2.02 West Florida Hospital, East Patient Hospital, 8383 N. Davis Highway, Pensacola

TYPE OF STRUCTURE—Hospital

EXPOSURE—B

WALL CONSTRUCTION—Concrete with EIFS cladding

ROOF TYPE—Single-ply membrane

ROOF PITCH—¼ " : 12

ROOF DECK—Cast-in-place concrete

CONSTRUCTION—The building is one of many on the site and is constructed mostly of substantial steel frame construction with original rock aggregate precast concrete exterior panels that had been retrofitted with an EIFS exterior cladding system. The roof deck, which is about 30 ft above grade, appears to be cast-in-place concrete. This roof has a gravel stop edge.

The Escambia inlet bay could be seen to the east and south from the roofs, yet the surrounding terrain would qualify as Exposure B, according to ASCE 7-02, with a height of surface roughness of about 25 to 30 ft above grade. Streets and parking lots create open areas on the east, northeast, south, and southeast side of the structure across the street, as well as adjacent to the structure.

ROOF MEMBRANE SYSTEM—The membrane was a loose-laid ballasted white reinforced elastomeric sheet single-ply membrane (Hypalon), The ballast was similar to ASTM 448 #4 or larger (average 1.5-in. with stones up to 2 in.) The membrane was installed over tapered Isocyanurate insulation.

DAMAGE CONDITIONS—No membrane damage was noted. There was a small amount of gravel scour at the windward side, at corners, and around penthouses. There were no signs that gravel had left the roof. Ballast scour may occur, based on previous wind studies, for winds over 115 mph at this building height. Some of the partially adhered, 1/2-in.-thick rubber walk pads had become loose from the membrane; some may have blown off the roof. A 30 to 40 ft segment of the snap on fascia edge metal cover become disengaged from its cleat and had blown off. An exhaust fan had also blown off the roof.

DAMAGE INITIATION—The shop-fabricated metal edge was clamped over an existing gravel stop. The cleat, although continuous, was thin and could not resist the bending forces of the fascia.

OTHER COMMENTS —This roof was a survivor. There were no known leaks, and the ballast remained on the roof. The damage to the edge was repairable. The section of the hospital had been closed because the windows in the east-facing wall leaked so badly that water was blowing into the patient rooms. They expected to have the area back in operation as soon as the rooms were dried out.

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

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

FS197–06/07
1504.7, Chapter 35

Proponent: Bob Eugene, Underwriters Laboratories Inc.

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

1. Revise as follows:

1504.7 Impact resistance. Roof coverings installed on low-slope roofs (roof slope < 2:12) in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M, UL 2218 or the “Resistance to Foot Traffic Test” in Section 5.5 of FM 4470.

2. Add standard to Chapter 35 as follows:

UL

2218-96 Impact Resistance of Prepared Roof Covering Materials, with Revisions through January 2002

Reason: Add a direct reference to UL 2218. UL 2218 has gained much popularity with insurance authorities and is now used throughout many jurisdictions.

All of the Standards listed in IBC 1504.7 evaluate roofing materials through impacts similar to that of UL2218. Below is a Comparison Table of the different methods demonstrating that UL 2218 is comparable.

CONSIDERATION OF UL 2218 AND COMPARISON OF IMPACT RESISTANCE TEST METHODS					
CLASS RATING	SAMPLE MEDIA	IMPACT MEDIA WT, LBS	DROPPED THROUGH A HEIGHT OF, FT	KINETIC ENERGY	
				FT-LBS	J
UL 2218					
1	1.25 inch dia. steel ball	0.28	12	3.53	4.78
2	1.5 inch dia. steel ball	0.48	15	7.35	9.95
3	1.75 inch dia. steel ball	0.79	17	13.56	18.37
4	2 inch dia. steel ball	1.15	20	23.71	32.12
FM 4470					
Class 1 - SH	1.75 inch dia. steel ball	0.79	17.8	14	19
Class 1 - MH	2 inch dia. steel ball	1.625	5	8	10.8
ASTM D 3746					
N/A	2 inch dia. x 6 inch long steel cylinder	5	4.4	22	30
ASTM D 4272					
N/A	1.25 inch dia. dart	2.5	2.2	5.4	7.3

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

Analysis: Results of the review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

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

FS198–06/07
1504.8, Table 1504.8

Proponent: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

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

Revise as follows:

1504.8 ~~Gravel and stone~~. Aggregate. ~~Gravel or stone~~ Aggregate shall not be used on the roof of a building located in a hurricane-prone region as defined in Section 1609.2, or on any other building with a mean roof height exceeding that permitted by Table 1504.8 based on the exposure category and basic wind speed at the building site.

TABLE 1504.8
MAXIMUM ALLOWABLE MEAN ROOF HEIGHT PERMITTED FOR BUILDINGS WITH ~~GRAVEL OR STONE~~ AGGREGATE ON THE ROOF IN AREAS OUTSIDE A HURRICANE-PRONE REGION

(No changes to table text)

Reason: This proposed code change is intended to clarify the intent of Section 1504.8. The terms "gravel and stone" are not used elsewhere in Chapter 15. The term "aggregate" is already used in Table 1507.10.2.

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

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

FS199–06/07
1505.2, 1505.3; IRC R902.1

Proponent: John C. Dean, The National Association of State Fire Marshals

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

PART I – IBC FIRE SAFETY

Revise as follows:

1505.2 Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class
A roof assemblies and roof coverings shall be listed and identified as Class A by an approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exception: Class A roof assemblies include those with coverings of brick, masonry, slate, clay or concrete roof tile, or exposed concrete roof deck~~, ferrous or copper shingles or sheets~~.

1505.3 Class B roof assemblies. Class B roof assemblies are those that are effective against moderate fire-test exposure. Class B roof assemblies and roof coverings shall be listed and identified as Class B by an approved testing agency.

~~**Exception:** Class B roof assemblies include those with coverings of metal sheets and shingles.~~

PART II – IRC BUILDING/ENERGY

Revise as follows:

R902.1 Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a property line. Classes A, B and C roofing required to be listed by this section shall be tested in accordance with UL 790 or ASTM E 108. Roof assemblies with coverings of brick, masonry, slate, clay or concrete roof tile, or exposed concrete roof deck, ~~ferrous or copper shingles or sheets, and metal sheets and shingles,~~ shall be considered Class A roof coverings.

Reason: All roof assemblies with metal roof covering should be tested in accordance with ASTM E 108 or UL 790. The increasingly wide range of materials and configurations used as metal roofing now available in the market can no longer support a general exemption from fire testing these assemblies.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IBC FIRE SAFETY

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

PART II – IRC BUILDING/ENERGY

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

FS200–06/07
1507.2.8.2, 1507.5.3, 1507.6.3, 1507.7.3, Table 1507.8, 1507.8.3 and 1507.9.3

Proponent: Lawrence Brown, CBO, National Association of Home Builders (NAHB)

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

Revise as follows:

1507.2.8.2 Ice ~~dam membrane~~ barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, ~~a membrane~~ an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet shall be used in lieu of normal underlayment and extend

from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

1507.5.3 Underlayment. Underlayment shall comply with ASTMD226, Type I or ASTMD4869.

1507.5.4 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

1507.6.3 Underlayment. Underlayment shall comply with ASTMD226, Type I orASTMD4869.

1507.6.4 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

1507.7.3 Underlayment. Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869.

1507.7.4 Ice barrier. In areas where the average daily temperature in January is 25□F (-4□C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

1507.8.3 Underlayment. Underlayment shall comply with ASTMD226, Type I orASTMD4869.

1507.8.4 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

1507.9.3 Underlayment. Underlayment shall comply with ASTMD226, Type I orASTMD4869.

1507.9.4 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

TABLE 1507.8
WOOD SHINGLE AND SHAKE INSTALLATION

ROOF ITEM	WOOD SHINGLES	WOOD SHAKES
4. Underlayment	—	—
Temperate climate	Underlayment shall comply with ASTM D 226, Type 1.	Underlayment shall comply with ASTM D 226, Type 1.
In areas where there is a possibility of ice forming along the eaves causing a backup of water.	An ice ~~shield~~ barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the eave's edge to a point at least 24 inches inside the exterior wall line of the building.	An ice ~~shield~~ barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches inside the exterior wall line of the building.

(Portions of table not shown do not change)

Reason: The intent of this Proposal is to coordinate the different Sections of IBC to consistently use the same terminology that most accurately describes this building element. The terms "ice shield", "ice dam membrane", and "ice barrier" are used in different Sections throughout both the IBC and IRC to describe the same element, that of a barrier to prevent damage from ice damming occurring under roof coverings. IBC Section 1507.2.8.2 uses the term "ice dam membrane", Table 1507.8 "ice shield", and Sections 1507.5.3, 1507.6.3, 1507.7.3, 1507.8.3 and 1507.9.3 all use the term "ice barrier". The change to the sections already containing the term "ice shield" is to only separate the text relating to the underlayment needing to comply with ASTM, and moving the text relating to the ice shield of that same section to a new subsection as these are two separate aspects of materials and construction. These Sections are already separated in Section 1507.2 for asphalt shingles.

The term "eave's edge" is changed to "lowest edges of all roof surfaces" due to the misapplication of this provision. It is the lowest edges of a roof where, due to the influence of gravity, melting snow and ice will refreeze and cause a back-up of ice. A few construction dictionaries define an "eave" as "the part of a roof that projects beyond the exterior wall". This would imply any exterior wall. Though, some dictionaries do go on to also state the eave is the "lower edge of a sloped roof". Technically, the extension over the roof on a gable end is a "rake", not an eave. This change correctly addresses the aspect that it is the lowest edges of a roof where there is a possibility of an ice dam occurring, not the rake or ridge of a roof. In its' application, it is the lowest edge of the roof where the underlayment is installed. This same change reflects the text of the 2006 IRC.

