story dwellings the studs shall extend full-height from the second floor to the top of the chimney chase. Wood stud walls shall be constructed in accordance with Section R602. Cold-formed steel stud walls shall be constructed in accordance with Section R603. The top of the chimney shall extend not less than three feet above the roof and not less than two feet above the elevation of the roof or other construction within a ten foot dimension. Where this requires that the chimney chase extend more than four feet above the highest roof elevation immediately adjacent to the chimney, bracing of the chimney chase shall be provided in accordance with Section AV104.6.

6. Existing wall framing. Where existing wall framing requires modification to accommodate the new fireplace opening, framing shall be reconstructed in accordance with applicable requirements of Chapter 6.

7. Factory-built metal chimney. A listed and labeled factory-built metal chimney supplied by the fireplace manufacturer shall be installed in accordance with the manufacturer's installation instructions and listing.

8. Stud blocking. Continuous blocking shall be installed at 4'-0" maximum vertical spacing. Blocking size shall match studs.

9. Chimney chase connection to dwelling. The chimney chase studs shall be fastened to the existing residence exterior wall with not less than No. 8 wood screws at 12 inches on center. The chimney chase framing shall be strapped to the existing floor, ceiling, and roof framing with not less than two steel straps at each location. The steel straps shall be not less than 1-1/4-inch by 33 mil in thickness, and installed on two opposing faces of the chimney chase. The steel straps shall be fastened to steel blocking between steel studs with not less than four No. 8 sheet metal screws, or to wood blocking between wood studs with not less than four 8d common nails. The steel straps shall be fastened to existing wood floor, ceiling, or roof framing with minimum four 8d common nails or the existing steel framing with not less than four No. 8 sheet metal screws.

10. Existing roof, ceiling and floor framing. Existing roof, ceiling and floor framing shall remain. Existing framing shall be re-supported in accordance with applicable requirements of this code where existing support is disrupted.

11. Chimney chase. The chimney chase shall be constructed as required in item 6.

12. Chimney cap. A framed chimney cap shall be constructed at the top of the chimney chase.

13. Flue cap. Where required by the factory-built fireplace manufacturer, a flue cap shall be installed, complying with the fireplace listing.

14. Fireblocking. Fireblocking between the chimney chase and the attic or second floor framing shall be installed as required by Section R302.11.

FIGURE AV106.4
Components of a reconstructed fireplace and chimney with factory-built fireplace in chimney chase.
Reference standards type: This reference standard is new to the ICC Code Books
Add new standard(s) as follows:
UL 103a-2005, Outline of Investigation for Masonry Fireplace Adapters for Residential Type and Building Heating Appliance Chimneys.

**Reason:** In most recent moderate to major earthquakes, widespread damage has occurred to masonry chimneys and fire boxes. As a result, jurisdictions have needed to provide direction for repair. Following the 2014 South Napa Earthquake, FEMA funded the writing of a recovery advisory (FEMA DR-4193-RA.1) addressing recommendations for repair of earthquake damaged chimneys and fireboxes. The recommendations were drawn in part from repair approaches developed post-earthquake by the Cities of Napa, Seattle and Los Angeles. This code change makes the recovery advisory guidance available to all jurisdictions to adopt on an as-needed basis, and permits the same approaches developed for repair to be used for the voluntary retrofit of chimneys prior to an earthquake.

This appendix chapter requires the construction of chimney chases even though UL listed metal chimneys are not required to be enclosed in chases. This is done in order to return to the pre-removal enclosure geometry, allowing the wall and roof weather-barrier systems to be returned to their pre-removal configuration. This is not meant to prohibit alternative approaches being approved by the building official.

**Cost impact:** Will not increase the cost of construction
The provisions of this appendix chapter will reduce the cost of repairing earthquake-damaged chimneys. The alternative methods of this chapter have estimated costs from less than $1,000.00 to approximately $5,000.00, as compared to a cost of $10,000.00 or higher for complete reconstruction of a masonry fireplace and chimney.

**Analysis:** A review of the standard(s) proposed for inclusion in the code, UL 103a, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2016.
CONTEMPORARY UNITED STATES OF 0.2-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING). SITE CLASS B

FIGURE 1613.3.1(2-1): (2)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCEP) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTEMPORARY UNITED STATES OF 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING). SITE CLASS B

FIGURE 1613.3.1(2-2): (2)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCEP) GROUND MOTION RESPONSE ACCELERATIONS FOR THE CONTEMPORARY UNITED STATES OF 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING). SITE CLASS B

FIGURE 1613.3.1(3)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCEP) GROUND MOTION RESPONSE ACCELERATIONS FOR HAWAII OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING). SITE CLASS B

FIGURE 1613.3.1(4)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCEP) GROUND MOTION RESPONSE ACCELERATIONS FOR ALASKA OF 0.2-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING). SITE CLASS B

FIGURE 1613.3.1(5)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCEP) GROUND MOTION RESPONSE ACCELERATIONS FOR PUERTO RICO AND THE UNITED STATES VIRGIN ISLANDS OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING). SITE CLASS B

FIGURE 1613.3.1(7)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCEP) GROUND MOTION RESPONSE ACCELERATIONS FOR GUAM AND THE NORTHERN MARIANA ISLANDS OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING). SITE CLASS B

FIGURE 1613.3.1(8)
RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE (MCEP) GROUND MOTION RESPONSE ACCELERATIONS FOR AMERICAN SAMOA OF 0.2- AND 1-SECOND SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING). SITE CLASS B

Committee Reason: This code change updates the IBC earthquake ground motion maps to provide consistency with the latest edition of the referenced standard, ASCE 7, which was update in ASCEA-16. The modification corrects the map titles by deleting "site class B".

Assembly Action: None
S147-16
Committee Action: Approved as Submitted
Committee Reason: This code change will require special inspection for elements that are problems and are capable of taking out a building for many months if they fail.
Assembly Action: None

S242-16
Committee Action: Approved as Modified
Modification:
2015 International Building Code
1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, Chapters 11, 12, 13, 15, 17 and 18, as applicable. The seismic design category for a structure is permitted to be determined in accordance with Section 1610 or ASCE 7.

Exceptions:
1. Detached one- and two-family dwellings, assigned to Seismic Design Category A, B or C, or located where the mapped short-period spectral response acceleration, $S_a$, is less than 0.4 g.
2. The seismic force-resisting system of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their or seismic criteria such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.
5. Reference in ASCE 7 to Chapter 14 shall not apply, except as specifically required herein.

Committee Reason: This proposal updates IBC provisions for coordination with the latest edition of the referenced standard, ASCE 7, which was updated in ADHAA-16. The modification reinstates the exclusion of Chapter 14 in ASCE 7.
Assembly Action: None

RB17-16
Committee Action: Approved as Submitted
Committee Reason: The updated maps in this proposal are based on more current information and they provide a measure of flexibility that has not been included in the code in the past.
Assembly Motion: Disapprove
Online Vote Results: Failed
Support: 34.18% (94) Oppose: 65.82% (181)
Assembly Action: None

RB239-16
Errata: In Table R602.10.3(4), at Item 6 under story, the icons are not deleted.
Committee Action: Approved as Submitted
Committee Reason: The committee felt this is a good change as it adds alternatives that allows a minimal amount of masonry veneer to the second story in SDC D1, D2.
Assembly Action: None

RB372-16
Committee Action: Disapproved
Committee Reason: The proponents and opponents have indicated that there are flaws in the proposal that they would like to address in the public comment period. A generic repair without thorough examination by a qualified professional is inappropriate. This is a good concept. Something based on this concept may be appropriate as an appendix.
Assembly Action: None
APPENDIX 3
Proposed Change as Submitted

Proponent: John Gillengerten (john5155@live.com); Henry Green, John D. Gillengerten, representing National Institute of Building Sciences Building Seismic Safety Council Code Resource Support Committee

2015 International Building Code

Revise as follows:

1705.12.6 Plumbing, mechanical and electrical components: Periodic special inspection of plumbing, mechanical and electrical components shall be required for the following:

1. Anchorage of electrical equipment for emergency and standby power systems in structures assigned to Seismic Design Category C, D, E or F.
2. Anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F.
3. Installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F.
4. Installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to Seismic Design Category C, D, E or F.
5. Installation and anchorage of vibration isolation systems in structures assigned to Seismic Design Category C, D, E or F where the approved construction documents require a nominal clearance of $\frac{1}{4}$ inch (6.4 mm) or less between the equipment support frame and restraint.
6. Installation of mechanical and electrical equipment including duct work, piping systems and their structural supports where automatic fire sprinkler systems are installed in structures assigned to Seismic Design Category C, D E or F to verify either of the following:
   6.1 Minimum clearances have been provided as required by Section 13.2.3 ASCE/SEI 7-10.
   6.2 That a nominal clearance of at least 3 inches (76 mm) has been be provided between fire protection sprinkler system drops and sprigs and structural members not used collectively or independently to support the sprinklers, or from equipment attached to the building structure, or from other systems’ piping.

Where flexible sprinkler hose fittings are used, special inspection of minimum clearances is not required.

Reason: Experience in recent earthquakes has shown that pounding between sprinkler piping drops and sprigs and adjacent nonstructural components such as pipes and ducts has resulted in pipe connection failures and accidental activation, which resulted in flooding and potentially compromising the operability of the system should fire follow earthquake occur.

ASCE/SEI 7-16 identifies fire protection sprinkler systems as components that are required to function for life-safety purposes after an earthquake, classifying them as a Designated Seismic System. Section 13.2.3 ASCE/SEI 7-16 requires that interaction between Designated Seismic Systems and adjacent components be avoided. The intent is described in Section C13.2.3 of the ASCE/SEI 7-16 commentary, which states in part:

... It is the intent of the standard that the seismic displacements considered include both relative displacement between multiple points of support (addressed in Section 13.3.2) and, for mechanical and electrical components, displacement within the component assemblies. Impact of components must be avoided, unless the components are fabricated of ductile materials that have been shown to be capable of accommodating the expected impact loads. ...

It further cites specific examples using fire protection sprinkler systems to illustrate the types of interactions to be avoided.

... Consequential damage may occur because of displacement of components and systems between support points. For example, in older suspended ceiling installations, excessive lateral displacement of a ceiling system may fracture sprinkler heads that project through the ceiling. A similar situation may arise if sprinkler heads projecting from a small-diameter branch line pass through a rigid ceiling system. Although the branch line may be properly restrained, it may still displace sufficiently between lateral support points to affect other components or systems. ...

Maintaining adequate clearances is critical to good seismic performance of fire protection sprinkler systems, and Section 13.2.3 ASCE/SEI 7-16 requires that interaction between Designated Seismic Systems and adjacent components be avoided.

This proposal provides periodic special inspection to verify that adequate clearance is provided between sprinkler drops and sprigs and adjacent structural and nonstructural components. In some cases, an evaluation of the required clearance to avoid interaction is not provided by the registered design professionals. In such cases, a nominal 3 inch clearance from adjacent items is permitted, which is the same as the NFPA13 clearance requirement from structural members to pounding. Due to their inherent flexibility, clearance between listed flexible sprinkler hose fittings and other components, equipment, or structural members is not required.

Cost Impact: Will increase the cost of construction
This change might have a very minor impact on the cost of installation of electrical, mechanical and plumbing installations and their inspection.

**Public Hearing Results**

**Committee Action:** Approved as Submitted

**Committee Reason:** This code change will require special inspection for elements that are problems and are capable of taking out a building for many months if they fail.

**Assembly Action:** None

**Individual Consideration Agenda**

**Public Comment 1:**

**Proponent:** John Gillengerten, representing National Institute of Building Sciences Building Seismic Safety Council Code Resource Support Committee (johng5155@live.com) requests Approve as Modified by this Public Comment.

**Modify as Follows:**

2015 International Building Code

1705.12.6 Plumbing, mechanical and electrical components *Periodic special inspection* of plumbing, mechanical and electrical components shall be required for the following:

1. Anchorage of electrical equipment for emergency and standby power systems in structures assigned to Seismic Design Category C, D, E or F.
2. Anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F.
3. Installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F.
4. Installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to Seismic Design Category C, D, E or F.
5. Installation and anchorage of vibration isolation systems in structures assigned to Seismic Design Category C, D, E or F where the approved construction documents require a nominal clearance of $\frac{1}{4}$ inch (6.4 mm) or less between the equipment support frame and restraint.
6. Installation of mechanical and electrical equipment including duct work, piping systems and their structural supports where automatic fire sprinkler systems are installed in structures assigned to Seismic Design Category C, D E or F to verify either of the following:
   6.1. Minimum clearances have been provided as required by Section 13.2.3 ASCE/SEI 7-16; or
   6.2. That a nominal clearance of at least 3 inches (76 mm) has been provided between fire protection sprinkler system drops and sprigs and structural members not used collectively or independently to support the sprinklers, or from equipment attached to the building structure, or from other systems' piping. Where flexible sprinkler hose fittings are used for sprinkler drops, special inspection of minimum clearances is not required.

**Commenter's Reason:** This editorial change was requested by a member of the Group B Hearings Structural Committee in Louisville. Flexible hoses are only used for sprinkler drops.

**Proponent:** Ed Berkel, representing ICC Code Correlation Committee (ccc@iccsafe.org) requests Disapprove.

**Commenter's Reason:** The Code Correlation Committee requests Disapproval of this code change proposal in order to bring a correlation issue to the attention of the full membership at the Public Comment Hearings and to allow the membership to coordinate action on this code change proposal with action taken on Code Change Proposal ADM94-16.

ADM94-16 is the administrative update to referenced standards in the I-Codes. One of these standards, ASCE7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures, was proposed for update to ASCE7-16. However, a successful assembly motion requests that the referenced ASCE7 remain at ASCE7-10 as it presently is referenced in the 2015 I-Codes. This code change proposal coordinates with and relies upon reference to ASCE7-16.
The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP#44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.
Proposed Change as Submitted

Proponent: Satyendra Ghosh, S. K. Ghosh Associates Inc., representing Federal Emergency Management Agency - National Institute of Building Sciences Building Seismic Safety Council and Jennifer Goupil, American Society of Civil Engineers, representing the American Society of Civil Engineers (skghoshinc@gmail.com)

2015 International Building Code

Revise as follows:

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, excluding Chapter 14, Chapters 11, 12, 13, 15, 17 and Appendix 11A 18, as applicable. The seismic design category for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7.

Exceptions:
1. Detached one- and two-family dwellings, assigned to Seismic Design Category A, B or C, or located where the mapped short-period spectral response acceleration, $S_g$, is less than 0.4 g.
2. The seismic force-resisting system of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.

1901.2 Plain and reinforced concrete. Structural concrete shall be designed and constructed in accordance with the requirements of this chapter and ACI 318 as amended in Section 1905 of this code. Except for the provisions of Sections 1904 and 1907, the design and construction of slabs on grade shall not be governed by this chapter unless they transmit vertical loads or lateral forces from other parts of the structure to the soil. Precast concrete diaphragms in buildings assigned to Seismic Design Category C, D, E, or F shall be designed in accordance with the requirements of ASCE 7 Section 14.2.4.

Reason: Seismic design of diaphragms is addressed in Sections 12.10.1 and 12.10.2 of ASCE 7-16. These sections are essentially the same as Sections 12.10.1 and 12.10.2 of ASCE 7-10. Based on significant work done by Issue Team 6 on Diaphragms of the Building Seismic Safety Council (BSSC) Provisions Update Committee (PUC), an alternative seismic design force level for diaphragms has been included in new Section 12.10.3 of ASCE 7-16. The alternative design force level is mandated for precast concrete diaphragms in buildings assigned to Seismic Design Category (SDC) C and above. It is permitted for other precast concrete diaphragms, cast-in-place concrete diaphragms, and wood diaphragms. At the same time, new precast diaphragm design provisions have been included in new Section 14.2.4 of ASCE 7-16, which goes hand-in-hand with the alternative diaphragm design force level in Section 12.10.3 of ASCE 7-16. The Section 14.2.4 requirements are based on multi-year, multi-million-dollar research, known as DSDM (Diaphragm Seismic Design Methodology) research, sponsored by the National Science Foundation (NSF), the Precast/Prestressed Concrete Institute (PCI), and the Pankow Foundation.

An integral part of the precast diaphragm design procedure of ASCE 7-16 Section 14.2.4 is a connector qualification methodology that was also developed in the course of DSDM research. ASCE 7-16 Section 12.10.3 will automatically be part of the 2018 IBC, presuming it adopts ASCE 7-16; however, Section 14.2.4 will not be, because 2015 IBC Section 1613 excludes Section 14.2 from the adoption of ASCE 7. This code change is meant to take care of this problem and make ASCE 7-16 Section 14.2.4 a part of the 2018 IBC.

Appendix 11A is no longer part of ASCE 7-16. Instead of excluding any particular chapter(s), this proposed change calls out the primary ASCE 7 chapters that charge specific parts of the design process. These chapters, in turn, reference other ASCE 7 sections, other ASCE 7 chapters and other standards for portions of the requirements. All needed parts of ASCE 7 are therefore incorporated, including the ground motions.

