COMMITTEES ON NFPA BUILDING CODE

Technical Committee on Structures, Construction and Materials

NFPA 5000 and NFPA 703 ROP Meeting Agenda

Tuesday, September 22, 2009

Embassy Suites Hotel
Cleveland - Downtown

1. Call to Order

The BLD-SCM meeting will be called to order by the chair, Peter J. Willse, at 8:00 a.m. EDT on Tuesday, September 22, 2009 at the Embassy Suites Hotel Cleveland – Downtown, OH.

2. Introduction of Attendees

A current committee roster is attached. (Page 3).

3. Approval of Minutes

Approve the NFPA 5000 October 1, 2007 Meeting Minutes. (Page 5).

4. NFPA 5000 Public Comment Preparation

Review of NFPA 5000 Public Proposals. (Page 8).

5. NFPA 703 Public Proposal Preparation

Review of NFPA 703 Public Proposals. (Page 44).

6. New Business

6. Date and Location of next meeting

7. Adjournment

AF/DM

Attachments

Address List No Phone

8/31/2009
Robert E. Solomon
BLD-SCM

Structures, Construction, and Materials

Building Code

Peter J. Willse — **I** 3/21/2006
Chair — **BLD-SCM**
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Alternate: Stephen V. Skalko

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James A. Rossberg — **SE** 3/15/2007
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Address List No Phone

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Structures, Construction, and Materials

Building Code

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Voting Alt. to AFPA Rep.

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ROC Meeting Minutes

Building Construction - Technical Committee on Structures, Construction and Materials

October 1, 2007 Meeting
Marriott Providence Downtown
Providence, RI

1. Call to Order

The NFPA 5000 ROC meeting of the Structures, Construction and Materials Technical Committee was called to order by the acting Chair, Jesse Beitel, at 1:05 PM on Monday October 1, 2007 at the Marriott Providence Downtown, Providence, RI.

2. Introduction of Committee Members and Guests.

The acting Chair opened the meeting with welcoming remarks followed by self-introduction of the attendees.

The following Technical Committee Principal and Alternate members were present:

TECHNICAL COMMITTEE MEMBERS PRESENT

NAME	REPRESENTING
Jesse Beitel	Hughes Associates, Inc.
David Collins	American Institute of Architects
Richard Davis (Alternate to John Harrington)	FM Global
John Harrington	FM Global
Joseph Holland	Hoover Treated Wood Products
James Kirby	National Roofing Contractors Association
John Loscheider	National Council of Structural Engineers
Bonnie Manley	American Iron and Steel Institute
Joseph Messersmith	Portland Cement Association
Dennis Pitts (Alternate to David Tyree)	FM Global
Sarah Rice	Schirmer Engineering Corporation
David Tyree	American Forest & Paper Association

GUESTS

NAME	REPRESENTING
Marcelo Hirschler	GBH International
Mark Graham	NRCA
Robert Wessel	Gypsum Association

The following NFPA staff members were in attendance:

Kristin Collette	NFPA
Hossein Davoodi	Staff Liaison, NFPA
Robert Solomon	NFPA

TECHNICAL COMMITTEE MEMBERS NOT PRESENT

NAME	REPRESENTING
Ralph Dorio	Insurance Services Office
Jeffrey Feid	State Farm Insurance Company
Michael Gardner	Gypsum Association
Alfred Hogan	New England Association of Fire Marshals
Eugene Novak	Commonwealth of Massachusetts
James Rossberg	American Society of Civil Engineers
Joseph Versteeg	International Fire Marshals Association
Peter Willse	Swiss Re, Global Asset Protection

3. Approval of minutes of November 6-7, 2006 meeting

The minutes of the November 6-7, 2006 meeting were approved as written and distributed.

4. Preparation of NFPA 5000 and 703 Report on Comments:

The Technical Committee reviewed and acted on 31 public comments received on NFPA 5000 and 1 public comment received on NFPA 703. 3 committee comments were generated by the Technical Committee on Furnishings and contents. The complete committee action on these comments can be found in the Report on Comments letter ballot.

5. ASCE Blast Protection Document

The Committee decided not to take an action until they have a chance to review the document.

6. Comment to NFPA 13

The Committee decided to submit a comment to NFPA 13 Committee to revise definition of "Thermal Barrier".

7. New Business

There was no new business introduced.

8. Date and Location of the Next Meeting

To be determined.

9. Meeting Adjournment

Meeting was adjourned at 4:30 PM on October 1, 2007.

5000-5 Log #CP25e BLD-SCM Final Action:
(Entire Document)

Submitter: Technical Committee on Structures, Construction, and Materials,
Recommendation: Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.
Substantiation: To conform to the NFPA Regulations Governing Committee Projects.

5000-8 Log #80 BLD-SCM Final Action:
(Chapter 2)

Note: This Proposal originates from Tentative Interim Amendment 5000-09-1 (TIA 923) issued by the Standards Council on July 24, 2008.
Submitter: Bonnie E. Manley, American Iron and Steel Institute
Recommendation: *1. Revise references in Chapter 2 to read as follows:*
AISI S214-07 w/ S2-08, *North American Standard for Cold-formed Steel Framing – Truss Design*, including Supplement 2 (Jun. 2008)
AISI S230-07 w/ S2-08, *Standard for Cold-formed Steel Framing—Prescriptive Method for One- and Two-family Dwellings*, including Supplement 2 (Jun. 2008)
Substantiation: After introducing the 2007 editions of AISI S214 and AISI S230 in Comment #5000-19, new information came to light which compelled the AISI Committee on Framing Standards to process the attached supplements. Please note: the language in the Prefaces of both supplements state "Supplement 2 replaces Supplement 1". That is, in both cases, Supplement 1, as appropriate, has been incorporated and printed in Supplement 2.
More to the point, the purpose of Supplement 2 of AISI S214 is to revise and clarify provisions related to design responsibilities, loading, quality criteria and bracing for greater consistency with the building codes and industry practice. Supplement 2 of AISI S230 is intended to revise and clarify provisions related to low wind and low seismic wall bracing.
While the exact edition number and date was not known at the time of the TC's ROC meeting, the TC noted the following in their acceptance of Comment #5000-19:
The Committee notes that there is a possibility that one or more supplements relating to the subjects covered by the referenced documents will be available in the coming months. If these supplements are completed and available prior to the NFPA Association meeting in June 2008, it would be the desire and recommendation of the Technical Committee that the supplements be adopted and returned as appropriate in NFPA 5000.
Additionally, the TCC Note on Comment #5000-19 states "that additional supplements are expected to be available for incorporation by reference in the 2009 edition of the code." Thus, both the TC and the TCC indicated a willingness to adopt the latest editions of these supplements. Finally, a NITMAM was submitted requesting the modifications shown above; however, it was not certified by the NFPA Motions Committee. This leaves a TIA as the only option to adopting the latest editions of both AISI S214 and AISI S230 in the 2009 edition of NFPA 5000.
Emergency Nature: The intent of the TIA is to update two reference standards in the proposed 2009 edition of NFPA 5000 that were not finalized and published until after the ROC meetings of the affected committees. While a Notice of an Intent to Make a Motion (NITMAM) was submitted to update these references, the Motions Committee of the Standards Council did not certify the NITMAM as section 4.6.5(b) of the Regulations Governing Committee Projects limits amendments (i.e. proposed motions), to proposals, comments or an identifiable part of a proposal or comment, exactly as published in the ROP or ROC. A TIA is the only means by which the updated references can be considered for inclusion in the proposed 2009 edition of NFPA 5000. This TIA will be considered by the Standards Council at its July 2008 meeting when it also considers the issuance of the proposed 2009 edition of NFPA 5000. When the TIA is considered by the Council, an appeal will also be filed requesting that the TIA only be issued for the proposed 2009 edition of NFPA 5000.

5000-9 Log #177 BLD-SCM Final Action:
(2.3.4)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. American Institute of Steel Construction
Recommendation: Revise Section 2.3.4 as follows:

2.3.4 AISC Publications. American Institute of Steel Construction, One East Wacker Drive, Suite 3100, Chicago, IL 60601-2001.

ANSI/AISC 341, *Seismic Provisions for Structural Steel Buildings*, ~~2005~~2010.

ANSI/AISC 360, *Specification for Structural Steel Buildings*, ~~2005~~2010.

Substantiation: This proposal updates the references to AISC 341 and AISC 360. Please note, public review drafts of the 2010 AISC documents can be found on the AISC website (www.aisc.org). The public review period for AISC 360-10 is currently scheduled for 8/14/09 through 9/28/09 and the public review period for AISC 341-10 is currently scheduled for 9/11/09 through 10/26/09. It is anticipated that the 2010 editions of both AISC 360 and AISC 341 will be technically complete by the end of October 2009, with ANSI approval in March 2010 and publication in August 2010.

5000-10 Log #110 BLD-SCM Final Action:
(2.3.5)

Submitter: Bonnie E. Manley, American Iron and Steel Institute
Recommendation: Revise Section 2.3.5 as follows:

2.3.5 AISI Publications. American Iron and Steel Institute, 1401 Connecticut Avenue, Suite 705, Washington, DC 20036.

AISI-S100 w/ S1-09, *North American Specification for the Design of Cold- Formed Steel Structural Members*, 2007, including Supplement 1 (2009).

AISI-S200, *North American Standard for Cold–Formed Steel Framing — General Provisions*, 2007.

AISI-S210, *North American Standard for Cold–Formed Steel Framing — Floor and Roof System Design*, 2007.

AISI-S211, *North American Standard for Cold–Formed Steel Framing —Wall Stud Design*, 2007.

AISI-S212, *North American Standard for Cold–Formed Steel Framing — Header Design*, 2007.

AISI-S213 w/ S1-09, *North American Standard for Cold–Formed Steel Framing — Lateral Design*, 2007, including Supplement 1 (2009).

AISI-S214, *North American Standard for Cold–Formed Steel Framing —Truss Design*, including Supplement 2 (June 2008).

AISI-S230, *Standard for Cold–Formed Steel Framing — Prescriptive Method for One- and Two-Family Dwellings*, including Supplement 2 (June 2008).

AISI S 214 and S230 references have been updated by a tentative interim amendment (TIA). See page 1.

Substantiation: This proposal updates the references to the AISI documents.

Supplement 1 to AISI S100, *North American Specification for the Design of Cold-Formed Steel Structural Members*, 2007 Edition, modifies Section F1.1, Load and Resistance Factor Design and Limit States Design, to recognize that the behavior and probability of failure for a composite interior partition wall stud differs from the direct load bearing system. Additionally, a reference to Supplement No. 1 of AISI S213, *North American Standard for Cold-Formed Steel Framing – Lateral Design,* is included. The Supplement also has included errata to the North American Specification.

Changes made in Supplement 1 to AISI S213, *North American Standard for Cold-Formed Steel Framing – Lateral Design,* 2007 Edition include the following:

- R_d values in Table A4-1 for diagonal *strap* braced (concentric) walls were adjusted to match the values approved by the Canadian National Committee on Earthquake Engineering (CANCEE) for inclusion in the National Building Code of Canada (NBCC) seismic provisions.
- Language in C1.1 was modified to clarify when design must comply with the special seismic requirements.
- The existing provisions on setbacks in Section C2, which the Committee felt should be limited to prescriptive methods with defined limits of applicability, were replaced with a requirement deemed to be more appropriate for a design standard.
- Adjustments were made to Table C2.1-3 for 0.027" steel sheet, one side, based on testing at the University of North Texas (Yu, 2007). Designation thickness for stud, track and blocking associated with the existing tabulated values was increased from 33 mils (min.) to 43 mils (min.). New values were added for designation thickness for stud, track and blocking equal to 33 mils (min.).
- Equation C2.1-1 for determining the design deflection of a blocked wood structural panel or sheet steel shear wall was consolidated for SI and Metric units.
- The word "countersunk" was deleted and commentary added to clarify provisions for tapping screws to attach wood structural panel sheathing in Section C2.2.2.
- Language in C3.3.2 was modified to clarify when the uplift anchorage and boundary chords must comply with the special seismic requirements.
- Equation D2.1-1 for determining the design deflection of a blocked wood structural panel diaphragm was consolidated for SI and Metric units.

It is anticipated that both of these supplements will be completed later this year.

5000-11 Log #182 BLD-SCM Final Action:
(2.3.5)

Submitter: Dennis L. Pitts, American Forest & Paper Association
Recommendation: Revise text to read as follows:
ANSI/AF&PA WFCM, *Wood Frame Construction Manual for One- and Two-Family Dwellings,* ~~2001~~ 2012.
Substantiation: This is an update of an existing ANSI/AF&PA standard. The current update schedule calls for the new edition (2012) to be approved by mid-2011.

5000-12 Log #183 BLD-SCM Final Action:
(2.3.5)

Submitter: Dennis L. Pitts, American Forest & Paper Association
Recommendation: Revise text to read as follows:
AF&PA SDPWS, *Special Design Provision for Wind and Seismic,* ~~2005~~ 2008.
Substantiation: This is an update of an existing ANSI/AF&PA standard.

5000-13 Log #185 BLD-SCM Final Action:
(2.3.5)

Submitter: Dennis L. Pitts, American Forest & Paper Association
Recommendation: Revise text to read as follows:
ANSI/AF&PA NDS, *National Design Specifications (NDS) for Wood Construction*, ~~2005~~ 2012
ANSI/AF&PA NDS Supplement, *NDS Supplement – Design Values for Wood Construction*, ~~2005~~ 2012
NO FURTHER REVISIONS TO THIS SECTION.
Substantiation: This is an update of an existing ANSI/AF&PA standard. The current update schedule calls for the new edition (2012) to be approved by mid-2011.

