



PUBLIC CODE CHANGE PROPOSAL FORM FOR PUBLIC PROPOSALS IN THE INTERNATIONAL CODES

2006/2007 CODE DEVELOPMENT CYCLE

CLOSING DATE: All Proposals Must Be Received by March 24, 2006

The 2006/2007 Code Development Hearings are scheduled for
September 20 to 30, 2006 in Orlando, FL

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Jurisdiction/Company: State of New Jersey, Department of Community Affairs, Division of Codes and Standards
Submitted on Behalf of: International Code Council Ad Hoc Committee on Terrorism Resistant Buildings
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- 2) ***Signature:** _____
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Signature for electronic submittal: When submitting proposals electronically, to complete the submittal process, print a copy of the ICC Electronic [Copyright Release](http://www.iccsafe.org) form found at www.iccsafe.org, fill in the requested information, send to ICC. One completed form is required. This must be done for each code change cycle and can be used for code changes and public comments.

- 3) Indicate appropriate International Code(s) associated with this Public Proposal – Please use Acronym: IBC
 If you have also submitted a separate coordination change to another I-Code, please indicate the code: _____
 (See section below for list of names and acronyms for the International Codes).

- 4) **Be sure to format your proposal and include all information as indicated on Page 2 of this form.**

- 5) Proposals should be sent to the following offices via regular mail or email. An e-mail submittal is preferred, including an electronic version, in either Wordperfect or Word. The only formatting that is needed is **BOLDING**, ~~STRIKEOUT~~ AND UNDERLINING. Please do not provide additional formatting such as tabs, columns, etc., as this will be done by ICC

Please use a separate form for each proposal submitted. Note: All code changes received will receive an acknowledgment.

Please check here if separate graphic file provided.

Graphic materials (Graphs, maps, drawings, charts, photographs, etc.) must be submitted as separate electronic files in .CDR,.IA,.TIF or .JPG format (300 DPI Minimum resolution; 600 DPI or more preferred) even though they may also be embedded in your Word or Wordperfect submittal.

Code	Send to:	Acronym	ICC Code Name
IBC	International Code Council	IBC	International Building Code
ICC EC	Chicago District Office	ICC EC	ICC Electrical Code–Administrative Provisions
IEBC	Attn: Diane Schoonover	IECC	International Energy Conservation Code
IFC	4051 West Flossmoor Road	IEBC	International Existing Building Code
IFGC	Country Club Hills, IL 60478-5795	IFC	International Fire Code
IPC	Fax: 708/799-0320	IFGC	International Fuel Gas Code
IPSDC	codechanges@iccsafe.org	IMC	International Mechanical Code
IPMC		ICC PC	ICC Performance Code
IWUIC		IPC	International Plumbing Code
IZC		IPSDC	International Private Sewage Disposal Code
		IPMC	International Property Maintenance Code
IECC	International Code Council	IRC	International Residential Code
ICC PC	Birmingham District Office	IWUIC	International Wildland-Urban Interface Code
IMC	Attn: Annette Sundberg	IZC	International Zoning Code
IRC	900 Montclair Road		
	Birmingham, AL 35213-1206		
	Fax: 205/592-7001		
	codechangesbhm@iccsafe.org		

CODE CHANGE PROPOSAL

Please provide all of the following items in your code change proposal. Your proposal may be entered on the following form, or you may attach a separate file. However, please read the instructions provided for each part of the code change proposal. The sections identified in parentheses are the applicable sections from CP #28 Code Development. The full procedures can be downloaded from www.iccsafe.org.

Code Sections/Tables/Figures Proposed for Revision (3.3.2): Section 1704.10

Note: If the proposal is for a new section, indicate (new).

Name/Company/Representing (3.3.1): William M. Connolly, Chairman, International Code Council Ad Hoc Committee on Terrorism Resistant Buildings

Note: You must indicate your name and the full name of who you are representing. Do not use acronyms.

Proposal:

(Revise as follows) 1704.10 Sprayed fire-resistant materials. Special inspections for sprayed fire-resistant materials applied to structural elements and decks shall be in accordance with Sections 1704.10.1 through 1704.10.56. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents. The tests described in this section shall be based on samplings of specific floor, roof and wall assemblies, and structural framing members. Special inspections shall be performed after the rough installation of electrical, mechanical and plumbing systems.

1704.10.1 Physical and Visual Tests. The following physical and visual tests are required to demonstrate compliance with the listing and the fire-resistance-rating:

1. Condition of substrates.
2. Thickness of application.
3. Density in pounds per cubic foot (kgs per m²).
4. Bond strength -adhesion/cohesion (psf or kPA).
5. Condition of finished application.
6. Field bond tests needed to qualify application over certain primers, paints, and encapsulants.

1704.10.12 Structural member surface conditions. The surfaces shall be prepared in accordance with the approved fire-resistance design and the approved manufacturer's written instructions. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

1704.10.23 Application. The substrate shall have a minimum ambient temperature before and after application as specified in the approved manufacturer's written instructions. The area for application shall be ventilated during and after application as required by the approved manufacturer's written instructions.

1704.10.34 Thickness. The average thickness minus two times the standard deviation of the thickness measurements of the sprayed fire-resistant materials applied to structural elements shall not be less than the thickness required by the approved fire-resistant design. Individual measured thickness, which exceeds the thickness specified in a design by 1/4 inch (6.4 mm) or more, shall be recorded as the thickness specified in the design plus 1/4 inch (6.4 mm). For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus 1/4 inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections 1704.10.34.1 and 1704.10.34.2.