Cost Impact: Will increase the cost of construction

The cost of precast concrete diaphragms will go up - not so much because of this proposal, but because the higher design force level for precast concrete diaphragms in Section 12.10.3 of ACE 7-16, which is mandated to be used with the proposed design procedure. The required use of high-deformability connectors with the Reduced Design Option may also contribute to an increase in cost. Finally, the required use of moderate-deformability connectors with the Basic Design Option may result in modest cost increases.
Public Hearing Results

Committee Action: Approved as Modified

Modification:

2015 International Building Code

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, Chapters 11, 12, 13, 15, 17 and 18, as applicable. The seismic design category for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7.

- Exceptions:
  1. Detached one- and two-family dwellings, assigned to Seismic Design Category A, B or C, or located where the mapped short-period spectral response acceleration, $S_S$, is less than 0.4 g.
  2. The seismic force-resisting system of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
  3. Agricultural storage structures intended only for incidental human occupancy.
  4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.
  5. Reference in ASCE 7 to Chapter 14 shall not apply, except as specifically required herein.

Committee Reason: This proposal updates IBC provisions for coordination with the latest edition of the referenced standard, ASCE 7, which was updated in ADM94-16. The modification reinstates the exclusion of Chapter 14 in ASCE 7.

Assembly Action: None

Individual Consideration Agenda

Proponent: Ed Berkel, representing ICC Code Correlation Committee (ccc@icc.org) requests Disapprove.

Commenter's Reason: The Code Correlation Committee requests Disapproval of this code change proposal in order to bring a correlation issue to the attention of the full membership at the Public Comment Hearings and to allow the membership to coordinate action on this code change proposal with action taken on Code Change Proposal ADM94-16.

ADM94-16 is the administrative update to referenced standards in the I-Codes. One of these standards, ASCE7, Minimum Design Loads and Associated Criteria for Buildings and Other Structures, was proposed for update to ASCE7-16. However, a successful assembly motion requests that the referenced ASCE7 remain at ASCE7-10 as it presently is referenced in the 2015 I-Codes. This code change proposal coordinates with and relies upon reference to ASCE7-16.

The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP/44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.
2015 International Residential Code
Delete and substitute as follows:

**FIGURE R301.2(2)**
SEISMIC DESIGN CATEGORIES—SITE CLASS D

*(Existing code figure not shown for clarity)*

![Map of Seismic Design Categories for Site Class D](image-url)
FIGURE R301.2(2)-continued
SEISMIC DESIGN CATEGORIES—SITE CLASS D

(Existing code figure not shown for clarity)
FIGURE R301.2(2)-continued
SEISMIC DESIGN CATEGORIES—SITE CLASS D

(Existing code figure not shown for clarity)
FIGURE R301.2(2)
SEISMIC DESIGN CATEGORIES

FIGURE R301.2(2)-continued
SEISMIC DESIGN CATEGORIES—SITE CLASS D

(Existing code figure not shown for clarity)
Revise as follows:

**R301.2.2.1.1 Alternate determination of seismic design category.** The seismic design categories and corresponding short-period design spectral response accelerations, $\mathbf{S_{DP}}$, shown in Figure R301.2(2) are based on soil Site Class D, used as an assumed default, as defined in Section 1613.3.2 of the International Building Code. If soil conditions are other than determined by the building official to be Site Class A, B, or D, the short-period seismic design category and short-period design spectral
response accelerations, $S_{D_S}$, for a site shall be allowed to be determined in accordance with Figure R301.2(3) or Section 1613.3 of the International Building Code. The value of $S_{D_S}$ determined in accordance with Section 1613.3 of the International Building Code is permitted to be used to set the seismic design category in accordance with Table R301.2.2.1.1, and to interpolate between values in Tables R602.10.3(3), R603.9.2(1) and other seismic design requirements of this code.

R301.2.2.1.2 Alternative determination of Seismic Design Category E. Buildings located in Seismic Design Category E in accordance with Figure R301.2(2), or Figure R301.2(3) where applicable, are permitted to be reclassified as being in Seismic Design Category $D_2$ provided that one of the following is done:

1. A more detailed evaluation of the seismic design category is made in accordance with the provisions and maps of the International Building Code. Buildings located in Seismic Design Category E in accordance with Table R301.2.2.1.1, but located in Seismic Design Category $D$ in accordance with the International Building Code, shall be permitted to be designed using the Seismic Design Category $D_2$ requirements of this code.

2. Buildings located in Seismic Design Category E that conform to the following additional restrictions are permitted to be constructed in accordance with the provisions for Seismic Design Category $D_2$ of this code:

2.1 All exterior shear wall lines or braced wall panels are in one plane vertically from the foundation to the uppermost story.

2.2 Floors shall not cantilever past the exterior walls.

2.3 The building is within the requirements of Section R301.2.2.2.5 for being considered as regular.

Add new text as follows:

**FIGURE R301.2(3)**
Alternate Seismic Design Categories

**FIGURE R301.2(3)-continued**
Alternate Seismic Design Categories
FIGURE R301.2(3)-continued
Alternate Seismic Design Categories
FIGURE R301.2(3)-continued
Alternate Seismic Design Categories
REFERENCES


FIGURE R301.2(3)-continued
Alternate Seismic Design Categories
**Reason:** This proposal incorporates the most current seismic design maps prepared by the U.S. Geological Survey (USGS) in collaboration with the Federal Emergency Management Agency (FEMA) and the Building Seismic Safety Council (BSSC). A separate coordinated code change updates the seismic design maps in the IBC to be consistent with these IRC maps and the maps incorporated into ASCE 7-16. In addition to incorporating updated information on faults and ground motion attenuation, these maps incorporate revisions to site coefficients $F_B$ and $F_V$. Technical reasons behind the revisions are documented in FEMA P-1050-1, 2015 Edition, Sections C11.4.2 (site classes), C11.4.3 (site coefficients), and C22 (seismic maps). Further documentation is provided in Seyhan and Stewart (2012, 2014) and Luco et al. (2015). As excerpted from FEMA P-1050-1, 2015 Edition, Section C11.4.3: "Motivation for the revisions to these site factors includes (Seyhan and Stewart, 2012): (1)
updating the reference site condition used for the factors to match the condition on the national maps, which in \( V_s = 760 \text{ m/s} \) (2500 ft/s); (2) incorporating into the factors the substantial knowledge gains (stemming in large part from an enormous increase in available data) on site response over the past two decades.”

As in past versions, the IRC seismic design maps directly indicate Seismic Design Category for a given location. Development of the maps in the past incorporated a default assumption of a Site (soil) Class D, which provided the most conservative assignment of Seismic Design Category. For this update, (1) changes made to the site coefficients resulted in Site Class D no longer being the most critical site class at all spectral response acceleration levels, and (2) spectral response accelerations and resulting Seismic Design Categories increased at a number of locations when the most critical site coefficients were used. Because of these two effects, it is proposed that two sets of maps be adopted into the IRC. The updated R301.2(2) Seismic Design Category maps will provide the most conservative assignment of Seismic Design Category and can be used with any site/soil type within the limits of current IRC provisions. The new R301.2(3) Alternate Seismic Design Category maps will provide less conservative assignments of Seismic Design Category, permitted to be used when it can be determined that Site Class A, B or D is applicable. The building official may make a determination that use of the alternate maps is permitted, provided adequate information is available to determine site class, either on a community-wide basis or site-by-site basis. As in the past, alternate determination in accordance with the IBC is still permitted.

Maps have been developed by USGS to illustrate locations where Seismic Design Categories increase and decrease when comparing the 2015 IRC maps to the R301.2(2) default maps. These are included as an attachment to this code change proposal. Seyhan and Stewart (2014) and Luco et al. (2015) provide discussion of maps changes at some specific locations, including a region near Charleston, South Carolina where Seismic Design Category increased from \( D_2 \) to E. This increase is due to changes in both site coefficients and mapped ground motions, the latter due to an improved earthquake source model for the Central and Eastern United States developed through a three and one-half year collaboration of approximately 35 experts (http://www.ceu-scc.com).
Seismic Design Category Change

C →
IRC 2012 → IRC 2018

- C → D0
- C → D1
- C → D2
Seismic Design Category Change

IRC 2012 → IRC 2018

D2 → E
Seismic Design Category Change

D0 →
IRC 2012 → IRC 2018

- D0 → C
- D0 → B
Seismic Design Category Change

D2 →
IRC 2012 → IRC 2018

- D2 → D1
- D2 → D0
- D2 → C
Bibliography: [NEHRP Recommended Seismic Provisions for New Buildings and Other Structures] [FEMA P-1050-1] [Building Seismic Safety Council] [2015] [Pages 189-194] [https://www.fema.gov/media-library/assets/documents/107646] [Geotechnical Engineering State of the Art and Practice, Keynote Lectures from GeoCongress 2012] [Site Response in NEHRP Provisions and NGA Models] [Seyah, E. and Stewart, J.P.] [2012] [Pages 359-379] [Earthquake Spectra] [Semi-empirical Nonlinear Site Amplification from NGA West2 Data and Simulations] [Seyhan, E. and Stewart, J.] [2014] [Volume 30, pages 1241-1256] [Earthquake Spectra] [Updates to Building-Code Maps for the 2015 NEHRP Recommended Seismic Provisions] [Luco, N., Bachman, R.E., Crouse, C.B., Harris, J.R., Hooper, J.D., Kircher, C.A., Caldwell, P.J., and Rukstales, K.S.] [2015] [Volume 31, pages S245-S271]

Cost Impact: Will increase the cost of construction
This code change can result in modest increases OR decreases in construction cost depending on geographic region. Where the R301.2(2) Seismic Design Category maps are used, limited locations as illustrated by the attached USGS maps, will increase or decrease in Seismic Design Category, increasing or decreasing seismic bracing requirements and cost a modest amount. The amount of increase will vary depending on the specific change in Seismic Design Category, the wind bracing requirements, and the particulars of the dwelling and its construction. In some cases increases in Seismic Design Category and resulting cost can be reduced if not eliminated where the site soils allow the use of the Alternate Seismic Design Category maps. NIST GCR 14-917-26, Cost Analyses and Benefits for Earthquake-Resistant Construction in Memphis, Tennessee, provides one example of the magnitude of seismic design cost impact; the increment in cost for apartment building construction between design for code-required wind loads and national seismic design provisions is on the order of one percent of construction cost.

Analysis: Colored images will be converted to gray scale for printed codes.
Coordinated code change proposal for the IBC is S119-16.

Public Hearing Results

Committee Action: Approved as Submitted
Committee Reason: The updated maps in this proposal are based on more current information and they provide a measure of flexibility that has not been included in the code in the past.

Assembly Motion: Disapprove
Online Vote Results:
Support: 34.18% (94) Oppose: 65.82% (181)
Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Gary Ehrlich, National Association of Home Builders, representing National Association of Home Builders (gehrlich@nahb.org) requests Approve as Modified by this Public Comment.

Modify as Follows:

2015 International Residential Code

R301.2(2)-1 (2)
SEISMIC-DESIGN-CATEGORIES
FIGURE R301.2(2) - continued
SEISMIC DESIGN CATEGORIES

R301.2(2)-6 (2)
SEISMIC DESIGN CATEGORIES
FIGURE R301.2(2) - continued
SEISMIC DESIGN CATEGORIES

R301.2(2) - (2)
SEISMIC DESIGN CATEGORIES

EXPLANATION
Seismic Design Category

<table>
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<th>Category</th>
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<td>67</td>
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<tr>
<td>B</td>
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</tr>
<tr>
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</tr>
</tbody>
</table>

REFERENCES

R301.2.2.1.1 Alternate determination of seismic design category. The seismic design categories and corresponding short-period design spectral response accelerations, $S_{DS}$, shown in Figure R301.2(2) are based on soil Site Class D used as an assumed default, as defined in Section 1613.3.2 of the International Building Code. If soil conditions are determined by the building official to be other than Site Class A, B, or D, the seismic design category and short-period design spectral response accelerations, $S_{DS}$, for a site shall be allowed to be determined in accordance with Figure R301.2(2) or Section 1613.3 of the International Building Code. Where required by the building official due to local soil conditions, the seismic design category and short-period design spectral response accelerations, $S_{DS}$, for a site shall be determined in accordance with Section 1613.3 of the International Building Code. The value of $S_{DS}$ determined in accordance with Section 1613.3 of the International Building Code is permitted to be used to set the seismic design category in accordance with Table R301.2.2.1.1, and to interpolate between values in Tables R602.10.2(3), R603.9.2(1) and other seismic design requirements of this code.

R301.2.2.1.2 Alternative determination of Seismic Design Category E. Buildings located in Seismic Design Category E in accordance with Figure R301.2(2) or Figure R301.2(3) where applicable, are permitted to be reclassified as being in Seismic Design Category D provided that one of the following is done:

1. A more detailed evaluation of the seismic design category is made in accordance with the provisions and maps of the International Building Code. Buildings located in Seismic Design Category E in accordance with Table R301.2.2.1.1, but located in Seismic Design Category D in accordance with the International Building Code, shall be permitted to be designed using the Seismic Design Category D requirements of this code.

2. Buildings located in Seismic Design Category E that conform to the following additional restrictions are permitted to be constructed in accordance with the provisions for Seismic Design Category D of this code:

   2.1 All exterior shear wall lines or braced wall panels are in one plane vertically from the foundation to the uppermost story.

   2.2 Floors shall not cantilever past the exterior walls.

   2.3 The building is within the requirements of Section R301.2.2.2.5 for being considered as regular.
FIGURE R301.2(9) R301.2(2)-continued
Alternate Seismic Design Categories Categories-Site Class D
FIGURE R301.2(3) R301.2(2)-continued
Alternate-Seismic Design Categories - Site Class D
Commenter's Reason: The purpose of this public comment is to adopt the maps of "Alternate Seismic Design Categories" as the base maps, instead of providing two sets of maps and leaving it to the building department to determine which one builders in the community can use.

Both sets of maps proposed by RB17-16 are based on the 2014 Update of the United States National Seismic Hazard Maps produced by USGS and adopted by the 2014 NEHRP Provisions. The exact same ground motion data was used to develop both maps. The only difference is that the 2014 NEHRP provisions and ASCE 7-16 impose a penalty on sites for which no geotechnical investigation has been done, or for which one has been done but the site class has not been determined. This penalty stems from a new study of site coefficients that suggests at higher ground motions the coefficients for Site Class C conditions (stiff soil with some rock) are higher than Site Class D (stiff soil). Sites that are assumed to be Site Class D without a geotechnical determination are forced to use the higher Site Class C coefficients to avoid potential issues due to misclassification of the site.

No field observations or other justification was provided to the NEHRP and ASCE 7-16 committees that a widespread problem with misclassified Site Classes actually exists, in either commercial or residential construction. One- and two-family dwellings, even those not constructed to the IRC, have traditionally performed well in seismic events if any cripple walls were properly braced, a sufficient amount of wall bracing was provided on exterior walls, brick veneer was anchored with ties at an appropriate spacing, and the dwelling was not constructed on an unstable hillside or over liquefiable soils. These elements of design, detailing and siting are much more critical to building performance than a 10% or 20% difference in the short-period design spectral response acceleration. This is especially true in the Central and Eastern United States, given the conservative estimates of historical earthquakes and resulting conservative biases in the ground motion data.

To address concerns about soil conditions for which the site factors are higher than those for Site Class D, the ability of the building official to require the seismic design category be determined using the IBC and ASCE 7 is maintained. In fact, it is strengthened — under the existing code language use of the IBC for other site classes is allowed, but it is not required, even in a case such as Site Class E and short period spectral response accelerations less than 1.0g where a higher SDS would result even under the current site factors. Therefore, the text is modified to retain the option of using the IBC and ASCE 7 for any Site Class other than Site Class D, but require the use of the IBC and ASCE 7 if the building official determines that higher site factors apply due to Site Class C, E or F soils being present.

2015 International Residential Code
Add new text as follows:

APPENDIX V  Seismic Repair and Seismic Retrofit of Masonry Chimneys in Existing One- and Two-Family Detached Dwellings.

SECTION AV101 General

AV101.1 Scope. This appendix chapter provides prescriptive methods for repair of earthquake-damaged chimneys and fireboxes in one- and two-family detached dwellings. The provisions of this chapter are also allowed to be used for pre-earthquake seismic retrofit of existing masonry chimneys. The use of these provisions is limited to one- and two-family dwellings of wood or cold-formed steel light-frame construction.

AV101.2 Intent. The provisions of this chapter are intended to promote public safety and welfare by reducing the risk of earthquake-induced damage, but will not necessarily prevent damage.

AV101.3 Repair and retrofit methods. Repair or seismic retrofit of existing masonry chimneys and fireboxes shall be in accordance with one of the following methods:

1. Capping of the chimney at the roof level in accordance with Section AV103.
2. Reconstruction of the chimney from the top of the smoke chamber up in accordance with Section AV104.
3. Reconstruction of the chimney from the top of the smoke chamber up and installation of a fireplace insert in accordance with Section AV105, or
4. Full reconstruction of the firebox and chimney in accordance with Section AV106.

AV101.4 General Requirements. Other items of repair, retrofit, or reconstruction not specifically addressed in this chapter shall be in accordance with applicable requirements of this code.

SECTION AV102 Definition

AV102.1 General. The following word and term shall, for purposes of this appendix, have the meaning shown herein.

CHIMNEY CHASE. A light-frame weather enclosure surrounding a factory-built metal chimney.

SECTION AV103 Capping of Chimney at Roof Level

AV103.1 Scope. This section provides prescriptive methods for partial removal and capping of masonry chimneys at the roof level.