5000-20 Log #114 BLD-SCM Final Action:
(2.3.27)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. National Assn of Architectural Metal Mfgs
Recommendation: Revise Section 2.3.27 as follows:
2.3.27 NAAMM Publications. National Association of Architectural Metal Manufacturers, 8 South MichiganAvenue, Suite 1000, Chicago, IL 60603.
ANSI/NAAMM FP 1001, *Guide Specifications for Design of Metal Flagpoles Manual,* ~~1997~~ 2007.
Substantiation: This proposal updates the reference to NAAMM FP 1001. The major change to this 5th edition of the standard is that the basic wind speed map found in the previous editions has been replaced with the new wind speed map in ASCE 7-05, which is based on 3-second gust speeds.

5000-21 Log #116 BLD-SCM Final Action:
(2.3.32)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. Steel Joist Institute
Recommendation: Revise 2.3.32 as follows:

2.3.32 SJI Publications. Steel Joist Institute, 1173B London Links Drive, Forest, VA 24551~~3127 Mr. Joe White Avenue, Myrtle Beach, SC 29577-6760~~.

SJI CJ, *Standard Specifications for Composite Steel Joist, ~~C-J~~ CJ-Series,* ~~2006~~2010.

SJI JG, *Standard Specifications for Joist Girders*, ~~2005~~2010.

~~*Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders*, 2005.~~

SJI K, *Standard Specification for Open Web Steel Joists, K-Series*, 2010.

SJI LH/DLH, *Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series,* ~~2005~~2010.

~~*Standard Specifications for Open Web Steel Joists, K-Series*, 2005.~~

Substantiation: This proposal editorially corrects the SJI references to reflect the actual document titles and updates the document editions to 2010. Major changes to the new editions of the SJI standard specifications include the following:

- Revising all the Standard Specifications Sections 4.4, 103.4, and 1003.4 Members to include a new reduction factor associated with crimped angle web members.
- Revising all the Standard Specifications Sections 4.4, 103.4, and 1003.4 Members to include a node shear check provision.
- Revising all the Standard Specifications Sections 4.5, 103.5, and 1003.5 Connections based on information provided in updated SJI Technical Digest 8 (2008).
- Adding new K factor table to the K-Series Standard Specification and revise similar table currently found in the LH/DLH-Series Standard Specification.
- Revising the K-Series Standard Specification Load Tables to remove the 8K1 designation.
- Revising the LH/DLH-Series Standard Specification DLH-Series Load Table to now include joists that have a nominal depth up to 120 in. and a span up to 240 ft.
- Revising the LH/DLH-Series Standard Specification to now include provisions for specifying longspan floor joists based on applied load and span.
- Revising the Joist Girder Standard Specification Section 1003.4 Members to include a transverse bending check provision.

Several other minor changes and lots of editorial/clarification changes are still being worked on. It is anticipated that all the Standard Specifications and Load Tables will be completed in time to be voted on at the SJI Fall 2009 Board of Directors meeting in November. After which they will go to the ANSI Canvass Committee with completion planned in 1st quarter 2010.

5000-37 Log #26b BLD-SCM Final Action:
(3.3.46.3 Thermal Barrier and A.3.3.46.3)

Submitter: Marcelo M. Hirschler, GBH International / Rep. American Fire Safety Council
Recommendation: Revise text to read as follows:

~~3.3.46.3* Thermal Barrier. A material that limits the average temperature rise of an unexposed surface to not more than 250°F (139°C) for a specified fire exposure complying with the standard time–temperature curve of NFPA 251, Standard Methods of Tests of Fire Resistance of Building Construction and Materials.~~

3.3.46.3* Thermal Barrier for Foam Plastic Insulation (Thermal Barrier). A material, product, or assembly that prevents or delays ignition of foam plastic insulation by limiting the temperature rise on the surface of the foam plastic insulation and by acting as a flame exposure barrier to the foam plastic insulation for a 15-minute time period (NFPA 275).

A.3.3.46.3 Thermal Barrier. ~~Finish ratings, as published in the UL Fire Resistance Directory, are one way of determining thermal barrier.~~ NFPA 275 is a test method designed specifically to assess whether a material, product or assembly constitutes a thermal barrier. FM 4880, UL 1040 and UL 1715 are also test methods recognized by the code for approving materials, products or assemblies as thermal barriers.

Add NFPA 275, Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation, into chapter 2 on referenced standard and into the annex on informational references

Substantiation: The present definition should be replaced by extracting the one contained in NFPA 275, since NFPA 275 was specifically developed to clarify the test for thermal barrier materials to be used over foam plastic insulation. This definition is more generic and ties in with the two conditions needed for a thermal barrier: temperature transmission and assembly integrity. The existing definition addresses the aspect of temperature transmission only.

NFPA 275 contains two tests.

1. The temperature transmission fire test in NFPA 275 uses the ASTM E 119 (or NFPA 251 or UL 263) time-temperature fire curve to expose the thermal barrier specimen and it requires the following: “4.8.1 During the 15-minute test period, the average measured temperature rise above the average temperature at the start of the fire test for the thermocouples described in Section 4.3 shall not exceed 250°F (139°C), and the measured temperature rise of any such single thermocouple shall not exceed 325°F (181°C).” Therefore, the temperature transmission fire test in NFPA 275 corresponds to what the code requires now.

2. The integrity fire test in NFPA 275 requires that the thermal barrier material, together with the foam plastic insulation, be tested to NFPA 286 (which is a 15 minute test) and that the pass/fail criteria are identical to those used for NFPA 286 elsewhere in the code (for example Chapter 10).

The code should continue to recognize that thermal barrier materials tested, in conjunction with foam plastic insulation, to FM 4880, UL 1040 and UL 1715 and complying with the conditions of acceptance of these tests are equally acceptable. NFPA 275 also states that the integrity fire test can be conducted in accordance with these alternate test methods, when their pass/fail criteria are used.

The annex note is being changed because there are now specific methods for assessing whether a material, product or assembly constitutes a thermal barrier, rather than using a UL directory.

5000-67 Log #CP24b BLD-SCM Final Action:
(3.3.618 Tank)

Submitter: Technical Committee on Fundamentals,
Recommendation: Revise text to read as follows:

3.3.618 Tank. A closed vessel having a liquid capacity in excess of 227 L (60 gal). [122, 2004]

Substantiation: This definition is the preferred definition from the NFPA Glossary of Terms. Changing the secondary definition to the preferred definition complies with the Glossary of Terms Project.

5000-169 Log #9 BLD-SCM Final Action:
(22.3.x (New))

Note: This proposal appeared as Comment 5000-190 (Log #64b) which was held from the Annual 2008 ROC on Proposal 5000-162.

Submitter: Technical Correlating Committee on Building Code,

Recommendation: Add new text as follows:

Attached Garages.

- Provisions shall be made to provide fire separation between the garage and the dwelling unit.
- As a minimum, the garage shall be separated from the dwelling unit and its attic by not less than / in. (mm) gypsum board applied to the garage side and the separation shall be continuous from the bottom of the floor to the underside of the roof deck. The design approval and the manufacturer's installation instructions shall include provision for equivalent vertical separation between the garage and the space below the dwelling unit's floor system.
- Openings between the garage directly into a room designated for sleeping purposes shall not be permitted. Other openings between the garage and the manufactured home shall be equipped with solid wood doors not less than in. (5 mm) in thickness, solid or honeycomb steel doors not less than in. (5 mm) in thickness, or 0-minute fire rated doors, and all doors shall be self-closing.
- Ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. gauge steel or other approved material and shall have no openings in the garage.
- Exception: When a sprinkler system is installed.

Substantiation: We have resubmitted to make sure the committee and TCC statement of redirection was done. They suggested that this proposal be submitted to the TC on Structures, Construction, and Materials and BLD-BLC.

Currently there are no provisions for the separation of the garage from the dwelling unit. The text was extracted from NFPA 501. Fire starting in a garage can spread into the dwelling unit with no protection. The proposed text provides text in protecting the dwelling unit from a garage fire and vice versa.

5000-184 Log #21 BLD-SCM Final Action:
(32.4.3 and 32.4.5.3)

Submitter: Marcelo M. Hirschler, GBH International

Recommendation: Revise text to read as follows:

32.4.3 Coverings. Awnings and canopies shall be permitted to have a combustible covering that meets the flame propagation performance criteria of NFPA 701, or that meets the requirements of Class A in accordance with ~~has a Class A rating as specified in~~ Chapter 10.

32.4.5.3 Combustible materials used in or on a canopy shall comply with any one of the following:

(1) Combustible materials shall be completely shielded from the fuel dispensers by a noncombustible component of the canopy or by wood meeting Type IV construction sizes.

(2) Plastics shall meet the following criteria:

(a) They shall be covered by an aluminum skin having a minimum thickness of 0.019 in. (0.5 mm) or a corrosion-resistant steel skin having a minimum base metal thickness of 0.016 in. (0.41 mm).

(b) They shall meet the requirements of Class A in accordance with ~~have a Class A rating, as specified in~~ Chapter 10, when tested in the form intended for use and a self-ignition temperature of not less than 650°F (343°C) when tested in accordance with ASTM D 1929, Standard Test Method for Determining Ignition Temperature of Plastics.

(3) Light-transmitting plastic panels shall meet the following criteria:

(a) The panels shall be located not less than 10 ft (3050 mm) from any building on the same property, and not less than 40 ft (12.2 m) from the street or open yard to the property line.

(b) The aggregate area of such panels shall be not greater than 1000 ft^2 (93 m^2).

(c) The area of any individual plastic panel shall be not greater than 100 ft^2 (9.3 m^2).

Substantiation: The term rating should not be used since Classes are based either on a flame spread index of 25 or less and a smoke developed index of 450 or less or on a low heat release rate, low smoke release and no flashover, in accordance with NFPA 286. This is purely an editorial change; the term rating is being used for fire resistance rating and fire protection rating.

5000-185 Log #11 BLD-SCM Final Action:
(32.7.8.2.3)

Submitter: Jon Nisja, Northcentral Regional Fire Code Development Committee
Recommendation: Revise to read:

32.7.8.2.3 Manufacturer Requirements. ~~The manufacturer shall comply with the requirements of 32.7.8.2.3.1 and 32.7.8.2.3.2.~~

~~32.7.8.2.3.1~~ Where required by the authority having jurisdiction, the manufacturer shall ~~submit~~ certify that the equipment supplied is in accordance with the design or is essentially identical to the structure tested and submit either of the following:

(1) Calculations verifying the design analysis prepared by a professional engineer or registered architect

(2) Report of load tests conducted by an approved, independent testing laboratory and certified by a professional engineer

~~32.7.8.2.3.2 Where required by the authority having jurisdiction, the manufacturer shall certify that the equipment supplied is in accordance with the design or is essentially identical to the structure tested.~~

Substantiation: Removes redundant text and consolidates all the requirements in a single section.

5000-186 Log #12 BLD-SCM Final Action:
(32.7.8.2.4.1)

Submitter: Jon Nisja, Northcentral Regional Fire Code Development Committee
Recommendation: Revise to read:

32.7.8.2.4.2 The drawings specified in 32.7.8.2.4.1 shall include the following:

(1) Conformance with approved designs, which are permitted to refer to approved standard drawings, with any variations applicable to the job noted

(2) Location of the folding or telescopic seating units and details of attachments, if any

(3) Location of guards and details thereof

~~32.7.8.2.4.3 The owner, or the owner's duly authorized representative, shall file with the authority having jurisdiction evidence of the following:~~

(~~1~~4) Capability of means of egress to accommodate the occupants of the seating, as well as all other occupants, based on Chapter 11

(~~2~~5) Structural capacity of the site to support the folding and telescopic seating dead loads when closed and also to support the dead loads and live loads when open

Substantiation: Consolidates all the requirements in a single section making it easier for the user. The items in 32.7.8.2.4.3 as also required when submitting a plan so they should be included in the same section.

5000-200 Log #117 BLD-SCM Final Action:
(35.1.2.8.3)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. Steel Joist Institute
Recommendation: Revise Section 35.1.2.8.3 as follows:

35.1.2.8.3 Steel. The deflection of steel structural members shall not exceed that permitted by the following, as applicable:

(1) AISC 360, *Specification for Structural Steel Buildings*
(2) AISI S100, *North American Specification for the Design of Cold-Formed Steel Structural Members*
(3) ASCE/SEI 3, *Standard for the Structural Design of Composite Slabs*
(4) ASCE/SEI 8, *Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members*
(5) SJI CJ, *Standard Specification for Composite Steel Joists, CJ-Series* ~~SJI, *Standard Specifications, Load Tables and Weight Tables forSteel Joists and Joist Girders*~~
(6) SJI JG, *Standard Specification for Joist Girders*
(7) SJI K, *Standard Specification for Open Web Steel Joists, K-Series*
(8) SJI LH/DLH, *Standard Specification for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series.*

Substantiation: This proposal editorially corrects the SJI references to reflect the actual document titles.

5000-201 Log #111 BLD-SCM Final Action:
(35.9)

Submitter: Bonnie E. Manley, American Iron and Steel Institute
Recommendation: Revise Section 35.9 as follows:

35.9 Wind Loads.
35.9.1 General.
35.9.1.1 All buildings, structures, and parts thereof shall be designed to withstand the appropriate wind loads prescribed herein.
35.9.1.2 Decreases in wind loads shall not be permitted to be made to account for the effect of shielding by other structures.
35.9.1.3 Determination of wind loads shall be in accordance with 35.9.1.3.1 and 35.9.1.3.2.
35.9.1.3.1 Wind loads on every building or structure shall be determined by the provisions of Section 6 of ASCE/SEI 7.
35.9.1.3.2 As an alternative to the requirement of 35.9.1.3.1, wind loads determined by the following shall be permitted, subject to the limitations therein:

(1) ANSI/NAAMM FP 1001, *Guide Specifications for Design of Metal Flagpoles Manual*
(2) Wind tunnel tests conducted in accordance with Section 6.6 of ASCE/SEI 7
(3) ANSI/TIA/EIA-222-F, *Structural Standards for Steel Antenna Towers and Antenna Structures*
(4) For bleachers and grandstands, the requirements of 35.9.1.5
(5) For residential structures, AISI S230.

