

EB1-12

[B]301.1.4, [B]301.1.4.1, [B]Table 301.1.4.1, [B]301.1.4.2, [B]Table 301.1.4.2

Proposed Change as Submitted

Proponent: Jennifer Goupil, The Structural Engineering Institute of ASCE (jgoupil@asce.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 301.1.4 Evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the *International Building Code*, ASCE 34 or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2.

[B] 301.1.4.1 Compliance with IBC level seismic forces. Where compliance with the seismic design provisions of the *International Building Code* is required, the procedures shall be in accordance with one of the following:

1. One-hundred percent of the values in the *International Building Code*. Where the existing seismic force-resisting system is a type that can be designated as "Ordinary," values of R , Ω_o and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be those specified for structural systems classified as "Ordinary" in accordance with Table 12.2-1 of ASCE 7, unless it can be demonstrated that the structural system will provide performance equivalent to that of a "Detailed," "Intermediate" or "Special" system.
2. Compliance with the performance objectives in ASCE 41 ~~using both the BSE-1 and BSE-2 earthquake hazard levels and the corresponding performance levels shown in Table 301.1.4.1 Section 2.2.4 based on the assigned Risk Category for the building.~~

~~[B] TABLE 301.1.4.1~~

~~PERFORMANCE CRITERIA FOR IBC—LEVEL SEISMIC FORCES OCCUPANCY~~

[B] 301.1.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R , Ω_o and C_d used for analysis shall be as specified in Section 301.1.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix Chapters shall be deemed to comply with this section.
 - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
 - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.
 - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
 - 2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be

based on the procedures specified in Chapter A4. 2.5. Seismic evaluation and design of concrete buildings in all risk categories are permitted to be based on the procedures specified in Chapter A5.

- ~~3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 301.1.4.2. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.~~
- ~~43. Compliance with the performance objectives in ASCE 41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 301.1.4.2. The design spectral response acceleration parameters S_{as} and S_{ms} specified in ASCE 41 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters S_{DS} and S_{D1} defined by the International Building Code Section 2.2.1 based on the assigned Risk Category for the building.~~

[B] TABLE 301.1.4.2

PERFORMANCE CRITERIA FOR REDUCED IBC—LEVEL SEISMIC FORCES RISK CATEGORY

Reason: This proposal has two primary purposes:

1. Replace references to ASCE 31-03 and 41-06 with the updated standard ASCE 41-13, which combined 31 and 41 and contains numerous technical updates, representing the state of the practice for seismic evaluation and rehabilitation of existing buildings.
2. Remove IEBC Tables 301.1.4.1 and 301.1.4.2 and replace with a reference to the related sections of ASCE 41-13. The update standard contains performance objective criteria for both a new building standard equivalent level (“IBC-level seismic forces” in the IEBC), and a basic retrofit level (“reduced IBC-level seismic forces” in the IEBC).

Both of these purposes and a general summary of the changes associated with the new standard are presented below:

ASCE 41-13 Summary

ASCE 41-13 is the culmination of a multi-year, ANSI approved update process for the two seismic evaluation and rehabilitation standards promulgated by ASCE. There are several significant updates to the standards:

- ASCE 31-03 and 41-06 have been combined into one standard for improved consistency and usability. The primary features of the two standards have been maintained, including a three-tiered analysis approach; the use of simplified, experience-based approach for common building types; the use of advance analytical techniques for more complex or unusual buildings.
- Updated seismic hazard and performance objectives, including the addition of a “new building standard equivalent” performance and a change in the seismic hazard determination of the basic performance objective for existing buildings. The new building equivalent utilizes the same seismic hazards as ASCE 7-10. The existing building performance has removed the 0.75 factors on demands that has traditionally been used and instead uses reduced seismic hazards (see below for more detail). This approach is currently used for existing buildings in the 2007 California Building Code.
- Updated and revised checklists for the Tier 1 screening procedure that was in ASCE 31-03.
- Updated provisions for analysis, foundations, and the major materials chapters in ASCE 41-06 based on incorporation of research and practice since ASCE 41-06 was developed.

A public ballot version of the new standard will be available from ASCE in the spring of 2012 and it is expected that it a prepublication (white cover) version will be available prior to the ICC Final Action Hearings in October of 2012. Any person interested in obtaining a public comment copy of ASCE 41-13 may do so by contacting the proponent at jgoupil@asce.org.

Referencing ASCE 41-13 for Seismic Performance

It is our opinion that the table describing the ASCE 41 performance levels is best kept within the standard rather than defining force levels, performance objectives, and interpolation of acceptance criteria in the IEBC. This is consistent with how ASCE 7 works with the IBC. Namely, a building is assigned a Risk Category by the IBC, and then ASCE 7 defines the performance objective for that Risk Category. In ASCE 7 this is done via the seismic importance factor and other limitations contained in the standard. We propose the same method for the IEBC: Risk Category is assigned by the Code (in this case the IEBC), and associated seismic performance is specified by the referenced standard (ASCE 41-13).

Section 301.1.4.1 IBC Level Seismic Forces

This proposal removes the ASCE 41-06 performance levels from the IEBC and instead references a new section in ASCE 41-13 that contains criteria for “New Building Standards Equivalent Performance Objective.” The objectives are similar to Table 301.1.4.1 in the 2012 IEBC and are intended to be generally consistent with the IBC and ASCE 7 as referenced in IEBC Section 301.1.4.1 Item 1.

Since ASCE 41-13 Section 2.2.4 addresses both structural and nonstructural items, the revised text references only the structural performance criteria consistent with Table 301.1.4.1 in the IEBC.

If kept within the IEBC, an updated version of Table 301.1.4.1 would be as follows:

**TABLE 301.1.4.1
PERFORMANCE CRITERIA FOR IBC-LEVEL SEISMIC FORCES**

RISK CATEGORY (BASED ON IBC TABLE 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1N EARTHQUAKE HAZARD LEVEL	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-2N EARTHQUAKE HAZARD LEVEL
I	Life Safety (LS)	Collapse Prevention (CP)
II	Life Safety (LS)	Collapse Prevention (CP)
III	Damage Control Note a	Limited Safety Note a
IV	Immediate Occupancy (IO)	Life Safety (LS)

a. ~~Acceptance criteria for Risk Category III shall be taken as 80 percent of the acceptance criteria specified for Risk Category II performance, but need not be less than the acceptance criteria specified for Risk Category IV performance levels.~~

Therefore, this part of the proposal effectively has two substantive revisions to the 2012 version of Table 301.1.4.1 based on the updates in ASCE 41-13:

1. BSE-1N and BSE-2N in ASCE 41-13 are similar to the BSE-1 and BSE-2 in ASCE 41-06 except that they are based on the MCE_R ground motions consistent with ASCE 7-10. In addition whereas the BSE-1 in ASCE 41-06 was taken as the lesser of $2/3MCE$ and earthquake exceedance probability of 10% in 50 years, the BSE-1N is defined as MCE_R without considering the earthquake exceedance probability of 10% in 50 years.
2. The interpolation for Risk Category III has been changed from 80% of Risk Category IV to halfway between Risk Category II and Risk Category IV based on the definitions of "Damage Control" and "Limited Safety" in ASCE 41-13. Based on review and modifications to the acceptance criteria during the development of ASCE 41-06, the halfway interpolation better reflects the intent of the ASCE 7-10 Importance Factors for Risk Category III. Note also that the halfway interpolation is consistent with how the IEBC treated Risk Category III prior to 2009.

Section 301.1.4.2 Reduced IBC Level Seismic Forces

This proposal removes the ASCE 41-06 performance levels from the IEBC and instead references the section in ASCE 41-13 that contains criteria for "Basic Performance Objective for Existing Buildings." The objectives are similar to Table 301.1.4.2 in the 2012 IEBC and are intended to be generally consistent with the traditional approach for reduced seismic forces (75% of new code).

Since ASCE 41-13 Section 2.2.1 addresses both structural and nonstructural items, the revised text references only the structural performance criteria consistent with Table 301.1.4.1 in the IEBC.

ASCE 41-13 contains a three-tiered approach with Tiers 1 and 2 taken from ASCE 31-03 and Tier 3 being the Systematic Method from ASCE 41-06. Therefore, effectively the methods in ASCE 41-13 as referenced in new Item 3 and the same as those referenced in 2012 IEBC Items 3 and 4.

If kept within the IEBC, an updated version of Table 301.1.4.1 would be as follows:

**TABLE 301.1.4.2
PERFORMANCE CRITERIA FOR REDUCED IBC-LEVEL SEISMIC FORCES**

RISK CATEGORY (BASED ON IBC TABLE 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 31	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL
I	Life Safety (LS)	Life Safety (LS)
II	Life Safety (LS)	Life Safety (LS)
III	Note a	Damage Control Note a
IV	Immediate Occupancy (IO)	Immediate Occupancy (IO)

a. ~~For Risk Category III, the ASCE 41 Tier 1 Screening checklists shall be based on the Life Safety Performance Level, except that checklists statements using the Quick Check procedures of ASCE 41 Section 4.5.3 shall be to a demand to capacity ratio based on the average of the demand to applicable capacity ratio for Life Safety and Immediate Occupancy.~~

a. ~~Acceptance criteria for Risk Category III shall be taken as 80 percent of the acceptance criteria specified for Risk Category II performance, but need not be less than the acceptance criteria specified for Risk Category IV performance levels.~~

b. ~~For Risk Category III, the ASCE 31 screening phase checklists shall be based on the life safety performance level.~~

Therefore, this part of the proposal effectively has four substantive revisions:

1. The BSE-1E is a newly defined seismic hazard in ASCE 41-13 intended for the Basic Performance Objective for existing buildings. The hazard level is defined as an earthquake with a 20% exceedance probability in 50 years, which is generally consistent with a 10% in 50 year earthquake with the 0.75 factor that was built into the ASCE 31-03 methodology for seismic evaluation.
2. The interpolation for Risk Category III has been changed from 80% of Risk Category IV to halfway between Risk Category II and Risk Category IV based on the definitions of "Damage Control" in ASCE 41-13. Based on review and modifications to the acceptance criteria during the development of ASCE 41-06, the halfway interpolation better reflects the intent of the ASCE 7-10 Importance Factors for Risk Category III. Note also that the halfway interpolation is consistent with how the IEBC treated Risk Category III prior to 2009.
3. The performance objectives for the Tier 1 and Tier 2 procedures in ASCE 41-13 consists of a single check (one performance level and seismic hazard combination), consistent with ASCE 31-03 as referenced in the 2012 IEBC. Due to seismic hazard reduction (from $2/3 MCE$ to 20% in 50 year) combined with the elimination of the ASCE 31-03 0.75 factor, the effective performance objective for Tier 1 and Tier 2 is similar to what the 2012 IEBC Table 301.4.2 specifies for ASCE 31-03.