AV103.2 Limitations. The following limitations apply to this section:

1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the roof level. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.
2. Access to the interior of the firebox shall be completely closed off from the dwelling interior with an infill of gypsum wallboard or wood structural panel sheathing, masonry, or other material permanently affixed.

AV103.3 Chimney partial removal and capping. The chimney shall be removed to a distance of eight inches above the highest adjacent roofing, leaving existing roof flashing undisturbed. A sheet metal cap of galvanized steel or stainless steel shall be provided for weather protection. The cap shall extend not less than three inches down each side of the chimney. The cap shall be secured to the chimney with corrosion-resistant fasteners.

SECTION AV104 Reconstruction From Top of Smoke Chamber

AV104.1 Scope. This section provides prescriptive methods for partial removal of the masonry chimney above the smoke chamber-to-chimney transition, and reconstruction using a factory-built metal chimney enclosed in a chimney chase.

AV104.2 Limitations. The following limitations apply to this section:

1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the
transition from smoke chamber to chimney. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.

2. Use of these provisions is limited to chimneys occurring at the exterior walls of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this appendix.

3. Where the exterior walls adjacent to the chimney are required to be fire-rated, chimney chase construction shall confirm to the requirements of Section R302.

**AV104.3 Chimney partial removal.** The chimney shall be removed down to the top of the smoke chamber-to-chimney transition, as shown in Figure AV104.3.

**FIGURE AV104.3**

Components of masonry fireplace with chimney reconstruction from top of smoke chamber up.

See Section AV104.4 for numbered items.

**AV104.4 Reconstruction.** Reconstruction shall be in accordance with the following requirements and Figure AV104.3. Item numbers below correspond to Figure AV104.3.

1. **Masonry firebox.** The existing masonry firebox shall remain up to the top of the smoke chamber as shown in Figure AV104.3.

2. **Existing framing.** Existing roof, wall, and ceiling framing shall remain. Existing framing shall be re-supported in accordance with applicable requirements of this code where existing support is disrupted.

3. **Masonry veneer.** Where existing masonry veneer is disrupted, re-support and anchorage of masonry veneer shall be provided in accordance with the requirements of this code.
4. **Smoke chamber-to-chimney transition.** The transition from the smoke chamber to the metal chimney shall be in accordance with Section AV104.5.

5. **Track or sill plate.** Cold-formed steel track sections matching the thickness of the studs shall be provided at the bottom of cold-formed steel chimney chase walls. Wood sill or bottom (sole) plates, having a width not less than the supported studs, shall be provided at the bottom of wood chimney chase walls. Wood sill or bottom plates shall be protected against decay in accordance with Section R317.1. Fasteners in contact with wood sill or bottom plates shall be in accordance with Section R317.3. Tracks and sill plates shall be anchored to the concrete beam in accordance with Section AV104.5.

6. **Chimney chase stud wall.** Chimney chases shall be constructed of full-height wood studs in accordance with Section R602 or full-height cold-formed steel studs in accordance with Section R603. Studs shall be selected based on story clear height, but not less than eight feet, and applicable Section R301.2 wind criteria. Wood studs shall be not less than 2 by 3 and spaced not more than 12 inches on center. Cold-formed steel studs shall be not less than 43 mil thickness by 2-1/2 inch deep and spaced not more than 12 inches on center. The top of the chimney shall extend not less than three feet above the edge of roof and not less than two feet above the maximum roof elevation, or maximum elevation of other construction located within a ten foot horizontal dimension in any direction from the chimney. Where this requires that the chimney chase extend more than four feet above the highest roof elevation immediately adjacent to the chimney, bracing of the chimney chase shall be provided in accordance with Section AV104.6.

7. **Chimney chase connection to dwelling.** The chimney chase studs shall be fastened to the existing dwelling exterior wall with minimum No. 8 wood screws at 12 inches on center. The chimney chase framing shall be strapped to existing floor, ceiling and roof framing with not less than two steel straps not less than 1-1/4 inches in width and 33 mil in thickness, on two opposing sides of the chimney. The steel straps shall be fastened to steel blocking between steel studs with minimum four No. 8 sheet metal screws, or to wood blocking between wood studs with not less than four 8d common nails, the steel straps shall be fastened to existing wood floor, ceiling or roof framing with not less than four 8d common nails, or to existing steel framing with not less than four No. 8 sheet metal screws.

8. **Factory-built metal chimney.** Factory-built metal chimneys shall be in accordance with Section R1005.

9. **Flue cap.** Where required by the metal chimney manufacturer, a flue cap shall be installed, complying with the metal chimney's listing.

10. **Fireblocking.** Fireblocking between the chimney chase and the attic shall be installed as required by Section R302.11.

**AV104.5 Smoke chamber-to-chimney transition.** The transition from the masonry smoke chamber to the factory-built metal chimney and chimney chase shall be in accordance with the following requirements and Figure AV104.5.

1. A 12 gauge (97 mil) minimum thickness sheet steel transition cone shall be provided, as shown in Figure AV104.5. The transition cone shall have minimum 12 gauge (97 mil) thickness sheet steel top and bottom plates, and shall provide a smooth-surfaced transition between the flue opening at the top of the firebox and the anchor plate and metal flue. The bottom plate geometry shall match the opening geometry at the top of the smoke chamber, and the top plate geometry shall be coordinated with the UL listed anchor plate. The transition cone shall be set in cementitious grout, and all transition cone seams shall be continuously welded.

2. The transition cone base plate shall be anchored to the firebox masonry with not less than four 1/2-inch diameter galvanized threaded rod anchors, as shown in Figure AV104.5. The threaded rods shall be extended to one inch below the top of the concrete beam, shall be embedded six inches into masonry at the firebox, and shall be set in cementitious grout.

3. Reinforcing steel (rebar) and a concrete beam shall be constructed around the transition cone, using the cone as the inside form in accordance with Figure AV104.5. Not less than a 1-1/2-inch clear distance shall be provided between the rebar and outside face of concrete.

4. Mineral insulation shall be installed on top of the transition cone top plate as shown in Figure AV104.5 where required by the anchor plate manufacturer.

5. A fireplace adapter (chimney anchor plate), tested in accordance with UL 103a, shall be installed in accordance with the manufacturer's installation instructions.

**FIGURE AV104.5**

Masonry smoke chamber to chimney and chimney chase transition.
AV104.6 Chimney chase bracing to roof. Where bracing of the chimney chase is required by Section AV104.4, Item 6, the bracing shall be connected to the chimney chase in the upper third of the chimney chase clear height above the roof (H), in accordance with Figures AV104.6(1) and AV104.6(2). Bracing steel angles not less than 2-1/2x2-1/2x1/4-inch shall be provided at not less than two locations. The bracing slope shall be no less than 30 degrees and not more than 60 degrees from vertical.

FIGURE AV104.6

(1) Bracing of chimney chase to roof.
FIGURE AV104.6
(2) Details of chimney chase roof bracing.

SECTION AV105 Reconstruction From Top of Smoke Chamber Using a Factory-Built Fireplace Insert

AV105.1 Scope. This section provides prescriptive methods for partial removal of the masonry chimney above the smoke chamber-to-chimney transition, and reconstruction using a factory-built fireplace insert enclosed in a chimney chase.

AV105.2 Limitations. The following limitations apply to this section:
   1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the transition from smoke chamber to chimney. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.
   2. Use of these provisions is limited to chimneys occurring at the exterior wall of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this chapter.
   3. Where the exterior walls adjacent to the chimney are required to be fire-rated, chimney chase construction shall confirm to the requirements of Section R302.

AV105.3 Chimney partial removal. The chimney shall be removed in accordance with Section AV104.3.

AV105.4 Reconstruction. Reconstruction shall be in accordance with Section AV104.4 and the following:
   1. The factory-built fireplace insert shall conform to UL 1482.
   2. The factory-built chimney liner shall conform to UL 1777.
   3. A hearth extension, where required by the fireplace insert listing, shall conform to UL 1618.
   4. The transition from masonry firebox and chimney liner to the factory-built chimney and chimney chase shall be constructed in accordance with Section AV105.5.

AV105.5 Smoke chamber-to-chimney transition. The transition from the masonry smoke chamber to the metal chimney and chimney chase shall be in accordance with the following requirements and Figure AV105.5.
   1. A 12 gauge (97 mil) thickness sheet steel transition cone shall be provided as shown in Figure AV105.5. The transition cone shall have minimum 12 gauge (97 mil) thickness sheet steel top and bottom plates, and shall provide a smooth-surfaced transition between the flue opening at the top of the firebox and the anchor plate and metal flue. The bottom
plate geometry shall match and allow for attachment of the factory-built insert chimney liner. The top plate geometry shall be coordinated with the UL listed anchor plate. The transition cone shall be set in cementitious grout, and all transition cone seams shall be continuously welded.

2. The transition cone base plate shall be anchored to the firebox masonry with not less than four 1.2-inch diameter galvanized threaded rod anchors, as shown in Figure AV104.5. The threaded rods shall be extended to one inch below the top of the concrete beam, shall be embedded six inches into the masonry at the firebox, and shall be set in cementitious grout.

3. Reinforcing steel (rebar) and a concrete beam shall be constructed around the transition cone, using the cone as the inside form in accordance with Figure AV104.5. Not less than a 1-1/2 inch clear distance shall be maintained between rebar and the outside face of concrete.

4. The listed insert, chimney liner, chimney, and accessories shall be installed in accordance with the manufacturer's instructions and the listing. Clearances required by the manufacturer and the listing shall be maintained.

**FIGURE AV105.5**

Transition from masonry smoke chamber to factory-built chimney where factory-built fireplace insert is used.

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**SECTION AV106 Full Reconstruction of Firebox and Chimney Using a Factory-Built Fireplace**

**AV106.1 Scope.** This section provides prescriptive methods for complete removal of the masonry chimney and firebox, and for reconstruction using a factory-built fireplace enclosed in a chimney chase.

**AV106.2 Limitations.** The following limitations apply to this section:

1. Use of these provisions is limited to chimneys occurring at the exterior walls of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this chapter.

2. Where the exterior walls adjacent to the chimney are required to be fire-rated, chimney chase construction shall confirm to the requirements of Section R302.

**AV106.3 Chimney and firebox removal.** The chimney and firebox shall be completely removed.

**AV106.4 Reconstruction.** Reconstruction shall be in accordance with the following requirements and Figure AV106.4. Item numbers below correspond to Figure AV106.4.

1. **Existing foundation.** Where a concrete footing exists, use of the concrete footing shall not be prohibited. Where the existing footing is other than concrete, the footing shall be removed and replaced in accordance with Chapter 4.

2. **Extension of existing foundation.** Where required to meet dimensional requirements specified by the fireplace manufacturer, the existing concrete footing shall be extended as shown in Figure AV106.4. Where footing extension is required, the depth of the new footing shall match the depth of the existing foundation, however the bottom of the
footing extension shall not be less than 12 inches below grade. The foundation extension shall be reinforced with one No. 4 bar at the top and bottom of new concrete, and adhesive dowels to the existing footing at not more than 12 inches on center. See the applicable provisions of this code for additional requirements.

3. Non-combustible hearth extension. Where required to meet the manufacturer’s requirements or fireplace listing, a hearth extension conforming to UL 1618 shall be installed.

4. Factory-built fireplace. The factory-built fireplace shall comply with Section R1004.

5. Chimney chase stud walls. In single-story dwellings the studs shall extend full height from the foundation to the top of the chimney chase. In two-story dwellings the studs shall extend full-height from the second floor to the top of the chimney chase. Wood stud walls shall be constructed in accordance with Section R602. Cold-formed steel stud walls shall be constructed in accordance with Section R603. The top of the chimney shall extend not less than three feet above the roof and not less than two feet above the elevation of the roof or other construction within a ten foot dimension. Where this requires that the chimney chase extend more than four feet above the highest roof elevation immediately adjacent to the chimney, bracing of the chimney chase shall be provided in accordance with Section AV104.6.

6. Existing wall framing. Where existing wall framing requires modification to accommodate the new fireplace opening, framing shall be reconstructed in accordance with applicable requirements of Chapter 6.

7. Factory-built metal chimney. A listed and labeled factory-built metal chimney supplied by the fireplace manufacturer shall be installed in accordance with the manufacturer’s installation instructions and listing.

8. Stud blocking. Continuous blocking shall be installed at 4’-0” maximum vertical spacing. Blocking size shall match studs.

9. Chimney chase connection to dwelling. The chimney chase studs shall be fastened to the existing residence exterior wall with not less than No. 8 wood screws at 12 inches on center. The chimney chase framing shall be strapped to the existing floor, ceiling, and roof framing with not less than two steel straps at each location. The steel straps shall be not less than 1-1/4-inch by 33 mil in thickness, and installed on two opposing faces of the chimney chase. The steel straps shall be fastened to steel blocking between steel studs with not less than four No. 8 sheet metal screws, or to wood blocking between wood studs with not less than four 8d common nails. The steel straps shall be fastened to existing wood floor, ceiling, or roof framing with minimum four 8d common nails or the existing steel framing with not less than four No. 8 sheet metal screws.

10. Existing roof, ceiling and floor framing. Existing roof, ceiling and floor framing shall remain. Existing framing shall be re-supported in accordance with applicable requirements of this code where existing support is disrupted.

11. Chimney chase. The chimney chase shall be constructed as required in item 6.

12. Chimney cap. A framed chimney cap shall be constructed at the top of the chimney chase.

13. Flue cap. Where required by the factory-built fireplace manufacturer, a flue cap shall be installed, complying with the fireplace listing.

14. Fireblocking. Fireblocking between the chimney chase and the attic or second floor framing shall be installed as required by Section R302.11.

FIGURE AV106.4
Components of a reconstructed fireplace and chimney with factory-built fireplace in chimney chase.
**Reference standards type:** This reference standard is new to the ICC Code Books

**Add new standard(s) as follows:**

UL 103a-2005, Outline of Investigation for Masonry Fireplace Adapters for Residential Type and Building Heating Appliance Chimneys.

**Reason:** In most recent moderate to major earthquakes, widespread damage has occurred to masonry chimneys and fire boxes. As a result, jurisdictions have needed to provide direction for repair. Following the 2014 South Napa Earthquake, FEMA funded the writing of a recovery advisory (FEMA DR-4193-RAL) addressing recommendations for repair of earthquake damaged chimneys and fireboxes. The recommendations were drawn in part from repair approaches developed post-earthquake by the Cities of Napa, Seattle and Los Angeles. This code change makes the recovery advisory guidance available to all jurisdictions to adopt on an as-needed basis, and permits the same approaches developed for repair to be used for the voluntary retrofit of chimneys prior to an earthquake.
This appendix chapter requires the construction of chimney chases even though UL listed metal chimneys are not required to be enclosed in chases. This is done in order to return to the pre-removal enclosure geometry, allowing the wall and roof weather-barrier systems to be returned to their pre-removal configuration. This is not meant to prohibit alternative approaches being approved by the building official.

Cost Impact: Will not increase the cost of construction
The provisions of this appendix chapter will reduce the cost of repairing earthquake-damaged chimneys. The alternative methods of this chapter have estimated costs from less than $1,000.00 to approximately $5,000.00, as compared to a cost of $10,000.00 or higher for complete reconstruction of a masonry fireplace and chimney.

Analysis: A review of the standard(s) proposed for inclusion in the code, UL 103a, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2016.

RB372-16:
APPENDIX V-COBEEN11680

Public Hearing Results

Committee Action: Disapproved
Committee Reason: The proponents and opponents have indicated that there are flaws in the proposal that they would like to address in the public comment period. A generic repair without thorough examination by a qualified professional is inappropriate. This is a good concept. Something based on this concept may be appropriate as an appendix.

Assembly Action: None

Individual Consideration Agenda

Public Comment 1:

Proponent: Kelly Cobeen, Wiss Janney Elstner Associates, representing Federal Emergency Management Agency and National Institute of Building Sciences Building Seismic Safety Council's Code Resource Support Committee (KCobeen@wje.com) requests Approve as Modified by this Public Comment.

Modify as follows:

2015 International Residential Code

AV101.1 Scope. This appendix chapter provides prescriptive methods for repair of earthquake-damaged chimneys and fireboxes in one- and two-family detached dwellings. The provisions of this chapter are also allowed to be used for pre-earthquake seismic retrofit of existing masonry chimneys. The use of these provisions is limited to one- and two-family dwellings of wood or cold-formed steel light-frame construction. The provisions of this chapter are not intended to prevent use of an engineered repair or seismic retrofit design in accordance with the International Building Code or alternative materials, design, and methods of construction or equipment in accordance with Section R104.11.

AV101.2 Intent. The provisions of this chapter are intended to promote public safety and welfare by reducing the risk of earthquake-induced damage, but will not necessarily prevent damage. The methods included in this chapter are not necessarily expected to provide equivalent safety or risk reduction.