Substantiation: NFPA 5000-09 recognizes the use of the AISI S230, *Standard for Cold-formed Steel Framing-Prescriptive Method for One- and Two-family Dwellings,* in Section 44.7.7. Additionally, these prescriptive requirements form the basis for the cold-formed steel light frame construction provisions in ICC's IRC. The document, which addresses wind speeds up to 150 MPH, has been included by reference in ICC-600. Therefore, it is appropriate to further integrate this document as an acceptable method to address wind load requirements by recognizing its applicability in Section 35.9.1.3.2. This code change references the most current edition of AISI S230 – 2007 with 2008 supplement, which is based on ASCE 7-05 wind provisions and has already been adopted in the 2009 edition of NFPA 5000.

5000-202 Log #112 BLD-SCM Final Action:
(35.10 and 2.3.5)

Submitter: Bonnie E. Manley, American Iron and Steel Institute
Recommendation: Part I: Revise Section 35.10.9 as follows:
35.10.9 ~~Seismic Design of~~ Steel Structures.
35.10.9.1 Seismic design parameters for cold-formed steel special bolted moment frames. Add a new line, #C12 in ASCE 7, Table 12.2-1 for "Cold-formed Steel – Special Bolted Moment Frame" as follows:

Insert Table 12.2.1 Here

35.10.9.2 Seismic Design and Detailing for Steel Structures. The seismic design and detailing of steel structures shall be in accordance with the provisions of Chapter 44 of this *Code*. The provisions of Section 14.1 of ASCE/SEI 7 shall not apply.
Part II: Add the following document to Chapter 2:
2.3.5 AISI Publications. American Iron and Steel Institute, 1401 Connecticut Avenue, Suite 705, Washington, DC 20036.
AISI S110, *Standard for Seismic Design Of Cold-Formed Steel Structural Systems – Special Bolted Moment Frames*, 2007.

Substantiation: This proposal introduces the seismic design parameters for a new system, "Cold-formed Steel – Special Bolted Moment Frame" or CFS-SBMFs. This system has been vetted through the BSSC process (Proposal 6-4R) and will be included in Part I of the 2009 NEHRP Provisions. Additionally, it has been introduced for consideration in the 2010 edition of ASCE 7 (Proposal TC-6-CH12-102-R3). Processing for ASCE 7-10 is not yet complete and, because of its shorten cycle, the ASCE 7 Main Committee may not be able to complete its action on the proposal. Consequently, the necessary modifications to ASCE 7 are being introduced here. If action is taken on Proposal TC-6-CH12-102-R3 in time for inclusion in the 2010 edition of ASCE 7, then this proposal will be withdrawn.
Please note, this proposal serves as a companion proposal to a NFPA 5000 Chapter 44 modification which introduces a reference to the first edition of AISI S110, *Standard for Seismic Design of Cold- Formed Steel Structural Systems – Special Bolted Moment Frames*. This document is based upon research conducted by Drs. Uang and Sato at UCSD (2007). Specifically, the CFS-SBMF system is expected to experience substantial inelastic deformation during significant seismic events. It is intended that most of the inelastic deformation will take place at the bolted connections, due to slip and bearing. In order to develop the designated mechanism, requirements based on capacity design principles are provided in AISI S110 for the design of the beams, columns and associated connections. Additionally, AISI S110 has specific requirements for the application of quality assurance and quality control procedures.
As a first pass, Appendix 1 of AISI S110 makes recommendations on the seismic design coefficients of the CFS-SBMF system. These parameters have been introduced for consideration in the ASCE 7-10 proposal. The Response Modification Coefficient, R, is set at 3.5. Cyclic testing has shown that CFS-SBMFs have very large ductility capacity and significant hardening. This justifies the use of a value of 3.5 for the R-factor. The derivation of the deflection amplification factor, C_d, can be found in the AISI S110 Commentary, Section D1.3. Furthermore, a capacity design procedure has been provided in Section D1.5 of AISI S110 Commentary so that the designer can explicitly calculate the seismic load effect with overstrength, E_{mh},. at the design story drift level. Alternatively, a conservative system overstrength factor, Ω_o, is also provided to be compatible with the conventional approach to compute E_{mh} in ASCE 7. Finally the height limitation of 35 feet for all SDCs is based on practical use only and not from any limits on the CFS-SBMF system strength.

Seismic Force Resisting System	ASCE 7 Section where Detailing Requirements are Specified	Response Modification Coefficient, R	System Overstrength Factor, Ω_o	Deflection Amplification Factor, C_d	Structural System Limitations and Building Height (ft) Limit				
					Seismic Design Category				
					B	C	D	E	F
C12. Cold-Formed Steel – Special Bolted Moment Frame[b]	14.1	3.5	3.0[a]	3.5	35	35	35	35	35

[a] Alternately, the seismic load effect with overstrength, E_{mh}, can be based on the expected strength determined in accordance with AISI S110.

[b] Cold-formed steel – special bolted moment frames shall be limited to one-story in height in accordance with AISI S110.

5000-203 Log #22 BLD-SCM Final Action:
(37.4.4)

Submitter: Marcelo M. Hirschler, GBH International / Rep. American Fire Safety Council
Recommendation: Revise text to read as follows:

37.4.4.1 The thermal barrier specified in 37.4.4(3) shall not be required where MCM meet either of the following conditions:

(1) MCM are installed as part of a balcony or similar architectural appendage or as exterior trim.

(2) MCM are approved for the specific installation, based on tests conducted using the maximum thickness intended for use in accordance with one of the following:

(a) NFPA 286, Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth, with the acceptance criteria of 10.3.6.2

(b) UL 1040, Standard for Fire Test of Insulated Wall Construction

(c) FM 4880, Approval Standard for Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels; Interior Finish Materials or Coating, and Exterior Wall Systems

(d) UL 1715, Standard for Safety for Fire Test of Interior Finish Material

37.4.4.2 MCM tested in accordance with 37.4.4.1(2) shall be tested as an assembly in the manner intended for use that shall include joints, seams, fasteners, and other construction details typical of the intended installation.

Substantiation: NFPA 286 does not contain acceptance criteria – therefore the acceptance criteria need to be added, just as they are elsewhere in the code whenever NFPA 286 is referenced. Examples are 10.3.1.2, 10.3.3, 10.3.6, 48.3.3.2 and 48.4.4.1. Without this added language it is unclear what acceptance criteria are to be used for tests conducted to NFPA 286 and the section is unenforceable.

5000-204 Log #23 BLD-SCM Final Action:
(37.4.4, 37.4.5, and 37.4.6)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise text to read as follows:

37.4.4 MCM installed on the exterior of buildings classified as Type I, Type II, Type III, or Type IV construction shall comply with each of the following conditions:

(1) MCM that are part of the exterior wall assembly shall be tested in accordance with NFPA 285, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components, using the maximum panel thickness intended for use and shall meet the conditions of acceptance specified therein.

(2) MCM shall meet the requirements of Class A in accordance with ~~have a Class A rating, as specified in~~ Chapter 10, based on the maximum thickness intended for use.

(3) MCM shall be completely separated from the building interior by a thermal barrier meeting the requirements in 48.3.3.

37.4.5 MCM shall not be required to comply with 37.4.4, provided that one of the following conditions is met:

(1) MCM shall be permitted to be installed to a maximum height of 40 ft (12 m) above grade plane where either 37.4.5(1)(a) or 37.4.5(1)(b) and 37.4.5(1)(c) are met as follows:

(a) Where the exterior wall has 60 in. (1525 mm) or less horizontal separation, the MCM shall not cover more than 10 percent of the exterior wall.

(b) Where the exterior wall has 60 in. (1525 mm) or less horizontal separation, the area of the exterior wall covered by the MCM shall not be limited.

(c) MCM shall meet the requirements of Class B in accordance with ~~have a Class B rating, as specified in~~ Chapter 10, based on the maximum thickness intended for use.

(2) MCM shall be permitted to be installed to a maximum height of 50 ft (15 m) above grade plane, provided that all of the following conditions are met:

(a) MCM shall be installed on the exterior wall so that the aggregate area of contiguous panels bounded by vertical joints and a vertical separation of not less than 48 in. (1220 mm), as measured to adjacent MCM, does not exceed 300 ft2 (27.8 m2).

(b) MCM shall have a self-ignition temperature of not less than 650°F (343°C) when tested in accordance with ASTM D 1929, Standard Test Method for Determining Ignition Temperature of Plastics.

(c) MCM shall meet the requirements of Class B in accordance with ~~have a Class B rating, as specified in~~ Chapter 10, based on the maximum thickness intended for use.

37.4.6 MCM installed on the exterior walls of buildings classified as Type V construction shall meet the requirements of Class B in accordance with ~~have a Class B rating, as specified in~~ Chapter 10, based on the maximum thickness intended for use.

Substantiation: The term rating should not be used since Classes are based either on a flame spread index of 25 or less and a smoke developed index of 450 or less or on a low heat release rate, low smoke release and no flashover, in accordance with NFPA 286. This is purely an editorial change; the term rating is being used for fire resistance rating and fire protection rating.

5000-205 Log #87 BLD-SCM Final Action:
(38.9.3.6)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revised text to read as follows:

38.9.3.6 Wind Requirements. BUR roof assemblies shall be tested for wind resistance in accordance with one of the following applicable tests:

(1) FM 4470, Approval Standard for Class I Roof Covers

(2) ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies

(3) ANSI/UL 1897, Standard for Uplift Tests for Roof Covering Systems

Substantiation: Update referenced standards to reflect ANSI approval.

5000-206 Log #88 BLD-SCM Final Action:
(38.9.6.6)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
38.9.6.6 Wind Requirements. Modified bitumen roof assemblies shall be tested for wind resistance in accordance with one of the following applicable tests:
(1) FM 4470, Approval Standard for Class I Roof Covers
(2) ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies
(3) ANSI/UL 1897, Standard for Uplift Tests for Roof Covering Systems
Substantiation: Update referenced standards to reflect ANSI approval.

5000-207 Log #89 BLD-SCM Final Action:
(38.9.7.8.1)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
38.9.7.8.1 Through-fastened metal panel roof assemblies shall be tested for wind resistance in accordance with one of the following applicable tests:
(1) ASTM E 1592, Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
(2) FM 4471, Approval Standard for Class I Panel Roofs
(3) ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies
(4) ANSI/UL 1897, Standard for Uplift Tests for Roof Covering Systems
Substantiation: Update referenced standards to reflect ANSI approval.

5000-208 Log #90 BLD-SCM Final Action:
(38.9.7.8.2)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
38.9.7.8.2* Except as noted in 38.9.7.8.3, standing seam metal panel roof assemblies shall be tested for wind resistance, where the test specimen contains not less than three full panel widths and not less than four full panel spans (five structural elements), in accordance with one of the following applicable tests:
(1) ASTM E 1592, Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
(2) FM 4471, Approval Standard for Class I Panel Roofs
(3) ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies
(4) ANSI/UL 1897, Standard for Uplift Tests for Roof Covering Systems
Substantiation: Update referenced standards to reflect ANSI approval.

5000-209 Log #91 BLD-SCM Final Action:
(38.9.8.8)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
38.9.8.8 Wind Requirements. Metal shingle roof assemblies shall be tested for wind resistance in accordance with one of the following applicable tests:
(1) ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies
(2) ANSI/UL 1897, Standard for Uplift Tests for Roof Covering Systems
Substantiation: Update referenced standards to reflect ANSI approval.

5000-210 Log #92 BLD-SCM Final Action:
(38.9.9.8)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
38.9.8.8 Wind Requirements. Mineral-surfaced roll roofing assemblies shall be tested for wind resistance in accordance with one of the following applicable tests:
(1) FM 4470, Approval Standard for Class I Roof Covers
(2) ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies
(3) ANSI/UL 1897, Standard for Uplift Tests for Roof Covering Systems
Substantiation: Update referenced standards to reflect ANSI approval.

5000-211 Log #93 BLD-SCM Final Action:
(38.9.11.6)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
38.9.11.6 Wind Requirements. Spray polyurethane foam roof assemblies shall be tested for wind resistance in accordance with one of the following applicable tests:
(1) FM 4470, Approval Standard for Class I Roof Covers
(2) ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies
(3) ANSI/UL 1897, Standard for Uplift Tests for Roof Covering Systems
Substantiation: Update referenced standards to reflect ANSI approval.

5000-212 Log #94 BLD-SCM Final Action:
(38.9.12.6.1.1)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
38.9.12.6.1.1 Adhered sheet membrane roof assemblies shall be tested for wind resistance in accordance with one of the following applicable tests:
(1) FM 4470, Approval Standard for Class I Roof Covers
(2) ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies
(3) ANSI/UL 1897, Standard for Uplift Tests for Roof Covering Systems
Substantiation: Update referenced standards to reflect ANSI approval.

5000-213 Log #95 BLD-SCM Final Action:
(38.9.12.6.1.2)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
38.9.12.6.1.2 Mechanically attached sheet membrane roof assemblies shall be tested for wind resistance in accordance with FM 4470, ANSI/UL 580, or ANSI/UL 1897, whichever is applicable. The size of the test device shall be greater than two times the spacing between rows of roof cover fasteners and shall meet the requirements of the respective test. The test specimen shall not have less than two full spans and three rows of fasteners.
Substantiation: Update referenced standards to reflect ANSI approval.