4. The performance objective for the Tier 3 procedure in ASCE 41-13 consists of a dual check (two performance level and seismic hazard combination), which differs from how the 2012 IEBC references ASCE 41-06. The inclusion of the second seismic hazard (BSE-2E defined as 5% in 50 year) is intended to offset the effect of the hazard reduction from the ASCE 41-06 BSE-1 (10% in 50 year) to the ASCE 41-13 BSE-1E (20% in 50 year). Therefore, the dual level check proposed is intended to be generally consistent with the single level check in 2012 IEBC Table 301.1.4.2.

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

Analysis: This code change proposal references ASCE standard 41, which is already referenced in this code. However, the proposed change to code text is written to correlate with a new edition of the standard ASCE 41-13, rather than the edition presently referenced in the code, which is the 06 edition. The 13 edition of this standard is not yet completed, published and available. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. Should this code change proposal be approved, but the update to the standard not be approved by the Administrative Code Committee, the code text will revert to the text as it appears in the 2012 Edition of the code. Additionally, if the standard update is approved but the document is not published and available by December 1, 2014, an errata will be issued to the code that will return the affected code text to the text as it appears in the 2012 edition of the code.

301.1.4-EB-GOUPIL.doc

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

[B] 301.1.4 Evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the *International Building Code* or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2.

[B] 301.1.4.1 Compliance with IBC level seismic forces. Where compliance with the seismic design provisions of the *International Building Code* is required, the procedures criteria shall be in accordance with one of the following:

1. One-hundred percent of the values in the *International Building Code*. Where the existing seismic force-resisting system is a type that can be designated as "Ordinary," values of R , Ω_0 and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be those specified for structural systems classified as "Ordinary" in accordance with Table 12.2-1 of ASCE 7, unless it can be demonstrated that the structural system will provide performance equivalent to that of a "Detailed," "Intermediate" or "Special" system.
2. ~~Compliance with the performance objectives in ASCE 41 Section 2.2.4 based on the assigned Risk Category for the building.~~ ASCE 41, using a Tier 3 procedure and the two-level performance objective in Table 301.1.4.1 for the applicable risk category.

**[B] TABLE 301.1.4.1
PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH IBC-LEVEL SEISMIC FORCES**

<u>RISK CATEGORY (Based on IBC Table 1604.5)</u>	<u>STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1N EARTHQUAKE HAZARD LEVEL</u>	<u>STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2N EARTHQUAKE HAZARD LEVEL</u>
I	Life Safety (S-3)	Collapse Prevention (S-5)
II	Life Safety (S-3)	Collapse Prevention (S-5)
III	Damage Control (S-2)	Limited Safety (S-4)
IV	Immediate Occupancy (S-1)	Life safety (S-3)

[B] 301.1.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures criteria used shall be in accordance with one of the following:

3. The *International Building Code* using 75 percent of the prescribed forces. Values of R , Ω_0 and C_d used for analysis shall be as specified in Section 301.1.4.1 of this code.
4. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix. Chapters shall be deemed to comply with this section.
 - 4.1 The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
 - 4.2 Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.
 - 4.3 Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
 - 4.4 Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A4.
 - 4.5 Seismic evaluation and design of concrete buildings in all risk categories are permitted to be based on the procedures specified in Chapter A5.
5. ~~Compliance with the performance objectives in ASCE 41 Section 2.2.1 based on the assigned Risk Category for the building.~~ ASCE 41, using the performance objective in Table 301.1.4.2 for the applicable risk category.

**[B] TABLE 301.1.4.2
PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH REDUCED IBC-LEVEL SEISMIC FORCES**

RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1E EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3)
II	Life Safety (S-3)
III	Damage Control (S-2). See Note a
IV	Immediate Occupancy (S-1)

a. Tier 1 evaluation at the Damage Control performance level shall use the Tier 1 Life Safety checklists and Tier 1 Quick Check provisions midway between those specified for Life Safety and Immediate Occupancy performance.

Committee Reason: This IEBC update is a necessary step in making this section compatible with the new edition of ASCE 41. The modification will make this section easier to use by keeping the performance objectives in the code,

Analysis: This code change proposal references ASCE standard 41, which is already referenced in this code. However, the proposed change to code text is written to correlate with a new edition of the standard ASCE 41-13, rather than the edition presently referenced in the code, which is the 2006 edition. The 2013 edition of this standard is not yet completed, published and available. The update to this standard will be considered by the Administrative Code Committee during the 2013 Code Development Cycle. If the standard update is approved but the document is not published and available by December 1, 2014, an errata will be issued to the code that will return the referenced edition of the standard to the edition referenced in the 2012 edition of the code.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

James Bela, Oregon Earthquake Awareness, representing self, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

[B] 301.1.4 Evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the *International Building Code* or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2.

[B] 301.1.4.1 Compliance with IBC level seismic forces. Where compliance with the seismic design provisions of the *International Building Code* is required, the criteria shall be in accordance with one of the following:

1. One-hundred percent of the values in the *International Building Code*. Where the existing seismic force-resisting system is a type that can be designated as "Ordinary," values of R , Ω_0 and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be those specified for structural systems classified as "Ordinary" in accordance with Table 12.2-1 of ASCE 7, unless it can be demonstrated that the structural system will provide performance equivalent to that of a "Detailed," "Intermediate" or "Special" system.
2. ASCE 41, using a Tier 3 procedure and the two-level performance objective in Table 301.1.4.1 for the applicable risk category.

[B] TABLE
301.1.4.1

PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH IBC-LEVEL SEISMIC FORCES

RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1N EARTHQUAKE HAZARD LEVEL	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-2N EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3)	Collapse Prevention (S-5)
II	Life Safety (S-3)	Collapse Prevention (S-5)
III	Damage Control (S-2)	Limited Safety (S-4)
IV	Immediate Occupancy (S-1)	Life safety (S-3)

[B] 301.1.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the criteria used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R , Ω_0 and C_d used for analysis shall be as specified in Section 301.1.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix Chapters shall be deemed to comply with this section.
 - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
 - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.
 - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
 - 2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A4.
 - 2.5. Seismic evaluation and design of concrete buildings in all risk categories are permitted to be based on the procedures specified in Chapter A5.
3. ASCE 41, using the performance objective in Table 301.1.4.2 for the applicable risk category.

[B] TABLE
301.1.4.2

PERFORMANCE OBJECTIVES FOR USE IN ASCE 41 FOR COMPLIANCE WITH REDUCED IBC-LEVEL SEISMIC FORCES

RISK CATEGORY (Based on IBC Table 1604.5)	STRUCTURAL PERFORMANCE LEVEL FOR USE WITH BSE-1E EARTHQUAKE HAZARD LEVEL
I	Life Safety (S-3)
II	Life Safety (S-3)
III	Damage Control (S-2). See Note a
IV	Immediate Occupancy (S-1)

a. Tier 1 evaluation at the Damage Control performance level shall use the Tier 1 Life Safety checklists and Tier 1 Quick Check provisions midway between those specified for Life Safety and Immediate Occupancy performance.

Commenter's Reason: The IEBC should not be dealing with seismic upgrade and seismic retrofit issues; rather, it should remain limited to fire-and-life-safety, exiting requirements, and strength issues related to gravity and lateral loading (due to wind). If engineers want to use ASCE 41, they should do it without the presumed endorsement of the ICC code development process. Since ASCE 41 is out-of-step with the ICC code development process, it should not be permissible to incorporate anticipated future changes to it into ICC code development processes. Since ASCE 41 incorporates the same flaws and miscalculations regarding seismic hazard assessment as ASCE 7-10 (specifically now even MCE_R); the results thereof will be even more problematical for existing buildings. Existing buildings need to be confronted by the realities of a real earthquake determined by Deterministic Seismic Hazard Assessment, or DSHA. With the "yo-yoing" of seismic design forces resulting from the non-stability of seismic hazard mapping, then further reducing force levels below now reduced current code levels makes no sense whatsoever – and the

end results for public safety are really questionable. The so-called "Performance Levels" referred to in ASCE 41 are without physical meaning and without merit. Existing buildings need to be evaluated against a real earthquake criterion, which has a real magnitude, real frequency content, and a real duration of shaking.

EB1-12

Final Action:

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EB2-12

[B]301.1.4, [B]301.1.5 (New), Chapter 16 (New)

Proposed Change as Submitted

Proponent: Matthew Senecal, P.E., American Concrete Institute

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 301.1.4 Seismic evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the *International Building Code*, ASCE 31 or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2.

[B] 301.1.5 Concrete evaluation and design procedures. Non-seismic evaluation and design of structural concrete shall be in accordance with the requirements of ACI 562.

Add new standard to Chapter 16 as follows:

ACI

562-12 - Code Requirements for Evaluation, Repair, and Rehabilitation of Concrete Buildings

Reason: There are no general evaluation and design criteria for concrete structures in the IEBC. ASCE 31, ASCE 41, and Appendix A of this code provide direction for particular structural systems in high seismic areas. ACI 562 is a new referenced standard addressing non-seismic evaluation and design of concrete structures. ACI 562 is compatible with the principles of this code, ASCE 31, and ASCE 41.

Cost Impact: The code change proposal will set a minimum standard for the repair or rehabilitation of concrete structures; therefore, the cost of construction may increase or decrease depending on the standard of practice of the local jurisdiction.

Analysis: A review of the standard proposed for inclusion in the code ACI 562-12 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2012.

301.1.4-EB-SENECAL.doc

Public Hearing Results

Note: For staff analysis of the content of ACI 562 relative to CP#28, Section 3.6, please visit: http://www.iccsafe.org:8888/cs/codes/Documents/2012-13cycle/Proposed-A/00a_updates.pdf

Committee Action:

Approved as Submitted

Committee Reason: This proposal adds ACI 562 as an IEBC reference standard in order to provide guidance for the repair of concrete buildings.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment 1:

David Bonowitz, representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

301.1.4 Seismic evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the *International Building Code*, ASCE 31 or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2.

301.1.5 Concrete evaluation and design procedures. Non-seismic evaluation and design of structural concrete shall be in accordance with the requirements of ACI 562.

301.1.5 Non-seismic evaluation and design procedures. Where seismic evaluation or design is not required, and where the cited evaluation or design requirements are not specific with respect to existing conditions, compliance with ACI 562 shall be deemed to comply with requirements for evaluation, repair, or rehabilitation of structural concrete.

Commenter's Reason: This comment would clarify the intent and scope of proposal EB2, which was approved as submitted.