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

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

FS201 – 06/07

1507.2.9.2; IRC R905.2.8.2

Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturers Association

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

PART I – IBC STRUCTURAL

Revise as follows:

1507.2.9.2 Valleys. Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be at least 16 inches (406 mm) wide and of any of the corrosion-resistant metals in Table 1507.2.9.2.
2. For open valleys, valley lining of two plies of mineral-surfaced roll roofing complying with ASTM D 3909 or ASTM D 6380 shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys (valleys covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380, ~~Class S Type III, Class M Type II or ASTM D 3909~~ and at least 36 inches (914 mm) wide or types as described in Items 1 ~~and~~ or 2 above shall be permitted. ~~Specialty~~ Self-adhering polymer modified bitumen underlayment ~~shall comply with~~ complying with ASTM D 1970 shall be permitted in lieu of the lining material.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R905.2.8.2 Valleys. Valley linings shall be installed in accordance with the manufacturer's installation instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be at least 24 inches (610 mm) wide and of any of the corrosion-resistant metals in Table R905.2.8.2.
2. For open valleys, valley lining of two plies of mineral surfaced roll roofing, complying with ASTM D3909 or ASTM D6380 Class M, shall be permitted. The bottom layer shall be 18 inches (457mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys (valley covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D6380 ~~Class S Type III, Class M Type II, or ASTM D3909~~ and at least 36 inches wide (914 mm) or valley lining as described in Items 1 ~~and~~ or 2 above shall be permitted. ~~Specialty~~ Self-adhering polymer modified bitumen underlayment complying with ASTM D1970 ~~may be used~~ shall be permitted in lieu of the lining material.

Reason: (IBC and IRC) This proposal clarifies the requirements for valley linings and properly references ASTM D1970 for self-adhering modified bitumen underlayment. The IRC and IBC currently allow materials complying with ASTM D3909, normally used as cap sheets, to be used as valley lining in closed applications, but that reference is more appropriate for open conditions. This proposal appropriately provides for the addition of materials complying with ASTM D 1970 to be used in closed valley linings- consistent with the current underlayment requirements.
Additionally, a grammatical error in item number 1 is fixed, non-mandatory language in number 3 is corrected, and the self-adhering polymer modified bitumen underlayment reference is corrected for consistency with the referenced standard.

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

PART I – IBC STRUCTURAL

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

PART II – IRC BUILDING/ENERGY

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

FS202– 06/07

IBC 1507.3.1, 1507.3.2, 1507.3.3, 1507.3.3.1, 1507.3.3.2, 1507.3.6, Table 1507.3.7, 1507.3.8, 1507.3.9; IRC R905.3.1, R905.3.2, R905.3.3, R905.3.3.1, R905.3.3.2, R905.3.6, R905.3.8

Proponent: James Ragsdale, RE/COR Inc.

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

PART I – IBC Structural

1. Revise as follows:

1507.3.1 Deck requirements. Concrete and clay tile shall be installed only over solid sheathing ~~or spaced structural sheathing boards~~.

1507.3.2 Deck slope. Clay and concrete roof tile shall be installed on roof slopes of 21/2 units vertical in 12 units horizontal (21-percent slope) or greater. For roof slopes from 2½ units vertical in 12 units horizontal (21-percent slope) to four units vertical in 12 units horizontal (33-percent slope), and in areas subject to wind driven snow, double underlayment application and a vertical and horizontal batten system is required in accordance with Section 1507.3.3.

1507.3.3 Underlayment and battens. Unless otherwise noted, required underlayment shall conform to: ASTM D 226, Type II of Type 30 non-perforated base felt; ASTM D 2626 Type I non-perforated base sheet; or ASTM D 6380, Class M mineral-surfaced roll roofing. Fasteners for underlayments shall be galvanized steel, stainless steel, aluminum or copper roofing nails, minimum 12 gauge [0.105 inch (3mm)] shank with a minimum 3/8-inch (10mm) diameter head. Vertical battens or risers shall be a minimum of nominal 3/8-inch decay resistant natural or treated wood. Approved shims or risers of 3/8-inch made of moisture and decay resistant materials may be used as an alternative. Horizontal battens shall be a minimum of nominal 1 x 2 boards. Horizontal battens shall be decay resistant natural or treated wood when attached directly to the decking.

1507.3.3.1 Underlayment application for ~~L~~low-slope roofs and all slopes in areas subject to wind driven snow. For roof slopes from 2½ units vertical in 12 units horizontal (21-percent slope), up to four units vertical in 12 units horizontal (33-percent slope), and all slopes in areas subject to wind driven snow, underlayment shall be a minimum of two layers of ASTM D 226, Type II of Type 30 non-perforated base felt or ASTM D 2626 Type I non-perforated base sheet applied as follows:

1. Starting at the eave, a 19-inch (483 mm) strip of underlayment shall be applied parallel with the eave and fastened sufficiently in place.
2. Starting at the eave, 36-inch-wide (914 mm) strips of underlayment felt shall be applied overlapping successive sheets 19 inches (483 mm) and fastened sufficiently in place.
3. As an alternate underlayment to the above, one layer of ASTM D 6380 Class M mineral-surfaced roll roofing may be applied shingle fashion, parallel to, and starting from the eaves and lapped 2 inches (51mm), and fastened sufficiently in place.

2. Add new text as follows:

1507.3.3.2 Batten application for low-slope roofs and all slopes in areas subject to wind driven snow. For roof slopes from 2½ units vertical in 12 units horizontal (21-percent slope), up to four units vertical in 12 units horizontal (33-percent slope), and all slopes in areas subject to wind driven snow, battens shall be applied as follows:

1. Vertical battens or approved alternate risers shall be secured in place under the horizontal battens for positive water drainage under tile roofs. The proper spacing of the vertical battens shall be based on the size of the horizontal battens.
2. Horizontal battens shall be a minimum of No. 2 Grade boards. Horizontal battens are to be stress rated to structurally support the expected total roof loads of the tile and snow between the vertical battens.
3. Horizontal battens shall be fastened with corrosion resistant fasteners of sufficient length to penetrate the vertical battens a minimum of ¾ inch 0.75 inch (19.1 mm) or through the thickness of the vertical battens and deck, whichever is less. The minimum fastener size is 8d corrosion resistant nails. Corrosion resistant staples of No.16 gauge by 7/16-inch crown are allowed when vertical battens are spaced 12-inches on center or less.

1507.3.3.~~2~~ 3 High-slope roofs in areas not subject to wind driven snow. For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater, underlayment shall be a minimum of one layer of underlayment felt applied shingle fashion, parallel to, and starting from the eaves and lapped 2 inches (51 mm), fastened ~~only as necessary to hold in place~~ sufficiently in place.

3. Revise as follows:

1507.3.6 Fasteners. Tile fasteners shall be corrosion resistant and not less than 11 gage, 5/16-inch (8.0 mm) head, and of sufficient length to penetrate the deck a minimum of 0.75 inch (19.1 mm) or through the thickness of the deck, whichever is less. Where the attachment of tile is over a vertical and horizontal batten system the fasteners shall be of sufficient length to penetrate the horizontal batten a minimum of 0.75 inch (19.1 mm) but shall not penetrate the underlayment. Attaching wire for clay or concrete tile shall not be smaller than 0.083 inch (2.1 mm). Perimeter fastening areas include three tile courses but not less than 36 inches (914 mm) from either side of hips or ridges and edges of eaves and gable rakes.

4. Revise Table 1507.3.7 footnotes a and d as follows:

(No change to table)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s, 1 pound per square foot = 4.882 k g /m^2 .

a. Minimum fastener size. Corrosion-resistant nails not less than No. 11 gage with 5/16-inch head. Fasteners shall be long enough to penetrate into the sheathing 0.75 inch or through the thickness of the sheathing, whichever is less. Where the attachment of tile is over a vertical and horizontal batten system the fasteners shall be of sufficient length to penetrate the horizontal batten a minimum of 0.75 inch (19.1 mm) but shall not penetrate the underlayment. Attaching wire for clay and concrete tile shall not be smaller than 0.083 inch.
b. Snow areas. A minimum of two fasteners per tile are required or battens and one fastener.
c. Roof slopes greater than 24:12. The nose of all tiles shall be securely fastened.
d. Horizontal battens. Battens shall be not less than 1inch by 2 inch nominal. In areas not subject to wind driven snow provisions shall be made for drainage by a minimum of ~~1/8~~ 3/8-inch riser at each nail or by 4-foot-long battens with at least a 0.5-inch separation between battens. Horizontal battens are required for slopes over 7:12. In areas subject to wind driven snow 3/8-inch vertical battens or risers and horizontal battens are required for all slopes.
e. Perimeter fastening areas include three tile courses but not less than 36 inches from either side of hips or ridges and edges of eaves and gable rakes.

1507.3.8 Application. Tile shall be applied ~~according~~ in accordance with this chapter and to the manufacturer's installation instructions, based on the following:

1. Climatic conditions.
2. Roof slope.
3. Underlayment system.
4. Type of tile being installed.

1507.3.9 Flashing and weather blocking. At the juncture of the roof vertical surfaces, including walls, skylights, chimneys, and all other penetrations through the roof, a double flashing of one placed into the underlayments and one placed over the surface of the tile and counterflashing shall be provided in accordance with this chapter and the manufacturer's installation instructions, and where of metal, shall not be less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flowline formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley, or a self-adhering polymer-modified bitumen sheet complying with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing underlayment shall be solid cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed. An approved weather, animal, and bird blocking material shall be installed at all hips, ridges, and rakes under the trim tiles and over the surface of the field tile.