5000-214 Log #178 BLD-SCM Final Action:
(40.2.3.3)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. American Institute of Steel Construction
Recommendation: Revise Section 40.2.3.3 as follows:
40.2.3.3* Quality Assurance Programs in Seismic Design Category C through Seismic Design Category F.
40.2.3.3.1 In addition to the requirements in this chapter, the quality assurance program for structures and components assigned to Seismic Design Category C through Seismic Design Category F shall comply with the provisions of 40.2.3.3.
40.2.3.3.2 In Seismic Design Category C, steel systems that are not specifically detailed for seismic resistance, with a response modification coefficient, R, of 3, shall be permitted to be excluded from the additional provisions of 40.2.3.3.
40.2.3.3.3 The quality assurance plan shall, as a minimum, identify and address the following:
(1) Seismic force–resisting systems and designated seismic systems that are subject to quality assurance
(2) Type and frequency of testing and inspections that are required for each of the seismic force–resisting systems and designated seismic systems
(3) Frequency and distribution of test and inspection reports
(4) Structural observations to be performed and frequency and distribution of structural observation reports.

Substantiation: In Section 40.2.3.3, a general reference to SDC C is included for seismic force resisting systems in order to recognize that many structural systems require special detailing because of their seismic response characteristics.
However, these requirements do not reflect the unique response characteristics of some steel buildings. ASCE 7-05, Table 12.2-1 assigns steel building structures a response modification coefficient of R = 3, if they are built in SDC B or C as a "steel system not specifically detailed for seismic resistance, excluding cantilever column systems." For these building systems, the assigned seismic response coefficient reflects their inherent ductility. As a consequence, these structures are permitted to be constructed using only AISC 360 (that is, not detailed in accordance with the additional provisions of AISC 341). As these construction details and connections are the same as would be used in typical steel buildings following AISC 360, no additional inspection or testing should be required beyond that applied to typical steel buildings.

5000-215 Log #179 BLD-SCM Final Action:
(40.3.10 and Table 40.3.10(a), and 40.3.10(b))

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. AISI, AISC
Recommendation: Revise Section 40.3.10 and Tables 40.3.10(a) and 40.3.10(b) as follows:

40.3.10 Steel Construction. Structural tests and inspections for steel materials, fabrication, and erection shall be as required by the following:

(1) Structural steel construction shall comply with AISC 360 and AISC 341, as applicable ~~Table 40.3.10(a)~~.
(2) Cold-formed steel light-frame construction shall comply with Table 40.3.10(a)~~(b)~~.
(3) Other steel construction shall comply with Table 40.3.10(b).

Insert Table 40.3.10 Here

Substantiation: · *Adoption of AISC documents:* The 2010 edition of ANSI/AISC 360, *Specification for Structural Steel Buildings*, incorporates a new Chapter N, which addresses comprehensive quality control and quality assurance requirements for all structural steel construction. These requirements are similar in nature to those that were incorporated into the 2005 edition of AISC 341, Appendix Q. AISC 360-10, Chapter N provisions provide the foundation for the quality control and quality assurance requirements for general structural steel construction, with AISC 341-10, Chapter I (previously contained in AISC 341-05, Appendix Q) extending specific requirements to high-seismic applications.

The present Section 40.3.10 addresses all forms of steel construction. The majority of the requirements in Table 40.3.10(a) pertain to structural steel construction. However, there are a few items that are applicable to "steel construction other than structural steel", which are not covered by AISC 360. This proposal keeps those particular requirements while deleting the specific quality assurance requirements for structural steel. For structural steel, a direct reference is made in Section 40.3.10 to the more detailed requirements of AISC 360 and AISC 341.

Specifically, topics currently in Table 40.3.10(a) that are covered in AISC 360, Chapter N are as follows:

- Table 40.3.10(a), Fabricator Inspection: AISC 360, Section N (General)
- Table 40.3.10(a), Materials: AISC 360, Section N5.2
- Table 40.3.10(a), Anchor Rods: AISC 360, Section N5.7
- Table 40.3.10(a), Bolting: AISC 360, Section N5.6
- Table 40.3.10(a), Welding: AISC 360, Section N5.4
- Table 40.3.10(a), Shear Connectors: AISC 360, Section N6
- Table 40.3.10(a), Structural framing, bracing, details and assemblies: AISC 360, Section N5.7

Please note, public review drafts of the 2010 AISC documents can be found on the AISC website (www.aisc.org). The public review period for AISC 360-10 is currently scheduled for 8/14/09 through 9/28/09 and the public review period for AISC 341-10 is currently scheduled for 9/11/09 through 10/26/09. It is anticipated that the 2010 editions of both AISC 360 and AISC 341 will be technically complete by the end of October 2009, with ANSI approval in March 2010 and publication in August 2010.

· *Modifications to Cold-Formed Steel*: In the 2003 and 2006 editions of NFPA 5000, this table specifically referenced "light frame cold-formed steel". However, the charging text in both editions called out "cold-formed steel". In an attempt to have the text coordinate with the table, "light frame" was deleted from the table in the 2009 edition of NFPA 5000. However, this was not the correct solution, since there are cold-formed steel components addressed in Table 40.3.10(a) – i.e. metal decking. This proposal adds "light frame" back into the table and corrects the charging language to reflect the true scope of the table.

· *Other Steel Construction:* Since the structural steel items have been removed from Table 40.3.10(a), it has been recast as applicable to "other steel construction" and moved after the cold-formed steel light-frame construction table. Additionally, the steel joist entry was clarified to apply in field settings only.

Table 40.3.10(b)~~(a)~~ Other Steel Construction

Item	Scope (frequency determined by RDP responsible for design)
Steel construction quality control review	Review contractor's field quality control procedures. Review frequency and scope of field testing and inspections.
Fabricator certification/ quality control procedures	Review each fabricator's quality control procedures.
~~Fabricator inspection~~	~~Inspect in-plant fabrication, or review fabricator's approved independent inspection agency's reports.~~
~~Materials~~	~~Review materials certifications for conformance to the specifications.~~
~~Anchor rods~~	~~Review contractor's as-built survey. Verify that all anchor rods have been properly tightened and have adequate fit-up.~~
~~Bolting~~	~~Test and inspect bolted connections in accordance with specifications. Verify bolt size and grade.~~
~~Welding~~	~~Check welder qualifications. Visually inspect fillet welds and test full-penetration field welds in accordance with specifications.~~
~~Shear connectors~~	~~Inspect for size and placement. Test for proper weld attachment.~~
~~Structural framing, bracing, details, and assemblies~~	~~Inspect for size, grade of steel, camber, installation, and connection details. Check against approved construction documents and shop drawings.~~
Open web steel joists	Inspect for size, placement, bridging, bearing, and connection to structure. Visually inspect all field welds of a minimum of 5 percent of the joists, randomly selected.
Expansion and adhesive anchors	Review installation procedures for both mechanical anchors and adhesive anchors. Verify that materials are suitable for job conditions.
Metal decking	Verify gauge width and type. Inspect placement, laps, welds, sidelap attachment, and screws or other mechanical fasteners. Check welder's qualifications.
Field correction of fabricated items	Review documentation of repair approved by the RDP responsible for design, and verify completion of repairs.

Table 40.3.10(a)~~(b)~~ Cold-Formed Steel Light-Frame Construction

Item	Scope (frequency determined by RDP responsible for design)
Cold-formed steel light-frame construction quality control review	Review contractor's field quality control procedures. Review scope of testing and inspections.
Fabricator's quality control procedures	Review fabricator's quality control procedures.
Material certification	Review for conformance to construction documents.
Fabrication inspection	Inspect in-plant fabrication, or review fabricator's approved independent inspection agency's reports.
Shear walls, diaphragms, and hold-downs	Inspect thickness and grade of wood structural panel, blocking, hold-down anchors, and the edge and field attachment of the structural wood panel to the framing for conformance to the submittals approved by the RDP responsible for design and the construction documents. Review panelized construction for proper wood structural panel overlaps.
Installation	Verify that type, size, quantity, location, details, and connections of framing and bracing members conform to submittals approved by the RDP responsible for design and the construction documents.
Welding	Check welders' qualifications. Verify that welding conforms to AWS specifications, submittals approved by the RDP responsible for design, and

	the construction documents. Visually inspect welds.
Other fasteners	Verify fastener type and installation procedures. Verify that fasteners conform to submittals approved by the RDP responsible for design and the construction documents. Verify that fasteners are installed tight.
Field correction of fabricated items	Review documentation of repair approved by the RDP responsible for design, and verify completion of repairs.

5000-216 Log #79 BLD-SCM Final Action:
(41.5)

Note: This Proposal originates from Tentative Interim Amendment 5000-09-2 (TIA 911) issued by the Standards Council on July 24, 2008.

Submitter: Joseph J. Messersmith, Jr., Portland Cement Association

Recommendation: *1. Revise Section 41.5 as shown below:*

41.5 Seismic Requirements. In addition to the requirements of this chapter, the design and construction of concrete elements that resist seismic forces shall comply with the requirements of Section 14.2 of ASCE/SEI 7, except 14.2.2 of ASCE 7 shall be replaced by 41.5.1 of this *Code*. In addition, for purposes of seismic design under this *Code* and ASCE/SEI 7, instead of using ACI 318-05 as Section 23.1 of ASCE/SEI 7, the edition of ACI 318 listed in 2.3.4 of this *Code* shall be used.

41.5.1 Modifications to ACI 318. The text of ACI 318 shall be modified as indicated in 41.5.1.1 through 41.5.1.10. Italics are used for text within 41.5.1.1 through 41.5.1.10 to indicate requirements that differ from ACI 318. The modifications to ACI 318 are based on the edition listed in 2.3.4 of this *Code* instead of the edition adopted by Section 23.1 of ASCE/SEI 7.

41.5.1.1 Definitions. See also 3.3.608.

Detailed Plain Concrete Structural Wall. A wall complying with the requirements of Chapter 22 8, including 22.6.7 of ACI 31.

Ordinary Precast Structural Wall. A precast wall complying with the requirements of Chapters 1 through 18 of ACI 318.

Ordinary Reinforced Concrete Structural Wall. A cast-in-place wall complying with the requirements of Chapters 1 through 18 of ACI 318.

Ordinary Structural Plain Concrete Wall. A wall complying with the requirements of Chapter 22, excluding 22.6.7 of ACI 318.

Special Structural Wall. A cast-in-place or precast wall complying with the requirements of 21.1.3 through 21.1.7, 21.9, and 21.10 of ACI 318, as applicable, in addition to the requirements for ordinary reinforced concrete structural walls or ordinary precast structural walls, as applicable. Where ASCE 7 refers to a "special reinforced concrete structural wall," it shall be deemed to mean a "special structural wall."

Wall Pier. A wall segment with a horizontal length-to-thickness ratio of at least 2.5, but not exceeding 6, whose clear height is at least two times its horizontal length.

41.5.1.2 Ties Around Anchor Bolts. Section 7.10 of ACI 318 shall be modified by revising 7.10.5.6 of ACI 318 to read as shown in 41.4.1.2.1.

41.5.1.2.1 Where anchor bolts are placed in the top of columns or pedestals, the bolts shall be enclosed by lateral reinforcement that also surrounds at least four vertical bars of the column or pedestal. The lateral reinforcement shall also be distributed within 5 in. of the top of the column or pedestal, and shall consist of at least two No. 4 or three No. 3 bars. In structures assigned to Seismic Design Categories C, D, E, or F, the ties shall have a hook on each free end that complies with 7.1.4 of ACI 318.

~~41.5.1.3 Scope. Modify Sections 21.1.1.3 through 21.1.1.5 to read as follows.~~

~~21.1.1.3 *Structures assigned to SDC B shall comply with Chapters 1 through 19 and 22.* For a structure assigned to SDC B using ordinary moment frames as part of the seismic-force-resisting system, the provisions of 21.1.2 and 21.2 shall apply. For a structure assigned to SDC B and using intermediate or special systems, the applicable provisions of 21.1.3 through 21.1.7, and 21.3 through 21.10 shall also apply.~~

~~21.1.1.4 *Structures assigned to SDC C shall comply with Chapters 1 through 19, and the seismic-force-resisting system shall be intermediate or special moment frames, intermediate precast structural walls, or ordinary reinforced concrete or special structural walls.* For a structure assigned to SDC C and using intermediate moment frames as part of the seismic-force-resisting system the provisions of 21.1.2 and 21.3 shall apply. For a structure assigned to SDC C and using special moment frames, or intermediate precast or special structural walls, the applicable provisions of 21.1.3 through 21.1.7, and 21.4 through 21.10 shall also apply. Any structure assigned to SDC C shall satisfy 21.1.8. *Except for footings and basement walls in accordance with 22.10, structural elements of plain concrete are prohibited.*~~

~~21.1.1.5 *Structures assigned to SDC D, E or F shall comply with Chapters 1 through 19, and the seismic-force-resisting system shall be special moment frames, intermediate precast structural walls, or special structural walls.* For a structure assigned to SDC D, E, or F, the provisions of 21.1.2 through 21.1.8 and 21.4 through 21.13 shall apply. *Except for footings and basement walls in accordance with 22.10, structural elements of plain concrete are prohibited.*~~

41.5.1.3 Scope. Paragraphs 21.1.1.3 and 21.1.1.7 of ACI 318 shall be modified to read as shown in 41.5.1.3.1 and 41.5.1.3.2.