As submitted, proposal EB2 would require the use of ACI 562, but ACI 562 is problematic for several reasons:

- ACI 562 is a new standard, never used. Its final text has not been available for review. According to ACI, changes have been made to the document since the ballot draft was made available to ICC, and the new text is only going to public comment through ACI on August 1, 2012.
- ACI 562 creates confusion by referring to itself as a code, not a standard.
- "Non-seismic" as used in proposal EB2 is not defined. Does it refer to the seismic design category, the cause of the damage, the system or component in question, the load combination in question, or something else?
- "Design of structural concrete" as used in proposal EB2 is unclear. Does it apply only to existing components being repaired or altered, or does it also apply to new components being added (which are supposed to be as per code for new construction)?
- ACI 562 sec 1.3.4 et al. cite ACI 318 instead of citing the building code. Thus, any code modifications to ACI 318 are lost.
- ACI 562 uses non-code terminology not defined: "distressed," "life safety hazard," etc.
- ACI 562 uses non-code terminology inadequately defined by the standard: "service life," etc.
- ACI 562 sec 1.3.5 greatly increases the scope of work for repairs by requiring a potentially costly and disruptive investigation anywhere in the building of elements "similar" to damaged elements.
- ACI 562 sec 1.3.5 and 1.3.5C confuses construction defects (which always require remedy) and damage (which might or might not require repair). It makes the engineer and code official on a repair project responsible for finding original construction defects and hidden non-compliance.
- ACI 562 has administrative requirements in section 1.4 through 1.7 that appear to supersede IBC Chapter 1 inappropriately.
- ACI 562 section 1.5.3 and 1.7 make the engineer and code official responsible for developing a maintenance plan as part of a structural evaluation or design.
- ACI 562 section 4.2 inappropriately restates (and thus introduces potential confusion, if not conflict) compliance provisions in IEBC 301.
- ACI 562 section 4.4 inappropriately restates (and thus introduces potential confusion, if not conflict) basic provisions of the IEBC regarding design criteria for different project types.
- ACI 562 section 7.5 inappropriately restates (and thus introduces potential confusion, if not conflict) provisions in IEBC 301, 401, 602, etc.

For these reasons, proposal EB2 must at the very least be modified to clarify the intent as follows:

- It should be voluntary, not mandatory. Hence the recommended "deemed to comply" language.
- It should apply only where the default evaluation and design requirements – those in IBC Chapter 16 and material chapters, as modified by the triggering provision in the IEBC – are unclear, incomplete, or not applicable to existing conditions because they were developed to apply primarily to new construction.
- The new section should parallel the existing organization, which is based on load types, not materials.

Public Comment 2:

Mark K. Gilligan, representing self, requests Disapproval.

Commenter's Reason: Including ACI 562 as a reference standard is not appropriate because the document is severely flawed on multiple levels.

A basic concern for building officials is that in many places the document does not provide objective criteria for the building official to determine whether the proposed design complies or not. For example Sections 7.3.2.1, 7.4.2 through 7.4.4. 7.8.2.1, 7.9.1.4, 8.3.1, 8.4, and 8.5.

In numerous locations it tries to dictate who does what and not what the building must comply with.

Section 10.3.1C changes the very nature of Construction Observation into a requirement for a full fledged inspection program.

Sections 4.3.4 & 5.1.2 requires the design professional to have a detailed involvement in contractors shoring. While sequence of construction and loading can have an impact on the forces in concrete members the reality is that in most common situations the ultimate capacity is not very sensitive to these conditions. The same issue exists in new construction where common practice is to have the contractor design shoring and formwork. It does not make sense to have this requirement for repairs when we do not require it for new construction.

Section 1.5.3 requires the development of a maintenance program when there is no corresponding requirement for new construction.

Section 6.6 makes reference to ACI 437 which ACI considers a guideline and not a standard. According to ACI policy ACI 437 should not be used as a reference standard.

Issues such as load testing and post installed anchors are already addressed in ACI 318.

This document is a clear indication of the problems that can occur when reference standards are submitted for inclusion before people have had an opportunity to review the document. Standards of questionable value get adopted without anybody reading them.

Public Comment 3:

Marko Schotanus, Rutherford & Chekene, representing SEAOC Existing Buildings Committee, requests Disapproval.

Commenter's Reason: Proposal EB2 requires the use of a new standard, ACI 562, that is still incomplete, has never been used, and has not even been thoroughly reviewed by either ICC committee members, code officials, or engineers. According to ACI, changes have been made to the document since the ballot draft was made available to ICC, and the new text is only going to public comment through ACI on August 1, 2012. Also, proposal EB2 affects only the IEBC, not the IBC, leading to a lack of coordination.

Proposal EB2 should therefore be Disapproved at least until the final content of ACI 562 is known and accepted by consensus.

In addition, review of the draft copy of ACI 562 made available by the proponent revealed the following concerns that further argue for Disapproval of EB2:

- ACI 562 creates confusion by referring to itself as a code, not a standard.
- Proposal EB2 affects "non-seismic" applications only, but ACI 562 is comprehensive and addresses seismic issues as well. Thus, when sent to ACI 562 by proposed IEBC 301.1.5, the user will not know which sections to use and which to ignore.
- "Non-seismic" as used in proposal EB2 is not defined. Does it refer to the seismic design category, the cause of the damage, the system or component in question, the load combination in question, or something else?
- "Design of structural concrete" as used in proposal EB2 is unclear. Does it apply only to existing components being repaired or altered, or does it also apply to new components being added (which are supposed to be as per code for new construction)?
- Overall application of ACI 562 is unclear. Proposal EB2 would have it apply to any project type covered by the IEBC – additions, alterations, repairs, change of occupancy, relocation – but the content of ACI 562 appears to be almost entirely about repair. For example, see ACI 562 sec 4.2
- ACI 562 sec 1.3.4 et al. cite ACI 318 instead of citing the building code. Thus, any code modifications to ACI 318 are lost.
- ACI 562 uses non-code terminology not defined: "distressed," "life safety hazard," etc.
- ACI 562 uses non-code terminology inadequately defined by the standard: "service life," etc.
- ACI 562 sec 1.3.5 greatly increases the scope of work for repairs by requiring a potentially costly and disruptive investigation anywhere in the building of elements "similar" to damaged elements.
- ACI 562 sec 1.3.5 and 1.3.5C confuses construction defects (which always require remedy) and damage (which might or might not require repair). It makes the engineer and code official on a repair project responsible for finding original construction defects and hidden non-compliance.
- ACI 562 has administrative requirements in section 1.4 through 1.7 that appear to supersede IBC Chapter 1 inappropriately.
- ACI 562 section 1.5.3 and 1.7 make the engineer and code official responsible for developing a maintenance plan as part of a structural evaluation or design.
- ACI 562 section 4.2 inappropriately restates (and thus introduces potential confusion, if not conflict) compliance provisions in IEBC 301.

- ACI 562 section 4.4 inappropriately restates (and thus introduces potential confusion, if not conflict) basic provisions of the IEBC regarding design criteria for different project types.
- ACI 562 section 7.5 inappropriately restates (and thus introduces potential confusion, if not conflict) provisions in IEBC 301, 401, 602, etc.

EB2-12

Final Action: AS AM AMPC_____ D

EB3-12

[B]301.1.4.2, [B]A502.1

Proposed Change as Submitted

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 301.1.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R , Ω_0 and C_d used for analysis shall be as specified in Section 301.1.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix A Chapters shall be deemed to comply with this section.
 - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
 - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.
 - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
 - 2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A4.
 - 2.5. Seismic evaluation and design of concrete buildings ~~in all risk categories are~~ assigned to risk category I, II or III is permitted to be based on the procedures specified in Chapter A5.
3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 301.1.4.2. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.
4. Compliance with ASCE 41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 301.1.4.2. The design spectral response acceleration parameters S_{xs} and S_{x1} specified in ASCE 41 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters S_{DS} and S_{D1} defined by the *International Building Code*.

Revise as follows:

[B] A502.1 Scope. The provisions of this chapter shall apply to all buildings having concrete floors or roofs supported by reinforced concrete walls or by concrete frames and columns. This chapter shall not apply to buildings with roof diaphragms that are defined as flexible diaphragms by the building code, and shall not apply to concrete frame buildings with masonry infilled walls. Buildings that were designed and constructed in accordance with the seismic provisions of the 1993 *BOCA National Building Code*, the 1994 *Standard Building Code*, the 1976 *Uniform Building Code*, the 2000 *International Building Code* or

later editions of these codes shall be deemed to comply with these provisions, unless the seismicity of the region has increased since the design of the building.

Exception: This chapter shall not apply to ~~concrete buildings where Seismic Design Category A is permitted~~ assigned to risk category IV.

Reason: This proposal clarifies the eligibility of buildings to use Appendix Chapter A5, with coordinated revisions to Chapter 3 and Chapter A5. Two changes are proposed:

- Chapter A5 is intended to improve a building's performance with respect to safety but not necessarily with respect to post-earthquake functionality or recovery. As such, it is not appropriate for buildings assigned to risk category IV. The proposal makes appropriate revisions to Chapter 3 and Chapter A5.
- The current Chapter A5 text says the chapter does not "apply" to SDC A; commentary explains that this is based on the low seismicity associated with SDC A. There is no technical reason why the chapter's provisions cannot be used for these buildings, however, so that confusing "limitation" is removed.

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

301.1.4.2-EB-BONOWITZ.doc

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change clarifies the current intent of the IEBC by stating the risk categories that are permitted to utilize Appendix Chapter A5. Doing so fixes a hole in the code that could allow these retrofits in a Risk Category IV structure.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

James Bela, Oregon Earthquake Awareness, representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B] 301.1.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R , Ω_0 and C_d used for analysis shall be as specified in Section 301.1.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix A Chapters shall be deemed to comply with this section.
 - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
 - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Risk Category I or II are permitted to be based on the procedures specified in Chapter A2.
 - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
 - 2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Risk Category I or II are permitted to be based on the procedures specified in Chapter A4.
 - 2.5. Seismic evaluation and design of concrete buildings assigned to risk category I, II or III is permitted to be based on the procedures specified in Chapter A5.
3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 301.1.4.2. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.
4. Compliance with ASCE 41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 301.1.4.2. The design spectral response acceleration parameters S_{XS} and S_{X1} specified in ASCE 41 shall not be taken

less than 75 percent of the respective design spectral response acceleration parameters S_{DS} and S_{D1} defined by the *International Building Code*.

[B] A502.1 Scope. The provisions of this chapter shall apply to all buildings having concrete floors or roofs supported by reinforced concrete walls or by concrete frames and columns. This chapter shall not apply to buildings with roof diaphragms that are defined as flexible diaphragms by the building code, and shall not apply to concrete frame buildings with masonry infilled walls. Buildings that were designed and constructed in accordance with the seismic provisions of the 1993 *BOCA National Building Code*, the 1994 *Standard Building Code*, the 1976 *Uniform Building Code*, the 2000 *International Building Code* or later editions of these codes shall be deemed to comply with these provisions, unless the seismicity of the region has increased since the design of the building.
ICC

Exception: This chapter shall not apply to buildings assigned to risk category IV.

