Proposed Code Modifications

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WITHOUT COMMENTS
Sub Code: Building

R6720

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**Comments**

| General Comments | No | Alternate Language | No |

**Related Modifications**

**Summary of Modification**

Change section heading.

**Rationale**

Change of heading is inclusive of reroofing, recovering, repairs, roof components and maintenance.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  No impact. Provides improved code section language.

- **Impact to building and property owners relative to cost of compliance with code**
  No impact. Provides improved code section language.

- **Impact to industry relative to the cost of compliance with code**
  No impact. Provides improved code section language.

- **Impact to small business relative to the cost of compliance with code**
  No impact. Provides improved code section language.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  Provides improved guidance with established FBC code language

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  Provides improved guidance with established FBC code language

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  Does not discriminate. Provides improved guidance with established FBC code language

- **Does not degrade the effectiveness of the code**
  Does not degrade. Provides improved guidance with established FBC code language

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES
The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
Section 1511 Existing RE Roofing
See attached PDF file.
SECTION 1511 REROOFING
Provides clarification to current State Statute mandated Florida-specific criteria

To improve previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Impact to local entity relative to enforcement of code
No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
Does not discriminate. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Does not degrade the effectiveness of the code
Does not degrade. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
1507.4 Metal roof panels. The installation of metal roof panels shall comply with the provisions of this section. Metal roofing panels shall be factory or field manufactured in accordance with the manufacturers’ Product Approval specifications and limitations of use. Metal roofing panels shall be factory or field manufactured under a quality assurance program that is audited by a third-party quality assurance entity approved by the Florida Building Commission for that purpose.
See attached PDF file.
1507.4 Metal roof panels. The installation of metal roof panels shall comply with the provisions of this section. Metal roofing panels shall be manufactured in accordance with the manufacturers' Product Approval's specifications and limitations of use. Metal roofing panels shall be manufactured under a quality assurance program that is audited by a third-party quality assurance entity approved by the Florida Building Commission for that purpose.
### General Comments

**Alternate Language**  No

**Related Modifications**

### Summary of Modification

Updates to HVHZ roofing requirements

### Rationale

The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

These proposed modifications include:

- Removal of references to withdrawn standards.
- Removal of references to legacy documents, including ICBO acceptance criteria.
- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
- Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**  
  $0

- **Impact to building and property owners relative to cost of compliance with code**  
  $0

- **Impact to industry relative to the cost of compliance with code**  
  $0

- **Impact to small business relative to the cost of compliance with code**  
  $0

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**  
  Correlates updates for HVHZ requirements to improve building performance.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**  
  Removes outdated requirements

- **Does not discriminate against materials, products, methods, or systems of construction**  
  Incorporates latest versions of referenced standards and removes obstacles to product approval.

- **Does not degrade the effectiveness of the code**  
  Improves code effectiveness by removing unenforceable requirements.

**Is the proposed code modification part of a prior code version?**  No
Original Mod plus A3 (for original text, see original mod)

A3

FBC Chapter 15 HVHZ

ARMA Public Comment Please make additional changes as follows:

1513.1

CORROSION RESISTANT. Any component that passes FMRC-FM Global Test Standard 4470’s Appendix, as modified, and set forth in TAS 114.

1518.7.1

Underlayments meeting or exceeding minimum underlayments specifications, as detailed in Section 1518, shall be applied in compliance with the application methods detailed in the product approval. Where the architectural appearance of the underside of the roof is to be preserved, refer to Section 1519.5.2.

1521.17

Asphaltic-shingle assemblies may be applied over one existing layer of asphaltic-shingles having not more than 1/16-inch (3.2 mm) difference in level in the existing shingle material. Recover over an existing shingle system shall be with a product having a product approval as prepared roof covering, in strict compliance with the application method detailed in the product approval.

1523.5.1

All asphaltic-shingles, tile products and metal roofing panels and clips shall be labeled on the underside with the Florida Building Code, Building insignia, or product approval number, or the wording “Florida Building Code, Building product approved,” and manufacturer’s initials or manufacturer’s logo, or as specified in the manufacturer’s product approval.

1523.6.5.1 Asphaltic shingle systems.

All asphaltic shingle systems shall comply with the following requirements: TAS 100, TAS 107, ASTM D 3462 and ASTM D 3018. Asphaltic-shingle systems shall have a quality control testing program by an approved independent listing agency having an unannounced follow-up visit. Follow-up test results shall be made available to the certification agency upon request.

SECTION 1525 HIGH-VELOCITY HURRICANE ZONES UNIFORM PERMIT APPLICATION

The additional revisions make editorial changes resulting from additional collaboration between ARMA and Miami-Dade.

**Fiscal Impact Statement**

- Impact to local entity relative to enforcement of code: $0
- Impact to building and property owners relative to cost of compliance with code: $0
- Impact to industry relative to the cost of compliance with code: $0
- Impact to Small Business relative to the cost of compliance with code: $0

**Rationale**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Roofing is an important part of building performance in Florida's extreme weather conditions.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Clarifies code requirements.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Is editorial only.
- Does not degrade the effectiveness of the code
  - Is editorial only.

**Requirements**

- Is the proposed code modification part of a prior code version? No

**Comment:**

Please make the following editorial changes to the mod:

1514.2.3.1 – Keep the section and add the word “Reserved” to avoid renumbering.

1518.7.1 Should read: Underlayments meeting or exceeding minimum underlayment specifications....

1523.5.1, 1521.17 and 1523.6.5.1: Change &quot;Asphaltic&quot; to &quot;Asphalt&quot;


**Comment:**

Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to Chapter 15 as revised by the recent comment submitted by the original proponent, Mike Fischer. The proposal as revised by the recent comment submitted by the original proponent, Mike Fischer will significantly improve the code.
See attached file.
Please make additional mods as included in the attached file.
FBC Chapter 15 HVHZ ARMA Public Comment

Please make additional changes as follows:

1513.1

CORROSION RESISTANT. Any component that passes FM Global Test Standard 4470’s Appendix, as modified, and set forth in TAS 114.

1518.7.1
Underlayments meeting or exceeding minimum underlayment specifications, as detailed in Section 1518, shall be applied in compliance with the application methods detailed in the product approval. Where the architectural appearance of the underside of the roof is to be preserved, refer to Section 1519.5.2.

1521.17
Asphaltic shingle assemblies may be applied over one existing layer of asphaltic shingles having not more than \(\frac{1}{6}\) inch (3.2 mm) difference in level in the existing shingle material. Recover over an existing shingle system shall be with a product having a product approval as prepared roof covering, in strict compliance with the application method detailed in the product approval.

1523.5.1
All asphaltic shingles, tile products and metal roofing panels and clips shall be labeled on the underside with the Florida Building Code, Building insignia, or product approval number, or the wording “Florida Building Code, Building product approved,” and manufacturer’s initials or manufacturer’s logo, or as specified in the manufacturer’s product approval.

1523.6.5.1 Asphaltic shingle systems.
All asphaltic shingle systems shall comply with the following requirements: TAS 100, TAS 107, ASTM D 3462 and ASTM D 3018. Asphaltic shingle systems shall have a quality control testing program by an approved independent listing agency having an unannounced follow-up visit. Follow-up test results shall be made available to the certification agency upon request.

SECTION 1525 HIGH-VELOCITY HURRICANE ZONES UNIFORM PERMIT APPLICATION

SECTION 1512 HIGH-VELOCITY HURRICANE ZONES—GENERAL

1512.1 Scope.
Sections 1512 through 1525 set forth minimum requirements for the materials and installation of roofing components, roofing systems, roofing assemblies and the waterproofing thereof.

1512.2 Application.
These high-velocity hurricane zone roofing requirements with associated roofing application standards (RAS) and testing application standards (TAS) are solely to be implemented in the HVHZ areas of high basic wind speeds, or and where the jurisdiction having authority has adopted their use.

1512.2.1
All roofing components, roofing systems and roofing assemblies for construction regulated by this code shall comply with this chapter. All roofing components, roofing systems and roofing assemblies shall have a valid and current product approval. In the event that the manufacturer’s published literature or instructions are in conflict with those of the product approval, the product approval shall prevail. Where items specifically and expressly addressed in this chapter are in conflict with the product approval, the provisions of this chapter shall prevail.

1512.2.2
Innovative products and/or systems outside those currently recognized under this chapter may have a product approval issued based on performance testing; in such case(s) the conditions set in the product approval shall prevail.

1512.2.3
For roofing systems to be installed on a specific building or structure, where an existing product approval may not be applied, such roofing system shall be permitted to be approved on a one-time project basis may be granted a one time approval by the authority having jurisdiction, provided the applicant demonstrates, by testing and/or rational analysis that such roofing system complies with the provision of this code.

1512.2.4
Where a product approval does not address a detail for a specific job condition, the permit applicant may propose to the building official an alternate detail to address the specific need of the job. The building official shall be permitted to approve may accept such proposal if it can be demonstrated that the provisions of this code will be met.

1512.2.5 Workmanship standards.
All roofing work shall be performed by a qualified contractor licensed to perform roofing, in compliance with the tolerances, quality and methods of construction established herein or set forth in the standards adopted by these high-velocity hurricane zone requirements. Roofing assemblies detailed in the product approval shall be installed in strict compliance with the method of application set forth in such product approval or, if not part of the product approval, in compliance with manufacturer's published application instructions, or as approved by the building official. (Aesthetic issues not affecting the performance of the roof are not part of this chapter.)

1512.2.5.1 Appearance.
Where the architectural appearance of the underside of the roof is to be preserved from below, an alternate method of attachment complying with the windload requirements of Chapter 16 (High-Velocity Hurricane Zones) may be proposed unless otherwise addressed in Chapter 15. The alternative attachment shall be prepared, signed and sealed by a Florida-registered architect or a Florida-registered engineer, which architect or engineer shall be proficient in structural design.

1512.3
Permits outside these high-velocity hurricane zone requirements shall comply with Section 105. Permits within the HVHZ high wind-areas shall be required for all work in connection with the application, repair or maintenance of any roofing component or any roofing assembly and/or any of its components except as otherwise permitted in Section 105 of this code.

1512.3.1
All new roofing construction, including recovering and reroofing, repair or maintenance shall have an HVHZ Uniform Roofing Permit Application, as required established by the authority having jurisdiction, completed and executed by a licensed contractor.
1512.3.2 The HVHZ Uniform Roofing Permit Application shall include calculations in accordance with Chapter 16 (High-Velocity Hurricane Zones) of this code, unless the roofing assembly is less than the height/pressure threshold allowed in the applicable protocols herein.

1512.3.3 Reserved.

1512.3.4 Attachments to the HVHZ Uniform Roofing Permit Application shall include two copies of each of the following documents: properly executed OWNERS NOTIFICATION FOR ROOFING CONSIDERATIONS herein; the fire directory listing pages, product approval, and applicable detail drawings; the municipal permit application; other components approvals; and any other additional data reasonably required by the authority having jurisdiction needed to determine the integrity of the roofing system.

1512.4 Inspections.

1512.4.1 All roofing work for which a permit is required shall be inspected by the building official. One or more inspections may be performed at the same time at the request of the roofing contractor or when feasible. Lack of roofing contractor’s personnel at the job site, in and of itself, shall not be cause to fail the inspection. Certain roofing inspections shall be performed during specific phases of the applications as noted below.

1512.4.2 For discontinuous roofing systems (as defined herein or Chapter 2).

1512.4.2.1 During or after application of the base sheet, anchor sheet or underlayment of any roofing system.

1512.4.2.2 During the installation of the cap sheet.

1512.4.2.3 During the installation of any prepared roof covering, such as shingles, tiles, slates, shakes and similar.

1512.4.2.4 Upon completion of all adhesive-set and mortar-set tile systems, and prior to the final inspection, a field verification and static uplift test, in compliance with TAS 106 shall be required to confirm tile adhesion to the underlayment. This test may be required by the building official for mechanically attached tile systems. All results of this test shall be submitted to the building official.

1512.4.3 For continuous roofing systems (as defined herein or Chapter 2).

1512.4.3.1 During application of any roofing system prior to the full concealment of the adhesion/attachment process to the roof deck or to the existing roofing assembly.

1512.4.3.2 In cases where a roof area is less than 1,500 square feet (139 m²), and when the building official is not able to perform any of the above requested inspection in a timely manner, the building official may authorize to continue with the work and may require that satisfactory evidence be provided to show that the covered work was performed in compliance with this code.

1512.4.3.3 After all roofing work has been completed, a final inspection shall be performed by the building official.

SECTION 1513 HIGH-VELOCITY HURRICANE ZONES—DEFINITIONS
1513.1 Definitions.
For definitions outside Sections 1512 through 1525 and accompanied RAS and TAS, see Chapter 2. For the purposes of Sections 1512 through 1525, accompanying RAS, TAS and roofing products approval, roofing terms shall be defined in compliance with ASTM D 1079, unless otherwise defined below. The definitions listed below shall take preference. Other terms used herein shall be defined as set forth in Chapter 2 of this code.

AIR PERMEABLE ROOFING SYSTEM. A roofing system consisting of a prepared roof covering over an approved underlayment on a sloped roof. The components within the prepared roof covering are discontinuously laid and small, with unsealed side and head laps. Air permeable roofing systems shall be applied over sheathed decks with either mechanical attachment or a mortar/adhesive bond. Any roofing system with sealed side or end laps shall not be defined as an air permeable roofing system. The authority having jurisdiction may require testing in compliance with TAS 116, to determine whether a roofing system is air permeable.

ANCHOR SHEET. A roofing felt mechanically attached to a nailable deck with approved fasteners to which insulation is then installed in a solid mopping of asphalt. The roofing membrane is then installed to the insulation in the usual manner.

ARCHITECTURAL METAL PANEL. Water shedding (hydrokinetic) roof panel fastened to a roof deck.

ASTM (ASTM International). A scientific and technical organization that is responsible for the development of standards on characteristics and performance of materials, products, systems, as adopted for the high-velocity hurricane zone.

BASE SHEET. The bottom or first ply of a roofing assembly over which subsequent roofing plies are applied. A base sheet may be designed for mechanical attachment, full or partial adhesion to the substrate.

BUILDING INTEGRATED PHOTOVOLTAIC ROOFING. A roofing product consisting of electricity generating photovoltaic component integrated into a roof covering.

“CLASS A” ROOFING ASSEMBLY. A roofing assembly that, in combination with the roof slope, has been classified by an approved testing agency, with a listing and follow-up service, as “Class A” in compliance with ASTM E 108 or UL 790.

“CLASS B” ROOFING ASSEMBLY. A roofing assembly that, in combination with the roof slope, has been classified by an approved testing agency, with a listing and follow-up service, as “Class B” in compliance with ASTM E 108 or UL 790.

“CLASS C” ROOFING ASSEMBLY. A roofing assembly that, in combination with the roof slope, has been classified by an approved testing agency, with a listing and follow-up service, as “Class C” in compliance with ASTM E 108 or UL 790.

CONTINUOUS ROOFING SYSTEM. An impervious roof covering, composed from a single or multiple layers, forming a homogenous membrane over the entire roof surface, applied to either a flat or pitched roof surface(s).

CORROSION RESISTANT. Any component that passes FMRC Test Standard 4470’s Appendix, as modified, and set forth in TAS 114.

COUNTER BATTENS. Vertical wood strips installed on sloped roofs over which horizontal battens are secured. The primary roof covering is attached or secured to these horizontal battens.

COUNTERFLASHING. Formed metal or elastomeric sheeting secured on or into a wall, curb, pipe, roof-top unit or other surface to cover and protect the upper edge of a base flashing and its associated fasteners.

DISCONTINUOUS ROOFING SYSTEM. A roofing system with unsealed overlapping components, where the combined roofing system has openings at the point of overlap, applied to a sloped surface with a pitch of 2:12, or greater. Discontinuous roofing systems include asphalt shingles; concrete, clay or metal tile; wood shingles or shakes; and cement fiber roofing systems.

DRY-IN. The process of applying the first layer of felt in a roofing system.
FM Approvals FMRC (Factory Mutual Research Corporation). A research and testing organization that is responsible for examination and testing of construction and other products on behalf of member insurance companies.

FASTENER WITHDRAWAL RESISTANCE TEST. A static pullout test of mechanical fasteners, which are used to anchor any roofing component, to determine the force required to withdraw a fastener from the substrate. Testing shall be in compliance with the test procedure detailed in TAS 105.

FIRE-RESISTANT ROOF COVERING. Any Class A, Class B or Class C roofing system applied to the appropriate deck type within the specified slope of the listed classification.

FLASHING. The roofing component used to seal roofing systems, where the system is interrupted or terminated.

FLAT ROOF TILE PROFILE. Those tiles with less than \( \frac{1}{2} \)-inch (12.7 mm) rise.

HIGH ROOF TILE PROFILE. Those tiles having a rise-to-width ratio greater than 0.20.


LOW ROOF TILE PROFILE. Those tiles having a rise-to-width ratio less or equal than 0.20; except those tiles meeting the flat profile definition.

METAL PROFILE. Including but not limited to eave and gable drip, gravel stop, raised edge systems and fascia systems. All composite and nonmetallic flashing materials shall have a product approval.

METAL ROOF PANEL. An interlocking metal sheet having an installed weather exposure equal to or greater than three square feet (0.3 m\(^2\)) per sheet.

METAL ROOF SHINGLE. An interlocking metal sheet having an installed weather exposure less than 3 square feet (0.3 m\(^2\)) per sheet.

MINIMUM CHARACTERISTIC RESISTANCE FORCE. A force or pressure which is representative of data from withdrawal resistance testing; static uplift testing; and/or wind uplift testing after the data has been statistically analyzed to a 95-percent level of precision.

MOMENT. A quantity that represents the effect of a force applied at a particular point in relation to a specific point or axis.


NET FREE VENTILATING AREA (NFVA). The gross area of the smallest plane area of the ventilating device reduced by the percentage of physical obstruction to the plane area.

PREPARED ROOF COVERING. Any manufactured or processed roof covering designed for use as the top layer of a discontinuous roofing system applied to a sloped roof.

RAS. Roofing application standards.

RECOVERING. The process of covering an existing roofing assembly with a new roofing system or a prepared roofing system.

REPAIR. The work of corrective procedures by replacing or altering an existing roofing component or system to eliminate water intrusion.

REEROOFING. The process of recovering or replacing an existing roofing system, either in its entirety or in existing sections.
RIDGE VENT. A ventilator located within 18 inches (457 mm) of the ridge that allows the escape of warm and/or moist air from the attic area or rafter cavity.

ROOF COVERING. An assembly of multiple field-applied components or a single component designed to weatherproof a building's top surface. A roof covering may be a roofing assembly or form a portion thereof.

ROOF DECK. Solid or spaced sheathing to which the roofing or waterproofing system is applied.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

ROOF SECTION. A separation or division of a roof area by existing expansion joints, parapet walls, flashing (excluding valleys), difference of elevation (excluding hips and ridges), roof type or legal description; not including the roof area required for a proper tie-off with an existing system.

ROOFING ACCESSORY. A type of roofing product as described in Section 1517.6 of this code.

ROOFING ASSEMBLY. An assembly of interacting roofing components [includes the roof deck, vapor retarder (if present), insulation, and roof covering].

ROOFING COATINGS, ADHESIVES AND MASTICS. Any and all liquid materials applied to the roofing membrane layer to enhance ultraviolet light resistance; increase resistance to fire; increase reflectivity of the roofing assembly; or, in some way, enhance the performance of the roofing assembly. Roofing coatings, adhesives or mastics shall not contain asbestos materials.

ROOFING COMPONENT. A roofing product that is incorporated into various roofing assemblies.

ROOFING MAINTENANCE. Is the work of extending the longevity of a roofing system through preventative care, such as refilling pitch pans, applying coatings, regraveling, resurfacing and recaulking.

ROOFING SYSTEM. A system of interacting roofing components, generally consisting of membrane or primary roof covering and insulation (not including the roof deck) designed to weatherproof, and sometimes to improve, the building's thermal resistance.

STRUCTURAL METAL PANEL. Roof covering intended to be self-supporting between structural members (see Sections 2003.8.2 and 2222.4).

TAS. Testing application standard.

UNDERLAYMENT. One or more water-shedding layers applied to a sloped roof prior to the application of a prepared roof covering. The primary purpose of an underlayment is defined as a water shedding layer to function in combination with a prepared roof covering.

WOOD SHAKES. Tapered or straight pieces of red cedar, or other wood types, of widths ranging from 3 inches to 14 inches (76 mm to 356 mm) ranging in lengths from 18 inches to 32 inches (457 mm to 813 mm) applied to a sloped roof, in conjunction with an approved underlayment, forming a discontinuous prepared roof system.

WOOD SHINGLES. Tapered pieces of red cedar, or other wood types, sawn on both faces, of widths ranging from 3 inches to 14 inches (356 mm) and lengths of 16 inches (406 mm), 18 inches (457 mm), and 24 inches (610 mm) applied to a sloped roof forming a discontinuous prepared roof system.

SECTION 1514 HIGH-VELOCITY HURRICANE ZONES—WEATHER PROTECTION

1514.1 General.
Roof decks shall be covered with roof coverings secured to the building or structure in accordance with the provisions of this chapter. Roof coverings shall be designed, installed and maintained in accordance with this code and the manufacturer's installation instructions such that the roof covering shall serve to protect the building or structure. All roof coverings, roof systems and roof assemblies shall be designed and installed to resist the windload requirements of Chapter 16 (High-Velocity Hurricane Zones) of this code.
1514.2 Flashings.  
All roof flashing and terminations shall be designed and installed to resist the windload requirements of Chapter 16 (High-Velocity Hurricane Zone) of this code, and shall be in compliance with the provisions set forth in RAS 111.

1514.2.1 Locations.  
Where flashing is of metal, the metal shall conform with the provisions of RAS 111.

1514.2.2 Membrane flashings.  
All membrane flashing shall be installed according to the roof assembly manufacturer’s published literature and in accordance with the provisions set forth in RAS 111.

1514.2.2.1  
Membrane flashings shall be embedded in hot bitumen or an approved adhesive.

1514.2.3 Metal flashings and terminations.  
Metal flashing and terminations shall be of the material and thickness described in Section 1517.6 and RAS 111 of this code, and shall be designed and installed in accordance with RAS 111.

1514.2.3.1  
Such felt shall be embedded in hot bitumen or an approved adhesive. (Renumber subsequent sections as needed)

1514.2.3.2  
Metal surfaces shall be primed with an ASTM D 41 or ASTM D 43 primer, as appropriate, and allowed to dry prior to receiving hot bitumen or cold adhesive.

1514.2.4 Metal counterflashing.  
Metal counterflashing shall be of the material and thickness described in Section 1517.6 and RAS 111 of this code, and shall be installed in accordance with RAS 111.

1514.2.4.1  
Metal counterflashing shall be built into walls, set in reglets or applied as stucco type and shall be turned down over base flashing not less than 3 inches (76 mm).

1514.2.4.2  
Metal counterflashing shall be side lapped a minimum of 4 inches (102 mm).

1514.2.4.3  
Metal counterflashing, where set in reglets or surface-mounted, shall be waterproofed, in accordance with applicable application standards.

1514.2.4.4  
Where metal counterflashing is used as the means of sealing (such as a vented system) it shall be set in an approved sealant, sealed with an approved adhesive on the top flange and all joints shall be sealed with an approved sealant and lapped a minimum of 4 inches (102 mm).

1514.2.5 Roof penetration flashing.

1514.2.5.1  
All pipes shall be flashed with approved lead sleeve-type, pitch pans or other approved methods detailed in the roofing system assembly product approval. Lead flashing shall not be less than 2.5 pounds per square foot (12.2 kg/m²). Flanges shall be a minimum of 4 inches (102 mm).

1514.2.5.2  
Other roof penetrations shall be suitably flashed with curbs, collars, pitch pans, in compliance with RAS 111 or an approved method, in compliance with the roofing system assembly product approval.

1514.2.5.3  
No roof penetration shall be located in roof valleys.
1514.3 Coping.
Copings shall be designed and installed to resist the windload requirements of Chapter 16 (High-Velocity Hurricane Zones) of this code, and shall be in accordance with the provisions set forth in RAS 111.

1514.4 Roof drainage.
Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof. Where required for roof drainage, scuppers shall be placed level with the roof surface in a wall or parapet. The scupper shall be located as determined by the roof slope and contributing roof area. Scuppers shall be sized in accordance with the provisions contained in ASCE 7, Section 8 with commentary and shall comply with Section 1611 herein.

1514.4.1 Gutters.
Gutters shall be in compliance with RAS 111.

1514.4.2 Overflow drains and scuppers.
Where roof drains are required, overflow drains or overflow scuppers sized in accordance with Florida Building Code, Plumbing shall be installed with the inlet flow line located not less than 2 inches (51 mm) or more than 4 inches (102 mm) above the low point of the finished roofing surface, excluding sumps. Overflow scuppers shall be a minimum of 4 inches (102 mm) in any dimension and shall be located as close as practical to required vertical leaders, conductors or downspouts. Overflow drains and scuppers shall also comply with the Florida Building Code, Plumbing, and Section 1611 of this code.

1514.4.2.1 When overflow scuppers and roof drains are installed, they shall be lined with approved metal or other approved materials set forth in the roofing system assembly product approval.

1514.4.2.2 When recovering, reroofing or repairing an existing roof, the existing number of scuppers and/or roof drains shall not be reduced, unless a new drainage system is designed by an architect or engineer, in compliance with the provisions of this code.

1514.4.3 Sizing and discharge.
Roof drains, gutters, conductors and leaders shall be sized and discharge in accordance with the Florida Building Code, Plumbing.

SECTION 1515 HIGH-VELOCITY HURRICANE ZONES—PERFORMANCE REQUIREMENTS

1515.1 General.
All roof assemblies, roof coverings and roof systems shall have Product Approval, and shall meet the following minimum requirements.

1515.1.1 All continuous roofing assemblies shall be tested in compliance with FMRC Test Standards 4470 and/or 4471 (for metal roofing), as modified for the purposes of this code and set forth in TAS 114. Only those components listed within the roofing assembly product approval shall be approved for use with the roof covering. Roofing assemblies shall be acceptable for use in this code’s jurisdiction providing they are in compliance with the fire classification required for the structure to which the roofing assembly is to be installed.

1515.1.2 All fastening devices and fastening assemblies used for insulation, anchor sheet or roof coverings shall be tested in compliance with Section 1523 of this code.

1515.1.3 All roofing assemblies shall be tested by a testing laboratory, certified by the certification agency in accordance with TAS 301, to confirm compliance with the fire classification and other sections of this code.

1515.1.4 All roofing membranes and components shall be tested in compliance with the physical property test requirements detailed in TAS 110.
1515.1.5
No loose laid ballasted or nonballasted system shall be permitted. allowed.

1515.2 Guidelines for roofing applications.

**TABLE 1515.2 MINIMUM SLOPE**

<table>
<thead>
<tr>
<th>SYSTEM TYPE</th>
<th>SLOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibrous Cement Shingles</td>
<td>4:12</td>
</tr>
<tr>
<td>Metal Panels</td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>2:12</td>
</tr>
<tr>
<td>Metal Shingles</td>
<td>4:12</td>
</tr>
<tr>
<td>Mortar or Adhesive Tile</td>
<td>2:12</td>
</tr>
<tr>
<td>Mechanically Fastened Tile</td>
<td>4:12</td>
</tr>
<tr>
<td>Asphalt Shingles</td>
<td></td>
</tr>
<tr>
<td>Laminated</td>
<td>2:12</td>
</tr>
<tr>
<td>3-Tab</td>
<td>2:12</td>
</tr>
<tr>
<td>Quarry Slate</td>
<td>3\frac{1}{2}:12</td>
</tr>
<tr>
<td>Wood</td>
<td></td>
</tr>
<tr>
<td>Shakes</td>
<td>4:12</td>
</tr>
<tr>
<td>Shingles</td>
<td>3\frac{1}{2}:12</td>
</tr>
</tbody>
</table>

1515.2.1 Decks.
All roofing systems and prepared roof coverings shall be installed over solid decks, unless otherwise specifically allowed in other sections of this code.

1515.2.2 Minimum slope.
All roofing assemblies must be installed in compliance with the slope requirements specified in the product control approval, in compliance with Table 1515.2.

1515.2.2.1
In new construction, the minimum deck slope shall be not less than 1\frac{1}{4}:12.

1515.2.3 Deck preparation.

1515.2.3.1 Reserved.

1515.2.3.2
All eaves shall provide a firm nailable substrate for secure attachment of perimeter edge metal in compliance with RAS 111.

1515.2.3.3
Perimeter edge metal shall be fastened with nails or fasteners fabricated from similar or compatible material. The nails or fasteners shall be as set forth in the roofing assembly product approval.

1515.2.4 Impact resistance.
Roof coverings installed on low slope roofs in accordance with Section 1519 shall resist impact damage based on the results of test conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB-37,-FM 4470 or TAS 114.

1515.2.5 Ridge vents.
Ridge vents shall have a product approval, and shall be tested for wind driven rain in accordance with TAS 110 and Section 1523.

**SECTION 1516 HIGH-VELOCITY HURRICANE ZONES—FIRE CLASSIFICATION**
1516.1 General.
Roof assemblies shall be divided into the classes defined below. Class A, B and C roof assemblies and roof coverings required to be listed by this section shall be tested in accordance with ASTM E 108 or UL 790. In addition, fire-retardant treated wood roof coverings shall be tested in accordance with ASTM D 2898.

1516.2
Fire-resistant roofing assemblies and coverings shall be provided on all structures. Fire classification of roofing assemblies and coverings shall be based on the exposure hazard as follows.

1516.2.1 Class A.
Zero feet to 20 feet (0 to 6.1 m) distance separation measured horizontally from the closest point of any building edge to the nearest point to an adjoining structure, and all buildings with occupation greater than 300 persons.

Exception: Brick, masonry, slate, clay or concrete roof tile and exposed concrete roof deck are considered to meet Class A roof covering provisions without testing.

1516.2.2 Class B.
All other structures, except as noted below.

1516.2.3 Class C.
Structures not occupied by humans.

1516.2.4
All roofing assemblies shall be installed at a slope no greater than the maximum allowed for the required fire classification.

1516.2.5
Waterproofing assembly must possess a Class A, Class B or Class C fire rating as required herein.

SECTION 1517 HIGH-VELOCITY HURRICANE ZONES—MATERIALS

1517.1 Scope.
Every roofing component shall comply with the applicable ASTM material standards adopted by this code. All such products shall bear the testing logo imprinted on the material and/or container or shall be marked in a distinctive manner to define compliance with the standards and shall be subject to be evaluated for compliance. The certification agency shall carry out random testing of labeled products to confirm compliance with ASTM material standard.

1517.2 Compatibility of materials.
Reserved.

1517.3 Material specification and physical characteristics.
Reserved.

1517.4 Product identification.
All roofing components shall be labeled and/or identified as mandated by the product approval.

1517.4.1
ASTM standard roll goods shall be marked with a yellow line to identify the ASTM standard, or such other marking as may be deemed appropriate by the product approval.

1517.5 Fasteners.

1517.5.1
Nails shall be minimum 12 gage, annular ring Shank nails having not less than 20 rings per inch, heads not less than \( \frac{3}{16} \) inch (9.5 mm) in diameter, and lengths sufficient to penetrate through the thickness of plywood panel or wood plank decking not less than \( \frac{3}{16} \) inch (4.8 mm), or to penetrate into a 1 inch (25 mm) or greater thickness of lumber not less than 1 inch (25 mm). Nails or wood screws shall be hot dipped electro- or mechanically galvanized to a
thickness sufficient to resist corrosion in compliance with TAS 114, Appendix E, Section 2 (ASTM G 85). All nails shall be listed by a certification agency. All nail cartons or carton labels shall be labeled to note compliance with the corrosion-resistance requirements. No roofing material shall be fully or partially adhered directly to a nailable deck, unless otherwise noted in the roof assembly product approval.

1517.5.2 Such fasteners shall be applied through "tin caps" no less than 15/8 inches (41 mm) and not more than 2 inches (51 mm) in diameter and of not less than 32 gage (0.010 inch) sheet metal. "Cap nails" or prefabricated fasteners with integral heads complying with this section shall be an acceptable substitute. All "tin caps," "cap nails" or prefabricated fasteners with integral heads shall be tested for corrosion resistance in compliance with TAS 114, Appendix E, Section 2 (ASTM G 85), and shall be product control listed. All cartons or carton labels of "tin caps," "cap nails" or prefabricated fasteners with integral heads shall be labeled to note compliance with the corrosion-resistance requirements.

1517.6 Metal roofing accessories.
All metal accessories for roofs shall be not less than 26 gage G-90 galvanized or stainless steel, 16 ounce copper, 0.025-inch (0.6 mm) thick aluminum, lead sheet with a minimum 2.5 pounds per square foot (12.2 kg/m²) or equivalent noncorrosive metal alloys or composite materials manufactured for use as roof termination. All composite and nonmetallic flashing materials shall have a product approval.

1517.6.1 Metal accessories may be of a manufactured, shop-fabricated or field-fabricated type, providing the materials and fasteners are in compliance with the minimum requirements of this code and shall be sized, designed and installed in compliance with methods set forth in RAS 111.

1517.6.2 Gravel stop or drip edge profiles shall be as follows.

1517.6.2.1 The vertical face shall be a minimum of 11/2 inches (38 mm) and shall extend down not less than 1/2 inch (12.7 mm) below the sheathing or other member immediately contiguous thereto. In all cases, the deck flange shall be not less than 2 inches (51 mm) in width. Gravel stop or drip edge shall be sized, designed and installed in compliance with RAS 111.

1517.6.2.2 Gravel stop or drip edge shall be designed so that the bottom (the kick of the metal) of the drip edge shall have a minimum of 1/2-inch (12.7 mm) clearance from the structure.

1517.6.2.3 Reserved.

1517.6.2.4 Gravel stops shall be installed after all roofing felts have been applied, or in compliance with the application method set forth in the roofing assembly product approval. All asphalt or approved cold adhesive bonding areas shall be coated with ASTM D 41 or ASTM D 43, as required, and allowed to dry prior to application.

1517.6.2.5 Gravel stops and drip edges shall be jointed by lapping a minimum of 4 inches (102 mm) and the entire interior of the joints shall be coated with approved flashing cement. Cover and splice plates shall be of the same material as the gravel stop and drip edge, and shall be sized, fabricated and installed in compliance with RAS 111.

1517.6.2.6 The deck flange shall be nailed with an approved minimum 12 gage annular ring shank nail at 4 inches (102 mm) o.c. The nail shall be manufactured from similar and/or compatible material to the termination profile. All composite materials shall be fastened with nonferrous nails.

SECTION 1518 HIGH-VELOCITY HURRICANE ZONES—ROOF COVERINGS WITH SLOPES 2:12 OR GREATER

1518.1 General.
Prepared roof coverings shall be as defined in Section 1513 and in general limited to application over sloped roof decks capable of receiving mechanical fasteners. Prepared roof coverings may be mechanically fastened or, in specific limited cases noted in the product approval, set in an adhesive bond.

1518.2 Underlayments.
Underlayment shall be as defined in Section 1513. Underlayment shall be installed in compliance with the roofing component product approval and shall be in compliance with the following minimum requirements.

1518.2.1
Underlayment shall be attached to a nailable deck in a grid pattern of 12 inches (305 mm) between the overlaps, with 6-inch (152 mm) spacing at the overlaps.

1518.2.2
Where the architectural appearance of the underside is to be preserved, the underlayment shall be secured in accordance with Section 1519.5.2.

1518.2.3
Tin caps and nails or cap nails shall be as defined in Section 1517.5.2.

1518.2.4
Underlayment nails shall be as defined in Section 1517.5.1.

1518.3
If the underlayment is a self-adhering membrane, the membrane shall be applied over a mechanically attached anchor sheet, attached in compliance with Section 1518.2.1.

1518.4
All underlayment applications for prepared roof coverings shall be applied in compliance with the manufacturer roofing assembly product approval, and shall be not less than one of the following: (1) A double layer of an ASTM D 226 Type I, with a 19-inch (483 mm) headlap; or (2) A single layer of an ASTM D 226, Type II with a 4-inch (102 mm) headlap; or (3) A single layer of an ASTM D 2626 coated base sheet with a 4-inch (102 mm) headlap, and (4) All endlaps shall be a minimum of 6 inches (152 mm).

1518.5 Fiber-cement shingles.
Fiber-cement shingles shall be applied in compliance with the shingle manufacturer’s roofing assembly product approval. The roofing system assembly product approval shall meet the following minimum requirements.

1518.5.1
All nonasbestos fiber-cement shingles shall conform to ASTM C 1225.

1518.5.2
Fiber-cement shingles shall be installed in compliance with the nailing requirements set forth in the product approval; however, attachment of each component shall be with not less than two corrosion-resistant fasteners. If adhesive is used at the head or side laps, the system shall be defined as a “sealed system” with load calculations in compliance with Chapter 16 (High-Velocity Hurricane Zones).

1518.5.3
All intersections shall be flashed in metal as provided in Section 1517.6 and RAS 111.

1518.5.4
Fiber-cement shingles shall be tested as set forth in Section 1523.

1518.6 Quarry slate.
Quarry slates shall be applied in compliance with the slate manufacturer’s product approval. The roofing assembly product approval shall meet the following minimum requirements.

1518.6.1
Quarry slates shall be installed with not less than two approved fasteners per slate.
1518.6.2 All terminations and intersections shall be flashed in metal as provided in Section 1517.6 and RAS 111.

1518.6.3 Quarry slates shall be tested in compliance with the requirements set forth in Section 1523.

1518.6.4 Installation of all quarry roof slates shall be limited to a roof mean height of 33 feet (10 m), unless otherwise specifically noted in the product approval.

1518.7 Asphalitic shingles. Asphalitic shingles layout, alignment and placement of mechanical attachment shall be in compliance with the product approval, and shall be installed in accordance with RAS 115.

1518.7.1 Underlayment meeting or exceeding minimum underlayment, as detailed in Section 1518, shall be applied in compliance with the application methods detailed in the product approval. Where the architectural appearance of the underside of the roof is to be preserved, refer to Section 1519.5.2.

1518.7.2 Installation of all asphalitic shingles shall be limited to a roof mean height of 33 feet (10 m), unless otherwise specifically noted in the product approval.

1518.7.3 The asphalitic shingle product approval shall meet the following minimum requirements.

1518.7.3.1 Where asphalitic shingles are to be installed over insulated roof deck, a suitable nailable substrate, in accordance with Section 1520.5.7 must be installed over the insulation prior to the installation of approved underlayment and shingles.

1518.7.3.2 Asphalitic shingles shall be installed in compliance with the product approval, but in no case with less than six approved roofing nails or approved fastening devices which penetrate through the thickness of sheathing or wood plank a minimum of \( \frac{3}{16} \) inch (4.8 mm) or penetrate into a 1 inch (25 mm) or greater thickness of lumber a minimum of 1 inch (25 mm), except where architectural appearance is to be preserved, in which case a minimum \( \frac{1}{4} \) inch (19 mm) ring shank roofing nail may be used.

1518.7.3.3 Intersections, eaves, rakes, valleys, gable ends, and the starter course of asphalitic shingles shall be set in an 8-inch (203 mm) wide bed of approved cold adhesive or roofing cement. Application of adhesive or cement shall be in compliance with the application instructions of the Product Approval. Shingles shall not extend more than \( \frac{1}{4} \) inch (6.4 mm) beyond the eave drip.

1518.7.3.4 All perimeter termination and valleys shall be fabricated from metal. Minimum metal requirements are set forth in Section 1517.6 and RAS 111.

1518.7.3.5 Asphalitic shingles shall be tested in compliance with the provisions set forth in Section 1523.

1518.8 Clay and concrete roof tile. Clay tile shall be clay, concrete or composition material of various configurations complying with the physical property requirements of this code. All tile and tile systems shall be tested in compliance with the provisions set forth in Section 1523. Tile shall have a product approval for a complete tile system, which shall include the tile, underlayment and all tile related accessories required to provide a waterproof system.

1518.8.1 Application. All tile systems shall be installed over solid sheathed decks. All tile installation shall be in accordance with RAS 118,
RAS 119, and RAS 120, as applicable.

1518.8.1.1 Roof tile mortar shall either be a premixed unit having a product approval and tested in compliance with TAS 123 or a job-site mix approved by the building official and in compliance with RAS 113.

1518.8.2 The roof tile product approval shall specify the slope requirement for each tile and underlayment system in accordance with Table 1515.2.

1518.8.3 All roof tile fasteners shall be tested and comply with the requirements set forth in Section 1523.

1518.8.4 All tile systems. All tile application designs shall comply with the following limitations in order to withstand the wind loads prescribed in this section, as well as all wind load requirements set forth in Chapter 16 (High-Velocity Hurricane Zones).

1518.8.4.1 Roof tile systems, combining mechanically fastened tile and mortar and/or adhesive, shall be acceptable.

1518.8.4.2 In an air permeable tile roofing systems, (1) the length of each tile shall be not less than 12 inches (305 mm) and not greater than 21 inches (533 mm) and the exposed width of the tile shall be between 8.5 inches and 15 inches (216 and 381 mm); (2) the maximum thickness of the nose (leading edge) of the tile shall not exceed 1.3 inches (33 mm); and (3) mortar or adhesive set system shall have at least two-thirds of the tile free of mortar and/or adhesive contact.