41.5.1.3.1 Structures assigned to Seismic Design Category A shall satisfy requirements of Chapters 1 to 19 and 22; Chapter 21 of ACI 318 does not apply. Structures assigned to Seismic Design Category B, C, D, E, or F also shall satisfy 21.1.1.4 through 21.1.1.8 of ACI 318, as applicable. Except for structural elements of plain concrete complying with 41.5.1.9, structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E or F.

41.5.1.3.2 Structural systems designated as part of the seismic-force-resisting system shall be restricted to those *permitted by ASCE 7.* Except for *Seismic Design Category* A, for which Chapter 21 of ACI 318 does not apply, the following provisions shall be satisfied for each structural system designated as part of the seismic-force-resisting system, regardless of the *Seismic Design Category.*

(1) Ordinary moment frames shall satisfy Section 21.2 of ACI 318.

(2) Ordinary *reinforced concrete* structural walls *and ordinary precast structural walls* need not satisfy any provisions in Chapter 21 of ACI 318.

(3) Intermediate moment frames shall satisfy Section 21.3 of ACI 318.

(4) Intermediate precast *structural* walls shall satisfy Section 21.4 of ACI 318.

(5) Special moment frames shall satisfy Section 21.5 through Section 21.8 of ACI 318.

(6) Special structural walls shall satisfy Section 21.9 of ACI 318.

(7) Special structural walls *constructed using precast concrete* shall satisfy Section 21.10 of ACI 318.

(8) All special moment frames and special structural walls shall also satisfy 21.1.3 through 21.1.7 of ACI 318.

41.5.1.4 Intermediate Precast Structural Walls. Section 21.4 of ACI 318 shall be modified by renumbering 21.4.3 to 21.4.4 and adding new 21.4.3 and 21.4.5 to read as shown in 41.5.1.4.1 through 41.5.1.4.3.1.

41.5.1.4.1 Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement, or shall use Type 2 mechanical splices.

41.5.1.4.2 Elements of the connection that are not designed to yield shall develop at least 1.5 Sy.

41.5.1.4.3 Wall piers not designed as part of a moment frame shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3 of ACI 318. Spacing of transverse reinforcement shall not exceed 8 in. (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 in. (305 mm).

Exceptions: The preceding requirement need not apply in the following situations:

(1) Wall piers that satisfy 21.13.

(2) Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.

41.5.1.4.3.1 Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

41.5.1.5 Wall Piers and Wall Segments. Section 21.9 of ACI 318 shall be modified by adding new 21.9.10 of ACI 318 to read as shown in 41.5.1.5.1 through 41.5.1.5.1.3.

41.5.1.5.1 Wall Piers and Wall Segments.

41.5.1.5.1.1 Wall piers not designed as a part of a special moment frame shall have transverse reinforcement designed to satisfy the requirements in 21.9.10.2 of ACI 318.

Exceptions:

(1) Wall piers that satisfy Section 21.13 of ACI 318.

(2) Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers, and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.

41.5.1.5.1.2 Transverse reinforcement with seismic hooks at both ends shall be designed to resist the shear forces determined from 21.6.5.1 of ACI 318. Spacing of transverse reinforcement shall not exceed 6 in. (152 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 in. (305 mm).

41.5.1.5.1.3 Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

41.5.1.6 Special Precast Structural Walls. Subsection 21.10.2 of ACI 318 shall be modified to read as shown in 41.5.1.6.1.

41.5.1.6.1 Special structural walls constructed using precast concrete shall satisfy all the requirements of Section 21.9 of ACI 318 for cast-in-place special structural walls in addition to 21.4.2 through 21.4.4 of ACI 318.

41.5.1.7 Foundations. Paragraph 21.12.1.1 of ACI 318 shall be modified to read as shown in 41.5.1.7.1.

41.5.1.7.1 Foundations resisting earthquake-induced forces or transferring earthquake-induced forces between a structure and ground shall comply with the requirements of Section 21.12 of ACI 318 and other applicable provisions of ACI 318 unless modified by Sections 12.1.5, 12.13, or 14.2 of ASCE/SEI 7.

41.5.1.8 Detailed Plain Concrete Structural Walls. Section 22.6 of ACI 318 shall be modified by adding new 22.6.7 to read as shown in 41.5.1.8.1 through 41.5.1.8.1.3.

41.5.1.8.1 Detailed Plain Concrete Structural Walls.

41.5.1.8.1.1 Detailed plain concrete structural walls are walls conforming to the requirements of ordinary structural plain concrete walls and 22.6.7.2 of ACI 318.

41.5.1.8.1.2 Reinforcement shall be provided as follows:

(1) Vertical reinforcement of at least 0.20 in.^{2} (129 mm^2) in cross-sectional area shall be provided continuously from support to support at each corner, at each side of each opening and at the ends of walls. The continuous vertical bar required beside an opening is permitted to substitute for one of the two No. 5 bars required by 22.6.6.5 of ACI 318.

(2) Horizontal reinforcement at least 0.20 in.^{2} (129 mm^2) in cross-sectional area shall be provid.:

(a) Continuously at structurally connected roof and floor levels and at the top of walls.

(b) At the bottom of load-bearing walls or in the top of foundations where doweled to the wall.

(c) At a maximum spacing of 120 in. (3048 mm).

41.5.1.8.1.3 Reinforcement at the top and bottom of openings, where used in determining the maximum spacing specified in Item 3 in the preceding text, shall be continuous in the wall.

41.5.1.9 Plain Concrete in Structures Assigned to Seismic Design Category C, D E, or F. Section 22.10 of ACI 318 shall be deleted and replaced with text shown in 41.5.1.9.1 through 41.5.1.9.2.

41.5.1.9.1 Plain concrete in structures assigned to Seismic Design Category C, D, E or F.

41.5.1.9.2 Structures assigned to Seismic Design Category C, D, E or F shall not have elements of structural plain concrete, except as follows:

(1) Structural plain concrete basement, foundation, or other walls below the base are permitted in detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls. In dwellings assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 ft (2438 mm), the thickness shall not be less than 7-1/2 in. (190 mm), and the wall shall retain no more than 4 ft (1219 mm) of unbalanced fill. Walls shall have reinforcement in accordance with 22.6.6.5.

(2) Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.

Exception: In detached one- and two-family dwellings three stories or less in height, the projection of the footing beyond the face of the supported member is permitted to exceed the footing thickness.

(3) Plain concrete footings supporting walls are permitted provided the footings have not less than two continuous longitudinal reinforcing bars. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing. For footings that exceed 8 in. (203 mm) in thickness, a minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.

Exceptions:

(1) In detached one- and two-family dwellings three stories or less in height and constructed with stud-bearing walls, plain concrete footings supporting walls and without longitudinal reinforcement are permitted.

(2) For foundation systems consisting of a plain concrete footing and a plain concrete stemwall, a minimum of one bar shall be provided at the top of the stemwall and at the bottom of the footing.

(3) Where a slab-on-ground is cast monolithically with the footing, one No. 5 bar is permitted to be located at either the top or bottom of the footing.

41.5.1.10 Strength Requirements for Anchors. Modify Section D.4 of ACI 318 shall be modified by adding a new exception at the end of D.4.2.2 to read as follows:

Exception: *If N_b is determined using Eq. D-7 of ACI 318, the concrete breakout strength of D.4.2 of ACI 318 shall be considered satisfied by the design procedure of D.5.2 and D.6.2 of ACI 318 without the need for testing regardless of anchor bolt diameter and tensile embedment.*

Substantiation: This proposed TIA modifies the language of section 41.5 of the 2006 edition of NFPA 5000 on Seismic Requirements. The intent is for the changes in section 41.5 to take effect only for the proposed 2009 edition (Annual 2008 cycle) and not for the 2006 edition. When this TIA is considered for issuance by the Standards Council, an appeal will be filed requesting that the TIA only apply to the proposed 2009 edition of NFPA 5000.

The changes proposed by this TIA are the same as those introduced by Proposal 5000-214 and Comment 5000-268, and accepted by the TC on Structures, Construction and Materials and the TCC on the Building Code with one modification which is the reason for the TIA. The intent is for this TIA, if issued by the Standards Council, to supersede the action of Proposal 5000-214 and Comment 5000-268 as documented in the 2008 Annual Revision Cycle Report on Proposals and Report on Comments.

Proposal 5000-214 and Comment 5000-268 revise and modify the mandatory reference of certain requirements of ACI 318, 2008 edition, and its relationship to ASCE/SEI 7. Proposal 5000-214 and Comment 5000-268 were prompted by proposed changes to ACI 318-05 as posted on the ACI website on July 1, 2007. Final revisions to ACI 318-05 were confirmed and made available in January 2008 after the ROC meetings for NFPA 5000 had occurred. The most

noteworthy change to ACI 318 that occurred between the July 2007 proposed revision and the January 2008 final revision is the removal of provisions that specify the types of structural systems permitted for the various seismic design categories. Section 21.1.1.7 of ACI 318-08 now defers to the building code adopting ACI 318 for specifying the types of systems permitted. The final text of ACI 218 – 08 section 21.1.1.7 reads as follows:

"Structural systems designed as part of the seismic-force-resisting system shall be restricted to those designated by the legally adopted general building code of which this Code forms a part, or determined by other authority having jurisdiction in areas without a legally adopted building code."

While Proposal 5000-214 and Comment 5000-268 capture the majority of the changes to ACI 318, they do not capture the final text of section 21.1.1.7. It is the timing of this final modification to ACI 318 that prompts the TIA. NFPA Regulations do not permit new text to be introduced after the ROC stage of a document's revision cycle, and therefore a Notice of Intent to Make A Motion (NITMAM) at the June 2008 Association Technical Meeting to correct the language would not be in order. The processing of a TIA is the only means by which the changes to section 41.5 can be correctly instituted for the proposed 2009 edition of NFPA 5000. The TIA puts forth all the changes recommended by Proposal 5000-214 and Comment 5000-268 with the exception of the revisions concerning the final version of ACI 318 which are shown as shaded text in the TIA.

Emergency Nature: In accordance with Section 5.2 of the NFPA Regulations, this TIA is recommended to insure that the 2009 edition of NFPA 5000 is consistent with the recently issued, 2008 edition of ACI 318 which is a mandatory reference. The TIA is the result of a timing issue concerning the final revision of ACI 318, and not the result of an oversight or missed deadline during the processing of the next revision of NFPA 5000. Both the TC and the TCC were aware that ACI 318 was being updated during at the time of the ROC meetings but that the final changes to ACI 318 would not be confirmed until January 2008.

5000-217 Log #180 BLD-SCM Final Action:
(44.2)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. American Institute of Steel Construction
Recommendation: Revise Section 44.2 as follows:

44.2 Structural Steel Construction.

44.2.1 General.

44.2.1.1 The design, fabrication, and erection of structural steel for buildings and structures shall be in accordance with AISC 360, *Specification for Structural Steel Buildings*.

44.2.1.2 Web openings in structural steel beams shall be permitted to be designed in accordance with ASCE/SEI 23, *Specification for Structural Steel Beams with Web Openings*.

44.2.2 Seismic Design Category B and ~~A through~~ Seismic Design Category C.

44.2.2.1 Structural steel buildings assigned to Seismic Design Category B and ~~A through~~ Seismic Design Category C shall be of any construction permitted in AISC 360.

44.2.2.2 ~~An *R* factor as set forth in~~Where a response modification coefficient, R, in accordance with ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, Table 12.2-1~~,~~ is used for the design of structural steel structures assigned to Seismic Design Category B or Seismic Design Category C, the structures shall be ~~appropriate steel system shall be permitted where the structure is~~ designed and detailed in accordance with the provisions of AISC 341, *Seismic Provisions for Structural Steel Buildings*, ~~Part I~~ except as permitted in Section 44.2.2.3.

44.2.2.3 ~~Systems not detailed in accordance with 44.2.2.1 and 44.2.2.2 shall use the *R* factor i~~In ASCE/SEI 7, Table 12.2-1, the response modification coefficient, R, designated for "~~structural~~ steel systems not specifically detailed for seismic resistance, excluding cantilever column systems~~.~~" shall be permitted to be used for systems designed and detailed in accordance with the provisions of AISC 360 only.

44.2.3 Seismic Design Category D through Seismic Design Category F. Structural steel buildings assigned to Seismic Design Category D through Seismic Design Category F shall be designed and detailed in accordance with AISC 341, except as permitted in ASCE 7, Table 15.4-1. ~~Part I~~.

Substantiation: The following modifications to Section 44.2 are primarily editorial in nature:

- The reference to SDC A has been eliminated. For SDC A, ASCE 7 does specify lateral forces to be used as the seismic loads and effects, but these calculations do not involve the use of an *R* factor. Thus, for SDC A, it is not necessary to define a seismic force resisting system that meets any special requirements, and, consequently, AISC 341 does not apply.
- Section 44.2.2.2 has been reworked to clearly indicate that all structural steel structures assigned to SDC B or C need to be detailed in accordance with AISC 341. The only exception to this is in Section 44.2.2.3 for systems that fall under Line H of ASCE 7, Table 12.2-1, which is for "Steel systems not specifically detailed for seismic resistance, excluding cantilever column systems." These systems are permitted to be designed and detailed in accordance with AISC 360. The title of Line H has been corrected editorially and Section 44.2.2.3 has been clarified.
- The modification to Section 44.2.3 is intended to correct an oversight in the 2006 and 2009 edition of NFPA 5000. Beginning with the 2005 edition of ASCE 7, Table 15.4-1 permits certain select systems with reduced response modification coefficients to be designed and detailed in accordance with AISC 360 only.
- Finally, in Sections 44.2.2.2 and 44.2.3, the reference to "Part I" of AISC 341 has been eliminated. This level of detail is unnecessary and, in addition, it is anticipated that the 2010 edition of AISC 341 will no longer be divided into two parts.