Commenter's Reason: The IEBC should not be dealing with seismic upgrade and seismic retrofit issues; rather, it should remain limited to fire-and-life-safety, exiting requirements, and strength issues related to gravity and lateral loading (due to wind). I fail to see the implied argument that "the similarities are different" between Risk Category III and Risk Category IV. Risk Category III structures, which include schools, have just as significant consequences for failure as does Risk Category IV. It is better to leave any differences, if they truly can be justified, to Chapter A5. Besides, the engineer and the regulator are left hanging wondering how one exactly is to evaluate and design concrete buildings unfortunate enough to be Risk Category IV. See additional reasons of Public Comment EB1-12.

Code language should most often be formatted as positive statements. Seismic Design Categories are not precisely defined due to systemic errors in the formulation of seismic hazard maps, which are proving "non-stable" over succeeding editions (see reasons and bibliography under **Public Comment S110-12 Public Comment AS – Figs. 1613.3.1 Deleting MCEsub R Maps**. Any free passes (or get-out-fixing-your-bad-building exceptions) are really best handled specifically and exclusively in the Appendix itself.

EB3-12

Final Action: AS AM AMPC_____ D

EB6-12, Part I

[B] 807.5, [IBC] 3404.4

Proposed Change as Submitted

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

PART I - IEBC

Revise as follows:

[B] 807.5 Existing structural elements resisting lateral loads. ~~Alterations affecting the demands or capacities of existing elements of the lateral load-resisting system shall be evaluated using the wind provisions of the *International Building Code* and the reduced IBC-level seismic forces. Any existing lateral load-resisting structural elements whose demand-capacity ratio with the alteration considered is more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be brought into compliance with those wind and seismic provisions. In addition, the alteration shall not create a structural irregularity prohibited by ASCE 7 unless the entire structure complies with Section 301.1.4.2. For the purposes of this section, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacity shall account for the cumulative effects of additions and alterations since the original construction. Except as permitted by Section 807.6, where the alteration increases design lateral loads, or where the alteration results in prohibited structural irregularity as defined in ASCE 7, or where the alteration decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall be shown to meet the wind and seismic provisions of the *International Building Code*. Reduced IBC-level seismic forces shall be permitted.~~

Exception: Any existing lateral load-carrying structural element whose demand-capacity ratio with the alteration considered is no more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces per IBC Sections 1609 and 1613. Reduced IBC-level seismic forces shall be permitted. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of additions and alterations since original construction.

Reason: The proposal rewrites IEBC Section 807.5 using the clearer logic of IBC Section 3404.4. No change in scope or effect is intended. In applying the clearer wording, however, the scope of triggered work associated with the creation of a prohibited irregularity is slightly changed, from full compliance without exception to the usual compliance eligible for the 10 percent DCR exception. This is appropriate, and the resulting IEBC provision will be consistent with the corresponding IBC provision, except that the IEBC criteria will continue to allow the use of reduced seismic forces.

The proposal also modifies IBC Section 3404.4 for consistency by inserting the word "prohibited" in one place.

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

807.5-EB-BONOWITZ.doc

Public Hearing Results

PART I - IEBC

Committee Action:

Approved as Submitted

Committee Reason: This proposal adopts the clearer language of the corresponding IBC section for the compliance triggers for alterations. The treatment of prohibited structural irregularities is more appropriate.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

James Bela, Oregon Earthquake Awareness, representing self, requests Disapproval.

Commenter's Reason: Using "prohibited" in the same sentence that leads with "permitted" is not necessary, and it is potentially confusing. Are there any such things as permitted irregularities.

EB6-12, Part I

Final Action:

AS

AM

AMPC_____

D

EB6-12, Part II [B] 807.5, [IBC] 3404.4

Proposed Change as Submitted

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS IS A TWO PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE AS TWO SEPARATE CODE CHANGES. SEE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

PART II – IBC STRUCTURAL

Revise as follows:

3404.4 Existing structural elements carrying lateral load. Except as permitted by Section 3404.5, where the *alteration* increases design lateral loads in accordance with Section 1609 or 1613, or where the *alteration* results in a prohibited structural irregularity as defined in ASCE 7, or where the *alteration* decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall be shown to meet the requirements of Sections 1609 and 1613.

Exception: Any existing lateral load-carrying structural element whose demand-capacity ratio with the *alteration* considered is no more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces per Sections 1609 and 1613. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of *additions* and *alterations* since original construction.

Reason: The proposal rewrites IEBC Section 807.5 using the clearer logic of IBC Section 3404.4. No change in scope or effect is intended. In applying the clearer wording, however, the scope of triggered work associated with the creation of a prohibited irregularity is slightly changed, from full compliance without exception to the usual compliance eligible for the 10 percent DCR exception. This is appropriate, and the resulting IEBC provision will be consistent with the corresponding IBC provision, except that the IEBC criteria will continue to allow the use of reduced seismic forces.

The proposal also modifies IBC Section 3404.4 for consistency by inserting the word “prohibited” in one place.

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

807.5-EB-BONOWITZ.doc

Public Hearing Results

PART II – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: Consistent with the action taken on Part I of this code change, a clarification is made to refer to “prohibited structural irregularities” which is considered more appropriate terminology.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

James Bela, Oregon Earthquake Awareness, representing self, requests Disapproval.

Commenter's Reason: Using "prohibited" in the same sentence that leads with "permitted" is not necessary, and it is potentially confusing. Are there any such things as permitted irregularities?

EB6-12, Part II

Final Action:

AS

AM

AMPC_____

D

EB7-12
[B] 907.4.2

Proposed Change as Submitted

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 907.4.2 Substantial structural alteration. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural *alteration* within a five-year period, the evaluation and analysis shall demonstrate that the lateral load resisting system of the altered building or structure complies with the *International Building Code* for wind loading and with reduced IBC-level seismic forces. The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

Reason: This proposal clarifies the long-standing intent of the IEBC that alteration-triggered structural upgrade applies to the (designated or *de facto*) lateral system only, and not to the gravity system or to nonstructural components.

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

907.4.2-EB-BONOWITZ.doc

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change is a good clarification of triggered upgrades in alterations under the IEBC, since the intent of this provision has been that the upgrade be required only for the lateral force system.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

James Bela, Oregon Earthquake Awareness representing self, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B] 907.4.2 Substantial structural alteration. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural alteration ~~within a five-year period~~, the evaluation and analysis shall demonstrate that the ~~lateral load resisting system of the~~ altered building or structure complies with the International Building Code for wind loading and with reduced IBC-level seismic forces. The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

Commenter's Reason: Substantial alteration should result in a substantially safer building, since its life is being extended. This includes, in particular, non-structural safety issues. So-called "gravity only" columns must be able to participate in the deflections imposed by the lateral load resisting system of the altered building or structures. The existing language is unsafe.

EB7-12

Final Action: AS AM AMPC_____ D

EB12-12

[B] 1103.3

Proposed Change as Submitted

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] 1103.3 Lateral force-resisting system. The lateral force-resisting system of *existing buildings* to which additions are made shall comply with Sections 1103.3.1, 1103.3.2 and 1103.3.3.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
- ~~2. In other *existing buildings* where the lateral force story shear in any story is not increased by more than 10 percent cumulative.~~
2. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *addition* considered is no more than 10 percent greater than its demand-capacity ratio with the *addition* ignored shall be permitted to remain unaltered. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of additions and alterations since original construction.

Reason: The proposal follows the precedent set in the 2006 IBC, making the exception to lateral system upgrade element-based, as opposed to story-based. The intent is that elements triggered for lateral upgrade by Section 1103.3.1 or 1103.3.2 should be exempt based on their individual demand-capacity ratios, not on the overall story shear. A focus on story shear can miss critical individual elements in vertical additions and can be difficult to define in the case of horizontal additions. The language of the proposed exception is taken from IBC Section 3403.4.

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

1103.3-EB-BONOWITZ.doc

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The revision to the second exception to Section 1103.3 coordinates the lateral force system treatment in the IEBC with similar provisions for additions under Chapter 34 of the IBC.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment 1:

David Bonowitz, representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B] 1103.3 Lateral force-resisting system.

The lateral force-resisting system of *existing buildings* to which additions are made shall comply with Sections 1103.3.1, 1103.3.2 and 1103.3.3.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *addition* considered is no more than 10 percent greater than its demand-capacity ratio with the *addition* ignored shall be permitted to remain unaltered. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of additions and alterations since original construction. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations involving IBC level seismic forces in accordance with Section 301.1.4.1.

Commenter's Reason: As the proponents of EB12-12, we believe the proposal is fine as submitted, and the ICC Structural Committee agreed. However, if there is concern about how to calculate the demand-capacity ratios as required by the revised Exception 2, a sentence can be added to clarify that the full IBC level seismic forces apply, just as they would throughout Section 1103.3 if the exception were not invoked. Either of the two methods allowed by Section 301.1.4.1 is suitable for making the calculations required by the exception.

Public Comment 2:

Jonathan Siu, City of Seattle Department of Planning & Development, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

[B] 1103.3 Lateral force-resisting system. The lateral force-resisting system of *existing buildings* to which additions are made shall comply with Sections 1103.3.1, 1103.3.2 and 1103.3.3.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes where the *existing building* and the *addition* comply with the conventional light-frame construction methods of the *International Building Code* or the provisions of the *International Residential Code*.
2. Any existing lateral load-carrying structural element whose demand-capacity ratio with the *addition* considered is no more than 10 percent greater than its demand-capacity ratio with the *addition* ignored shall be permitted to remain unaltered. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of additions and alterations since original construction. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces in accordance with Section 301.1.4.1, item 1.

Commenter's Reason: The original proposal added text to the IEBC taken from Chapter 34 of the IBC. However, additional guidance from the corresponding section in IBC Chapter 34 was not carried over into the IEBC in the original proposal. Without this text, it is unclear what loads are required to be used to determine the demand—can they be the reduced loads ordinarily allowed for

existing buildings in this code, or are they required to be based on the loads for new construction? By referencing Item 1 in Section 304.1.4.1, this public comment clarifies it is the new construction loading that is required to be used, and maintains alignment between the IEBC and the IBC.

EB12-12

Final Action:

AS

AM

AMPC_____

D

EB14-12
[B]1302.6

Proposed Change as Submitted

Proponent: John Ingargiola and Gregory Wilson, representing Department of Homeland Security, Federal Emergency Management Agency (john.ingargiola@dhs.gov, gregory.p.wilson@dhs.gov) and Rebecca Quinn, RCQuinn Consulting, Inc., representing Federal Emergency Management Agency (rcquinn@earthlink.net).

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B]1302.6 Flood hazard areas. If relocated or moved into a flood hazard area, structures shall comply with Section 1612 of the *International Building Code* or Section R322 of the *International Residential Code*, as applicable.

Reason: Section 1302.2 already specifies that the foundation system of relocated buildings shall comply with the IBC or IRC, as applicable. As currently written, Section 1302.6 does not allow use of the flood resistant requirements of the IRC. This proposal clarifies that the provisions of the International Residential Code may be used, if applicable to the occupancy.