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R905.3.1 Deck requirements. Concrete and clay tile shall be installed only over solid sheathing ~~or spaced structural sheathing boards.~~

R905.3.2 Deck slope. Clay and concrete roof tile shall be installed on roof slopes of two and one-half units vertical in 12 units horizontal (21/2:12) or greater. For roof slopes from two and one-half units vertical in 12 units horizontal (21/2:12) to four units vertical in 12 units horizontal (4:12), and in areas subject to wind driven snow, double underlayment application and a vertical and horizontal batten system is required in accordance with Section R905.3.3.

R905.3.3 Underlayment and battens. Unless otherwise noted, required underlayment shall conform to: ASTM D 226 Type II of Type 30 non-perforated base felt; ASTM D 2626 Type I non-perforated base sheet; or ASTM D 6380 Class M mineral surfaced roll roofing. Fasteners for underlayments shall be galvanized steel, stainless steel, aluminum or copper roofing nails, minimum 12 gauge [0.105 inch (3mm)] shank with a minimum 3/8-inch (10mm) diameter head. Vertical battens or risers shall be a minimum of nominal 3/8-inch decay resistant natural or treated wood. Approved shims or risers of 3/8-inch made of moisture and decay resistant materials may be used as an alternative. Horizontal battens shall be a minimum of nominal 1 x 2 boards. Horizontal battens shall be decay resistant natural or treated wood when attached directly to the decking.

R905.3.3.1 Underlayment application for ~~L~~low-slope roofs and all slopes in areas subject to wind driven snow. For roof slopes from two and one-half units vertical in 12 units horizontal ~~(21/2:12)~~ (21-percent slope), up to four units vertical in 12 units horizontal ~~(4:12)~~ (33-percent slope), and all slopes in areas subject to wind driven snow, underlayment shall be a minimum of two layers of ASTM D 226, Type II of Type 30 non-perforated base felt or ASTM D 2626 Type I non-perforated base sheet underlayment applied as follows:

1. Starting at the eave, a 19-inch (483 mm) strip of underlayment shall be applied parallel with the eave and fastened sufficiently in place.
2. Starting at the eave, 36-inch-wide (914 mm) strips of underlayment felt shall be applied, overlapping successive sheets 19 inches (483 mm), and fastened sufficiently in place.
3. As an alternate underlayment to the above, one layer of ASTM D 6380 Class M mineral-surfaced roll roofing may be applied shingle fashion, parallel to, and starting from the eaves and lapped 2 inches (51mm), and fastened sufficiently in place.

2. Add new text as follows:

R905.3.3.2 Batten application for low-slope roofs and all slopes in areas subject to wind driven snow. For roof slopes from 2½ units vertical in 12 units horizontal (21-percent slope), up to four units vertical in 12 units horizontal (33-percent slope), and all slopes in areas subject to wind driven snow, battens shall be applied as follows:

1. Vertical battens or approved alternate risers shall be secured in place under the horizontal battens for positive water drainage under tile roofs. The proper spacing of the vertical battens shall be based on the size of the horizontal battens
2. Horizontal battens shall be a minimum of No. 2 Grade boards. Horizontal battens are to be stress rated to structurally support the expected total roof loads of the tile and snow between the vertical battens.
3. Horizontal battens shall be fastened with corrosion resistant fasteners of sufficient length to penetrate the vertical battens a minimum of ¾ inch 0.75 inch (19.1 mm) or through the thickness of the vertical battens and deck, whichever is less. The minimum fastener size is 8d corrosion resistant nails. Corrosion resistant staples of No. 16 gauge by 7/16-inch crown are allowed when vertical battens are spaced 12-inches on center or less.

R905.3.3.~~2~~ 3 High slope roofs in areas not subject to wind driven snow. For roof slopes of four units vertical in 12 units horizontal (4:12) or greater, underlayment shall be a minimum of one layer of underlayment felt applied shingle fashion, parallel to and starting from the eaves and lapped 2 inches (51 mm), fastened sufficiently in place.

R905.3.6 Fasteners. ~~Nails~~ Tile fasteners shall be corrosion resistant and not less than 11 gage, 5/16-inch ~~(11 mm)~~ (8.0 mm) head, and of sufficient length to penetrate the deck a minimum of ¾ inch (19.1 mm) or through the thickness of the deck, whichever is less. Where the attachment of tile is over a vertical and horizontal batten system the fasteners shall be of sufficient length to penetrate the horizontal batten a minimum of 0.75 inch (19.1 mm) but shall not penetrate the underlayment. Attaching wire for clay or concrete tile shall not be smaller than 0.083 inch (2.1 mm). Perimeter fastening areas include three tile courses but not less than 36 inches (914 mm) from either side of hips or ridges and edges of eaves and gable rakes.

~~**R905.3.7 Application.** Tile shall be applied in accordance with this chapter and the manufacturer's installation instructions, based on the following:~~

~~1. Climatic conditions.~~
~~2. Roof slope.~~
~~3. Underlayment system.~~
~~4. Type of tile being installed.~~

R905.3.7 Attachment. Clay and concrete roof tiles shall be fastened in accordance with this section and the manufacturer's installation instructions. Perimeter tiles shall be fastened with a minimum of one fastener per tile. Tiles with installed weight less than 9 pounds per square foot (0.4 kg/m2) require a minimum of one fastener per tile regardless of roof slope. ~~Clay and concrete roof tile attachment shall be in accordance with the manufacturer's installation instructions where applied~~ In areas where the basic wind speed exceeds 100 miles per hour (45 m/s) ~~and~~ or on buildings where the roof is located more than 40 feet (12 192 mm) above grade~~.~~, a minimum of two fasteners per tile for non-lugged tile and one fastener per tile for tile with projecting anchor lugs when installed with battens is required. The nose of all eave tiles shall be fastened with approved clips. All rake tiles shall be nailed with two nails. The nose of all ridge, hip and rake tiles shall be set in a bead of roofer's mastic. In areas subject to snow, a minimum of two fasteners per tile for non-lugged tile and one fastener per tile for tile with projecting anchor lugs when installed with battens is required. In all other areas, clay and concrete roof tiles shall be attached in accordance with Table R905.3.7.

R905.3.8 Application. Tile shall be applied in accordance with this chapter and the manufacturer's installation instructions, based on the following:

1. Climatic conditions.
2. Roof slope.
3. Underlayment system.
4. Type of tile being installed.

R905.3.~~8~~.9 Flashing and weather blocking. At the juncture of roof vertical surfaces, including walls, skylights, chimneys, and all other penetrations through the roof, a double flashing of one placed into the underlayments and one placed over the surface of the tile and counterflashing shall be provided in accordance with this chapter and the manufacturer's installation instructions and, where of metal, shall not be less than 0.019 inch (0.5 mm) (No. 26 galvanized units sheet gage) corrosion- resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three vertical in 12 units horizontal (25-percent slope) and greater, valley flashing shall have a 36-inch-wide (914 mm) underlayment of one layer of Type I underlayment running the full length of the valley, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less, metal valley flashing underlayment shall be solid-cemented to the roofing underlayment for slopes less than seven units vertical in 12 units horizontal (58-percent slope) or be of self-adhering polymer modified bitumen sheet. An approved weather, animal, and bird blocking material shall be installed at all hips, ridges, and rakes under the trim tiles and over the surface of the field tile.

Reason: (IBC 1507.3.1 & IRC R905.3.1) A tile roof is only a single coverage roof system whereas asphalt shingles or shakes are double coverage roof systems. Tile is very susceptible to water penetration to the deck and base felts from wind driven snow. Insects, small birds, animals and even snakes routinely gain access under tile roofs and therefore easily into attics if spaced sheathing is used.

(IBC 1507.3.2 & IRC R905.3.2) Low-sloped roofs regardless of roofing materials are very susceptible to water penetration to the base felts and therefore have required additional base felts. In addition tile has also required vertical and horizontal battens as stated historically in ES Reports. However, regardless of the pitch of the roof, tile roofs are also very susceptible to water penetration to the base felts from wind driven snow. Thus, the same required additional base felts and vertical and horizontal battens used for low-sloped roofs should apply to tile roofs installed in areas that are subject to wind driven snow. A tile roof is only a single coverage roof system having a 3" head lap, which is only about 20% to 30% of their weather exposure. Asphalt shingles, cedar shakes and shingles are double and triple coverage roof systems having head laps of more than twice (200% to 300%) their weather exposure. I can attest that wind driven snow will pack in so tightly under a tile roof that when the tile roof is lifted, a clear mirror image of the back of the tile including the manufacturer's name is left in the snow.

(IBC 1507.3.3 & IRC R905.3.3) To better define underlayment, vertical and horizontal batten material and fasteners for underlayments.

(IBC 1507.3.3.1 & IRC R905.3.3.1) State in No. 3 one layer of ASTM D 6380 as an alternate underlayment of what is commonly called 90 pound mineral surfaced roll roofing. It has specifications permitting it to be applied as a roof covering down to a roof slope of 1 unit vertical in 12 units horizontal (8-percent slope). Its mineral surface makes it resistant to damage from UV rays, oxidation from air, and foot traffic where the other types of underlayment are not.

(IBC 1507.3.3 & R905.3.3.3) Remove the current wording only in R905.3.3.3 because it is redundant to what is stated in R905.3.3.1 and because of what I am suggesting to be put in its place. I know of no one who would apply fasteners at only 36 inches on center even with no winds. Most roofers nail 6 to 8-inches on center at edges, more if windy and many nails are randomly placed through out the center of each roll of underlayment to keep it in place.