1704.10.34.1 Floor, roof and wall assemblies. The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, taking the average minus two times the standard deviation of the thickness measurements of not less than four measurements for each 1,000 square feet (93m²) of the sprayed area on each floor or part thereof.

1704.10.4.1.1 Flat Decks. Thickness measurements shall be taken from a 12-in. (300-mm) square with minimum of four measurements, symmetrically.

1704.10.4.1.2 Fluted Decks. Thickness measurements shall be taken from a 12-in. (300-mm) square with four random, symmetrical measurements within the square, including one each of the following: valley, crest and sides and report as an average.

1704.10.34.2 Structural framing members. The thickness of the sprayed fire-resistant material applied to

structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

1704.10.4.2.1 Beams. Thickness measurements shall be made at nine locations around the beam at each end of a 12-in. (300-mm) length.

1704.10.4.2.2 Joists and Trusses. Thickness measurements shall be made at seven locations around the joist or truss at each end of a 12-in. (300-mm) length.

1704.10.4.2.3 W-Shape Columns. Thickness measurements shall be made at 12 locations around the column at each end of a 12-in. (300-mm) length.

1704.10.4.2.4 Tube and Pipe Columns. Thickness measurements shall be made at a minimum of four locations around the column at each end of a 12-in. (300-mm) length.

1704.10.4.5 Density. The density of the sprayed fire-resistant material shall not be less than the density specified in the approved fire-resistant design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605. The test samples for determining the density of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (929 m²) or part thereof of the sprayed area in each story.

1704.10.5.6 Bond strength. Except as required in Table 403.15, the cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to structural elements shall not be less than 150 pounds per square foot (psf) (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.10.5.1 and 1704.10.5.2 ~~3~~.

1704.10.5.6.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every ~~10,000~~ 2,500 square feet (929 m²) or part thereof of the sprayed area in each story.

1704.10.5.6.2 Structural framing members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, joists, trusses and columns at the rate of not less than one sample for each type of structural framing member for each ~~10,000~~ 2,500 square feet (929 m²) of floor area or part thereof in each story.

1704.10.7 Primer, Paint and Encapsulant Bond Field Tests. Bond tests to qualify a primer, paint or encapsulant shall be conducted only when the fire-resistive coating is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the fire resistive material is not covered by the listing.

Supporting Information (3.3.4 & 3.4):

This code change proposal is one of fourteen proposals being submitted by the International Code Council Ad Hoc Committee on Terrorism Resistant Buildings.

Purpose:

The purpose of this proposal is to increase the in-place durability of Spray Applied Fire Resistant Material by strengthening and more completely specifying the content of the SFRM special inspections that are already required by Section 1704.10 of the Code.

Reason:

The National Institute of Standards and Technology's (NIST) investigation of the World Trade Center (WTC) tragedy documented that the proximate cause of the actual collapse was the action of a building contents fire on light steel members in the absence of spray applied fire resistive material, which had been dislodged. Events far less dramatic than an airplane attack have been known to dislodge SFRM. Events as simple as an elevator movement, building sway or maintenance activities can dislodge SFRM if it is not adhered properly.

Recommendation 6 of the NIST WTC Report calls for improvement of the in place durability of SFRM. This proposal is one of three that seeks to achieve that objective. The other two are a proposal for a new Section 403.15 requiring higher bond strengths for SFRM in taller buildings and a proposed new Section 714.8 dealing with application requirements for SFRM.

Substantiation:

The Code already recognizes the importance of SFRM application by providing for a special inspection procedure at Section

1704.10. This proposal strengthens that procedure by further specifying what must be inspected, the frequency of measurements and tests, and adding certain pass/fail criteria.

New subsection 1704.10.1 establishes requirements for the matters which need to be documented by the special inspector.

Revised and renumbered section 1704.10.4 amends the pass/fail criteria for thickness. The current language of this section specifies that the average thickness of SFRM must exceed the required thickness as provided for by the listing. This is obviously insufficient since some sections could be very thin and the criteria would still be met if other sections were very thick. The current code responds to this with a series of limitations on how to record thickness. Even with these provisions, some areas of application could be dangerously thin because the approach relies on where individual measurements are taken. This change proposes a new and more scientifically sound method by specifying that the average thickness minus two times the standard deviation of thickness measurements shall not be less than the required thickness. In practical terms, this means that 95% of measurements will meet the required standard or, stated another way, 95% of the surface to which the material is applied will meet the required standard. Standard deviation is a routine statistical concept that will more appropriately ensure the intent of the Code is met. Special inspectors can be expected to calculate it without difficulty.

The proposed changes to renumbered Section 1704.10.4.1 add much greater specificity to the number and location of thickness measurements that will be required to establish average thickness measurements.

The proposed changes to renumbered Section 1704.10.5 specify a sampling rate for density tests. A sampling rate is not specified in the current code text. The one chosen is the same as that specified for bond tests.

The proposed changes to renumbered Section 1704.10.6 changes existing sampling rates for bond tests for from every 10,000 square feet to every 2,500 square feet. The proponents believe that the 10,000 square feet rate is too large and increases the probability that fatal bond weaknesses might not be identified during the special inspection process.

New Section 1704.10.7 qualifies the requirement for field bond tests.

Bibliography:

National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Referenced Standards (3.4 & 3.6):

None.

Cost Impact (3.3.4.6):

Costs:

There will be no increase in actual construction costs. There will be a modest increase in special inspection costs.