Cost Impact: The cost for some residential foundations may be lower because the prescriptive provisions of the IRC can be used, rather than requiring a registered design professional for all foundation system for relocated homes.

1302.6-EB-INGARGIOLA-WILSON-QUINN.doc

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: This proposal allows the use of IRC Section R322 for relocated structures where applicable. A public comment is suggested for any additional Section references that may be needed.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

John Ingargiola and Gregory Wilson; Rebecca C. Quinn, RCQuinn Consulting, Inc., representing Dept Homeland Security, Federal Emergency Management Agency, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B] 402.2 [Additions] Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable, any addition that constitutes substantial improvement of the existing structure, as defined in Section 202, shall comply with the flood design requirements for new construction and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in *flood hazard areas* established in Section 1612.3 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable, any *additions* that do not constitute *substantial improvement* of the existing structure, as defined in Section 202, are not required to comply with the flood design requirements for new construction.

[B] 403.2 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable, any *alteration* that constitutes *substantial Improvement* of the existing structure, as defined in Section 202, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in *flood hazard areas* established in Section 1612.3 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable, any *alterations* that do not constitute *substantial improvement* of the existing structure, as defined in Section 202, are not required to comply with the flood design requirements for new construction.

[B] 404.5 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable, any *repair* that constitutes *substantial improvement* of the existing structure, as defined in Section 202, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in *flood hazard areas* established in Section 1612.3 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable, any repairs that do not constitute *substantial improvement* or repair of *substantial damage* of the existing structure, as defined in Section 202, are not required to comply with the flood design requirements for new construction.

[B] 408.2 Flood hazard areas. Within flood hazard areas established in accordance with Section 1612.3 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable, where the work proposed constitutes substantial improvement as defined in Section 1612.2 of the *International Building Code*, the building shall be brought into conformance with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.

Exception: *Historic buildings* need not be brought into compliance that are:

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places;
2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

[B] 601.3 Flood hazard areas. In flood hazard areas, repairs that constitute *substantial improvement* shall require that the building comply with Chapter 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.

[B] 606.2.4 Flood hazard areas. In flood hazard areas, buildings that have sustained *substantial damage* shall be brought into compliance with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.

[B] 701.3 Flood hazard areas. In flood hazard areas, alterations that constitute *substantial improvement* shall require that the building comply with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.

[B] 1103.5 Flood Hazard Areas. Additions and foundations in flood hazard areas shall comply with the following requirements:

1. For horizontal additions that are structurally interconnected to the existing building:
 - 1.1 If the addition and all other proposed work, when combined, constitute substantial improvement, the existing building and the addition shall comply with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.
 - 1.2 If the addition constitutes substantial improvement, the existing building and the addition shall comply with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.
2. For horizontal additions that are not structurally interconnected to the existing building:
 - 2.1 The addition shall comply with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.
 - 2.2 If the addition and all other proposed work, when combined, constitute substantial improvement, the existing building and the addition shall comply with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.
3. For vertical additions and all other proposed work, when combined, that constitute substantial improvement, the existing building shall comply with Section 1612 of the *International Building Code*, or Section R322 of the *International Residential Code*, as applicable.
4. For a new, replacement, raised, or extended foundation, if the foundation work and all other proposed work, when combined, constitute substantial improvement, the existing building shall comply with Section 1612 of the *International*

Building Code, or Section R322 of the International Residential Code, as applicable.

[B] 1201.4 Flood hazard areas. In flood hazard areas, if all proposed work, including repairs, work required because of a change of occupancy, and alterations, constitutes substantial improvement, then the existing building shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

Exception: If an *historic building* will continue to be an *historic building* after the proposed work is completed, then the proposed work is not considered a *substantial improvement*. For the purposes of this exception, an *historic building* is:

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places;
2. Determined by the Secretary of the U.S. Department of Interior to contribute to the historical significance of a registered historic district or a district preliminarily determined to qualify as a historic district; or
3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

[B] 1302.6 Flood hazard areas. If relocated or moved into a flood hazard area, structures shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable.

[B] 1401.3.3 Compliance with flood hazard provisions. In flood hazard areas, buildings that are evaluated in accordance with this section shall comply with Section 1612 of the International Building Code, or Section R322 of the International Residential Code, as applicable, if the work covered by this section constitutes substantial improvement.

Commenter's Reason: EB14-12 was Approved as Submitted, with a committee comment suggesting submission of a public comment for any additional section references that may be needed to carry the concept throughout the IEBC.

This modification carries the proposed language in EB14 to other flood provisions of the IEBC. The justification for making the change that was Approved as Submitted to Section 1302.6 extends to those other flood provisions. If a state or community adopts the IEBC and applies it to all buildings, including dwellings within the scope of the IRC, it is appropriate that when existing dwellings are required to be brought into compliance because of substantial improvement that compliance be determined by the IRC. For dwellings within the scope of the IRC there is one significant difference between compliance with Sec. 1612 and compliance with R322 – Sec. 1612 by reference to ASCE 24 requires an additional foot of elevation. Thus existing dwellings would be required to meet a different standard than new dwellings. This proposal would require compliance with the IRC, thus avoiding unequal treatment.

EB14-12

Final Action: AS AM AMPC_____ D

EB23-12
[B] A301.3

Proposed Change as Submitted

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A301.3 Alternative design procedures. The details and prescriptive provisions herein are not intended to be the only acceptable strengthening methods permitted. Alternative details and methods may be used where designed by a registered design professional ~~and~~ or approved by the *code official*. Approval of alternatives shall be based on a demonstration that the method or material used is at least equivalent in terms of strength, deflection and capacity to that provided by the prescriptive methods and materials.

Where analysis by a registered design professional is required, such analysis shall be in accordance with all requirements of the building code, except that the seismic forces may be taken as 75 percent of those specified in the building code.

Reason: This proposal provides flexibility to local jurisdictions to use alternative prescriptive solutions without the need for engineered solutions. This is consistent with the intent of the chapter and represents a practice already successfully in place in Berkeley and other California jurisdictions. Since the final sentence of the section already requires a demonstration of equivalence, code official approval is sufficient and there should be no need for both special approval *and* engineered design.

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

A301.3-EB-BONOWITZ.doc

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: If accepted this change would have changed the scope of the Building Official's review of alternative designs. It would allow a single person, rather than two, to approve alternative designs. There is agreement with the intent of providing flexibility to local jurisdictions, but the wording needs more thought.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

David Bonowitz, representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

A301.3 Alternative design procedures. The details and prescriptive provisions herein are not intended to be the only acceptable strengthening methods permitted. Alternative details and methods may be used where ~~designed by a registered design professional~~

and approved by the code official. Approval of alternatives shall be based on a demonstration that the method or material used is at least equivalent in terms of strength, deflection and capacity to that provided by the prescriptive methods and materials.

Where analysis by a registered design professional is required, such analysis shall be in accordance with all requirements of the building code, except that the seismic forces may be taken as 75 percent of those specified in the building code.

Commenter's Reason: Section A301.3 already allows alternative means of compliance and gives guidance for how to assess them. The purpose of proposal EB23 is to allow local jurisdictions to implement that guidance without necessarily requiring an engineered design. This is necessary and appropriate for prescriptive retrofit of conventional houses. It provides flexibility to local jurisdictions represents a practice already successfully in place in Berkeley and other California jurisdictions.

The ICC Structural committee agreed with the intent. However, they correctly pointed out the wording originally proposed might have removed the authority of the code official to approve the alternative design. This comment therefore resolves that problem. By eliminating the clause as shown, approval of the code official is maintained, while the requirement for an engineered custom design is properly relaxed.

EB23-12

Final Action: AS AM AMPC____ D

EB26-12

[B] A304.2.6, Chapter A6 (New)

Proposed Change as Submitted

Proponent: David Bonowitz, Chair, Existing Buildings Subcommittee, Code Advisory Committee, National Council of Structural Engineers Associations (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] A304.2.6 New sill plates. Where new sill plates are used in conjunction with new foundations, they shall be minimum 2x nominal thickness and shall be preservative-treated wood or naturally durable wood permitted by the building code for similar applications, and shall be marked or branded by an approved agency. Nails Fasteners in contact with preservative-treated wood shall be hot-dip galvanized or other material permitted by the building code for similar applications. Fasteners, whether cast-in-place or post-installed, that anchor a preservative-treated sill plate to the foundation shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum. Metal framing anchors in contact with preservative treated wood shall be galvanized in accordance with ASTM A 653 with a G 185 coating.

Add new standard to Chapter A6 as follows:

ASTM

B695-04 Standard Specification for Coating of Zinc Mechanically Deposited on Iron and Steel

Reason: This proposal makes two improvements related to metal hardware in contact with treated wood:

- In the second sentence, it replaces "nails" with "fasteners" to clarify that the provision is general.
- It inserts a sentence addressing allowable compliance for anchor bolts. The compliance details match those in 2012 IBC Section 2304.9.5.3.

Since ASTM B 695 is not yet used in the IEBC, the proposal adds it to Chapter A6. However, B 695 is already used in the IBC, so a copy is not provided with the proposal.

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

EB26-12

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

A304.2.6-EB-BONOWITZ.doc

Public Hearing Results

Note: For staff analysis of the content of ASTM B 695 relative to CP#28, Section 3.6, please visit: http://www.iccsafe.org:8888/cs/codes/Documents/2012-13cycle/Proposed-A/00a_updates.pdf

Committee Action:

Approved as Submitted

Committee Reason: The committee agrees that adding the referenced standard is necessary in order to bring the IEBC provision for fasteners in contact with treated wood in line with the IBC.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Jonathan Siu, City of Seattle Department of Planning & Development, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B] A304.2.6 New sill plates. Where new sill plates are used in conjunction with new foundations, they shall be minimum 2x nominal thickness and shall be preservative-treated wood or naturally durable wood permitted by the building code for similar applications, and shall be marked or branded by an approved agency. Fasteners in contact with preservative-treated wood shall be hot-dip galvanized or other material permitted by the building code for similar applications. ~~Fasteners~~ **Anchor**s, ~~whether cast-in-place or post-installed,~~ that anchor attach a preservative-treated sill plate to the foundation shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum. Metal framing anchors in contact with preservative treated wood shall be galvanized in accordance with ASTM A 653 with a G 185 coating.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The original proposal brought language into the IEBC taken from IBC Section 2304.9.5.1, allowing a different method and standard for protecting fasteners anchoring preservative treated sill plates to concrete foundations. However, the IBC requires nails to be hot-dipped galvanized, since Section 2304.9.5.1 specifically excludes nails and other fasteners from being allowed to use ASTM B 695. By referring to "fasteners" in the added text, this proposal may have introduced some confusion as to whether the nails used to attach metal framing anchors are required to be hot-dipped galvanized, or whether mechanically deposited zinc coating would be permitted.