The proposed revision and additions to IBC 1507.3.3, 1507.3.3.1, 1507.3.3.2 and IRC R905.3.3, R905.3.3.1, R905.3.3.2 and IBC 1507.3.3.3, and IRC R905.3.3.3, are intended to define and differentiate the weather conditions of areas of the country subject to wind driven snow and areas that are not. The installation and use of underlayments, flashing and weather blocking materials, and vertical and horizontal battens is different for tile roofs in areas subject to wind driven snow.

(1) This is not a new installation method. The following statement has appeared in all tile ES Reports and manufacturer's specifications for over 25 years; "In areas designated by local building departments as subject to rooftop accumulation of sand, snow or rain driven by high winds horizontal battens shall be installed on top of vertical battens…". This has also been stated in manufacturer's specifications another way; "For pitches less than 3:12 or areas of wind driven snow, special wind regions, or roof ice, 3/8" vertical battens or shims are required under horizontal battens." Building departments have been enforcing this when they are informed of the ES Reports. Where this has not been fully enforced roofers generally follow this installation practice on most high-end housing but do not on tract housing. All roofs should be treated the same whether tract or high-end housing or commercial. Effects from weather to roofs are the same. All slopes of tile in areas subject to wind driven snow should be treated the same as low-sloped roofs to be consistent with years of ES Reports.

(2) There is a big difference in weather conditions all across the country. Areas subject to wind driven snow such as Denver, Colorado or Omaha, Nebraska should have tile roofs installed differently than roofs in Phoenix, Arizona or San Diego, California. The National Oceanic and Atmospheric Administration NOAA states that wind driven snow occurs in all areas where they issue blowing and drifting snow advisories, or warnings, snow squalls, or blizzards. These weather conditions occur in most of the Western, Northern and Central parts of the Midwest, and the Northeastern areas of the United States. www.weather.gov/os/winter/index.php?letter=b
www.weather.gov/glossary/index.php?letter=s
www.nws.noaa.gov/om/brochures/wintstm.htm

(3) A tile roof is only a single coverage roof system whereas asphalt shingles or shakes are double coverage roof systems. Tile is very susceptible to water penetration to the base felts from wind driven snow. During wind driven snow storms, snow will completely fill the void between the back of the field tile and the underlayment. I can attest that wind driven snow will pack in so tightly under a tile roof that when the tile roof is lifted, a clear mirror image of the back of the tile including the manufacturer's name is left in the snow.

(4) Water running over the felt's surface removes the asphalt's oils causing a more rapid deterioration of the exposed felt's surface. Underlayments under shake or asphalt roofs are not subjected to water running over their surface as they are under tile roofs.

(5) Exposure to the sun's ultraviolet rays also deteriorates the felt's exposed surface very quickly. During new construction the base felts are often left exposed to the sun for weeks and in many cases months before the tile is installed. Underlayments under shake or asphalt roofs are not subjected to as long of an exposure to the sun's ultraviolet rays as they are with tile roof installations.

(6) Asphalt felt exposed to the air oxidizes and becomes brittle over time. Underlayments under tile roofs are constantly exposed to the air because the tile does not set directly on top of the underlayments. Underlayments under shake or asphalt roofs are not subjected to the air because they do set directly on top and completely cover the underlayments.

(7) There is a greater chance the base felts will also be damaged from foot traffic due to the long passage of time between the installation of the base felt and much later the installation of the tile.

(8) In a two-ply base felt system the unexposed portion of the base felt will greatly out last the exposed portion because it is not exposed to the sun's ultraviolet rays, to water running over it's surface, or to the air and foot traffic.

(9) Installing vertical (counter) battens under the horizontal battens on all slopes will provide positive drainage of moisture because water will be able to run under the tile and horizontal battens to the eaves and off the roof. Premature deterioration of the underlayments and battens will not occur as it does with battens directly attached to the decking because the water, silt and debris will not be pooling behind the battens.

(10) These additions also clarify the size, the installation, the spacing for structural roof load support/deflection, the attachment, and the accepted alternatives for vertical (counter) battens

(IBC 1507.3.6 & IRC R905.3.6) The underlayment of a tile roof is subjected to water penetration from wind driven snow and therefore should not have holes in it from nails fastening down the field tile when installed over a vertical and horizontal batten system. The addition of this statement has been stated in many past ES reports and manufacturer's specifications and is common sense.

(IBC Table 1507.3.7, footnote a) Change the table to correctly match the wording in the proposed section 1507.3.6 and what has been stated in many past ES reports and manufacturer's specifications. Tile fasteners should never penetrate the underlayments when installed on a vertical and horizontal batten system because of moisture penetration through the field tile from wind driven snow.

(IBC Table 1507.3.7, footnote d) Change the table to correctly match what is written in the proposed section IBC 1507.3.2 and what has been stated in many past ES reports and manufacturer's specifications. Horizontal battens are installed over vertical battens or risers of a minimum thickness of 3/8-inch so that water will flow unimpeded off the roof under the tiles. This unimpeded flow of water will carry with it the silt and debris that gathers under tile roofs instead of standing behind the battens and prematurely rotting the underlayments and battens.

(IBC 1507.3.8) To clarify that the application of tile is also in accordance to chapter 15 of IBC.

(IRC R905.3.7, R905.3.8 & R905.3.9) Remove the first part of the text from the current R905.3.7 and change the title from Application to Attachment. The first part of the text in the current R905.3.7 is then moved to R905.3.8 and titled Application. The Title and wording of the current R905.3.8 now moves to a new section R905.3.9. Application and attachment are two distinct sections and should be separated. This also improves the flow from section R905.3.6 to R905.3.7 to R905.3.8 to R905.3.9 and matches the flow in the corresponding sections of chapter 15 of the IBC.

(IBC 1507.3.9, IRC R905.3.9) The additions to this section clarify what has been written in manufacturer's installation instructions and ES Reports. Protrusions through a tile roof and intersections or junctures with other surfaces are very susceptible to moisture penetration. In addition to flashing set in the underlayments at walls, skylights, chimneys and all other penetrations through the roof a flashing or weather blocking is also needed on the surface of the tile. Flashing should divert water back on to the surface of the roofing material as it does with all other roof systems. Tile has one other problem; small animals, birds and even snakes gain access under tile. There is a large space between the underlayments and the back of the tile where small animals and birds like to nest. Blocking all gaps, protrusions, intersections or junctures will decrease the damage caused by small animals and birds by limiting their access and increase the life of the underlayments by keeping more of the water on the surface of the tile.

Bibliography: Westile Roofing Products Technical Guide; ICBO Evaluation Reports; ER-3748 (Sept. 1, 1998), ER-4660 (June 1, 2001), ER-2656 (June 1, 2001); Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions; Concrete and Clay Tile Roof Design Criteria Manual for Cold and Snow Regions; Monier Lifetile Technical Bulletin #4 and Photo Document of Tile Installation Problems and;
www.weather.gov/os/winter/index.php?letter=b
www.weather.gov/glossary/index.php?letter=s
www.nws.noaa.gov/om/brochures/wintstm.htm

Cost Impact: The code change proposal will not increase the cost of construction. There is no additional cost for those who are currently installing tile as historically written in ES Reports with 2 plies of underlayment and vertical and horizontal battens. For those who have been installing tile with only one ply of underlayment and horizontal battens applied directly to the deck the cost would increase about $25.00 to $30.00 per square an increase of about 10% of the total cost for a tile roof. However the cost to property owners if tile roofs are not installed as described is staggering considering not only the premature failure of the roofs but the damage to the interior and substrate of each property.

Analysis: Additional supporting documents including photographs showing examples of the tile roof problems and all of the items listed in the bibliography were submitted but have not been printed here. To view or download current copies ICBO Evaluation Reports; ER-3748, 4660, 2656 go to http://www.icc-es.org and then select the "Evaluation Reports" link in the left margin. The available copies of ER-3748 and ER-4660 do not contain the requirements which are the topic of concern and were highlighted in the submitted substantiation copies.

PART I – IBC STRUCTURAL

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

PART II – IRC BUILDING/ENERGY

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

FS203–06/07

1507.4.3, 1507.5.4, Table 1507.4.3(1), 1507.4.3(2) (New)

Proponents: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

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

Revise as follows:

1507.4.3 Material standards. Metal-sheet roof covering systems that incorporate supporting structural members shall be designed in accordance with Chapter 22. Metal-sheet roof coverings installed over structural decking shall comply with Table 1507.4.3(1). The materials used for metal-sheet roof coverings shall be naturally corrosion resistant or provided with corrosion resistance in accordance with the standards and minimum thicknesses shown in Table 1507.4.3~~(2)~~(3).

1507.5.4 Material standards. Metal roof shingle roof coverings shall comply with Table 1507.4.3~~(1)~~(2). The materials used for metal-roof shingle roof coverings shall be naturally corrosion resistant or provided with corrosion resistance in accordance with the standards and minimum thicknesses specified in the standards listed in Table 1507.4.3~~(2)~~(3).