1518.8.5 The proposed method of attachment for tile systems which are considered to be air permeable, shall provide sufficient attachment resistance (Mi) (listed in tile product approval) to meet or exceed the moment of resistance (M,) as determined by following the procedures outlined in RAS 127. The aerodynamic multiplier (k) needed in RAS 127 shall be part of the tile product approval and shall be derived from the following formula:

- For direct deck application \[ k = (0.156) \times (b) \times (l)^2 \]
- For batten application \[ k = (0.144) \times (b) \times (l)^2 \]

Where b (in feet) = exposed width of the tiles
Where l (in feet) = length of tiles

1518.8.6 The proposed method of attachment for tile systems which are not considered air permeable shall provide a minimum characteristic force (F') (listed in tile product control approval) to meet or exceed the required uplift resistance (Fr) as determined by following the procedures outlined in RAS 127.

1518.8.7 Tile systems shall extend beyond the drip edge (not including the rake) not less than \(3/4\) inch (19 mm) but not more than 2 inches (51 mm).

1518.8.8 Reserved.

1518.8.9 Reserved.

1518.8.10 Mortar or adhesive set tiles applied at an incline from 6:12 up to and including 7:12 shall have the first course of tile (this applies to pan only on two-piece barrel tile) mechanically fastened with not less than one fastener per tile. As an alternate, the first course of tile shall be applied in mortar over a single layer of minimum 20 gage galvanized wire.
mesh with openings of not less than 1/2 inch (12.7 mm) or greater than 1 1/2 inches (38 mm) with minimum exposure of 12 inches (305 mm) which is mechanically attached to the deck through the underlayment with approved fasteners and tin-cap when back-nailing the cap sheet. Additionally, for roof inclines of 6:12 up to and including 7:12, every third tile of every fifth course, shall be mechanically fastened with not less than one fastener per tile. For roof inclines above 7:12, in addition to the mortar or adhesive, all tiles shall be mechanically fastened with not less than one fastener per tile. Apply approved flashing cement to seal all tile fastener penetrations, for all roof inclines.

1518.8.11
All tile systems shall be shingle lapped interlocking and installed with the headlap as specified in the tile system product approval. In no case shall the minimum headlap be less than 2 inches (51 mm) for mortar or adhesive set tile, or less than 3 inches (76 mm) for mechanically set tile, unless restricted by product design.

1518.8.12
Where tiles are to be installed over an insulated roof deck, a suitable nailable substrate, in accordance with Sections 1520.5.6 and 1520.5.7 must be installed over the insulation prior to the installation of approved underlayment and tiles.

1518.8.13
For mortar or adhesive set tile, no more than two tiles shall be loose per roofing square [100 square feet (9.3 m²)]. No loose tile shall be adjacent to each other.

1518.9 Metal panels/shingles.
Steel panels/shingles shall be a minimum of G-90 corrosion resistant, and shall be not less than 26 gage in thickness. Aluminum panels/shingles shall not be less than 0.025-inch (0.685 mm) thick. All other metal panel/shingle products shall be an equivalent weight. All metal panel/shingle assemblies shall be capable of withstanding foot traffic without damage to the metal panels/shingles. Metal panels/shingles shall have product approval for a complete metal system, which shall include the panel/shingle, underlayment and all related accessories to provide a complete waterproof system.

1518.9.1
All metal panels/shingles assemblies shall be tested in accordance with Section 1523 and TAS 125.

1518.9.2
The entire application method of all metal panel/shingle systems shall be detailed in the product approval and RAS 133, as applicable.

1518.9.3
Metal shingles may be applied as a recover over a single layer of asphalitic shingles or smooth surface roofing, providing the deck is solid sheathed and in compliance with the provisions of this code, the existing prepared roof covering is in compliance with provisions of this code and the entire metal shingle system is applied as set forth in the product approval.

1518.9.4
Metal panel/shingle systems shall not extend more than 1 inch (25 mm) beyond the roof eave.

1518.9.5
All intersections shall be flashed in metal as provided in Section 1517.6, RAS 111 and the roof assembly product approval.

1518.10 Wood shingles and shakes.
All wood shingles and shakes shall be installed in accordance with RAS 130. Installation of all wood shingles and shakes shall be limited to a roof mean height of 33 feet (10 m), unless otherwise specifically noted in the product approval.

1518.10.1
All wood shingle/shake systems shall be tested in accordance with Section 1523.

1518.11 Building integrated photovoltaic roofing modules/shingles.
The installation of building integrated photovoltaic roofing modules/shingles shall comply with the provisions of this
section.

1518.11.1 Material standards.
Building integrated photovoltaic roofing modules/shingles shall be listed and labeled in accordance with UL 1703.

1518.11.2 Attachment.
Building integrated photovoltaic roofing modules/shingles shall be attached in accordance with the manufacturer’s product approval.

1518.11.3 Wind resistance.
Building integrated photovoltaic roofing modules/shingles shall be tested in accordance with procedures and acceptance criteria in TAS 107. Building integrated photovoltaic roofing modules/shingle packaging shall bear a label to indicate compliance with the procedures in TAS 107.

SECTION 1519 HIGH-VELOCITY HURRICANE ZONES—ROOF COVERINGS WITH SLOPES LESS THAN 2:12

1519.1 General.
All adhered roofing components shall be bonded to the various types of substrates in compliance with the requirements set forth in the roofing assembly product approval and the following minimum requirements. The authority having jurisdiction may adopt RAS 150 as the means of complying with the requirements listed in this section.

1519.2
All packaged asphalt shall have the following data printed on the carton wrapper:

1519.2.1
ASTM designation and type;

1519.2.2
Flash point as determined by ASTM D 92, Flash and Fire Point by Cleveland Open Cup; and

1519.2.3
Equiviscous temperature (EVT) at which the asphalt attains a viscosity of 125 centipoise (25 centipoise for coal tar) as determined by ASTM D 4402, Viscosity Determinations of Unfilled Asphalt Using The Brookfield Thermoset Apparatus.

1519.3
Asphalt types, as defined by ASTM D 312, shall be employed in all roofing assemblies. Application of asphalt shall be in compliance with Table 1519.3A and Table 1519.3B or as detailed in the roofing assembly product approval.

TABLE 1519.3A SLOPE AND APPLICATION TEMPERATURE CRITERIA

<table>
<thead>
<tr>
<th>MAXIMUM</th>
<th>Slope (in./ft.)</th>
<th>Temperature (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D 312</td>
<td>MOP</td>
<td>MECHANICAL</td>
</tr>
<tr>
<td>Types of Asphalt</td>
<td>Type I</td>
<td>Dead level</td>
</tr>
<tr>
<td></td>
<td>Type II</td>
<td>Flat</td>
</tr>
<tr>
<td></td>
<td>Type III</td>
<td>Steep</td>
</tr>
<tr>
<td></td>
<td>Type IV</td>
<td>Special steep (All roof tile systems)</td>
</tr>
</tbody>
</table>

1 inch = 25.4 mm; °C = 5/9 (°F - 32).
1. Temperature and slope measurements are at point of application.
TABLE 1519.3B SLOPE AND APPLICATION TEMPERATURE CRITERIA

<table>
<thead>
<tr>
<th>ASTM 450</th>
<th>TYPE OF COAL TAR</th>
<th>MAXIMUM SLOPE (in./ft.)</th>
<th>TEMPERATURE RANGE (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>Coal tar pitch</td>
<td>1/4</td>
<td>360 ± 25</td>
</tr>
<tr>
<td>Type II</td>
<td>Coal tar bitumen</td>
<td>1/4</td>
<td>375 ± 25</td>
</tr>
</tbody>
</table>

1 inch = 25.4 mm; °C = 5/9 (°F - 32).

1519.4
Back nailing of interply sheets shall not be required when using ASTM D 312 Type IV asphalt on slopes less than 3:12.

1519.5 Mechanical attachment.
All mechanically attached roofing components shall be attached to the various types of substrates in compliance with the requirements set forth in the roofing assembly product approval and the following minimum requirements.

1519.5.1 Base sheet attachment on wood decks.
Nails shall be minimum 12 gage, annular ring shank nails having not less than 20 rings per inch; heads not less than 3/16 inch (9.5 mm) in diameter; and lengths sufficient to penetrate through the thickness of plywood panel or wood plank decking not less than 3/16 inch (5 mm), or to penetrate into a 1-inch (25.4 mm), or greater, thickness of lumber not less than 1 inch (25.4 mm). Nails shall be hot dipped; electro- or mechanically galvanized to a thickness sufficient to resist corrosion in compliance with Appendix E of TAS 114. All nails shall have product approval. All nail cartons or carton labels shall be labeled to note compliance with the corrosion-resistance requirements. No roofing material shall be fully or partially adhered, unless otherwise noted in the roof assembly product approval directly to a nailable deck.

1519.5.1.1
Tin caps shall meet the requirements of Section 1517.5.2.

1519.5.1.2
Prefabricated fastener systems complying with Section 1519.5.1 and Section 1519.5.1.1 may be used, provided they are product approved.

1519.5.1.3
Spacing of such fasteners shall be in compliance with patterns set forth in the roofing assembly product approval.

1519.5.2
Where the architectural appearance of the underside is to be preserved, a base sheet may be secured in an alternate method of attachment prepared, signed, and sealed by a Florida-registered architect or engineer, or in buildings where the mean roof height does not exceed 15 feet (4.6 m), a base sheet may be secured with 1 1/4-inch (32 mm) fasteners on supporting members, with a minimum of 1/2-inch (12.7 mm) fasteners between the supporting members, all of which shall be secured through tin caps and nailed 6 inches (152 mm) o.c. in all directions.

1519.5.3 Lightweight insulating concrete.
All lightweight insulating concrete shall be vented in accordance with roofing system manufacturer recommendations.

1519.5.3.1
Lightweight concrete shall not be applied over an existing roof deck unless the supporting structure has been approved as adequate to sustain the added weight. Calculations verifying the adequacy of the existing structure to sustain the added weight shall be prepared, signed, sealed and dated by a Florida-registered architect or engineer, who is proficient in structural design, and submitted with the uniform roofing permit application.
1519.5.4 Other nailable decks.
The mechanical attachment of roofing components to other nailable decks shall be governed by the roofing assembly product approval.

1519.6 Cast-in-place and precast structural concrete decks.
Cast-in-place and precast structural concrete decks are considered nonnailable. Concrete decks shall be clean, dry and fully primed with ASTM D 41 or ASTM D 43, as required, primer applied at a rate of not less than 1 gallon (3.8 L) per square. Hot asphalt or cold adhesive shall not be applied until the primer has fully dried.

1519.6.1 Reserved.

1519.7 Steel decks.
Steel decks shall be covered with a roof insulation panel having its own product approval and listed in the roofing assembly product approval. Insulation panels shall be mechanically fastened in compliance with the mechanical attachment patterns listed in the roofing assembly product approval and in accordance with the provisions of RAS 117.

1519.7.1 If the deck thickness on an existing steel deck is less than 22 gage, a field fastener withdrawal resistance test shall be conducted in compliance with TAS 105, to confirm compliance with the wind load requirements of Chapter 16 (High-Velocity Hurricane Zones). Test results shall be submitted with the uniform roofing permit application for review prior to issuance of the roofing permit. The field fastener withdrawal resistance test shall be carried out by an approved testing laboratory.

1519.7.2 Steel decks shall be welded or mechanically attached to the structure in compliance with the design pressure requirements set forth in Chapter 16 (High Velocity Hurricane Zones).

1519.7.3 Composite wood and insulation panels shall be mechanically attached to steel decks in compliance with the attachment requirements enumerated in the insulation roofing component product approval. The composite wood insulation panel shall be in compliance with the minimum sheathing requirements of this code.

1519.8 Flashing.
All flashing shall be installed according to the roof assembly manufacturer’s published details and literature and in accordance with RAS 111.

1519.9 Valleys.
Valleys in BUR shall be installed according to the roof assembly manufacturer’s published literature for high wind areas and in compliance with the applicable detail described in the product approval.

1519.10 Parapet walls.
All parapet wall details shall be installed in accordance with the roofing system product approval, manufacturer’s published details and literature and in accordance with approved methods detailed in RAS 111.

1519.11 Insulation.
Roof insulation shall be applied in compliance with the roofing system product approval and RAS 117.

1519.12 Surfacing.
Roofing assemblies shall be surfaced in compliance with the product approval. Surfacing shall be in sufficient quantity to comply with the required fire classification. Aggregate surfacing shall not be used on slopes greater than 3:12. Aggregate shall be embedded in a flood coat of bitumen applied over a prepared top ply.

1519.12.1 On slopes of 3:12 or less, not less than 400 pounds (182 kg) of roofing gravel or 300 pounds (145 kg) of slag per square shall be applied. A minimum of 50 percent of the total aggregate shall be embedded in the flood coat of bitumen. Aggregate shall be dry and free from dirt and shall be in compliance with the sizing requirements set forth in ASTM D 1863. A building official may request a test to confirm compliance with these requirements.
1519.12.2
On inclines greater than 3:12, a smooth surface coating shall be applied.

1519.12.3
Mineral surfaced cap sheet applications shall not require any additional surfacing unless required with the particular assembly for a fire classification.

1519.12.4
All smooth surface applications shall be coated with an aluminized or emulsion coating, having a valid and current product approval and shall be in compliance with the application instructions in said product approval. Coating quantity shall be in compliance with the required fire rating classification for the structure.

1519.13 Attachment of metal termination.
All edge metal and terminations shall be installed according to manufacturer’s published literature, provided it meets the minimum requirements as set forth in RAS 111 and Chapter 16 (High Velocity Hurricane Zones).

1519.14 Expansion joints.
Expansion joint covers and expansion joint components shall be constructed and installed in accordance with the roofing assembly manufacturer’s published literature.

1519.15 Venting roofing assemblies.
All roof assemblies shall be applied to a dry substrate. Vapor retarders shall be installed, where applicable, to reduce moisture vapor flow into insulation from the warm, humid building interior, leading to internal condensation. Vents shall be installed to assist in the expulsion of moisture vapor where such vapor may enter the roofing assembly or moisture, as defined in Section 1521.12. Venting units shall not allow vapor to enter the roofing assembly when the high vapor pressure side is above the roofing membrane.

1519.16 Waterproofing.
Waterproofing systems may be installed in lieu of an approved roof system over sloped or horizontal decks specifically designed for pedestrian and/or vehicular traffic, whether the deck is above occupied or unoccupied space. In new construction, the minimum deck slope shall be $\frac{1}{4}:12$.

1519.16.1
The waterproofing system must possess a current and valid product approval.

1519.16.2
If an overburden or wearing surface is not to be installed, the waterproofing system must be approved by the manufacturer for use in vehicular and/or pedestrian traffic locations.

1519.16.3 Reserved.

1519.16.4
If any portion of the waterproofing membrane is to remain exposed, the waterproofing system shall be ultraviolet resistant.

1519.16.5
Flashings must be installed in accordance with the waterproofing manufacturer’s published specifications and in compliance with the material and attachment standards of RAS 111.

1519.16.6
The waterproofing system shall be flood-tested in accordance with ASTM D 5957.

1519.16.6.1
The flood test shall take place after installation of the waterproofing membrane and prior to the installation of any above membrane components, wearing surface or overburden.

1519.16.6.2
An approved testing lab shall provide written verification to the building official confirming that the flood test was
SECTION 1520 HIGH-VELOCITY HURRICANE ZONES—ROOF INSULATION

1520.1 General.
All roof insulation shall have a product approval as an approved roofing component for use in roofing assemblies. All insulation shall be tested for physical properties in accordance with TAS 110.

1520.2 Foam plastic.
Reserved.

1520.2.1
Foam insulation panels shall be overlaid with a perlite, fiberglass, wood fiber or mineral wool overlay unless specifically stated to the contrary in the roof assembly product approval.

1520.3 Cellulose fiberboard.
Reserved.

1520.4 Insulation fasteners, membrane fasteners and stress plates.
All insulation fasteners, membrane fasteners and stress plates shall have a roof component product approval, and shall be tested in compliance with RAS 117 Appendices A, B and C, and TAS 110 and TAS 114, Appendix E, Section 3 (DIN 50018), for corrosion resistance.

1520.5 Application.
Roof insulation shall be applied in strict compliance with the application methods detailed in the roof assembly product approval and with the requirements set forth in RAS 117.

1520.5.1
Roof insulation, either on the ground or on the roof top, shall be kept dry. The building official shall instruct the removal of the insulation from the job when elevated moisture levels are found in the insulation or where panels cannot achieve 85-percent adhesion.

1520.5.2
When applied in hot asphalt or cold adhesive, no insulation panel’s dimension shall be greater than 4 feet (1219 mm).

1520.5.3
Strip or spot mopping of insulation panels shall be used as an application method only when approved in the roof assembly product approval.

1520.5.4
Where more than one layer of insulation is applied, joints between layers shall be staggered.

1520.5.5
Application in approved cold adhesive shall be as detailed in the product approval and shall be in compliance with the required fire classification.

1520.5.6
Nail boards or composite panels with a nailable surface may be applied to sloped decks for the application of prepared roof covering or metal roofing systems, providing that the nailing surface is minimum 1/32-inch (12 mm) exterior grade plywood sheathing, and has been attached to the deck with approved fastening assemblies in accordance with the windload requirements of Chapter 16 (High-Velocity Hurricane Zones). Composite panels shall be gapped a minimum of 1/6 inch (3.2 mm) to allow for expansion of the sheathing panel.

1520.5.7
Suitable nailable decks installed over rigid board roof insulation in buildings of mean roof height of 35 feet (10.7 m) or less, shall be a minimum of 1/32-inch (12 mm) exterior grade plywood sheathing. These decks shall be fastened to every structural roof frame member or to the existing deck under the insulation, at intervals of not more than 24 inches (610 mm) apart, with a minimum #12 approved insulation fastener spaced at a maximum of 12 inches (305
mm) apart in one direction with a minimum penetration of $1'/_{8}\text{ inches (38 mm)}$ into the structural member or deck. In these cases, the maximum thickness of the rigid insulation board shall not exceed 2 inches (51 mm). An alternate method of attachment may be proposed, provided it is in compliance with Chapter 16 (High-Velocity Hurricane Zones), and it is prepared, signed and sealed by a Florida-registered architect or a Florida professional engineer, which architect or engineer shall be proficient in structural design.

1520.5.8
Mechanical attachment of insulation panels at uneven areas shall be acceptable. Hollowing, cutting or scoring of insulation panels to provide contact shall not be acceptable.

SECTION 1521 HIGH-VELOCITY HURRICANE ZONES—RE ROOFING

1521.1 General.
Materials and methods of application used for recovering or replacing an existing roof covering, system or assembly shall comply with the requirements set forth in Sections 1512 through 1525.

1521.2 Repairs shall be carried out with roofing components as defined in this chapter having a product approval.

1521.3 Repairs shall be carried out in such a manner as to not create additional ponding water.

1521.4 Not more than 25 percent of the total roof area or roof section of any existing building or structure shall be repaired, replaced or recovered in any 12-month period unless the entire existing roofing system or roof section is replaced to conform to requirements of this code.

1521.5 A roofing system shall not be applied over an existing roof or over an existing roof deck where the roof sheathing has not been fastened in compliance with this code or where the roof sheathing will not permit effective fastening or where sheathing is water soaked or deteriorated so that effective attachment is not possible. All areas of deteriorated sheathing shall be removed and replaced. The building official shall not be required to inspect the renailing of the sheathing under this section.

1521.6 Structural concrete decks shall be allowed to dry or shall be dried prior to application of an ASTM D 41 or ASTM D 43, as required, or roofing system proprietary primer where the base sheet or base insulation layer is bonded to the concrete deck.

1521.7 On lightweight insulating concrete, gypsum and cementitious wood fiber roof decks, a field fastener withdrawal resistance test, in compliance with TAS 105, shall be carried out to confirm compliance with wind load requirements of Chapter 16 (High-Velocity Hurricane Zones).

1521.7.1 If the tested fasteners exhibit a minimum characteristic resistance force less than 80 percent than that listed in the product approval, a structural engineer shall examine the deck’s integrity and provide a proposed attachment specification. Such specification shall be submitted with the uniform roofing permit application for review and approval by the building official prior to the issuance of a roofing permit. Calculations for the attachment of the anchor sheet/base sheet or insulation over these deck types, shall be in compliance with RAS 117.

1521.8 Steel decks shall be examined prior to recover for indication of corrosion. Any corrosion identified and exposed on the roof side shall be treated with a rust inhibitor, providing the field fastener withdrawal resistance values of the proposed mechanical fasteners comply with the requirements of Chapter 16 (High-Velocity Hurricane Zone) of this code. All steel decks less than 22 gage shall be field tested for fastener withdrawal resistance for compliance with Chapter 16 (High-Velocity Hurricane Zones) prior to application of a new roofing system. Test results shall be submitted with the uniform roofing permit application.
1521.9
One additional roofing system may be applied over an original roofing assembly, providing the existing roofing assembly complies with the requirements of Section 1521.

1521.10
If the recover roofing assembly is to be bonded to an existing roofing membrane, the existing roofing membrane shall be tested in compliance with TAS 124 for uplift resistance. The existing roofing membrane shall resist the design pressures calculated under Chapter 16 (High-Velocity Hurricane Zones) of this code. Test results shall be submitted with the uniform roofing permit application.

1521.11
If the recover roofing assembly is mechanically attached through either a base sheet or insulation layer, the attachment assembly shall be field tested for fastener withdrawal resistance, in compliance with TAS 105, and laboratory tested for pull-over resistance to insure compliance with wind uplift requirements set forth in Chapter 16 (High-Velocity Hurricane Zones) of this code. Test results shall be submitted with the uniform roofing permit application. Recover roofing assembly anchor sheet or base sheet shall not be mechanically fastened directly to existing gravel roof unless all gravel is completely removed.

1521.12
Moisture content of the existing roofing assembly to be covered by a new roofing system shall not exceed 5 percent by weight in the roofing membrane and 8 percent by weight in commercially manufactured rigid board roof insulation as verified by moisture survey performed in accordance with TAS 126. Test results shall be submitted with the Uniform Roofing Permit Application. Testing for moisture content shall not be required for existing lightweight insulating concrete, gypsum, and cementitious wood fiber roof decks. All existing lightweight insulating concrete, gypsum and cementitious wood fiber roof decks shall be tested in accordance with Section 1521.7 to confirm compliance with wind load requirements of Chapter 16 (High-Velocity Hurricane Zones).

1521.13
Prior to starting the work the contractor has the responsibility of notifying the owner, by means of the roofing permit and required owner's notification for roofing considerations herein, of any possibility of ponding water and recommend a structural review if ponding water is a possibility.

1521.14
If the new roofing system is to be bonded to the existing roof surface, the surface shall be free of all loose gravel, dirt and silt and dry prior to commencement of the roofing application. All blisters shall be cut and repaired prior to roofing application.

1521.14.1
If the existing roof surface has gravel embedded in hot asphalt, all loose gravel shall be removed together with any dirt and silt. The dry membrane surface shall be primed with ASTM D 41 primer or proprietary roofing system primer and allowed to dry thoroughly. A flood coat of ASTM D 312, Type III or IV asphalt shall be applied to sufficient depth to cover the remaining embedded gravel. The prepared substrate shall be suitable for application of a new insulation layer only.

1521.14.2
In the case of existing coal tar assemblies, the existing roof surface shall be primed with ASTM D 43 primer or covered with a mechanically attached separation board prior to application of a new coal tar assembly. If an existing coal tar assembly is to be covered with an asphalt applied roofing system, only the separation board is acceptable. The attachment of the entire assembly, including the separation board, shall meet the design pressure requirements set forth in Chapter 16 (High-Velocity Hurricane Zones).

1521.14.3
Insulation shall have a product approval as a roofing component approved for use as a part of the roofing assembly. The insulation panels shall be bonded or mechanically attached in compliance with the product approval and RAS 117.

1521.15
Where an existing sloped roof is sheathed with spaced sheathing, any existing prepared roof covering shall be removed. New sheathing shall be applied in compliance with Chapter 16 (High-Velocity Hurricane Zones), or open
spacing shall be filled with dimensional lumber to create solid wood sheathing providing the spaced sheathing is in compliance with this code. Spaced sheathing is approved for use with wood shakes and wood shingles only.

1521.16
No recover application shall take place over existing wood shingles, shakes, slate, tile or metal shingles.

1521.17
Asphaltic shingle assemblies may be applied over one existing layer of asphaltic shingles having not more than \( \frac{1}{6} \) inch (3.2 mm) difference in level in the existing shingle material. Recover over an existing shingle system shall be with a product having a product approval as prepared roof covering, in strict compliance with the application method detailed in the product approval.

1521.17.1
Application of elastomeric and or maintenance coating systems over existing asphalt shingles shall be in accordance with the shingle manufacturer’s approved installation instructions.

1521.18
Sprayed polyurethane foam (PUF) and elastomeric coating systems may be applied over existing roofing assemblies providing the PUF system has obtained a product approval, the deck has been prepared in compliance with the product approval and this code, the application is in strict compliance with the foam manufacturer’s published application instructions for the environmental conditions at the time of application and post-application inspections conform to RAS 109.

1521.18.1
No PUF system shall be applied over existing composition shingles.

1521.18.2
Upon completion of a PUF system, an inspection of the system shall be carried out by an authorized representative of the coating manufacturer. A certification shall be furnished to the building official within 30 days of completion, confirming that the quality control tests detailed in the PUF system product approval have been carried out with satisfactory results.

1521.18.3
Should a PUF system have inadequate adhesion to meet the design pressures, as set forth in Chapter 16 (High-Velocity Hurricane Zones), the roofing system shall be removed and replaced with a roofing system tested to adequate adhesion. An additional inspection shall be required once the roofing system has been replaced. A field adhesion test may be requested by the building official during the application or at the completion of the project to confirm adequate adhesion.

1521.18.4
The PUF system shall comply with Section 1521.

1521.18.5
All PUF systems shall be installed by licensed roofing contractors holding an applicator’s certificate from the manufacturer holding the product approval for the PUF system.

1521.19
Roof coverings or roofing components, such as tile, slate or similar, shall not be applied over an existing roofing system.

1521.20
Lightweight insulating concrete shall not be applied over an existing roofing system unless the existing roofing assembly is verified to be adequate to accept the new lightweight insulating concrete and is in compliance with the testing required herein.

1521.21 Reserved.

SECTION 1522 HIGH-VELOCITY HURRICANE ZONES—ROOFTOP STRUCTURES AND COMPONENTS
1522.1 Rooftop structures.
Rooftop structures shall be designed and constructed in accordance with the Florida Building Code.

1522.2 Rooftop mounted equipment.
All rooftop equipment and supports shall be secured to the structure in compliance with the loading requirements of Chapter 16 (High-Velocity Hurricane Zones). The use of wood “sleepers” shall not be permitted.

1522.3
Machinery, piping, conduit, ductwork, signs and similar equipment may be mounted on roofs in compliance with the following.

**TABLE 1522.3 ROOF MOUNTED EQUIPMENT HEIGHT REQUIREMENTS**

<table>
<thead>
<tr>
<th>WIDTH OF EQUIPMENT (In.)</th>
<th>HEIGHT OF LEGS (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 24</td>
<td>14</td>
</tr>
<tr>
<td>25 to 36</td>
<td>18</td>
</tr>
<tr>
<td>37 to 48</td>
<td>24</td>
</tr>
<tr>
<td>49 to 60</td>
<td>30</td>
</tr>
<tr>
<td>61 and wider</td>
<td>48</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

1522.3.1
Permanently mounted rooftop equipment shall be installed to provide clearances, in accordance with Table 1522.3, to permit repairs, replacement and/or maintenance of the roofing system or any of its components.

1522.3.2
When reroofing, recovering, performing repair or roof maintenance, and where the roof top equipment is moved to properly execute such work, the minimum clearances of the said equipment support shall be in accordance with Table 1522.3.

1522.3.3
In buildings where the existing rooftop equipment, in the opinion of the building official, provides sufficient clearance to repair, recover, replace and/or maintain the roofing system or any of its components, such existing equipment need not comply with Table 1522.3.

1522.3.4
Electrical conduit, mechanical piping or any other service lines running on the roof shall be raised not less than 8 inches (203 mm) above the finished roof surface.

1522.3.5
Condensate lines shall not drain on the roofing system or any of its components. Condensate lines need not comply with the minimum clearance requirements.

**SECTION 1523 HIGH-VELOCITY HURRICANE ZONES—TESTING**

1523.1 Scope.
This section defines the minimum testing requirements for substrates, roofing components, roofing systems and roofing assemblies. All roofing products shall be tested for physical properties, water-infiltration, uplift performance and fire resistance, as addressed within this code.

1523.1.1
Testing requirements for physical properties of all roofing products shall be as set forth in TAS 110.

1523.1.2 Reserved.
1523.2 Application.
Testing for substrates, roofing components, roofing systems and roofing assemblies shall comply with the provisions herein and those of this code, TAS and RAS listed in this code.

1523.3 Laboratory certification.
All testing required by this code shall be performed by an approved testing laboratory.

1523.4 Margin of safety.
A margin of safety of 2:1 shall be applied to all wind uplift resistance test results. All in-situ (on site) testing shall have an applied 1.45:1 margin of safety.

1523.5 Material labeling.
All products shall be identified with the product approval number or logo; or the manufacturer’s name or logo. ASTM standard roll goods shall be marked with a yellow line to identify the ASTM standard, or such other marking indicated in the product approval.

1523.5.1
All asphaltic shingles, tile products and metal roofing panels and clips shall be labeled on the underside with the Florida Building Code, Building insignia, or product approval number, or the wording “Florida Building Code, Building product approved,” and manufacturer’s initials or manufacturer’s logo, or as specified in the manufacturer’s product approval.

1523.6 Testing requirements.

1523.6.1
The certification agency, at its discretion, may carry out, observe or delegate the inspection and testing to an independent testing laboratory for any approved product. Should the manufacturer fail to meet the minimum requirements set forth in this code or specifically listed in the manufacturer’s product control approval, the certification agency shall have the authority to withdraw the approval until such time as the manufacturer complies with the approved physical properties. The certification agency shall have the authority, and shall charge the manufacturer for any cost incurred.

1523.6.2 Continuous roofing systems.
All continuous roofing systems shall be tested in compliance with TAS 110 and TAS 114 in its entirety. All continuous roofing systems shall resist a minimum of 90 pounds per square foot (psf) (4309 Pa) tested wind uplift pressure resistance. Continuous roofing system testing requirements shall be as follows.

1523.6.2.1
Spray applied polyurethane foam. All spray applied polyurethane foam systems shall be tested in compliance to RAS 109 and TAS 110 and TAS 114.

1523.6.2.1.1
Physical properties testing for acrylic coatings used on spray applied polyurethane foam roofing assemblies shall be tested in compliance with ASTM D 6083 and federal specification TTC-555B, Test Specification for Wind Driven Rain Infiltration Resistance.

1523.6.3 Liquid applied roofing membranes systems.
All liquid applied roofing membranes systems shall be tested in compliance with TAS 114, in addition to the physical properties testing requirements set forth in TAS 110, and fire resistance.

1523.6.3.1
For liquid applied acrylic roofing membrane assemblies, physical properties testing shall be in compliance with ASTM D 6083 and federal specification TTC-555B, Test Specification for Wind Driven Rain Infiltration Resistance.

1523.6.4
The building official may request that a quality control field uplift test be carried out on a continuous roofing system in compliance with test procedure TAS 124. Single-ply systems are not required to meet the deflection requirements established in the test protocol. The roofing system shall resist the design pressures as calculated in compliance with Chapter 16 (High-Velocity Hurricane Zones), and as established in TAS 124.
1523.6.4.1 Should a roofing system fail to meet a quality control field uplift test, the roofing contractor may propose to the building official an acceptable method of repair that is in compliance with the requirements of this code.

1523.6.5 Discontinuous roofing systems.
All discontinuous roofing systems shall be tested in compliance with TAS 100 for wind-driven water infiltration resistance. Test specimens used for this test shall be constructed at the approved test facility. Testing requirements shall be as follows.

1523.6.5.1 Asphaltic shingle systems.
All asphaltic shingle systems shall comply with the following requirements: TAS 100, TAS 107, ASTM D 3462 and ASTM D 3018. Asphaltic shingle systems shall have a quality control testing program by an approved independent listing agency having an unannounced follow-up visit. Follow-up test results shall be made available to the certification agency upon request.

1523.6.5.2 Clay and cement roof tiles.
All roof tiles shall be tested in compliance with TAS 100. Physical properties testing for clay roof tiles shall be in compliance with ASTM C 1167. Physical properties testing for concrete roof tiles shall be in compliance with TAS 112. All approved roof tile manufacturers shall submit a quarterly TAS 112, Appendix A, test report to the certification agency for review. All roof tiles shall resist a minimum wind uplift resistance as determined by Chapter 16 (High-Velocity Hurricane Zones) of this code and RAS 127. Clay and cement roof tile systems requirements are as follows.

1523.6.5.2.1 Underlayment.
All underlaminations used in discontinuous roof tile systems shall be tested in compliance with TAS 103 and TAS 104, unless otherwise specifically listed in the applicable RAS.

1523.6.5.2.2 Mortar or adhesive set roof tile systems.
All mortar or adhesive set tile systems shall be tested for static uplift resistance in compliance with TAS 101, the results of which shall be listed in the system manufacturer’s product approval.

1523.6.5.2.2.1 Additionally, roof tile system manufacturers may test for wind characteristics in compliance with TAS 108, provided the system is determined to be air permeable by testing in compliance with TAS 116; and the tiles meet the size criteria set forth in TAS 108. The result from this testing shall be an aerodynamic multiplier (I) which represents the system’s wind characteristics and shall be listed in the system manufacturer’s product approval.

1523.6.5.2.2.2 Systems which are tested for wind characteristics, in compliance with TAS 108 as specified above, shall have the results of the TAS 101 testing treated as attachment-resistance moment (Mr), which is representative of the tile bond’s resistance to overturning moment, and the tile’s restoring moment due to gravity (Mg). Such systems shall use the system’s aerodynamic multiplier (I) in conjunction with the system’s attachment-resistance moment (MF) and restoring moment due to gravity (Mg), as determined from the TAS 101 static uplift testing. These results shall be used in conjunction with the attachment calculations outlined in RAS 127 as a moment-based system. Such calculations shall be submitted to the building official for review.

1523.6.5.2.2.3 Systems that are not tested in compliance with TAS 108 as specified above shall have their product control approval based on the system’s uplift minimum characteristic resistance force (F’), as determined from TAS 101 static uplift testing. These results shall be used in conjunction with the attachment calculations outlined in RAS 127 as an uplift-based system. Such calculations shall be submitted to the building official for review.

1523.6.5.2.4 Testing in accordance with TAS 106 shall be considered a product application quality control test to determine the general adhesion properties of the system.

1523.6.5.2.3 Mechanically fastened, rigid roofing systems.
All mechanically attached set tile systems shall be tested for static uplift resistance in compliance with TAS 102 or
TAS 102(A), the results of which shall be listed in the system manufacturer’s notice of acceptance (NOA).

1523.6.5.2.3.1
Additionally, roof tile system manufacturers may test for wind characteristics in compliance with TAS 108, provided the system is determined to be air permeable by testing in compliance with TAS 116; and the tiles meet the size criteria set forth in TAS 108. The result from this testing shall be an aerodynamic multiplier (k) which represents the system’s wind characteristics and shall be listed in the system manufacturer’s product approval.

1523.6.5.2.3.2
Systems which are tested for wind characteristics in compliance with TAS 108 as specified above shall have the results of the TAS 102 or TAS 102(A) testing treated as an attachment-resistance moment (Mf) which is representative of the rigid component’s attachment resistance to an overturning moment, and the tile’s restoring moment due to gravity (Mg). Such systems shall use the system’s aerodynamic multiplier (k), in conjunction with the system’s attachment-resistance moment (Mf) and restoring moment due to gravity (Mg), as determined from the TAS 102 or TAS 102(A) static uplift testing. These results shall be used in conjunction with the attachment calculations outlined in RAS 127 as a moment-based system. Such calculations shall be submitted to the building official for review.

1523.6.5.2.3.3
Systems that are not tested in compliance with TAS 108 as specified above shall have their product control approval based on the system’s uplift minimum characteristic resistance force (F′), as determined from TAS 102 or TAS 102(A) static uplift testing. These results shall be used in conjunction with the attachment calculations outlined in RAS 127 as an uplift-based system. Such calculations shall be submitted to the building official for review.

1523.6.5.2.3.4
TAS 106 quality control field static uplift testing shall be considered a product application quality control test to determine the general uplift resistance properties of the system.

1523.6.5.2.4 Metal shingles/panels.
All metal roofing shall be tested in compliance with TAS 100. All metal roofing shall resist a minimum wind uplift resistance as determined by Chapter 16 (High-Velocity Hurricane Zones) for a roof slope of 9.5 degrees (0.0166 rad) and a roof mean height of 15 feet (4.6 m). All metal roofing systems testing requirements shall be as follows.

1523.6.5.2.4.1
All metal roofing shall be tested in compliance with requirements set forth in TAS 110 and TAS 125, and shall be tested for wind driven rain infiltration resistance in compliance with TAS 100.

1523.6.5.2.4.2
Rigid metal shingle systems may be tested in an identical manner to nail-on or batten tile systems as set forth in this code.

1523.6.5.2.5 Wood shingles or shakes.
All wood shingles and shakes shall be tested, as a system, for wind driven rain infiltration resistance in compliance with TAS 100. The same specimens as tested in TAS 100 shall be tested for pull-through tear resistance, and such values shall be listed in the manufacturer’s product approval.

1523.6.5.2.6 Fiber-cement shingle or tile panels.
All fiber-cement shingles or tiles shall resist a minimum wind uplift resistance as determined by Chapter 16 (High-Velocity Hurricane Zones) for a roof slope of 9.5 degrees (0.0166 rad) and a roof mean height of 15 feet (4.6 m). All fiber-cement shingles or tiles shall be tested in compliance with the following requirements: wind driven water resistance in compliance with TAS 100, physical properties in compliance with TAS 110, TAS 135 and uplift resistance.

1523.6.5.2.6.1
Additionally, fiber-cement tile system manufacturers may test for wind characteristics in compliance with TAS 108, provided the system is determined to be air permeable by testing in compliance with TAS 116 and the tiles meet the size criteria set forth in TAS 108. The result from this testing shall be an aerodynamic multiplier (k) which represents the system’s wind characteristics and shall be listed in the system manufacturer’s product approval.
1523.6.5.2.6.2
Systems which are tested for wind characteristics in compliance with TAS 108 as specified above shall have the results of the TAS 102 or TAS 102(A) testing treated as an attachment-resistance moment (MF) which is representative of the rigid component's attachment resistance to an overturning moment, and the tile's restoring moment due to gravity (Mg). Such systems shall use the system's aerodynamic multiplier (I), in conjunction with the system's attachment-resistance moment (MF) and restoring moment due to gravity (Mg), as determined from the TAS 102 or TAS 102(A) static uplift testing. These results shall be used in conjunction with the attachment calculations outlined in RAS 127 as a moment-based system. Such calculations shall be submitted to the building official for review.

1523.6.5.2.6.3
Systems that are not tested in compliance with TAS 108 as specified above shall have their product approval based on the system's uplift minimum characteristic resistance force (F"), as determined from TAS 102 or TAS 102(A) static uplift testing. These results shall be used in conjunction with the attachment calculations outlined in RAS 115 as an uplift-based system. Such calculations shall be submitted to the building official for review.

1523.6.5.2.6.4
TAS 106 quality control field static uplift testing shall be considered a product application quality control test to determine the general uplift resistance properties of the system.

1523.6.5.2.7 Quarry roof slate.
All quarry roof slate shall be tested in compliance with TAS 100 and TAS 110.

1523.6.5.2.8 Roof board insulation.
All roof board insulation shall be tested for physical properties as set forth in Section 7 of TAS 110.

1523.6.5.2.9 Insulation fasteners, membrane fasteners and stress plates.
All insulation fasteners, membrane fasteners and stress plates shall be tested in compliance with TAS 117 Appendices A, B and C, and TAS 110 and TAS 114, Appendix E, Section 3, (DIN 50018), for corrosion resistance.

1523.6.5.2.10 Roofing nails and tin-caps.
All roofing nails and tin-caps shall be tested for corrosion resistance in compliance with TAS 114, Appendix E, Section 2 (ASTM G 85).

1523.6.5.2.11 Roof tile nails or fasteners.
All roof tile nails or fasteners, except those made of copper, monel, aluminum or stainless steel, shall be tested for corrosion in compliance with TAS 114, Appendix E, Section 2 (ASTM G 85), for salt spray for 1000 hours.

1523.6.5.2.11.1 Tile fasteners used in coastal building zones, as defined in Chapter 16 (High-Velocity Hurricane Zone), shall be copper, monel, aluminum or stainless steel.

1523.6.5.2.12 Roofing adhesives, mastics and coatings.
All roofing adhesives, mastics and coatings shall be tested in compliance with TAS 110 and TAS 121.

1523.6.5.2.12.1 All roofing adhesives, mastics and coatings shall have a quality control testing program by an approved independent listing agency having unannounced follow-up visits.