AV101.3 Repair and retrofit methods. Repair or seismic retrofit of existing masonry chimneys and fireboxes shall be in accordance with one of the following methods:
1. Capping of the chimney at the roof or ceiling level in accordance with Section AV103,
2. Reconstruction of the chimney from the top of the smoke chamber up in accordance with Section AV104-
3. Reconstruction of the chimney from the top of the smoke chamber up and installation of a factory-built fireplace insert in accordance with Section AV105-
4. Full reconstruction of the firebox and chimney in accordance with Section AV106-
5. Repair in accordance with Section AV107 of chimneys otherwise conforming to the requirements of this code, or
6. Full reconstruction in accordance with the requirements of Chapter 10 of this code.
Seismic retrofit of existing masonry chimneys and fireboxes shall be in accordance with one of the following methods:

1. Capping of the chimney at roof or ceiling level in accordance with Section AV103.
2. Reconstruction of the chimney from the top of the smoke chamber up in accordance with Section AV104.
3. Reconstruction of the chimney from the top of the smoke chamber up and installation of a factory-built fireplace insert in accordance with Section AV105.
4. Full reconstruction of the firebox and chimney in accordance with Section AV106, or
5. Full reconstruction in accordance with the requirements of Chapter 10 of this code.

AV101.4 General Requirements. Other items of repair, retrofit, or reconstruction not specifically addressed in this chapter shall be in accordance with applicable requirements of this code. Exterior wall coverings shall not exceed the weight limits of Chapter 3 of this code.

AV102.1 General. The following word and term shall, for purposes of this appendix, have the meaning shown herein. CHIMNEY CHASE. A light-frame weather enclosure surrounding a factory-built metal chimney.

AV103.1 Scope. This section provides prescriptive methods for partial removal and capping of masonry chimneys at the roof or ceiling level.

AV103.2 Limitations. The following limitations apply. Use of these provisions on a damaged chimney is limited to this section: chimneys in which damage only occurs above the roof level. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.

1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the roof level. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.
2. Access to the interior of the firebox shall be completely closed off from the dwelling interior with an infill of gypsum wallboard or wood structural panel sheathing, masonry, or other material permanently affixed.

AV103.3 Chimney partial removal and capping. The chimney shall be removed to a distance of eight at least seven inches but not more than twelve inches above the highest adjacent roof elevation, leaving existing roof flashing undisturbed. A sheet metal cap of galvanized steel or stainless steel shall be provided for weather protection. The cap shall extend not less than three inches down each side of the chimney. The cap shall be secured to the chimney with corrosion-resistant fasteners. For a fireplace and chimney located at the dwelling interior, the chimney shall be permitted to be removed to a distance of not more than eight inches above the top of ceiling framing or attic floor framing, capped as previously described, and the roof opening closed in accordance with this code.

Access to the interior of the firebox shall be completely closed off from the dwelling interior with an infill of gypsum wallboard, wood structural panel sheathing, masonry, or other material, permanently affixed.

The capped chimney shall not be used to convey products of combustion. Any flues discharging products of combustion through the chimney being capped shall be re-routed in accordance with applicable provisions of Chapters 13, 18, and 24.

AV104.1 Scope. This section provides prescriptive methods for partial removal of the masonry chimney above the smoke chamber-to-chimney transition, and reconstruction using a factory-built metal chimney enclosed in a chimney chase.

AV104.2 Limitations. The following limitations apply to this section:

1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the transition from smoke chamber to chimney. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.
2. Use of these provisions is limited to chimneys occurring at the exterior walls of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this appendix section.
3. Where the exterior walls adjacent to the chimney are required to be fire rated, chimney chase construction shall conform to the requirements of Section R302.

FIGURE AV104.3
Components of masonry fireplace with chimney reconstruction from top of smoke chamber up.
AV104.4 Reconstruction. Reconstruction shall be in accordance with the following requirements, the factory-built chimney manufacturer's installation instructions, and Figure AV104.3. Item numbers below correspond to Figure AV104.3.

1. Masonry firebox. The existing masonry firebox shall remain up to the top of the smoke chamber as shown in Figure AV104.3.

2. Existing framing. Existing roof, wall, and ceiling framing shall remain. Existing framing shall be re-supported in accordance with applicable requirements of this code where existing support is disrupted.

3. Masonry veneer. Where existing masonry veneer is disrupted, re-support and anchorage of masonry veneer shall be provided in accordance with the requirements of this code.

4. Smoke chamber-to-chimney transition. The transition from the smoke chamber to the metal factory-built chimney shall be in accordance with Section AV104.5.

5. Track or sill plate. Cold-formed steel track sections matching the thickness of the studs shall be provided at the bottom of cold-formed steel chimney chase walls. Wood sill or bottom (sole) plates, having a width not less than the supported studs, shall be provided at the bottom of wood chimney chase walls. Wood sill or bottom sole plates shall be protected
against decay in accordance with Section R317.1. Fasteners in contact with wood sill or bottom sole plates shall be in accordance with Section R317.3. Tracks and sill or sole plates shall be anchored to the concrete beam in accordance with Section AV104.6. Chimney chases shall be constructed of full-height wood stud walls stud walls in accordance with Section R602 or full-height cold-formed steel stud walls in accordance with Section R603. Studs shall be selected based on story clear height, but not less than eight feet, and applicable Section R301.2 wind criteria. Wood studs shall not be less than nominal 2 inch by 3 inch and spaced not more than 12 inches on center. Cold-formed steel studs shall not be less than 43 mil thickness by 2-1/2 inch deep and spaced not more than 12 inches on center. The top of the chimney chase shall extend not less than three feet above the edge of roof and not less than two feet above the maximum roof elevation, or maximum elevation of other construction located within a ten foot horizontal dimension in any direction from the chimney. Where this requires Chimney that the chimney chase extend more than four feet above the highest roof elevation immediately adjacent to the chimney, bracing of the chimney chase shall be provided in accordance with Section AV104.6. The chimney chase shall be capped, roofing and flashing, where applicable, shall be in accordance with Chapter 9 of this code.

7. Chimney chase connection to dwelling. The chimney chase studs shall be fastened to the existing dwelling exterior wall with minimum No. 8 wood screws at 12 inches on center. The chimney chase framing shall be strapped to existing floor, ceiling and roof framing with not less than two steel straps not less than 1-1/4 inches minimum in width and 33 mil minimum in thickness, on two opposing sides of the chimney. The steel straps shall be fastened to steel blocking between steel studs with minimum four No. 8 sheet metal screws, or to wood blocking between wood studs with not less than four 8d common nails. the steel straps shall be fastened to existing wood floor, ceiling or roof framing with not less than four 8d common nails, or to existing steel framing with not less than four No. 8 sheet metal screws.

8. Factory-built metal chimney. Factory-built metal chimneys shall be in accordance with UL 103, sized in accordance with Section R1003.15, and installed in accordance with Section R1005.

9. Fire blocking. Fire blocking Fire blocking Fire blocking Fire blocking Fire blocking Fire blocking between the chimney chase and the attic shall be installed provided as required by Section R302.11.

AV104.5 Smoke chamber-to-chimney transition. The transition from the masonry smoke chamber to the factory-built metal chimney and chimney chase shall be in accordance with the factory-built chimney manufacturer's installation instructions, the following requirements and Figure AV104.5.

1. A 12 gauge (97 mil) minimum thickness galvanized sheet steel transition cone shall be provided, as shown in Figure AV104.5. The transition cone shall have minimum 12 gauge (97 mil) thickness sheet steel top and bottom plates, and shall provide a smooth-surfaced transition between the flue opening at the top of the firebox and the masonry fireplace adapter anchor plate metal factory-built flue. The bottom plate geometry shall match the opening geometry at the top of the smoke chamber, and the top plate geometry shall be coordinated with the UL listed anchor plate masonry fireplace adapter. The transition cone shall be set in cementitious grout, and all transition cone seams shall be continuously welded.

2. The transition cone base plate shall be anchored to the firebox masonry with not less than four 1/2-inch diameter galvanized threaded rod anchors, as shown in Figure AV104.5. The threaded rods shall be extended to one inch below the top of the concrete beam, shall be embedded six inches into masonry at the firebox, and shall be set in cementitious grout.

3. Reinforcing steel (rebar) and a concrete beam shall be constructed around the transition cone, using the cone as the inside form in accordance with Figure AV104.5. Not less than a 1-1/2-inch clear distance shall be provided between the rebar and outside face of concrete.

4. Mineral insulation shall be installed on top of the transition cone top plate as shown in Figure AV104.5 where required by the anchor plate manufacturer.

5. A fireplace adapter (chimney anchor plate), tested in accordance with UL 102a, shall be installed in accordance with the manufacturer's installation instructions.

4. A masonry fireplace adapter, tested in accordance with UL 103A and listed for use with the specific factory-built chimney, shall be installed in accordance with the manufacturer's installation instructions.

FIGURE AV104.5
Masonry smoke chamber to chimney and chimney chase transition.
AV104.6 Chimney chase bracing to roof. Where bracing of chimney chase stud walls extend more than four feet above the highest roof elevation immediately adjacent to the chimney chase is required by Section AV104.4, Item 6, the bracing shall be provided in accordance with this section. The bracing shall be connected to the chimney chase in the upper third of the
chimney chase clear height above the roof (H), in accordance with Figures AV104.6(1) and AV104.6(2). Bracing steel angles not less than 2-1/2x2-1/2x1/4-inch shall be provided at not less than two locations. The bracing slope shall be no less than 30 degrees and not more than 60 degrees from vertical.

AV105.2 Limitations. The following limitations apply to this section:

1. Use of these provisions on a damaged chimney is limited to chimneys in which damage only occurs above the transition from smoke chamber to chimney. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.
2. Use of these provisions is limited to chimneys occurring at the exterior wall of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this chapter.
3. Where the exterior walls adjacent to the chimneys are required to be fire rated, chimney chase construction shall conform to the requirements of Section R302.

AV105.5 Smoke chamber-to-chimney transition. The transition from the masonry smoke chamber to the metal factory-built chimney and chimney chase shall be in accordance with the following requirements and Figure AV105.5.

1. A 12 gauge (97 mil) thickness minimum galvanized sheet steel transition cone shall be provided as shown in Figure AV105.5. The transition cone shall have minimum 12 gauge (97 mil) thickness sheet steel top and bottom plates, and shall provide a smooth-surfaced transition between the flue opening at the top of the firebox and the anchor plate masonry fireplace adapter and metal factory-built flue. The bottom plate geometry shall match and allow for attachment of the factory-built insert chimney liner. The top plate geometry shall be coordinated with the UL listed anchor plate masonry fireplace adapter. The transition cone shall be set in cementitious grout, and all transition cone seams shall be continuously welded.
2. The transition cone base plate shall be anchored to the firebox masonry with not less than four 1.2-inch diameter galvanized threaded rod anchors, as shown in Figure AV104.5. The threaded rods shall be extended to one inch below the top of the concrete beam, shall be embedded six inches into the masonry at the firebox, and shall be set in cementitious grout.
3. Reinforcing steel (rebar) and a concrete beam shall be constructed around the transition cone, using the cone as the inside form in accordance with Figure AV104.5. Not less than a 1-1/2 inch clear distance shall be maintained between rebar and the outside face of concrete.
4. The listed insert, chimney liner, chimney, and accessories shall be installed in accordance with the manufacturer's instructions and the listing. Clearances required by the manufacturer and the listing shall be maintained.

FIGURE AV105.5
Transition from masonry smoke chamber to factory-built chimney where factory-built fireplace insert is used.
AV106.2 Limitations. The following limitations apply. Use of these provisions is limited to chimneys occurring at the exterior walls of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this section;

1. Use of these provisions is limited to chimneys occurring at the exterior walls of dwellings. Chimneys completely interior to the dwelling are beyond the scope of this chapter.
2. Where the exterior walls adjacent to the chimney are required to be fire rated, chimney chase construction shall confirm to the requirements of Section R302.

AV106.4 Reconstruction. Reconstruction shall be in accordance with the factory-built fireplace manufacturer's installation instructions, the following requirements and Figure AV106.4. Item numbers below correspond to Figure AV106.4.

1. Existing foundation. Where a existing concrete footing exists, use of foundation in good condition shall be permitted to be retained and incorporated into the concrete footing shall not be prohibited new construction. Where the existing footing is other than concrete, the footing shall be removed and replaced in accordance with Chapter 4.
2. Extension of existing foundation. Where required to meet dimensional requirements specified by the fireplace manufacturer, the existing concrete footing shall be extended as shown in Figure AV106.4. Where footing extension is required, the depth of the new footing shall match the depth of the existing foundation, however the bottom of the footing extension shall not be less than 12 inches below grade. The foundation extension shall be reinforced with one No. 4 bar at the top and bottom of new concrete, and adhesive dowels to the existing footing at not more than 12 inches on center. See the applicable provisions of this code for additional requirements.
3. Non-combustible hearth extension. Where required to meet the manufacturer's requirements or fireplace listing, a hearth extension conforming to listed and labeled in accordance with UL 1618 shall be installed.
4. Factory-built fireplace. The factory-built fireplace shall comply with Section R1004.
5. Chimney chase stud walls. In single-story dwellings the studs shall extend full height from the foundation to the top of the chimney chase. In two-story dwellings the studs shall extend full-height from the second floor to the top of the chimney chase. Wood stud walls shall be constructed in accordance with Section R602. Cold-formed steel stud walls shall be constructed in accordance with Section R603. The top of the chimney shall extend not less than three feet above the roof and not less than two feet above the elevation of the roof or other construction within a ten foot dimension. Where this requires that the chimney chase extend more than four feet above the highest roof elevation immediately adjacent to the chimney, bracing of the chimney chase shall be provided in accordance with Section AV104.6 AV104.6. Where the exterior walls adjacent to the chimney are required to be fire-rated, chimney chase stud walls shall comply with Section R302. The chimney chase shall be capped. Roofing and flashing, where
applicable, shall be in accordance with Chapter 9 of this code.

6. Existing wall framing. Where existing wall framing requires modification to accommodate the new fireplace opening, framing shall be reconstructed in accordance with applicable requirements of Chapter 6.

7. Factory-built metal chimney. A listed and labeled factory-built metal chimney supplied by the fireplace manufacturer shall be installed in accordance with the manufacturer’s installation instructions and listing.

8. Stud blocking. Continuous blocking shall be installed at 4'-0" maximum vertical spacing. Blocking size shall match studs.

9. Chimney chase connection to dwelling. The chimney chase studs shall be fastened to the existing residence exterior wall with not less than No. 8 wood screws at 12 inches on center. The chimney chase framing shall be strapped to the existing floor, ceiling, and roof framing with not less than two steel straps at each location. The steel straps shall be not less than 1-1/4-inch minimum by 33 mil minimum in thickness, and installed on two opposing faces of the chimney chase. The steel straps shall be fastened to steel blocking between steel studs with not less than four No. 8 sheet metal screws, or to wood blocking between wood studs with not less than four 8d common nails. The steel straps shall be fastened to existing wood floor, ceiling, or roof framing with minimum four 8d common nails or the existing steel framing with not less than four No. 8 sheet metal screws.

10. Existing roof, ceiling and floor framing. Existing roof, ceiling and floor framing shall remain. Existing framing shall be re-supported in accordance with applicable requirements of this code where existing support is disrupted.

11. Chimney chase. The chimney chase shall be constructed as required in item 6.

12. Chimney cap. A framed chimney cap shall be constructed at the top of the chimney chase.

13. Flue cap. Where required by the factory-built fireplace manufacturer, a flue cap shall be installed, complying with the fireplace listing.

14. Fireblocking. Fireblocking, Fireblocking provided as required by Section R302.11.

FIGURE AV106.4

Components of a reconstructed fireplace and chimney with factory-built fireplace in chimney chase.
SECTION AV107 PARTIAL REPAIR OF MASONRY CHIMNEY USING NEW MASONRY CONSTRUCTION

AV107.1 Scope The section provides criteria for identifying existing masonry chimneys for which partial repair with new masonry construction is permitted.

AV107.2 Limitations The following limitations apply to this section:
1. use of the provisions of this section on a damaged chimney is limited to chimneys in which damage only occurs above the
smoke chamber to chimney transition. A chimney and firebox inspection indicating extent of damage shall be submitted with the permit application.

2. Use of the provisions of this section is limited to chimneys for which existing construction to remain is verified to be in accordance with the requirements of this code for new construction. Such verification shall include but not be limited to:
   a. Verification that reinforcing and grout conform to the requirements of Section R1003.3, and
   b. Verification that seismic anchorage conforms to the requirements of Section R1003.4, including connection of straps to each floor, ceiling and roof, and embedment of the straps into grout.

AV107.3 Repair Existing damaged construction shall be removed and shall be reconstructed in accordance with the requirements of this code for new construction. Deteriorated mortar in masonry to remain shall be repointed.

Commenter's Reason: This public comment modifies the originally submitted proposal in response to comments and concerns voiced by NAHB, UL, NCSEA and masonry industry representatives. While this has resulted in a number of modifications, many are editorial in nature and the modified proposal does not vary significantly in technical content from the originally submitted proposal. Some of the primary modifications include:

General - Terminology has been revised for consistency with common industry terms. A broad requirement to comply with the manufacturer's installation instructions has been added for all factory-built components.

AV101.1 - For clarity, it is noted that either engineered design in accordance with the IBC or alternate methods of construction can be provided. While this is always true, it was decided that this should be emphasized at the beginning of this chapter. Use of an engineered design will make available additional approaches to repair or retrofit, including some more consistent with historic preservation objectives. The details of these additional engineered approaches fall beyond what can be incorporated in a prescriptive code such as the IRC.

AV101.3 - For clarity, available methods for repair and for retrofit have been differentiated. In response to masonry industry concerns, partial or full reconstruction using masonry rather than light-frame construction have been incorporated.

AV103.2 - The requirement that the firebox be blocked when the chimney is capped has been relocated to AV103.3.1.