We believe the intent of the proposal was to allow only anchor bolts and similar attachment hardware such as post-installed expansion or adhesive bolts to have mechanically deposited zinc coating in accordance with ASTM B 695. This public comment, by using the generic term "anchors," does not change the allowance for anchors bolts, expansion bolts, or epoxied bolts, but clarifies that nails are excluded from that allowance.

Deletion of "whether cast in place or post-installed" is proposed to eliminate unnecessary text. Anchors into concrete foundations must be installed by one method or the other, so stating both methods is not necessary.

EB26-12

Final Action: AS AM AMPC____ D

EB36-12

[B]C101.1, [B]C101.2, [B]C101.3 (New)

Proposed Change as Submitted

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

~~**[B]C101.1 Intent and purpose.** The provisions of this chapter provide prescriptive methods for selected structural retrofitting of existing buildings to increase their resistance to wind loads. Except as provided herein, other structural provisions of the *International Building Code* or the *International Residential Code* shall apply, as required.~~

~~**[B]C101.2 Scope.** The following prescriptive methods are intended for applications where the gable end wall framing is provided by a metal-plate-connected gable end frame or a conventionally framed gable end. The retrofits are appropriate for wall studs or webs spaced 24 inches (610 mm) on center maximum and oriented with the wide face either parallel or perpendicular to the surface of the gable end. Gable ends to be strengthened shall be permitted to be retrofitted using methods prescribed by this chapter.~~

~~**[B]C101.1 Purpose.** This chapter provides prescriptive methods for partial structural retrofit of an existing building to increase its resistance to out-of-plane wind loads. It is intended for voluntary use and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by addition, alteration, repair, change of occupancy, building relocation or other circumstances.~~

~~**[B]C101.2 Eligible buildings and gable end walls.** The provisions of this chapter are applicable only to buildings that meet the following eligibility requirements:~~

- ~~1. The building is not more than three stories tall, from adjacent grade to the bottom plate of each gable end wall being retrofitted with this chapter.~~
- ~~2. The building is classified as Occupancy Group R3 (1-2 family dwellings)~~
- ~~3. The structure includes one or more wood-framed gable end walls, either conventionally framed or metal-plate-connected.~~

~~In addition, the provisions of this chapter are applicable only to gable end walls that meet the following eligibility requirements:~~

- ~~4. Each gable end wall has or shall be provided with studs or vertical webs spaced 24 inches (610 mm) on center maximum.~~
- ~~5. Each gable end wall has a maximum height of 16 ft.~~

~~**[B]C101.3 Compliance.** Eligible gable end walls in eligible buildings may be retrofitted with this chapter. Eligible buildings with one or more ineligible gable end walls may be retrofitted with this chapter, provided all ineligible gable end walls are retrofitted with alternative criteria approved by the building official as equivalent. All other modifications required for conformance with this chapter shall be designed and constructed in accordance with the *International Building Code* or *International Residential Code* provisions for new construction except as specifically provided for by this chapter.~~

Reason: This proposal reorganizes, clarifies, and supplements the Chapter's provisions regarding intent, scope, eligibility, and compliance.

Proposed section C101.1 restates the first sentence of current section C101.1 and adds two clarifying sentences that confirm the relationship of this chapter to the rest of the IEBC and to other I-codes (similar to the current text of Section C201.1). Chapter C1 was added to the 2012 IEBC as a good idea suitable for voluntary use but not benchmarked in terms of performance. Because other IEBC provisions at times call for structural evaluation or retrofit to resist wind loads, it is important to be clear that Chapter C1 does not necessarily satisfy those requirements.

Proposed section C101.2 lays out the eligibility requirements in a more direct and specific way:

- Item 1: The proposed three-story limit is new, but it reflects our understanding (based on review of the supporting calculations and Chapter history) of the intent of Chapter C1 to apply to typical 1-2 unit dwellings of conventional wood framing. Given the limits of the Chapter's supporting studies and past applications, it would be wrong to encourage this retrofit scheme for taller or more complex structures that happen to have wood framed gable end walls.
- Item 2: The proposed occupancy eligibility rule is new, but it again reflects our understanding of the intent of Chapter 1 to apply to typical 1-2 unit dwellings. Given the limits of the Chapter's supporting studies, past applications, and lack of benchmarking by risk category, it would be wrong to encourage this retrofit scheme for multi-unit complexes or for assisted living, commercial, educational, or other occupancies simply because the building looks like a house. (For ease of use by homeowners and residential contractors, we have proposed this eligibility limit in terms of occupancy. Alternatively, because the governing load is extreme wind, eligibility could be written in terms of risk category with reference to IBC Table 1604.5.)
- Item 3: This is a simple provision that merely confirms the presence of the structural elements of interest.
- Item 4: The 24 inch spacing requirement matches the current provision in C101.2. The proposed rule adds an allowance that a non-conforming structure may be made to conform through the retrofit.
- Item 5: The 16 ft height limit comes from current Table C104.2. It is useful to have such eligibility rules in one place near the top of the chapter.

Proposed section C101.3 implements the eligibility rules of proposed section C101.2 and explicitly addresses the case of buildings where some gable end walls are eligible and others are not. The final sentence restates the provision from current section C101.1, but in an appropriate place. The text is borrowed from IEBC A403.1, which has the same intent.

In summary, the proposal is measured and fair, and it respects the intention of the Chapter and its proponents. We have limited the proposal to basic issues, leaving aside remaining questions regarding, for example, maximum spans, suitable roof sheathing, suitable ceiling construction, and suitable exterior wall sheathing or siding.

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

C101.1-EB-BONOWITZ

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee supports the proponent's stated intent of clarifying the intent and scope of IEBC Appendix C1, but believes a public comment should be considered to address the issues raised in testimony. The wording should clarify the requirements for eligibility. It is not appropriate to require at all gable end walls. Where C101.3 brings up "equivalent" there's a question on what criteria would be used. Also the scope should clarify that the IRC is allowed.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment 1:

David Bonowitz, representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B]C101.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an existing building to increase its resistance to out-of-plane wind loads. It is intended for voluntary use and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by addition, alteration, repair, change of occupancy, building relocation or other circumstances.

[B]C101.2 Eligible buildings and gable end walls. The provisions of this chapter are applicable only to buildings that meet the following eligibility requirements:

1. The building is not more than three stories tall, from adjacent grade to the bottom plate of each gable end wall being retrofitted with this chapter.
2. The building is classified as Occupancy Group R3 (1-2 family dwellings) or is within the scope of the *International Residential Code*.
3. The structure includes one or more wood-framed gable end walls, either conventionally framed or metal-plate-connected.

In addition, the provisions of this chapter are applicable only to gable end walls that meet the following eligibility requirements:

4. Each gable end wall shall be provided with studs or vertical webs spaced 24 inches (610 mm) on center maximum.
5. Each gable end wall has a maximum height of 16 ft.

[B]C101.3 Compliance. Eligible gable end walls in eligible buildings may be retrofitted with this chapter. ~~Eligible buildings with one or more ineligible gable end walls may be retrofitted with this chapter, provided all ineligible gable end walls are retrofitted with alternative criteria approved by the building official as equivalent.~~ All other modifications required for conformance with this chapter shall be designed and constructed in accordance with the *International Building Code* or *International Residential Code* provisions for new construction except as specifically provided for by this chapter.

Commenter's Reason: As noted in the ROH, the ICC Structural committee supported the overall intent of proposal EB36 but had concerns about one proposed sentence. This comment therefore simply removes the sentence in question from proposed section C101.3, thereby resolving the committee's objection and achieving the main benefit intended by the proposal. The sentence in question would have read, "Eligible buildings with one or more ineligible gable end walls may be retrofitted with this chapter, provided all ineligible gable end walls are retrofitted with alternative criteria approved by the building official as equivalent."

In addition, item 2 in proposed section C101.2 is modified relative to the original proposal so as to match the similar modification approved for EB37-12. This resolves the final point raised by the committee in the ROH.

Public Comment 2:

Gary J. Ehrlich, P.E, representing National Association of Home Builders (NAHB), requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B]C101.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an existing building to increase its resistance to out-of-plane wind loads. It is intended for voluntary use and for reference by mitigation programs. ~~The provisions of this chapter do not necessarily satisfy requirements for new construction.~~ Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by addition, alteration, repair, change of occupancy, building relocation or other circumstances.

[B]C101.2 Eligible buildings and gable end walls. The provisions of this chapter are applicable only to buildings that meet the following eligibility requirements:

1. The building is not more than three stories tall, from adjacent grade to the bottom plate of each gable end wall being retrofitted with this chapter.
2. The building is classified as Occupancy Group R-2 or R-3 (1-2 family dwellings), or is within the scope of the *International Residential Code*.
3. The structure includes one or more wood-framed gable end walls, either conventionally framed or metal-plate-connected.

In addition, the provisions of this chapter are applicable only to gable end walls that meet the following eligibility requirements:

4. Each gable end wall has or shall be provided with studs or vertical webs spaced 24 inches (610 mm) on center maximum.
5. Each gable end wall has a maximum height of 16 ft.

[B]C101.3 Compliance. Eligible gable end walls in eligible buildings shall be permitted to be ~~may be~~ retrofitted with this chapter. ~~Eligible buildings with one or more ineligible gable end walls may be retrofitted with this chapter, provided all ineligible gable end walls are retrofitted with alternative criteria approved by the building official as equivalent.~~ All other modifications required for conformance with this chapter shall be designed and constructed in accordance with the *International Building Code* or *International Residential Code* provisions for new construction except as specifically provided for by this chapter.

Commenter's Reason: The purpose of this public comment is to revise the proposed scope, eligibility criteria, and compliance criteria for using the Appendix C1 gable end retrofits

While these retrofits were originally designed for use with one- and two-family dwellings, there is no reason they cannot be made applicable to any low-rise multifamily residential building. The loads and engineering design are the same. By allowing these affordable gable end retrofits to be made in low-rise condominium and apartment buildings as well as houses, damage from wind

events can be minimized and the possibility that the residents of these multifamily buildings will not be displaced. Also, a direct reference to the International Residential Code is provided. The scope of the IRC is not defined by occupancy group.

Unnecessary language regarding new construction is removed from the proposed new Section C101.1. Chapter 1 of the IEBC and the remaining language of this proposal for Sections C101.1 and C101.3 make it clear that these provisions apply only to retrofit work done within existing buildings and using the Appendix C provisions. Further, the statement gives the user the impression that these provisions do not comply with standard engineering practice. This is not true. The provisions as codified here were developed by IBHS engineers working with an NAHB member in Florida with the intent of developing retrofit methods solidly rooted in engineering principles but easy to implement by building owners. There was an earlier version of these provisions based on calculations by another engineer, but they were deemed not feasible to construct. The revised, easier-to-construct approach which was approved last cycle reflects calculations done by IBHS engineers and complies with standard engineering practices in high-wind regions.