1523.6.5.2.12.2 Acrylic roof coatings shall be tested for physical properties in compliance with ASTM D 6083.

1523.6.5.2.13 Ridge vents of metal, plastic or composition material.
All ridge vents shall be tested in compliance with TAS 100(A) for wind driven water infiltration. All ridge ventilators shall be restricted to roof mean height as tested in compliance with TAS 100(A), and shall be listed in the system manufacturer's product approval.

1523.6.5.2.13.1 All plastic ridge ventilators shall be tested for physical properties as set forth in TAS 110 and Chapter 26 of this
code.

1523.6.5.2.13.2
All plastic ridge ventilator manufacturers shall have an unannounced follow-up quality control program from an approved listing agency. Follow-up test results shall be made available to the certification agency upon request.

1523.6.5.2.14 Edge metal, flashings, and coping.
All edge metal, flashing and copings, not specifically described in RAS 111, shall be tested in compliance with TAS 110, TAS 111(A), TAS 111(B) or TAS 111(C), respectively.

1523.6.5.2.15 Roof tile premixed bagged mortar.
All premixed roof tile mortar shall comply with the requirements set forth in TAS 110 and TAS 123, and shall have a quality control testing program by an approved independent listing agency having unannounced follow-up visits. Follow-up test results shall be made available to the certification agency upon request.

1523.6.5.2.16 Roof tile adhesive used in repair or supplemental tile attachment.
All roof tile adhesive used in repair or supplemental tile attachment shall comply with the requirements set forth in TAS 110 and TAS 123(A).

1523.6.5.2.17 Roof tile adhesive used in adhesive set tiles systems.
All roof tile adhesive used in adhesive set tile systems shall comply with the requirements set forth in TAS 110 and TAS 123. Physical properties shall be as follows.

1523.6.5.2.17.1
Tested for compressive strength in compliance with ASTM D 1621 with a minimum strength of 18 psi (121 kPa) parallel to rise, and 12 psi (82.7 kPa) perpendicular to rise.

1523.6.5.2.17.2
Tested for density in compliance with ASTM D 1622 with a minimum density of 1.6 pounds per cubic foot (25.6 kg/m³).

1523.6.5.2.17.3
Tested for tensile strength in compliance with ASTM D 1623 with a minimum requirement of 28 psi (193 kPa) parallel to rise.

1523.6.5.2.17.4
Tested for dimensional stability taken from a free rise sample specimen. Tested in compliance with ASTM D 2126 with a maximum volume change of +0.07-percent volume change at -40°F (-40°C) for two weeks; and +6.0-percent volume change at 158°F (70°C) and 100-percent RH for two weeks.

1523.6.5.2.17.5
Tested in compliance with ASTM D 2856 from a free rise sample specimen with a minimum requirement for 85 percent.

1523.6.5.2.17.6
Tested for water absorption in compliance with ASTM D 2842 with a maximum requirement of 10 percent.

1523.6.5.2.17.7
Tested in compliance with ASTM E 96 for moisture vapor transmission for a maximum of 3.1 perms.

SECTION 1524 HIGH-VELOCITY HURRICANE ZONES—REQUIRED OWNERS NOTIFICATION FOR ROOFING CONSIDERATIONS

1524.1 Scope.
As it pertains to this section, it is the responsibility of the roofing contractor to provide the owner with the required roofing permit, and to explain to the owner the content of this section. The provisions of this chapter govern the minimum requirements and standards of the industry for roofing system installations. Additionally, the following items should be addressed as part of the agreement between the owner and the contractor. The owner's initial in the designated space indicates that the item has been explained.
1. Aesthetics—workmanship. Reserved.

2. Renailing wood decks. When replacing roofing, the existing wood roof deck may have to be renailed in accordance with the current provisions of Chapter 16 (High-Velocity Hurricane Zones) of this code. (The roof deck is usually concealed prior to removing the existing roof system.)


4. Exposed ceilings. Exposed, open beam ceilings are where the underside of the roof decking can be viewed from below. The owner may wish to maintain the architectural appearance; therefore, roofing nail penetrations of the underside of the decking may not be acceptable. The owner provides the option of maintaining this appearance.

5. Ponding water. Reserved.

6. Overflow scuppers (wall outlets). It is required that rainwater flow off so that the roof is not overloaded from a buildup of water. Perimeter/edge walls or other roof extensions may block this discharge if overflow scuppers (wall outlets) are not provided. It may be necessary to install overflow scuppers in accordance with the requirements of Chapter 15 and 16 herein and the Florida Building Code, Plumbing.

SECTION 1525 HIGH-VELOCITY HURRICANE ZONES UNIFORM PERMIT APPLICATION


High-Velocity Hurricane Zone Uniform Permit Application Form

INSTRUCTION PAGE

COMPLETE THE NECESSARY SECTIONS OF THE UNIFORM ROOFING PERMIT APPLICATION FORM AND ATTACH THE REQUIRED DOCUMENTS AS NOTED BELOW:

<table>
<thead>
<tr>
<th>Roof System</th>
<th>Required Sections of the Permit Application Form</th>
<th>Attachments Required See List Below</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Slope Application</td>
<td>A,B,C</td>
<td>1,2,3,4,5,6,7</td>
</tr>
<tr>
<td>Prescriptive BUR-RAS 150</td>
<td>A,B,C</td>
<td>4,5,6,7</td>
</tr>
<tr>
<td>Asphaltic Shingles</td>
<td>A,B,D</td>
<td>1,2,4,5,6,7</td>
</tr>
<tr>
<td>Concrete or Clay Tile</td>
<td>A,B,D,E</td>
<td>1,2,3,4,5,6,7</td>
</tr>
<tr>
<td>Metal Roofs</td>
<td>A,B,D</td>
<td>1,2,3,4,5,6,7</td>
</tr>
<tr>
<td>Wood Shingles and Shakes</td>
<td>A,B,D</td>
<td>1,2,4,5,6,7</td>
</tr>
<tr>
<td>Other</td>
<td>As Applicable</td>
<td>1,2,3,4,5,6,7</td>
</tr>
</tbody>
</table>

ATTACHMENTS REQUIRED:

1. Fire Directory Listing Page
2. From Product Approval:
   - Front Page
   - Specific System Description
   - Specific System Limitations
   - General Limitations
   - Applicable Detail Drawings
3. Design Calculations per Chapter 16, or if applicable, RAS 127 or RAS 128
4. Other Component of Product Approval
5. Municipal Permit Application
6. Owners Notification for Roofing Considerations (Reroofing Only)
7. Any Required Roof Testing/Calculation Documentation

High-Velocity Hurricane Zone Uniform Permit Application Form.

Section A (General Information)

Master Permit No.__________________________ Process No.__________________________

Contractor’s Name______________________________________________________________

Job Address______________________________________________________________

ROOF CATEGORY

☐ Low Slope    ☐ Mechanically Fastened Tile    ☐ Mortar/Adhesive Set Tiles
☐ Asphalitic Shingles    ☐ Metal Panel/Shingles    ☐ Wood Shingles/Shakes
☐ Prescriptive BUR-RAS 150

ROOF TYPE

☐ New roof    ☐ Repair    ☐ Maintenance    ☐ Reroofing    ☐ Recovering

ROOF SYSTEM INFORMATION

Low Slope Roof Area (SF)_____    Steep Sloped Roof AREA (SSF)_____    Total (SF)_____

Section B (Roof Plan)

Sketch Roof Plan: Illustrate all levels and sections, roof drains, scuppers, overflow scuppers and overflow drains. Include dimensions of sections and levels, clearly identify dimensions of elevated pressure zones and location of parapets.
Section C (Low Slope Application)
Fill in specific roof assembly components and identify manufacturer
(If a component is not used, identify as "NA")

System Manufacturer:

Product Approval No.:

Design Wind Pressures, From RAS 128 or Calculations:
P1: ______________ P2: ______________ P3: ______________

Max. Design Pressure, from the specific product approval system:

Deck:
Type:
Gauge/Thickness:
Slope:

Anchor/Base Sheet & No. of Ply(s):

Anchor/Base Sheet Fastener/Bonding Material:

Insulation Base Layer:

Base Insulation Size and Thickness:

Base Insulation Fastener/Bonding Material:

Top Insulation Layer:

Top Insulation Size and Thickness:

Top Insulation Fastener/Bonding Material:

Base Sheet(s) & No. of Ply(s):

Base Sheet Fastener/Bonding Material:

Ply Sheet(s) & No. of Ply(s):

Ply Sheet Fastener/Bonding Material:

Top Ply:

Top Ply Fastener/Bonding Material:

Surfacing:

Fastener Spacing for Anchor/Base Sheet Attachment:
Field: ___" oc @ Lap, # Rows ___ @ ___" oc
Perimeter: ___" oc @ Lap, # Rows ___ @ ___" oc
Corner: ___" oc @ Lap, # Rows ___ @ ___" oc

Number of Fasteners Per Insulation Board:
Field ___ Perimeter ___ Corner ___

Illustrate Components Noted and Details as Applicable:
Woodblocking, Gutter, Edge Termination, Stripping, Flashing, Continuous Cleat, Cant Strip, Base Flashing, Counter Flashing, Coping, Etc.

Indicate: Mean Roof Height, Parapet Height, Height of Base Flashing, Component Material, Material Thickness, Fastener Type, Fastener Spacing or Submit Manufacturers Details that Comply with RAS 111 and Chapter 16.
High-Velocity Hurricane Zone Uniform Permit Application Form

Section D (Steep Sloped Roof System):

Roof System Manufacturer: ______________________________

Notice of Acceptance Number: ______________________________

Minimum Design Wind Pressures, If Applicable (From RAS 127 or Calculations):
P1: __________  P1: __________  P1: __________

Deck Type: ______________________________

Type Underlayment: ______________________________

Insulation: ______________________________

Fire Barrier: ______________________________

Roof Slope: ______: 12

Ridge Ventilation? ______________________________

Fastener Type & Spacing: ______________________________

Adhesive Type: ______________________________

Type Cap Sheet: ______________________________

Mean Roof Height: ______________________________

Roof Covering: ______________________________

Type & Size Drip Edge: ______________________________
Section E (Tile Calculations)

For Moment based tile systems, choose either Method 1 or 2. Compare the values for M, with the values from M. If the M, values are greater than or equal to the M, values, for each area of the roof, then the tile attachment method is acceptable.

Method 1 "Moment Based Tile Calculations Per RAS 127"

(P1: ___ x _\lambda_ = _) - Mg: ___ = M, ___ Product Approval M,
(P2: ___ x _\lambda_ = _) - Mg: ___ = M, ___ Product Approval M,
(P3: ___ x _\lambda_ = _) - Mg: ___ = M, ___ Product Approval M, 

Method 2 "Simplified Tile Calculations Per Table Below"

Required Moment of Resistance (M,) From Table Below Product Approval M,

<table>
<thead>
<tr>
<th>Mean Roof Height</th>
<th>15'</th>
<th>20'</th>
<th>25'</th>
<th>30'</th>
<th>40'</th>
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<tbody>
<tr>
<td>Roof Slope</td>
<td>2:12</td>
<td>3:12</td>
<td>4:12</td>
<td>5:12</td>
<td>6:12</td>
</tr>
<tr>
<td></td>
<td>34.4</td>
<td>32.2</td>
<td>30.4</td>
<td>28.4</td>
<td>26.4</td>
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<td>32.2</td>
<td>30.1</td>
<td>28.0</td>
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<td></td>
<td>38.2</td>
<td>36.0</td>
<td>33.8</td>
<td>31.6</td>
<td>29.4</td>
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<tr>
<td></td>
<td>39.7</td>
<td>37.4</td>
<td>35.1</td>
<td>32.8</td>
<td>30.5</td>
</tr>
<tr>
<td></td>
<td>42.2</td>
<td>39.8</td>
<td>37.3</td>
<td>34.9</td>
<td>32.4</td>
</tr>
</tbody>
</table>

*Must be used in conjunction with a list of moment based tile systems endorsed by the Broward County Board of Rules and Appeals.

For Uplift based tile systems use Method 3. Compare the values for F' with the values for Fr. If the F' values are greater than or equal to the Fr values, for each area of the roof, then the tile attachment method is acceptable.

Method 3 "Uplift Based Tile Calculations Per RAS 127"

(P1: ___ x L = ___ x w: = _) - W: ___ x cos \theta = F, ___ Product Approval F,
(P2: ___ x L = ___ x w: = _) - W: ___ x cos \theta = F, ___ Product Approval F,
(P3: ___ x L = ___ x w: = _) - W: ___ x cos \theta = F, ___ Product Approval F,

Where to Obtain Information

<table>
<thead>
<tr>
<th>Description</th>
<th>Symbol</th>
<th>Where to find</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Pressure</td>
<td>P1 or P2 or P3</td>
<td>RAS 127 Table 1 or by an engineering analysis prepared by PE based on ASCE 7</td>
</tr>
<tr>
<td>Mean Roof Height</td>
<td>H</td>
<td>Job Site</td>
</tr>
<tr>
<td>Roof Slope</td>
<td>\theta</td>
<td>Job Site</td>
</tr>
<tr>
<td>Aerodynamic Multiplier (\lambda)</td>
<td>\lambda</td>
<td>Product Approval</td>
</tr>
<tr>
<td>Restoring Moment due to Gravity</td>
<td>M, g</td>
<td>Product Approval</td>
</tr>
<tr>
<td>Attachment Resistance (M,)</td>
<td>M, a</td>
<td>Product Approval</td>
</tr>
<tr>
<td>Required Moment Resistance (M,)</td>
<td>M, r</td>
<td>Calculated</td>
</tr>
<tr>
<td>Minimum Attachment Resistance (F',)</td>
<td>F', m</td>
<td>Product Approval</td>
</tr>
<tr>
<td>Required Uplift Resistance (F,)</td>
<td>F', u</td>
<td>Calculated</td>
</tr>
<tr>
<td>Average Tile Weight (W)</td>
<td>W</td>
<td>Product Approval</td>
</tr>
<tr>
<td>Tile Dimensions (L = length) (W = width)</td>
<td>L = length, W = width</td>
<td>Product Approval</td>
</tr>
</tbody>
</table>

All calculations must be submitted to the building official at the time of permit application.
### R6665

<table>
<thead>
<tr>
<th>Date Submitted</th>
<th>Section</th>
<th>Proponent</th>
<th>Affects HVHZ</th>
<th>TAC Recommendation</th>
<th>Commission Action</th>
<th>Attached</th>
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<tr>
<td>12/20/2015</td>
<td>706</td>
<td>Mark Zehnal</td>
<td>No</td>
<td>Approved as Modified</td>
<td>Pending Review</td>
<td>Yes</td>
</tr>
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</table>

#### Comments

- **General Comments**: No
- **Alternate Language**: No

#### Related Modifications

- None

#### Summary of Modification

- Change section heading.

#### Rationale

- Change of heading is inclusive of reroofing, recovering, repairs, roof components and maintenance.

#### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**: No impact. Provides improved code section language.
- **Impact to building and property owners relative to cost of compliance with code**: No impact. Provides improved code section language.
- **Impact to industry relative to the cost of compliance with code**: No impact. Provides improved code section language.
- **Impact to small business relative to the cost of compliance with code**: No impact. Provides improved code section language.

#### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**: Provides improved guidance with established FBC code language.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**: Provides improved guidance with established FBC code language.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**: Does not discriminate. Provides improved guidance with established FBC code language.
- **Does not degrade the effectiveness of the code**: Does not degrade. Provides improved guidance with established FBC code language.

- **Is the proposed code modification part of a prior code version?** YES

- **The provisions contained in the proposed amendment are addressed in the applicable international code?** NO

- **The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?** YES

- **The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?** NO
Section 706 Existing Roofing
See attached PDF file.
### R6687

<table>
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<th>Date Submitted</th>
<th>12/21/2015</th>
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</thead>
<tbody>
<tr>
<td>Chapter</td>
<td>9</td>
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<tr>
<td>Section</td>
<td>908</td>
</tr>
<tr>
<td>Affects HVHZ</td>
<td>No</td>
</tr>
<tr>
<td>Proponent</td>
<td>Mark Zehnal</td>
</tr>
<tr>
<td>Attachments</td>
<td>Yes</td>
</tr>
<tr>
<td>TAC Recommendation</td>
<td>Approved as Modified</td>
</tr>
<tr>
<td>Commission Action</td>
<td>Pending Review</td>
</tr>
</tbody>
</table>

#### Comments

**General Comments**

No

**Alternate Language**

No

#### Related Modifications

No

#### Summary of Modification

Change section heading.

#### Rationale

Change of heading is inclusive of reroofing, recovering, repairs, roof components and maintenance.

#### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  
  No impact. Provides improved code section language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  
  No impact. Provides improved code section language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  
  No impact. Provides improved code section language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  
  No impact. Provides improved code section language without any new requirements being established.

#### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  
  Provides improved guidance with established FBC code language.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  
  Provides improved guidance with established FBC code language.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  
  Does not discriminate. Provides improved guidance with established FBC code language.

- **Does not degrade the effectiveness of the code**
  
  Does not degrade. Provides improved guidance with established FBC code language.

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
SECTION R908 REROOFING
**Comments**

<table>
<thead>
<tr>
<th>General Comments</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>Alternate Language</td>
<td>No</td>
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**Related Modifications**

**Summary of Modification**

Provides clarification to current State Statute mandated Florida-specific criteria

**Rationale**

To improve previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- Impact to local entity relative to enforcement of code
  - No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- Impact to building and property owners relative to cost of compliance with code
  - No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- Impact to industry relative to the cost of compliance with code
  - No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- Impact to small business relative to the cost of compliance with code
  - No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

**Requirements**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Does not discriminate. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- Does not degrade the effectiveness of the code
  - Does not degrade. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

**Is the proposed code modification part of a prior code version?**

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
R905.10 **Metal roof panels.** The installation of metal roof panels shall comply with the provisions of this section. Metal roofing panels shall be factory or field manufactured in accordance with the manufacturers’ Product Approval specifications and limitations of use. Metal roofing panels shall be factory or field manufactured under a quality assurance program that is audited by a third-party quality assurance entity approved by the Florida Building Commission for that purpose.
Keystone Certifications supports this Code Modification because it clarifies metal roof manufacturer responsibility to demonstrate that products are manufactured as approved, regardless of product approval method (statewide or local). We continue to receive complaints from legitimate manufacturers regarding competitors that do not employ quality assurance without consequence because building officials are not clear on the requirement, leading to inconsistent enforcement and opening the door for the installation of inferior roof products in the state of Florida.

Implementation of this Code Mod in conjunction with Mods 6730 & 6779, which further clarify who is the manufacturer of metal roof products (not equipment suppliers), will provide code officials the understanding necessary to consistently implement the requirements of the Florida Building Codes.
See attached PDF file.
R905.10

**Metal roof panels.** The installation of metal roof panels shall comply with the provisions of this section. Metal roofing panels shall be manufactured in accordance with the manufactures’ Product Approval’s specifications and limitations of use. Metal roofing panels shall be manufactured under a quality assurance program that is audited by a third-party quality assurance entity approved by the Florida Building Commission for that purpose.
To add a definition to clarify who is a metal roof covering manufacturer.

To assist in clarification of products manufactured for use in construction of metal roofing and for compliance with the Florida Building Code and the Florida Statutes.

Impact to local entity relative to enforcement of code
No impact.

Impact to building and property owners relative to cost of compliance with code
No impact.

Impact to industry relative to the cost of compliance with code
No impact.

Impact to small business relative to the cost of compliance with code
No impact.

Is the proposed code modification part of a prior code version? No

Companies with no FPA using false FPA.....Something needs to be done with roofing contractors using machines with no florida product approvals. They are able to pull anyone's FPA info and submit stating they are using this product when in fact its coming off a machine that hasn't been tested or through the Quality Assurance Company. The manufacturers out there that pay out all this money for testing, and updating for FPA gets taken advantage of when there are companies out there that are cheating the system.
Keystone Certifications supports this Code Modification because it clarifies who is the manufacturer of metal roof products, and therefore who is the party responsible to demonstrate the products are manufactured as approved. We continue to receive complaints from legitimate manufacturers regarding competitors who employ the Florida Product Approvals issued in the name of their equipment suppliers and do not participate in a quality assurance program to demonstrate the products are produced as approved.

Implementation of this Code Mod in conjunction with Mods 6783 & 6784 OR 6734 & 6776, which further clarify the quality assurance requirement, will provide code officials with the understanding necessary to consistently implement the requirements of the Florida Building Codes.
[BS] METAL ROOF PANEL. An interlocking metal sheet having a minimum installed weather exposure of 3 square feet (0.279 m$^2$) per sheet.

[BS] METAL ROOF SHINGLE. An interlocking metal sheet having an installed weather exposure less than 3 square feet (0.279 m$^2$) per sheet.

[RB] METAL ROOF PANEL, METAL ROOF SHINGLE MANUFACTURER,

The party responsible that forms raw material into metal roof panels and/or metal roof shingles used in building construction.
R6638

Proponent: Mark Zehnal

Date Submitted: 12/19/2015

Chapter: 15

Section: 1502

Affects HVHZ: No

Attachments: Yes

Commission Action: Pending Review

TAC Recommendation: Approved as Submitted

Comments

General Comments: No

Alternate Language: No

Related Modifications

Summary of Modification

Provides current Florida-specific criteria

Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact. Current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code

No impact. Current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code

No impact. Current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code

No impact. Current 2014 FBC code language without any new requirements being established.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities


Does not degrade the effectiveness of the code


Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
1502.1 Definitions.
The following terms are defined in Chapter 2:
The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AGGREGATE.

BALLAST.

BUILDING-INTEGRATED-PHOTOVOLTAIC (BIPV) PRODUCT.

BUILT-UP ROOF COVERING.

INTERLAYMENT.

MECHANICAL EQUIPMENT SCREEN.

METAL ROOF PANEL.

METAL ROOF SHINGLE.

MODIFIED BITUMEN ROOF COVERING.

PENTHOUSE.

PHOTOVOLTAIC MODULE.

PHOTOVOLTAIC PANEL.

PHOTOVOLTAIC PANEL SYSTEM.

POSITIVE ROOF DRAINAGE.

RADIANT BARRIER

REROOFING.
ROOF ASSEMBLY.

ROOF COVERING.

ROOF COVERING SYSTEM.

ROOF DECK.

ROOF RECOVER.

ROOF REPAIR.

ROOF REPLACEMENT.

ROOF VENTILATION.

ROOFTOP STRUCTURE.

SCUPPER.

SINGLE-PLY MEMBRANE.

UNDERLAYMENT.

AGGREGATE. In roofing, crushed stone, crushed slag or water-worn gravel used for surfacing for roof coverings.

BALLAST. In roofing, ballast comes in the form of large stones or paver systems or light-weight interlocking paver systems and is used to provide uplift resistance for roofing systems that are not adhered or mechanically attached to the roof deck.

BUILDING INTEGRATED PHOTOVOLTAIC ROOFING. A roofing product consisting of electricity generating photovoltaic component integrated into a roof covering.

BUILT-UP ROOF COVERING. Two or more layers of felt cemented together and surfaced with a cap sheet, mineral aggregate, smooth coating or similar surfacing material.
INTERLAYMENT. A layer of felt or nonbituminous saturated felt not less than 18 inches (457 mm) wide, shingled between each course of a wood-shake roof covering.

MECHANICAL EQUIPMENT SCREEN. A partially enclosed rooftop structure used to aesthetically conceal heating, ventilating and air conditioning (HVAC) electrical or mechanical equipment from view.

METAL ROOF PANEL. An interlocking metal sheet having a minimum installed weather exposure of 3 square feet (0.279 m²) per sheet.

METAL ROOF SHINGLE. An interlocking metal sheet having an installed weather exposure less than 3 square feet (0.279 m²) per sheet.

MODIFIED BITUMEN ROOF COVERING. One or more layers of polymer-modified asphalt sheets. The sheet materials shall be fully adhered or mechanically attached to the substrate or held in place with an approved ballast layer.

PENTHOUSE. An enclosed, unoccupied structure above the roof of a building, other than a tank, tower, spire, dome cupola or bulkhead.

PHOTOVOLTAIC MODULE. A complete, environmentally protected unit consisting of solar cells, optics and other components, exclusive of tracker, designed to generate DC power when exposed to sunlight.

PHOTOVOLTAIC PANEL. A collection of modules mechanically fastened together, wired and designed to provide a field-installable unit.

PHOTOVOLTAIC PANEL SYSTEM. A system that incorporates discrete photovoltaic panels, that converts solar radiation into electricity, including rack support systems.

POSITIVE ROOF DRAINAGE. The drainage condition in which consideration has been made for all loading deflections of the roof deck, and additional slope has been provided to ensure drainage of the roof within 48 hours of precipitation.
RADIANT BARRIER. A material having a low-emittance surface of 0.1 or less installed in building assemblies.

REEROOFING. The process of recovering or replacing an existing roof covering. See "Roof recover" and "Roof replacement."

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof deck, vapor retarder, substrate or thermal barrier, insulation, vapor retarder and roof covering.

The definition of "Roof assembly" is limited in application to the provisions of Chapter 15.

ROOF COVERING. The covering applied to the roof deck for weather resistance, fire classification or appearance.

ROOF COVERING SYSTEM. See "Roof assembly."

ROOF DECK. The flat or sloped surface not including its supporting members or vertical supports.

ROOF RECOVER. The process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

ROOF SECTION. A separation or division of a roof area by existing joints, parapet walls, flashing (excluding valleys), difference of elevation (excluding hips and ridges), roof type or legal description; not including the roof area required for a proper tie-off with an existing system.

ROOF VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, attics, cathedral ceilings or other enclosed spaces over which a roof assembly is installed.
**ROOFTOP STRUCTURE.** An enclosed structure on or above the roof of any part of a building.

**SCUPPER.** An opening in a wall or parapet that allows water to drain from a roof.

**SINGLE-Ply MEMBRANE.** A roofing membrane that is field applied using one layer of membrane material (either homogeneous or composite) rather than multiple layers.

**UNDERLAYMENT.** One or more layers of felt, sheathing paper, nonbituminous saturated felt or other approved material over which a steep-slope roof covering is applied.
## R6639
### Date Submitted
12/19/2015
### Chapter
15
### Section
1503
### TAC Recommendation
Approved as Submitted
### Commission Action
Pending Review
### Proponent
Mark Zehnal
### Affects HVHZ
No
### Approved as Submitted
1503
### Pending Review
Yes

### Comments
<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>No</td>
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### Related Modifications

### Summary of Modification
Provides current Florida-specific criteria

### Rationale
To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement
- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements
- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO

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2017 Triennial Roofing

Page 75 of 509
See attached PDF file.
SECTION 1503 WEATHER PROTECTION

WEATHER PROTECTION 1503.1 General. Roof decks shall be covered with approved roof coverings secured to the building or structure in accordance with the provisions of this chapter. Roof coverings shall be designed and installed in accordance with this code and the approved manufacturer’s instructions such that the roof covering shall serve to protect the building or structure.

1503.2 Flashing.
Flashings shall be installed in such a manner so as to prevent moisture entering the wall and roof through joints in copings, through moisture-permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

| TABLE 1503.2 |
| METAL FLASHING MATERIAL |
| MATERIAL | MINIMUM THICKNESS (INCHES) | GAGE | WEIGHT (LBS PER SQ FT) |
| Copper | | 1 (16 oz) |
| Aluminum | 0.024 | | |
| Stainless Steel | 0.0179 | 28 | |
| Galvanized Steel | 0.0179 | 26 (zinc coated G90) | |
| Aluminum Zinc Coated Steel | 0.0179 | 26 (AZ50 Alum Zinc) | |
| Zinc Alloy | 0.027 | | |
| Lead | | 2.5 (40 oz) | |
| Painted Terne | | 1.25 (20 oz) | |

1503.2.1 Locations.
Flashings shall be installed at wall and roof intersections, at gutters, wherever there is a change in roof slope or direction and around roof openings. Where flashing is of metal, the metal shall be corrosion resistant with a thickness not less than 0.019 inch (0.483 mm) (No. 26 galvanized sheet) provided in Table 1503.2.

Exception: This requirement does not apply to hip and ridge junctions.
1503.3 Coping. Parapet walls shall be properly coped with noncombustible, weatherproof materials of a width no less than the thickness of the parapet wall.

[P] 1503.4 Roof drainage. Unless roofs are sloped to drain over roof edges, design and installation of roof drainage systems shall comply with Section 1503 of this code and Sections 1106 and 1108, as applicable, of the Florida Building Code, Plumbing, and the International Plumbing Code, Florida Building Code, Plumbing, Chapter 11.

[P] 1503.4.1 Secondary (emergency overflow) drains or scuppers. Where roof drains are required, secondary (emergency overflow) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. The installation and sizing of secondary emergency overflow drains, leaders and conductors shall comply with Sections 1106 and 1108, as applicable, of the International Plumbing Code, Florida Building Code, Plumbing, Chapter 11.

1503.4.2 Scuppers. When scuppers are used for secondary (emergency overflow) roof drainage, the quantity, size, location and inlet elevation of the scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1611.1. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when locating and sizing scuppers.

Where required for roof drainage, a scupper shall be placed level with the roof surface in a wall or parapet. The scupper shall be located as determined by the slope and the contributing area of the roof. The exterior facing or lining of a scupper, if metal, shall be the same as flashing material required by Sections 1503 through 1510 for the particular type of covering specified for the building. For other type materials, follow manufacturer’s specifications.

1503.4.2.1 Overflow scuppers.

When other means of drainage of overflow water is not provided, overflow scuppers shall be placed in walls or parapets not less than 2 inches (51 mm) nor more than 4 inches (102 mm) above the finished roof covering and shall be located as close as practical to required vertical leaders or downspouts or wall and parapet scuppers. An overflow scupper shall be sized in accordance with the Florida Building Code, Plumbing.

1503.4.3 Gutters. Gutters and leaders placed on the outside of buildings, other than Group R-3, private garages and buildings of Type V construction, shall be of noncombustible material or a minimum of Schedule 40 plastic pipe.
1503.5 Attic and Rafter Roof ventilation. Attic ventilation intake and exhaust vents shall be provided in accordance with Section 1203.2 and the vent product manufacturer's installation instructions.

1503.6 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney or penetration greater than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

Exception: Unit skylights installed in accordance with Section 2405.5 and flashed in accordance with the manufacturer's instructions shall be permitted to be installed without a cricket or saddle.

1503.7 Protection against decay and termites. Condensate lines and roof downspouts shall discharge at least 1 foot (305 mm) away from the structure sidewall, whether by underground piping, tail extensions, or splash blocks. Gutters with downspouts are required on all buildings with eaves of less than 6 inches (152 mm) horizontal projection except for gable end rakes or on a roof above another roof.
**Comments**

<table>
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<tbody>
<tr>
<td>Alternate Language</td>
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**Related Modifications**

<table>
<thead>
<tr>
<th>Summary of Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides current Florida-specific criteria</td>
</tr>
</tbody>
</table>

**Rationale**

To carry forward previous Commission approved code language without adding additional sections. Providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  - Does not discriminate. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

- **Does not degrade the effectiveness of the code**
  - Does not degrade. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
SECTION 1505 FIRE CLASSIFICATION

1505.1 General. Roof assemblies shall be divided into the classes defined below. Class A, B and C roof assemblies and roof coverings required to be listed by this section shall be tested in accordance with ASTM E 108 or UL 790. In addition, fire-retardant-treated wood roof coverings shall be tested in accordance with ASTM D 2898. The minimum roof coverings installed on buildings shall comply with Table 1505.1 based on the type of construction of the building.

Exception: Skylights and sloped glazing that comply with Chapter 24 or Section 2610.

TABLE 1505.1a, b

MINIMUM ROOF COVERING CLASSIFICATION FOR TYPES OF CONSTRUCTION

<table>
<thead>
<tr>
<th>IA</th>
<th>IB</th>
<th>IIA</th>
<th>IIB</th>
<th>IIIA</th>
<th>IIIb</th>
<th>IV</th>
<th>VA</th>
<th>VB</th>
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<tbody>
<tr>
<td>B</td>
<td>B</td>
<td>B</td>
<td>C^c</td>
<td>B</td>
<td>C^c</td>
<td>B</td>
<td>B</td>
<td>C^c</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. Unless otherwise required in accordance with the International Wildland-Urban Interface Code or due to the location of the building within a fire district in accordance with Appendix D.

b. Nonclassified roof coverings shall be permitted on buildings of Group R-3 and Group U occupancies, where there is a minimum fire-separation distance of 6 feet measured from the leading edge of the roof.

c. Buildings that are not more than two stories above grade plane and having not more than 6,000 square feet of projected roof area and where there is a minimum 10-foot fire-separation distance from the leading edge of the roof to a lot line on all sides of the building, except for street fronts or public ways, shall be permitted to have roofs of No. 1 cedar or redwood shakes and No. 1 shingles constructed in accordance with Section 1505.7.
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.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry or an exposed concrete roof deck.

2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile or slate installed on noncombustible decks or ferrous, copper or metal sheets installed without a roof deck on noncombustible framing.

3. Class A roof assemblies include minimum 16 ounce per square foot (0.0416 kg/m2) copper sheets installed over combustible decks.

4. Class A roof assemblies include slate installed over ASTM D 226, Type II underlayment over combustible decks. **RESERVED**

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.

1505.4 **Class C roof assemblies.** Class C roof assemblies are those that are effective against light fire-test exposure. Class C roof assemblies and roof coverings shall be listed and identified as Class C by an approved testing agency.

1505.5 **Nonclassified roofing.** Nonclassified roofing is approved material that is not listed as a Class A, B or C roof covering.

1505.6 **Fire-retardant-treated wood shingles and shakes.** Fire-retardant-treated wood shakes and shingles shall be treated by impregnation with chemicals by the full-cell vacuum-pressure process, in accordance with AWPA C1. Each bundle shall be marked to identify the manufactured unit and the manufacturer, and shall also be labeled to identify the classification of the material in accordance with the testing required in Section 1505.1, the treating company and the quality control agency.
1505.7 Special purpose roofs. Special-purpose wood-shingle or wood-shake roofing shall conform to the grading and application requirements of Section 1507.8 or 1507.9. In addition, an underlayment of 5/8 inch (15.9 mm) Type X water-resistant gypsum backing board or gypsum sheathing shall be placed under minimum nominal 1/2 inch-thick (12.7 mm) wood structural panel solid sheathing or 1-inch (25 mm) nominal spaced sheathing. **Reserved.**

1505.8 Building-integrated photovoltaic products. Building-integrated photovoltaic products installed as the roof covering shall be tested, listed and labeled for fire classification in accordance with Section 1505.1. **RESERVED**

1505.9 Photovoltaic panels and modules. Rooftop-mounted photovoltaic panel systems shall be tested, listed and identified with a fire classification in accordance with UL 1703. The fire classification shall comply with Table 1505.1 based on the type of construction of the building. **Reserved.**

1505.10 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with Section 1607.16 and shall be installed in accordance with ANSI/SPRI VF-1. **Reserved.**
## Comments

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## Related Modifications

### Summary of Modification

Provides current Florida-specific criteria

### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

**Impact to local entity relative to enforcement of code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to building and property owners relative to cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to industry relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to small business relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

#### Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

#### Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

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#### Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities


#### Does not degrade the effectiveness of the code


### Is the proposed code modification part of a prior code version?

YES

### The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

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YES

### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
1507.8 Wood shingles. The installation of wood shingles shall comply with the provisions of this section and Table 1507.8.

1507.8.1 Deck requirements. Wood shingles shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners.

1507.8.1.1 Solid sheathing required. Solid sheathing is required 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. RESERVED

1507.8.2 Deck slope. Wood shingles shall be installed on slopes of not less than three units vertical in 12 units horizontal (25-percent slope).

1507.8.3 Underlayment. Underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV.

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds (V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1) shall be applied with corrosionresistant fasteners in accordance with the manufacturer’s installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd} in accordance with Section 1609.3.1 equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer’s installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32 gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted. RESERVED
1507.8.3.2 Underlayment Application.

Underlayment shall be installed using one of the following methods:

1. Two layer underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV: Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm), and fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with one row in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm).

2. One layer underlayment shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV: Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). End laps shall be offset by 6 feet (1829 mm).

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 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.

RESERVED

1507.8.5 Material standards. Wood shingles shall be of naturally durable wood and comply with the requirements of Table 1507.8.5.
TABLE 1507.8.5

WOOD SHINGLE MATERIAL REQUIREMENTS

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>APPLICABLE MINIMUM GRADES</th>
<th>GRADING RULES</th>
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</thead>
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<tr>
<td>Wood shingles of naturally durable wood</td>
<td>1, 2 or 3</td>
<td>CSSB</td>
</tr>
</tbody>
</table>

CSSB = Cedar Shake and Shingle Bureau

1507.8.6 Attachment. Fasteners for wood shingles shall be corrosion resistant with a minimum penetration of 3/4 inch (19.1 mm) into the sheathing. For sheathing less than 1/2 inch (12.7 mm) in thickness, the fasteners shall extend through the sheathing. Each shingle shall be attached with a minimum of two fasteners.

1507.8.7 Application. Wood shingles shall be laid with a side lap not less than 11/2 inches (38 mm) between joints in adjacent courses, and not be in direct alignment in alternate courses. Spacing between shingles shall be 1/4 to 3/8 inch (6.4 to 9.5 mm). Weather exposure for wood shingles shall not exceed that set in Table 1507.8.7.

TABLE 1507.8.7

WOOD SHINGLE WEATHER EXPOSURE AND ROOF SLOPE

<table>
<thead>
<tr>
<th>ROOFING MATERIAL</th>
<th>LENGTH (inches)</th>
<th>GRADE</th>
<th>EXPOSURE (inches)</th>
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<td>Shingles of 16</td>
<td>No. 1</td>
<td>3.75</td>
<td>5</td>
</tr>
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</table>
1507.8.8 Flashing.
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided in accordance with 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 comply with Table 1503.2. 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 units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) layer of 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 solidly 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.

TABLE 1507.8
WOOD SHINGLE AND SHAKE INSTALLATION

<table>
<thead>
<tr>
<th>ROOF ITEM</th>
<th>WOOD SHINGLES</th>
<th>WOOD SHAKE</th>
</tr>
</thead>
</table>

For SI: 1 inch = 25.4 mm.
<table>
<thead>
<tr>
<th></th>
<th>1. Roof slope</th>
<th>Wood shingles shall be installed on slopes of three units vertical in 12 units horizontal (3:12) or greater.</th>
<th>Wood shakes shall be installed on slopes of four units vertical in 12 units horizontal (4:12) or greater.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Deck requirement</td>
<td>Shingles shall be applied to roofs with solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall not be less than 1&quot; x 4&quot; nominal dimensions and shall be spaced on center equal to the weather exposure to coincide with the placement of fasteners.</td>
<td>Shakes shall be applied to roofs with solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall not be less than 1&quot; x 4&quot; nominal dimensions and shall be spaced on center equal to the weather exposure to coincide with the placement of fasteners. When 1&quot; x 4&quot; spaced sheathing is installed at 10 inches, boards must be installed between the sheathing boards.</td>
</tr>
<tr>
<td></td>
<td>Temperate climate</td>
<td>In areas where the average daily temperature in January is 25°F or less or where there is a possibility of ice forming along the eaves causing a backup of water.</td>
<td>Solid sheathing required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Solid sheathing is required.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Interlayerment</td>
<td>No requirements.</td>
<td>Interlayerment shall comply with ASTM D 226, Type 1.</td>
</tr>
<tr>
<td></td>
<td>4. Underlayerment</td>
<td>Underlayerment shall comply with ASTM D 226, Type 1.</td>
<td>Underlayerment shall comply with ASTM D 226, Type 1.</td>
</tr>
<tr>
<td></td>
<td>Temperate climate</td>
<td>In areas where there is a possibility of ice forming along the eaves causing a backup of water.</td>
<td>An ice barrier that consists of at least two layers of underlayerment 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.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>An ice barrier that consists of at least two layers of underlayerment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the lowest edges of all roof surfaces to a point at least 24 inches inside the exterior wall line of the building.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Application</td>
<td>Attachment</td>
<td>Fasteners for wood shingles shall be hot-dipped</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fasteners for wood shakes shall be hot-dipped galvanized or Type 304</td>
<td></td>
</tr>
</tbody>
</table>
2017 Triennial

Roofing

Page 92 of 509

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_6650_Text_Section 1507.8 Wood shingles_6.png

R6650

Page: 6

Text Modification


**R6651**

<table>
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<th>Date Submitted</th>
<th>12/19/2015</th>
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<tr>
<td>Proponent</td>
<td>Mark Zehnal</td>
</tr>
<tr>
<td>Chapter</td>
<td>15</td>
</tr>
<tr>
<td>TAC Recommendation</td>
<td>Approved as Submitted</td>
</tr>
<tr>
<td>Commission Action</td>
<td>Pending Review</td>
</tr>
</tbody>
</table>

**Comments**

<table>
<thead>
<tr>
<th>General Comments</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternate Language</td>
<td>No</td>
</tr>
</tbody>
</table>

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
1507.9 Wood shakes.
The installation of wood shakes shall comply with the provisions of this section and Table 1507.8.

1507.9.1 Deck requirements.
Wood shakes shall only be used on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) on center, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards.

1507.9.1.1 Solid sheathing required.
Solid sheathing is required 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. Reserved.

1507.9.2 Deck slope.
Wood shakes shall only be used on slopes of net less than four units vertical in 12 units horizontal (33-percent slope) or greater.