TABLE 1507.4.3(1)
METAL ROOF COVERINGS FOR METAL ROOF PANELS

ROOF COVERING TYPE	STANDARD APPLICATION RATE/THICKNESS
Aluminum	ASTM B 209, 0.024 inch minimum thickness for roll-formed panels ~~and 0.019 inch minimum thickness for press-formed shingles~~.
Aluminum-zinc alloy coated steel	ASTM A 792 AZ 50
Cold-rolled copper	ASTM B 370 minimum 16 oz/sq. ft. and 12 oz./sq. ft. high yield copper for metal-sheet roof covering systems~~: 12 oz/sq. ft. for preformed metal shingle systems~~.
Copper	16 oz./sq. ft. for metal-sheet roof covering systems~~; 12 oz./sq. ft. for preformed metal shingle systems~~.
Galvanized steel	ASTM A 653 G-90 zinc-coated[a].
Hard lead	2 lbs./sq. ft.
Lead-coated copper	ASTM B 101
Prepainted steel	ASTM A 755
Soft lead	3 lbs./sq. ft.
Stainless steel	ASTM A 240, 300 Series Alloys
Steel	ASTM A 924
Terne and terne-coated stainless	Terne coating of 40 lbs. per double base box, field painted where applicable in accordance with manufacturer's installation instructions.
Zinc	0.027 inch minimum thickness; 99.995% electrolytic high grade zinc with alloy additives of copper (0.08% - 0.20%), titanium (0.07% - 0.12%) and aluminum (0.015%).

For SI: 1 ounce per square foot = 0.0026 kg/m^2, 1 pound per square foot = 4.882 kg/m^2, 1 inch = 25.4 mm, 1 pound = 0.454 kg.

a. For Group U buildings, the minimum coating thickness for ASTM A 653 galvanized steel roofing shall be G.

2. Add new table as follows:

TABLE 1507.4.3(2)
METAL ROOF COVERINGS FOR METAL ROOF SHINGLES

ROOF COVERING TYPE	STANDARD APPLICATION RATE/THICKNESS
Aluminum	ASTM B 209, 0.019 inch minimum thickness for press-formed shingles.
Aluminum-zinc alloy coated steel	ASTM A 792 AZ 50
Cold-rolled copper	ASTM B 370 minimum 12 oz/sq. ft. for preformed metal shingle systems.
Copper	12 oz./sq. ft. for preformed metal shingle systems.
Galvanized steel	ASTM A 653 G-90 zinc-coated[a].
Hard lead	2 lbs./sq. ft.
Lead-coated copper	ASTM B 101
Prepainted steel	ASTM A 755
Soft lead	3 lbs./sq. ft.
Stainless steel	ASTM A 240, 300 Series Alloys
Steel	ASTM A 924
Terne and terne-coated stainless	Terne coating of 40 lbs. per double base box, field painted where applicable in accordance with manufacturer's installation instructions.
Zinc	0.027 inch minimum thickness; 99.995% electrolytic high grade zinc with alloy additives of copper (0.08% - 0.20%), titanium (0.07% - 0.12%) and aluminum (0.015%).

For SI: 1 ounce per square foot = 0.0026 kg/m^2, 1 pound per square foot = 4.882 kg/m^2, 1 inch = 25.4 mm, 1 pound = 0.454 kg.

a. For Group U buildings, the minimum coating thickness for ASTM A 653 galvanized steel roofing shall be G.

TABLE 1507.4.3~~(2)~~(3)
MINIMUM CORROSION RESISTANCE

(No change to table contents)

Reason: This code change proposal does not change any technical requirements for metal coverings. This code proposal separates the Standard Application Rates and Thicknesses for metal panel and shingle types into two (2) tables. This makes the code easier to use and provides a simplified way to establish differences between metal panel and metal shingle requirements in the future.

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

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

FS204–06/07
Table 1507.8; IRC R905.7.5, R905.8.6

Proponent: Steven William Harris, Quality Auditing Institute, representing Cedar Shake and Shingle Bureau

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

PART I – IBC STRUCTURAL

Revise table as follows:

TABLE 1507.8
WOOD SHINGLE AND SHAKE INSTALLATION

ROOF ITEM	WOOD SHINGLES	WOOD SHAKES
5. Application	—	—
Attachment	Fasteners for wood shingles shall be ~~corrosion resistant~~ hot dipped galvanized or type 304 (type 316 for coastal areas) stainless steel with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.	Fasteners for wood shakes shall be ~~corrosion resistant~~ hot dipped galvanized or type 304 (type 316 for coastal areas) with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.
No. of fasteners	Two per shingle.	Two per shake.
Exposure	Weather exposures shall not forth in Table 1507.8.6	Weather exposures shall not exceed those set forth in Table 1507.9.7
Method	Shingles shall be laid with a side lap of not less than 1.5 inches between joints in courses, and no two joints in any three adjacent courses shall be in direct alignment. Spacing between shingles shall be 0.25 to 0.375 inch.	Shakes shall be laid with a side lap of not less than 1.5 inches between joints in adjacent courses. Spacing between shakes shall not be less than 0.375 inch or more than 0.625 inch for shakes and tapersawn shakes of naturally durable wood and shall be 0.25 to 0.375 inch for preservative taper sawn shakes.

(Portions of table not shown do not change)

PART II – IRC BUILDING/ENERGY

Revise as follows:

R905.7.5 Application. Wood shingles shall be installed according to this chapter and the manufacturer's installation instructions. Wood shingles shall be laid with a side lap not less than 1½ inches (38 mm) between joints in courses, and no two joints in any three adjacent courses shall be in direct alignment. Spacing between shingles shall not be less than ¼ inch to 3/8 inch (6 mm to 10 mm).Weather exposure for wood shingles shall not exceed those set in Table R905.7.5. Fasteners for wood shingles shall be ~~corrosion resistant~~ hot dipped galvanized or type 304 (type 316 for coastal areas) stainless steel, with a minimum penetration of ½ inch (13 mm) into the sheathing. For sheathing less than ½ inch (13 mm) in thickness, the fasteners shall extend through the sheathing. Wood shingles shall be attached to the roof with two fasteners per shingle, positioned no more than ¾ inch (19 mm) from each edge and no more than 1 inch (25 mm) above the exposure line.

R905.8.6 Application. Wood shakes shall be installed according to this chapter and the manufacturer's installation instructions. Wood shakes shall be laid with a side lap not less than 1½ inches (38 mm) between joints in adjacent courses. Spacing between shakes in the same course shall be 1/8 inch to 5/8 inch (3 mm to 16 mm) for shakes and tapersawn shakes of naturally durable wood and shall be ¼ inch to 3/8 inch (6mmto 10 mm) for preservative treated taper sawn shakes. Weather exposure for wood shakes shall not exceed those set forth in Table R905.8.6. Fasteners for wood shakes shall be ~~corrosion-resistant~~ hot dipped galvanized or type 304 (type 316 for coastal areas) stainless steel, with a minimum penetration of ½ inch (12.7 mm) into the sheathing. For sheathing less than ½ inch (12.7 mm) in thickness, the fasteners shall extend through the sheathing. Wood shakes shall be attached to the roof with two fasteners per shake, positioned no more than 1 inch (25 mm) from each edge and no more than 2 inches (51 mm) above the exposure line.

Reason: This code change will eliminate the use of electro galvanized fasteners which have been shown to fail prematurely causing shakes or shingles to lose their attachment to the deck.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IBC STRUCTURAL

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

PART II – IRC BUILDING/ENERGY

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

FS205–06/07
Table 1507.8; IRC R905.7.5

Proponent: Steven William Harris, Quality Auditing Institute, representing Cedar Shake and Shingle Bureau

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

PART I – IBC STRUCTURAL

Revise table as follows:

TABLE 1507.8
WOOD SHINGLE AND SHAKE INSTALLATION

ROOF ITEM	WOOD SHINGLES	WOOD SHAKES
5. Application	—	—
Attachment	Fasteners for wood shingles shall be corrosion resistant with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.	Fasteners for wood shakes shall be corrosion resistant with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.
No. of fasteners	Two per shingle.	Two per shake.
Exposure	Weather exposures shall not forth in Table 1507.8.6	Weather exposures shall not exceed those set forth in Table 1507.9.7
Method	Shingles shall be laid with a side lap of not less than 1.5 inches between joints in courses, and ~~no two joints in any three adjacent courses shall be in direct alignment~~ not more than 10% of joints shall be in direct alignment in alternate courses. Spacing between shingles shall be 0.25 to 0.375 inch	Shakes shall be laid with a side lap of not less than 1.5 inches between joints in adjacent courses. Spacing between shakes shall not be less than 0.375 inch or more than 0.625 inch for shakes and tapersawn shakes of naturally durable wood and shall be 0.25 to 0.375 inch for preservative taper sawn shakes.

(Portions of table not shown do not change)

PART II – IRC BUILDING/ENERGY

Revise as follows:

R905.7.5 Application. Wood shingles shall be installed according to this chapter and the manufacturer's installation instructions. Wood shingles shall be laid with a side lap not less than 1½ inches (38 mm) between joints in courses, ~~and no two joints in any three adjacent courses shall be in direct alignment~~ and not more than 10% shall be in direct alignment in alternate courses. Spacing between shingles shall not be less than ¼ inch to 3/8 inch (6 mm to 10 mm). Weather exposure for wood shingles shall not exceed those set in Table R905.7.5. Fasteners for wood shingles shall be corrosion resistant with a minimum penetration of 1/2 inch (13 mm) into the sheathing. For sheathing less than ½ inch (13 mm) in thickness, the fasteners shall extend through the sheathing. Wood shingles shall be attached to the roof with two fasteners per shingle, positioned no more than 3/4 inch (19 mm) from each edge and no more than 1 inch (25 mm) above the exposure line.