Finally, the requirement that all gable ends be retrofitted is deleted. The original intent of these provisions was to allow a homeowner or building owner to make an incremental improvement to their structure. Realizing that homeowners and building owners have limited funds, and that gable end framing may be concealed by interior finishes or inaccessible due to mechanical equipment in the attic space, the provisions allow an owner to retrofit only the gable end or ends the owner chooses because of opportunity and funding. This may be a gable end where extensive deterioration has occurred, where exterior siding and sheathing is being replaced making access to the framing easy, or may be the gable end with the worst exposure to severe winds. It was not the intent to force the owner to upgrade every gable end in the building regardless of their condition or whether or not the particular gable end framing in question is accessible. Instead, the intent was to encourage strengthening the building at every opportunity as the owner's interests or budget permitted. In contrast, the originally proposed language in EB36 is so demanding in many instances that it will discourage strengthening of buildings by making the option either retrofitting all gable ends or no gable ends at all. Gable end retrofitting is an option that should be encouraged not made prohibitive because of cost. It is presumed that any strengthening is beneficial.

It is noted the IBC and IRC contain no additional explicit requirements for new construction for connecting gable end walls to the remainder of the structure. Conversely, the gable end retrofit provisions in the IEBC provide an explicit set of requirements fully grounded in engineering principles. Applying these provisions will result in a retrofitted gable end that is substantially stronger and better connected than would be provided in new construction.

EB36-12

Final Action: AS AM AMPC_____ D

EB37-12

[B]C201.1, [B]C201.2

Proposed Change as Submitted

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

~~**[B]C201.1 Intent and purpose.** The provisions of this chapter provide prescriptive methods for selected structural retrofitting of existing buildings. Compliance with these provisions will not always meet the requirements for new construction in the *International Building Code* or the *International Residential Code*. The provisions of this chapter are intended to provide methods for strengthening existing buildings to increase resistance to wind loads.~~

~~**[B]C201.2 Scope.** The provisions of this chapter are a prescriptive alternative for one- and two-family dwellings located where the wind speed according to Section 1609 of the *International Building Code* exceeds 100 mph (44.7 m/s) to achieve compliance with Section 706.3 of the *International Existing Building Code*.~~

[B]C201.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an existing building to increase its resistance to wind loads. It is intended for voluntary use and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by addition, alteration, repair, change of occupancy, building relocation or other circumstances.

[B]C201.2 Eligible conditions. The provisions of this chapter are applicable only to buildings that meet the following eligibility requirements:

1. Buildings assigned to risk category I or II per *International Building Code* Table 1604.5.

Reason: This proposal clarifies and corrects the Chapter's provisions regarding intent, scope, and eligibility.

Proposed section C201.1 restates current section C201.1 and adds a clarifying sentence that confirms the relationship of this chapter to the rest of the IEBC and to other I-codes. Chapter C2 was added to the 2012 IEBC as a good idea suitable for voluntary use but not benchmarked in terms of performance. Because other IEBC provisions at times call for structural evaluation or retrofit to resist wind loads, it is important to be clear that Chapter C2 does not necessarily satisfy those requirements. In particular, the statement in current section C201.2 regarding compliance with Section 706.3 is for that reason proposed for deletion.

Proposed section C201.2 expands the current reference to "one- and two-family dwellings." Since nothing in Chapter C2 presumes a building use or a construction type specific to R3 occupancy, the Chapter actually has broader applicability than is currently stated. The appropriate limit is to risk category I and II buildings, as proposed. Also, there is no need to state a minimum wind speed in the provision; if the criteria are good for wind speeds over 100 mph, they are also good for lower demands.

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

C201.1-EB-BONOWITZ

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

[B]C201.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an existing building to increase its resistance to wind loads. It is intended for voluntary use where the ultimate design wind speed, V_{ult} , determined in accordance with Figure 1609A of the *International Building Code* exceeds 130 mph (58 m/s) and for reference by mitigation programs. The provisions of this chapter do not necessarily satisfy requirements for new construction. Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by addition, alteration, repair, change of occupancy, building relocation or other circumstances.

[B]C201.2 Eligible conditions. The provisions of this chapter are applicable only to buildings that meet the following eligibility requirements:

1. Buildings assigned to Risk Category I or II in accordance with *International Building Code* Table 1604.5; or buildings within the scope of the *International Residential Code*.

Committee Reason: This proposal helps to clarify that Appendix Chapter C2; is optional; does not apply to an entire building; and does not necessarily achieve full compliance. The modification reinstates the threshold regarding high wind speeds and also clarifies that the applicability of the chapter includes buildings within the scope of the IRC.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Gary J. Ehrlich, P.E, representing National Association of Home Builders (NAHB), requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

[B]C201.1 Purpose. This chapter provides prescriptive methods for partial structural retrofit of an existing building to increase its resistance to wind loads. It is intended for voluntary use where the ultimate design wind speed, V_{ult} , determined in accordance with Figure 1609A of the *International Building Code* exceeds 130 mph (58 m/s) and for reference by mitigation programs. ~~The provisions of this chapter do not necessarily satisfy requirements for new construction.~~ Unless specifically cited, the provisions of this chapter do not necessarily satisfy requirements for structural improvements triggered by addition, alteration, repair, change of occupancy, building relocation or other circumstances.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The purpose of this public comment is to remove unnecessary language from the proposed revisions to Appendix C2. Chapter 1 of the IEBC and the remaining language of this proposal for Section C201.1 make it clear that these provisions apply only to retrofit work done within existing buildings.

Further, the statement gives the user the impression that these provisions do not comply with standard engineering practice. This is not true. The provisions as codified here were developed by IBHS engineers working with an NAHB member in Florida with the intent of developing retrofit methods solidly rooted in engineering principles but easy to implement by building owners. There was an earlier version of these provisions based on calculations by another engineer, but they were deemed overly conservative and not feasible to construct. The revised, easier-to-construct approach which was approved last cycle reflects calculations done by IBHS engineers and complies with standard engineering practices in high-wind regions.

EB37-12

Final Action:

AS

AM

AMPC ____

D

EB38-12

[B] C201.2, [B] Table C202.1.2

Proposed Change as Submitted

Proponent: Gary J. Ehrlich, P.E., National Association of Home Builders (NAHB) (gehrlich@nahb.org)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] C201.2 Scope. The provisions of this chapter are a prescriptive alternative for one- and two-family dwellings located where the ultimate design wind speed V_{ult} , determined in accordance with Figure 1609A according to Section 1609 of the *International Building Code* exceeds ~~130 mph (58 m/s)~~ 100 mph (44.7 m/s) to achieve compliance with Section 706.3 of the *International Existing Building Code*.

[B] TABLE C202.1.2
SUPPLEMENTAL FASTENERS AT PANEL EDGES AND INTERMEDIATE FRAMING

EXISTING FASTENERS	EXISTING FASTENER SPACING (EDGE OR INTERMEDIATE SUPPORTS)	MAXIMUM SUPPLEMENTAL FASTENER SPACING FOR WIND SPEEDS GREATER THAN 100 MPH $130 \text{ MPH} < V_{ULT} \leq 140 \text{ MPH}$	MAXIMUM SUPPLEMENTAL FASTENER SPACING FOR INTERIOR ZONE ^c LOCATIONS FOR WIND SPEEDS EXCEEDING $V_{ULT} > 140 \text{ MPH}$ 110 MPH AND EDGE ZONES NOT COVERED BY THE COLUMN TO THE RIGHT	EDGE ZONE ^d FOR WIND SPEED GREATER THAN $V_{ULT} > 160 \text{ MPH}$ 120 MPH AND EXPOSURE C, OR WIND SPEED GREATER THAN $V_{ULT} > 180 \text{ MPH}$ 140 MPH AND EXPOSURE B

(Portions of table not shown remain unchanged)

Reason: The purpose of this proposal is to correlate basic wind speed triggers in the IEBC with the IBC. The 2012 IBC adopted new ultimate-strength basis wind speed maps from ASCE 7-10. A conversion factor from the ultimate wind speed selected from the new maps (V_{ult}) down to the old allowable-stress level wind speed (V_{asd}) was introduced into the IBC to accommodate triggers for special requirements in high-wind regions, tables limiting the use of ballasted roofs at certain heights and wind speeds, and tables for proper selection of shingles and other roofing materials for wind resistance. Unfortunately, this conversion was not introduced into the IEBC, with the result that provisions which were supposed to apply only in high-wind regions now appear to apply across the entire United States. This proposal not only corrects this oversight, it fully updates the IEBC provisions to match the 2012 IBC and ASCE 7-10.

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

C201.2-EB-EHRLICH

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

[B] C201.2 Scope. The provisions of this chapter are a prescriptive alternative for one- and two-family dwellings located where the ultimate design wind speed V_{ult} , determined in accordance with Figure 1609A according to Section 1609 of the *International Building Code* exceeds ~~130 mph (58 m/s)~~ 100 mph (44.7 m/s) to achieve compliance with Section 706.3 of the *International Existing Building Code*.

**[B] TABLE C202.1.2
SUPPLEMENTAL FASTENERS AT PANEL EDGES AND INTERMEDIATE FRAMING**

EXISTING FASTENERS	EXISTING FASTENER SPACING (EDGE OR INTERMEDIATE SUPPORTS)	MAXIMUM SUPPLEMENTAL FASTENER SPACING FOR 130 MPH < V _{ULT} ≤ 140 MPH	MAXIMUM SUPPLEMENTAL FASTENER SPACING FOR INTERIOR ZONE ^c LOCATIONS FOR V _{ULT} > 140 MPH AND EDGE ZONES NOT COVERED BY THE COLUMN TO THE RIGHT	EDGE ZONE ^d FOR V _{ULT} > 160 MPH AND EXPOSURE C, OR V _{ULT} > 180 MPH AND EXPOSURE B
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(Portions of table not shown remain unchanged)

Committee Reason: This code change updates the wind speed triggers in IEBC Appendix Chapter 2 in order to correlate with the IBC. The modification accepts the wind speed updates to Table C202.1.2, but undoes the changes proposed in Section C201.2, because the changes made to this section by EB37-12 are preferred.

Assembly Action: **None**

Individual Consideration Agenda

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

Public Comment:

Gary J. Ehrlich, P.E, representing National Association of Home Builders (NAHB), requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

**TABLE C104.2
STUD LENGTH LIMITATIONS BASED ON EXPOSURE AND DESIGN WIND SPEED**

EXPOSURE CATEGORY	MAXIMUM 3-SEC GUST BASIC WIND SPEED ^a	MAXIMUM HEIGHT OF GABLE END RETROFIT STUD ^b			
		A	B	C	D
C	110140	8'-0"	11'-3"	14'-9"	16'-0"
C	120150	7'-6"	10'-6"	13'-6"	16'-0"
C	130165	7'-0"	10'-0"	12'-3"	16'-0"
C	140180	7'-0"	10'-0"	12'-3"	16'-0"
C	150190	6'-6"	8'-9"	11'-0"	16'-0"
B	110140	8'-0"	12'-3"	16'-0"	N/R ^c
B	120150	8'-0"	11'-3"	14'-9"	16'-0"
B	130165	8'-0"	11'-3"	14'-9"	16'-0"
B	140180	7'-6"	10'-6"	13'-6"	16'-0"
B	150190	7'-0"	10'-0"	12'-3"	16'-0"
	Retrofit Configuration	A	B	C	D

For SI: 1 inch = 25.4 mm, 1 Foot = 304.8 mm

- a. Interpolation between given wind speeds not permitted.
- b. Existing gable end studs less than or equal to 3'-0" in height shall not require retrofitting.
- c. N/R = Not Required. Configuration C is acceptable to 16'-0" maximum height.