1507.9.3 Underlayment.
Underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869 Type II or Type IV.

1507.9.3.1 Underlayment and high wind.
Underlayment applied in areas subject to high winds \[ V_{awt} \] greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer’s installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where \[ V_{awt} \] in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer’s installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of \( \frac{1}{4} \) inch (19.1 mm) into the roof sheathing.
Exception: As an alternative, adhered-underlayment complying with ASTM-D-1970 shall be permitted. RESERVED.

1507.9.3.2 Underlayment Application.

Underlayment shall be installed using one of the following methods:

1. Two layer underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV. Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm), and fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with one row in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm).

2. One layer underlayment shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). End laps shall be offset by 6 feet (1829 mm).

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 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. RESERVED.

1507.9.5 Interlayment.
Interlayment shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV.

1507.9.6 Material standards.
Wood shakes shall comply with the requirements of Table 1507.9.6.
### TABLE 1507.9.6 WOOD SHAKE MATERIAL REQUIREMENTS

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>MINIMUM GRADES</th>
<th>APPLICABLE GRADING RULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood shakes of naturally durable wood</td>
<td>1</td>
<td>CSSB</td>
</tr>
<tr>
<td>Taper sawn shakes of naturally durable wood</td>
<td>1 or 2</td>
<td>CSSB</td>
</tr>
<tr>
<td>Preservative-treated shakes and shingles of naturally durable wood</td>
<td>1</td>
<td>CSSB</td>
</tr>
<tr>
<td>Fire-retardant-treated shakes and shingles of naturally durable wood</td>
<td>1</td>
<td>CSSB</td>
</tr>
<tr>
<td>Preservative-treated taper sawn shakes of Southern pine treated in accordance with AWPA U1 (Commodity Specification A, Use Category 3B and Section 5.6)</td>
<td>1 or 2</td>
<td>TFS</td>
</tr>
</tbody>
</table>

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

**1507.9.7 Attachment.**
Fasteners for wood shakes shall be corrosion resistant with a minimum penetration of $3/4$ inch (19.1 mm) into the sheathing. For sheathing less than $1\frac{1}{2}$ inch (12.7 mm) in thickness, the fasteners shall extend through the sheathing. Each shake shall be attached with a minimum of two fasteners.

**1507.9.8 Application.**
Wood shakes shall be laid with a side lap not less than $1\frac{1}{2}$ inches (38 mm) between joints in adjacent courses. Spacing between shakes in the same course shall be $3/8$ to $5/8$ inch (9.5 to 15.9 mm) for shakes and taper sawn shakes of naturally durable wood and shall be $1/4$ to $3/8$ inch (6.4 to 9.5 mm) for preservative taper sawn shakes. Weather exposure for wood shakes shall not exceed those set in Table 1507.9.8.

### TABLE 1507.9.8 WOOD SHAKE WEATHER EXPOSURE AND ROOF SLOPE

<table>
<thead>
<tr>
<th>ROOFING MATERIAL</th>
<th>LENGTH (inches)</th>
<th>GRADE</th>
<th>EXPOSURE (inches) 4:12 PITCH OR STEEPER</th>
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</thead>
<tbody>
<tr>
<td>Shakes of naturally durable wood</td>
<td>18</td>
<td>No. 1</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 1</td>
<td>10°</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>Preservative-treated taper sawn shakes of Southern yellow pine</td>
<td>18</td>
<td>No. 1</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>No. 2</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 2</td>
<td>7.5</td>
</tr>
<tr>
<td>Taper sawn shakes of naturally durable wood</td>
<td>18</td>
<td>No. 1</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 1</td>
<td>10</td>
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<tr>
<td></td>
<td>18</td>
<td>No. 2</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 2</td>
<td>7.5</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.
a. For 24-inch by 0.375-inch handsplit shakes, the maximum exposure is 7.5 inches.

1507.9.9 Flashing.
At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided in accordance with 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 comply with Table 1503.2. 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 units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) layer of 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 26°F (-3°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 solidly 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.
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<th>12/19/2015</th>
<th><strong>Section</strong></th>
<th>1507.10</th>
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<tbody>
<tr>
<td><strong>Chapter</strong></td>
<td>15</td>
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<td>No</td>
</tr>
<tr>
<td><strong>Proponent</strong></td>
<td>Mark Zehnal</td>
<td><strong>Attachments</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>TAC Recommendation</strong></td>
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<td><strong>Commission Action</strong></td>
<td>Pending Review</td>
</tr>
</tbody>
</table>

### Comments

<table>
<thead>
<tr>
<th><strong>General Comments</strong></th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alternate Language</strong></td>
<td>No</td>
</tr>
</tbody>
</table>

### Related Modifications

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
1507.10 Built-up roofs. The installation of built-up roofs shall comply with the provisions of this section.

1507.10.1 Slope. Built-up roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage, except for coal-tar built-up roofs that shall have a design slope of a minimum one-eighth unit vertical in 12 units horizontal (1-percent slope).

1507.10.2 Material standards. Built-up roof covering materials shall comply with the standards in Table 1507.10.2 (SEE TABLE) or UL 55A.

1507.10.3 Red rosin paper. Red rosin paper shall be used when the membrane is applied directly to a wood deck or cementitious fiber decks.

<table>
<thead>
<tr>
<th>MATERIAL STANDARD</th>
<th>STANDARD</th>
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<tbody>
<tr>
<td>Acrylic coatings used in roofing</td>
<td>ASTM D 6083</td>
</tr>
<tr>
<td>Aggregate surfacing</td>
<td>ASTM D 1863</td>
</tr>
<tr>
<td>Asphalt adhesive used in roofing</td>
<td>ASTM D 3747</td>
</tr>
<tr>
<td>Asphalt cements used in roofing</td>
<td>ASTM D 3019; D 2822; D 4586</td>
</tr>
<tr>
<td>Asphalt-coated glass fiber base sheet</td>
<td>ASTM D 4601</td>
</tr>
<tr>
<td>Asphalt coatings used in roofing</td>
<td>ASTM D 1227; D 2823; D 2824; D 4479</td>
</tr>
<tr>
<td>Asphalt glass felt</td>
<td>ASTM D 2178</td>
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<td>Material Description</td>
<td>ASTM Standard</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
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<tr>
<td>Asphalt primer used in roofing</td>
<td>ASTM D 41</td>
</tr>
<tr>
<td>Asphalt-saturated and asphalt-coated organic felt base sheet</td>
<td>ASTM D 2626</td>
</tr>
<tr>
<td>Asphalt-saturated organic felt (perforated)</td>
<td>ASTM D 226</td>
</tr>
<tr>
<td>Asphalt used in roofing</td>
<td>ASTM D 312</td>
</tr>
<tr>
<td>Coal-tar cements used in roofing</td>
<td>ASTM D 4022; D 5643</td>
</tr>
<tr>
<td>Coal-tar saturated organic felt</td>
<td>ASTM D 227</td>
</tr>
<tr>
<td>Coal-tar pitch used in roofing</td>
<td>ASTM D 450; Type I or II</td>
</tr>
<tr>
<td>Coal-tar primer used in roofing, dampproofing and waterproofing</td>
<td>ASTM D 43</td>
</tr>
<tr>
<td>Glass mat, coal tar</td>
<td>ASTM D 4990</td>
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<td>Glass mat, venting type</td>
<td>ASTM D 4897</td>
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<tr>
<td>Mineral-surfaced inorganic cap sheet</td>
<td>ASTM D 3909</td>
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<td>Thermoplastic fabrics used in roofing</td>
<td>ASTM D 5665, D 5726</td>
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**Related Modifications**

**Summary of Modification**
Provides current Florida-specific criteria

**Rationale**
To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**
YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**
NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**
YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**
NO
See attached PDF file.
1507.16 Vegetative roofs, roof gardens and landscaped roofs. Vegetative roofs, roof gardens and landscaped roofs shall comply with the requirements of this chapter, Sections 1607.12.3 and 1607.12.3.1 and the International Florida Fire Prevention Code.

[BF] 1507.16.1 Structural fire resistance. The structural frame and roof construction supporting the load imposed upon the roof by the vegetative roof, roof gardens or landscaped roofs shall comply with the requirements of Table 601.
R6654

Date Submitted: 12/19/2015
Chapter: 15

Section: 1507.17
Affects HVHZ: No
Proponent: Mark Zehnal
Attachments: Yes

TAC Recommendation: Approved as Submitted
Commission Action: Pending Review

Comments
General Comments: No
Alternate Language: No

Related Modifications

Summary of Modification
Provides current Florida-specific criteria

Rationale
To carry forward previous Commission approved code language without adding additional sections. Providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
No impact. Current 2014 FBC code language without any new sections or requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Current 2014 FBC code language without any new sections or requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new sections or requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new sections or requirements being established.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
Does not discriminate. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

Does not degrade the effectiveness of the code
Does not degrade. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
1507.17 Photovoltaic modules/shingles. Building integrated photovoltaic roofing modules/shingles. The installation of building integrated photovoltaic roofing modules/shingles shall comply with the provisions of this section.

1507.17.1 Deck requirements. Photovoltaic shingles shall be applied to a solid or closely fitted deck, except where the shingles are specifically designed to be applied over spaced sheathing. RESERVED

1507.17.2 Deck slope. Photovoltaic shingles shall not be installed on roof slopes less than three units vertical in 12 units horizontal (25-percent slope). RESERVED

1507.17.3 Underlayment. Unless otherwise noted, required underlayment shall conform to ASTM D-226, ASTM D-4869 or ASTM D-6757. RESERVED

1507.17.4 Underlayment application. Underlayment shall be applied shingle fashion, parallel to and starting from the eave, lapped 2 inches (51 mm) and fastened sufficiently to hold in place. RESERVED

1507.17.4.1 High wind attachment. Underlayment applied in areas subject to high winds [Vased > 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer’s instructions. Fasteners shall be applied along the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where Vased is not less than 120 mph (54 m/s) shall comply with ASTM D-226, Type II, ASTM D-4869, Type IV or ASTM D-6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D-1970 shall be permitted. RESERVED

1507.17.4.2 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 instead of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building.
Exception: Detached accessory structures that contain no conditioned floor area.

RESERVED

1507.17.5 Fasteners. Fasteners for photovoltaic shingles shall be galvanized, stainless steel, aluminum or copper roofing nails, minimum 11-gage (0.105 inch (2.67 mm)) shank with a minimum 3/8 inch diameter (9.5 mm) head, of a length to penetrate through the roofing materials and a minimum of 3/4 inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than 3/4 inch (19.1 mm) thick, the nails shall penetrate through the sheathing. Fasteners shall comply with ASTM F-1667. RESERVED

1507.17.6 Material standards. Building integrated photovoltaic roofing modules/shingles shall be listed and labeled in accordance with UL 1703.

1507.17.7 Attachment. Building integrated photovoltaic roofing modules/shingles shall be attached in accordance with the manufacturer’s installation instructions.

1507.17.8 Wind resistance. Building integrated photovoltaic roofing modules/shingles shall be tested in accordance with procedures and acceptance criteria in ASTM D 3161 or TAS 107. Building integrated photovoltaic roofing modules/shingles shall comply with the classification requirements of Table 4604.1.4 1507.2.7.1 for the appropriate maximum nominal design basic wind speed. Building integrated photovoltaic roofing modules/shingles packaging shall bear a label to indicate compliance with the procedures in ASTM D 3161 or TAS 107 and the required classification from Table 4604.1.4 1507.2.7.1.
### Summary of Modification

Provides current Florida-specific criteria

### Rationale

Not part of a roofing system that should be mandated by code. Does not add benefit to the wind uplift. Material manufacturer's option whether detrimental to the life cycle of the roofing system or warranty.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact without any new sections or requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact without any new sections or requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact without any new sections or requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact without any new sections or requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Does not add benefit to the wind uplift. Material manufacturer’s option whether detrimental to the life cycle of the roofing system or warranty.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Does not add benefit to the wind uplift. Material manufacturer’s option whether detrimental to the life cycle of the roofing system or warranty.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  - Does not discriminate. Material manufacturer’s option whether detrimental to the life cycle of the roofing system or warranty.

- **Does not degrade the effectiveness of the code**
  - Does not degrade. Material manufacturer’s option whether detrimental to the life cycle of the roofing system or warranty.

### Is the proposed code modification part of a prior code version?

No
See attached PDF file.
SECTION 1509 RADIANT BARRIERS INSTALLED ABOVE DECK

1509.1 General.
A radiant barrier installed above a deck shall comply with Sections 1509.2 through 1509.4: RESERVED

1509.2 Fire testing.
Radiant barriers shall be permitted for use above decks where the radiant barrier is covered with an approved roof covering and the system consisting of the radiant barrier and the roof covering complies with the requirements of either FM 4550 or UL 1256: RESERVED

1509.3 Installation.
The low emittance surface of the radiant barrier shall face the continuous airspace between the radiant barrier and the roof covering: RESERVED

1509.4 Material standards.
A radiant barrier installed above a deck shall comply with ASTM-C 4343/4343M: RESERVED
### Comments

<table>
<thead>
<tr>
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### Related Modifications

#### Summary of Modification

- Provides current Florida-specific criteria

#### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

#### Is the proposed code modification part of a prior code version?

**YES**

#### The provisions contained in the proposed amendment are addressed in the applicable international code?

**NO**

#### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

**YES**

#### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

**NO**
See attached PDF file.
SECTION 1510 ROOFTOP STRUCTURES

1510.1 General.
The provisions of this section shall govern the construction of rooftop structures.

1510.2 Penthouses.
Penthouses in compliance with Sections 1510.2.1 through 1510.2.5 shall be considered as a portion of the story directly below the roof deck on which such penthouses are located. All other penthouses shall be considered as an additional story of the building.

1510.2.1 Height above roof deck.
Penthouses constructed on buildings of other than Type I construction shall not exceed 18 feet (5486 mm) in height above the roof deck as measured to the average height of the roof of the penthouse.

Exceptions:

1. Where used to enclose tanks or elevators that travel to the roof level, penthouses shall be permitted to have a maximum height of 28 feet (8534 mm) above the roof deck.

2. Penthouses located on the roof of buildings of Type I construction shall not be limited in height.

1510.2.2 Area limitation.
The aggregate area of penthouses and other enclosed rooftop structures shall not exceed one-third the area of the supporting roof deck. Such penthouses and other enclosed rooftop structures shall not be required to be included in determining the building area or number of stories as regulated by Section 503.1. The area of such penthouses shall not be included in determining the fire area specified in Section 901.7.

1510.2.3 Use limitations.
Penthouses shall not be used for purposes other than the shelter of mechanical or electrical equipment, tanks, or vertical shaft openings in the roof assembly.

1510.2.4 Weather protection.
Provisions such as louvers, louver blades or flashing shall be made to protect the mechanical and electrical equipment and the building interior from the elements.

1510.2.5 Type of construction.
Penthouses shall be constructed with walls, floors and roofs as required for the type of construction of the building on which such penthouses are built.

Exceptions:

1. On buildings of Type I construction, the exterior walls and roofs of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall not be required to have a fire-resistance rating.

2. On buildings of Type I construction two stories or less in height above grade plane or of Type II construction, the exterior walls and roofs of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602 and be constructed of fire-retardant-treated wood. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be constructed of fire-retardant-treated wood and shall not be required to have a fire-resistance rating. Interior framing and walls shall be permitted to be constructed of fire-retardant-treated wood.

3. On buildings of Type III, IV or V construction, the exterior walls of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602. On buildings of Type III, IV or VA construction, the exterior walls of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be of Type IV or noncombustible construction or fire-retardant-treated wood and shall not be required to have a fire-resistance rating.

1510.3 Tanks.
Tanks having a capacity of more than 500 gallons (1893 L) located on the roof deck of a building shall be supported on masonry, reinforced concrete, steel or Type IV construction provided that, where such supports are located in the building above the lowest story, the support shall be fire-resistance rated as required for Type IA construction.

1510.3.1 Valve and drain.
In the bottom or on the side near the bottom of the tank, a pipe or outlet, fitted with a suitable quick-opening valve for discharging the contents into a drain in an emergency
shall be provided.

1510.3.2 Location.
Tanks shall not be placed over or near a stairway or an elevator shaft, unless there is a solid roof or floor underneath the tank.

1510.3.3 Tank cover.
Unenclosed roof tanks shall have covers sloping toward the perimeter of the tanks.

1510.4 Cooling towers.
Cooling towers located on the roof deck of a building and greater than 250 square feet (23.2 m²) in base area or greater than 15 feet (4572 mm) in height above the roof deck, as measured to the highest point on the cooling tower, where the roof is greater than 50 feet (15 240 mm) in height above grade plane shall be constructed of noncombustible materials. The base area of cooling towers shall not exceed one-third the area of the supporting roof deck.

Exception: Drip boards and the enclosing construction shall be permitted to be of wood not less than 1 inch (25 mm) nominal thickness, provided the wood is covered on the exterior of the tower with noncombustible material.

1510.5 Towers, spires, domes and cupolas.
Towers, spires, domes and cupolas shall be of a type of construction having fire-resistance ratings not less than required for the building on top of which such tower, spire, dome or cupola is built. Towers, spires, domes and cupolas greater than 85 feet (25 908 mm) in height above grade plane as measured to the highest point on such structures, and either greater than 200 square feet (18.6 m²) in horizontal area or used for any purpose other than a belfry or an architectural embellishment, shall be constructed of and supported on Type I or II construction.

1510.5.1 Noncombustible construction required.
Towers, spires, domes and cupolas greater than 60 feet (18 288 mm) in height above the highest point at which such structure contacts the roof as measured to the highest point on such structure, or that exceeds 200 square feet (18.6 m²) in area at any horizontal section, or which is intended to be used for any purpose other than a belfry or architectural embellishment, or is located on the top of a building greater than 50 feet (1524 mm) in building height shall be constructed of and supported by noncombustible materials and shall be separated from the building below by construction having a fire-resistance rating of not less than 1.5 hours with openings protected in accordance with Section 712. Such structures located on the top of a building greater than 50 feet (15
240 mm) in building height shall be supported by noncombustible construction.

1510.5.2 Towers and spires.
Enclosed towers and spires shall have exterior walls constructed as required for the building on top of which such towers and spires are built. The roof covering of spires shall be not less than the same class of roof covering required for the building on top of which the spire is located.

1510.6 Mechanical equipment screens.
Mechanical equipment screens shall be constructed of the materials specified for the exterior walls in accordance with the type of construction of the building. Where the fire separation distance is greater than 5 feet (1524 mm), mechanical equipment screens shall not be required to comply with the fire-resistance rating requirements.

1510.6.1 Height limitations.
Mechanical equipment screens shall not exceed 18 feet (5486 mm) in height above the roof deck, as measured to the highest point on the mechanical equipment screen.

Exception: Where located on buildings of Type IA construction, the height of mechanical equipment screens shall not be limited.

1510.6.2 Type I, II, III and IV construction.
Regardless of the requirements in Section 1510.6, mechanical equipment screens that are located on the roof decks of buildings of Type I, II, III or IV construction shall be permitted to be constructed of combustible materials in accordance with any one of the following limitations:

1. The fire separation distance shall be not less than 20 feet (6096 mm) and the height of the mechanical equipment screen above the roof deck shall not exceed 4 feet (1219 mm) as measured to the highest point on the mechanical equipment screen.

2. The fire separation distance shall be not less than 20 feet (6096 mm) and the mechanical equipment screen shall be constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation.

3. Where exterior wall covering panels are used, the panels shall have a flame spread index of 25 or less when tested in the minimum and maximum thicknesses intended for use, with each face tested independently in accordance with ASTM E 64 or UL 723. The panels shall be tested in the minimum and maximum thicknesses intended for use in accordance with, and shall comply with the acceptance criteria of, NFPA 285 and shall
be installed as tested. Where the panels are tested as part of an exterior wall assembly in accordance with NFPA 285, the panels shall be installed on the face of the mechanical equipment screen supporting structure in the same manner as they were installed on the tested exterior wall assembly.

1510.6.3 Type V construction.
The height of mechanical equipment screens located on the roof decks of buildings of Type V construction, as measured from grade plane to the highest point on the mechanical equipment screen, shall be permitted to exceed the maximum building height allowed for the building by other provisions of this code where complying with any one of the following limitations, provided the fire separation distance is greater than 5 feet (1524 mm):

1. Where the fire separation distance is not less than 20 feet (6096 mm), the height above grade plane of the mechanical equipment screen shall not exceed 4 feet (1219 mm) more than the maximum building height allowed;

2. The mechanical equipment screen shall be constructed of noncombustible materials;

3. The mechanical equipment screen shall be constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation; or

4. Where the fire separation distance is not less than 20 feet (6096 mm), the mechanical equipment screen shall be constructed of materials having a flame spread index of 25 or less when tested in the minimum and maximum thicknesses intended for use with each face tested independently in accordance with ASTM E 84 or UL 723.

1510.7 Photovoltaic panels and modules systems.
Rooftop-mounted photovoltaic panels and modules systems shall be designed in accordance with this section.

1510.7.1 Wind resistance.
Rooftop-mounted photovoltaic panels and modules systems shall be designed for wind loads for component and cladding wind loads in accordance with Chapter 16 using an effective wind area based on the dimensions of a single unit frame.

1510.7.2 Fire classification.
Rooftop-mounted photovoltaic panels and modules systems shall have the fire classification in accordance with Section 1505.9 as the roof assembly required by Section 1505.
1510.7.3 Installation.
Rooftop-mounted photovoltaic panels and modules systems shall be installed in accordance with the manufacturer's instructions.

1510.7.4 Photovoltaic panels and modules.
Rooftop-mounted photovoltaic panels and modules mounted on top of a roof shall be listed and labeled in accordance with UL 1703 and shall be installed in accordance with the manufacturer's installation instructions.

1510.8 Other rooftop structures.
Rooftop structures not regulated by Sections 1510.2 through 1510.7 shall comply with Sections 1510.8.1 through 1510.8.5, as applicable.

1510.8.1 Aerial supports.
Aerial supports shall be constructed of noncombustible materials.

Exception: Aerial supports not greater than 12 feet (3658 mm) in height as measured from the roof deck to the highest point on the aerial supports shall be permitted to be constructed of combustible materials.

1510.8.2 Bulkheads.
Bulkheads used for the shelter of mechanical or electrical equipment or vertical shaft openings in the roof assembly shall comply with Section 1510.2 as penthouses. Bulkheads used for any other purpose shall be considered as an additional story of the building.

1510.8.3 Dormers.
Dormers shall be of the same type of construction as required for the roof in which such dormers are located or the exterior walls of the building.

1510.8.4 Fences.
Fences and similar structures shall comply with Section 1510.6 as mechanical equipment screens.

1510.8.5 Flagpoles.
Flagpoles and similar structures shall not be required to be constructed of noncombustible materials and shall not be limited in height or number.
1510.9 Structural fire resistance.
The structural frame and roof construction supporting imposed loads upon the roof by any rooftop structure shall comply with the requirements of Table 601. The fire-resistance reduction permitted by Table 601, Note a, shall not apply to roofs containing rooftop structures.

1510.10 Mechanical units. Roof mounted mechanical units shall be mounted on curbs raised a minimum of 8 inches (203 mm) above the roof surface, or where roofing materials extend beneath the unit, on raised equipment supports providing a minimum clearance height in accordance with Table 1510.10.

Exception: In buildings where the existing rooftop equipment, in the opinion of the building official, provides sufficient clearance to repair, recover, replace and/or maintain the roofing system or any of its components, such existing equipment need not comply with Table 1510.10.

TABLE 1510.10 CLEARANCE BELOW RAISED ROOF MOUNTED MECHANICAL UNITS

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<thead>
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<td>48 &lt; 60</td>
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<td>&gt; 60</td>
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For SI: 1 inch = 25.4 mm.
## Comments

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<td>Alternate Language</td>
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### Related Modifications

**Summary of Modification**

Provides current Florida-specific criteria

### Rationale

To carry forward previous Commission approved code language without adding additional sections. Providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  - Does not discriminate. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

- **Does not degrade the effectiveness of the code**
  - Does not degrade. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

**Is the proposed code modification part of a prior code version?**

**YES**

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

**NO**

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

**YES**

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

**NO**
See attached PDF file.
1511.1 General.
Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 15.

Exception:

1. Roof replacement or roof recover of existing low-slope roof coverings Reroofing shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide positive roof drainage.

2. Recovering or replacing an existing roof covering shall not be required to meet the requirement for secondary (emergency overflow) drains or scuppers in Section 1503.4 for roofs that provide for positive roof drainage. For the purposes of this exception, existing secondary drainage or scupper systems required in accordance with this code shall not be removed unless they are replaced by secondary drains or scuppers designed and installed in accordance with Section 1503.4.

1511.2 Structural and construction loads.
Structural roof components shall be capable of supporting the roof-covering system and the material and equipment loads that will be encountered during installation of the system.

1511.3 Roof Recovering versus replacement.

Roof replacement shall include the removal of all existing layers of roof coverings down to the roof deck.

Exception: Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1607.

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.
4. When blisters exist in any roofing, unless blisters are cut or scraped open and remaining materials secured down before applying additional roofing.

5. Where the existing roof is to be used for attachment for a new roof system and compliance with the securement provisions of Section 1504.1 cannot be met.

**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. RESERVED.

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. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

1511.3.1 Roof recover.
The installation of a new roof covering over an existing roof covering shall be permitted where any of the following conditions occur:

1. Where the new roof covering is installed in accordance with the roof-covering manufacturer’s approved instructions.

2. Complete and separate roofing systems, such as standing-seam metal roof panel 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.

3. 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 1511.4.

4. 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.
1611.3.1.1 Exceptions.
A roof recovery shall not be permitted 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 slate, clay, cement or asbestos-cement tile.

3. Where the existing roof has two or more applications of any type of roof covering.

RESERVED

1511.4 Roof recovering.
Where the application of a new roof covering over wood shingle or shake roofs creates a combustible concealed space, the entire existing surface shall be covered with gypsum board, mineral fiber, glass fiber or other approved materials securely fastened in place.

1511.5 Reinstallation of materials.
Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. Existing vent flashing, metal edgings, drain outlets, collars and metal counterflashings shall not be reinstalled where rusted, damaged or deteriorated. Aggregate surfacing materials shall not be reinstalled.

1511.6 Flashings.
Flashings shall be reconstructed in accordance with approved manufacturer's installation instructions. Metal flashing to which bituminous materials are to be adhered shall be primed prior to installation.
**R6660**

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<td>Section</td>
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**Related Modifications**

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
SECTION 1512 Solar Photovoltaic panels and modules

1512.1 Photovoltaic panels/modules. Solar Photovoltaic panels and modules installed upon a roof or as an integral part of a roof assembly shall comply with the requirements of this code and the International Fire Code Florida Fire Prevention Code.

1512.1.1 Structural fire resistance. The structural frame and roof construction supporting the load imposed upon the roof by the photovoltaic panels/modules shall comply with the requirements of Table 601.
Provides definition for flashing found throughout chapter 15

Provides guidance for contractors, design professionals and enforcement professionals as to the usage of and purpose for flashing in a roofing system connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

No impact. Provides guidance for contractors, design professionals and enforcement professionals as to the usage of and purpose for flashing in a roofing system without any new requirements being established.

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Does not discriminate. Provides guidance for contractors, design professionals and enforcement professionals as to the usage of and purpose for flashing in a roofing system without any new requirements being established.

Does not degrade. Provides guidance for contractors, design professionals and enforcement professionals as to the usage of and purpose for flashing in a roofing system without any new requirements being established.

Yes
See attached PDF file.
1502.1 Definitions.

**FLASHING.** The roofing component used to seal roofing systems, where the system is interrupted or terminated.
Related Modifications

Summary of Modification
Provides clarification to current Florida-specific criteria

Rationale
To clarify previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement
Impact to local entity relative to enforcement of code
No impact. Clarify current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Clarify current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Clarify current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Clarify current 2014 FBC code language without any new requirements being established.

Requirements
Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Clarifies current, commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Clarifies current, commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
Does not discriminate. Clarifies current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not degrade the effectiveness of the code
Does not degrade. Clarifies current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
1503.2 Flashing.
Flashings shall be used to seal roofing systems, where the system is interrupted or terminated and shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.
## R6696

<table>
<thead>
<tr>
<th>Date Submitted</th>
<th>Section</th>
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<th>Affects HVHZ</th>
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<td>1503.2.1</td>
<td>Mark Zehnal</td>
<td>No</td>
<td>Approved as Submitted</td>
<td>Pending Review</td>
<td>Yes</td>
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### Comments

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### Related Modifications

- **Summary of Modification**: Provides current Florida-specific criteria including RAS-111.

### Rationale

- **To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.**

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**: No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**: No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**: No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**: No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**: Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**: Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**: Does not discriminate. Current Commission approved 2014 FBC requirement.
- **Does not degrade the effectiveness of the code**: Does not degrade. Current Commission approved 2014 FBC requirement.

### Is the proposed code modification part of a prior code version?

YES

### The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
1503.2.1 Locations.
Flashing shall be installed at wall and roof intersections, at gutters, wherever there is a change in roof slope or direction and around roof openings. Where flashing is of metal, the metal shall be corrosion resistant with a thickness not less than 0.040 inch (0.483 mm) (No. 26 galvanized sheet) provided in Table 1503.2 or in compliance with RAS-111.

Exception: This requirement does not apply to hip and ridge junctions.
Summarized Modification

Provides current Florida-specific criteria including RAS-115

Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

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Requirements

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Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
1507.2 **Asphalt shingles.** The installation of asphalt shingles shall comply with the provisions of this section or RAS-115.
<table>
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**Comments**

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**Rationale**

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  
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**Requirements**

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- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  

- **Does not degrade the effectiveness of the code**
  

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
1507.2.3 Underlayment. Unless otherwise noted, required underlayment shall conform to ASTM D-226, Type I, ASTM D-4869, Type I, or ASTM D-6757. Underlayment shall comply and be installed in accordance with Section 1507.1.1.
R6702

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Related Modifications

1507.1.1

Summary of Modification

1507.1.1 Underlayment Table provides current Florida-specific criteria

Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

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Is the proposed code modification part of a prior code version?

| YES |

The provisions contained in the proposed amendment are addressed in the applicable international code?

| NO |

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

| YES |

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

| NO |
See attached PDF file.
1507.2.8 Underlayment application.

For roof slopes from two units vertical in 12 units horizontal (17 percent slope) and up to four units vertical in 12 units horizontal (33 percent slope), underlayment shall be two layers applied in the following manner. Apply a minimum 19-inch-wide (483 mm) strip of underlayment felt parallel with and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment overlapping successive sheets 10 inches (254 mm), by fastened sufficiently to hold in place. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of four units vertical in 12 units horizontal (33 percent slope) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened sufficiently to hold in place. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. RESERVED
**Comments**

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**Related Modifications**

**Summary of Modification**

Provides current Florida-specific criteria including RAS-111

**Rationale**

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
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**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
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- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
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- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?  
**YES**

The provisions contained in the proposed amendment are addressed in the applicable international code?  
**NO**

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?  
**YES**

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?  
**NO**
See attached PDF file.
1507.2.9 Flashings. Flashing for asphalt shingles shall comply with this section or RAS 111. Flashing shall be applied in accordance with this section and the asphalt shingle manufacturer’s printed instructions or RAS 111.
## Comments

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## Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

## Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

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  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

## Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
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- **Does not degrade the effectiveness of the code**

### Is the proposed code modification part of a prior code version?

**YES**

### The provisions contained in the proposed amendment are addressed in the applicable international code?

**NO**

### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

**YES**

### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

**NO**
See attached PDF file.
1507.2.9.1 Base and eave counter flashing.
Base and eave counter flashing shall be installed in accordance with the manufacturer’s instructions. Base flashing shall be of either corrosion-resistant metal of minimum nominal 0.019-inch (0.483 mm) thickness or mineral-surfaced roll roofing weighing a minimum of 77 pounds per 100 square feet (3.76 kg/m²). Cap flashing shall be corrosion-resistant metal of minimum nominal 0.019-inch (0.483 mm) thickness, as follows:

1. In accordance with manufacturer’s installation instructions, or
2. In compliance with RAS-111, or
3. A continuous metal minimum 4" × 4" "L" flashing shall be set in approved flashing cement and set flush to base of wall and over the underlayment. Both horizontal and vertical metal flanges shall be fastened 6 inches (152 mm) on center with approved fasteners. All laps shall be a minimum of 4 inches (102 mm) fully sealed in approved flashing cement. Flashing shall start at the lower portion of roof to insure water-shedding capabilities of all metal laps. The entire edge of the horizontal flange shall be sealed covering all nail penetrations with approved flashing cement and membrane. Shingles will overlap the horizontal flange and shall be set in approved flashing cement.

Base flashing shall be of either corrosion resistant metal with a minimum thickness provided in Table 1503.2 or mineral surface roll roofing weighing a minimum of 77 pounds per 100 square feet (3.76 kg/m²). Counter flashing shall be corrosion resistant metal with a minimum thickness provided in Table 1503.2.
The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

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Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact. Current 2014 FBC code language without any new requirements being established.

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Rationale

To carry forward previous Commission approved code language providing clarity and continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Related Modifications

Provides clarity to current Florida-specific criteria

Summary of Modification

Provides clarity to current Florida-specific criteria

Comments

General Comments

No

Alternate Language

No

Proponent

Mark Zehnal

Affects HVHZ

No

Attachments

Yes

TAC Recommendation

Approved as Submitted

Commission Action

Pending Review

Chapter

15

Section

1507.3.3

Date Submitted

12/21/2015

Approved as Submitted

1507.3.3

Pending Review

Proponent

Mark Zehnal

Affects HVHZ

No

Attachments

Yes

General Comments

No

Alternate Language

No

Related Modifications

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YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
1507.3.3 Underlayment. 
Unless otherwise noted, required underlayment shall conform to: ASTM D 226, Type II; ASTM D 2626 or ASTM D 6380. Class M mineral surfaced roll roofing underlayment shall be applied according to the underlayment manufacturer's installation instructions or the recommendations of the FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual, Fifth Edition where the basic wind speed, $V_{ead}$, is determined in accordance with Section 1609.3.1 or the recommendations of RAS 118, 119 or 120.
R6706

Date Submitted  12/21/2015
Chapter  15

Proponent  Mark Zehnal
Attachments  Yes

TAC Recommendation  Approved as Submitted
Commission Action  Pending Review

Comments

General Comments  No
Alternate Language  No

Related Modifications

Summary of Modification
Provides current Florida-specific criteria including RAS-111

Rationale
To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
1507.3.9 Flashing.
At the juncture of the roof vertical surfaces, flashing and counterflashing shall be provided in accordance with 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 flow line forming 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 (59 percent slope) or self-adhering polymer-modified bitumen sheet shall be installed or the recommendations of the FRSA/ TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual, Fifth Edition where the basic wind speed, \(V_{100}\), is determined in accordance with Section 1609.3.1 or the recommendation of RAS 111, 118, 119 or 120.
**R6707**

**Date Submitted**: 12/21/2015  
**Chapter**: 15  
**Section**: 1507.4.5.1  
**Affects HVHZ**: No  
**Proponent**: Mark Zehnal  
**Attachments**: Yes

| TAC Recommendation | Approved as Submitted  
|---------------------|-----------------------  
| Commission Action   | Pending Review  

**Comments**

| General Comments | No  
|------------------|-----  
| Alternate Language | No  

**Related Modifications**

1507.1.1

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?  
**YES**

The provisions contained in the proposed amendment are addressed in the applicable international code?  
**NO**

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?  
**YES**

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?  
**NO**
See attached PDF file.
1507.4.5.1 Underlayment. Underlayment shall comply with and be installed in accordance with Section 1507.1.1.
### Comments

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#### Related Modifications

1507.1.1

#### Summary of Modification

Provides current Florida-specific criteria

#### Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

#### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

#### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

#### Is the proposed code modification part of a prior code version?

Yes

#### The provisions contained in the proposed amendment are addressed in the applicable international code?

No

#### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

Yes

#### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

No
See attached PDF file.
1507.5.3 Underlayment. Underlayment shall comply with ASTM D-226, Type I or ASTM D-4869 and be installed in accordance with Section 1507.1.1.
2017 Triennial

Roofing

Page 166 of 509
See attached PDF file.
1507.6.3 **Underlayment.** Underlayment shall comply with **ASTM D 226, Type I or ASTM D 4869** and be installed in accordance with Section 1507.1.1.
### Comments

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### Related Modifications

**1507.1.1**

### Summary of Modification

Provides current Florida-specific criteria

### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

### Is the proposed code modification part of a prior code version?

Yes

### The provisions contained in the proposed amendment are addressed in the applicable international code?

No

### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

Yes

### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

No
See attached PDF file.
1507.7.3 Underlayment. Underlayment shall comply with ASTM D-226, Type II or ASTM D-4869, Type III or IV, and be installed in accordance with Section 1507.1.1.
Section 1507.8.3

Comments
General Comments No Alternate Language No

Related Modifications
1507.1.1

Summary of Modification
Provides current Florida-specific criteria

Rationale
To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement
Impact to local entity relative to enforcement of code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
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Impact to small business relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Requirements
Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
1507.8.3 Underlayment. Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869 and be installed in accordance with Section 1507.1.1.
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<th>12/21/2015</th>
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**Comments**

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**Related Modifications**

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
1507.8.9 Label required. Each bundle of shingles shall be identified by a label of an approved grading or inspection bureau or agency.
R6715

Date Submitted: 12/21/2015  
Section: 1507.9.3  
Proponent: Mark Zehnal  
Attachments: Yes

**Comments**

**General Comments**  No  
**Alternate Language**  No

**Related Modifications**

1507.1.1

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
1507.9.3 Underlayment. Underlayment shall comply with ASTM D-226, Type I or ASTM D-4869 and be installed in accordance with Section 1507.1.1.
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<th>Section</th>
<th>1507.10</th>
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Related Modifications

Summary of Modification
Provides current Florida-specific criteria

Rationale
To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

**Impact to local entity relative to enforcement of code**
No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to building and property owners relative to cost of compliance with code**
No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to industry relative to the cost of compliance with code**
No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to small business relative to the cost of compliance with code**
No impact. Current 2014 FBC code language without any new requirements being established.

Requirements

**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

**Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

**Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

**Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
1507.9.10 Label required. Each bundle of shingles shall be identified by a label of an approved grading or inspection bureau or agency.
**Comments**

| General Comments | No | Alternate Language | No |

**Related Modifications**

**Summary of Modification**

Provides current Florida-specific criteria including RAS-109 and RAS-109A

**Rationale**

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

*Is the proposed code modification part of a prior code version?*

YES

*The provisions contained in the proposed amendment are addressed in the applicable international code?*

NO

*The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?*

YES

*The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?*

NO
See attached PDF file.
1507.14 Sprayed polyurethane foam roofing. The installation of sprayed polyurethane foam roofing shall comply with the provisions of this section or in compliance with RAS-109 and 109-A.
Date Submitted: 12/21/2015  
Section: 1507.17.3  
Proponent: Mark Zehnal  
Attachments: Yes  

**Comments**

General Comments: No  
Alternate Language: No  

**Related Modifications**

If approved will need to be added to 1507.1.1 underlayment Table  

**Summary of Modification**

Provides current Florida-specific criteria  

**Rationale**

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.  

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.  
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.  
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.  
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.  

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.  
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.  
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?  
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?  
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?  
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?  
NO
See attached PDF file.
1507.17.3 Underlayment. Unless otherwise noted, required underlayment shall conform to ASTM D 226, ASTM D 4869 or ASTM D 6757. Underlayment shall comply and be installed in accordance with Section 1507.1.1.
### Comments

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### Related Modifications

1507.17.3, 1507.1.1 underlayment Table

### Summary of Modification

Provides current Florida-specific criteria

### Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

**Impact to local entity relative to enforcement of code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to building and property owners relative to cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to industry relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to small business relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

**Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

**Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**


**Does not degrade the effectiveness of the code**


Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
1507.17.4 Underlayment application. Underlayment shall be applied shingle fashion, parallel to and starting from the eave, lapped 2 inches (51 mm) and fastened sufficiently to hold in place. RESERVED
### Comments

**General Comments**  
No

**Alternate Language**  
No

### Related Modifications

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### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

**Impact to local entity relative to enforcement of code**  
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No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to industry relative to the cost of compliance with code**  
No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to small business relative to the cost of compliance with code**  
No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**  
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

**Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**  
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

**Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**  

**Does not degrade the effectiveness of the code**  

Is the proposed code modification part of a prior code version?  
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?  
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?  
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?  
NO
See attached PDF file.
1511.1.1
Not more than 25 percent of the total roof area or roof section of any existing building or structure shall be repaired, replaced or recovered in any 12-month period unless the entire existing roofing system or roof section is replaced to conform to requirements of this code.
### Related Modifications

**Summary of Modification**
- Provides current Florida-specific criteria including RAS-111

**Rationale**
- To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**
- YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**
- NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**
- YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**
- NO
See attached PDF file.
1511.6 Flashings.
Flashings shall be reconstructed in accordance with approved manufacturer's installation instructions or RAS-111. Metal flashing to which bituminous materials are to be adhered shall be primed prior to installation.
Summary of Modification

Provides clarification to current State Statute mandated Florida-specific criteria

Rationale

To improve previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code

No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Impact to industry relative to the cost of compliance with code

No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Impact to small business relative to the cost of compliance with code

No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Does not degrade the effectiveness of the code

Does not degrade. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

NO

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
1506.3 Product identification. Roof-covering materials shall be delivered in packages bearing the manufacturer’s identifying marks and approved testing agency labels required in accordance with Section 1505. Bulk shipments and/or site manufactured of materials shall be accompanied with the same information or issued in the form of a certificate or on a bill of lading by the manufacturer.
Proposes readoption of Florida-specific Section 1917 in its entirety with no changes.