Please note, public review drafts of the 2010 AISC documents can be found on the AISC website (www.aisc.org). The public review period for AISC 360-10 is currently scheduled for 8/14/09 through 9/28/09 and the public review period for AISC 341-10 is currently scheduled for 9/11/09 through 10/26/09. It is anticipated that the 2010 editions of both AISC 360 and AISC 341 will be technically complete by the end of October 2009, with ANSI approval in March 2010 and publication in August 2010.

5000-218 Log #181 BLD-SCM Final Action:
(44.2.4)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. American Institute of Steel Construction
Recommendation: Revise Section 44.2.4 as follows:

44.3 Composite Structural Steel and Concrete Construction.

44.3.1 General. Systems of structural steel acting compositely with reinforced concrete shall be designed in accordance with AISC 360 and ACI 318, *Building Code Requirements for Structural Concrete*, excluding ACI Chapter 22.

44.3.2~~44.2.4~~ Seismic Requirements for Composite Structural Steel and Concrete Construction.

~~44.2.4.1 The design, construction, and quality of composite steel and concrete components that resist seismic forces shall conform to the requirements of the AISC 360 or ACI 318, *Building Code Requirements for Structural Concrete.*~~

~~44.2.4.2 An *R* factor as set forth in~~ Where a response modification coefficient, R, in accordance with ASCE/SEI 7, Table 12.2-1, is used for ~~the appropriate~~ a system of structural steel acting compositely with reinforced concrete, the structure ~~composite steel and concrete system~~ shall be ~~permitted where the structure is~~ designed and detailed in accordance with the provisions of AISC 341~~, Part II~~.

~~44.2.4.3 In Seismic Design Category B through Seismic Design Category F, the design of the systems shall conform to the requirements of AISC 341, Part II.~~

~~44.2.4.4 Composite structures shall be permitted in Seismic Design Category D through Seismic Design Category F, subject to the limitations in ASCE/SEI 7, Table 12.2-1, when evidence approved by the authority having jurisdiction is provided to demonstrate that the proposed system will perform as intended by AISC 341, Part II.~~

~~44.2.4.5 Where composite elements or connections are required to sustain inelastic deformations, the evidence approved by the authority having jurisdiction shall be based on cyclic testing.~~

[Renumber remaining sections of Chapter 44…]

Substantiation: The purpose of this proposal is twofold. First, it editorially reorganizes composite structural steel and concrete structures under its own section within Chapter 44. The layout chosen for the section is similar to that found in Section 44.2 for structural steel. However, unlike the section on structural steel, no distinction is made between seismic design categories – no matter what category a composite structure is assigned to, it must be designed and detailed in accordance with AISC 341. Also, the reference to AISC 341, Part II has been eliminated. This level of detail is unnecessary and, in addition, it is anticipated that the 2010 edition of AISC 341 will no longer be divided into two parts.

Secondly, the proposal recommends the elimination of the requirements for substantiating evidence in composite structures assigned to SDC D, E and F. First, it is redundant to require design and detailing in accordance with AISC 341 and then to turn around and require substantiating evidence to demonstrate that the system performs as intended by AISC 341. Additionally, the 2010 edition of AISC 341 provides detailed requirements for testing where appropriate, specifically in Section G3.6b (Composite Special Moment Frames), Section G4.6b (Composite Partially Restrained Moment Frames), and Section H3 (Composite Eccentrically Braced Frames). The requirement recommended for deletion in Section 44.2.4.5 currently overwrites these requirements, and, is, in all reality, an oversimplification. Rather, the design document should be allowed to govern in this case.

Please note, public review drafts of the 2010 AISC documents can be found on the AISC website (www.aisc.org). The public review period for AISC 360-10 is currently scheduled for 8/14/09 through 9/28/09 and the public review period for AISC 341-10 is currently scheduled for 9/11/09 through 10/26/09. It is anticipated that the 2010 editions of both AISC 360 and AISC 341 will be technically complete by the end of October 2009, with ANSI approval in March 2010 and publication in August 2010.

5000-219 Log #118 BLD-SCM Final Action:
(44.3)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. Steel Joist Institute
Recommendation: Revise Section 44.3 as follows:

44.3 Steel Joists.

44.3.1 The design, manufacture, and use of open web steel joists and joist girders shall be in accordance with one of the following Steel Joist Institute (SJI) specifications:

(3)~~(1)~~ SJI K, *Standard Specifications for Open Web Steel Joists, K-Series*

(4)~~(2)~~ SJI LH/DLH, *Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series*

(2)~~(3)~~ SJI JG, *Standard Specifications for Joist Girders*

(1)~~(4)~~ SJI CJ, *Standard Specifications for Composite Steel Joists, ~~C-J~~ CJ-Series*

~~44.3.2 Where required, the seismic design of steel buildings in which joists are used shall be in accordance with the additional provisions of 44.2.2 or 44.2.3.~~

Substantiation: This proposal editorially corrects the section by adding the ANSI short titles for the various SJI documents. Additionally it deletes Section 44.3.2. As written, this section is duplicative and unnecessary.

5000-220 Log #115 BLD-SCM Final Action:
(44.5 and 2.3.31)

Submitter: Bonnie E. Manley, American Iron and Steel Institute / Rep. Rack Manufacturers Institute
Recommendation: Part I: Revise Section 44.5 as follows:

44.5 Steel Storage Racks.

44.5.1 The design, testing, and utilization of industrial steel storage racks, made of cold-formed or hot-rolled steel structural members, shall be in accordance with ANSI MH16.1, *Specification for the Design, Testing and Utilization of Industrial Steel Storage Racks*~~, the scope of which includes industrial pallet racks, movable shelf racks, and stacker racks~~.

44.5.2 ~~ANSI MH16.1 shall not apply to other types of racks, such as drive-in and drive-through racks, cantilever racks, portable racks, or rack buildings.~~

~~44.5.3~~ Where required, the seismic design of storage racks shall ~~also~~ be in accordance with the additional requirements of Section 15.5.3 of ASCE/SEI 7.

Part II: Revise Section 2.3.31 as follows:

2.3.31 RMI Publications. Rack Manufacturers Institute, 8720 Red Oak Boulevard, Suite 201, Charlotte, NC 28217

RMI/ANSI MH16.1, *Specification for Design, Testing and Utilization of Industrial Steel Storage Racks, ~~2005~~2010.*

Substantiation: This proposal editorially tightens up Section 44.5 by deleting the repetition of the scope of ANSI MH16.1. It also adds language which clarifies that racks can be made from either cold-formed steel or hot-rolled steel. The proposal updates the edition year of RMI's ANSI/MH 16.1, *Specification for Design, Testing and Utilization of Industrial Steel Storage Racks,* from 2005 to 2010. That edition is expected to be completed in early 2010 and will include expanded coverage and clarification of the issues of (1) drift and drift limits, (2) load factors and load combinations, (3) seismic behavior of frames in the transverse direction, and (4) design considerations for column base plates, anchor bolts, and shims on concrete floors. Also, the phrase "the additional requirements" is added to emphasize that, for seismic design, steel storage racks must also be designed in accordance with the applicable modifications contained in ASCE 7, Section 15.5.3.

5000-221 Log #113 BLD-SCM Final Action:
(44.6 and 2.3.5)

Submitter: Bonnie E. Manley, American Iron and Steel Institute
Recommendation: Part I: Revise Section 44.6 as follows:

44.6 Cold-Formed Steel.

44.6.1 Design.

44.6.1.1 The design of cold-formed carbon and low alloy steel structural members shall be in accordance with AISI-S100, *North American Specification for the Design of Cold-Formed Steel Structural Members*.

44.6.1.2 The design of cold-formed stainless steel structural members shall be in accordance with ASCE/SEI 8, *Standard Specification for the Design of Cold-Formed Stainless Steel Structural Members.*

44.6.2 Steel Decks. The design and construction of cold-formed steel decks shall be in accordance with this section.

44.6.2.1 Composite Slabs on Steel Decks. Composite slabs of concrete on steel decks shall be designed and constructed in accordance with ASCE/SEI 3, *Standard for the Structural Design of Composite Slabs,* or other approved standards.

44.6.3 Seismic Requirements for Cold-Formed Steel Structures. Where a response modification coefficient, R, in accordance with ASCE 7, Table 12.2-1 is used for the design of cold-formed steel structures, the structures shall be designed and detailed in accordance with the requirements of AISI S100, ASCE 8, or AISI S110 as modified in Section 44.6.4.

44.6.4 Modifications to AISI S110. The text of AISI S110 shall be modified as indicated in Sections 44.6.4.1 through 44.6.4.6. Italics are used for text within Sections 44.6.4.1 through 44.6.4.6 to indicate requirements that differ from AISI S110.

44.6.4.1 AISI S110, Section D1. Modify Section D1 by revising to read as follows.

D1 Cold-Formed Steel Special Bolted Moment Frames (CFS-SBMF)

Cold-formed steel–special bolted moment frames (CFS-SBMF) systems shall withstand significant inelastic deformations through friction and bearing at their bolted connections. Beams, columns, and connections shall satisfy the requirements in this section. CFS-SBMF systems shall be limited to one-story structures, no greater than 35 feet in height, without column splices and satisfying the requirements in this section. *The CFS-SBMF shall engage all columns supporting the roof or floor above. The single size beam and single size column with the same bolted moment connection detail shall be used for each frame. The frame is to be supported on a level floor or foundation.*

44.6.4.2 AISI S110, Section D1.1.1. Modify Section D1.1.1 by revising to read as follows.

D1.1.1 Connection Limitations

Beam-to-column connections in CFS-SBMF systems shall be bolted connections with snug-tight high-strength bolts. The bolt spacing and edge distance shall be in accordance with the limits of AISI S100, Section E3. *The 8-bolt configuration shown in Table D1-1 shall be used. The faying surfaces of the beam and column in the bolted moment connection region shall be free of lubricants or debris.*

44.6.4.3 AISI S110, Section D1.2.1. Modify Section D1.2.1 by revising to read as follows.

D1.2.1 Beam Limitations

In addition to the requirements of Section D1.2.3, beams in CFS-SBMF systems shall be *ASTM A653 galvanized 55 ksi (374 MPa) yield stress* cold-formed *steel* C-sections members with lips, and designed in accordance with Chapter C of AISI S100. *The beams shall have a minimum design thickness of 0.105 inches (2.67 mm). The beam depth shall be not less than 12 in (305 mm) or greater than 20 in (508 mm).* The flat depth-to-thickness ratio of the web shall not exceed 6.18.

Insert Equation E5000-601 Here

44.6.4.4 AISI S110, Section D1.2.2. Modify Section D1.2.2 by revising to read as follows.

D1.2.2 Column Limitations

In addition to the requirements of D1.2.3, columns in CFS-SBMF systems shall be *ASTM A500 Grade B* cold-formed *steel* hollow structural section (HSS) members *painted with a standard industrial finished surface,* and designed in accordance with Chapter C of AISI S100. *The column depth shall be not less than 8 in (203 mm) or greater than 12 in (305 mm).* The flat depth-to-thickness ratio shall not exceed ~~1.58~~*1.40.*

Insert Equation E5000-601 Here

$\sqrt{E / F_y}$

44.6.4.5 AISI S110, Section D1.3. Modify Section D1.3 by revising to read as follows.

D1.3 Design Story Drift

~~The design story drift, Δ, when subjected to the forces resulting from the motion of the design earthquake, shall be computed in accordance with the applicable building code.~~ Where the applicable building code does not contain design coefficients for CSF-SBMF systems, the provisions of Appendix 1 shall apply.

For structures having a period less than T_s, as defined in the applicable building code, alternate methods of computing Δ shall be permitted, provided such alternate methods are acceptable to the authority having jurisdiction

~~The design story drift shall not exceed 0.05h, unless approved by authority having jurisdiction.~~

44.6.4.6 AISI S110, Section D1.5. Add a new Section D1.5 as follows.

D1.5 Period Determination

The fundamental period of the structure, T, in the direction under consideration shall be established in accordance with the applicable building code using the structural properties and deformational characteristics of the resisting elements in a properly substantiated analysis. Use of the approximate building period, T_a, as an alternative fundamental period shall not be permitted.

Part II: Add the following document to Chapter 2:

2.3.5 AISI Publications. American Iron and Steel Institute, 1401 Connecticut Avenue, Suite 705, Washington, DC 20036.

AISI S110, *Standard for Seismic Design Of Cold-Formed Steel Structural Systems – Special Bolted Moment Frames*, 2007.

Substantiation: This proposal introduces a reference to the first edition of AISI S110, *Standard For Seismic Design Of Cold-Formed Steel Structural Systems – Special Bolted Moment Frames*, which is based upon research conducted by Drs. Uang and Sato at UCSD (2007). Specifically, the standard focuses on providing design provisions for a newly defined seismic force resisting system entitled "Cold-formed Steel – Special Bolted Moment Frame" or CFS-SBMFs. This type of system is expected to experience substantial inelastic deformation during significant seismic events. It is intended that most of the inelastic deformation will take place at the bolted connections, due to slip and bearing. In order to develop the designated mechanism, requirements based on the capacity design principles are provided for the design of the beams, columns and associated connections. Additionally, AISI S110 has specific requirements for the application of quality assurance and quality control procedures.