**[B] TABLE C104.5.1
SPACING OF GUSSET ANGLES**

EXPOSURE CATEGORY	BASIC WIND SPEED (mph)	SPACING OF GUSSET ANGLES (inches)
C	110140	38
C	120150	32
C	130165	28
C	140180	24
C	150190	20
B	110140	48
B	120150	40
B	130165	36
B	140180	30
B	150190	26

**[B] TABLE C104.5.2
SPACING OF LAG OR MASONRY SCREWS USED TO CONNECT SILL PLATE OF GABLE END WALL TO TOP OF THE WALL
BELOW**

EXPOSURE CATEGORY	BASIC WIND SPEED (mph)	SPACING OF LAG OR MASONRY SCREWS (inches)
C	110 140	19
C	120 150	16
C	130 165	14
C	140 180	14
C	150 190	10
B	110 140	24
B	120 150	20
B	130 165	18
B	140 180	15
B	150 190	13

Commenter's Reason: The purpose of this public comment is to correlate tables in Appendix C1 with the new ultimate wind speeds in the 2012 IBC and ASCE 7-10. As a result of confusion regarding potential changes to Appendix C1, a proposal was not submitted to update Tables C104.2, C104.5.1, and C104.5.2 at the same time as proposals were submitted to correlate Section 706.3.2 and Table C202.1.2. This public comment makes the appropriate correlations to the basic wind speeds in the Appendix C1 tables and will provide consistency with the approval of the similar revisions to Section 706.3.2 and Appendix C2.

EB38-12

Final Action: AS AM AMPC____ D

EB39-12

[B] Figure A3-1, [B] Figure A3-2

Proposed Change as Submitted

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] FIGURE A3-1 NEW REINFORCED CONCRETE FOUNDATION SYSTEM

- a. Where frost conditions occur, the minimum depth shall extend below the frost line.
- b. The ground surface along the interior side of the foundation may be excavated to the elevation of the top of the footing.
- c. ~~When expansive soil is encountered~~ Where the code official has designated the soil as expansive, the foundation depth and reinforcement shall be ~~as directed~~ approved by the building code official.

(Portions of figure not shown remain unchanged)

[B] FIGURE A3-2 NEW MASONRY CONCRETE FOUNDATION

- a. Where frost conditions occur, the minimum depth shall extend below the frost line.
- b. The ground surface along the interior side of the foundation may be excavated to the elevation of the top of the footing.
- c. ~~When expansive soil is encountered~~ Where the code official has designated the soil as expansive, the foundation depth and reinforcement shall be ~~as directed~~ approved by the building code official.

(Portions of figure not shown remain unchanged)

Reason: This proposal clarifies the intended applicability and alternative criteria for expansive soil conditions. The intent of these notes is simply that the default, tabulated values might not be appropriate for highly expansive soil. Since most building departments are aware of local expansive soil conditions (and might even have their own prescriptive pre-approved details), the intent is to call attention to those known cases. Thus, the current wording about "when expansive soil is encountered" gives the wrong impression. Instead, since this chapter presumes no engineered design, there should be no burden on the builder to know or discover the soil conditions. Rather, the burden should merely be to check if the code official has made a designation, and if so, to get appropriate plan check approval for the footing details.

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

F A3-1-EB-BONOWITZ

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee feels that Building Officials would not want to be the one to designate soils as expansive as the proposed wording would require. It would make the Building Official part of the design team.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

David Bonowitz, representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B] FIGURE A3-1 NEW REINFORCED CONCRETE FOUNDATION SYSTEM

- a. Where frost conditions occur, the minimum depth shall extend below the frost line.
- b. The ground surface along the interior side of the foundation may be excavated to the elevation of the top of the footing.
- c. Where the ~~code official has designated~~ the soil is designated as expansive, the foundation depth and reinforcement shall be approved by the code official.

(Portions of figure not shown remain unchanged)

[B] FIGURE A3-2 NEW MASONRY CONCRETE FOUNDATION

- a. Where frost conditions occur, the minimum depth shall extend below the frost line.
- b. The ground surface along the interior side of the foundation may be excavated to the elevation of the top of the footing.
- c. Where the ~~code official has designated~~ the soil is designated as expansive, the foundation depth and reinforcement shall be approved by the code official.

(Portions of figure not shown remain unchanged)

Commenter's Reason: Existing wording in the 2012 IEBC makes the owner responsible for identifying expansive soil. This is improper, and EB39 tries to correct it, for three reasons: First, Chapter A3 is specifically intended to be prescriptive and not to require the input of a design professional or geotechnical engineer. Second, Chapter A3 applies only to relatively old houses where the impacts of expansive soil, if it exists at the site, would presumably already be known. Third, Chapter A3 facilitates highly beneficial seismic improvements that are only marginally affected by the presence of expansive soil. Certainly, if the soil is expansive, the foundation should have appropriate detailing. But burdening the owner with a soil investigation is not necessary. Rather, the intent of this provision has always been that where the soil is known to be expansive, one should use the appropriate detail.

The ICC Structural Committee had two concerns with the original proposal. One was that the code official would have become responsible for identifying expansive soil. That was not the intent; rather, as the original reason statement explained, most building departments already have information about local soil types, as well as alternative details for house construction. But given this concern, the comment revises the wording so that the burden is now shared; either party may identify the soil as expansive. This achieves the necessary goal of the proposal, which is to relieve the non-expert owner from having to investigate the soil on what is supposed to be a straightforward and inexpensive improvement to an old house.

The other committee concern was that the proposal would have made the code official part of the design team. This is simply incorrect. On the contrary, the current language says the code official "directs" the design. Only proposal EB39 (both the original and this comment) revises the code official's role back to one of approval.

EB39-12

Final Action: AS AM AMPC____ D

EB42-12

[B] Table A3-A, [B] Figure A3-3

Proposed Change as Submitted

Proponent: David Bonowitz, S.E., representing NCSEA Code Advisory Committee, Existing Buildings Subcommittee (dbonowitz@att.net)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[B] TABLE A3-A SILL PLATE ANCHORAGE AND CRIPPLE WALL BRACING

- Sill plate anchors shall be chemical anchors or expansion bolts in accordance with Section A304.3.1.
- All washer plates shall be 3 inches by 3 inches by .229 inch (76 mm x 76 mm x 5.8 mm) ~~2 inches by 2 inches by $\frac{3}{16}$ inch (51 mm by 51 mm by 4.8 mm)~~ minimum.
- See Figure A3-10 for braced panel layout.
- Braced panels at ends of walls shall be located as near to the end as possible.
- All panels along a wall shall be nearly equal in length and shall be nearly equal in spacing along the length of the wall.
- The minimum required underfloor ventilation openings are permitted in accordance with Section A304.4.4.

(Portions of Table not shown remain unchanged)

[B] FIGURE A3-3 SILL PLATE BOLTING TO EXISTING FOUNDATION

For SI: 1 inch = 25.4 mm.

NOTES:

- Plate washers shall comply with the following:
 $\frac{1}{2}$ in. anchor or bolt – ~~2 in. x 2 in. x $\frac{3}{16}$ in.~~ 3 in x 3 in x 0.229 in (76 mm x 76 mm x 5.8 mm) minimum
 $\frac{5}{8}$ in. anchor or bolt – ~~2 in. x 2 in. x $\frac{3}{16}$ in.~~ 3 in x 3 in x 0.229 in (76 mm x 76 mm x 5.8 mm) minimum
- See Figure A3-5 or A3-6 for cripple wall bracing.

(Portion of Figure not shown remains unchanged)

Reason: This proposal coordinates the minimum washer size with provisions in IRC Section R602.11. The change is made to both Table A3-A (note b) and Figure A3-3 (note 1).

Note to ICC: The washer size listed in 2012 Figure A3-3 note 1 should already be 3" x 3" x 1/4" per EB54-09/10, but that approved change was apparently not picked up in publication. This should be corrected through IEBC errata

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

T A3-A-EB-BONOWITZ

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal fills in needed information on sill plate anchorage. The committee also supports a public comment to introduce slotted holes in the plate washers as allowed under the IBC & IRC.

Assembly Action:

None

Individual Consideration Agenda

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

Public Comment:

Jonathan Siu, representing City of Seattle Dept of Planning & Development, requests Approval as Modified by this Public Comment.

Modify the proposal as follows:

[B] TABLE A3-A SILL PLATE ANCHORAGE AND CRIPPLE WALL BRACING

- a. Sill plate anchors shall be chemical anchors or expansion bolts in accordance with Section A304.3.1.
- b. All washer plates shall be 3 inches by 3 inches by 0.229 inch (76 mm x 76 mm x 5.8 mm) minimum. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (4.76 mm) larger than the bolt diameter and a slot length not to exceed 1-3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.
- c. See Figure A3-10 for braced panel layout.
- d. Braced panels at ends of walls shall be located as near to the end as possible.
- e. All panels along a wall shall be nearly equal in length and shall be nearly equal in spacing along the length of the wall.
- f. The minimum required underfloor ventilation openings are permitted in accordance with Section A304.4.4.

(Portions of Table not shown remain unchanged)

[B] FIGURE A3-3 SILL PLATE BOLTING TO EXISTING FOUNDATION

For SI: 1 inch = 25.4 mm.

NOTES:

1. Plate washers shall comply with the following:

½ in. anchor or bolt – 3 in x 3 in x 0.229 in (76 mm x 76 mm x 5.8 mm) minimum

5/8 in. anchor or bolt – 3 in x 3 in x 0.229 in (76 mm x 76 mm x 5.8 mm) minimum

A diagonal slot in the plate washer is permitted in accordance with Table A3-A, Footnote b.

2. See Figure A3-5 or A3-6 for cripple wall bracing.

(Portion of Figure not shown remains unchanged)

Commenter's Reason: Precise anchor bolt placement can be a problem when coupled with the 3x3 plate washers in a wall with 2x4 framing. The slotted hole allows the plate washer location to be adjusted. The text for the footnote in Table A3-A is taken verbatim from IBC Section 2308.12.8. This public comment is consistent with the direction given by the Structural Committee in its approval.

EB42-12

Final Action: AS AM AMPC _____ D