Although lightweight insulating concrete roof decks are utilized throughout the world, Florida is by far the most substantial market for the material with proven performance of this roofing insulation material in Florida’s climactic conditions due to its ability to wick moisture and fully adhere, providing excellent performance in high velocity wind zones. The origins of s. 1917 were in the original South Florida Building Code. It has been adopted as part of the Florida Building Code since its creation and is relied upon by contractors, applicators, manufacturers, code officials and design professionals and is looked to by other states for guidance.

- Impact to local entity relative to enforcement of code: None. There would be negative impact if these provisions are not readopted.
- Impact to building and property owners relative to cost of compliance with code: None. There would be negative impact if these provisions are not readopted.
- Impact to industry relative to the cost of compliance with code: None. There would be negative impact if these provisions are not readopted.
- Impact to small business relative to the cost of compliance with code: None. There would be negative impact if these provisions are not readopted.

Requirements
- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  Proper application, testing and inspection of lightweight insulating concrete roof decks is critical to the roofing process and the integrity of the building envelope.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  Re-adoption of these code provisions will ensure continued consistency in the application, testing and regulation of lightweight insulating concrete roof decks.
- Does not discriminate against materials, products, methods, or systems of construction
  Does not discriminate against any materials, products, methods or systems.
- Does not degrade the effectiveness of the code
  Improves the effectiveness of the code. Failure to readopt these provisions would degrade the effectiveness of the code.

Is the proposed code modification part of a prior code version? YES

The provisions contained in the proposed amendment are addressed in the applicable international code? NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state? YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process? NO
SECTION 1917 LIGHTWEIGHT INSULATING CONCRETE ROOFS

1917.1 Lightweight insulating concrete.
Material produced with or without aggregate additions to Portland cement, water and air to form a hardened material possessing insulating qualities, which, when oven dried shall have a unit weight no greater than 50 pcf (801 kg/m³).

1917.1.1 Aggregate lightweight insulating concrete.
Insulating concrete formulated predominantly with perlite or vermiculite aggregate having a minimum compressive strength of 125 psi (861.8 kPa) when tested in compliance with ASTM C 495.

1917.1.2 Cellular lightweight insulating concrete.
Insulating concrete formulated by mixing a hydrated cementitious matrix around noninterconnecting air cells created by the addition of preformed foam formed from hydrolyzed proteins or synthetic surfactants. The cured cellular lightweight insulating concrete shall have minimum compressive strength of 160 psi (1103 kPa) when tested in compliance with ASTM C 495 and C 796.

1917.1.3 Cellular/aggregate (hybrid) lightweight insulating concrete.
Insulated concrete formulated by combining preformed foam with low density aggregates to impart properties of both aggregate and cellular lightweight insulating concrete. It shall have a minimum compressive strength of 200 psi (1379 kPa) when tested in compliance with ASTM C 495 and C 796.

1917.2 Inspection.

1917.2.1 Application of all lightweight insulating concrete roof decks shall be by applicators approved by the lightweight insulating concrete deck manufacturer. Product approval shall be required for all lightweight insulating concrete systems.

1917.2.2 The permit holder shall notify the building official 48 hours prior to the pouring of lightweight insulating concrete.

1917.2.3 The permit holder shall make available to the building official a job log with the following minimum items.

1. Cast density recordings/hour.

2. Product evaluation for application.

3. Date and job locations identified.

4. Results of any field test conducted.

1917.2.4 Once the roof deck system can support foot traffic, the building official shall have clear access and clear path at his option for inspection of lightweight insulating concrete.

1917.3 Testing.
The building official may require tests of the lightweight insulating concrete to confirm the fastener withdrawal resistance, compressive strength or drainage ability.

1917.3.1 Existing roof assemblies to receive lightweight insulating concrete other than galvanized G-90 steel deck or structural concrete deck shall be tested for uplift for adhesion to the substrate to confirm compliance with design
pressure.

1917.4 Materials and limitations of use.
Lightweight insulating concrete, in conjunction with galvanized formed steel sheets, shall not be used as a roof deck in areas where highly corrosive chemicals are used or stored.

1917.4.1
Lightweight insulating concrete shall be poured over bottom slotted galvanized (G-90) steel decking as follows; cellular, 0.5-percent open; hybrid, 0.75-percent open, aggregate, 1.5-percent open. No lightweight insulating concrete shall be poured over a painted or nongalvanized steel deck.

1. Lightweight insulating concrete over structural concrete slabs, twin tees, precast units or other nonventing substrates shall be vented to allow the escape of excess moisture.

1917.4.2
Minimum thickness of lightweight insulating concrete shall be 2 inches (51 mm) over the top plane of the substrate unless otherwise specified in the product approval. Lightweight insulating concrete shall be of sufficient thickness to receive the specified base ply fastener length.

1917.4.3
Galvanized coatings of formed steel sheets shall be in accordance with ASTM A 525 with a minimum coating designation of G-90. Base steel shall conform to ASTM A 446, Grade A, B, C, D or greater and ASTM A 611 C, D or E.

1917.4.4
Chemical admixtures shall be in compliance with ASTM C 494. Calcium chloride or any admixture containing chloride salts shall not be used in insulating concrete. Fiber reinforcement may be used to control cracking. Mineral admixtures shall conform to ASTM C 618.

1917.4.5
Vermiculite or perlite shall be in compliance with ASTM C 332, Group I. Foam concentrates shall be in compliance with ASTM C 796 and ASTM C 869.

1917.4.6
Mixing, placing and finishing shall be in compliance with the deck system product approval. Slurry coating, two-density casting and double casting shall be acceptable per the specific manufacturer’s recommendations.

1917.4.7
If the lightweight insulating concrete deck is to receive product approval for a direct-adhered roofing system, the deck surface shall be prepared to the requirements set forth in the roof system product approval.

1917.4.8
All base ply fasteners for use in lightweight insulating concrete roof decks shall have a product approval for use with the specific lightweight insulating concrete roof system in compliance with manufacturer’s recommendations and the design pressure of Section 1609 (Section 1620 for the High-Velocity Hurricane Zone).

1917.4.9
The lightweight insulating concrete fastener withdrawal shall have a minimum resistance for new pours of:

1. 60 pounds (267 N) in 28 days when the fastener is installed and allowed to age in the concrete.

2. 40 pounds (178 N) at time of roofing.
1917.4.10
Insulation board with lightweight insulating concrete shall conform to Type I expanded polystyrene insulation as defined in ASTM C 578.

1. Packaged insulation board delivered to the job site shall comply with the provisions of Section 2603.2.

2. Installation of insulating board in conjunction with lightweight insulating concrete shall comply with uplift requirements set forth in Section 1609 (Section 1620 for the High-Velocity Hurricane Zone). Insulation panels shall be placed in a minimum 1/8-inch (3.2 mm) slurry of insulating concrete while the material is still in a plastic state. The insulating concrete shall be cast over the insulation boards according to the insulating concrete manufacturer's product approval. Insulation panels shall be provided with holes and/or slots for keying and venting.

1917.4.11
Reinforcing mesh shall be provided as required to meet fire-rating and/or special structural design requirements. Refer to a specific product approval for the specific requirements applicable to the product being installed.
## R7076

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<td>Proponent</td>
<td>Michael Fischer</td>
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### Comments

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#### Related Modifications

- FBC-res version

#### Summary of Modification

Update referenced standard.

#### Rationale

Update D 1970 to most current version; this is a Florida-specific need due to changes in the nail-backing requirements during testing. Use of D 1970 compliant product is an important windstorm mitigation method in Florida.

#### Fiscal Impact Statement

- Impact to local entity relative to enforcement of code:
  - $0
- Impact to building and property owners relative to cost of compliance with code:
  - $0
- Impact to industry relative to the cost of compliance with code:
  - $0
- Impact to small business relative to the cost of compliance with code:
  - $0

#### Requirements

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Updates referenced standard.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Requires compliance with most current version of standard.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Standard is an ASTM consensus document.
- Does not degrade the effectiveness of the code
  - Requires compliance with most current version of standard.

Is the proposed code modification part of a prior code version? No

### 1st Comment Period History

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<tr>
<th>Proponent</th>
<th>Jaime Gascon</th>
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<td>2/25/2016</td>
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Comment:

Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to Chapter 35 that is the subject of this code modification. This proposal will significantly improve the code.
D 1970—1315
Specification for Self-adhering Polymer Modified
Bituminous Sheet Materials Used as Steep Roof
Underlayment for Ice Dam Protection
### Summary of Modification

Carry over requirements from 2010 Florida Building Code, Existing Buildings that send re-roofing of existing buildings to Section 708 on Re-roofing.

### Rationale

The 2010 FBC-Existing Buildings had a pointer in Chapter 5 to send users to Section 708 when re-roofing. This was left out of the 2014 FBC-Existing Buildings and has caused confusion, resulting in the need for a recent DEC statement. This will restore that reference.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  
  No change in impact. Carry over from previous code and in agreement with recent Commission DEC statement.

- **Impact to building and property owners relative to cost of compliance with code**
  
  No change in impact. Carry over from previous code and in agreement with recent Commission DEC statement.

- **Impact to industry relative to the cost of compliance with code**
  
  No change in impact. Carry over from previous code and in agreement with recent Commission DEC statement.

- **Impact to small business relative to the cost of compliance with code**
  
  No change in impact. Carry over from previous code and in agreement with recent Commission DEC statement.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  
  Yes. The roof covering is the first line of defense against moisture and wind-driven rain. Repairs to roof coverings need to comply with the requirements for new roofing to ensure proper performance of the roof covering.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  
  Improves the code. Current code omitted this reference and it has caused confusion that resulted in the need for a Commission DEC statement.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  
  Does not discriminate. Continuation of current requirements.

- **Does not degrade the effectiveness of the code**
  
  does not degrade.

### Is the proposed code modification part of a prior code version? No
502.2 Application.

Repairs shall comply with the provisions of Chapter 6. Re-roofing shall comply with the provisions of Section 706.
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<th>12/20/2015</th>
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<td>No</td>
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<td>Mark Zehnal</td>
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**TAC Recommendation**
- Approved as Submitted
- Pending Review

**Commission Action**

**Comments**
- General Comments: No
- Alternate Language: No

**Related Modifications**

**Summary of Modification**
- Provides current Florida-specific roofing criteria for the purpose of consistent code compliant guidance in the design and installation of roof repairs.

**Rationale**
- Providing continuity for the proper installation of roofing systems and components connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**
- Impact to local entity relative to enforcement of code
  - No impact. Provides guidance with established FBC code language.
- Impact to building and property owners relative to cost of compliance with code
  - No impact. Provides guidance with established FBC code language.
- Impact to industry relative to the cost of compliance with code
  - No impact. Provides guidance with established FBC code language.
- Impact to small business relative to the cost of compliance with code
  - No impact. Provides guidance with established FBC code language.

**Requirements**
- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Provides guidance with established FBC code language.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Provides guidance with established FBC code language.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Does not discriminate. Provides guidance with established FBC code language.
- Does not degrade the effectiveness of the code
  - Does not degrade. Provides guidance with established FBC code language.

Is the proposed code modification part of a prior code version? No
See attached PDF file.
601.1 Scope.

Repairs as described in Section 502 shall comply with the requirements of this chapter and with the provisions of Section 708. Repairs to historic buildings need only comply with Chapter 12.
## Summary of Modification

Provides current Florida-specific roofing criteria for the purpose of consistent code compliant guidance in the design and installation of roof repairs.

## Rationale

Providing continuity for the proper installation of roofing systems and components connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

## Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  
  No impact. Provides guidance with established FBC code language.

- **Impact to building and property owners relative to cost of compliance with code**
  
  No impact. Provides guidance with established FBC code language.

- **Impact to industry relative to the cost of compliance with code**
  
  No impact. Provides guidance with established FBC code language.

- **Impact to small business relative to the cost of compliance with code**
  
  No impact. Provides guidance with established FBC code language.

## Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  
  Provides guidance with established FBC code language.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  
  Provides guidance with established FBC code language.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  
  Does not discriminate. Provides guidance with established FBC code language.

- **Does not degrade the effectiveness of the code**
  
  Does not degrade. Provides guidance with established FBC code language.

## Is the proposed code modification part of a prior code version?

YES

## The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

## The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

## The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
606.2 Repairs to damaged buildings.
Repairs to damaged buildings shall comply with this section and Section 706.
Reroofing.
R6662

Date Submitted: 12/20/2015
Chapter: 7

Section: 706.7.2
Proponent: Mark Zehnal

Affects HVHZ: No
Attachments: Yes

TAC Recommendation: Approved as Submitted
Commission Action: Pending Review

Comments
General Comments: No
Alternate Language: No

Related Modifications

Summary of Modification
Provides correction to current Florida-specific criteria.

Rationale
Correct scrivener’s error so prescriptive language will be consistent with FBC chapter 15 and FRC chapter 9.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
No impact. Correct current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Correct current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Correct current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Correct current 2014 FBC code language without any new requirements being established.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Correct current, Commission approved 2014 FBC performance proven code language without any new requirements being
established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Correct current, Commission approved 2014 FBC performance proven code language without any new requirements being
established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the
foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment
applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida
Building Code amendment process?
NO
See attached PDF file.
706.7.2 Roof secondary water barrier for site-built single family residential structures. A secondary water barrier shall be installed using one of the following methods when roof covering is removed and replaced:

1. In either HVHZ or Non-HVHZ regions:

   a) All joints in structural panel roof sheathing or decking shall be covered with a minimum 4 inch (102 mm) wide strip of self-adhering polymer modified bitumen tape applied directly to the sheathing or decking. The deck and self-adhering polymer modified bitumen tape shall be covered with one of the underlayment systems approved for the particular roof covering to be applied to the roof.

   b) The entire roof deck shall be covered with an approved asphalt impregnated 30# felt underlayment or approved synthetic underlayment installed with nails and tin-tabs in accordance with Sections 1518.2, 1518.3, or 1518.4 of the Florida Building Code, Building. (No additional underlayment shall be required over the top of this sheet.) The synthetic underlayment shall be fastened in accordance with the manufacturer’s recommendations.

2. Outside the High Velocity Hurricane Zone:

   a) The entire roof deck shall be covered with an approved self-adhering polymer modified bitumen sheet meeting ASTM D 1970 or an approved self-adhering synthetic underlayment installed in accordance with the manufacturer’s installation instructions. No additional underlayment shall be required on top of this sheet for new installations.

   b) An underlayment system approved for the particular roof covering shall be applied with the following modification:

      (1) For roof slopes that require one layer of underlayment, a layer of approved asphalt impregnated ASTM D 226, Type I or Type II, ASTM D 4869, Type I or Type II, or Type IV underlayment or approved synthetic underlayment shall be installed. The felt is to be fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). Synthetic underlayment shall be fastened in accordance with this section and the manufacturer’s recommendations.

      (2) For roof slopes that require two layers of underlayment, an approved asphalt impregnated ASTM D 226 Type I or Type II, ASTM D 4869, Type II or Type IV underlayment shall be installed in a shingle-fashion and lapped 19 inch (483 mm) and fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs, attached to a nailable deck with one row in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps...
fastened 6 in. o.c. (152 mm). An approved synthetic underlayment shall be installed in accordance with this section and the manufacturer’s installation instruction. (No additional underlayment shall be required over the top of this sheet.)

Exceptions:

1. Roof slopes < 2:12 having a continuous roof system shall be deemed to comply with Section 706.7.2 requirements for a secondary water barrier.

2. Clay and concrete tile roof systems installed as required by the Florida Building Code are deemed to comply with the requirements of Section 706.7.2 for Secondary Water Barriers.
Sub Code: Residential

R6779

**Date Submitted**: 12/22/2015  
**Section**: 202  
**Affects HVHZ**: Yes  
**Proponent**: Dwight Wilkes  
**Attachments**: No

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**Related Modifications**: 6776R905.4&.10

**Summary of Modification**:  
To add a definition to clarify who is a metal roof covering manufacturer.

**Rationale**:  
To insure the metal roof shingles and metal roof panels are consistently manufactured in compliance with the requirements of the Florida Building Code(s), Florida Statute(s) 553.8425 Local Product Approval and 61G20-3 statewide Product Approval

**Fiscal Impact Statement**:  
- Impact to local entity relative to enforcement of code: No impact  
- Impact to building and property owners relative to cost of compliance with code: No impact  
- Impact to industry relative to the cost of compliance with code: No impact  
- Impact to small business relative to the cost of compliance with code: No impact

**Requirements**:  
- Has a reasonable and substantial connection with the health, safety, and welfare of the general public: Yes clearly identifies the party responsible for metal roof products code compliance.  
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction: Improves the code by identifying the party responsible for metal roof products code compliance.  
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities: Does not discriminate.  
- Does not degrade the effectiveness of the code: Does not.

**Is the proposed code modification part of a prior code version?** No

**1st Comment Period History**

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</table>

**Comment**:  
Companies with no FPA using false FPA....Something needs to be done with roofing contractors using machines with no florida product approvals. They are able to pull anyone's FPA info and submit stating they are using this product when in fact its coming off a machine that hasn't been tested or through the Quality Assurance Company. The manufacturers out there that pay out all this money for testing, and updating for FPA gets taken advantage of when there are companies out there that are cheating the system.

There needs to be away to have FPA ONLY come from the manufacturer itself and signed off by the manufacturer that in fact is their panel on that said project.
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There needs to be away to have FPA ONLY come from the manufacturer itself and signed off by the manufacturer that in fact is their panel on that said project.

Keystone Certifications supports this Code Modification because it clarifies who is the manufacturer of metal roof products, and therefore who is the party responsible to demonstrate the products are manufactured as approved. We continue to receive complaints from legitimate manufacturers regarding competitors who employ the Florida Product Approvals issued in the name of their equipment suppliers and do not participate in a quality assurance program to demonstrate the products are produced as approved.

Implementation of this Code Mod in conjunction with Mods 6783 & 6784 & 6734 & 6776, which further clarify the quality assurance requirement, will provide code officials with the understanding necessary to consistently implement the requirements of the Florida Building Codes.
Chapter 2, Section 202:

[RB] METAL ROOF PANEL. An interlocking metal sheet having a minimum installed weather exposure of 3 square feet (0.279 m²) per sheet.

[RB] METAL ROOF SHINGLE. An interlocking metal sheet having an installed weather exposure less than 3 square feet (0.279 m²) per sheet.

METAL ROOF PANEL, or METAL ROOF SHINGLE, MANUFACTURER. The party responsible for forming sheet metal raw materials into the metal roof panels and/or metal roof shingles used in building construction.
<table>
<thead>
<tr>
<th>TAC Recommendation</th>
<th>Approved as Submitted</th>
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<tbody>
<tr>
<td>Commission Action</td>
<td>Pending Review</td>
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<table>
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<tr>
<th>Comments</th>
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<tr>
<td>General Comments</td>
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<td>Alternate Language</td>
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<tr>
<th>Related Modifications</th>
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<tr>
<th>Summary of Modification</th>
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<tr>
<td>Provides current Florida-specific criteria</td>
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<td>To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.</td>
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- **Impact to local entity relative to enforcement of code**
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
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- **Impact to small business relative to the cost of compliance with code**
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- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
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- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
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- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
SECTION R902 FIRE CLASSIFICATION

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 jurisdictions designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a lot line. Class A, B and C roofing required by this section to be listed shall be tested in accordance with UL 790 or ASTM E 108.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry and exposed concrete roof deck.

2. Class A roof assemblies include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.

3. Class A roof assemblies include minimum 16 ounces per square foot copper sheets installed over combustible decks.

4. Class A roof assemblies include slate installed over underlayment over combustible decks.

R902.2 Fire-retardant-treated shingles and shakes.
Fire-retardant-treated wood shakes and shingles shall be treated by impregnation with chemicals by the full-cell vacuum-pressure process, in accordance with AWPA C1. Each bundle shall be marked to identify the manufactured unit and the manufacturer, and shall be labeled to identify the classification of the material in accordance with the testing required in Section R902.1, the treating company and the quality control agency.

R902.3 Building-integrated photovoltaic product.
Building-integrated photovoltaic products installed as the roof covering shall be tested, listed and labeled for fire classification in accordance with Section R902.1.

R902.4 Rooftop-mounted photovoltaic panels and modules.
Rooftop-mounted photovoltaic panels and modules installed on or above the roof covering shall be tested, listed and identified with a fire classification in accordance with UL 793. Class A, B or C photovoltaic panels and modules shall be installed in jurisdictions designated by law as requiring their use or where the edge of the roof is less than 3 feet (914 mm) from a lot line.
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<td>Alternate Language</td>
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### Related Modifications

#### Summary of Modification
- Provides current Florida-specific criteria

### Rationale
- To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

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- NO
SECTION R903 WEATHER PROTECTION

R903.1 General. Roof decks shall be covered with approved roof coverings secured to the building or structure in accordance with the provisions of this chapter. Roof assemblies shall be designed and installed in accordance with this code and the approved manufacturer's installation instructions such that the roof assembly shall serve to protect the building or structure.

R903.2 Flashing.
Flashings shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

R903.2.1 Locations.
Flashings shall be installed at wall and roof intersections, wherever there is a change in roof slope or direction and around roof openings. A flashing shall be installed to divert the water away from where the eave of a sloped roof intersects a vertical sidewall. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.5 mm) (No. 26 galvanized sheet) provided in Table R903.2.1.

Exception: Flashing is not required at hip and ridge junctions.

<table>
<thead>
<tr>
<th>TABLE R903.2.1 METAL FLASHING MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATERIAL</td>
</tr>
<tr>
<td>Copper</td>
</tr>
<tr>
<td>Aluminum</td>
</tr>
<tr>
<td>Stainless steel</td>
</tr>
<tr>
<td>Galvanized steel</td>
</tr>
<tr>
<td>Aluminum zinc coated steel</td>
</tr>
<tr>
<td>Zinc alloy</td>
</tr>
<tr>
<td>Lead</td>
</tr>
</tbody>
</table>

R903.2.2 Crickets and saddles.
A cricket or saddle shall be installed on the ridge side of any chimney or penetration more than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.
Exception: Unit skylights installed in accordance with Section R308.6 and flashed in accordance with the manufacturer’s instructions shall be permitted to be installed without a cricket or saddle.

R903.2.3 Membrane flashings.
All membrane flashing shall be installed according to the roof assembly manufacturer’s published literature.

R903.3 Coping.
Parapet walls shall be properly coped with noncombustible, weatherproof materials of a width not less than the thickness of the parapet wall.

R903.4 Roof drainage.
Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof. Where required for roof drainage, scuppers shall be placed level with the roof surface in a wall or parapet. The scupper shall be located as determined by the roof slope and contributing roof area.

R903.4.1 Secondary (emergency overflow) drains or scuppers. Overflow drains and scuppers.
Where roof drains are required, secondary emergency overflow roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. Overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains and having a minimum opening height of 4 inches (102 mm) shall be installed in the adjacent parapet walls with the inlet flow located 2 inches (51 mm) above the low point of the roof served. The installation and sizing of overflow drains, leaders and conductors shall comply with Sections 1106 and 1108 of the International Plumbing Code, as applicable. When other means of drainage of overflow water is not provided, overflow scuppers shall be placed in walls or parapets not less than 2 inches (51 mm) nor more than 4 inches (102 mm) above the finished roof covering and shall be located as close as practical to required vertical leaders or downspouts or wall and parapet scuppers. An overflow scupper shall be sized in accordance with the Florida Building Code, Plumbing.

Overflow drains shall discharge to an approved location and shall not be connected to roof drain lines.

R903.4.2 One and two family dwellings, and private garages.

When gutters and leaders are placed on the outside of buildings, the gutters and leaders shall be constructed of metal or approved plastic for outdoor exposure with lapped, soldered or caulked joints and shall be securely fastened to the building with a corrosion resistant fastening device of similar or compatible material to the gutters and downspouts.
## Comments

### General Comments
- No

### Alternate Language
- No

## Related Modifications

## Summary of Modification

Provides current Florida-specific criteria

## Rationale

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## Requirements

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## The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
- No
See attached PDF file.
R905.1 Roof covering application.
Roof coverings shall be applied in accordance with the applicable provisions of this section and the manufacturer's installation instructions. Unless otherwise specified in this section, roof coverings shall be installed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3).

R905.1.1 Underlayment.

Underlayment for asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate type shingles, wood shingles, wood shakes and metal roof panels shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D 226, D 1970, D 4869 and D 6757 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). Underlayment shall be applied in accordance with Table R905.1.1(2). Underlayment shall be attached in accordance with Table R905.1.1(3).

Exceptions:

1. As an alternative, self-adhering polymer modified bitumen underlayment complying with ASTM D 1970 installed in accordance with both the underlayment manufacturer's and roof covering manufacturer's instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted.

2. As an alternative, a minimum 4-inch-wide (102-mm) strip of self-adhering polymer-modified bitumen membrane complying with ASTM D 1970, installed in accordance with the manufacturer's instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for maximum ultimate design wind speeds, $V_{ult}$, less than 140 miles per hour shall be applied over the entire roof over the 4-inch-wide (102-mm) membrane strips.

<table>
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<tr>
<th>TABLE R905.1.1(1) UNDERLAMENT TYPES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROOF-COVERING</td>
</tr>
</tbody>
</table>

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_6603_Text_Section_R905.1_1.png
### TABLE R905.1.1(2) UNDERLayment APPLICATION

<table>
<thead>
<tr>
<th>ROOF COVERING</th>
<th>SECTION</th>
<th>MAXIMUM-ULTIMATE-DESIGN-WIND SPEED, Vult &lt; 140 MPH</th>
<th>MAXIMUM-ULTIMATE-DESIGN-WIND SPEED, Vult ≥ 140 MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt shingles</td>
<td>R905.2</td>
<td>For roof slopes from two units vertical in 12 units horizontal (2:12), up to four units vertical in 12 units horizontal (4:12): Underlayment shall be two layers applied in the following manner: Apply a 10-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eaves, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of four units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner: Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to</td>
<td>Same as Maximum-Ultimate-Design Wind Speed, Vult &lt; 140 mph except all laps shall be not less than 4 inches.</td>
</tr>
</tbody>
</table>
### TABLE R905.1.1(3) UNDERLAYERMENT-ATTACHMENT

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<thead>
<tr>
<th>ROOF-COVERING</th>
<th>SECTION</th>
<th>MAXIMUM ULTIMATE DESIGN WIND SPEED, ( \text{Vult} &lt; 140 \text{ MPH} )</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R6603.3</td>
<td>For roof-slopes from two to one-half units vertical in 12 units horizontal ( (2:12, 1:12) ), up to four units vertical in 12 units horizontal ( (4:12) ), underlayment shall be a minimum of two layers applied as follows: starting at the eave, apply a 1(\frac{1}{2})-inch strip of underlayment perpendicularly with the eave. Starting at the rafter, apply 36-inch-wide strips of underlayment, overlapping successive strips 12 inches. 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 eave and lapped 2 inches. End laps shall be 4 inches and shall be offset by 6 feet. Same as Maximum Ultimate Design Wind Speed, ( \text{Vult} = 140 \text{ MPH} ) except all laps shall be not less than 4 inches.</td>
<td>For roof-slopes from two units vertical in 12 units horizontal ( (2:12) ), up to four units vertical in 12 units horizontal ( (4:12) ), underlayment shall be two layers applied in the following manner: apply a 1(\frac{1}{2})-inch strip of underlayment felt perpendicularly with the eave. Starting at the rafter, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 12 inches, and fastened sufficiently to hold in place. For roof-slopes of four units vertical in 12 units horizontal ( (4:12) ) or greater, underlayment shall be one layer applied in the following manner: underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 4 inches. End laps shall be 4 inches and shall be offset by 6 feet.</td>
</tr>
<tr>
<td>Clay and concrete-tile</td>
<td>R6603.4</td>
<td>Metal roof shingles</td>
<td>Metal panels</td>
</tr>
<tr>
<td>Mineral-surfaced roll roofing</td>
<td>R6603.5</td>
<td>Slate and slate-type shingles</td>
<td>R6603.6</td>
</tr>
<tr>
<td>Wood shingles</td>
<td>R6603.7</td>
<td>Wood shakes</td>
<td>R6603.8</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.
<table>
<thead>
<tr>
<th>Material</th>
<th>Code</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt shingles</td>
<td>R905.2</td>
<td>Fastened sufficiently to hold in place. The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6 inch spacing at the side laps. Underlayment shall be attached using metal or plastic cap nails or cap staples with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 3/32 inch. The cap nail shank shall be not less than 0.036 inch for ring shank cap nails and 0.081 inch for smooth shank cap nails. Staples shall be not less than 21 gage. Cap nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.</td>
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<td>R905.3</td>
<td></td>
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<td>Metal roof shingles</td>
<td>R905.4</td>
<td>Manufacturer's installation instructions. The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6 inch spacing at the side laps. Underlayment shall be attached using metal or plastic cap nails or cap staples with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of at least 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 3/32 inch. Minimum thickness of the outside edge of plastic caps shall be 0.036 inch. The cap nail shank shall be not less than 0.036 inch for ring shank cap nails and 0.081 inch for smooth shank cap nails. Staples shall be not less than 21 gage. Cap nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.</td>
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For SI: 1 inch = 25.4 mm.

**RESERVED**

**R905.1.2 Ice barriers.** In areas where there has been a history of ice forming along the eaves causing a backup of water as designated in Table R301.2(1), an ice barrier shall be installed for asphalt shingles, metal roof shingles, mineral—surfaced roll roofing, slate and slate-type shingles, wood shingles and wood shakes. The ice barrier shall consist...
of not fewer than two layers of underlayment cemented together, or a self-adhering polymer modified bitumen sheet shall be used in place of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building. On roofs with slope equal to or greater than 8 units vertical in 12 units horizontal, the ice barrier shall also be applied not less than 36 inches (914 mm) measured along the roof slope from the eave edge of the building.

Exception: Detached accessory structures not containing conditioned floor area.

RESERVED
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YES

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NO
Comment:
In R905.6.1.1 Nails, the nails should be specified as Type 304 or Type 316 Stainless steel. There are many types of stainless steel, some are more corrosion resistant, but there are types that are not that corrosion resistant. In the struck text from the Base Code, 304 or 316 is specified. This should be maintained.
See attached PDF file,
R905.7 Wood shingles.  
The installation of wood shingles shall comply with the provisions of this section.

R905.7.1 Deck requirements.  
Wood shingles shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners.

R905.7.1.1 Solid sheathing required.  
In areas where the average daily temperature in January is 25°F (-4°C) or less, solid sheathing is required on that portion of the roof requiring the application of an ice barrier. **Reserved.**

R905.7.2 Deck slope.  
Wood shingles shall be installed on slopes of three units vertical in 12 units horizontal (25-percent slope) or greater.

R905.7.3 Underlayment.  
Underlayment shall comply with Section 905.4.1 ASTM D 226, Type I or Type II or ASTM D 4869, Type I or Type II or Type IV.

R905.7.3.1 Ice barrier. Where required, ice barriers shall comply with Section R905.1.2. **RESERVED**

R905.7.3.2 Underlayment Application.  
Underlayment shall be installed using one of the following methods:
1. Two layer underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV: Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm), and fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with one row in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm).

2. One layer underlayment shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV: Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). End laps shall be offset by 6 feet (1829 mm).

**R905.7.4 Material standards.**
Wood shingles shall be of naturally durable wood and comply with the requirements of Table R905.7.4.

**TABLE R905.7.4 WOOD SHINGLE MATERIAL REQUIREMENTS**

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>MINIMUM GRADES</th>
<th>APPLICABLE GRADING RULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood shingles of naturally durable wood</td>
<td>1, 2 or 3</td>
<td>Cedar Shake and Shingle Bureau</td>
</tr>
</tbody>
</table>

**R905.7.5 Application Attachment.**
Wood shingles shall be installed in accordance with according to this chapter and the manufacturer's installation instructions. Wood shingles shall be laid with a side lap not less than $1\frac{1}{2}$ inches (38 mm) between joints in courses, and two joints shall not be in direct alignment in any three adjacent courses. Spacing between shingles shall be not less than $\frac{3}{4}$ inch to $\frac{3}{8}$ inch (6.4 mm to 9.5 mm). Weather exposure for wood shingles shall not exceed those set in Table R905.7.5(1). Fasteners for untreated (naturally durable) wood shingles shall be box nails in accordance with Table R905.7.5(2). Nails shall be stainless steel Type 304 or 316 or hot-dipped galvanized with a coating weight.
of ASTM A 153 Class D (1.0 oz/ft²). Alternatively, two 16-gage stainless steel Type 304 or 316 staples with crown widths of 7/16 inch (11.1 mm) minimum, 3/16 inch (19.1 mm) maximum, shall be used. Fasteners installed within 16 miles (26 km) of salt water coastal areas shall be stainless steel Type 316. Fasteners for fire-retardant-treated shingles in accordance with Section R902 or pressure-impregnated-preservative-treated shingles of naturally durable wood in accordance with AWPA U1 shall be stainless steel Type 316. All fasteners shall have a minimum penetration into the sheathing of 3/4 inch (19.1 mm). For sheathing less than 3/4 inch in thickness, each fastener shall penetrate through the sheathing. Wood shingles shall be attached to the roof with two fasteners per shingle, positioned in accordance with the manufacturer’s installation instructions. Fastener packaging shall bear a label indicating the appropriate grade material or coating weight. Attachment in accordance with Table R905.7.5 shall be used for roofs with a mean roof height of 40 feet or less and in regions with a $V_{wind}$ as determined in accordance with Section R301.2.1.3 to be 100 mph or less.

**TABLE R905.7.5**  
**WOOD SHINGLE AND SHAKE INSTALLATION**

<table>
<thead>
<tr>
<th>ROOF ITEM</th>
<th>WOOD SHINGLES</th>
<th>WOOD SHAKES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deck Requirements</td>
<td>Shingles shall be applied to roofs with solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall not be 4 less than 1” x 4” nominal dimensions and shall be spaced on center equal to the weather exposure to coincide with the placement of fasteners.</td>
<td>Shakes shall be applied to roofs with solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall not be less than 1” x 4” nominal dimensions and shall be spaced on center equal to the weather exposure to coincide with the placement of fasteners. When 1” x 4” spaced sheathing is installed at 10 inches, boards must be installed between the sheathing boards.</td>
</tr>
<tr>
<td>2. Interlayer</td>
<td>No requirements.</td>
<td>Interlayer shall comply with ASTM D 226, Type 1.</td>
</tr>
<tr>
<td>3. Underlayer</td>
<td>Underlayer shall comply with ASTM D 226, Type 1.</td>
<td>No requirements.</td>
</tr>
<tr>
<td>4. Application</td>
<td>Fasteners for wood shingles shall be corrosion resistant with a minimum penetration of 3/4 inch into the sheathing. For sheathing less than 1/2 inch thick, the</td>
<td>Fasteners for wood shakes shall be corrosion resistant with a minimum penetration of 3/4 inch into the sheathing. For sheathing less than 1/2 inch thick, the fasteners shall extend</td>
</tr>
</tbody>
</table>

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_6624_Text_Section_R905.7_Wood_shingles_3.png
<table>
<thead>
<tr>
<th>No. of fasteners</th>
<th>fasteners shall extend through the sheathing a minimum of ( \frac{3}{8} ) inch.</th>
<th>through the sheathing a minimum of ( \frac{3}{8} ) inch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood shingles</td>
<td>Wood shingles shall be attached to the roof with two fasteners per shingle, positioned no more than ( \frac{3}{4} ) inch (19.1 mm) from each edge and no more than ( 1\frac{1}{2} ) inch (38.1 mm) above the exposure line.</td>
<td></td>
</tr>
<tr>
<td>Wood shakes</td>
<td>Wood shakes shall be attached to the roof with two fasteners per shake, positioned no more than 1 inch (25.4 mm) from each edge and no more than ( 1\frac{1}{2} ) inches (38.1 mm) above the exposure line.</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE R905.7.5(2) NAIL REQUIREMENTS FOR WOOD SHAKES AND WOOD SHINGLES**

<table>
<thead>
<tr>
<th>SHAKES</th>
<th>NAIL TYPE-AND MINIMUM LENGTH</th>
<th>MINIMUM HEAD SIZE</th>
<th>MINIMUM SHANK DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>16” straight-split</td>
<td>5d-box 4 3/4”</td>
<td>0.19”</td>
<td>.080”</td>
</tr>
<tr>
<td>16” and 24” handsplit-and-resawn</td>
<td>6d-box 2”</td>
<td>0.19”</td>
<td>.0915”</td>
</tr>
<tr>
<td>24” taper-split</td>
<td>5d-box 4 3/4”</td>
<td>0.19”</td>
<td>.080”</td>
</tr>
<tr>
<td>16” and 24” tapersawn</td>
<td>6d box 2”</td>
<td>0.19”</td>
<td>.0915”</td>
</tr>
<tr>
<td>Shingles</td>
<td>Nail Type-And Minimum Length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16” and 18”</td>
<td>3d-box 4 3/4”</td>
<td>0.19”</td>
<td>.080”</td>
</tr>
<tr>
<td>24”</td>
<td>4d-box 4 3/4”</td>
<td>0.19”</td>
<td>.080”</td>
</tr>
</tbody>
</table>

**RESERVED**

**R905.7.6 Attachment for Vasd, as determined in accordance with Section R301.2.1.3, greater than 100 mph.**

Wood shingles installed in accordance with Table R905.7.5 and the requirements of R905.7.6 have an allowable uplift resistance of 45 psf. The installation of wood shingles shall be limited to roofs where the allowable uplift resistance is equal to or greater than the design uplift pressure for the roof listed in Table R301.2(2).
R905.7.6.1 Fasteners.

R905.7.6.1.1 Nails. Nails to attach the wood shakes shall be 3d stainless-steel ring-shank nails. The nails shall have sufficient length to penetrate through the wood shakes and shall penetrate through the sheathing.

R905.7.6.1.2 Screws. Screws to attach the battens to the framing shall be No. 8 by 21/2 inches (64 mm) long corrosion resistant wood screws. Wood screws shall be corrosion resistant screws conforming to ANSI/ASME B18.6.1. The corrosion resistance shall meet ASTM A 641, Class 1 or an equal corrosion resistance by coating, electrogalvanization, mechanical galvanization, stainless steel, nonferrous metal or other suitable corrosion-resistant material.

R905.7.6.1.3 Wood battens. 1 × 4 wood battens shall be attached to the wood joists with 2 screws per joist. The first batten shall be located 6 inches (152 mm) from the outer edge of the wood joist. Second batten shall be spaced 1 1/4 inches (32 mm) from the first batten. The remaining battens shall be spaced a maximum 2 inches (51 mm) apart, except the last one which shall be spaced no greater than 3/4 inches (19 mm) from the previous batten.

R905.7.6.1.4 Shingles. Shingles shall be attached to the battens with 2 nails for each shingle placed 1 1/2 inches (38 mm) above the exposure line. The nailsedges.

R905.7.7 Application. Wood shingles shall be installed according to this chapter and the manufacturer’s installation instructions. Weather exposure for wood shingles shall not exceed those set in Table R905.7.7.

<p>| TABLE R905.7.5(4)7 WOOD SHINGLE WEATHER EXPOSURE AND ROOF SLOPE |
|------------------|------------------|------------------|
| ROOFING MATERIAL | LENGTH (inches)  | GRADE            |
|                  |                  | EXPOSURE (inches) |
|                  |                  | 3:12 pitch       |
|                  |                  | 4:12 pitch       |</p>
<table>
<thead>
<tr>
<th>Shingles of naturally durable wood</th>
<th>to &lt; 4:12</th>
<th>or steeper</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 1</td>
<td>3³/₄</td>
<td>5</td>
</tr>
<tr>
<td>No. 2</td>
<td>3¹/₂</td>
<td>4</td>
</tr>
<tr>
<td>No. 3</td>
<td>3</td>
<td>3¹/₂</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 1</td>
<td>4¹/₄</td>
<td>5¹/₂</td>
</tr>
<tr>
<td>No. 2</td>
<td>4</td>
<td>4¹/₂</td>
</tr>
<tr>
<td>No. 3</td>
<td>3¹/₂</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 1</td>
<td>5³/₄</td>
<td>7¹/₂</td>
</tr>
<tr>
<td>No. 2</td>
<td>5¹/₂</td>
<td>6¹/₂</td>
</tr>
<tr>
<td>No. 3</td>
<td>5</td>
<td>5¹/₂</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4mm.

**R905.7.8 Flashing.**
At the juncture of the roof and vertical surfaces, flashing and counter flashing shall be provided in accordance with the manufacturer’s installation instructions, and where of metal, shall not be less than 0.0179-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal.

**R905.7.68.1 Valley flashing.**
Roof flashing shall be not less than No. 26 gage [0.0179 inches (0.48 mm)] corrosion-resistant sheet metal and shall extend 10 inches (254 mm) from the centerline each way for roofs having slopes less than 12 units vertical in 12 units horizontal (100-percent slope), and 7 inches (178 mm) from the centerline each way for slopes of 12 units vertical in 12 units horizontal and greater. Sections of flashing shall have an end lap of not less than 4 inches (102 mm).