Reason: (IBC and IRC) Cedar shingle roofs have been applied this way for many years in accordance with the Cedar Shake and Shingle Bureau application manual page 5. To the best of the Cedar Shake and Shingle Bureau's knowledge, allowing 10% of the shingle keyways in alternate courses to line up does not adversely affect the performance of the roof. When you consider how many shingles there are to apply to a roof it would be very difficult to ensure that no two joints in alternate courses would be in direct alignment. The Cedar Shake and Shingle Bureau believes that shingle roofs are already being applied this way as our experts inform us that it is very near impossible to apply a shingle roof without any of the shingle keyways in alternate courses lining up. I have included letters and pictures from roofing consultants, manufacturers and applicators in support of this code change.

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

Analysis: The letters of support were received with this proposal but have not been printed here. The letters are from: Anbrook Industries Ltd.; G&R Cedar Ltd.; Watkins Sawmills Ltd.; and Quality Auditing Institute.

PART I – IBC STRUCTURAL

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

PART II – IRC BUILDING/ENERGY

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

FS206–06/07

Table 1507.8; IRC R905.8.6

Proponent: Steven William Harris, Quality Auditing Institute, representing Cedar Shake and Shingle Bureau

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

PART I – IBC STRUCTURAL

Revise table as follows:

TABLE 1507.8
WOOD SHINGLE AND SHAKE INSTALLATION

ROOF ITEM	WOOD SHINGLES	WOOD SHAKES
5. Application	—	—
Attachment	Fasteners for wood shingles shall be corrosion resistant with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.	Fasteners for wood shakes shall be corrosion resistant with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.
No. of fasteners	Two per shingle.	Two per shake.
Exposure	Weather exposures shall not forth in Table 1507.8.6	Weather exposures shall not exceed those set forth in Table 1507.9.7
Method	Shingles shall be laid with a side lap of not less than 1.5 inches between joints in courses, and no two joints in any three adjacent courses shall be in direct alignment. Spacing between shingles shall be 0.25 to 0.375 inch.	Shakes shall be laid with a side lap of not less than 1.5 inches between joints in adjacent courses. Spacing between shakes shall ~~not be less than 0.375 inch or more than 0.625~~ 3/8 inch to 5/8 inch for shakes and tapersawn shakes of naturally durable wood and shall be ~~0.25~~ 3/8 to ~~0.375~~ 5/8 inch for preservative taper sawn shakes.

(Portions of table not shown do not change)

PART II – IRC BUILDING/ENERGY

R905.8.6 Application. Wood shakes shall be installed according to this chapter and the manufacturer's installation instructions. Wood shakes shall be laid with a side lap not less than 1½ inches (38 mm) between joints in adjacent courses. Spacing between shakes in the same course shall be ~~1/8~~ 3/8 inch to 5/8 inch (~~3~~ 9.5 mm to ~~16~~ 15.9 mm) for shakes and taper sawn shakes of naturally durable wood and shall be ~~¼~~ 3/8 inch to ~~3/8~~ 5/8 inch (~~6~~ 9.5 mm to ~~10~~ 15.9 mm) for preservative treated taper sawn shakes. Weather exposure for wood shakes shall not exceed those set forth in Table R905.8.6. Fasteners for wood shakes shall be corrosion-resistant, with minimum penetration of ½ inch (12.7 mm) into the sheathing. For sheathing less than ½ inch (12.7 mm) in thickness, the fasteners shall extend through the sheathing. Wood shakes shall be attached to the roof with two fasteners per shake, positioned no more than 1 inch (25 mm) from each edge and no more than 2 inches (51 mm) above the exposure line.

Reason: The Cedar Shake and Shingle Bureau's application instructions require that the minimum spacing between shakes be 3/8 inches. The reason for this is that with a 1/8 inch spacing it has been found that leaves and/or needles from evergreen trees get trapped in the keyways and may cause premature aging of the product.

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

PART I – IBC STRUCTURAL

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

PART II – IRC BUILDING/ENERGY

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

FS207–06/07
Table 1507.9.5

Proponents: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

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

Revise table as follows:

TABLE 1507.9.5
WOOD SHAKE MATERIAL REQUIREMENTS

Material	Minimum Grades	Applicable Grading Rules
Wood shakes of naturally durable wood	1	CSSB
Taper sawn shakes of naturally durable wood	1 or 2	CSSB
Preservative-treated shakes and shingles of naturally durable wood	1	CSSB
Fire-retardant-treated shakes and shingles of naturally durable wood	1	CSSB
~~Preservative-treated taper sawn shakes of Southern pine treated in accordance with AWPA U1 (Commodity Specification A, Use Category 3B and Section 5.6)~~	~~1 or 2~~	~~TFS~~

CSSB = Cedar Shake and Shingle Bureau
~~TFS = Forest Products Laboratory of the Texas Forest Services~~

Reason: This proposal omits from the Code a reference standard that does not appear to comply with ICC's criteria for reference standards. TFS was added during the Code's last development cycle. Omission of TFS does not change the code's requirements in that other acceptable reference standards are already included in this section.

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

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

FS208–06/07
1507.12.3

Proponent: David L. Roodvoets, DLR Consultants, representing Single-ply Roofing Institute, Inc. (SPRI)

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

Add new text as follows:

1507.12.3 Ballasted thermoset low slope roofs (<2:12) shall be installed in accordance with this section and section 1504.4

Reason: This change clarifies the requirements for thermoset ballasted roofs. It is proposed to be added so that uses can refer directly to section requirements.

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

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

FS209–06/07
1507.13.3 (New)

Proponent: David L. Roodvoets, DLR Consultants, representing Single-ply Roofing Institute, Inc. (SPRI)

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

Add new text as follows:

1507.13.3 Ballasted thermoplastic low slope roofs (<2:12) shall be installed in accordance with this section and section 1504.4

(Renumber subsequent sections)

Reason: This change clarifies the requirements for thermoplastic ballasted roofs. It is proposed to be added so that uses can refer directly to section requirements.

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

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

FS210–06/07
1507.16 (New)

Proponent: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

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

Add new text as follows:

1507.16 Roof gardens and landscaped roofs. Roof gardens and landscaped roof shall comply with the requirements of this Chapter, Section 1607.11.2.2 and Section 1607.11.2.3.

Reason: This proposed code change adds new requirements and clarifies existing requirements in the code. This proposed code language requires roof gardens and landscaped roofs to equivalently meet the same requirements as all other roof systems. Additionally, this proposed code language ties the existing requirements for special purpose roofs (e.g., garden roofs) and landscaped roofs in Chapter 16 to Chapter 15.

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

Analysis: Is this provision better located in 1504 or 1509?

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

FS211–06/07
1509.2.1

Proponent: Joe Holland, Hoover Treated Wood Products, Inc.

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

Revise as follows:

1509.2.1 Type of construction. Penthouses shall be constructed with walls, floors and roof as required for the building.

Exceptions:

1. On buildings of Type I ~~and II~~ construction, the exterior walls and roofs of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be of at least 1-hour fire-resistance-rated noncombustible construction. Walls and roofs with a fire separation distance of 20 feet (6096 mm) or greater shall be of noncombustible construction. Interior framing and walls shall be of noncombustible construction.
2. On buildings of Type I two stories or less in height and Type II construction, the exterior walls and roofs of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be of at least 1-hour fire-resistance-rated noncombustible or fire-retardant-treated wood construction. Walls and roofs with a fire separation distance of 20 feet (6096 mm) or greater shall be of noncombustible or fire-retardant-treated wood construction. Interior framing and walls shall be of noncombustible or fire-retardant-treated wood construction.
~~2.~~ 3. On buildings of Type III, IV and V construction, the exterior walls of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be at least 1-hour fire-resistance-rated construction. Walls with a fire separation distance of 20 feet (6096 mm) or greater from a common property line shall be of Type IV, ~~or~~ noncombustible, or fire-retardant-treated wood construction.

Roofs shall be constructed of materials and fire-resistance rated as required in Table 601and Section 601 item 1.3. Interior framing and walls shall be Type IV, ~~or~~ noncombustible, or fire-retardant-treated wood construction.

~~3.~~ 4. On buildings of Type I ~~U~~unprotected noncombustible enclosures housing only mechanical equipment and located with a minimum fire separation distance of 20 feet (6096 mm) shall be permitted.

5. On buildings of Type I two stories or less, II, III, IV, and V unprotected noncombustible or fire-retardant-treated wood enclosures housing only mechanical equipment and located with a minimum fire separation distance of 20 feet (6096 mm) shall be permitted.

~~4.~~ 6. On one-story buildings, combustible unroofed mechanical equipment screens, fences or similar enclosures are permitted where located with a fire separation distance of at least 20 feet (6096 mm) from adjacent property lines and where not exceeding 4 feet (1219 mm) in height above the roof surface.

~~5.~~ 7. Dormers shall be of the same type of construction as the roof on which they are placed, or of the exterior walls of the building.

Reason: The roof structure on all types of construction can be constructed using fire-retardant-treated wood. This change clarifies that a roof top structure can be FRTW as well.

With the limitation and size restrictions contained within the exceptions for rooftop structures it's inconsistent to not allow materials used in the construction of the roof structure to be used for a fence on a roof, or a penthouse.

Section 603.1.3 allows the roof structure to be FRTW in Type I two stories or less and Type II.

Cost Impact: The code change proposal will not increase the cost of construction and may save in construction costs and time.

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

FS212–06/07
1510.3

Proponents: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

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

Revise as follows:

1510.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.

Reason: The proposed code change clarifies the intent of the code by specifically indicating that when roof removal is necessary removal of all roof coverings down to the roof is required.