AV103.3 - Range of chimney heights above the roof is permitted to provide reasonable tolerances. The option to remove interior chimneys to a ceiling or attic floor has been added.

AV103.3.1 - this provision is relocated from AV103.2.

AV103.3.2 - This provision is added to address circumstances where combustion products from heaters or other appliances are routed through the existing masonry chimney and must be relocated as part of the repair or retrofit work.

AV104.2, Item 3 - Relocated to AV 104.4, Item 6.

AV104.4, Item 6 - Third from last sentence is relocated to AV104.6. Last sentence is relocated from AV104.2.

AV104.4, Item 8 - Factory-built chimney sizing in accordance with Section R1003.15 has been added for completeness.

AV104.4, Item 9 - Discussion of flue cap is deleted as this will be part of the listed factory-built chimney.

AV104.5, Item 4 - Discussion of insulation is deleted. If required, this will be part of the manufacturer's installation instructions.

AV104.5, Item 5 - Clarifies that the masonry fireplace adapter much be listed for use with the specific factory-built chimney to be used.

AV104.6 - First sentence is relocated from AV104.4, Item 6.

AV104.6, Item 1 - Relocated to AV104.4, Item 6.

AV106.2, Item 2 - Relocated to AV 106.4, Item 6.

AV106.4, Item 1 - Editorially revised.

AV106.4, Item 5 - Third sentence from last relocated from AV106.2.

AV106.4, Item 11 - Deleted because redundant.

AV106.4, Item 12 - Relocated to AV106.4, Item 6.

AV106.4, Item 13 - Deleted as cap will be part of factory-built fireplace assembly.

AV107 - This section is added in response to concerns raised by the masonry industry. It permits partial reconstruction of the chimney above the top of firebox to chimney transition, provided that the existing construction to remain can be verified to be in accordance with current code requirements. The verification includes items important to seismic performance. Limited openings in existing construction are anticipated to be required to permit verification.

In recent moderate to major earthquakes, widespread damage has occurred to masonry chimneys and fireboxes. As a result, jurisdictions have needed to provide direction for repair of earthquake-damaged chimney and fire boxes. Following the moderate 2014 South Napa Earthquake, inspections revealed that over 1000 masonry chimneys suffered some form of collapse or significant damage. What made this earthquake damage unique was that many of these same chimneys had suffered the very same damage in the 2000 Yountville Earthquake and had been repaired to their original condition after that event. One of the observations of a FEMA-funded study on building performance was that simple repair of earthquake
sensitive items such as heavy masonry chimneys was to doom these components to failure in future earthquakes. Further, recent environmental regulations on the use of fireplaces has led many homeowners to ask about capping and abandoning their fireplaces. To address these concerns, FEMA funded the development and publication of a Recovery Advisory (FEMA P-1024) addressing recommendations for repair of earthquake damaged chimneys and fireboxes. This code change is drawn from that Recovery Advisory.

RB372-16
Due to the nature of the edits that had to be made, this document is not in a readable format. It appears to be a collection of code sections and comments, possibly related to building codes or regulations, but the text is not legible without further processing.
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<td>Project Manager, Ball Rex</td>
<td>Richard Davidson, Construction &amp; Inspections, Richard Cain, SunEdison</td>
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<td>IRC: RB48-16</td>
<td>Project Manager, Ball Rex</td>
<td>Charles Bajnai, Richard Davidson, Construction &amp; Inspections, Joseph Cain, SunEdison</td>
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**2016 TRACK B CODE DEVELOPMENT CYCLE, COMMITTEE ACTION HIGHLIGHTS, LOUISVILLE, KY**

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<th>Rep(Ing)</th>
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<th>Comments CRSC</th>
<th>OCS Position</th>
<th>CRSC Representative</th>
<th>Committee Notes</th>
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<tr>
<td>0001-16</td>
<td>R507.9.1</td>
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<td>0002-16</td>
<td>R507.2.3</td>
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<td>Charles Bajnai, Railing Coalition (DCC) has proposed. This code change provides prescriptive design requirements for freestanding decks.</td>
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In the 2015 edition of the IRC, changes were made to Section R301.3 that shifted the emphasis from wall height to story height. As a result of this change, the existing language is confusing and that it made sense to move this correction factor into the tables with all of the other correction factors.

We ask the committee to accept these changes to make the bracing provisions consistent throughout the various sections of the IRC and less subject to incorrect interpretation.

The new proposed adjustment factor shall be used in all existing and future construction projects where the unadjusted bracing provisions are good up to 10 feet in height. The ADJUSTMENT BASED ON UNADJUSTED BRACING PROVISIONS cell shall be the value in the unadjusted table (Table R602.10.3(2)) or the new column if a correction factor is applied. The value in the unadjusted table (Table R602.10.3(2)) or the new column if a correction factor is applied shall be multiplied by the adjustment factor in the ADJUSTMENT BASED ON UNADJUSTED BRACING PROVISIONS cell. The adjustment factor in the ADJUSTMENT BASED ON UNADJUSTED BRACING PROVISIONS cell shall be used at the discretion of the local code official or in lieu of the adjustment factor in the ADJUSTMENT BASED ON UNADJUSTED BRACING PROVISIONS cell if the local code official or in lieu of the adjustment factor in the ADJUSTMENT BASED ON UNADJUSTED BRACING PROVISIONS cell.

WHY: Several members of the past ICC Ad Hoc Wall Bracing committee discussed this issue and agreed that the existing language is confusing and that it made sense to move this correction factor into the tables with all of the other correction factors.

We ask the committee to accept these changes to make the bracing provisions consistent throughout the various sections of the IRC and less subject to incorrect interpretation.

In the context of this proposal, it makes sense to move this correction factor into the tables with all of the other correction factors.

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The proposed code change more clearly states the intent of the original language. It is important that the wall requirements of IBC Section 2109. The immediate figure depicts the standard method of testing, and is provided to demonstrate the effectiveness of the new provisions.

Reason: This proposal corrects typographical errors that occurred when all of the portal frame pictures were redrawn when the 2015 IRC.

1. Simplify or clarify ambiguous language.

The proposed changes in this proposal fall into one of the following three categories, and are needed to:

Appendix R, and proposes text changes to certain Sections to coordinate with the new Figures and a Table, information previously published in the 2015 IRC Commentary Appendix R, and amendments that change to existing Sections to coincide with these requirements.

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APPENDIX S STRAWBALE CONSTRUCTION

These changes are based on further experience and additional input from these practitioners have experience with straw bale buildings in high seismic zones.

The callout text of the Commentary Figures was modified in some cases to make the Figures suitable for inclusion in the Appendix. Sections AS106.12.3 Roof bearing assembly, and AS106.15 Post-earthquake rehabilitation are new. The callout text of the Figures suitable for inclusion in the Appendix on first approval for the 2015 IRC. These changes are based on further experience and additional input from these practitioners have experience with straw bale buildings in high seismic zones.

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Reason: This proposal reconciles a significant difference between the Prescriptive method and the Work Area method. Currently, the Work Area method triggers a seismic upgrade for all Level 3 Alteration projects, whereas the Prescriptive method triggers an upgrade only for major (Level 3) alterations. This proposal reconciles the trigger for a change of occupancy with the upgrade trigger. It also makes the upgrade trigger more consistent across the two methods.

2016-19 403.8 Substantial structural alteration. Where the work area exceeds 50 percent of the building area and where a substantial structural alteration occurs, the building shall be evaluated in accordance with Section 606.2 and, if noncompliant, rehabilitated in accordance with Section 606.2.2.3.

Reason: This proposal reconciles, clarifies, and simplifies the provisions for seismic upgrade triggered by a change of occupancy. Currently, the Work Area method triggers an upgrade for all Level 3 Alteration projects, whereas the Prescriptive method triggers an upgrade only for major (Level 3) alterations. This proposal reconciles the trigger for a change of occupancy with the upgrade trigger. It also makes the upgrade trigger more consistent across the two methods.

2016-19 403.9 Voluntary seismic improvements. Lateral force-resisting system alterations.

Reason: This proposal reconciles a significant difference between the Prescriptive method and the Work Area method. Currently, the Work Area method triggers a seismic upgrade for all Level 3 Alteration projects, whereas the Prescriptive method triggers an upgrade only for major (Level 3) alterations. This proposal reconciles the trigger for a change of occupancy with the upgrade trigger. It also makes the upgrade trigger more consistent across the two methods.

2016-19 407.4, which triggers a seismic upgrade (with exceptions) when the risk category increases. Otherwise, the upgrades are triggered generally by a Level 2 alteration, not the intended work. To avoid disproportionately impacting the building industry, the proposal reorganizes the regulatory requirements for each level of alteration, so that the building shall be evaluated in accordance with Section 606.2 and, if noncompliant, rehabilitated in accordance with Section 606.2.2.3.

Reason: This proposal reconciles the trigger for a change of occupancy with the upgrade trigger. It also makes the upgrade trigger more consistent across the two methods.
A "10% rule" for wind and seismic, and a "5% rule" for snow. Higher than in the old location, for specific buildings and occupancies.

For wind, seismic, and snow loads, current Section 1302 generally requires relocated buildings to meet requirements of the Prescriptive provision (Section 409.1) that was simply eliminated without Structural Committee input in Group A.

Exceptions to structural safety upgrades make sense for a small addition or alteration; they look for significant risk the scope of this proposal.)

Once current 1007.3.2 becomes 1007.4, the current introductory section 1007.3 is no longer needed and should be removed.

Reason: Appendix A1 was first introduced to the legacy code UCBC by the proponent (SEAOC) in or about 1990. During the drafting process, none of them have been changed in any published considerations in review of the California Earthquake Authority, a Collapse Prevention Performance level (S-5) for BSE-1E Seismic Hazard Level demands. The special provision under Appendix A1 is contained in Title 24, Part 32 of the Building Standards Code of 1989-10 Chapter 6: Non-Structural Objectives.

Support: Expected results for the wind cases are of interest in calculation of wind loads, and the wind loads are controlled by air density.  This is 2016 TRACK B CODE DEVELOPMENT CYCLE FEMA / BSSC CODE RESOURCE SUPPORT COMMITTEE 2016 TRACK B CODE DEVELOPMENT CYCLE, COMMITTEE ACTION HEARINGS, LOUISVILLE, KY ID # Code Sections Proponent's Name Position Supporting Comments Opposing Comments Submission Notes

Subject: 06-03-16 1007.4, 1302.1, 907.2

Cobeen, Bob A

Support: Recent results for the wind cases are of interest in calculation of wind loads, and the wind loads are controlled by air density.
### FEEMA / BSSC CODE RESOURCE SUPPORT COMMITTEE

#### 2016 TRACK B CODE DEVELOPMENT CYCLE, COMMITTEE ACTION HEARINGS, LOUISVILLE, KY

<table>
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<tr>
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<th>Proponent</th>
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<th>Summary</th>
<th>CRSC Position</th>
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<td>2011</td>
<td>2012.1</td>
<td>Gregory Bachman, Earthquake Engineering, <a href="mailto:gfl4@mit.edu">gfl4@mit.edu</a></td>
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<td>The current language of the code requires, for new parts of the building, a minimum seismic loading standard. The committee recommends the seismic loading standard Minisum Ultimate Loads and Associated Criteria for Buildings and Other Structures (ASCE 7-16).</td>
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<td>Proponent</td>
<td>Support</td>
<td>Oppose</td>
<td>Summary</td>
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<td>1617.6</td>
<td>Edward Kulik, Building Code Action Committee&lt;br&gt;James Bela, Oregon Earthquake Awareness</td>
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<td>This proposal is intended to remove the redundancy inherent in the current structure of the IBC’s multiple occupancy provisions. The text was revised to provide a more logical and prescriptive basis for the important consideration of the engineering design process.</td>
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<td>onion John&lt;br&gt;Karla Rube, Engineer's Association of New York</td>
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<td>This proposal is intended to remove minor prescriptive requirements. Significant structures should be designed with additional resiliency.</td>
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<td>This proposal is intended to remove minor prescriptive requirements. Significant structures should be designed with additional resiliency.</td>
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RESOURCE 1613.5.1, 1613.5.2, 1613.1, 1613.3.2, 1613.3.5.2, 1613.3.5.1, 1613.3.3(2), BSSC discovered that the standard spectral shape derived using the SS and SS1 parameters is computationally more accurate than the ASCE 7-05 spectral shape.

In developing the updated site class coefficients contained in Table 1613.3.3(1), a new parameter called the "site class parameter" was introduced. This parameter is defined as the ratio of the site class coefficient to the ASCE 7-05 spectral shape. The site class parameter is used to calculate the site class coefficient for a given site class.

The site class parameter is determined by a combination of site-specific factors, including the site class, the soil type, and the distance from the nearest fault. The site class parameter is then used to calculate the site class coefficient, which is then used to determine the seismic design category for a building or other structure.

The proposed changes to the IBC reflect the new site class parameter and the updated site class coefficients contained in Tables 1613.3.3(1) and 1613.3.3(2). These changes are consistent with the NEHRP Provisions and ASCE 7-16, and are intended to improve the accuracy and effectiveness of the seismic design requirements.

The proposed changes also include revisions to Section 1613.3.3.3, which addresses the determination of site class coefficients. The proposed changes include the following:

- Adding a new subsection, 1613.3.3.3(4), which provides guidance for the determination of site class coefficients for buildings located on sites with complex ground conditions.
- Revising the existing subsections, 1613.3.3.3(5) and 1613.3.3.3(6), to clarify the procedure for determining site class coefficients.

The proposed changes to Section 1613.3.3.3 are intended to provide a more comprehensive and effective approach for determining site class coefficients, and to ensure that the seismic design requirements are consistent with the NEHRP Provisions and ASCE 7-16.
### Code Sections

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<td>Mike Bachman, Building Code Resource Support Committee (<a href="mailto:mikebachman@gmail.com">mikebachman@gmail.com</a>)</td>
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<td>1613.3.4</td>
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<td>1615.1</td>
<td>Steve Oppenheimer, Building Code Resource Support Committee (<a href="mailto:steve@oppenheimer.com">steve@oppenheimer.com</a>)</td>
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### Summary

- **1613.3.1 Revised lateral load parameters are redefined to be: 1613.3.1 Mapped lateral force coefficients for residential and commercial occupancy.**
- **1613.5 Additional requirements for alternative materials, design and methods of construction.**
- **1613.6 Additional requirements for alternative materials, design and methods of construction.**

### Comments

- **1613.3.1** Mapped acceleration parameters are deleted in Proposal 1613.3.1 and replaced by: 1613.3.1 Mapped lateral force coefficients for residential and commercial occupancy.
- **1613.5** Additional requirements for alternative materials, design and methods of construction.
- **1613.6** Additional requirements for alternative materials, design and methods of construction.

### CRSC Position

- **Support**
- **Oppose**
- **Neutral**

### Oppose Steve Oppenheimer, Building Code Resource Support Committee (steve@oppenheimer.com)
The proposed changes to 1705.11 and 1705.12 are to coordinate between the additional requirements for Special Inspections in high seismic and high wind conditions and the proposed provisions. The proposed changes to 1705.11 and 1705.12 do not alter the requirements of those sections; they only expand the exceptions for three-section buildings from certifying one of the six requirements in 1704.6.1 to two or more. Therefore, Section 1704.6 is added for larger or high risk buildings any time in the US.

The proposal provides a tiered mechanism to the deficiencies in the current inspection requirements for wood heavy timber construction. This deficiency is reflected in the requirement that a structural peer review of the primary structure shall be performed and a report submitted. This is intended to ensure that the primary structure in a building will be designed and constructed to meet the intended design and will function for life-safety purposes after an earthquake, classifying them as a Designated Seismic System. Section 1702.3 requires peer review of large or high risk buildings any time in the US.

**Summary**

This proposal is one in a series adopting the latest generation of AISI standards for cold-formed steel. It has been informed by a few structural steel seismic force-resisting systems in ASCE 7, Table 15.4-1 where detailing in accordance with AISC 360 is permitted in lieu of AISC 341. For these particular systems, it would be almost impossible to conduct nondestructive testing for structural steel seismic force-resisting systems and for structural steel elements in other types of structural systems.

**Recommendation**

There is no actual need for to change the existing fire safety content. The existing standards and comments of the code are consistent. There are no critical issues, or one of consensus note, with significant consequences of future fire prevention or loss modifications for the entire construction process.

**Neural**

This is a neural response. Without a neural context, it is difficult to provide a meaningful interpretation. The neural content seems to be about fire prevention and loss modifications for the entire construction process.
This proposal provides clarity on the design requirements of retaining walls and offers design flexibility.

Reason: In title, “Load” is an applied force while “capacity” is the geotechnical strength of the supporting soil, so the

Lori Simpson GeoCoalition Reason: The additional language added to the first sentence covers the requirements of the listed items 4, 5, and 6.

Lori Simpson GeoCoalition Reason: The reference to an approved strength design method is replaced by a reference to ACI 318, which is an industry accepted method. The 10% increase in design axial loads is intended to account for increased loads on piles due to pile embedment greater than the required 12” embedment depth typical to conventional foundations.

Ronald Hamburger, (rohamburger@sgh.com) representing SELF International Code Council

Donald Finocchio Mass. Dept. of Public Safety

This proposal refers to the ASCE 7-16 and the ASCE 7-05. The ASCE 7-16 moved all of the Load Combinations including seismic from Chapter 12 to Chapter 2. This proposal is necessary to correct the reference to Load Combinations including over-strength seismic loads to the appropriate location in ASCE 7-16. The Load Combinations for Section 1810.3.12.1 are not new. When creating the ASCE 7 Section numbers 2.0, the better example was understood to be the top number. The only change is to the ASCE 7 Section number.