**R905.7.79 Label required.**
Each bundle of shingles shall be identified by a label of an approved grading or inspection bureau or agency.
R6625

Date Submitted: 12/19/2015
Chapter: 9
Affects HVHZ: No
Attachments: Yes

TAC Recommendation: Approved as Submitted
Commission Action: Pending Review

Proponent: Mark Zehnal

Comments
General Comments: No
Alternate Language: No

Related Modifications

Summary of Modification
Provides current Florida-specific criteria

Rationale
To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
Comment:
In R905.8.7.1.1 Nails, the nails should be specified as Type 304 or Type 316 Stainless steel. There are many types of stainless steel, some are more corrosion resistant, but there are types that are not that corrosion resistant. In the struck text from the Base Code, 304 or 316 is specified. This should be maintained.
See attached PDF file,
R905.8 Wood shakes.
The installation of wood shakes shall comply with the provisions of this section.

R905.8.1 Deck requirements.
Wood shakes shall be used only on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) on center, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards.

R905.8.1.1 Solid sheathing required.
In areas where the average daily temperature in January is 25°F (-4°C) or less, solid sheathing is required on that portion of the roof requiring an ice barrier. **Reserved**.

R905.8.2 Deck slope.
Wood shakes shall only be used on slopes of three 4 units vertical in 12 units horizontal (25 33-percent slope) or greater.

R905.8.3 Underlayment

Underlayment shall comply with Section R905.1.4 ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV.

R905.8.3.1 Ice barrier. Where required, ice barriers shall comply with Section R905.1.2. **RESERVED**

R905.8.3.2 Underlayment Application.

Underlayment shall be installed using one of the following methods:
1. Two layer underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV: Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm), and fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with one row in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm).

2. One layer underlayment shall comply with ASTM D 226, Type I or ASTM D 4869, Type IV: Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). End laps shall be offset by 6 feet (1829 mm).

**R905.8.3.4 Interlayment.**
Interlayment shall comply with ASTM D 226, Type I.

**R905.8.4 Attachment.** Attachment in accordance with Table R905.7.5 shall be used for roofs with a mean roof height of 40 feet (12 192 mm) or less and in regions with a *Vasd*, as determined in accordance with Section R301.2.1.3, of 100 mph (44.7 m/s) or less.

**R905.8.5 Material standards.**
Wood shakes shall comply with the requirements of Table R905.8.5.

**TABLE R905.8.5 WOOD SHAKE MATERIAL REQUIREMENTS**

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>MINIMUM GRADES</th>
<th>APPLICABLE GRADING RULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood shakes of naturally durable wood</td>
<td>1</td>
<td>Cedar Shake and Shingle Bureau</td>
</tr>
<tr>
<td>Tapersawn shakes of naturally durable wood</td>
<td>1 or 2</td>
<td>Cedar Shake and Shingle Bureau</td>
</tr>
<tr>
<td>Preservative-treated shakes and shingles of naturally durable wood</td>
<td>1</td>
<td>Cedar Shake and Shingle Bureau</td>
</tr>
<tr>
<td>Fire-retardant-treated shakes and</td>
<td>1</td>
<td>Cedar Shake and Shingle Bureau</td>
</tr>
</tbody>
</table>
R905.8.6 Application.
Wood shakes shall be installed in accordance with this chapter and the manufacturer’s installation instructions. Wood shakes shall be laid with a side lap not less than 4 1/2 inches (38 mm) between joints in adjacent courses. Spacing between shakes in the same course shall be 3/8 inch to 5/16 inch (9.5 mm to 15.9 mm) including taper sawn shakes. Weather exposures for wood shakes shall not exceed those set in Table R905.8.6. Fasteners for untreated (naturally durable) wood shakes shall be box nails in accordance with Table R905.7.5(2). Nails shall be stainless steel Type 304, or Type 316 or hot-dipped with a coating weight of ASTM A 153 Class D (1.0 oz/ft²). Alternatively, two 16 gage Type 304 or Type 316 stainless steel staples, with crown widths 3/16 inch (11.1 mm) minimum, 3/8 inch (19.1 mm) maximum, shall be used. Fasteners installed within 15 miles (24 km) of salt water coastal areas shall be stainless steel Type 316.
Wood shakes shall be attached to the roof with two fasteners per shake positioned in accordance with the manufacturer’s installation instructions. Fasteners for fire-retardant-treated (as defined in Section R902) shakes or pressure-impregnated-preservative-treated shakes of naturally durable wood in accordance with AWPA U1 shall be stainless steel Type 316. All fasteners shall have a minimum penetration into the sheathing of 3/16 inch (10.1 mm). Where the sheathing is less than 3/16 inch (10.1 mm) thick, each fastener shall penetrate through the sheathing. Fastener packaging shall bear a label indicating the appropriate grade material or coating weight.

**TABLE R905.8.6 WOOD SHAKE WEATHER EXPOSURE AND ROOF SLOPE**

<table>
<thead>
<tr>
<th>ROOFING MATERIAL</th>
<th>LENGTH (inches)</th>
<th>GRADE</th>
<th>EXPOSURE (inches) 4:12 pitch or steeper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shakes of naturally durable wood</td>
<td>48</td>
<td>No. 1</td>
<td>7 1/2</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 1</td>
<td>10</td>
</tr>
<tr>
<td>Preservative-treated taper sawn</td>
<td>18</td>
<td>No. 1</td>
<td>7 1/2</td>
</tr>
<tr>
<td>shakes of Southern Yellow Pine</td>
<td>24</td>
<td>No. 1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>No. 2</td>
<td>5 1/2</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 2</td>
<td>7 1/2</td>
</tr>
<tr>
<td>Taper-sawn shakes of naturally</td>
<td>18</td>
<td>No. 1</td>
<td>7 1/2</td>
</tr>
</tbody>
</table>
For SI: 1 inch = 25.4 mm.
a. For 24-inch by \( \frac{5}{8} \)-inch handsplit shakes, the maximum exposure is \( 7\frac{1}{2} \) inches.

**R905.8.7 Shake-placement Attachment for Vard, as determined in accordance with Section R301.2.1.3, greater than 100 mph.**

The starter course at the eaves shall be doubled and the bottom layer shall be either 15-inch (381 mm), 18-inch (457 mm) or 24-inch (610 mm) wood shakes or wood shingles. Fifteen-inch (381 mm) or 18-inch (457 mm) wood shakes shall be permitted to be used for the final course at the ridge. Shakes shall be interlaid with 18-inch wide (457 mm) strips of not less than No. 30 felt shingled between each course in such a manner that no felt is exposed to the weather by positioning the lower edge of each felt strip above the butt end of the shake it covers a distance equal to twice the weather exposure. Wood shakes installed in accordance with Table R905.7.5 and the requirements of Section R905.8.7 have an allowable uplift resistance of 90 psf. The installation of wood shakes shall be limited to roofs where the allowable uplift resistance is equal to or greater than the design uplift pressure for the roof listed in Table R301.2(2).

**R905.8.7.1 Fasteners.**

**R905.8.7.1.1 Nails.** Nails to attach the wood shakes shall be 6d stainless-steel ring-shank nails. The nails shall have sufficient length to penetrate through the wood shakes and shall penetrate through the sheathing.

**R905.8.7.1.2 Screws.** Screws to attach the battens to the framing shall be No. 8 by 2 1/2 inches (64 mm) long corrosion-resistant wood screws. Wood screws shall be corrosion-resistant screws conforming to ANSI/ASME B18.6.1. The corrosion resistance shall meet ASTM A641, Class 1 or an equal corrosion resistance by coating, electrogalvanization, mechanical galvanization, stainless steel, nonferrous metal or other suitable corrosion-resistant material.
R905.8.7.1.3 Wood battens. 1 × 6 wood battens shall be attached to the wood joists with 2 screws per joist. The first batten shall be located 6 inches (152 mm) from the outer edge of the wood joist. The second batten shall be spaced 1 1/4 inches (32 mm) from the first batten. The remaining battens shall be spaced a maximum 2 inches (51 mm) apart, except the last one, which shall be spaced no greater than 3/4 inches (19 mm) from the previous batten.

R905.8.7.1.4 Shakes. Shakes shall be attached to the battens with 2 nails for each shake placed 11/2 inches (38 mm) above the exposure line. The nails shall be 3/4 to 1 inch (19 mm to 25 mm) from the shake edges.

R905.8.8 Application. Wood shakes shall be laid with a side lap not less than 11/2 inches (38 mm) between joints in adjacent courses. Spacing between shakes in the same course shall be 3/8 to 5/8 inches (9.5 to 15.9 mm) for shakes and taper sawn shakes of naturally durable wood and shall be 1/4 to 3/8 inch (6.4 to 9.5 mm) for preservative taper sawn shakes. Weather exposure for wood shakes shall not exceed those set in Table R905.8.8.

### TABLE R905.8.8 WOOD SHAKE WEATHER EXPOSURE AND ROOF SLOPE

<table>
<thead>
<tr>
<th>ROOFING MATERIAL</th>
<th>LENGTH (inches)</th>
<th>GRADE</th>
<th>EXPOSURE (inches) 4:12 pitch or steeper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shakes of naturally durable wood</td>
<td>18</td>
<td>No. 1</td>
<td>7(\frac{1}{2})</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 1</td>
<td>10(^a)</td>
</tr>
<tr>
<td>Preservative-treated tapersawn shakes of Southern Yellow Pine</td>
<td>18</td>
<td>No. 1</td>
<td>7(\frac{1}{2})</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 1</td>
<td>10</td>
</tr>
<tr>
<td>Taper-sawn shakes of naturally durable wood</td>
<td>18</td>
<td>No. 1</td>
<td>7(\frac{1}{2})</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>No. 1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>No. 2</td>
<td>5(\frac{1}{2})</td>
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<tr>
<td></td>
<td>24</td>
<td>No. 2</td>
<td>7(\frac{1}{2})</td>
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</tbody>
</table>

For SI: 1 inch = 25.4 mm.

\(^a\) For 24-inch by \(\frac{3}{16}\)-inch handsplit shakes, the maximum exposure is 7\(\frac{1}{2}\) inches.
**R905.8.8.1 Flashing.**
At the juncture of the roof and vertical surfaces, flashing and counter flashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall not be less than 0.0179-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal.

**R905.8.2 Valley flashing.**
Roof valley flashing shall be not less than No. 26 gage [0.019 inch (0.5 mm)] corrosion-resistant sheet metal and shall extend not less than 11 inches (279 mm) from the centerline each way. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). 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 4 units vertical in 12 units horizontal (33-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of one layer of ASTM D 226. Type I underlayment running the full length of the valley, in addition to other required underlayment per Table R903.2.1. Valley flashing and flashing metal shall be a minimum thickness as provided in Table R903.2.1 for nonferrous metal or stainless steel.

**R905.8.9 Label required.**
Each bundle of shakes shall be identified by a label of an approved grading or inspection bureau or agency.
<table>
<thead>
<tr>
<th><strong>Comments</strong></th>
<th><strong>Alternate Language</strong></th>
</tr>
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<td>No</td>
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<td>Alternate Language</td>
<td>No</td>
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**Related Modifications**

**Summary of Modification**
Provides current Florida-specific criteria

**Rationale**
To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**
- **Impact to local entity relative to enforcement of code**
  No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**
- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?  
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?  
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?  
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?  
NO
See attached PDF file,
R905.9 Built-up roofs.
The installation of built-up roofs shall comply with the provisions of this section.

R905.9.1 Slope.
Built-up roofs shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage, except for coal-tar built-up roofs, which shall have a design slope of a minimum one-eighth unit vertical in 12 units horizontal (1-percent slope).

R905.9.2 Material standards.
Built-up roof covering materials shall comply with the standards in Table R905.9.2 or UL 55A.

TABLE R905.9.2 BUILT-UP ROOFING MATERIAL STANDARDS

<table>
<thead>
<tr>
<th>MATERIAL STANDARD</th>
<th>STANDARD</th>
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<tbody>
<tr>
<td>Acrylic coatings used in roofing</td>
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</tr>
<tr>
<td>Aggregate surfacing</td>
<td>ASTM D 1863</td>
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<td>Asphalt adhesive used in roofing</td>
<td>ASTM D 3747</td>
</tr>
<tr>
<td>Asphalt cements used in roofing</td>
<td>ASTM D 2822; D 3019; D 4586</td>
</tr>
<tr>
<td>Asphalt-coated glass fiber base sheet</td>
<td>ASTM D 4601</td>
</tr>
<tr>
<td>Asphalt coatings used in roofing</td>
<td>ASTM D 1227; D 2823; D 2824; D 4479</td>
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<tr>
<td>Asphalt glass felt</td>
<td>ASTM D 2178</td>
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<tr>
<td>Asphalt primer used in roofing</td>
<td>ASTM D 41</td>
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<tr>
<td>Asphalt-saturated and asphalt-coated organic felt</td>
<td>ASTM D 2626</td>
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<tr>
<td>base sheet</td>
<td></td>
</tr>
<tr>
<td>Asphalt-saturated organic felt (perforated)</td>
<td>ASTM D 226</td>
</tr>
<tr>
<td>Asphalt used in roofing</td>
<td>ASTM D 312</td>
</tr>
<tr>
<td>Coal-tar cements used in roofing</td>
<td>ASTM D 4022; D 5643</td>
</tr>
<tr>
<td>Coal-tar primer used in roofing, dampproofing and</td>
<td>ASTM D 43</td>
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<tr>
<td>waterproofing</td>
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<tr>
<td>Coal-tar saturated organic felt</td>
<td>ASTM D 227</td>
</tr>
<tr>
<td>Coal-tar used in roofing</td>
<td>ASTM D 450, Type I or II</td>
</tr>
<tr>
<td>Glass mat, coal tar</td>
<td>ASTM D 4990</td>
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<tr>
<td>Glass mat, venting type</td>
<td>ASTM D 4897</td>
</tr>
<tr>
<td>Mineral-surfaced inorganic cap sheet</td>
<td>ASTM D 3909</td>
</tr>
<tr>
<td>Thermoplastic fabrics used in roofing</td>
<td>ASTM D 5665; D 5726</td>
</tr>
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</table>
R905.9.2.1
Rosin paper shall be used when the membrane is applied directly to a wood deck or cementitious fiber decks.

R905.9.3 Application.
Built-up roofs shall be installed in accordance with this chapter and the manufacturer’s instructions. RESERVED
### R6628

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<td>Section</td>
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<td>Proponent</td>
<td>Mark Zehnal</td>
</tr>
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<td>Affects HVHZ</td>
<td>No</td>
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<td>TAC Recommendation</td>
<td>Approved as Submitted</td>
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<td>Commission Action</td>
<td>Pending Review</td>
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<td>Section</td>
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<tr>
<td>Commission</td>
<td>Approved as Submitted</td>
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<tr>
<td>Action</td>
<td>Pending Review</td>
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#### Comments

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<td>Alternate Language</td>
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**Related Modifications**

**Summary of Modification**

- Provides current Florida-specific criteria

**Rationale**

- To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?  
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?  
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?  
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?  
NO
See attached PDF file,
**R905.11 Modified bitumen roofing.**  
The installation of modified bitumen roofing shall comply with the provisions of this section.

**R905.11.1 Slope.**  
Modified bitumen membrane roofs shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

**R905.11.2 Material standards.**  
Modified bitumen roof coverings shall comply with the standards in Table R905.11.2.

**TABLE R905.11.2 MODIFIED BITUMEN ROOFING MATERIAL STANDARDS**

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>STANDARD</th>
</tr>
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<tbody>
<tr>
<td>Acrylic coating</td>
<td>ASTM D 6083</td>
</tr>
<tr>
<td>Asphalt adhesive</td>
<td>ASTM D 3747</td>
</tr>
<tr>
<td>Asphalt cement</td>
<td>ASTM D 3019</td>
</tr>
<tr>
<td>Asphalt coating</td>
<td>ASTM D 1227; D 2824</td>
</tr>
<tr>
<td>Asphalt primer</td>
<td>ASTM D 41</td>
</tr>
<tr>
<td>Modified bitumen roof membrane</td>
<td>ASTM D 6162; D 6163; D 6164; D 6222; D 6223; D 6298; D 6509; CGSB 37-GP-56M</td>
</tr>
</tbody>
</table>

**R905.11.3 Application.**  
Modified bitumen roofs shall be installed in accordance with this chapter and the manufacturer’s instructions. The approved allowable uplift resistance for the modified bitumen roof shall be equal to or greater than the uplift resistance for the roof based on Table R301.2(2).
Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  
  No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  

- **Does not degrade the effectiveness of the code**
  

Is the proposed code modification part of a prior code version?

**YES**

The provisions contained in the proposed amendment are addressed in the applicable international code?

**NO**

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

**YES**

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

**NO**
See attached PDF file,
R905.12 Thermoset single-ply roofing.
The installation of thermoset single-ply roofing shall comply with the provisions of this section.

R905.12.1 Slope.
Thermoset single-ply membrane roofs shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

R905.12.2 Material standards.
Thermoset single-ply roof coverings shall comply with ASTM D 4637, ASTM D 5019 or CGSB 37-GP-52M.

R905.12.3 Application.
Thermoset single-ply roofs shall be installed in accordance with this chapter and the manufacturer's instructions. The approved allowable uplift resistance for the thermoset single-ply membrane roof shall be equal to or greater than the uplift resistance for the roof based on Table R301.2(2).
### Comments

<table>
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<tbody>
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<td>Alternate Language</td>
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### Related Modifications

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file,
R905.13 Thermoplastic single-ply roofing.
The installation of thermoplastic single-ply roofing shall comply with the provisions of this section.

R905.13.1 Slope.
Thermoplastic single-ply membrane roofs shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope).

R905.13.2 Material standards.
Thermoplastic single-ply roof coverings shall comply with ASTM D 4434, ASTM D 6754, ASTM D 6878 or CGSB CAN/CGSB 37.54.

R905.13.3 Application.
Thermoplastic single-ply roofs shall be installed in accordance with this chapter and the manufacturer’s instructions. The approved allowable uplift resistance for the thermoplastic single-ply roof shall be equal to or greater than the uplift resistance for the roof based on Table R301.2(2).
R6631

Date Submitted: 12/19/2015  
Proponent: Mark Zehnal  
Attachments: Yes  

Comments  
General Comments: No  
Alternate Language: No  

Related Modifications  

Summary of Modification  
Provides current Florida-specific criteria  

Rationale  
To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.  

Fiscal Impact Statement  
Impact to local entity relative to enforcement of code  
No impact. Current 2014 FBC code language without any new requirements being established.  

Impact to building and property owners relative to cost of compliance with code  
No impact. Current 2014 FBC code language without any new requirements being established.  

Impact to industry relative to the cost of compliance with code  
No impact. Current 2014 FBC code language without any new requirements being established.  

Impact to small business relative to the cost of compliance with code  
No impact. Current 2014 FBC code language without any new requirements being established.  

Requirements  
Has a reasonable and substantial connection with the health, safety, and welfare of the general public  
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.  

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction  
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.  

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities  

Does not degrade the effectiveness of the code  

Is the proposed code modification part of a prior code version?  
YES  

The provisions contained in the proposed amendment are addressed in the applicable international code?  
NO  

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?  
YES  

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?  
NO
See attached PDF file,
R905.14 Sprayed polyurethane foam roofing.
The installation of sprayed polyurethane foam roofing shall comply with the provisions of this section.

R905.14.1 Slope.
Sprayed polyurethane foam roofs shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

R905.14.2 Material standards.
Spray-applied polyurethane foam insulation shall comply with ASTM C 1029, Type III or IV or ASTM D 7425.

R905.14.3 Application.
Foamed-in-place roof insulation shall be installed in accordance with this chapter and the manufacturer’s instructions. A liquid-applied protective coating that complies with Table R905.14.3 shall be applied not less than 2 hours nor more than 72 hours following the application of the foam. The approved allowable uplift resistance for the sprayed polyurethane foam roofing shall be equal to or greater than the uplift resistance for the roof based on Table R301.2(2).

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<tr>
<td>Acrylic coating</td>
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<td>Silicone coating</td>
<td>ASTM D 6694</td>
</tr>
<tr>
<td>Moisture-cured polyurethane coating</td>
<td>ASTM D 6947</td>
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R905.14.4 Foam plastics.
Foam plastic materials and installation shall comply with Section R316.
### Comments

<table>
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### Related Modifications

- **Summary of Modification**
  - Provides current Florida-specific criteria

### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

| Impact to local entity relative to enforcement of code | No impact. Current 2014 FBC code language without any new requirements being established. |
| Impact to building and property owners relative to cost of compliance with code | No impact. Current 2014 FBC code language without any new requirements being established. |
| Impact to industry relative to the cost of compliance with code | No impact. Current 2014 FBC code language without any new requirements being established. |
| Impact to small business relative to the cost of compliance with code | No impact. Current 2014 FBC code language without any new requirements being established. |

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

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- **Does not degrade the effectiveness of the code**

### Is the proposed code modification part of a prior code version?

- **YES**

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- **NO**

### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

- **YES**

### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

- **NO**
See attached PDF file,
R905.15 Liquid-applied roofing.
The installation of liquid-applied roofing shall comply with the provisions of this section.

R905.15.1 Slope.
Liquid-applied roofing shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope).

R905.15.2 Material standards.
Liquid-applied roofing shall comply with ASTM C 836, C 957, D 1227, D 3468, D 6083, D 6694 or D 6947.

R905.15.3 Application.
Liquid-applied roofing shall be installed in accordance with this chapter and the manufacturer’s instructions. The approved allowable uplift resistance for the liquid-applied coatings shall be equal to or greater than the uplift resistance for the roof based on Table R301.2(2).
### R6633

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#### Rationale

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#### Fiscal Impact Statement

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- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

#### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
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- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
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- **Does not degrade the effectiveness of the code**

#### Is the proposed code modification part of a prior code version?**

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#### The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

#### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

#### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file,
R905.16 Building-integrated Photovoltaic roofing modules/shingles. The installation of building-integrated photovoltaic roofing modules/shingles shall comply with the provisions of this section.

R905.16.1 Deck requirements. Photovoltaic shingles shall be applied to a solid or closely-fitted deck, except where the roof covering is specifically designed to be applied over spaced sheathing. **RESERVED**

R905.16.2 Deck slope. Photovoltaic shingles shall be used only on roof slopes of two units vertical in 12 units horizontal (2:12) or greater. **RESERVED**

R905.16.3 Underlayment. Unless otherwise noted, required underlayment shall conform to ASTM D 4869 or ASTM D6757. **RESERVED**

R905.16.4 Underlayment application. Underlayment shall be applied shingle fashion, parallel to and starting from the eave, lapped 2 inches (51 mm) and fastened sufficiently to hold in place. **RESERVED**

R905.16.4.1 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, as designated in Table R301.2(1), an ice barrier that consists of not less than 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 lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building.

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

R905.16.4.2 Underlayment and high winds. Underlayment applied in areas subject to high winds [above 140 mph (63
m/s), in accordance with Figure R301.2(4)A] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer’s installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the ultimate design wind speed equals or exceeds 150 mph (67 m/s) shall comply with ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Underlayment shall be applied as required for asphalt shingles in accordance with Table R905.1.1(2). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gage sheet metal. The cap-nail shank shall be not less than 12 gage (0.105 inches) with a length to penetrate through the roof sheathing or not less than 3/4 inch (19 mm) into the roof sheathing.

**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted. **RESERVED**

**R905.16.5 Material standards.**

Building-integrated Photovoltaic roofing modules/shingles shall be listed and labeled in accordance with UL 1703.

**R905.16.6 Attachment.**

Building-integrated Photovoltaic roofing modules/shingles shall be attached in accordance with the manufacturer’s installation instructions.

**R905.16.7 Wind resistance.**

Building-integrated Photovoltaic roofing modules/shingles shall be tested in accordance with procedures and acceptance criteria in ASTM D 3161 or TAS 107. Building-integrated Photovoltaic roofing modules/shingles shall comply with the classification requirements of Table R905.2.4 6.1 for the appropriate maximum basic wind speed. Building-integrated Photovoltaic roofing modules/shingles packaging shall bear a label to indicate compliance with the procedures in ASTM D 3161 or TAS 107 and the required classification from Table R905.2.4 6.1.
### Comments

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### Related Modifications

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  
  No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  
  No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  

- **Does not degrade the effectiveness of the code**
  

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file,
R905.17 Photovoltaic systems. Rooftop mounted photovoltaic systems shall be designed in accordance with this section.

R905.17.1 Wind resistance. Rooftop mounted photovoltaic systems shall be designed for wind loads for component and cladding in accordance with Chapter 16 of the Florida Building Code, Building using an effective wind area based on the dimensions of a single unit frame.

R905.17.2 Fire classification. Rooftop mounted photovoltaic systems shall have the same fire classification as the roof assembly required by Section R902.

R905.17.3 Installation. Rooftop mounted photovoltaic systems shall be installed in accordance with the manufacturer’s installation instructions.

R905.17.4 Photovoltaic panels and modules. Photovoltaic panels and modules mounted on top of a roof shall be listed and labeled in accordance with UL 1703 and shall be installed in accordance with the manufacturer’s installation instructions.
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<tr>
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<td>907</td>
<td>Mark Zehnal</td>
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### Comments

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### Related Modifications

<table>
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### Rationale

To carry forward previous Commission approved code language without adding additional sections. Providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new sections or requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  - Does not discriminate. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.
- **Does not degrade the effectiveness of the code**
  - Does not degrade. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

### Is the proposed code modification part of a prior code version? No
See attached PDF file,
SECTION R907 ROOFTOP-MOUNTED PHOTOVOLTAIC SYSTEMS

R907.1 Rooftop-mounted photovoltaic systems.
Rooftop-mounted photovoltaic panels or modules shall be installed in accordance with this section, Section R324 and NFPA 70. RESERVED

R907.2 Wind resistance.
Rooftop-mounted photovoltaic panel or modules systems shall be installed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3). RESERVED

R907.3 Fire classification.
Rooftop-mounted photovoltaic panels or modules shall have the same fire classification as the roof assembly required in Section R902. RESERVED

R907.4 Installation.
Rooftop-mounted photovoltaic panels or modules shall be installed in accordance with the manufacturer's instructions. RESERVED

R907.5 Photovoltaic panels and modules.
Rooftop-mounted photovoltaic panels and modules shall be listed and labeled in accordance with UL-1703 and shall be installed in accordance with the manufacturer's printed instructions. RESERVED
### R6637

**Date Submitted:** 12/19/2015  
**Chapter:** 9  
**Section:** 909  
**Proponent:** Mark Zehnal  
**Affects HVHZ:** No  
**Attachments:** Yes

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**Related Modifiations**

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language without adding additional sections. Providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**  
  No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**  
  No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to industry relative to the cost of compliance with code**  
  No impact. Current 2014 FBC code language without any new sections or requirements being established.

- **Impact to small business relative to the cost of compliance with code**  
  No impact. Current 2014 FBC code language without any new sections or requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**  
  Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**  
  Current, Commission approved 2014 FBC performance proven code language without any new sections or requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**  
  Does not discriminate. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

- **Does not degrade the effectiveness of the code**  
  Does not degrade. Current Commission approved 2014 FBC requirement without any new sections or requirements being established.

**Is the proposed code modification part of a prior code version?** Yes
See attached PDF file,
SECTION R909 ROOFTOP-MOUNTED PHOTOVOLTAIC PANEL SYSTEMS

R909.1 General.
The installation of photovoltaic panel systems that are mounted on or above the roof covering shall comply with this section, Section R324 and NFPA-70.

R909.2 Structural requirements.
Rooftop mounted photovoltaic panel systems shall be designed to structurally support the system and withstand applicable gravity loads in accordance with Chapter 3. The roof upon which these systems are installed shall be designed and constructed to support the loads imposed by such systems in accordance with Chapter 8.

R909.3 Installation.
Rooftop-mounted photovoltaic systems shall be installed in accordance with the manufacturer’s instructions. Roof penetrations shall be flashed and sealed in accordance with this chapter.
R6669

Date Submitted: 12/21/2015
Proponent: Mark Zehnal

TAC Recommendation: Approved as Submitted
Commission Action: Pending Review

Comments
General Comments: No
Alternate Language: No

Related Modifications

Summary of Modification
Provides clarification to current Florida-specific criteria

Rationale
To clarify previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement
Impact to local entity relative to enforcement of code
No impact. Clarify current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Clarify current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Clarify current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Clarify current 2014 FBC code language without any new requirements being established.

Requirements
Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Clarifies current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Clarifies current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
Does not discriminate. Clarifies current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not degrade the effectiveness of the code
Does not degrade. Clarifies current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
R903.2 Flashing.
Flashings shall be used to seal roofing systems, where the system is interrupted or terminated and shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.
Provides current Florida-specific criteria including RAS-111

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Impact to local entity relative to enforcement of code
No impact. A recognized option within the current 2014 FBC code without adding any new requirements.

Impact to building and property owners relative to cost of compliance with code
No impact. A recognized option within the current 2014 FBC code without adding any new requirements.

Impact to industry relative to the cost of compliance with code
No impact. A recognized option within the current 2014 FBC code without adding any new requirements.

Impact to small business relative to the cost of compliance with code
No impact. A recognized option within the current 2014 FBC code without adding any new requirements.

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
R903.2.1 Locations.

Flashings shall be installed at wall and roof intersections, wherever there is a change in roof slope or direction and around roof openings. A flashing shall be installed to divert the water away from where the eave of a sloped roof intersects a vertical sidewall. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.5 mm) (No. 26 galvanized sheet) provided in Table R903.2.1 or in compliance with RAS-111.

Exception: Flashing is not required at hip and ridge junctions.
## Summary of Modification

Provides current Florida-specific criteria to include RAS-115

## Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

## Fiscal Impact Statement

**Impact to local entity relative to enforcement of code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to building and property owners relative to cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to industry relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to small business relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

## Requirements

**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

**Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

**Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**


**Does not degrade the effectiveness of the code**


**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
R905.2 Asphalt shingles. The installation of asphalt shingles shall comply with the provisions of this section or RAS-115.
R6673

Date Submitted: 12/21/2015

Section: 905.2.3

Proponent: Mark Zehnal

Affects HVHZ: No

Attachments: Yes

TAC Recommendation: Approved as Submitted

Commission Action: Pending Review

Comments

General Comments: No

Alternate Language: No

Related Modifications: 905.1.1

Summary of Modification:
Provides current Florida-specific criteria

Rationale:
To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
R905.2.3 Underlayment. Underlayment shall comply and be installed in accordance with Section R905.1.1.
Provides Florida-specific criteria from 2007 and 2010 code versions overlooked in last code cycle

To carry forward previous Commission approved code language from 2007 and 2010 Florida Building Codes, providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

No impact. Provides Florida-specific criteria from 2007 and 2010 code versions as an approved alternate method for attachment of asphalt shingles to exposed from below sheathing without any new requirements being established.

No impact. Provides Florida-specific criteria from 2007 and 2010 code versions as an approved alternate method for attachment of asphalt shingles to exposed from below sheathing without any new requirements being established.

No impact. Provides Florida-specific criteria from 2007 and 2010 code versions as an approved alternate method for attachment of asphalt shingles to exposed from below sheathing without any new requirements being established.

No impact. Provides Florida-specific criteria from 2007 and 2010 code versions as an approved alternate method for attachment of asphalt shingles to exposed from below sheathing without any new requirements being established.

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
R905.2.5 Fasteners. Fasteners for asphalt shingles shall be galvanized steel, stainless steel, aluminum or copper roofing nails, minimum 12-gage [0.105 inch (3 mm)] shank with a minimum 3/8-inch-diameter (9.5 mm) head, complying with ASTM F 1667, of a length to penetrate through the roofing materials and not less than 3/4 inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than 3/4 inch (19.1 mm) thick, the fasteners shall penetrate through the sheathing.

Exception: If the architectural appearance is to be preserved from below, an alternate method of attachment complying with the wind load requirements of Chapter 16 of the Florida Building Code, Building may be proposed unless otherwise addressed in Chapter 9. The alternative attachment shall be prepared, signed and sealed by a Florida-registered architect or a Florida-registered engineer, which architect or engineer shall be proficient in structural design.
## Comments

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## Related Modifications

### Summary of Modification

Provides current Florida-specific criteria including RAS-111

### Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version? **YES**

The provisions contained in the proposed amendment are addressed in the applicable international code? **NO**

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state? **YES**

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process? **NO**
See attached PDF file.
R905.2.8 Flashings. Flashing for asphalt shingles shall comply with this section or RAS 111.
Related Modifications

Summary of Modification
Provides current Florida-specific criteria including RAS-111

Rationale
To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

Fiscal Impact Statement
Impact to local entity relative to enforcement of code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code
No impact. Current 2014 FBC code language without any new requirements being established.

Requirements
Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

Is the proposed code modification part of a prior code version?
YES

The provisions contained in the proposed amendment are addressed in the applicable international code?
NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
NO
See attached PDF file.
R905.2.8.1 Base and cap counter flashing.

Base and cap counter flashing shall be installed in accordance with manufacturer's installation instructions. Base flashing shall be of either corrosion-resistant metal of minimum nominal 0.019 inch (0.5 mm) thickness or mineral surface roll roofing weighing a minimum of 77 pounds per 100 square feet (4 kg/m²). Cap flashing shall be corrosion-resistant metal of minimum nominal 0.019 inch (0.5 mm) thickness as follows:

1. In accordance with manufacturer's installation instructions, or
2. In compliance with RAS-111, or
3. A continuous metal minimum 4 inch by 4 inch "L" flashing shall be set in approved flashing cement and set flush to base of wall and over the underlayment. Both horizontal and vertical metal flanges shall be fastened 6 inches (152 mm) on center with approved fasteners. All laps shall be a minimum of 4 inches (102 mm) fully sealed in approved flashing cement. Flashing shall start at the lower portion of roof to ensure water-shedding capabilities of all metal laps. The entire edge of the horizontal flange shall be sealed covering all nail penetrations with approved flashing cement and membrane. Shingles shall overlap the horizontal flange and shall be set in approved flashing cement.

Base flashing shall be of either corrosion-resistant metal provided in Section R905.2.8.1 or mineral surface roll roofing weighing a minimum of 77 pounds per 100 square feet (3.76 kg/m²). Counter flashing shall be corrosion-resistant metal with a minimum thickness provided in Table R903.2.1.
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<td>Commission Action</td>
<td>Pending Review</td>
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**Comments**

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<th>No</th>
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<tbody>
<tr>
<td>Alternate Language</td>
<td>No</td>
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</table>

**Summary of Modification**

- Provides clarity to current Florida-specific criteria

**Rationale**

- To carry forward previous Commission approved code language providing clarity and continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

- Yes

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

- No

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

- Yes

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

- No
See attached PDF file.
R905.3.3 Underlayment.
Underlayment shall comply with Section R905.1.1. Required underlayment shall comply with the underlayment manufacturer’s installation instructions in accordance with the FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual, Fifth Edition where the V_{avg} is determined in accordance with Section R301.2.1.3 or the recommendations of RAS 118, 119 or 120.
### Summary of Modification

Provides current Florida-specific criteria including RAS-111

### Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

### Is the proposed code modification part of a prior code version?

**YES**

### The provisions contained in the proposed amendment are addressed in the applicable international code?

**NO**

### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

**YES**

### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

**NO**
See attached PDF file.
R905.3.8 Flashing.
At the juncture of roof vertical surfaces, flashing 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 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 divisor 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 units 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 Typo 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. Instructions, recommendations of the FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual, Fifth Edition where the Vₚₑ₂₀ is determined in accordance with Section R301.2.1.3 or the recommendations of RAS 111, 118, 119 or 120.
R6679

Date Submitted: 12/21/2015  
Chapter: 9  
Section: 905.4.3  
Affects HVHZ: No  
Proponent: Mark Zehnal  
Attachments: Yes

TAC Recommendation: Approved as Submitted  
Commission Action: Pending Review

**Comments**

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<td>Alternate Language</td>
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</table>

**Related Modifications**

- R905.1.1

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?  
**YES**

The provisions contained in the proposed amendment are addressed in the applicable international code?  
**NO**

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?  
**YES**

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?  
**NO**
See attached PDF file.
R905.4.3 Underlayment. Underlayment shall comply and be installed in accordance with Section R905.1.1.
## Comments

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</table>

### Related Modifications

- R905.1.1

### Summary of Modification

Provides current Florida-specific criteria

### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida's unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**

- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
R905.5.3 Underlayment. Underlayment shall comply and be installed in accordance with Section R905.1.1.
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<td>R905.1.1</td>
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<td>Rationale</td>
<td>To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.</td>
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<td>Fiscal Impact Statement</td>
<td>Impact to local entity relative to enforcement of code</td>
<td>No impact. Current 2014 FBC code language without any new requirements being established.</td>
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<td>Impact to small business relative to the cost of compliance with code</td>
<td>No impact. Current 2014 FBC code language without any new requirements being established.</td>
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<td>Requirements</td>
<td>Has a reasonable and substantial connection with the health, safety, and welfare of the general public</td>
<td>Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.</td>
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<td>Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction</td>
<td>Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.</td>
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<td>Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities</td>
<td>Does not discriminate. Current Commission approved 2014 FBC requirement.</td>
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<td>Does not degrade the effectiveness of the code</td>
<td>Does not degrade. Current Commission approved 2014 FBC requirement.</td>
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<tr>
<td>Is the proposed code modification part of a prior code version?</td>
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<td>The provisions contained in the proposed amendment are addressed in the applicable international code?</td>
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<td>The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?</td>
<td>YES</td>
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See attached PDF file.
R905.6.3 Underlayment. Underlayment shall comply and be installed in accordance with Section R905.1.1.
**R6682**

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<tr>
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<td>9</td>
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<td>Section</td>
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<td>Proponent</td>
<td>Mark Zehnal</td>
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**Comments**

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<td>Alternate Language</td>
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**Related Modifications**

- R905.1.1

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

<table>
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<tr>
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<tr>
<td>No impact. Current 2014 FBC code language without any new requirements being established.</td>
</tr>
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</table>

**Requirements**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

- Does not degrade the effectiveness of the code

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
R905.7.3 Underlayment. Underlayment shall comply and be installed in accordance with Section R905.1.1.
### Comments

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### Related Modifications

- R905.1.1

### Summary of Modification

Provides current Florida-specific criteria

### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

Is the proposed code modification part of a prior code version?
- **YES**

The provisions contained in the proposed amendment are addressed in the applicable international code?
- **NO**

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?
- **YES**

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?
- **NO**
See attached PDF file.
R905.8.3 Underlayment. Underlayment shall comply and be installed in accordance with Section R905.1.1.
**R6684**

**Date Submitted**: 12/21/2015

**Proponent**: Mark Zehnal

**Attachments**: Yes

**Comments**

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**Related Modifications**

R905.1.1

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

**Impact to local entity relative to enforcement of code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to building and property owners relative to cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to industry relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to small business relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  
  Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  

- **Does not degrade the effectiveness of the code**
  

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
R905.10.5 Underlayment. Underlayment shall comply and be installed in accordance with Section R905.1.1.
### Commentary

**General Comments:** No

**Alternate Language:** No

### Summary of Modification

Provides current Florida-specific criteria including RAS-109 and RAS-109A

### Rationale

To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code:**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code:**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code:**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code:**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public:**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction:**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities:**
- **Does not degrade the effectiveness of the code:**

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**

NO
See attached PDF file.
R905.14 Sprayed polyurethane foam roofing. The installation of sprayed polyurethane foam roofing shall comply with the provisions of this section or in compliance with RAS-109 and 109-A.
## Comments

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### Related Modifications

- if approve would need to be added to the 905.1.1 Table

### Summary of Modification

- Provides current Florida-specific criteria

### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

### Is the proposed code modification part of a prior code version?

**YES**

### The provisions contained in the proposed amendment are addressed in the applicable international code?

**NO**

### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

**YES**

### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

**NO**
See attached PDF file.
R905.16.3 Underlayment. Unless otherwise noted, required Underlayment shall conform to ASTM D4869 or ASTM D6757 and comply and be installed in accordance with Section R905.1.1.
### Summary of Modification

Provides uniformity to current Florida-specific criteria.

### Rationale

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code:**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code:**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code:**
  - No impact. Current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code:**
  - No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public:**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction:**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities:**

- **Does not degrade the effectiveness of the code:**

### Is the proposed code modification part of a prior code version?

**YES**

### The provisions contained in the proposed amendment are addressed in the applicable international code?

**NO**

### The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

**YES**

### The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

**NO**
See attached PDF file.
R908.1.1
Not more than 25 percent of the total roof area or roof section of any existing building or structure shall be repaired, replaced or recovered in any 12-month period unless the entire existing roofing system or roof section is replaced to conform to requirements of this code.
### Comments

<table>
<thead>
<tr>
<th>General Comments</th>
<th>Alternate Language</th>
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### Related Modifications

- **Summary of Modification**: Provides current Florida-specific criteria including RAS-111

- **Rationale**: To carry forward previous Commission approved code language as options providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**: No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**: No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**: No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**: No impact. Current 2014 FBC code language without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**: Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**: Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**: Does not discriminate. Current Commission approved 2014 FBC requirement.
- **Does not degrade the effectiveness of the code**: Does not degrade. Current Commission approved 2014 FBC requirement.