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

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

FS213–06/07
1510.3; IRC R907.3

Proponent: T. Eric Stafford, Institute for Business and Home Safety, Birmingham, AL

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

PART I – IBC STRUCTURAL

Revise as follows:

1510.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.
4. <u>For tested assemblies, where the roof covering being installed has not been tested indicating equivalent performance for installation over existing roofs.</u>

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R907.3 Re-covering versus replacement. New roof coverings shall not be installed with out first removing existing roof coverings where any of the following conditions occur:

1. Where the existing roof or roof covering is water-soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.
4. For asphalt shingles, when the building is located in an area subject to moderate or severe hail exposure according to Figure R903.5.
5. <u>For tested assemblies, where the roof covering being installed has not been tested indicating equivalent performance for installation over existing roofs</u>

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Installation of metal panel, metal shingle, and concrete and clay tile roof coverings over existing wood shake roofs shall be permitted when the application is in accordance with Section R907.4.
3. The application of new protective coating over existing spray polyurethane foam roofing systems shall be permitted without tear-off of existing roof coverings.

Reason: (IBC 1510.3 and IRC R907.3) This proposal is intended to ensure that when new roof coverings that are required to be tested are installed over existing roof coverings, that the new roof covering has been tested and shown to perform equivalently over an existing roof as compared to installation directly to the roof deck. This provision only applies to roof coverings required to be tested. For example, currently asphalt shingles are required to be tested for areas where the basic wind speed is 110 mph or greater. For asphalt shingles installed over existing asphalt shingle roofs in areas where the basic wind speed is 110 mph or greater, the testing will have to show that installation over a existing roof will not be detrimental to the performance of the new roof covering.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IBC STRUCTURAL

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

PART II – IRC BUILDING/ENERGY

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

FS214–06/07
1510.3; IRC R907.3

Proponent: Mason Knowles, Spray Polyurethane Foam Alliance

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

PART I – IBC STRUCTURAL

Revise as follows:

1510.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.
4. <u>The application of spray polyurethane foam roofing systems shall be permitted over asphalt shingles, clay and concrete tile roof coverings without tear-off when installed in accordance with Section 1507.14 and Section 1510.5</u>

PART II – IRC BUILDING/ENERGY

Revise as follows:

R907.3 Re-covering versus replacement. New roof coverings shall not be installed without first removing existing roof coverings where any of the following conditions occur:

1. Where the existing roof or roof covering is water-soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.
4. For asphalt shingles, when the building is located in an area subject to moderate or severe hail exposure according to Figure R903.5.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.

2. Installation of metal panel, metal shingle, and concrete and clay tile roof coverings over existing wood shake roofs shall be permitted when the application is in accordance with Section R907.4.

4. The application of new protective coating over existing spray polyurethane foam roofing systems shall be permitted without tear-off of existing roof coverings.

4. The application of spray polyurethane foam roofing systems shall be permitted over asphalt shingles, clay and concrete tile roof coverings without tear-off when installed in accordance with Section R905.14 and R907.5.

Reason: (IBC) The code change is to specifically allow the use of SPF roofing systems over shingle and tile roof systems. Use of SPF over shingles and tile is an enhancement of the existing roofing system.

SPF installed over existing shingles and tile roofing systems has performed exceptionally well in high wind areas. Installing SPF roofing systems over existing shingles and tile increases the wind up lift resistance of the existing system and minimizes damage from wind driven debris.

(IRC) The code change would allow the use of SPF over existing shingle and tile roofing systems.

SPF installed over existing shingles and tile roofing systems has performed exceptionally well in high wind areas. Installing SPF roofing systems over existing shingles and tile increases the wind up lift resistance of the existing system and minimizes damage from wind driven debris. The proponent shall justify changing the current code provisions, stating why the proposal is superior to the current provisions of the Code. Proposals that add or delete requirements shall be supported by a logical explanation which clearly shows why the current Code provisions are inadequate or overly restrictive, specifies the shortcomings of the current Code provisions and explains how such proposals will improve the Code.

The Roofing Industries Committee for Weather Issues, (RICOWI) Hurricane Charley and Ivan report documents exceptional performance of SPF roofing systems over shingles and tile roofs in high wind areas. The proponent shall substantiate the proposed code change based on technical information and substantiation. Substantiation provided which is reviewed in accordance with Section 4.2 and determined as not germane to the technical issues addressed in the proposed code change shall be identified as such. The proponent shall be notified that the proposal is considered an incomplete proposal in accordance with Section 4.3, and the proposal shall be held until the deficiencies are corrected. The proponent shall have the right to appeal this action in accordance with the policy of the ICC Board. The burden of providing substantiating material lies with the proponent of the code change proposal. A minimum of two copies of all substantiating information shall be submitted.

Bibliography (IBC): The proponent shall submit a bibliography of any substantiating material submitted with the code change proposal. The bibliography shall be published with the code change and the proponent shall make the substantiating materials available for review at the appropriate ICC office and during the public hearing.

Bibliography (IRC): Research conducted by the Roofing Industry's Committee on Weather Issues confirm that SPF installed over shingles and tile roofing systems perform exceptionally well in high wind areas.. Refer to the Roofing Industries Committee for Weather Issues, Hurricane Charley and Ivan report.

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

PART I – IBC STRUCTURAL

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

PART II – IRC BUILDING/ENERGY

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

FS215–06/07
2602.1, 2604 (New)

Proponent: Charles Cottrell, North American Insulation Manufacturers Association (NAIMA), Alexandria, VA

Add new text as follows:

2602.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

REFLECTIVE PLASTIC CORE INSULATION. A reduced-density plastic insulation material with a reflective metallic surface on at least one side and less than 0.5 inches (12.7 mm) thick containing voids consisting of open or closed cells distributed throughout the material.

SECTION 2604
REFLECTIVE PLASTIC CORE INSULATION

2604.1 General. The provisions of this section shall govern the requirements and uses of reflective plastic core insulation in buildings and structures.

2604.2 Labeling and identification. Packages and containers of reflective plastic core insulation and reflective plastic core insulation components delivered to the job site shall bear the label of an approved agency showing the

manufacturer's name, the product listing, product identification and information sufficient to determine that the end use will comply with the code requirements.

2604.3 Surface-burning characteristics. Except as provided for in Section 2604.5, reflective plastic core insulation shall have a flame spread index of not more than 75 and a smoke-developed index of not more than 450 when tested at the maximum thickness intended for use in accordance with ASTM E 84. The ASTM E84 test shall be conducted using a mounting method related to the actual end-use configuration.

Reflective plastic core insulations used as an interior finish based on the tests in Section 2604.5 shall also conform to the flame spread requirements of Chapter 8.

2604.4 Thermal barrier. Reflective plastic core insulation shall be separated from the interior of a building by an approved thermal barrier of 0.5-inch (12.7 mm) gypsum wallboard or equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250ºF (120ºC) after 15 minutes of fire exposure, complying with the standard time-temperature curve of ASTM E 119. The thermal barrier shall be installed in such a manner that it will remain in place for 15 minutes based on FM 4880, UL 1040, NFPA 286 or UL 1715.

2604.5 Special approval. Reflective plastic core insulation shall not be required to comply with the requirements of Sections 2604.3 and 2604.4 where specifically approved based on large-scale tests such as, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.2) FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished reflective plastic core insulation assembly in the maximum thickness intended for use. Reflective plastic core insulations that are used as interior finish on the basis of special tests shall also conform to the flame spread requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

(Renumber subsequent sections)

Reason: The purpose of this proposal is to add a definition for reflective foam core insulation and requirements for this type of materials to the IBC.

There are a number of reflective insulation materials made using "bubble pack" plastic as the core. This is the material used as a packing material for fragile items. (You know the stuff that is fun to pop.) Most manufacturers of these materials claim they do not have to comply with the combustibility requirements for foam plastics in chapter 26 because they do not use a "blowing agent to expand the plastic core.

These reflective insulation materials are being advertised for exposed installation in buildings without any thermal barrier or protective covering. This presents a significant fire hazard.

The current definition of foam plastic does not include "bubble pack" type materials because the "bubbles" in the materials are not formed with a foaming agent - but are mechanically formed using a stamping process. From a fire performance standpoint, these materials are predominantly plastic containing voids filled with air that support combustion.

The requirements in the new Section 2604, are modeled after those for "foam plastics" but have been modified to address specific issues NAIMA has identified in the testing of these materials. Specifically, the language, "The ASTM E84 test shall be conducted using a mounting method related to the actual end-use configuration" is to address the issue of how NAIMA believes some manufacturers are mounting their materials in the tunnel test. In 2001 NAIMA performed several ASTM E84 tests on these types of materials that showed if they are mounted in the tunnel and supported with poultry netting (chicken wire) the flame spread index is reduced from over 300 to 25 or less.

The addition of the language, "Reflective plastic core insulations used as interior finish on the basis of special tests in Section 2604.5 shall also conform to the flame spread requirements of Chapter 8" was added to direct the user to the requirements in chapter 8 when the materials are used as an interior finish. This was done because these materials are specifically marketed for that application, unlike most foam plastic materials.

Finally, for those that argue the materials will not be able to be used because they cannot meet the flame and smoke spread indices, new 2604.5 Special Approvals allows a manufacturer to demonstrate the material is safe for the intended application using accepted full-scale tests like a corner room.

This change will add a definition and requirements for a combustible material that technically is not covered in the building codes. The materials will be required to pass one of the large scale tests in the new section 2604.5 Special Approvals or to be covered with an appropriate thermal barrier.