FEMA / BSSC CODE RESOURCE SUPPORT COMMITTEE
2016 TRACK B CODE DEVELOPMENT CYCLE, COMMITTEE ACTION HEARINGS, LOUISVILLE, KY

ID # | Code Sections | Proponent | Rep/Eng. | Summary | CRSC Position | Comments | CRSC Representative | Committee Focus
--- | --- | --- | --- | --- | --- | --- | --- | ---
001.16 | Table 1810.3.12.1, 1808.3, 1807.2.5 | Jennifer Goupil, AMERICAN SOCIETY OF CIVIL ENGINEERS, (jgoupil@asce.org) representing CRSC | Scott DiFiore, GeoCoalition (sjdifiore@sgh.com); Lori Simpson, P.E., G.E., representing CRSC | Work of a vacuous geotechnical CLASS OF MATERIAL. A disposition is asked for vacuous geotechnical materials to be allowed in determining soil classification. |jected | Scott DiFiore, Lori Simpson, John Hooper | Neutral
002.16 | Table 1810.3.12.1, 1808.3, 1807.2.5 | Jennifer Goupil, AMERICAN SOCIETY OF CIVIL ENGINEERS, (jgoupil@asce.org) representing CRSC | Lori Simpson GeoCoalition | Work of a vacuous geotechnical CLASS OF MATERIAL. A disposition is asked for vacuous geotechnical materials to be allowed in determining soil classification. |jected | Scott DiFiore, Lori Simpson, John Hooper | Neutral
003.16 | Table 1810.3.12.1, 1808.3, 1807.2.5 | Jennifer Goupil, AMERICAN SOCIETY OF CIVIL ENGINEERS, (jgoupil@asce.org) representing CRSC | Ronald Hamburger, (rohamburger@sgh.com) representing SELF International Code Council | Work of a vacuous geotechnical CLASS OF MATERIAL. A disposition is asked for vacuous geotechnical materials to be allowed in determining soil classification. |jected | Scott DiFiore, Lori Simpson, John Hooper | Neutral
004.16 | Table 1810.3.12.1, 1808.3, 1807.2.5 | Jennifer Goupil, AMERICAN SOCIETY OF CIVIL ENGINEERS, (jgoupil@asce.org) representing CRSC | Neutral | Work of a vacuous geotechnical CLASS OF MATERIAL. A disposition is asked for vacuous geotechnical materials to be allowed in determining soil classification. |jected | Scott DiFiore, Lori Simpson, John Hooper | Neutral
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<table>
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<td>2016-14</td>
<td>1901.2.2</td>
<td>Satyendra Ghosh, S. K.</td>
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2016-18 | 12.10.1(c) | John Bachman, John Hooper | | Support | The proposal seeks to refine the seismic design criteria for diaphragms, specifically addressing the effects of diaphragm flexibility. The proposed change aims to improve the seismic performance of diaphragms by incorporating advancements in research and design practices. The summary outlines the rationale behind the proposed change, emphasizing the need for updated design criteria that reflect current understanding in the field. The proposal is supported by peer-reviewed research and industry perspectives, highlighting the need for a more refined approach to seismic design. |

2016-18 | 12.10.3 | Yannick Sibony, C. D. | | Support | The proposal seeks to address the seismic design requirements for diaphragms, focusing on the implementation of advanced design methods. The proposed change aims to enhance the seismic performance of diaphragms by incorporating recent research findings and best practices. The summary highlights the importance of this change in improving the safety and durability of diaphragms during seismic events. The proposal is supported by comprehensive research and industry perspectives, underscoring the need for a more refined approach to seismic design. |
2016 TRACK B CODE DEVELOPMENT CYCLE

FEEMA / BSSC CODE RESOURCE SUPPORT COMMITTEE

2016 TRACK B CODE DEVELOPMENT CYCLE, COMMITTEE ACTION HEARINGS, LOUISVILLE, KY

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<td>Should continue to discuss the development of some specific standards for tensioning steel stress.</td>
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Note: The summary provided is a natural reading of the document content, formatted to maintain clarity and coherence. It may not capture all nuances or technical details present in the original text.
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<td>Kdo in addition to the number of bolts required for the seismic category, the table also indicates the required length of the bolts. This is an additional requirement that was not included in the (S-313-16) code. In addition, footnote e was added to 2018 NFPA 225-1 indicating that only the bolts shall be considered in the seismic category. The intention is to clarify the requirements for calculating structural steel 2018 PCCP as is.</td>
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<td>CRSC Voting Recommendations for Assembly Floor Motions from the April 17-27, 2016 Committee Action Hearings</td>
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<tr>
<td><strong>Key</strong></td>
<td>D = Disapproved; S = Support; N = Neutral; AS = As Submitted; AM = As modified; OV = Online Vote;</td>
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<tr>
<td><strong>Prop # (all are 2016)</strong></td>
<td>Proponent/ Description</td>
<td>CAH Result</td>
<td>Floor Motion</td>
<td>Online Vote Recommendation</td>
<td>CRSC OV</td>
<td>NAHB OV</td>
<td>NCSEA OV</td>
<td>AIA OV</td>
</tr>
<tr>
<td>ADM 27 Pt. I</td>
<td>Bonowitz/ Change def of repair, Winkel oposed in error</td>
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<tr>
<td>ADM35, Pt. III</td>
<td>Schron/ four story townhouses in IECC, turned down for all other parts</td>
<td>AS</td>
<td>D</td>
<td>N</td>
<td>S</td>
<td>S</td>
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<tr>
<td>ADM94</td>
<td>This proposal updates the publication date of existing referenced standards. Included is an update to the 2016 edition of ASCE 7, which will significantly increase the cost of construction in some regions of the country. Of particular concern are higher roof wind pressures which may limit roof covering options in high wind regions. The floor motion modifies ADM94 to retain the 2010 edition of ASCE 7.</td>
<td>AM</td>
<td>AM w/ further Mod.</td>
<td>Oppose</td>
<td>S</td>
<td>O</td>
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<td>G4</td>
<td>Bonowitz/ Dangerous bulding definition</td>
<td>D</td>
<td>AS</td>
<td>Support</td>
<td>S</td>
<td>S</td>
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<tr>
<td>S19</td>
<td>Ennis-SPRI/ roof ballast criteria</td>
<td>D</td>
<td>AS</td>
<td>N</td>
<td>N</td>
<td>O</td>
<td></td>
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<tr>
<td>S20</td>
<td>Fisher-ARMA/ he proposal provides an option for the use of aggregate when the roof system has an engineered parapet control system.</td>
<td>D</td>
<td>AM</td>
<td>N</td>
<td>N</td>
<td>O</td>
<td></td>
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<tr>
<td>S71</td>
<td>Bela/ Risk categories</td>
<td>D</td>
<td>AS</td>
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<tr>
<td>S105</td>
<td>MBMA / wind loads per ASCE 7-10</td>
<td>D</td>
<td>AS</td>
<td>Oppose</td>
<td>O</td>
<td>S</td>
<td>O</td>
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<tr>
<td>S130</td>
<td>Gilligen / Deletes statement of special inspections for cold formed steel</td>
<td>D</td>
<td>AS</td>
<td>N</td>
<td>N</td>
<td>S</td>
<td></td>
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<tr>
<td>S172</td>
<td>Maynard/ Underpinning monitoring</td>
<td>D</td>
<td>AS</td>
<td>N</td>
<td>O</td>
<td>S</td>
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<tr>
<td>S190</td>
<td>Geocoalition/ retaining wall stability check</td>
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<td>O</td>
<td>O</td>
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<tr>
<td>S279</td>
<td>AWC/ Drainage for wood decks with toppings</td>
<td>D</td>
<td>AS</td>
<td>Support</td>
<td>N</td>
<td>O</td>
<td>S</td>
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<td>S301</td>
<td>Crandell/ Water resistive barriers</td>
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<td>AS</td>
<td>N</td>
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<tr>
<td>S306</td>
<td>fema flood/ designation of floodplain administrator</td>
<td>D</td>
<td>AS</td>
<td>N</td>
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<tr>
<td>Prop # (all are 2016)</td>
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<td>S308</td>
<td>FEMA Flood/ submission of new technical flood data</td>
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<td>AS</td>
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<tr>
<td>EB57</td>
<td>Bonowitz/ Building move criteria changes</td>
<td>D</td>
<td>AS</td>
<td>N</td>
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<td>RB17</td>
<td>CRSC/IRC seismic maps</td>
<td>AS</td>
<td>D</td>
<td>Oppose</td>
<td>O</td>
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<tr>
<td>RB18</td>
<td>Bela/ Against new maps</td>
<td>D</td>
<td>AS</td>
<td>Oppose</td>
<td>O</td>
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<tr>
<td>RB20</td>
<td>Wind Loads- This proposal updates Table R301.2(2) based on new roof pressure coefficients in ASCE 7-16. Roofing costs in high-wind regions would increase significantly and material options would be limited. A new wind map reduces wind speeds in the West, but wall bracing and other relevant tables have not been modified to take advantage of the reductions.</td>
<td>D</td>
<td>AS</td>
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<tr>
<td>RB22</td>
<td>Bela/Revises seismic design categories</td>
<td>D</td>
<td>AS</td>
<td>Oppose</td>
<td>O</td>
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<tr>
<td>RB160</td>
<td>FEMA flood/ slabs in flood areas</td>
<td>D</td>
<td>AS</td>
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<tr>
<td>RB211</td>
<td>Deck coalition/ deck guard details and loading</td>
<td>D</td>
<td>AS</td>
<td>Oppose</td>
<td>O</td>
<td>O</td>
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</table>
APPENDIX 6
## FEMA / BSSC RESOURCE SUPPORT COMMITTEE

### 2016 TRACK B CODE DEVELOPMENT CYCLE, PUBLIC COMMENTS HEARINGS, Kansas City, MO

<table>
<thead>
<tr>
<th>Id#</th>
<th>Code Sections</th>
<th>Initial Proponent of CAM</th>
<th>Rep:*</th>
<th>Initial Proposal</th>
<th>Motion on Floor in KC</th>
<th>PCH Proposal</th>
<th>CRSC Past CAM Position</th>
<th>CRSC PCH Position &amp; Representatives</th>
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</thead>
<tbody>
<tr>
<td>6767</td>
<td>IRC: R301.5</td>
<td>Brian D. F. (New)</td>
<td>Gainsborough, North America Associates, Inc.</td>
<td>Brian D. F.</td>
<td>R301.5: This is the 2016\textsuperscript{1} standard update code change</td>
<td>160/147: approved</td>
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<td>6768</td>
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<td>Brian D. F. (New)</td>
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<td>R301.5: This is the 2016\textsuperscript{1} standard update code change</td>
<td>160/147: approved</td>
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<td>Brian D. F. (New)</td>
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<td>Brian D. F.</td>
<td>R301.5: This is the 2016\textsuperscript{1} standard update code change</td>
<td>160/147: approved</td>
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\textsuperscript{1}Approved by the U.S. House Committee on the Budget. \textsuperscript{2}Approved by the U.S. Senate Committee on Appropriations. \textsuperscript{3}Approved by the President. \textsuperscript{4}Approved by the U.S. House of Representatives. \textsuperscript{5}Approved by the U.S. Senate. \textsuperscript{6}Approved by the U.S. President. \textsuperscript{7}Approved by the U.S. Congress. \textsuperscript{8}Approved by the U.S. President.

---

Page 1 of 18
Gregory Rigid, Manager of Emergency Management Agency

Reason: The IRC Section R507.6 requires documentation signed and sealed by registered design professionals that the structure in coastal high hazard areas (Zone V) and coastal A Zones (FEMA Land of Moderate Wave Action) is analyzed and designed to meet the applicable codes. ASCE 24 Flood Resistant Design and Construction is the standard of practice for flood resistant design and construction in coastal high hazard areas. ASCE 24 already has a referenced standard to ASCE 24. A side-by-side comparison of ASCE 24 and ASCE 24 shows differences in behavior that are not substantial, in part because several changes approved for the 2015 IRC were based on consensus with the 2014 edition of ASCE 24. One clear difference is that in ASCE 24 specified either v-walls, which are not permitted by Section R322.3.1 but may be appropriate for some formulations to resist lateral loads. The proposal should be approved as is with the ASCE engineers' Association (NADRA) (bajnaic@chesterfield.gov) requests approval of the IRC to reflect the standard of practice for construction in flood hazard areas.

Motion on Floor: Motion to delete six sections without substitution; explicit in ASCE 24 (nor it is precluded).

CRSC Past Position:
CRSC PCH Position & Representatives

Proposal CRSC - "Acknowledge presented technical information. Comment on the potential for ASCE 24 to be the standard of practice for construction in flood hazard areas.

CRSC Past Position: Motion to delete six sections without substitution; explicit in ASCE 24 (nor it is precluded).

CRSC PCH Position & Representatives

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FEMA / BSSC CODE RESOURCE SUPPORT COMMITTEE

1) Code Sections
2) Initial Proposing Committee
3) Rep
4) Initial Proposal
5) Motion on Floor in KC
6) PCH Proposal
7) CRSC Part Position & Representatives

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<th>Rep</th>
<th>Initial Proposal</th>
<th>Motion on Floor in KC</th>
<th>PCH Proposal</th>
<th>CRSC Part Position &amp; Representatives</th>
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<tr>
<td>40932 14</td>
<td>R610.3.1</td>
<td>Bascom, Bajnai</td>
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<td>R610.3.5</td>
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<td>Approved</td>
<td>Neutral 16</td>
<td>NADRA</td>
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</tbody>
</table>

Footnote b reflects the requirement from FEMA Technical bulletin 8.
Proposal: The proposal retained the exception that allow the code official to evaluate certain architectural and other requirements that the IRC adds normally trigger an alteration project. It removes the exception, however, regarding structural provisions. The current exception already does not apply to alterations in flood resistant areas (a flood sometimes triggers structural improvements) or to structures completed after alteration. So the proposal does not change the current exception.

Since the existing structural provisions for alterations are already measured, already allow reduced loads and alternative criteria in many cases, and already trigger structural improvements only in rare severe cases, the proposed change to this exception should have little impact except to confirm that structural safety is fundamental to the code's intent.

By rolling back the blanket waiver for structural safety issues, the proposal helps code officials embrace the code as intended. It prevents the IRC's basic structural provisions from being undermined by a permit applicant's pressure to reserve a декоративно я не знаю. (декоративно я не знаю) 

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Since the existing structural provisions for alterations are already measured, already allow reduced loads and alternative criteria in many cases, and already trigger structural improvements only in rare severe cases, the proposed change to this exception should have little impact except to confirm that structural safety is fundamental to the code's intent.
EB39 proposes a change to the seismic upgrade triggers in the International Existing Building Code (IEBC). The change represents a significant increase in risk that the code should address. The proposal is intended to clarify the code's current mitigation priorities and to help jurisdictions better understand the rationale behind the proposed changes.

The proposal is being considered by the International Code Council (ICC) and the International Association of Codes and Standards (IASC). The proposal was presented at the 2016 International Code Conference (ICC) in Kansas City, MO.

The proposal has received mixed support from various stakeholders, including engineers, architects, and building code officials. Some comments indicate a need for further clarification and simplification, while others support the proposed changes.

The proposal has been referred to the Standing Committee on Rehabilitation of Existing Buildings (REDB) for further review and consideration.

The full proposal can be found at the following link: [Proposal Link]

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**Additional Information:**

- The proposal is available for public review and comment until [Date]
- The proposal was presented by [Proposer] on behalf of [Organization]
- The proposal includes [Number] pages and [Number] attachments
- The proposal can be accessed at [Proposal Website]

---

**Related Documents:**

- [IEBC Website]
- [ACI 562-16 Website]
- [ASCE 41-17 Website]

---

**Contacts:**

- [David Bonowitz, National Council of Structural Engineers Associations (dbonowitz@att.net)]
- [Additional contacts and resources available on the proposal website]
FEMA / BSCC CODE RESOURCE SUPPORT COMMITTEE

2016 TRACK B CODE DEVELOPMENT CYCLE, PUBLIC COMMENTS HEARINGS, Kansas City, MO

Proposal CRSC

B56-18

Adopt

M. L. Clark, Chair,
SEAOE, Existing Building Committee; Fred Turner, S.E., Chair; Ad Hoc committee member, administrative member; C. Ermer, Member, Ad Hoc Committee;

Proposal motion: It includes the structural upgrade exceptions for relocated buildings and restores some of the intent of the Prescriptive provision (Section 419.1) that was not applied to buildings in the old location. It provides for a type of exception 1. Exception 1 HEREIN THE ADOPTION OF A PROVISION FROM THE LATEST EDITION OF THE CODE, AS THE COMMITTEE INTENDS.

Motion on Floor in KC

CRSC Vote

CRSC-PCH Position & Representatives

Neutral

Support

Neutral

Approve as Submitted.

Proposal motion: It includes the structural upgrade exceptions for relocated buildings and restores some of the intent of the Prescriptive provision (Section 419.1) that was not applied to buildings in the old location. It provides for a type of exception 1. Exception 1 HEREIN THE ADOPTION OF A PROVISION FROM THE LATEST EDITION OF THE CODE, AS THE COMMITTEE INTENDS.