Is the proposed code modification part of a prior code version?

**YES**

The provisions contained in the proposed amendment are addressed in the applicable international code?

**NO**

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

**YES**

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

**NO**
See attached PDF file.
R908.6 Flashings.
Flashings shall be reconstructed in accordance with approved manufacturer’s installation instructions or in compliance with RAS-111. Metal flashing to which bituminous materials are to be adhered shall be primed prior to installation.
### Comments

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### Related Modifications

<table>
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<tr>
<td>Provides clarification to current State Statute mandated Florida-specific criteria</td>
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### Rationale

To improve previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

### Fiscal Impact Statement

- **Impact to local entity relative to enforcement of code**
  - No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  - Does not discriminate. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

- **Does not degrade the effectiveness of the code**
  - Does not degrade. Current legislative requirements in 553.842 integrated into FBC code language clarified without any new requirements being established.

### Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
R904.4 Product identification.

Roof covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required. Bulk shipments and/or site manufactured of materials shall be accompanied by the same information or issued in the form of a certificate or on a bill of lading by the manufacturer.
## Comments

### General Comments
- No

### Alternate Language
- No

### Related Modifications
- FBC- Building

### Summary of Modification
- Update referenced standard.

### Rationale
- Update D 1970 to most current version; this is a Florida-specific need due to changes in the nail-backing requirements during testing.
- Use of D 1970 compliant product is an important windstorm mitigation method in Florida.

### Fiscal Impact Statement

| Impact to local entity relative to enforcement of code | $0 |
| Impact to building and property owners relative to cost of compliance with code | $0 |
| Impact to industry relative to the cost of compliance with code | $0 |
| Impact to small business relative to the cost of compliance with code | $0 |

### Requirements

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
- Updates referenced standard.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Requires compliance with most current version of standard.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Standard is an ASTM consensus document.
- Does not degrade the effectiveness of the code
  - Requires compliance with the most current version of standard.

### Is the proposed code modification part of a prior code version?
- No

## 1st Comment Period History

| Proponent       | Jaime Gascon | Submitted | 2/25/2016 | Attachments | No |

**Comment:**

Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to Chapter 46 that is the subject of this code modification. This proposal will significantly improve the code.
D 1970—1315

Specification for Self-adhering Polymer Modified

Bituminous Sheet Materials Used as Steep Roof
Underlayment for Ice Dam Protectio
R7084

Date Submitted: 1/3/2016

Section 1

Proponent: Michael Fischer

Affects HVHZ: Yes

Attachments: Yes

TAC Recommendation: Approved as Submitted

Commission Action: Pending Review

Comments

General Comments: No

Alternate Language: No

Related Modifications

RAS TAS

Summary of Modification

HVHZ Roofing updates

Rationale

The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort. These proposed modifications include:

• Removal of references to withdrawn standards.
• Removal of references to legacy documents, including ICBO acceptance criteria.
• Updates to referenced standards, including name changes.
• Updates to performance criteria to reflect changes in referenced standards.
• Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
• Removal of redundant or unnecessary requirements.
• Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

$0

Impact to building and property owners relative to cost of compliance with code

$0

Impact to industry relative to the cost of compliance with code

Reduced product approval expense

Impact to small business relative to the cost of compliance with code

$0

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Updates important roofing requirements for HVHZ use.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Removes outdated references.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not require use of any specific type of product.

Does not degrade the effectiveness of the code

Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? No
<table>
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<tr>
<th>Proponent</th>
<th>Michael Fischer</th>
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See attached file.
ROOFING APPLICATION STANDARD (RAS) No. 109

1. Scope

1.1 This Roofing Application Standard sets the requirements to determine whether a substrate and surrounding environmental conditions are appropriate for the application of a spray applied polyurethane foam Roof Assembly; whether the final application is in compliance with the requirements of the Florida Building Code, Building and, whether proposed details are in compliance with industry standards.

2. Referenced Documents

2.1 For definitions of terms used in this application standard, refer to ASTM D 1079; and the Florida Building Code, Building.

3. Significance and Use

3.1 The test procedures outlined herein provide a means for establishing the use of industry accepted details of spray applied polyurethane foam Roof Assemblies, proper substrate and environmental conditions at the time of application, and methods of quality control during and after application of the Roof Assembly.

3.2 Quality control test methods are intended to confirm compliance with the wind load requirements of Chapter 16 (High-Velocity Hurricane Zones) of the Florida Building Code, Building and compliance with the spray applied polyurethane foam Roof Assembly manufacturer’s Product Approval.

4. General Requirements

4.1 All spray applied polyurethane foam (PUF) Roof Assemblies shall have Product Approval. Spray applied polyurethane manufacturers’ Product Approval shall include all components used in accepted systems, and manufacturer’s installation instructions, including environmental constraints concerning application temperatures and relative humidity.

4.2 All spray applied polyurethane foam (PUF), and coatings applied over spray applied polyurethane foam shall comply with Section 1521 of the Florida Building Code, Building.

4.3 All spray applied polyurethane foam applications shall have a minimum slope of \( \frac{1}{4} \) in.:12 in. The application shall be applied to eliminate ponding. Ponding, for the purposes of this Roofing Application Standard, shall be defined as any roof area of 100 ft² or more which holds 1½ in. or more of water as measured 24 hours after a rain fall.

4.4 Certification–A Certificate of Compliance of a completed spray applied polyurethane foam Roof System Assembly shall be provided to the building official within 30 days of job completion as detailed in Section 1521 of the Florida Building Code, Building.
4.5 The minimum finished thickness of all spray applied polyurethane foam applications shall be not less than 1 in. A foam pass (or lift) shall not be less than 0.50 in. in thickness.

4.6 The spray polyurethane foam shall be uniformly terminated a minimum of four inches above the roof line at all penetrations (except drains, parapet walls or building junctions). Foamed in place cants shall be smooth and uniform to allow for positive drainage.

4.7 The spray polyurethane foam shall be terminated below existing weep holes at through wall flashings. Weep holes shall not be covered with foam or coatings.

5. Details

5.1 Model details for spray applied polyurethane foam applications are provided in Appendix “A,” herein.

6. General Practices – The following general practices shall be observed prior to and during the application of spray applied polyurethane foam:

6.1 A Job Log shall be maintained on the job site in a ring binder, including but not limited to:

   • Roof Assembly Product Approval
   • Section II of the Uniform Building Permit Application
   • All pre-job testing
   • All job testing detailed in this Roofing Application Standard
   • Daily weather conditions
   • All written or verbal communications with spray applied polyurethane foam roof assembly manufacturer relating to the application
   • A list of all accessory products used within the Roof Assembly; and,
   • All material safety data sheets

6.2 The building official shall have access to the Job Log during site inspections.

6.3 The roof deck shall be securely fastened to the building structure in compliance with the requirements set forth in the relevant decking chapter of the Florida Building Code, Building.

6.4 Surface preparation of the roof decking shall be in compliance with the Guide Specifications of the Polyurethane Foam Contractors Division, Section 3.02.
6.5 For spray applied polyurethane foam applications over an existing built-up Roof Assembly, the existing Assembly shall be tested for uplift resistance in compliance with TAS 124 to confirm compliance with design pressures determined in compliance with Chapter 16 (High-Velocity Hurricane Zones) of the Florida Building Code, Building.

6.6 Should the existing roof assembly fail to meet the required design pressures, additional mechanical attachment consisting of approved insulation fasteners and stress plate assemblies at a density calculated in compliance with RAS 117 and Chapter 16 (High-Velocity Hurricane Zones) of the Florida Building Code, Building may shall be permitted to be provided. Alternatively the removal of the existing roof assembly, including any insulation substrate, may be removed to the structural deck shall be permitted.

7. Adhesion to Substrate

7.1 Spray-applied polyurethane foam shall be permitted to may be applied to a large-variety-of substrate materials including but not limited to concrete, painted steel, galvanized steel, gravel-surfacd built-up roofing, smooth surface built-up roofing, synthetic membranes, and coatings. If an adhesion of the spray applied polyurethane foam to the specific existing substrate is not listed in the manufacturer’s Product Approval, adhesion testing conducted in compliance with TAS 124 may shall be permitted to be conducted in compliance with TAS 124.

7.1.1 A minimum of three adhesion tests shall be conducted in each roof area (i.e. field, perimeter and corner areas). The test report shall include results from each adhesion test as well as a mean value of the sample.

7.1.2 Average adhesion test results in each respective roof area shall meet or exceed 1.45 times the design pressure for that respective roof area, calculated in compliance with Chapter 16 (High-Velocity Hurricane Zones) of the Florida Building Code, Building.

7.1.3 If primer is used in the test specimen construction, then primer shall be required as a part of the application. The spray applied polyurethane foam manufacturer shall provide primer application instructions together with material safety data sheets and acceptable environmental conditions for application.

7.1.4 The adhesion test report shall be attached to Section II of the Uniform Building Permit Application, and submitted to the building official for review.

7.2 Prior to application of any spray applied polyurethane foam, the substrate surface shall be clean; dry; free from loose dirt or any contaminants that may interfere with proper adhesion of any of the Roof Assembly components. Any deteriorated sections of deck or membrane shall be removed and replaced in compliance with this code.

7.2.1 Deck contaminants and debris shall be removed by methods approved by the spray applied polyurethane foam manufacturer. The application substrate shall be in similar condition to the substrate tested for adhesion performance.
7.3 Areas to receive spray-applied polyurethane foam shall be thoroughly examined and tested for moisture immediately prior to foam application, particularly early in the morning and late in the afternoon, when condensation is most likely to be present. Testing shall be carried out on all areas, including those areas that appear dry to sight and touch.

7.3.1 Moisture detection shall be conducted using moisture detection paper or other moisture detection device that is sensitive to small quantities of surface moisture.

7.3.2 Results of all moisture testing shall be recorded in the job log including: 1) the type of testing; 2) the area(s) tested; 3) the time; and 4) the results.

7.3.3 A minimum of six moisture tests shall be conducted. All test results shall be recorded in the Job Log.

7.3.4 Moisture test shall be conducted: 1) not less than three more for every additional 100 squares of roof area; 2) not less than every twelve feet in the direction of the deck slope; and 3) within five feet of each drain.

7.3.5 The building official may, at his/her discretion, is permitted to request additional moisture tests in areas to be foamed and/or may require examination of foam already in place to examine cell structure.

7.3.6 Where testing is carried out at areas already foamed, a minimum of 3 to 4 inches in diameter core sample of foam shall be removed to the substrate level. Where the foam has been applied to a monolithic substrate, the sample shall be scraped from the substrate, bagging all pieces of the sample and labeling the bag with: 1) the date of application; 2) the date of sampling; 3) the person taking the sample; and 4) a general description of material bagged.

7.3.6.1 Samples shall be forwarded to an approved testing agency for cell analysis. If inferior or irregular cell structure is observed, a “Bonded Pull Test,” in compliance with TAS 124, shall be carried out in areas of inferior or irregular cell structure or as directed by the building official.

7.3.6.2 Results of all testing shall be submitted to building official for review.

8. Moisture at Application Nozzles

8.1 Functional air dryers shall be installed on all air inlets to spray equipment to eliminate moisture contamination. The building official may, at his/her discretion is permitted to, test the spray gun assembly for moisture using moisture detection paper or some other type of moisture detection to verify dry purge air.

8.2 The roofing contractor shall test nozzles not less than twice each day and record the results in the Job Log.

9. Humidity
9.1 Water vapor in humid air can react with a curing foam surface resulting in a weakened bond with the ensuing layer of foam. Humidity can create a weakness in the bond lines of multiple foam passes.

9.2 Care shall be taken to monitor humidity conditions during applications. Application shall cease when humidity levels are above the acceptable levels described in the foam manufacturer's Product Approval.

9.3 The building official may be permitted to require direct testing of areas installed during high humidity conditions.

9.4 All spray-applied polyurethane foam Roof Assemblies Product Approval shall include a chart of ambient temperature and humidity application limits. Ambient humidity shall be monitored in all projects with a sling or self-contained psychrometer. Readings shall be taken before spray applications commence and every two hours while spraying. All readings shall be recorded in the Job Log.

10. Visual Inspections

10.1 Slit test samples of a minimum ½ in. wide, 2 in. to 3 in. long and least 3/4 in. deep shall be cut at a minimum of one sample every 2,500 ft² for visual observation and testing. In addition, one slit sample within ten feet of each drain shall be taken.

10.2 Samples shall be marked and bagged in an air tight polyurethane bags and stored until project completion. Bags shall be identified with date and location of core sampling.

10.3 A list of all stored samples shall be maintained in the Job Log. The building official may be permitted to request laboratory testing of samples during the period of construction or prior to final inspection.

10.4 Applied foam shall be visually examined for cell structure and uniformity of color. Bond lines shall also be examined for adhesion. Results of the visual examination shall be recorded in the Job Log.

11. Laboratory Examination

11.1 Round core samples having a diameter not less than 3 inches shall be taken at a minimum of one sample every 10,000 ft² at the thickest application of foam.

11.2 Samples shall be taken by approved testing agency, and shall provide a written report of the visual examination of color, cell structure and adhesion at bond lines. Copies of the reports shall be kept in the Job Log for reference by the building official.

11.3 Final inspection shall not be complete without satisfactory test reports on file at job completion.

12. Remedial Repairs
12.1 Should irregularities be found during visual or laboratory examination of slit or core samples, the surrounding area shall be examined by removing additional slit or core samples working outward from the initial sample location until the foam is determined to be satisfactory by an approved testing agency. All inferior foam shall be removed and replaced.

12.2 If areas requiring remedial repair have been determined to be inferior by the designated testing agency, core samples on all sides of the repair area shall be taken and forwarded to the approved testing agency for examination. If the repair area is coated prior to the return of the results, the area shall be delineated for identification purposes.

13. Wood Decks and Surfaces

13.1 Wood deck application shall comply with Section 1521.5 of the *Florida Building Code, Building*.

14. Steel Decks and Surfaces

14.1 All structural steel decks shall be not lighter than 22 ga. unless examined by a professional structural engineer, prior to application, confirming the suitability of application. In addition, a letter shall be provided by the spray applied polyurethane foam manufacturer confirming the specific application is in compliance manufacturer’s guidelines. A copy of the structural report and manufacturers letter shall be attached to Section II of the Uniform Building Permit application and submitted to the building official for review.

14.2 Nonstructural metal panels forming the substrate for a spray applied polyurethane foam Roof Assembly shall be not lighter than 24 ga.

14.3 All steel deck joints shall be correctly lapped, fastened and sealed prior to application of spray applied polyurethane foam.

14.4 If an approved insulation board is applied to a fluted deck, the board shall be attached in compliance with RAS 117 and the wind load requirements set forth in Chapter 16 (High-Velocity Hurricane Zones) of the *Florida Building Code, Building*. Insulation boards shall be of sufficient dimension to span deck flutes.

15. Concrete Decks and Surfaces

15.1 All concrete shall be free of contaminants and chemical release agents.

15.2 Priming of all concrete surfaces is required. New concrete decks shall have a cure period of not less than 28 days prior to the application of spray applied polyurethane foam.

15.3 All joints greater than 1/8 in. shall be filled or bridged with an acceptable product to the spray applied polyurethane foam manufacturer.

15.4 Spray-applied polyurethane foam shall not be applied to lightweight insulating concrete.
16. Wind Speeds

16.1 Spray-applied polyurethane foam may shall be applied up to at wind speeds of 25 mph or less. If effective wind screens, tenting, or robotic equipment, are shall be used to prevent over spray damage and unacceptable surface texture.

17. Coatings

17.1 All coatings shall be approved for use with the spray-applied polyurethane foam Roof Assembly and shall be noted as such in the coating manufacturer’s Product Approval and the spray applied polyurethane foam manufacturer’s roof assembly Product Approval.

17.2 Coating shall may be one of the following:

- Acrylics
- Butyls
- Chlorinated synthetic rubbers
- Silicones
- Polyurethanes
- Modified asphalts.

Other approved coatings.

17.3 All coatings shall be in compliance with applicable physical properties noted in Chapter 15 (High-Velocity Hurricane Zone) of the Florida Building Code, Building and TAS 110. Additionally, coatings shall be tested for peel strength of the coatings to foam in compliance with TAS 114(H) and RAS 109(A).

17.4 The coatings shall be applied in compliance with coating manufacturer’s Product Approval, and spray applied polyurethane foam manufactures Product Approval.

17.5 The base coat, if necessary, shall be applied the same day as the spray applied polyurethane foam. The base coats shall be allowed to cured as specified by the coating manufacturer prior to the application of the final top coat.

17.6 After application of top coating, the surface shall be allowed to fully cured prior to inspection for pin holes, thin coated areas and other defects.

18. Coating Testing

18.1 Slit test samples of a minimum $\frac{1}{2}$ in. wide, 2 in. to 3 in. long and least $\frac{3}{4}$ in. deep shall be cut at
a minimum of one sample every 2,500 ft² for visual observation and testing. In addition, one slit sample within ten feet of each drain shall be taken.

18.2 Four thickness measurements shall be taken from each sample.

18.3 Results of the tests shall be provided in the Job Log for review by the building official.

18.4.1 If any samples in the random sampling are determined to be inferior, additional test samples shall be taken at an interval of one sample every 2,500 ft² to determine the extent of inferior application.

18.4.2 Any areas found to be inferior shall be recoated following methods published by the component manufacturer and maintained in the Job Log.

19. Walkways

19.1 Walkways, when installed, shall be breathable walk pads approved by the coating manufacturer, and shall be installed and bonded to the coating surface.

20. Perimeter Metal

20.1 All perimeter metal shall be in compliance with RAS 111 for retrofit, reroof and new applications.

21. Final Inspection

21.1 A final inspection of the completed Roof Assembly shall be conducted by the building official to confirm compliance with the requirements of this Application Standard and the requirements set forth in the Florida Building Code, Building.

21.2 A final inspection shall also be conducted by the Roof Assembly manufacturer, or an inspection service designated by the manufacturer, confirming the application is in compliance with the material requirements and application standards established by the manufacturer.

21.3 The Roof Assembly manufacturer shall complete a final inspection certification not later than 30 days after completion of the application, as required in Section 1621.18.2 of the Florida Building Code, Building.
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

These proposed modifications include:
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- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
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- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  
  $0

- **Impact to building and property owners relative to cost of compliance with code**
  
  $0

- **Impact to industry relative to the cost of compliance with code**

  Reduced product approval expense.

- **Impact to small business relative to the cost of compliance with code**

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**Requirements**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  
  Updates important roofing requirements for HVHZ use.

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- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

  Does not require use of any specific type of product.

- Does not degrade the effectiveness of the code

  Ensures that the code is up to date with available research and referenced standards.

**Is the proposed code modification part of a prior code version?** No

**1st Comment Period History**

- **Proponent:** Aaron Phillips
- **Submitted:** 2/10/2016
- **Attachments:** No

**Comment:**

TAMKO Building Products, Inc., a manufacturer of roofing products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
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<th>Jaime Gascon</th>
<th>Submitted</th>
<th>2/25/2016</th>
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<td>Owens Corning Roofing and Asphalt, LLC is a manufacturer of roofing products and accessories that are approved for use in the HVHZ. After review of the proposed changes, we find that the change(s) to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is/are the subject of this code modification will improve the usability and consistency of the document significantly.</td>
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See attached file.
1. Scope

1.1 This roofing application standard has been developed to provide a responsive method of complying with the requirements of Chapters 15 and 16 (High-Velocity Hurricane Zones) of the Florida Building Code, Building while providing a prescriptive method of installing asphaltic shingles.

2. Definitions

2.1 For definitions of terms used in this application standard, refer to ASTM D 1079 and the Florida Building Code, Building.

3. General

3.1 Asphaltic shingles shall not be installed on roof mean heights greater than 33 feet, unless specifically specified in the roof assembly’s Product Approval. Roof slope criteria shall be in accordance with Table 1515.2.

3.2 Where asphaltic shingles are to be installed over insulated roof deck, a suitable nailable substrate, in accordance with Section 1520.5.7 must be installed over the insulation prior to the installation of approved underlayment and shingles.

3.3 Asphaltic shingles shall be installed in compliance with the Product Approval installation specifications, but in no case with less than six approved roofing nails (12 ga. by 1 1/4 in. corrosion-resistant annular ring shank roofing nails) or approved fastening devices which penetrate through the sheathing or wood plank a minimum of 3/16 in. or penetrate a 1 in. or greater thickness of lumber a minimum of 1 in. except where architectural appearance is to be preserved, in which case a minimum of 3/16 in. nail may be used.

4. Underlayment

4.1 Minimum prescriptive underlayment shall be one of the following, unless otherwise specifically noted in roofing assembly Product Approval:

- A double layer of an ASTM D 226, Type I, with a 19-inch headlap; or

- A single layer of an ASTM D 226, type II with a 4-inch headlap; or

- A single layer of an ASTM D 2626 coated base sheet with a 4-inch headlap.

- All endlaps shall be a minimum of 6 inches.

- All valleys shall be woven.

4.2 All underlayment shall be fastened with approved minimum 12 gage by 1 1/4 in. corrosion-resistant annular ring shank roofing nails fastened through minimum 32 gage by 15/8 in. diameter approved tin caps. Maximum fastener spacing shall be 6 in. o.c. at the laps with two additional rows in the field at a maximum spacing of 12 in. o.c. Nails shall be of sufficient length to penetrate through the sheathing or wood plank a minimum of 3/16 in. or penetrate 1 inch (25 mm) or greater thickness of lumber a minimum of 1 in., except where architectural appearance is to be preserved, in which
case a minimum of \( \frac{3}{4} \) in. nail may be used.

4.3 If the underlayment is a self-adhering membrane, the membrane shall be applied over a mechanically attached anchor/base sheet attached in compliance with this section above.

5. Metal Accessories

5.1 All metal accessories shall be in compliance with Section 1517.6 of the Florida Building Code, Building and RAS 111.

5.2 Eave and gable drip metal vertical face shall be a minimum of 1\( \frac{1}{2} \) inches and shall extend down not less than \( \frac{3}{4} \) inch below the sheathing or other member immediately contiguous thereto. In all cases, the deck flange shall be not less than 2 inches in width. Where required, a continuous clip (hook strip) shall be installed in compliance with RAS 111.

5.3 Eave and gable drip metal shall be joined by a lapped of a minimum of 4 in. and the entire interior of the joints shall be coated with approved flashing cement. Eave and gable drip metal shall be fastened with minimum 12 gauge annular ring shank nails at a maximum spacing of 4 in. o.c. The nails shall be manufactured from similar and compatible material to the termination profile. All composite materials shall be fastened with nonferrous nails. All metal profiles shall be installed in compliance with RAS 111.

5.4 Valley metal shall be a minimum 16 in. wide rolled or preformed material of thickness in compliance with Section 1517.6 of the Florida Building Code, Building. Valley metal shall be set over the underlayment, or over an optional 18 in. sweat sheet. Fasten valley metal with minimum 12 gage by \( 1\frac{1}{4} \) in. annular ring shank roofing nails of similar materials 12 in. o.c. 1 in. in from each exterior edge, except where architectural appearance is to be preserved, in which case a min \( \frac{3}{4} \) in. nail may be used. The entire edge of the flange shall be sealed, covering all nail penetrations with flashing cement and membrane. All horizontal laps shall be a minimum of 6 in. and shall be fully embedded with approved flashing cement. No nails shall be permitted in the center of the valley.

6. Shingle Installation

6.1 At all intersections, eaves, rakes, valleys, and gable ends the shingles and starter strips shall be set in a minimum 8-in. wide strip of approved flashing cement. Maximum thickness of flashing cement shall be \( \frac{1}{8} \) in. as excessive use of the cement may cause blistering, or bleed through. Shingles shall not extend more than \( \frac{1}{4} \) in. beyond the eave and rake drip.

6.2 The starter strip may be either a row of nonlaminated shingles trimmed to the shingle manufacturer’s recommendations or a strip of mineral-surfaced roll roofing not less than 7 in. wide.

6.3 If self-sealing shingles are used for the starter strip, remove the tab portion of each shingle and position the remaining strip with the factory-applied adhesive face up along the eaves. Trim material from the end of the first shingle in the starter strip according to manufacturer’s specifications to ensure that the cutouts of the first course of shingles are not placed over the starter strip joints. Fasten starter strips parallel to the eaves along a line above the eave line according to manufacturer’s specifications. Position fasteners to insure they will not be exposed under the cutouts in the first course.

6.4 For shingles without a self-sealing strip the tabs shall be removed and approved flashing cement shall be applied in spots approximately the size of a quarter at the corner of each tab of the first course. Starter shingles shall be nailed along a line not greater than 4 in. above the eave line nailing not greater than 6 in. o.c. Ensure that the cutouts of the first course are not placed over the starter
strip joints.

6.5 If roll roofing is used for the starter strip, nail along a line not greater than 4 inches above the eave line nailing not greater than 12 inches o.c. Approved flashing cement shall be applied as noted above for nonsealing shingle starter. If more than one piece of roll roofing must be used, the end joint shall be butted. Joints shall be staggered with succeeding shingle joints, and the number of starter joints shall be kept to a minimum.

6.6 First course shall be laid straight, checking it regularly during application against a horizontal chalk line. A few vertical chalk lines aligned with the ends of shingles in the first course will ensure proper alignment of cutouts. A shingle hatchet is an acceptable alternative to the use of succeeding chalk lines. The first course starts with a full shingle, while succeeding courses shall be installed in strict compliance with the shingle manufacturers’ Product Approval course layout detail.

6.7 Valley courses shall be terminated with shingles not less than 12 in. in length. Rake courses shall terminate with shingles not less than 6 in. length. To obtain the correct exposure for square-tab strip shingles, align the butts with the top of the cutouts in the course below. Install no-cutout shingles and those with variable butt lines according to the manufacturer’s installation instructions/directions to obtain correct exposure.

NOTE: Follow manufacturer’s instructions concerning shingle alignment. See “Exposure, Course Layout, and Fastening Detail” in shingle manufacturer’s Product Approval.

7. Fastening

7.1 Use six approved nails per shingle. Place the fasteners in strict compliance with shingle manufacturers Product Approval course layout, fastening details.

7.2 Align the shingles properly to avoid exposing fasteners in the course below. Drive the fasteners straight and do not break the shingle surface with the fastener head. Do not drive fasteners into knot holes or cracks in the roof deck. Repair faulty fastening immediately. If fastener is improperly driven or exposed, remove the fastener and repair the hole in the shingle with approved flashing cement or replace the entire shingle.

7.3 Shingle nails shall be located in accordance with the manufacturer’s product approval. Ensure no cutout or end joint is less than 2 inches from a nail in an underlying course. Start nailing from the end nearest the shingle just laid and proceed across. Do not attempt to realign a shingle by shifting the free end after two nails are in place. Drive nails straight so that the edge of the nail head does not cut into the shingle. Nail heads should be driven flush with the shingle surface. Fasteners shall not be improperly driven (see Detail A).

DETAIL A

8. Valleys
8.1 Valleys may be applied in open, closed or woven fashion. Valley metal shall be in compliance with Section 5.4.

8.2 Open valley: Snap two chalk lines, one on each side of the valley centerline over the full length of the valley flashing. Locate the upper ends of the chalk lines 6 in. apart in the center of valley at the ridge (i.e., three inches to either side of the valley centerline). The lower ends should diverge from each other a minimum of \(\frac{1}{8}\) in. per linear foot of valley length, (i.e., for an eight foot long valley the chalk lines shall be 7 inches apart at the eaves).

As shingles are applied toward the valley, trim the last shingle in each course to fit on the chalk line. Never use a shingle trimmed to less than 12 inches in length to finish a course running into a valley. If necessary, trim a tab off the adjacent shingle in the same course to allow a longer portion to be used, trim 1 inch on a 45-degree angle from the upper corner to direct water into the valley and prevent it from penetrating between the courses. Finally, to form a tight seal, cement the shingle to the valley lining with a minimum eight-inch width of asphalt flashing cement. There should be no exposed nails along the valley flashing.

8.3 Closed cut valley: With valley flashings already in place, apply the first course of shingles along the eaves of one of the intersecting roof planes and across the valley. For proper flow of water over the trimmed shingle, always start applying the shingles on the roof plane that has the lower slope or lesser height. Extend the end shingle at least twelve inches onto the adjoining roof. Do not make a joint in the valley. If a shingle falls short, add in one or two tab sections so that joint occurs outside the line of the valley. Apply succeeding courses in the same manner, extending them across the valley and onto the adjoining roof. Press shingle tightly into the valley. Use normal shingle fastening methods except that no nails should be within six inches of the valley centerline and two nails shall be placed at the end of each shingle crossing the valley. Snap a chalk line two inches from the centerline of the valley on the under-shingled side. Then apply shingles on the under shingled side. Trim the shingles as they are being installed to the chalk lines to ensure a neat installation. Trim one inch on a 45-degree angle from the upper corner of each shingle upon installation. This will direct water into the valley. Finally embed each end shingle in a 3-inch (76 mm) wide strip of flashing cement.

8.4 Woven valley: The valley flashing should already be in place as described earlier. Shingles on the intersecting roof surfaces may be applied toward the valley from both roof areas simultaneously or each roof area may be worked separately up to a point about three feet from the center of the valley and the gap closed later. Regardless of which procedure is followed, apply the first course along the eaves of one roof area up to and over the valley with the last shingle extending at least 12 inches onto the intersecting roof. Then apply the first course of the intersecting roof along the eaves and extend it across the valley over the top of the shingle already crossing the valley and at least 12 inches onto the other surface. Apply successive courses alternately from the adjoining areas, weaving the valley shingle over the other. Press each shingle tightly into the valley. Use normal shingle fastening methods except that no nails should be within six inches of the valley centerline and two nails shall be placed at the end of each shingle crossing the valley.

9. Flashing

9.1 All shingles that butt against wall flashings shall be step bulled with approved flashing cement a minimum of eight inches, and all roof planes that butt against vertical walls shall be flashed in one of the following manners:

9.2 Option A: All wall abutments shall be flashed with a minimum of 4 in. by 5 in. “L” metal flashings of materials and thickness in accordance with Section 1517.6 of the Florida Building Code, Building.
The metal “L” flashing shall be set in approved flashing cement and set flush to base of wall and over underlayment (see Detail B). Both horizontal and vertical metal flanges shall be fastened 6 inches o.c. with approved fasteners. Fastening shall be in accordance with RAS 111. All laps shall be a minimum of 4 inches fully sealed in approved flashing cement. Flashing shall start at the lower portion of the roof to ensure water-shedding capabilities of all metal laps. The entire edge of the metal flashing shall be sealed covering all nail penetrations with approved flashing cement and membrane. The metal “L” flashing shall be counter flashed. All metal counter flashing shall be installed in accordance with RAS 111.

9.3 Option B: Roof planes that butt against vertical walls shall be step flashed with 10 in. long metal shingles which are 2 in. wider than the exposed face of the roofing shingles (see Detail C). Place the first flashing unit over the end of the starter strip and position it so that the tab of the end shingle in the first course covers it completely. Secure the horizontal arm to the roof with two approved roofing nails. Do not nail flashing to the wall; settling of the roof could damage the seal. Apply the first course of shingles up to the wall. Position the second step flashing strip over the end shingle in the first course 5 inches up from the butt so that the tab of the end shingle in the second course covers it completely. Fasten the horizontal arm to the roof. The second course of shingles follows, the end is flashed as in the preceding courses and so on to the top of the intersection. Bring siding or other wall treatment down over the vertical sections of the step flashing to serve as cap flashing. Wall treatment or cap flashing shall terminate a minimum of 1 in. above the roofline. All metal counter flashing shall be installed in accordance with RAS 111.
DETAIL C

9.4 Head/apron flashing at all vertical end walls: Apply shingles up the roof until a course must be trimmed to fit at the base of the vertical wall. Adjust the exposure slightly in the previous two courses so that the last course is at least 8 inches wide. Apply a continuous piece of metal flashing over the last course of shingles by embedding it in approved flashing cement and nailing it to the roof. The metal flashing strip shall be bent to extend at least 5 inches up the vertical wall and at least 4 inches onto the last shingle course. Do not nail the strip to the wall. Apply an additional row of shingles over the metal flashing strip, trimmed to the width of the strip. Bring siding down over the vertical flashing to serve as cap flashing. Wall treatment or cap flashing shall terminate a minimum of 1 in. above the roofline. Do not nail siding into the vertical flashing. If the vertical front wall meets a side wall, as in dormer construction cut flashing so that it extends at least 7 inches around the corner. Continue up the side wall with step flashing as detailed above.

10. Soil Stacks and Vent Pipes

10.1 Apply shingles up to the vent pipe. Cut a hole in a shingle to go over the pipe and set the shingle in ASTM D 4586 flashing cement. A preformed flashing flange that fits snugly over the pipe is then placed over the shingle and vent pipe and set in approved flashing cement. Place the flange over the pipe to lay flat on the shingle below. After the flashing is in place, resume shingle application. Cut shingles in successive courses to fit around the pipe and embed them in approved flashing cement where they overlap the flange. Avoid excessive use of cement as it may cause blistering. Do not drive fasteners close to the pipe. The lower part of the flange shall overlap the
lower shingles and the side and upper shingles shall overlap the flange.

10.2 For ventilator and exhaust stacks located at the ridge, follow the same procedure, but bring the shingles up to the pipe from both sides and bend the flange over the ridge to lie in both roof planes, overlapping the roof shingles at all points. Ridge shingles are then positioned to cover the flange. Embed the ridge shingles in approved flashing cement where they overlap the flange. Roof ventilators and ridge vents shall be installed and flashed in accordance with their Product Approval.

11. Chimneys

11.1 Chimneys shall be flashed with a two-piece base and cap flashing to allow for differential movement. Apply shingles up to the front edge of the chimney before any flashings are installed. Apply a coat of ASTM D 41 asphalt primer if the chimney is constructed of masonry or metal to seal the surface and to provide good adhesion to all points where flashing cement will later be applied.

11.2 Install flashing in accordance with Section 9 above. Apply the base flashing to the low side of the chimney first. Bend the base flashing so that the lower section extends at a minimum of 4 inches over the shingles and the upper section extends a minimum of 12 inches up the vertical face of the chimney. Work the flashing firmly and smoothly into the joint between the shingles and chimney. Set both the roof and chimney overlaps in approved flashing cement placed over the shingles and on the chimney face. The flashing shall be secured in accordance with RAS 111. Use metal step flashing for the sides of the chimney, positioning the units in the same manner as flashing on a vertical side wall, in accordance with Details A and B herein. Secure each flashing unit to the masonry with approved flashing cement and to the deck with approved nails. Embed the end shingles in each course that overlap the flashing in an 8" bed of approved flashing cement. Place the rear base flashing over the cricket and the high side of the chimney. Chimney crickets shall be waterproofed in compliance with the shingle manufacturers published literature. All chimney flashings shall be counter flashed. Metal counter flashing shall be in accordance with RAS 111.

12. Hips and Ridges

12.1 Apply pre-manufactured hip and ridge shingle components or cut hip and ridge shingles from manufacturer’s strip shingles. Lay hip and ridge away from prevailing wind. Insure all fasteners are covered. Exposure shall not exceed 5 inches—unless specified in the roof assembly’s product approval. Taper the lap portion of each cap shingle slightly so that it is narrower than the exposed portion.
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort. These proposed modifications include:

- Removal of references to withdrawn standards.
- Removal of references to legacy documents, including ICBO acceptance criteria.
- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
- Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

Fiscal Impact Statement

- Impact to local entity relative to enforcement of code: $0
- Impact to building and property owners relative to cost of compliance with code: $0
- Impact to industry relative to the cost of compliance with code: reduced product approval expense
- Impact to small business relative to the cost of compliance with code: $0

Requirements

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
- Updates important roofing requirements for HVHZ use.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
- Removes outdated references.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
- Does not require use of any specific type of product.
- Does not degrade the effectiveness of the code

Is the proposed code modification part of a prior code version? No

Comment Period History

- Proponent: Aaron Phillips
- Submitted: 2/10/2016
- Attachments: No

Comment:
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See attached file.
ROOFING APPLICATION STANDARD (RAS) No. 117 STANDARD REQUIREMENTS FOR
BONDING OR MECHANICAL ATTACHMENT OF INSULATION PANELS AND MECHANICAL
ATTACHMENT OF ANCHOR AND/OR BASE SHEETS TO SUBSTRATES

1. Scope

1.1 The standards set forth herein provide a means of determining proper attachment of anchor
and/or base sheets and insulation panels.

1.2 All testing shall be conducted by an approved testing agency. A Professional Engineer, or
Registered Architect, shall sign and seal all calculations.

2. Anchor and Base Sheets, General

2.1 All damaged stress plates shall be removed and replaced.

2.2 Insulation shall only be attached with approved insulation fasteners.

3. Insulation, General

3.1 All insulation fasteners shall be installed in compliance with the fastener manufacturer’s
published installation instructions and the limitations set forth in the Product Approval. Insulation
attachment for panels in the field area of the roof shall use a fastener spacing in compliance with
Figures 1 through 4 of this Application Standard, as referenced in the Roof Assembly Product
Approval. Fastener placement guidelines shall be as follows:

- Fasteners installed at insulation panel edges shall be spaced not greater than 13½ inches nor less
than 4½ inches from the edge of the panel unless otherwise specified in the product approval.

- Fasteners shall be evenly distributed over the panel area.

3.2 All insulation fasteners and stress plates shall be tested in compliance with Chapter 15 (High-
Velocity Hurricane Zone) of the Florida Building Code, Building. Minimum withdrawal resistance for
insulation fasteners shall be 275 lbf.

3.3 For recover or reroof applications over an existing steel deck, having a thickness less than 22
gage, insulation fasteners shall be tested for withdrawal resistance in compliance with TAS 105.

3.4 Insulation fasteners and stress plates, and minimum acceptable insulation panel size and
thickness shall be as listed in the roof assembly Product Approval.

3.5 Installation of more than one insulation layer using a single fastener shall utilize the fastening
pattern and fastener designated for the top insulation panel.

3.6 Mixing of insulation panels (e.g., different manufacturer’s, insulation types) shall not be
acceptable when applied in the same layer.

3.7 Only as much insulation as can be roofed shall be installed each working day. Water shall not be
allowed to run in the flutes of steel deck ribs under completed roof sections.

3.8 Insulation panels shall be installed with minimum joint dimensions and shall be tightly butted.
Maximum joint widths shall be 3/8 in.
3.9 All insulation joints shall be staggered. Tapered insulation shall be installed in accordance with manufacturer’s recommendations.

3.10 Tapered insulation may be substituted for any flat stock type listed in the Roof System Assembly Product Approval. The fastening requirements shall remain the same. Polysiocyanurate tapered insulation systems shall have a minimum average thickness per panel of 1 in.

3.11 Insulation pieces that are cut from larger panels and are smaller than one square foot shall not be acceptable.

3.12 All insulated decks containing interior drains shall be sumped at the drains. Sump area insulation shall be tapered at a minimum slope of 1/6 of an inch per foot to the drain. The drain sump area shall be a minimum of (24 in. by 24 in.) 576 square inches, unless restricted by a wall or any other obstruction.

3.13 All overdriven fasteners or fasteners driven at an angle, shall be removed and replaced. If the insulation facer has been broken by a stress plate, that section of insulation panel shall be removed and replaced.

3.14 Attachment of any low density insulation panel, fiberglass or mineral wool, shall be with self-locking fasteners.

3.15 Insulation fasteners and stress plates shall be installed with tooling specified by the fastener manufacturer.

3.16 Predrilling, if any, shall be with the diameter bit listed in the withdrawal resistance test report. The drill bit tolerance range noted in the test report shall be maintained throughout the project. Should a change in bit size be required due to varying density of the deck material, an additional withdrawal resistance test shall be conducted to confirm fastener performance. Drill holes shall not spalled.

3.17 When installing “hammer-in” concrete fasteners, all deformed stress plates shall be removed and replaced.

3.18 Concrete dust shall be removed by brushing or forced air from the insulation top surface prior to the application of hot asphalt or adhesive.

3.19 Roof insulation and roll goods, either on the ground or on the roof top, shall be kept dry. The building official shall instruct the removal of the insulation or roll goods from the job when elevated moisture levels are found.

4. Insulation Attachment Over Steel Decks

4.1 Steel deck insulation fasteners shall penetrate the top flange of a steel deck not less than 1/2 in.

4.2 The two opposite edges of any insulation panel shall be supported on the top flanges of the steel deck, and shall have a minimum bearing width of 1 1/2 in. unless restricted by top flange width. Alternatively, minimum 22 gage galvanized or painted sheet steel may be placed over the deck ribs and secured with minimum #12 diameter fasteners spaced 18 in. o.c. (see Figure 5).

4.3 Steel deck sections shall properly “nest,” allowing insulation panels to have full contact with the top flanges. If any deck sections do not “nest” properly, the sections shall be repaired prior to the
application of the roof insulation. Cutting, scoring or hollowing of the insulation panels is not acceptable.

5. Insulation Attachment Over Concrete Decks

5.1 Threaded concrete fasteners shall be a minimum of a #14 diameter. "Hammer-in" concrete fasteners having a length less than or equal to 8 in. shall have a minimum diameter of 3/16 in. "Hammer-in" concrete fasteners having a length in excess of 8 in. shall have a minimum diameter of 1/4 in.