This system has been vetted through the BSSC process (Proposal 6-4R) and will be included in Part I of the 2009 NEHRP Provisions. Additionally, it has been introduced for consideration in the 2010 edition of ASCE 7 (Proposal TC-6-CH12-102-R3). As a first pass, Appendix 1 of AISI S110 makes recommendations on the seismic design coefficients of the CFS-SBMF system. These parameters have been introduced for consideration to ASCE 7-10. The Response Modification Coefficient, R, is set at 3.5. Cyclic testing has shown that CFS-SBMFs have very large ductility capacity and significant hardening. This justifies the use of a value of 3.5 for the R-factor. The derivation of the deflection amplification factor, C_d, can be found in the AISI S110 Commentary, Section D1.3. Furthermore, a capacity design procedure has been provided in Section D1.5 of AISI S110 Commentary so that the designer can explicitly calculate the seismic load effect with overstrength, E_{mh},. at the design story drift level. Alternatively, a conservative system overstrength factor,Ω_o, is also provided to be compatible with the conventional approach to compute E_{mh} in ASCE 7. Finally the height limitation of 35 feet for all SDCs is based on practical use only and not from any limits on the CFS-SBMF system strength.

Modifications to AISI S110 (2007 edition) were developed primarily in the BSSC's NEHRP process and adopted by ASCE 7 in Chapter 14. Since ASCE 7, Chapter 14 is not adopted in NFPA 5000, these modifications needed to be included within this proposal. The reasons for the modifications are as follows:

· In Section 44.6.4.1, the language was modified to reflect that CFS-SBMF needs to use the same-size beams and same-size columns throughout. In addition, the system needs to engage all primary columns, which support the roof or floor above, and those columns need to be supported on a level floor or foundation.

· In Section 44.6.4.2, the modifications were made for consistency with the test database.

· In Section 44.6.4.3, the modifications were made to be consistent with the test database (Uang and Sato, 2007), and limitations on the beam depth, steel grade, and surface treatment are added in Section D1.2.1 of AISI S110.

· In Section 44.6.4.4 the language was modified to be consistent with the test database (Uang and Sato, 2007), and limitations on column depth, steel grade, and surface treatment are added in Section D1.2.2 of AISI S110. The width-thickness ratio was reduced based upon further review of the test specimens.

· In Section 44.6.4.5, AISI S110 is intended primarily for industrial platforms; however, the standard is not limited to these non-building structures and does not prohibit architectural attachments (such as partition walls). As approved by the BSSC PUC, Proposal 6-4R reduced the $0.05h$ drift limit in Section D1.3 of AISI S110 to $0.03h$ in order to more closely align with the $0.025h$ drift limit of ASCE 7. Also, the BSSC PUC inserted the sentence, "In no case shall the design story drift exceed 0.05h." to ensure an absolute upper bound on the drift limit. However, the ASCE 7 Seismic Subcommittee did not agree with the BSSC PUC and, instead, requested that ASCE 7, Section 12.12 not be overwritten by AISI S110. Therefore, the $0.05h$ drift limit in Section D1.3 of AISI S110 has been eliminated in deference to the design story drift limits found in ASCE 7, Section 12.12. In addition, the first sentence of the AISI S110, Section D1.3 was deleted because it was considered commentary.

Two additional modifications are presented in this proposal which are not included in ASCE 7-10, Chapter 14, but were deemed important enough to be included in NFPA 5000. First in Section 44.6.4.3, a minimum thickness for the beams was added to reflect the specimens tested. Secondly, Section 44.6.4.6 clarifies that the approximate fundamental period, T_a, in accordance with ASCE 7 Section 12.8.2.1, should not be used in the design of CFS-SBMF systems. Instead, the fundamental period of the structure, T, needs to be based upon the structural properties and deformational characteristics of the resisting elements. The approximate fundament period in ASCE 7, Section 12.8.1 simply does not predict the period as accurately as needed for the variety of uses of this framing system.

Please note, AISI is in the process of developing a supplement to AISI S110-07, which will address the modifications in Section 44.6.4. It is anticipated that the supplement will be completed in early 2010, in time to be referenced in NFPA 5000-12. In that case, Section 44.6.4 will not be needed.

5000-222 Log #58 BLD-SCM Final Action:
(44.6.2 and 2.3.x (New))

Submitter: Thomas Sputo, Steel Deck Institute
Recommendation: Add text to read as follows:

44.6.2 Composite Slabs on Steel Decks. Composite slabs of concrete on steel decks shall be designed and constructed in accordance with ASCE/SEI 3, Standard for the Structural Design of Composite Slabs, ANSI/SDI-C1.0 Standard for Composite Steel Floor Deck, or other approved standards.

2.3.x SDI Publications. Steel Deck Institute, PO Box 25, Fox River Grove, IL 60021.

ANSI/SDI-C1.0, *Standard for Composite Steel Floor Deck, 2006.*

Substantiation: ANSI/SDI-C1.0-2006 is proposed for inclusion because it is the current standard for the design of composite steel floor deck, It is intended that users be permitted to use this document in lieu of the more formal approach of AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members, or ASCE/SEI 3. This consensus standard reflects current industry practice. This standard is readily available to code officials, designers, and other users of the code, both in print form and as a free download from the Steel Deck Institute website at www.sdi.org.

An updated version of this standard (ANSI/SDI-C-2011) is being prepared and it is anticipated that this revised standard will be completed and approved sometime in 2011.

Note: Supporting material is available for review at NFPA Headquarters.

This is not original material; its reference/source is as follows:

The ANSI/SDI-C1.0 standard is copyrighted by Steel Deck Institute, PO Box 25, Fox River Grove, IL 60021

5000-223 Log #56 BLD-SCM Final Action:
(44.6.3 and 2.3.x (New))

Submitter: Thomas Sputo, Steel Deck Institute
Recommendation: Add text to read as follows:
44.6.3 Steel roof deck. Steel roof decks shall be designed and constructed in accordance with ANSI/SDI-RD1.0, *Standard for Steel Roof Deck.*
2.3.x SDI Publications. Steel Deck Institute, PO Box 25, Fox river Grove, IL 60021
ANSI/SDI-RD1.0, *Standard for Steel Roof Deck, 2006*
Substantiation: ANSI/SDI RD1.0 is proposed for inclusion because it is the current standard for the design of steel roof deck. It is intended that users be permitted to use this document in lieu of the more formal approach of AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members. This consensus standard reflects current industry practice. This standard is readily available to code officials, designers and other users of the code, both in print form and as a free download from the Steel Deck Institute website at www.sdi.org.
An updated version of this standard (ANSI/SDI-RD-2010) is being prepared and it is anticipated that this revised standard will be completed and approved sometime in 2010.
Note: Supporting material is available for review at NFPA Headquarters.
This is not original material; its reference/source is as follows:
The ANSI/SDI-RD1.0 standard is copyrighted by Steel Deck Institute, PO Box 25, Fox River Grove, IL 60021

5000-224 Log #57 BLD-SCM Final Action:
(44.6.4 and 2.3.x (New))

Submitter: Thomas Sputo, Steel Deck Institute
Recommendation: Add text to read as follows:
44.6.4 Non-composite steel floor deck. Non-composite steel floor decks shall be designed and constructed in accordance with ANSI/SDI-NC1.0, *Standard for Non-Composite Steel Floor Deck.*
2.3.x SDI Publications. Steel Deck Institute, PO Box 25, Fox River Grove, IL 60021
ANSI/SDI-NC1.0, *Standard for Non-Composite Steel Floor Deck, 2006.*
Substantiation: ANSI/SDI-NC1.0 is proposed for inclusion because it is the current standard for the design of non-composite steel floor deck. It is intended that users be permitted to use this document in lieu of the more formal approach of AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members. This consensus standard reflects current industry practice. This standard is readily available to code officials, designers, and other users of the code, both in print form and as a free download from the Steel Deck Institute website at www.sdi.org.
An updated version of this standard (ANSI/SDI-NC-2010) is being prepared and it is anticipated that this revised standard will be completed and approved sometime in 2010.
Note: Supporting material is available for review at NFPA Headquarters.

This is not original material; its reference/source is as follows:
The ANSI/SDI-NC1.0 standard is copyrighted by Steel Deck Institute, PO Box 25, Fox River Grove, IL 60021

5000-225 Log #187 BLD-SCM Final Action:
(45.5.2)

Submitter: Dennis L. Pitts, American Forest & Paper Association
Recommendation: Revise text to read as follows:
45.5.2 Lumber Identification. Lumber used for load-supporting purposes, including end-jointed or edge-glued lumber, machine stress-rated lumber, and machine- evaluated lumber, as well as solid-sawn lumber, shall be identified by the grade mark of a lumber grading or inspection agency that has been approved by an accreditation body that complies with USDOC PS 20, or equivalent, and the following shall also apply:
(1). Grading practices and identification shall comply with rules published by an agency approved in accordance with the USDOC PS 20 or equivalent procedures.
(2). In lieu of a grade mark on the material, a certificate of inspection as to species and grade issued by a lumber grading or inspection agency meeting the requirements of 45.5.2 shall be permitted for precut, remanufactured, or rough-sawn lumber, and for sizes larger than 3 in. (75 mm) nominal thickness.
(3). End-jointed lumber used in an assembly required elsewhere in this code to have a fire resistance rating shall have the designation “Heat Resistant Adhesive” or “HRA” included in its grade mark.
Substantiation: The American Lumber Standards Committee (ALSC) recently added elevated-temperature performance requirements for end-jointed lumber adhesives intended for use in fire resistance-rated assemblies. End-jointed lumber manufactured with adhesives which meet the new requirements is being designated as "Heat Resistant Adhesive" or "HRA" on the grade stamp. Heat Resistant Adhesives are required to be qualified in accordance with one of two new ASTM standards, *D7374-08 Practice for Evaluating Elevated Temperature Performance of Adhesives Used in End-Jointed Lumber* and *D7470-08 Practice for Evaluating Elevated Temperature Performance of End-Jointed Lumber Studs*. End-jointed lumber manufactured with a Heat Resistant Adhesive under an auditing program of an ALSC-accredited grading agency is allowed to carry the HRA mark on the grade-stamp. End-jointed lumber manufactured with an adhesive not qualified as a Heat Resistant Adhesive will be designated as "Non-Heat Resistant Adhesive" or "non-HRA" on the grade stamp. Lumber carrying the HRA mark is permitted to be used interchangeably with solid-sawn members of the same species and grade in fire-rated applications.

5000-226 Log #24 BLD-SCM Final Action:
(45.5.15)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise text to read as follows:
45.5.15 Fire-Retardant-Treated Wood.
45.5.15.1 Labeling. Fire-retardant-treated lumber and wood structural panels shall be labeled and listed with the following information:
(1) Identification mark of an approved agency that lists materials in accordance with Chapter 3(see 3.2.5, Listed)
(2) Identification of the treating manufacturer
(3) Name of the fire-retardant treatment
(4) Species of wood treated
(5) End use of the product
(6) Flame spread index and smoke developed index ~~rating~~
(7) Method of drying after treatment
(8) Verification of conformance with appropriate standards in accordance with 45.5.15.2 through 45.5.15.5
(9) Wording for fire-retardant-treated wood exposed to weather, damp, or wet locations as follows: “No increase in the listed classification when subjected to the Standard Rain Test (ASTM D 2898, Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire-Testing)”
Substantiation: The term rating should not be used since Classes are based on the terms flame spread index and smoke developed index. This is purely an editorial change; the term rating is being used for fire resistance rating and fire protection rating.

5000-227 Log #184 BLD-SCM Final Action:
(45.6.8.7, A.36.7, and 2.3.5)

Submitter: Dennis L. Pitts, American Forest & Paper Association

Recommendation: *REVISE NFPA 5000, SECTION 2.3.5, AF&PA PUBLICATIONS, IN THE FOLLOWING MANNER:*
~~Technical Report No. 7, *Permanent Wood Foundation System,* 1987.~~ AF&PA PWF-07, *Permanent Wood Foundation Design Specification,* 2007

REVISE THE FOLLOWING SECTIONS AS SHOWN:

45.6.8.7 Fastenings for wood foundations shall be permitted to be in accordance with the ~~AF&PA Technical Report No. 7, *Permanent Wood Foundation System*~~ AF&PA PWF-07, *Permanent Wood Foundation Design Specification,* 2007, or the SPC publication *Permanent Wood Foundations: Design & Construction Guide.*

A.36.7 Detailed design and construction information is available in the ~~AF&PA Technical Report No. 7, *Permanent Wood Foundation System*~~ AF&PA PWF-07, *Permanent Wood Foundation Design Specification,* 2007, and in the Southern Pine Council, *Permanent Wood Foundations: Design and Construction Guide.*

Substantiation: The new ANSI/AF&PA standard *Permanent Wood Foundation Design Specification* was developed as a consensus standard to replace reference to an AF&PA technical report that has been referenced in building codes for at least 20 years. The new specification refers the designer to the current version of the ASCE 7 standard for loading and to AF&PA's NDS and SDPWS for resistance. It also includes special requirements for below-ground design of treated wood structures.

5000-228 Log #25 BLD-SCM Final Action:
(48.3.3)

Submitter: Marcelo M. Hirschler, GBH International / Rep. American Fire Safety Council
Recommendation: Revise text to read as follows:

48.3.3 Thermal Barrier.

48.3.3.1 Foam plastic insulation and components shall be separated from the interior of a building and from plenums by an approved thermal barrier of ½ in. (13 mm) gypsum wallboard or equivalent material ~~that will limit the average temperature rise of the unexposed surface to not more than 250°F (121°C) after 15 minutes of fire exposure complying with the standard time–temperature curve of NFPA 251, Standard Methods of Tests of Fire Resistance of Building Construction and Materials~~. The thermal barrier material shall comply with 48.3.3.1.1 or 48.3.3.1.2.

48.3.3.1.1 The thermal barrier material shall comply with the requirements of the temperature transmission fire test and of the integrity fire test in NFPA 275, Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation.

48.3.3.1.2 The thermal barrier material shall comply with the temperature transmission test in NFPA 275 and with the conditions of acceptance of FM 4880, UL 1040 or UL 1715 when tested in conjunction with the foam plastic insulation for a period of 15 minutes.