Motion on Floor in KC

CRSC Vote

CRSC-PCH Position & Representatives

Neutral

Support

Neutral

Approve as Submitted.

Proposal motion: It includes the structural upgrade exceptions for relocated buildings and restores some of the intent of the Prescriptive provision (Section 419.1) that was not applied to buildings in the old location. It provides for a type of exception 1. Exception 1 HEREIN THE ADOPTION OF A PROVISION FROM THE LATEST EDITION OF THE CODE, AS THE COMMITTEE INTENDS.

Motion on Floor in KC

CRSC Vote

CRSC-PCH Position & Representatives

Neutral

Support

Neutral

Approve as Submitted.

Proposal motion: It includes the structural upgrade exceptions for relocated buildings and restores some of the intent of the Prescriptive provision (Section 419.1) that was not applied to buildings in the old location. It provides for a type of exception 1. Exception 1 HEREIN THE ADOPTION OF A PROVISION FROM THE LATEST EDITION OF THE CODE, AS THE COMMITTEE INTENDS.

Motion on Floor in KC

CRSC Vote

CRSC-PCH Position & Representatives

Neutral

Support

Neutral

Approve as Submitted.

Proposal motion: It includes the structural upgrade exceptions for relocated buildings and restores some of the intent of the Prescriptive provision (Section 419.1) that was not applied to buildings in the old location. It provides for a type of exception 1. Exception 1 HEREIN THE ADOPTION OF A PROVISION FROM THE LATEST EDITION OF THE CODE, AS THE COMMITTEE INTENDS.

Motion on Floor in KC

CRSC Vote

CRSC-PCH Position & Representatives

Neutral

Support

Neutral

Approve as Submitted.
### FEMM / BSSC CODE RESOURCE SUPPORT COMMITTEE

#### 2016 TRACK B CODE DEVELOPMENT CYCLE, PUBLIC COMMENTS HEARINGS, Kansas City, MO

<table>
<thead>
<tr>
<th>ID#</th>
<th>Code Sections</th>
<th>Initial Committee Position</th>
<th>Rep.</th>
<th>Initial Proposal</th>
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<th>CRSC Past Committee Position</th>
<th>CRSC PCH Position &amp; Representatives</th>
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<tbody>
<tr>
<td><strong>IBC-5</strong></td>
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<tr>
<td>16-04</td>
<td></td>
<td>Jennifer Wing</td>
<td>American Society of Civil Engineers, representing SELF (<a href="mailto:jw@asce.org">jw@asce.org</a>)</td>
<td>The change proposes to coordinate the discussions in Chapter 16 of the BOC in the 2016 edition of the referenced loading standardMinimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-16). The motivation is to clarify how to combine horizontal fire loads with other loads. Unlike other live loads, it is important that the vertical loads for fire walls be combined with the reduced dead loads of equations 16-9 and 16-10. Like the other load combinations, these combinations need to be maintained in IBC and not referenced to another standard.</td>
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<td>1607.14.2</td>
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**Comments:**

**Oppose:**

- John G., Siu, Department of Civil Engineering, University of British Columbia, representing CRSC
- Shafqat H., Earthquake Engineering Research Institute, representing SELF

**Support:**

- James L. | Oregon Earthquake Awareness (sasquake@gmail.com) requests Approve as Modified by this Public Comment.
<table>
<thead>
<tr>
<th>Id</th>
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<tbody>
<tr>
<td>482.5A</td>
<td>2016.1.1(10)</td>
<td>Karli Rubenacker, Stefan Murty (<a href="mailto:sasquake@gmail.com">sasquake@gmail.com</a>)</td>
<td>Creation: Structures should be designed to avoid disproportionate collapse. &quot;Typical&quot; structure should have minimum prescriptive requirements.</td>
<td>Oppose</td>
<td>Oppose</td>
<td>Supporting: Scott Campbell, representing Portland Cement Association (<a href="mailto:scampbell@cement.org">scampbell@cement.org</a>) requests Approve as Submitted.</td>
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</table>

**Public Comments Hearing, Kansas City, MO**

**Commenter's Reason:** Including specific provisions for structural integrity design will be beneficial for public safety and property protection by ensuring design of critical elements to all applicable loads or by provision of an alternate load path. The proposed code change is both comprehensive and clear, and will achieve the goal of providing for adequate structural integrity for buildings subject to the requirements.

**CRSC-FAC Position & Representatives:** Supporting: Scott Campbell, representing Portland Cement Association (scampbell@cement.org) requests Approve as Submitted.

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**Tables:**

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<thead>
<tr>
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<td>101.9</td>
<td>1613.9, 1613.2.5, 1613.5</td>
<td>James Bela, representing Oregon Earthquake Awareness</td>
<td>(<a href="mailto:sasquake@gmail.com">sasquake@gmail.com</a>)</td>
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Proposed: This proposal is to add a similar stipulation to the draft portions of AISC standards for cold-formed steel. It has been offered by the industry with the intent of coordinating it to the comparable NDSA proposal adopting specific inspection requirements for cold light frame construction. It is true that various members of the IBC light frame construction industry are concerned that AISC has not issued a similar section in both cold and cold-formed steel framing. Often, the materials are direct competitors. Rather than upset the solution in both wood and cold-formed steel framing. Often on account of AISI standards for cold-formed steel. It has been offered by the Common Sense Coalition, which means that both proposals must be accepted or fail together.

Motion on Floor in KC:

Rep's Initial Comments:

AM 1705.1 General. High rise buildings are required to be assigned to Category III or IV, and shall comply with the requirements of Section 1615.4. The requirements for high-rise buildings (> 75 ft) are an important factor in determining community reliance, and therefore they are worthy of additional design effort and care.

Motion: The Committee for high-rise buildings are required to be assigned to Category III or IV, and shall comply with the requirements of Section 1615.3. The requirement for high-rise buildings (> 75 ft) are an important factor in determining community reliance, and therefore they are worthy of additional design effort and care.

Proposal Motion

While high-rise buildings are an important factor in determining community reliance, and therefore they are worthy of additional design effort and care. The proposed motion is to add a similar stipulation to the draft portions of AISC standards for cold-formed steel. It has been offered by the industry with the intent of coordinating it to the comparable NDSA proposal adopting specific inspection requirements for cold light frame construction. It is true that various members of the IBC light frame construction industry are concerned that AISC has not issued a similar section in both cold and cold-formed steel framing. Often, the materials are direct competitors. Rather than upset the solution in both wood and cold-formed steel framing. Often on account of AISI standards for cold-formed steel. It has been offered by the Common Sense Coalition, which means that both proposals must be accepted or fail together.

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Motion: The Committee for high-rise buildings are required to be assigned to Category III or IV, and shall comply with the requirements of Section 1615.3. The requirement for high-rise buildings (> 75 ft) are an important factor in determining community reliance, and therefore they are worthy of additional design effort and care.
The proposal provides a needed clarification in the exception to these sections on special inspection and nondestructive testing for structural steel seismic force-resisting systems or for structural steel elements in other types of seismic force-resisting systems. In buildings and structures assigned to SDC D, E or F, IBC Section 1705.5 recognizes that the structural steel seismic force-resisting systems in ASCE 7, Table C15.4-1 where detailing in accordance with AISC 341 for these systems is not detailed in accordance with AISC 341, new second exception in Section 1705.12.1.1 and 1705.13.1.2. The modification is editorial, clarifying the special inspection of structural steel elements that resist seismic forces. The modification is consistent with current practice and eliminates any exemption for these systems from conflicting with the new requirements. In addition, these new special inspection requirements of the IBC for Wood Light Frame Construction to other structural systems using a sample building. For comparison, use a four-story building with 1705.11 (wood) and 1705-12 (seismic) do not apply; there are no trusses spanning 60 feet or more and there are no high-rise dormitories.

**Motion on Floor in KC**

Public Comment 1

Proposers: Scott Carneski representing Portland Cement Association (scarneski@comcast.net) requests Approval as Submitted. Commenter’s Reason: Additional inspection of critical items in wood structures is necessary to ensure safety at a level comparable to other building systems. The lack of special inspection can compromise safety and does not ensure compliance with the design documents. Adequate exemptions are included in the proposal for small structures that do not generally require special inspection. Public Comment 2

Proposers: Renee Moody, ASG representing American Institute of Steel Construction (rmoody@steel.org) requests Approval as Submitted. Commenter’s Reason: This proposal clarifies the special inspection of steel elements that resist seismic forces. The modification is editorial, consistent with current practice and reasonable to incorporate during construction, effective in reducing the time and cost to construct non-compliant wood and steel to ensure the buildings are safe for the public. Costs for these inspections will be included in a manner consistent with building codes. The inspections proposed within this code are specific that only apply any additional inspections occur on the project or the project is not completed by the Building Official. The lack of third party inspections often results in issues being discovered that can be cost-effective correction resulting in delays in completion and costs. The lack of special inspection specified in these sections is unnecessary to the safety of the public. The lack of special inspection is reasonable to incorporate during construction, effective in reducing the time and cost to construct non-compliant wood and steel to ensure the buildings are safe for the public. Costs for these inspections will be included in a manner consistent with building codes. The inspections proposed within this code are specific that only apply any additional inspections occur on the project or the project is not completed by the Building Official. The lack of third party inspections often results in issues being discovered that can be cost-effective correction resulting in delays in completion and costs.
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<th>CRSC Full</th>
<th>CRSC PCH Position &amp; Representatives</th>
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<tbody>
<tr>
<td>66</td>
<td>Sec. 1810.3.12, 1810.3.11.2, 1810.3.3.2, 1803.6.5, 1803.6.10</td>
<td>Jennifer Goupil, <a href="mailto:jgoupil@asce.org">jgoupil@asce.org</a></td>
<td>Group B Hearing, ASCE/SEI 7-16</td>
<td>This proposal is a coordination proposal to bring the 2018 IBC up to date or the provision of the 2016 edition of ASCE 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7-16). Section 1803.5.12- This proposal corrects a reference to the ASCE 7 Standard. ASCE 7 Chapter 21 includes several different procedures for determining load specific seismic hazard. In order to properly permit all of these procedures, reference to Chapter 21 is not necessary. Section 1810.3.11.2, 1810.3.3.2, 1810.3.11.2, 1810.3.3.2, ASCE 7-16 moved all the referenced load combinations from Chapter 12 to Chapter 2. This proposal is necessary to correct the reference to Load Combinations including earthquake seismic loads in the appropriate location in ASCE 7. (NOTE: The Exception for Section 1803.6.1 is no longer necessary. When revising the ASCE 7 Section number to 2.3.6, the entire Exception was underlined by the city Access system. The only change is to the ASCE 7 Section number.)</td>
<td>Disapproved</td>
<td>Disapprove</td>
<td>support request</td>
<td>support request</td>
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<tr>
<td>221</td>
<td>1810.3.2.6</td>
<td>Lori Simpson, GeoCoalition</td>
<td></td>
<td>Item 1: Larger helical pile elements are ever more common and shaft friction can play an important role for larger shaft diameters. This addition allows for the shaft friction to be taken into account.</td>
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<td>No motion.</td>
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<tr>
<td>222</td>
<td>1810.3.2.7</td>
<td>Dan Stevenson, GeoCoalition</td>
<td></td>
<td>Item 2: This item has been deleted to require load testing. Load testing is covered in the current design guides and methods.</td>
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<td>Motion passed.</td>
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<tr>
<td>223</td>
<td>1810.3.2.8</td>
<td>Gosling, GeoCoalition</td>
<td></td>
<td>Listed items 4-6, and combined stresses and buckling limits are covered by other design guide and methods. Reorganizing the first sentence allows for the shaft friction to be taken into account.</td>
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<td></td>
<td>No motion.</td>
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<tr>
<td>224</td>
<td>1810.3.2.9</td>
<td>Pierings, Republic</td>
<td></td>
<td>The additional language added to the first sentence covers the requirements of the listed Items 4-6, and 8. Reorganizing this section in this way allows for the geotechnical capacity limits of Item 2 to be separated from the mechanical (structural) limits of Item 4, 5, and 6. The mechanical axial limits are already covered in Table 1810.3.2.6, and combined stresses and buckling limits are covered by other design guide and methods. This reorganization allows for the shaft friction to be taken into account.</td>
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<td>Motion passed.</td>
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<tr>
<td>225</td>
<td>1810.3.3.1</td>
<td>Piering, R. P. E.</td>
<td></td>
<td>The proposed code change replaces an arbitrary criteria with nominal resistance, design strength, and allow able loadings. This is unconservative and should be included in the design.</td>
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<td>Motion passed.</td>
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<td>Piering, R. P. E.</td>
<td></td>
<td>The additional language added to the first sentence allows for the designer to utilize that skin friction designer may desire to include the effects of skin friction and the designer may desire to include the effects of skin friction. Skin friction is new to the designer to utilize that skin friction.</td>
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<td></td>
<td>Motion passed.</td>
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</tr>
<tr>
<td>227</td>
<td>1810.3.3.3</td>
<td>Piering, R. P. E.</td>
<td></td>
<td>The first sentence is rearranged to make the registered design professional responsible for the design of the splice. It also replaces “driving” with “installation” for consistency.</td>
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<td></td>
<td>No motion.</td>
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<tr>
<td>228</td>
<td>1810.3.3.4</td>
<td>Piering, R. P. E.</td>
<td></td>
<td>The requirements that splices develop not less than 75 percent of the bending strength and not less than 50 percent of the tension and bending strength are arbitrary and unnecessarily restrictive. The revised text for the sentence is streamlined to reflect design as appropriate for the application service loads and materials that are used in the splice.</td>
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<td></td>
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<td></td>
<td>Motion passed.</td>
<td></td>
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</tr>
<tr>
<td>229</td>
<td>1810.3.3.5</td>
<td>Piering, R. P. E.</td>
<td></td>
<td>The specification precludes commonly available splices that would be acceptable in many design situations, such as captive loaded at significant depth. The design professional analyzes the splice and load strength conditions for service and tension or compression axial loadings to determine the requirements for a splice. The existing Commentary describes a drive-fit splice for pipe piles and a stud-line splice that does not satisfy the current code. The last phrase is overly prescriptive and is removed because the testing requirements are covered adequately by Section 1810.2.2, and will be further evaluated by the registered design professional.</td>
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<td></td>
<td>Motion passed.</td>
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<tr>
<td>230</td>
<td>1810.3.3.6</td>
<td>Piering, R. P. E.</td>
<td></td>
<td>The proposal adds language as an advisory design requirement which is intended to guide the designer. The existing sentence is streamlined to make the registered design professional responsible for the design of the splice.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>No motion.</td>
<td></td>
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</tbody>
</table>

**Commentary:**

- The commentary describes drive-fit splices for pipe piles and stud-line splices that do not satisfy the current code. The last phrase is overly prescriptive and is removed because the testing requirements are covered adequately by Section 1810.2.2, and will be further evaluated by the registered design professional.
<table>
<thead>
<tr>
<th>ID#</th>
<th>Code Sections</th>
<th>Initial Proponent of CAM</th>
<th>Rep.</th>
<th>Initial Proposal</th>
<th>Motion on Floor in KC</th>
<th>CRCF Position</th>
<th>CRCF PCH Position &amp; Representatives</th>
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<tr>
<td>C Cr</td>
<td>ICC 1421.3, 1911.3</td>
<td>Sarah Watkins, NRM</td>
<td></td>
<td></td>
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<td>C Cr</td>
<td>ASCE 7-16</td>
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</tbody>
</table>

**FEMA / BSSC CODE RESOURCE SUPPORT COMMITTEE**

**2016 TRACK B CODE DEVELOPMENT CYCLE, PUBLIC COMMENTS HEARINGS, Kansas City, MO**

**2016 TRACK B CODE DEVELOPMENT CYCLE**

**HEARINGS**

- The proposed updates in Section 14.2.4 are based on multi-year, multi-million-dollar research, known as DSDM (Diaphragm Seismic Design Methodology) research, sponsored by the National Science Foundation and the Precast/Poured Concrete Institute.

- The alternative design force level for sheathing was revised in Section 14.2.3 of ASCE 7-16. The issue to the attention of the full membership at the Public Comment Hearings and to allow the membership to coordinate action on this code change proposal with action taken on Code-Change Proposal ADM94-16. ADMM-16 is the administrative update to referenced standards in the I-Codes. One of these standards, ASCE7, Models Design Loads and Associated Criteria for Buildings and Other Structures, was proposed for clarification. A successful assembly motion requests Disapprove. The reference is to ASCE7-16.

**Proposition**

- Boisvert, representing ISC's Code Committee, requests Disapprove of this code change proposal in order to bring a correlation issue to the attention of the full membership at the Public Comment Hearings. This code change proposal with action taken on Code-Change Proposal ADM94-16. ADMM-16 is the administrative update to referenced standards in the I-Codes. One of these standards, ASCE7, Models Design Loads and Associated Criteria for Buildings and Other Structures, was proposed for clarification. A successful assembly motion requests Disapprove. The reference is to ASCE7-16. The code change proposal coordinates with and relies upon reference to ASCE7-16.

**Synopsis**

- The proposed updates to Section 14.2.4 are based on multi-year, multi-million-dollar research, known as DSDM (Diaphragm Seismic Design Methodology) research, sponsored by the National Science Foundation and the Precast/Poured Concrete Institute.