The North American Insulation Manufacturers Association (NAIMA), the trade association representing the fiber glass industry has performed 2 full scale fire tests on these materials. The bubble pack types of materials that NAIMA tested in a UL 1715 corner room test and a full scale metal building demonstration (a modified NFPA 286 test) flashed over in less than 2 minutes. A summary of the UL 1715 testing is available on line in our literature piece entitled, "Fire & Thermal Performance of Reflective Insulations in Metal Building Applications" which can be viewed on line at http://www.naima.org/pages/resources/library/pdf/MB313.PDF

Although this publication is focused on metal building applications these types of materials are sold in home improvement stores for homeowners to install in any application they see fit without sufficient warnings about the combustibility of the products. Additionally there is an extensive explanation of the testing contained on a video CD produced by NAIMA entitled, "*Reflective Insulation Fire Testing*" in January 2006.

The ASTM E84 tests NAIMA did in 2001 on these types of materials showed if they are mounted in the tunnel and supported with poultry netting (chicken wire) the flame spread index is reduced from over 300 to 25 or less. These test results are summarized in a video CD entitled, "*Metal Building Insulation Code Compliance"* which is available upon request from the association.

Below is a photo of a reflective bubble pack insulation material installed without any covering in a utility type metal building – the photo was taken less than 1 minute and 30 seconds after the material was exposed to a 40Kw (approximately wastebasket size) fire.

Copies of all applicable ASTM E84, UL 1715 and modified NFPA 286 test reports will also be supplied upon request.

Bibliography:
Omega Point Laboratories (UL 1715) – Project # 13220-109402, November 15, 2001
Omega Point Laboratories (ASTM E84) – Project # 13220-109403, August 23, 2001
Omega Point Laboratories (ASTM E84) – Project # 13220-109417, August 23, 2001
Omega Point Laboratories (UL 1715) – Project # 13220-109410, November 15, 2001
Omega Point Laboratories (ASTM E84) – Project # 13220-109406, August 23, 2001
Omega Point Laboratories (ASTM E84) – Project # 13220-109405, August 23, 2001
Intertek ETK SEMKO (modified NFPA 286) – Project No. 3088157-501, January 13, 2006

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

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

FS216–06/07
2606.4

Proponent: William E. Koffel, P.E., Koffel Associates, Inc.

Revise as follows:

2606.4 Specifications. Light-transmitting plastics, including thermoplastic, thermosetting or reinforced thermosetting plastic material, shall have a self-ignition temperature of 650°F (343°C) or greater where tested in accordance with ASTM D 1929; a smoke-developed index not greater than 450 where tested in the manner intended for use in accordance with ASTME84, or an average smoke density rating not greater than 75 where tested in the thickness intended for use in accordance with ASTM D 2843 and shall conform to one of the following combustibility classifications:

Class CC1: Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635,
Class CC2: Plastic materials that have a burning rate of 2.5 inches per minute (1.06 mm/s) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635.

Reason: ASTM D 2843 required that a smoke density rating be obtained for three specimens and that an average smoke density rating for the three specimens be reported. The proposed change clarifies the original intent of the code which was that the average smoke density rating of the three specimens does not exceed 75. Without the clarification, one could interpret the Code to say that the smoke density of all three specimens shall not exceed 75.

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

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

FS217 - 06/07
Chapter 35

Proponent: Standards writing organizations as listed below.

Revise standards as follows:

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Standard reference number	Title
A 240/A 240M-05a ~~04~~	Standard Specification for Chromium and Chromium-nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications
A 463/A 463M – 05 ~~02a~~	Specification for Steel Sheet, Aluminum-coated, by the Hot Dip Process
A 653/A 653-05a ~~04a~~	Specification for Steel Sheet, Zinc-Coated Galvanized or Zinc-Iron Alloy-coated Galvannealed by the Hot-Dip Process
A 755/A 755M-03 ~~04~~	Specification for Steel Sheet, Metallic-coated by the Hot-dip Process and Prepainted by the Coil-coating Process for Exterior Exposed Building Products
A 792A 792M-05 ~~03~~	Specification for Steel Sheet, 55% Aluminum-zinc Allow-coated by the Hot-dip Process
A 875/A 875M- 05 ~~02a~~	Standard Specification for Steel Sheet Zinc-5 percent, Aluminum Allow-coated by the Hot-dip Process
A 924/A 924M-04	Standard Specification for General Requirements for Steel Sheet, Metallic-coated by the Hot-Dip Process
C 73-05 ~~99a~~	Specification for Calcium Silicate Face Brick (Sand-Lime Brick)
C 140-05a ~~03~~	Test Method Sampling and Testing Concrete Masonry Units and Related Units
C 330-05 ~~04~~	Specification for Lightweight Aggregates for Structural Concrete
C 331-05 ~~04~~	Specification for Lightweight Aggregates for Concrete Masonry Units
C 406-05 ~~00~~	Specification Roofing Slate
C 514-04 ~~01~~	Specification for Nails for the Application of Gypsum Board
C 547-06 ~~03~~	Specification for Mineral Fiber Pipe Insulation
C 635-04 ~~00~~	Specification for the Manufacturer, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
C 728-05 ~~97~~[e1]	Standard Specification for Perlite Thermal Insulation Board
C 836-05 ~~03~~	Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
C 957-05a ~~04~~	Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface
C 1029-05a ~~02~~	Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation
C 1289—05a ~~03~~	Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
D 41-05 ~~94(2000)e01~~	Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
D 225-05 ~~04~~	Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules
D 226-05 ~~97a~~	Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
D 1227-95(2000) ~~00~~	Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
D 1863-03 ~~05~~	Specification for Mineral Aggregate Used on Built-Up Roofs
D 2178-04 ~~97a~~	Specification for Asphalt Glass Felt Used in Roofing and Waterproofing
D 2822- 05 ~~91(1997)e01~~	Specification for Asphalt Roof Cement
D 2898-94 (2004) ~~1999~~	Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
D 3019-94(2000)e01 ~~(Supp)~~	Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos Fibered, and Non-Asbestos Fibered
D 3161-05 ~~03b~~	Test Method for a Wind Resistance of Asphalt Shingles (Fan Induced Method)
D 3462-05 ~~04~~	Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules

D 3679-05 ~~04~~	Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding
D 3909-97b(2004)e01	Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules
D 4869-05 ~~04~~	Specification for Asphalt-Saturated (Organic Felt) Underlayment Used in Steep Slope Roofing
D 4990-97a(2005)e01	Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing
D 5019-05 ~~96e01~~	Specification for Reinforced Non-Vulcanized Polymeric Sheet Used in Roofing Membrane
D 5726-98(2005)	Specification for Thermoplastic Fabrics Used in Hot-Applied Roofing and Waterproofing
D 6083-05e01 ~~97a~~	Specification for Liquid Applied Acrylic Coating Used in Roofing
D 6164-05 ~~00~~	Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements
D 6222-02e01	Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements
D 6298-05 ~~00~~	Specification for Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface
D 6380-03 ~~01~~[e1]	Standard Specification for Asphalt Roll Roofing (Organic) Felt
D 6381-03b	Standard Test Method for Measurement of Asphalt Shingle Mechanical Uplift Resistance
D 6757-05 ~~02~~	Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products
E 108-05 ~~04~~	Test Methods for Fire Test of Roof Coverings
E 119-05a ~~00~~	Test Methods for Fire Tests of Building Construction and Materials
E 136-04 ~~99e01~~	Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C
E1592-05 ~~01~~	Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
E 1966-01 ~~00~~	Test Method for Fire Resistant Joint Systems
E 2307-04e01	Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-Story Test Apparatus
F 1667-05 ~~03~~	Specification for Driven Fasteners: Nails, Spikes and Staples
F 2006-00(2005)	Standard/Safety Specification for Window Fall Prevention Devices for Non-Emergency Escape (Egress) and Rescue (Ingress) Windows
G 152-05 ~~04~~	Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
G 154-05 ~~00A~~	Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
G 155-05a ~~04~~	Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

GA

Gypsum Association
810 First Street, N.E. #510
Washington, DC 20002-42881

Standard reference number	Title
GA 600-06 ~~03~~	Fire Resistance Design Manual 18th ~~17th Edition~~

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269-9101

Standard reference number	Title
101-06 ~~030~~	Life Safety Code
257-00	Standard ~~for~~ on Fire Test for Window and Glass Block Assemblies
259-03 ~~04~~	Test Method for Potential Heat of Building Materials
285-06 ~~98~~	Method of Test for the Evaluation of ~~Flammability~~ Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
286-06 ~~00~~	Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
288-01	Standard Methods of Fire Tests ofFloor Fire Door Assemblies Installed Horizontally Fire-Resistance-Rated Floor Systems

UL	Underwriters Laboratories 333 Pfingsten Road Northbrook, IL 60062
Standard reference number	Title
103-2001	Factory-Built Chimneys, for Residential Type and Building Heating Appliances with Revisions through December ~~2003~~ 2005
217–97	Single and Multiple Stations Smoke Alarms - with revisions through ~~January 2004~~ August 2005
300-2005 ~~1996~~	Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas ~~- with Revisions through December 1998~~
790-04 ~~98~~	Tests for Fire Resistance of Roof Covering Materials ~~- with Revisions through July 1998~~
1784-2001 ~~95~~	Air Leakage Tests of Door Assemblies - with Revisions through December 2004
1897-2004 ~~1998~~	Uplift Tests for Roof Covering Systems ~~- with Revisions through November 2002~~
2079-2004 ~~98~~	Tests for Fire Resistance of Building Joint Systems with Revisions through March 2006
2390-04	Test Method for Measuring the Wind Uplift Coefficients for Asphalt Shingles - with Revisions through January 2004

Reason: The *ICC Code Development Process for the International Codes* (Procedures) Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Proposal. In May 2005, a letter was sent to each developer of standards that are referenced in the I-Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the list received of the referenced standards under the maintenance responsibility of the IBC Fire Safety Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

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