Add NFPA 275, Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation, into chapter 2 on referenced standards

~~48.3.3.2 The thermal barrier shall remain in place for 15 minutes, based on one of the following tests.~~
~~(1) UL 1715, Standard for Fire Test of Interior Finish Material~~
~~(2) FM 4880, Approval Standard for Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coating, and Exterior Wall Systems~~
~~(3) UL 1040, Standard for Fire Test of Insulated Wall Construction~~
~~(4) NFPA 286, Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth, with the acceptance criteria of 10.3.6.2.~~

Substantiation: NFPA 275 was specifically developed to clarify the test for thermal barrier materials to be used over foam plastic insulation. It contains two tests.

The temperature transmission fire test in NFPA 275 uses the ASTM E 119 (or NFPA 251 or UL 263) time-temperature fire curve to expose the thermal barrier specimen and it requires the following: “4.8.1 During the 15-minute test period, the average measured temperature rise above the average temperature at the start of the fire test for the thermocouples described in Section 4.3 shall not exceed 250°F (139°C), and the measured temperature rise of any such single thermocouple shall not exceed 325°F (181°C).” Therefore, the temperature transmission fire test in NFPA 275 corresponds to what the code requires now.

The integrity fire test in NFPA 275 requires that the thermal barrier material, together with the foam plastic insulation, be tested to NFPA 286 (which is a 15 minute test) and that the pass/fail criteria are identical to those used for NFPA 286 elsewhere in the code (for example Chapter 10).

The code should continue to recognize that thermal barrier materials tested, in conjunction with foam plastic insulation, to FM 4880, UL 1040 and UL 1715 and complying with the conditions of acceptance of these tests are equally acceptable. NFPA 275 also states that the integrity fire test can be conducted in accordance with these alternate test methods, when their pass/fail criteria are used.

5000-253 Log #96 BLD-SCM Final Action:
(A.38.9.7.8.2)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:

A.38.9.7.8.2 Test equipment must be of adequate size for the tributary area of the roof specimen to properly quantify the wind resistance of roof systems. Standing seam metal roof panels (SSR) are typically 60 in. (1525 mm) on center and often vary from 4ft to 6 ft (1220 mm to 1830 mm) on center. FM 4471, Approval Standard for Class 1 Panel Roofs, is used to test wind uplift resistance of metal panel roofs. The test uses a nominal 12 ft × 24 ft (3660 mm × 7315 mm) test assembly. Panels span in the long dimension, which allows for four or more spans of roof panel based on the spans specified here. Similarly, ASTM E 1592, Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference, has specific requirements regarding the number of spans that meets or exceeds the proposed criteria.

The tests in ANSI/UL 580, Standard for Tests for Uplift Resistance of Roof Assemblies, and ANSI/UL 1897, Standard for Safety for Uplift Tests for Roof Covering Systems, have a limited minimum test size (10 ft × 10 ft) (3050 mm × 3050 mm) but do not have a limit on the maximum span of roof panel used in the assembly tested.

The fastener spacing for many panel roofs is such that they require larger tests, such as 12 ft × 24 ft (3660 mm × 7315 mm). Otherwise, the assemblies could fail at much lower pressures in actual installations than are indicated in the 10 ft × 10ft (3050 mm × 3050 mm) tests.

Substantiation: Update referenced standards to reflect ANSI approval. Update referenced standards to reflect ANSI approval.

703-1 Log #CP1 BLD-SCM Final Action:
(Entire Document)

Submitter: Technical Committee on Structures, Construction, and Materials,
Recommendation: Review entire document to: 1) Update any extracted material by preparing separate proposals to do so, and 2) review and update references to other organizations documents, by preparing proposal(s) as required.
Substantiation: To conform to the NFPA Regulations Governing Committee Projects.

703-2 Log #5 BLD-SCM Final Action:
(2.3.1)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise text to read as follows:
2.3.6 ASTM Publications.
ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org
ASTM D 2898, Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing, 2008 (e1) ~~1994 (2004)~~.
ASTM D 3201, Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Base Products, 2008a ~~1994 (2003)~~.
ASTM D 5516, Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to Elevated Temperatures, 2009 ~~2003~~.
ASTM D 5664, Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant Treated Lumber, 2008 ~~2002~~.
ASTM D 6305, Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant Treated Plywood Roof Sheathing, 2008 ~~2002 e1~~.
ASTM D 6841, Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber, 2008 ~~2003~~.
ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials, 2009a ~~2004~~.
Substantiation: This proposal updates ASTM standards to the most recent editions.

703-3 Log #8 BLD-SCM Final Action:
(2.3.2)

Submitter: Bob Eugene, Underwriters Laboratories Inc.
Recommendation: Revise text to read as follows:
2.3.2 UL Publications.
Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096.
ANSI/UL 723, Standard for Test for Surface Burning Characteristics of Building Materials, ~~2003, Revised 2005~~ 2008.
Substantiation: Update referenced standards to reflect most recent revisions.

703-4 Log #6 BLD-SCM Final Action:
(3.3.1, 3.3.1.1, 3.3.1.2, Fire-Retardant Coating, 3.3.2, Fire-Retardant-Treated Wood, and 5.3.1)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise text to read as follows:

3.3.1 Fire-Retardant Coating. A coating that reduces the flame spread index of Douglas fir, and all other tested combustible surfaces to which it is applied, by at least 50 percent or to a flame spread index ~~classification~~ value of 75 or less, whichever is the lesser value, and has a smoke developed index ~~rating~~ not exceeding 200 when tested in accordance with ~~NFPA 255,~~ ASTM E 84 or ANSI/UL 723.

3.3.1.1 Class A Fire-Retardant Coating. A coating that reduces the flame spread index to 25 or less, and that has a smoke developed index ~~rating~~ not exceeding 200 where applied to the applicable substrate, building material, or species of wood when tested in accordance with ~~NFPA 255,~~ ASTM E 84 or ANSI/UL 723.

3.3.1.2 Class B Fire-Retardant Coating. A coating that reduces the flame spread index to greater than 25 but not more than 75, and that has a smoke developed index ~~rating~~ not exceeding 200 where applied to the applicable substrate, building material, or species of wood when tested in accordance with ~~NFPA 255,~~ ASTM E 84 or ANSI/UL 723.

3.3.2 Fire-Retardant-Treated Wood. A wood product impregnated with chemical by a pressure process or other means during manufacture, which is tested in accordance with ~~NFPA 255,~~ ASTM E 84 or ANSI/UL 723, has a listed flame spread index of 25 or less, and shows no evidence of significant progressive combustion when the test is continued for an additional 20-minute period; nor does the flame front progress more than 10.5 ft (3.2 m) beyond the centerline of the burners at any time during the test.

5.3.1* Fire-retardant coatings shall be tested by ~~NFPA 255,~~ ASTM E 84 or ANSI/UL 723.

Also delete NFPA 255 from list of references in chapter 2.

Substantiation: This proposal simply eliminates the references to NFPA 255, which is slated for withdrawal. Note that UL 723 is now ANSI/UL 723.

Further, this proposal makes the editorial changes necessary to use the correct terms of flame spread index and smoke developed index.

703-5 Log #9 BLD-SCM Final Action:
(3.3.2 Fire-Retardant-Treated Wood)

Submitter: Joseph T. Holland, Hoover Treated Wood Products
Recommendation: Revise text as follows:

Fire-Retardant-Treated Wood. A pressure treated wood product ~~impregnated with chemical by a pressure process or other means during manufacture, which is~~ tested in accordance with ~~NFPA 255,~~ ASTM E84 or UL723;: has a listed flame spread index of 25 or less~~;~~, and shows no evidence of significant progressive combustion when the test is continued for an additional 20-minute period; nor does the flame front progress more than 10.5 ft. (3.2 m) beyond the centerline of the burner at any time during the test.

Substantiation: Revision is more concise. Present section Is wordy. In the fifty years of recognition in codes and standards there is no wood product meeting the requirements for FRTW where adding the fire retardant to the wood is done during manufacture. This provision creates interpretation problems in the field. Revision will improve enforcement of the code.

NFPA 255 has been discontinued in favor of ASTM E84 and UL723.

703-6 Log #1 BLD-SCM Final Action:
(4.1.1 (New))

Submitter: Eddie Phillips, Southern Regional Fire Code Development Committee
Recommendation: Add a new section to read: 4.1.1 Topically applied materials or chemicals shall not be identified or considered Fire Retardant–Treated Wood.
Substantiation: There are topically applied products marketing themselves as meeting the requirements of fire retardant-treated wood that do not meet the definition. By using these products the materials are used in places where fire-retardant materials is required to eliminate sprinkler protection etc. which is against the codes. This is not the intent of the standards and the proposed text helps clarify that right up front to the user.

703-7 Log #4 BLD-SCM Final Action:
(4.3, 4.5, and 5.3.2)

Submitter: Marcelo M. Hirschler, GBH International / Rep. American Fire Safety Council
Recommendation: Revise text to read as follows:
4.3 Exposure to Weather or Damp or Wet Locations.
Where fire retardant–treated wood is exposed to weather or damp or wet locations, it shall be identified as "exterior" to indicate that there is no increase in the listed flame spread index when subjected to ASTM D 2898 (Method A) . (See 3.3.2, Fire Retardant–Treated Wood.)
4.5 Labeling.
Fire retardant–treated lumber and wood structural panels shall be labeled and listed with the following information:
(1) Identification mark of an approved agency that lists materials in accordance with Chapter 3(See 3.2.4, Listed.)
(2) Identification of the treating manufacturer
(3) Name of the fire-retardant treatment
(4) Species of wood treated
(5) End use of the product
(6) Flame spread index and smoke developed index ~~rating~~
(7) Method of drying after treatment
(8) Verification of conformance with appropriate standards in accordance with Sections 4.2 through 4.4
(9) The words "No increase in the listed classification when subjected to the Standard Rain Test (ASTM D 2898 (Method A))," for fire retardant–treated wood exposed to weather or to damp or wet locations
5.3.2 Where fire-retardant coatings are to be subjected to sustained humidity of 80 percent or more or exposure to the weather, certification by a testing laboratory shall be required to indicate that there is no increase in listed classification when subjected to the "Standard Rain Test" described in ASTM D 2898 (Method A).
Substantiation: ASTM D 2898 has more than one method and Method A is the one that is applicable to exterior applications.
Further, this proposal makes the editorial changes necessary to use the correct terms of flame spread index and smoke developed index.

703-8 Log #12 BLD-SCM Final Action:
(5.1)

Submitter: Joseph T. Holland, Hoover Treated Wood Products
Recommendation: Revise text as follows:
5.1 Application. These requirements shall apply to fire retardant ~~coating such a~~ paints and other surface coating applied to building materials used for interior finish in existing construction ~~used~~ to reduce ~~certain burning characteristics~~ flame spread and smoke development ~~of building materials~~.
Substantiation: A review of NFPA codes and standards, 1, 101, 914, 5000 to name a few, limits fire retardant coatings to existing buildings. Not understanding the limitation has caused problems outside of NFPA. The standard is misapplied. This change makes it clear.

703-9 Log #10 BLD-SCM Final Action:
(5.3.1)

Submitter: Joseph T. Holland, Hoover Treated Wood Products
Recommendation: Revise text as follows:
Fire-retardant coatings shall be tested by ~~NFPA 255~~, ASTM E84 or UL723.
Substantiation: NFPA 255 has been discontinued.

703-10 Log #7 BLD-SCM Final Action:
(7.7.3)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise text to read as follows:
Replace the term "fire endurance" by the term "fire resistance" in section 7.7.3.
7.7.3 Fire-Resistant Safes. There are three classes of fire-resistant safes. All three classes must pass three tests: fire resistance ~~endurance~~, explosion, and impact. During the fire resistance ~~endurance~~ test, the inside temperature of a safe cannot exceed 350°F (176.7°C) at any time during the test. At the end of the test, all papers inside a safe must be entirely legible and uncharred.
Substantiation: The term "fire endurance" is being replaced in all NFPA documents by the preferred term "fire resistance". The term "fire endurance classification" is being replaced by "fire resistance rating".

703-11 Log #2 BLD-SCM Final Action:
(A.3.3.2 (New))

Submitter: Jon Nisja, Northcentral Regional Fire Code Development Committee
Recommendation: Add an annex note to read: A.3.3.2 Topically applied materials or chemicals do not meet the intent of impregnated wood materials.
Substantiation: There are products on the market that some are permitting topically applied materials to meet the fire retardant materials standard used to eliminate sprinklers etc. Per the definition of Fire Retardant–Treated Wood the product must be impregnated with the material not just applied like paint to meet the requirements.

703-12 Log #11 BLD-SCM Final Action:
(A.5.1)

Submitter: Joseph T. Holland, Hoover Treated Wood Products
Recommendation: Add new text as follows:
This section does not address the use of fire-retardant coating as a thermal barrier. Recognition of fire-retardant coating as an alternative to fire retardant-treated wood is outside the scope of this section.
Substantiation: Users are misapplying this section. The added text clarifies that coating are to be used for interior finish not structural applications as permitted by NFPA standards for fire retardant-treated wood.

703-13 Log #3 BLD-SCM Final Action:
(A.5.3.1)

Submitter: Marcelo M. Hirschler, GBH International
Recommendation: Revise text to read as follows:
A.5.3.1 The flame spread index ~~rating~~ is expressed numerically on a scale for which the zero point is fixed by the performance of inorganic-reinforced cement board and the 100 point (approximately) is fixed by the performance of red oak flooring.
Substantiation: This proposal makes the editorial changes necessary to use the correct terms of flame spread index and smoke developed index.