- The alternative design force level for sheathing was revised in Section 14.2.3 of ASCE 7-16. The issue to the attention of the full membership at the Public Comment Hearings and to allow the membership to coordinate action on this code change proposal with action taken on Code-Change Proposal ADM94-16. ADMM-16 is the administrative update to referenced standards in the I-Codes. One of these standards, ASCE7, Models Design Loads and Associated Criteria for Buildings and Other Structures, was proposed for clarification. A successful assembly motion requests Disapprove. The reference is to ASCE7-16. The code change proposal coordinates with and relies upon reference to ASCE7-16.

**Proposition**

- Boisvert, representing ISC's Code Committee, requests Disapprove of this code change proposal in order to bring a correlation issue to the attention of the full membership at the Public Comment Hearings. This code change proposal with action taken on Code-Change Proposal ADM94-16. ADMM-16 is the administrative update to referenced standards in the I-Codes. One of these standards, ASCE7, Models Design Loads and Associated Criteria for Buildings and Other Structures, was proposed for clarification. A successful assembly motion requests Disapprove. The reference is to ASCE7-16. The code change proposal coordinates with and relies upon reference to ASCE7-16.
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<tr>
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<th>Code Sections</th>
<th>Initial Proponent at CANT</th>
<th>Rep'ng.</th>
<th>Initial Proposal</th>
<th>Motion on Floor in KC</th>
<th>PHC Proposal</th>
<th>CRC PCH Position &amp; Representatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-18</td>
<td>2016 IPC, 1021.5, 1021.6</td>
<td>James Bela, representing Oregon Earthquake Awareness (<a href="mailto:sasquake@gmail.com">sasquake@gmail.com</a>)</td>
<td></td>
<td>APPENDIX E EARTHQUAKE RESISTANT CONSTRUCTION INSTRUMENTATION SECTION 5.1.1 GENERAL: Reason: Instruments should be located based upon the locations of the potentially largest earthquakes, not according to the output of a mathematically flawed hazard model, with all the systemic problems of such models.</td>
<td>Oppose</td>
<td>Approve as Submitted</td>
<td>Oppose</td>
</tr>
<tr>
<td>2016-18</td>
<td>2016 IPD, 1021.1, 1021.2, 1021.3, 1021.4</td>
<td>James Bela, representing Oregon Earthquake Awareness (<a href="mailto:sasquake@gmail.com">sasquake@gmail.com</a>)</td>
<td></td>
<td>APPENDIX M TSUNAMI-GENERATED FLOOD TSUNAMI HAZARD AND RISK SECTION 5.1.3: Reason: FEMA P646 is defective, and therefore shouldn't be promulgated in a regulatory framework. REFERENCE STANDARD REASON: The incorporation of so-called probabilistic tsunami hazard analysis is inappropriate, as explained elsewhere regarding psha.</td>
<td>Oppose</td>
<td>Approve as Submitted</td>
<td>Oppose</td>
</tr>
<tr>
<td>#</td>
<td>Code Sections</td>
<td>Initial Proponent of CAM</td>
<td>Rep'ing</td>
<td>Initial Proposal</td>
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<td>CRSC Part Position</td>
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<tr>
<td>2016</td>
<td>16: M101, M313.1, M113.1, B033.1, M035.1</td>
<td>Mike Mahoney, Mike Mahoney, Mike Mahoney, Mike Mahoney</td>
<td>Mike Mahoney, Mike Mahoney, Mike Mahoney, Mike Mahoney</td>
<td>SECTION M101 REFUGE STRUCTURES FOR UNIDENTIFIED EVACUATION FROM TSUNAMI-GENERATED FLOOD HAZARD</td>
<td>The amendments to Appendix M are necessary because the analysis and structural design aspects of FEMA P-466 (2012) Guidance for Design of Structures for Vertical Evacuation from Tsunamis, have been superseded by ASCE 7-2015 Minimum Design Loads and Associated Criteria for Buildings and Other Structures. ASCE 7-16 incorporates more recent knowledge that takes precedence over the older FEMA guidelines. In particular, the FEMA guidelines for determining inundation depth, flow speed, and waterline depths impact forces were found to lack reliability. The proposed updates to Appendix M to make it refer to the tsunami evacuation and site planning criteria of P-466-12 and not to its tsunami hazard mapping and structural design guidelines, thereby removing conflicts that would otherwise occur between the two documents. The title of Appendix M is revised because the original title was overly broad; FEMA P-646 only concerns tsunami refuge structures.</td>
<td>The amendments to Appendix M are necessary because the analysis and structural design aspects of FEMA P-466 (2012) Guidance for Design of Structures for Vertical Evacuation from Tsunamis, have been superseded by ASCE 7-2015 Minimum Design Loads and Associated Criteria for Buildings and Other Structures. ASCE 7-16 incorporates more recent knowledge that takes precedence over the older FEMA guidelines. In particular, the FEMA guidelines for determining inundation depth, flow speed, and waterline depths impact forces were found to lack reliability. The proposed updates to Appendix M to make it refer to the tsunami evacuation and site planning criteria of P-466-12 and not to its tsunami hazard mapping and structural design guidelines, thereby removing conflicts that would otherwise occur between the two documents. The title of Appendix M is revised because the original title was overly broad; FEMA P-646 only concerns tsunami refuge structures.</td>
<td>Support</td>
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<td>2016</td>
<td>16: 1603.1</td>
<td>James Bela, James Bela, James Bela, James Bela</td>
<td>James Bela, James Bela, James Bela, James Bela</td>
<td>SECTION M101 REFUGE STRUCTURES FOR UNIDENTIFIED EVACUATION FROM TSUNAMI-GENERATED FLOOD HAZARD</td>
<td>The amendments to Appendix M are necessary because the analysis and structural design aspects of FEMA P-466 (2012) Guidance for Design of Structures for Vertical Evacuation from Tsunamis, have been superseded by ASCE 7-2015 Minimum Design Loads and Associated Criteria for Buildings and Other Structures. ASCE 7-16 incorporates more recent knowledge that takes precedence over the older FEMA guidelines. In particular, the FEMA guidelines for determining inundation depth, flow speed, and waterline depths impact forces were found to lack reliability. The proposed updates to Appendix M to make it refer to the tsunami evacuation and site planning criteria of P-466-12 and not to its tsunami hazard mapping and structural design guidelines, thereby removing conflicts that would otherwise occur between the two documents. The title of Appendix M is revised because the original title was overly broad; FEMA P-646 only concerns tsunami refuge structures.</td>
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Building Seismic Safety Council (BSSC)
Code Resource Support Committee (CRSC)
VOTING SUGGESTIONS

for the

2016 International Code Council (ICC) Group B Code Changes
Online Governmental Consensus Vote (OGCV)

The National Institute of Building Sciences Building Seismic Safety Council (BSSC), developer of the National Earthquake Hazards Reduction Program (NEHRP) publication *NEHRP Recommended Seismic Provisions for New Buildings and Other Structures* for the Federal Emergency Management Agency (FEMA), urges governmental members of the International Code Council (ICC) to support code changes that advance seismic safety in the nation’s buildings.

As part of their role in supporting the NEHRP Program, members of the FEMA-funded BSSC Code Resource Support Committee (CRSC) provided input at both the ICC Committee Action Hearings (CAH), held April 17-27, 2016, in Louisville, Kentucky, and the ICC Public Comment Hearings (PCH), held October 19-25, 2016, in Kansas City, Missouri. The Online Governmental Consensus Vote (OGCV) ballot, which begins Tuesday, November 8, and runs through Monday, November 21, is the final action to determine if proposed code changes will become part of the 2018 *International Codes*. The CRSC is asking ICC members to support its positions on critical seismic-related code change proposals in the 2018 editions of the *International Building Code* (IBC), the *International Existing Building Code* (IEBC) and the *International Residential Code* (IRC).

The CRSC also requests building industry professionals who know ICC Governmental members to urge them to support the CRSC positions during the OGCV ballot.

The following tables include the seismic-related code changes in question and the CRSC position. In addition to the CRSC’s suggested voting actions for the OGCV ballot, the tables include the actions taken by ICC Code Change Committees during the CAH in Louisville and by the code officials at the PCH in Kansas City.

The acronyms are defined as follows:

- Approval as submitted (AS);
- Approval as modified at the Committee Action Hearing, (AM);
- Approval as modified by public comment (AMPC). If there are multiple comments, the comment # will be shown after AMPC); and
- Disapproval (D).
<table>
<thead>
<tr>
<th>ID #</th>
<th>CAH (Louisville)</th>
<th>PCH (Kansas City)</th>
<th>Recommended OGCV Vote</th>
<th>Code Sections</th>
<th>Initial Proposal</th>
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<tr>
<td>ADM94-16</td>
<td>AS</td>
<td>AS</td>
<td>AS</td>
<td>Standards update</td>
<td>By Jennifer Goupil (ASCE). This is the administrative standards update code change to adopt ASCE/SEI 7-16. The major improvements in ASCE/SEI 7-16 include updates in seismic design, new wind speed maps, new regional snow data, and a new chapter with tsunami design. The FEMA / BSSC CRSC has voted to be a co-proponent of ASCE and support the adoption of ASCE/SEI 7-16.</td>
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<tr>
<td>ID #</td>
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<tr>
<td>S53-16</td>
<td>AS</td>
<td>AS</td>
<td>AS</td>
<td>By Jennifer Goupil (ASCE). This change proposes to coordinate the notation in Chapter 16 of the IBC with the ASCE/SEI 7-16.</td>
<td></td>
</tr>
<tr>
<td>S61-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S 61-16 would have completely revised the seismic design provisions.</td>
<td></td>
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<tr>
<td>S63-16</td>
<td>AM</td>
<td>AM</td>
<td>AM</td>
<td>By Jennifer Goupil (ASCE). These proposed changes to Section 1604 will harmonize the provision in the code with the ASCE/SEI 7-16.</td>
<td></td>
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<tr>
<td>S71-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S 71-16 would have completely revised the seismic design provisions.</td>
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<tr>
<td>S72-16</td>
<td>AS</td>
<td>AS</td>
<td>AS</td>
<td>By Ronald Hamburger and Jennifer Goupil, representing ASCE. S 72-16 modifies Chapter 16 of the IBC to add a new section on tsunami design in coordination with the new ASCE/SEI 7-16.</td>
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<tr>
<td>S73-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S 73-16 would have completely revised the seismic design provisions.</td>
<td></td>
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<tr>
<td>S77-16</td>
<td>AS</td>
<td>AS</td>
<td>AS</td>
<td>By Jennifer Goupil (ASCE). This proposal is a coordination proposal to bring the 2018 IBC up to date with the provisions in ASCE/SEI 7-16.</td>
<td></td>
</tr>
<tr>
<td>S78-16</td>
<td>AM</td>
<td>AMPC1</td>
<td>AMPC1</td>
<td>This proposal is intended to remove minor discrepancies in requirements between the IBC and ASCE 7 standards version of the Strength and Basic Load Combinations by eliminating the duplication of this material. Public comment 1 by Vincent Sagan, Thomas Associates, representing Metal Building Manufacturers Association requests Approve as Modified by this Public Comment.</td>
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## INTERNATIONAL BUILDING CODE - STRUCTURAL (continued)

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<th>ID #</th>
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<tr>
<td>S112-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S 112-16 would have completely revised the seismic design provisions.</td>
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<tr>
<td>S113-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S 113-16 would have completely revised the seismic design provisions.</td>
</tr>
<tr>
<td>S114-16</td>
<td>AM</td>
<td>AM</td>
<td>AM</td>
<td>By Jennifer Goupil (ASCE). This proposal is a coordination proposal to bring the 2018 IBC up to date with the provisions of the ASCE/SEI 7-16.</td>
</tr>
<tr>
<td>S116-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S 116-16 would have completely revised the seismic design provisions.</td>
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<td>S118-16</td>
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<td>By James Bela. S 118-16 would have completely revised the seismic design provisions.</td>
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<td>S120-16</td>
<td>D</td>
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<td>By James Bela. S 120-16 would have completely revised the seismic design provisions.</td>
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<td>S121-16</td>
<td>D</td>
<td>D</td>
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<td>S122-16</td>
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<td>By James Bela. S 122-16 would have completely revised the seismic design provisions.</td>
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<tr>
<td>S125-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S 125-16 would have completely revised the seismic design provisions.</td>
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### INTERNATIONAL BUILDING CODE - STRUCTURAL (continued)

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<tr>
<td>S146-16</td>
<td>AM</td>
<td>AMPC1</td>
<td>AMPC1</td>
<td>By Bonnie Manley (AISI). This proposal provides a needed clarification in the exceptions in these sections on special inspection and nondestructive testing for structural steel seismic force-resisting systems and for structural steel elements in other types of seismic force-resisting systems. Public Comment 1 by Bonnie Manley to clean up the charging language to ASCE 7, Section 15.4, which governs nonbuilding structures.</td>
</tr>
<tr>
<td>S166-16</td>
<td>AS</td>
<td>AS</td>
<td>AS</td>
<td>By Jennifer Goupil (ASCE). This proposal is a coordination proposal to bring the 2018 IBC up to date with the ASCE/SEI 7-16.</td>
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<td>S242-16</td>
<td>AM</td>
<td>AM</td>
<td>AM</td>
<td>By SK Ghosh, representing FEMA and BSSC’s CRSC. S 242-16 was our change to improve seismic design of diaphragms in concert with the new ASCE/SEI 7-16.</td>
</tr>
<tr>
<td>S252-16</td>
<td>AS</td>
<td>AMPC1</td>
<td>AMPC1</td>
<td>Initial proposal by Bonnie Manley (AISI). This proposal is one in a series adopting the latest generation of AISI standards for cold-formed steel. This particular proposal focuses on Chapter 22 by incorporating references to three new cold-formed steel standards -- AISI S240, AISI S400, and AISI S202. Public Comments 1 and 2 represent the latest updates by AISI addressing public comments.</td>
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<tr>
<td>S313-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S313-16 would have completely revised Appendix L on seismic instrumentation.</td>
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<td>S314-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. S314-16 would have completely revised Appendix M on tsunami vertical evacuation structures.</td>
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<tr>
<td>S315-16</td>
<td>AS</td>
<td>AS</td>
<td>AS</td>
<td>By Mike Mahoney (FEMA). S315-16 revised Appendix M to eliminate conflicts with the new ASCE/SEI 7-16 Chapter 6 on tsunami loads.</td>
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<td>D</td>
<td>D</td>
<td>By James Bela. S318-16 would have completely revised the seismic design provisions.</td>
</tr>
</tbody>
</table>
### INTERNATIONAL EXISTING BUILDING CODE - STRUCTURAL

<table>
<thead>
<tr>
<th>ID #</th>
<th>CAH (Louisville)</th>
<th>PCH (Kansas City)</th>
<th>Recommended OGCV Vote</th>
<th>Initial Proposal</th>
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</thead>
<tbody>
<tr>
<td>EB58-16</td>
<td>AM</td>
<td>AMPC1</td>
<td><strong>AMPC1</strong></td>
<td>EB-58 updates IEBC Appendix A-1 Seismic Strengthening Provisions for Unreinforced Masonry Bearing Wall Buildings. This code change was recommended for approval as modified by the Code Change Committee. The proponent submitted a public comment to make some modifications.</td>
</tr>
<tr>
<td>ID #</td>
<td>CAH (Louisville)</td>
<td>PCH (Kansas City)</td>
<td>Recommended OGCV Vote</td>
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<tr>
<td>RB17-16</td>
<td>AS</td>
<td>AS</td>
<td>AS</td>
<td>By Kelly Cobeen, WJE, representing FEMA and the BSSC CRSC. This proposal incorporates the most current seismic design maps prepared by the U.S. Geological Survey (USGS) in collaboration with FEMA and BSSC. A separate coordinated code change updates the seismic design maps in the IBC to be consistent with these IRC maps and the maps incorporated into ASCE/SEI 7-16.</td>
</tr>
<tr>
<td>RB18-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. RB18-16 would delete the use of Seismic Design Categories from the IRC.</td>
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<tr>
<td>RB22-16</td>
<td>D</td>
<td>D</td>
<td>D</td>
<td>By James Bela. RB22-16 was a related change that introduced an alternate to Seismic Design Category.</td>
</tr>
<tr>
<td>RB 235-16</td>
<td>AS</td>
<td>AMPC 2</td>
<td>AMPC2</td>
<td>The proposal revises wall bracing provisions to clarify use in seismic areas. The wood industry submitted a public comment to further clarify the change and to mirror how wind is handled in the same code section.</td>
</tr>
<tr>
<td>RB372-16</td>
<td>D</td>
<td>AMPC 1</td>
<td>AMPC1</td>
<td>By Kelly Cobeen, WJE, representing FEMA and the BSSC CRSC. Proposed code change to add FEMA’s Recovery Advisory on Masonry Chimneys (FEMA P-1024 RA-1) into the IRC as a new Appendix V: APPENDIX V Seismic Repair and Seismic Retrofit of Masonry Chimneys in Existing One- and Two-Family Detached Dwellings. Public Comment 1 by Kelly Cobeen, which modified the originally submitted proposal in response to comments and concerns voiced by NAHB, UL, NCSEA and masonry industry representatives. While this has resulted in a number of modifications, many are editorial in nature and the modified proposal does not vary significantly in technical content from the originally submitted proposal.</td>
</tr>
</tbody>
</table>
For questions, contact:

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