![Diagram of Insulation Fastener Assembly](http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_7086_Text_RAS_117_3.png)

**FIGURE 5 USE OF STEEL SHEET TO ENSURE SUPPORT OF INSULATION PANEL GAGES**

5.2 Insulation fasteners shall penetrate the concrete deck a minimum of 1\(\frac{1}{4}\) in.

6. Lightweight Insulating Concrete

6.1 New pours of lightweight insulating concrete shall be tested for fastener withdrawal in compliance with Section 1917 of the Florida Building Code, Building.

6.2 Rigid roof insulation panels shall not be applied directly over lightweight concrete decks unless specified in the product approval.

6.3 For recover or reroof applications where the proposed mechanical attachment is through the lightweight insulating concrete and to the structural deck, a TAS 105 withdrawal resistance test of the proposed fastener shall be conducted. Calculations based on the TAS 105 shall be submitted to the building official for evaluation of the proposed fastening method.

7. Wood Decks

7.1 Approved insulation fasteners shall be used for insulation attachment to wood decks. Nails are not acceptable for insulation attachment.

8. Perimeter, and Corner Roof Areas

8.1 The roofing assembly Product Approval shall list the maximum design pressure for the accepted assembly. Such pressure shall be applicable to the field of the roof area (1) as defined in ASCE 7. Should the roof assembly Product Approval allow extrapolation to perimeter and corners areas (2...
and 3) as defined in ASCE 7, the following shall apply.

- The maximum extrapolation shall not be greater than 280 percent except as noted in Section 9.2.

- The minimum fastener separation shall not be less than 4 in. o.c.

- If the perimeter and/or corner areas of the roof have calculated design pressures which are less than or equal to the maximum design pressures noted in the roof assembly Product Approval, then specified anchor/base sheet or insulation attachment shall also apply in these areas.

- If the minimum design pressure exceeds the roof assembly maximum design pressure such roofing system may be granted a one-time approval by the authority having jurisdiction, provided the applicant demonstrates, by testing and/or rational-analysis that such roofing system complies with the provision of the Florida Building Code.

8.1.1 In recover or reroof applications, if testing in compliance with TAS 105 of the insulation fasteners results in a minimum characteristic resistance force less than 275 lbf (1224 N), a Professional Engineer, or Registered Architect shall perform a moisture survey, in compliance with TAS 126, and examine the deck’s integrity. The moisture survey and examination results, along with the withdrawal resistance test results and a proposed deck repair/replacement specification, shall be submitted to the building official for review prior to issuance of a roofing permit.

Subsequent to repair or replacement of the deck, a withdrawal resistance of the fasteners shall be conducted. The same criteria noted above shall apply.

8.2 As an alternate to data extrapolation, or in the event data extrapolation is not allowed, in-situ (on-site) field uplift resistance testing of the in place roof assembly may be conducted in elevated pressure zones to confirm uplift resistance performance. Testing shall be conducted in compliance with TAS 124. Such Field uplift resistance testing shall be conducted to 1.45 times the design pressure for the tested pressure zone, and submitted to the building official for review.

9. Insulation Attachment — New Construction/Reroof Application

9.1 Example of Data Extrapolation:

9.1.1 Given:
A building having a roof mean height less than 60 feet where the design pressures are as follows:

*Field Area:* - 43.0 psf  
*Perimeter Area:* - 56.0 psf  
*Corner Areas:* - 90.0 psf

Consider a Roof Assembly Product Approval, which includes a system having an accepted maximum design pressure of 45 pound per square foot (2155 Pa). The Product Approval specifies 4-ft by 4-ft insulation panels attached with four fasteners per panel.

9.1.2 Determine the required number of fasteners per insulation panel to meet the design pressures in the elevated pressure zones.

**General Equation:**
\[ \left( \frac{\text{known \# of fasteners}}{\text{max. design pressure}} \right) = \left( \frac{\text{unknown \# of fasteners}}{\text{elevated design pressure}} \right) \]

**Perimeter Area:**

\[ \left( \frac{4 \text{ fasteners}}{45 \text{ psf}} \right) = \left( \frac{X \text{ fasteners}}{56 \text{ psf}} \right) \Rightarrow X = 4.9 \text{ fasteners} \]

All fractions shall be rounded up to the next whole number. Therefore, the perimeter insulation panels shall be fastened with five fasteners per 4-ft by 4-ft panel. Fastener locations shall be in compliance with Figure 3, herein.

**Corner Areas:**

\[ \left( \frac{4 \text{ fasteners}}{45 \text{ psf}} \right) = \left( \frac{X \text{ fasteners}}{90 \text{ psf}} \right) \Rightarrow X = 8 \text{ fasteners} \]

Therefore, corner panels shall be attached with eight fasteners per 4-ft by 4-ft panel. Fastener locations shall be in compliance with Figure 3, herein.

9.2 If the data extrapolation results in a number of fasteners for an elevated pressure zone which exceeds 280 percent of that for the field area, additional testing, as determined by the building official, may be required to confirm the performance of the Roof System Assembly.

9.3 If an insulation panel overlaps into an elevated pressure zone (i.e. field area insulation panel overlapping into the perimeter or corner area of the roof, or a perimeter area insulation panel overlapping into the corner area of the roof), the more stringent fastener density shall apply to the entire overlapping panel.

9.4 For multilayer insulation systems, the fastener density specified for the top panel shall be used. If the top layer is bonded in hot asphalt, the fastener density of the base insulation layer shall be used.

9.5 Alternatively, the base sheet of an approved roof assembly may be mechanically attached with insulation fasteners and plates through the insulation panels to the structural deck to increase the uplift performance of the roof assembly. Base sheet fastener spacing shall be as listed in roof assembly Product Approval, or may be determined in compliance with Section 10, herein.

<table>
<thead>
<tr>
<th>TABLE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQUARE FEET PER FASTENER FOR COMMON ANCHOR/BASE SHEET ATTACHMENT PATTERNS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Side Lap Row</th>
<th>Center Row(s)</th>
<th>From Roof Assembly Product Approval</th>
<th>Square Feet per Fastener</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 ( \frac{1}{2} ) in. o.c.</td>
<td>one row, 7 ( \frac{1}{2} ) in. o.c.</td>
<td></td>
<td>0.83</td>
</tr>
<tr>
<td>9 in. o.c.</td>
<td>two staggered rows, 12 in. o.c.</td>
<td></td>
<td>0.80</td>
</tr>
<tr>
<td>9 in. o.c.</td>
<td>two staggered rows, 18 in. o.c.</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>12 in. o.c.</td>
<td>two staggered rows, 12 in. o.c.</td>
<td></td>
<td>0.89</td>
</tr>
<tr>
<td>12 in. o.c.</td>
<td>two staggered rows, 18 in. o.c.</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>12 in. o.c.</td>
<td>two staggered rows, 24 in. o.c.</td>
<td>1.33</td>
<td></td>
</tr>
</tbody>
</table>

9.6 For buildings of mean roof height greater than 60 feet the example above shall also apply.

10. Anchor or Base Sheet Attachment – New Construction/Reroof Applications

10.1 This section covers determination of anchor/base sheet fastener applications. Anchor/base sheet attachment for elevated pressure zones may be determined through extrapolation of the data for field area attachment. Data extrapolation outlined in Section 10.4.4 utilizes field area attachment data currently found in roof assembly Product Approval.

- For steel deck applications, fastener spacing shall be in increments of 6 in. o.c.

10.2 The following calculations have been performed for several common anchor/base sheet attachment patterns, the results of which are noted in Table 1 of this Roofing Application Standard. The values listed in Table 1 apply solely to anchor/base sheets having a width less than or equal to 36 inches and applications having a side lap equal to or greater than 4 in.

10.3 If the field area attachment pattern from the roof assembly Product Approval is not listed in Table 1, or the anchor/base sheet has a width in excess of 36 inches, or the side lap is less than 4 in. wide, then the following calculations shall be conducted to determine the number of square feet per fastener.

10. Example of Data Extrapolation:

10.4.1 Given:
A building having a concrete deck and a roof mean height less than 60 feet where the design pressures are as follows:

- Field Area: - 43.0 psf
- Perimeter Area: - 56.0 psf
- Corner Areas: - 90.0 psf

Consider a roof assembly Product Approval, which includes a system having a maximum design pressure of -45 psf (2155 Pa). The Product Approval specifies an anchor/base sheet, having a width of 36 in. attached with approved fasteners and bearing plates at a spacing of 12 in. o.c. at a 4 in. side lap and two rows staggered in the center of the sheet, 24 in. o.c.

10.4.2 Determine the number of square feet per fastener.

To determine the number of square feet per fastener, first determine the length of anchor/base sheet, which will yield one net square (i.e., 100 ft²).

Net Width of Sheet (ft):

\[
Net \text{ Width (ft)} = \frac{(Sheet \text{ Width}) - (Side \text{ Lap Width})}{12}
\]
Net Width (ft) = \frac{(36 \text{ in}) - (4 \text{ in})}{12} = 2.67 \text{ feet}

\textbf{Net Length to Make One Square (100 ft\(^2\)):}

\[
\text{Net Length} = \frac{(100 \text{ ft}^2)}{\text{Net Width}}
\]

\[
\text{Net Length} = \frac{(100 \text{ ft}^2)}{2.67 \text{ ft}} = 37.5 \text{ ft}
\]

Determine the total number of fasteners per square.

\textbf{General Equation:}

\[
\left( \frac{1 \text{ fastener}}{A} \right) \times \left( \frac{12 \text{ in.}}{\text{ft}} \right) \times \left( \frac{B}{\text{row}} \right) \times \left( \frac{C}{\text{square}} \right) = D
\]

where: 
A = specified fastener spacing (inches);
B = net length (in feet) to make one square;
C = number of rows having spacing (A); and,
D = number of fasteners per square.

\textbf{Side Lap Row:}

\[
\left( \frac{1 \text{ fastener}}{12 \text{ in.}} \right) \times \left( \frac{12 \text{ in.}}{\text{ft}} \right) \times \left( \frac{37.5 \text{ ft}}{\text{row}} \right) \times \left( \frac{1 \text{ row}}{\text{square}} \right) = 37.5 \text{ fasteners per square}
\]

\textbf{Center Rows:}

\[
\left( \frac{1 \text{ fastener}}{24 \text{ in.}} \right) \times \left( \frac{12 \text{ in.}}{\text{ft}} \right) \times \left( \frac{37.5 \text{ ft}}{\text{row}} \right) \times \left( \frac{2 \text{ row}}{\text{square}} \right) = 37.5 \text{ fasteners per square}
\]

Combining these values leads to a total of 75 fasteners per square, which equates to 1.33 square feet per fastener, as noted below.

\[
\left( \frac{100 \text{ ft}^2}{\text{square}} \right) \times \left( \frac{37.5 \text{ side lap fasteners}}{\text{square}} \right) \times \left( \frac{37.5 \text{ center row(s) fasteners}}{\text{square}} \right) = 1.33 \text{ per fastener}
\]
10.4.3 Determine the “fastener value:"

**General Equation:**

\[
f_r = (\text{max. design pressure}) \times (\text{ft}^2 \text{ per fastener})
\]

\[
f_r = \left( \frac{45 \text{ lbf}}{\text{ft}^2} \right) \times \left( \frac{133 \text{ ft}^2}{\text{fastener}} \right) = 60.0 \text{ lbf}
\]

10.4.4 Determine anchor/base sheet fastener spacing (FS) to meet the design pressures in the elevated pressure zones of the roof.

10.4.5 **General Equation:**

\[
FS = \frac{f_r \times 144}{P \times RS}
\]

FS = fastener spacing (in.);

\( f_r \) = fastener value (lbf);

P = design pressure (psf); and

RS = row spacing (in.).

**NOTE:** As noted in the above equation, the row spacing is not needed to determine the fastener spacing. The row spacing is merely the net width of the sheet divided by the number of rows. For this case, the net width is 32 in. and there are three fastener rows (i.e. one side lap row and two center rows). This leads to a row spacing of 10.7 in.

**Perimeter Area:**

\[
FS = \frac{(60.0 \text{ lbf}) \times \left( \frac{144 \text{ in.}^2}{\text{ft}^2} \right)}{(56.0 \text{ psf}) \times (10.7 \text{ inches})} = 14.4 \text{ inches}
\]

All fractions shall be rounded down to the next whole number. Therefore, perimeter area anchor/base sheet attachment could be with three rows spaced 10.7 in. apart, 14 in. o.c. Generally, side lap fastener spacing should not exceed 12 in. o.c.

**Corner Area:**
Therefore, a fastener spacing of 9 in. o.c. at a 4 in. side lap and two rows staggered in the center of the sheet, 9 in. o.c. would be an acceptable corner area anchor sheet fastener spacing.

10.5 In recover applications anchor/base sheet attachment applications shall utilize approved insulation fasteners and bearing plates. Anchor or base sheet fasteners or nails shall not be utilized in such applications.

10.6 For buildings of mean roof height greater than 60 feet the example above shall also apply.

11. Architectural Appearance Applications

11.1 Design Values

11.1.1 The design value for architectural appearance applications shall be the lesser of either the “Fastener Value” of the fastener, determined in compliance with TAS 105 or the “dynamic pull-through value” of the anchor/base sheet over the proposed bearing plate, determined in compliance with TAS 117(B). Values shall be listed in fastener/plate manufacturer’s Product Approval.

| TABLE 2 | TYPICAL FASTENER VALUES FOR ARCHITECTURAL APPEARANCE APPLICATIONS |
| --- | --- | --- | --- |
| Wood Deck Fastener | Substrate | Min. Penetration | Fastener Value |
| 12 gage annular ring shank nail | Nominal 1 in. Wood Plank (i.e., \( \frac{11}{16} \) in. tongue and groove) | \( \frac{3}{16} \) in | 32.00 |
| #7 wood screw | Nominal 1 in. Wood Plank (i.e., \( \frac{11}{16} \) in. tongue and groove) | \( \frac{3}{16} \) in | 45.00 |
| #7 wood screw | Nominal \( \frac{19}{32} \) in. Plywood | \( \frac{7}{64} \) in | 37.50 |

| TABLE 3 | TYPICAL 'DYNAMIC PULL THROUGH VALUES' FOR ARCHITECTURAL APPEARANCE APPLICATIONS |
| --- | --- | --- |
| Anchor or Base Sheet | Bearing Plate Diameter | Dynamic Pull-Through Value (lbf) |
| ASTM D 226, Type II (30# Organic Felt) with hot mopped mineral surfaced roll roofing | \( \frac{11}{8} \) in | 38.20 |
| ASTM D 4601, (Fiberglass) with hot mopped mineral surfaced roll roofing | \( \frac{11}{8} \) in | 49.40 |

11.1.2 Tables 2 and 3, below, list typical “Fastener Values” and “Dynamic Pull-through Values,” which may be used to determine anchor/base sheet fastener spacing in compliance with this section. Any wood deck fasteners, anchor/base sheets, which are proposed for use in an architectural appearance application and are not listed in Tables 2 and 3 shall be tested in compliance with TAS 117(A) and/or TAS 117(B) to determine necessary design values.

11.1.3 If a proposed fastener is “larger” than those noted in Table 2, the “Fastener Value” noted in
Table 2 may be utilized. If a proposed bearing plate is larger than those noted in Table 3, the “Dynamic Pull-through Value” of the anchor/base over the smallest bearing plate may be utilized.

11.2 Example of Data Extrapolation:

11.2.1 Given:
A building having a roof mean height less than 60 feet where the design pressures are as follows:

Field Area: - 43.0 psf
Perimeter Area: - 56.0 psf
Corner Areas: - 90.0 psf

Consider an architectural appearance application in which an ASTM D 226, Type II base sheet, having a width of 36 in., is to be mechanically attached with a 3-in. side lap, to nominal 1-in. wood plank (3/16-in. tongue and groove) using #8 wood screws and 1 3/4-inch diameter tin caps. One ply of approved mineral surfaced roll roofing is to be applied over the mechanically attached base sheet in a full mopping of hot asphalt.

11.2.2 Determine the design value to be used in data extrapolation.

From Table 2, the “Fastener Value” for this application is 45.0 lbf. From Table 3, the “Dynamic Pull-through Value” for this application is 38.2 lbf. Taking the lesser of the two values, the design value for this case would be 38.2 lbf.

11.2.3 Determine a base sheet fastener spacing (FS) to meet the design pressures in each pressure zone of the roof.

**General Equation:**

\[
FS = \frac{(design\ value) \times 144}{P \times RS}
\]

Note: The side lap, for this case is specified at 3 in. Therefore, the row spacing (RS) in the above noted equation shall be 11 inch [i.e., sheet width (36 inch) minus side lap width (3 inch) divided by the number of fastener rows (3)].

**Field Area:**

\[
FS = \frac{(38.2 \text{ lbf}) \times \left(\frac{144 \text{ in}^2}{\text{ft}^2}\right)}{(40.0 \text{ psf}) \times (11 \text{ inches})} = 12.5 \text{ inches}
\]

All fractions shall be rounded down to the next whole number. Therefore, a fastener spacing of 12 in. o.c. at a 3-in. side lap and two rows staggered in the center of the sheet, 12 in. o.c. would be an acceptable field area base sheet fastener spacing.

**Perimeter Area:**
\[
FS = \frac{(38.2 \text{ lbf}) \times \left( \frac{144 \text{ in}^2}{\text{ft}^2} \right)}{(470 \text{ psf}) \times (11 \text{ inches})} = 10.7 \text{ inches}
\]

All fractions shall be rounded down to the next whole number. Therefore, a fastener spacing of 10 in. o.c. at a 3-in. side lap and two rows staggered in the center of the sheet, 10 in. o.c. would be an acceptable perimeter area base sheet fastener spacing.

**Corner Areas:**

\[
FS = \frac{(38.2 \text{ lbf}) \times \left( \frac{144 \text{ in}^2}{\text{ft}^2} \right)}{(550 \text{ psf}) \times (11 \text{ inches})} = 9.1 \text{ inches}
\]

All fractions shall be rounded down to the next whole number. Therefore, a fastener spacing of 9 in. o.c. at a 3-in. side lap and two rows staggered in the center of the sheet, 9 in. o.c. would be an acceptable perimeter area base sheet fastener spacing.

12. **Bitumen or Adhesive Application, General**

12.1 Insulation panel sizes listed in the Product Approval are the minimum approved sizes and thickness. Panels up to 4 ft. by 4 ft. may be installed in hot asphalt or approved cold adhesive, as specified in roof assembly Product Approval.

12.2 Not less than 85 percent of each insulation panel shall be in contact with the substrate and bonded with asphalt or adhesive, unless a specific intermittent adhesive attachment pattern is detailed in the roof assembly manufacturer’s Product Approval.

12.3 Insulation panels set in hot asphalt shall be “walked in” to ensure complete adhesion to the substrate. Multiple “walk-in” procedures may be required for foam adhesive products that expand during the curing process.

12.4 For recovery applications where the insulation panels are to be bonded to an existing roof membrane, all loose gravel shall be completely removed and the substrate shall be fully primed with ASTM D 41 primer. For applications where the insulation panels are to be bonded to a structural concrete deck, the deck shall be fully primed with ASTM D 41 primer. Primer shall be allowed to completely dry prior to asphalt applications.

12.5 Approved foam adhesive applications of insulation panels shall be applied in strict compliance with the foam adhesive manufacturer’s Product Approval.

12.6 No extrapolation for the elevated pressure zones, as defined by ASCE 7, shall be allowed in adhered roof assemblies.

12.6.1 Bonded roof assembly may be tested in accordance with TAS 124 to verify attachment in the elevated pressure zones. The number of tests required shall comply with this Section. A minimum of four test specimens shall be conducted on each roof level with not less than two tests being
conducted in each elevated pressure zone (perimeters and corners). One additional test shall be conducted for every 25 roofing squares of the elevated pressure zone area. A 1.45:1 margin of safety shall be applied to the test results.

13. Bitumen or Adhesive Application, Structural Concrete

13.1 A “Deck Dryness Test” shall be performed on structural concrete decks prior to asphalt application. The following procedures are specified for testing the dryness of the roof deck.

13.1.1 Heat not less than one pint of the specified asphalt to 400°F. Pour into a container.

13.1.2 Pour the asphalt on the primed deck surface. If the asphalt foams, the deck contains too much moisture for the asphalt to bond.

13.1.3 After the asphalt has cooled, pull the asphalt patch from the deck surface. If the asphalt patch strips clean, the deck is not dry enough for Roof System Assembly application. Wait a further period for the deck to dry and a sufficient asphalt bond can be achieved. Repeat the test procedure.

13.2 Structural concrete decks shall be primed with ASTM D 41 primer and allowed to dry prior to asphalt application, as noted in Section 12.4.

13.3 If applied directly to the deck, insulation shall be adhered in a full mopping of hot asphalt at an application rate of between 20 and 40 pounds per square, depending on the asphalt EVT. Asphalt types and temperature ranges shall be in compliance with Chapter 15 (High-Velocity Hurricane Zones) of the Florida Building Code, Building.
FIGURE 1 FASTENER PLACEMENT FOR 2 FOOT BY 4 FOOT BOARDS
FIGURE 2 FASTENER PLACEMENT FOR 4 FOOT BY 4 FOOT BOARDS
R7086 Text Modification

Roofing

4 FASTENERS PER BOARD

5 FASTENERS PER BOARD

6 FASTENERS PER BOARD

8 FASTENERS PER BOARD

9 FASTENERS PER BOARD

12 FASTENERS PER BOARD

http://www.floridabuilding.org/Upload/Modifications/Rendered_Mod_7086_Text_RAS_17_16.png
FIGURE 3 FASTENER PLACEMENT FOR 4 FOOT BY 4 FOOT BOARDS

8 FASTENERS PER BOARD

10 FASTENERS PER BOARD

12 FASTENERS PER BOARD

15 FASTENERS PER BOARD

16 FASTENERS PER BOARD

24 FASTENERS PER BOARD

FIGURE 4 FASTENER PLACEMENT FOR 4 FOOT BY 8 FOOT BOARDS
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

These proposed modifications include:

• Removal of references to withdrawn standards.
• Removal of references to legacy documents, including ICBO acceptance criteria.
• Updates to referenced standards, including name changes.
• Updates to performance criteria to reflect changes in referenced standards.
• Modifying to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
• Removal of redundant or unnecessary requirements.
• Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
$0

Impact to building and property owners relative to cost of compliance with code
$0

Impact to industry relative to the cost of compliance with code
Reduced product approval expense

Impact to small business relative to the cost of compliance with code
$0

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Updates important roofing requirements for HVHZ use.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Removes outdated references.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not require use of any specific type of product.

Does not degrade the effectiveness of the code

Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? No

Comment:

TAMKO Building Products, Inc., a manufacturer of roofing products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
See attached file.
ROOFING APPLICATION STANDARD (RAS) No. 150 PRESCRIPTIVE BUR REQUIREMENTS

1. Scope

1.1 This application standard shall be used where the authority having jurisdiction has adopted its use, and in accordance with the provisions of this code.

2. Definitions

2.1 For definitions of terms used in this application standard, refer to ASTM D 1079 and the Florida Building Code, Building.

3. Built-up and Prepared Roof Covering Application

3.0 General

3.1 DECK PREPARATION: Before starting the roof covering:

3.1.1 All roof decks shall be broom-cleaned and dry.

3.1.2 Where practicable, eaves; parapet walls; vertical walls; penthouses and similar structures above the roof level shall have been completed.

3.1.3 Cant strips, where provided, shall extend at least three inches (3 in.) up vertical surfaces.

3.1.4 All eaves shall provide firm, nailable backing for the secure attachment of gravel stops and eave and gable drip.

3.1.5 All precast and prestressed concrete roof components shall be provided with insulation, or other leveling fill, where such component edges are more than one-half inch (1/2 in.) from being flush.

3.2 ATTACHMENT: All roof coverings shall be attached to the various types of decks by mopped-on adhesives or by mechanical fastening as set forth herein, or by other approved materials or methods.

3.3 ADHESIVES:

3.3.1 Bituminous compounds shall be asphalt (ASTM D 312), coal tar pitch (ASTM D 450), modified bitumen, or cold-applied roofing cement (ASTM D 4586 or ASTM D 3019, Type III).

3.3.2 Hot asphalt shall be applied in a quantity not less than 25 pounds plus or minus 15 percent per roofing square per ply and 60 pounds plus or minus 20 percent per square for flood coats and at a temperature recommended by the manufacturer for the system being installed. However, kettle or tanker temperatures should not exceed the following:

Type I Asphalt: 475 °F
Type III & IV Asphalt: 525 °F

NOTE: Asphalt can be heated to within 25°F below the actual flash point, but this temperature limitation should never be exceeded.
3.3.3 Coal tar pitch shall be applied in a quantity not less than 25 pounds plus or minus 15 percent per roofing square per ply and 70 pounds plus or minus 20 percent per square for flood coats and at a temperature of not less than 275 nor more than 350 °F (350 to 400 °F in the kettle).

3.3.4 Where roof incline exceeds two inches (2 in.) per foot, bituminous compounds shall be steep asphalt Type III or Type IV.

NOTE: Coal tar pitch not to exceed a slope of one-half inch (1/2 in.) per foot with organic felts, if using glass felts or tar coated felts, slope not to exceed one-quarter inch (1/4 in.) per foot.

3.3.5 Adhesive compounds other than bitumen may be applied subject to manufacturer's specifications.

4. BUILT-UP ROOF COVERING:

4.1 Materials: All materials used in the assembly of fire-retardant and ordinary built-up coverings shall bear the label of an approved agency, the Underwriter's Laboratories, Inc., and be compatible with Class A, Class B, or Class C roofing. Material shall be delivered in original packaging bearing the manufacturer’s labels.

4.2 ANCHOR SHEET: The anchor sheet, as defined herein, shall be a minimum one #30 felt lapped two inches (2 in.) and turned up vertical surfaces a minimum of four inches (4 in.) and secured as set forth herein.

4.3 WOOD DECKS:

4.3.1 Fasteners securing the anchor sheet to nominal one inch (1 in.) lumber or to wood based structural-use panels three-quarters inch (3/4 in.) or more in thickness shall be noncorrosive smooth shank nails with a shank diameter of a minimum of 0.118 inches or 11 gage, heads not less than three-eighths inches (3/8 in.) (0.375) diameter and not less than one inch (1 in.) in length; or noncorrosive 12 gage wire ring-shanked nails having not less than 20 rings per inch, not less than one inch (1 in.) in length with heads not less than three-eighths inch (3/8 in.) in diameter.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>FOR MINIMUM BASE SHEET</th>
<th>1 LAYER, TYPE #30, ASTM D 226 - TYPE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Roof Height (Fl.)</td>
<td>Fastening Pattern[^1]</td>
</tr>
<tr>
<td>0-30</td>
<td>6 in. @ laps, 2 rows @ 6 in. midsheet</td>
<td>6 in. @ laps, 2 rows @ 12 in. midsheet</td>
</tr>
<tr>
<td>40</td>
<td>6 in. @ laps, 2 rows @ 6 in. midsheet</td>
<td>6 in. @ laps, 2 rows @ 9 in. midsheet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FOR MINIMUM BASE SHEET</th>
<th>1 LAYER, TYPE #43, ASTM D 2526 - TYPE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Roof Height (Fl.)</td>
<td>Fastening Pattern[^1]</td>
</tr>
<tr>
<td>0-30</td>
<td>12 in. @ laps, 2 rows @ 15 in. midsheet</td>
</tr>
<tr>
<td>40</td>
<td>12 in. @ laps, 2 rows @ 12 in. midsheet</td>
</tr>
</tbody>
</table>
FOOTNOTES:
(1) See section 4 for fasteners.
(2) Perimeter edge is measured from all roof edges and each side of ridge as follows:
The smaller of 0.10 x minimum building width or 0.40 x mean roof height, gut not less than 0.04 x
minimum building width or 3 feet.
(3) This table applies to roof slopes up to three inches (3 in.) per twelve inches (12 in.) (Maximum)
(4) Rows of fasteners, midsheet, shall be evenly spaced across width of sheet and staggered along
length of sheet.
(5) Patterns shown require a minimum withdrawal capacity of 34 lb per fastener (unfactored).
(6) Patterns shown require a minimum withdrawal capacity of 67 lb per fastener (unfactored).

4.3.2 Fasteners securing the anchor sheet to wood based structural-use panels less than three-
quarters inch (\(\frac{3}{4}\) in.) in thickness shall be non corrosive smooth shank nails with a shank diameter of
a minimum of 0.118 inches or eleven (11) gage, heads not less than three-eighths inch (\(\frac{3}{8}\) in.)
(0.375 in.) diameter and not less in length than will penetrate such wood based structural-use panels
plus three-sixteenths inch (\(\frac{3}{16}\) in.); or noncorrosive 12 gage wire ring-shanked nails having not less
than 20 rings per inch, heads not less than three-eighths inch (\(\frac{3}{8}\) in.) diameter and not less in length
than will penetrate such wood based structural-use panels plus three-sixteenths inch (\(\frac{3}{16}\) in.).

4.3.3 Such fasteners shall be applied through tin-caps not less than one and five-eighths inches (\(\frac{5}{8}\)
in.) nor more than two inches (2 in.) in diameter and of not less than 32-gage sheet metal.

4.3.4 Spacing of such fasteners along the laps of sheets and both ways in the field between laps
shall comply with Table 1, based upon height above grade.

4.3.5 Where the architectural appearance is to be preserved from below, anchor sheet shall be
secured in accordance with Section 1519.5.2

4.3.6 Other sub-deck systems may use the spacing shown in Table 1 provided each fastener has
the required withdrawal load in the particular substrate for which the fastener is designed.

4.3.7 Sheathing paper shall be applied on such decks where anchor sheets are pitch-tarred felts
only and shall not be required under asphalt felts.

4.4 OTHER NAILABLE DECKS: Poured gypsum, precast gypsum planks, poured Vermiculite and
Perlite (light-weight, insulating concrete), as well as foamed cellular concrete and structural wood-
fiber used as roof decking are considered nailable and anchor sheets shall be attached as follows:

4.4.1 Poured gypsum and pre-cast gypsum planks: Use mechanical fasteners providing equal
withdrawal resistance when spaced as set forth in Table 1 of this Code.

4.4.2 Poured Vermiculite, Perlite, foamed cellular concrete, and other light-weight, insulating
concrete: Use only mechanical fasteners providing resistance to uplift not less than those shown in
Table 1.

4.4.3 Structural wood fiber units: Use mechanical fasteners specified by the deck manufacturer, or
after all joints have been stripped with six inch (6 in.) wide felt applied with approved cold adhesive,
the anchor sheet may be solid mopped to such decks.

4.5 NON-NAILABLE DECKS: Poured concrete and precast deck units are considered non-nailable
and anchor sheets shall be fastened as follows:
4.5.1 Such decks shall be primed with an approved asphalt primer applied at the rate of one and one third \( (1\frac{1}{3}) \) gallons per roofing square, solidly on poured decks but held back four inches (4 in.) from precast unit joints.

4.5.2 Strip or solid mop, holding back four inches (4 in.) from precast unit joints, using dead level asphalt or coal tar pitch as the adhesive unless otherwise specified on the plans and permit and embed anchor sheet firmly in the hot bitumen lapping each sheet four inches (4 in.).

4.5.3 Where the incline of such decks exceeds three inches (3 in.) per foot, anchor sheets shall, in addition to mopping, be mechanically fastened to wood strips spaced not more than 24 inches apart, cast into such decks.

4.5.4 Such wood strips shall be not less than a nominal one by two inches (1 in. x 2 in.), pressure treated with approved preservative, chamfered or otherwise secured flush with the deck surface.

4.5.5 Anchor sheets shall be attached to such wood strips with three-quarter inch \( (\frac{3}{4}) \) in. long fasteners applied through tin caps and spaced as set forth herein.

4.5.6 Anchor sheet attachment shall satisfy the resistance to uplift requirements of Section 4.3.6 herein.

4.6 METAL DECKS: Metal decks shall be covered with mechanically fastened roof insulation.

4.7 OTHER DECKS: Attachment of the anchor sheet to decks other than those specifically provided for herein shall be as approved by the building official.

4.8 ADDITIONAL SHEETS:

4.8.1 Each additional sheet above the anchor sheet shall be lapped a minimum of two inches (2 in.) over the preceding sheet and shall be thoroughly mopped between sheets with a bituminous compound, or other approved adhesive providing equivalent bond, so that in no place felt touches felt.

4.8.2 Sheets shall be embedded without wrinkles or buckles.

4.8.3 Each sheet, like the anchor sheet, shall be turned up vertical surfaces a minimum of four inches (4 in.).

4.8.4 (aa) Polymer modified bitumen membranes shall be permitted to may be applied as a single ply over a mechanically fastened anchor sheet without additional plies where slopes exceed one eighth inch \( (\frac{1}{8}) \) in. per foot. An additional ply is required for slopes less than \( \frac{1}{8} \) in. per foot. Slope requirement applies to new roofs, recover roofs and reroofs.

4.8.5 Polymer modified bitumen membranes shall not be applied to slopes exceeding three inches (3 in.) per foot. At slopes exceeding one inch (1 in.) per foot, they shall be backnailed four inches (4 in.) from the upper edge at maximum twenty-four inches (24 in.) on center.

4.8.6 Polymer modified bitumen shall must be applied utilizing hot or cold adhesives as specified in Section 3.2.

4.9 FELT FLASHINGS:
4.9.1 Flashing used in the construction of built-up roof coverings shall be carried over cant strips, where provided, and turned up all walls and other vertical surfaces a minimum of eight inches (8 in.) and maximum of twenty four inches (24 in.).

4.9.2 Each layer of flashing shall be uniformly mopped with hot asphalt applied in a quantity not less than 25 pounds plus or minus 15 percent per roofing square for each mopping, or attached with approved cold adhesive providing equivalent bond.

4.9.3 Flashing turned up vertical surfaces shall be not less than one #30 felt starting four inches (4 in.) out from the cant strip and carried up such vertical surfaces not less than six inches (6 in.), and one mineral surfaced felt starting six inches (6 in.) out from the cant strip and carried up a minimum of eight inches (8 in.) above the top of the cant.

4.9.4 Such flashing shall be fastened to the wall one and one-half inches (1 1/2 in.) down from the upper edge every six inches (6 in.) after which the top edge shall be finished with a three inch (3 in.) strip of membrane set in roofing cement (ASTM D 4586).

4.10 VALLEYS:

4.10.1 Valleys shall be metal, as set forth in Section 1517.6, Florida Building Code, Building.

4.11 PARAPET WALLS: Built-up roof covering felts shall not wrap over walls more than 24 in. in height above the deck and, where wrapped, shall be applied as follows:

4.11.1 Flashing turned up vertical surfaces shall be not less than one #30 felt starting four inches (4 in.) out from the cant strip and carried up the face over the top of the parapet, and one mineral surfaced rolled roofing (ASTM D 249) starting six inches (6 in.) out from the cant strip and carried up and over the parapet to within three inches (3 in.) of the outside edge and fastened six inches (6 in.) on center.

4.11.2 The resulting edge shall then be finished with either a three inch (3 in.) strip of membrane set in roofing cement (ASTM D 4586) and painted with aluminum paint or coping installed in accordance with Section 1517.6 of the Florida Building Code, Building.

4.12 INSULATION: Roof insulation may be applied under or over an anchor sheet and, where provided shall be attached as set forth in Section 5 herein.

4.13 SURFACING:

4.13.1 Mineral surfaced roofing shall not be applied on inclines greater than one-half inch (1/2 in.) or less per foot, and, when used, shall be applied only over anchor sheets and mopped in as provided in Section 4.8 herein, and on inclines five inches (5 in.) or more per foot, such caps shall be backnailed 18 inches on center.

4.13.2 Cap-surfacing with smooth or mineral surfaced felts, or modified bitumen of SBS shall not be limited to slope requirements and shall be permitted to consist of one layer of mineral surfaced fiberglass felt, may be:

4.13.2.1 One layer of mineral surfaced fiberglass felt.

4.13.3 COATINGS

4.13.3.1 Coatings shall be applied no later than 60 days after installation of membrane. Surface shall
be clean and dry when coating is applied. Roof to be coated shall not be glaze coated. Coatings shall be applied in a uniform coverage with no asphalt showing through.

4.13.3.2 Aluminum pigmented coatings conforming to ASTM D 2824, Type I or III shall be applied at a minimum rate of 1.5 gallons per 100 square feet.

4.13.3.3 Emulsion coatings conforming to ASTM D 1227, Type III or IV shall be applied at the minimum rate of 3 gallons per 100 square feet.

4.13.3.4 Acrylic coatings conforming to ASTM D6083, shall not be applied on slopes less than \(\frac{1}{4}\) in. per foot, and when used, shall be applied at the rate recommended by the coating manufacturer.

5. ROOF INSULATION

5.1 Application: Roof insulation shall provide an acceptable base for built-up or polymer-modified bitumen, or single-ply roof coverings, or shall become a part of such roof coverings as follows:

5.1.1 Over Wood Decks: Roof insulation shall be mechanically fastened directly to wood decks or shall be solidly mopped over an anchor sheet as set forth in Section 4.2 herein.

5.1.2 Over Other Nailable Decks: To reduce moisture absorption from the deck and preserve the insulating effectiveness, roof insulation shall be applied over an anchor sheet.

5.1.3 Insulation may be fully mopped to an anchor sheet on a nailable deck without any fasteners in the insulation.

5.1.4 Over Nonnailable Decks:

5.1.4.1 Roof insulation shall be solid-mopped as provided in Sections 4.5 and 4.6 herein for anchor sheet attachment to nonnailable roof decks.

5.1.4.2 Insulation used over structural or precast concrete deck shall be a maximum of 4' x 4' and fully mopped to the deck.

5.1.4.3 Over metal decks, roof insulation shall be mechanically attached per Table 2.

5.1.5 Over Anchor Sheet: Roof insulation applied over anchor sheets, attached as set forth in Section 4 herein shall be solid-mopped in as provided in Section 8 herein.

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>MECHANICALLY FASTENED INSULATION FOR BUILDINGS 40 FEET OR LESS IN HEIGHT</th>
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<tr>
<td></td>
<td>FASTENERS PER BOARD 1,2,3</td>
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<td>BOARD SIZE</td>
<td>FIELD PERIMETER 1,2,3</td>
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<tr>
<td>WOOD FIBERBOARD</td>
<td>2 x 4 1 inch minimum</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>8</td>
</tr>
<tr>
<td>FIBERGLASS</td>
<td>4 x 4 1/2 inch minimum</td>
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<tr>
<td>PERLITE</td>
<td>4 x 4 1.5 inch minimum</td>
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</table>
### Footnotes

1. Minimum 3-inch plates must be used.
2. Perimeter: Defined as the first board or a minimum of 4 feet from the roof edge.
3. Corners: Defined as 8 feet in from each side.
4. If the building has parapet walls 36 inches or higher around the entire roof perimeter, use the number of fasteners for the perimeter.
5. Wood and Steel decks use a minimum #12 screw and penetrate through the deck a minimum of \( \frac{1}{2} \) inch.
6. The installation of Polymer Modified Bitumen as a single-ply directly applied over mechanically fastened insulation requires DOUBLE the amount of fasteners in the field, perimeter and corners.

### 5.1.6 Under Anchor Sheet:

5.1.6.1 Where more than one layer of roof insulation is provided, each successive layer shall be solid-mopped in and all joints shall be staggered.

5.1.6.2 Anchor sheets applied over such insulation shall be solid-mopped thereto, or mechanically fastened through the insulation to nailable decks with approved fasteners spaced as set forth in Table 1 and the mechanical fastening of the insulation may be omitted.

5.1.6.3 Additional built-up roofing above the anchor sheet shall be mopped in place as provided in Section 4.8 herein.

5.1.6.4 Attachment of other roof coverings over roof insulation shall comply with the specific provisions set forth in this RAS.

### 6. Roof Incline:

6.1 Roof insulation applied to roof with inclines of 3 or more inches per foot (1 inch per foot on steel decks) shall be nailed, screwed or bolted through tin-caps spaced not more than 12 inches on centers both ways.

6.2 Only ASTM D 312 Type III or IV asphalt shall be used on such applications.

### 7. Vapor Retarders: Where vapor retarders are specified, they shall be as follows:

7.1 Over wood and other nailable decks, vapor retarders shall be not less than two #15 felts lapped 19 inches, or one #30 felt lapped 4 inches, solidly mopped to anchor sheet.

7.2 Over nonnailable decks, vapor retarders shall be not less than two #15 pound felts, lapped 19 inches, shingled in and solidly mopped with hot bitumen.
8. **Mopping**: Solid mopping shall be hot bitumen applied in a quantity of not less than 25 pounds per roofing square at temperatures as set forth in Section 3.3 and roof insulation shall be laid with staggered joints and pressed firmly into position while such mopping is hot.
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

These proposed modifications include:
- Removal of references to withdrawn standards.
- Removal of references to legacy documents, including ICBO acceptance criteria.
- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
- Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

**Fiscal Impact Statement**

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**Requirements**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Updates important roofing requirements for HVHZ use.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Removes outdated references.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Does not require use of any specific type of product.
- Does not degrade the effectiveness of the code
  - Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? **No**

**Comment:**

TAMKO Building Products, Inc., a manufacturer of roofing products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
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<th>Michael Fischer</th>
<th>Submitted</th>
<th>2/25/2016</th>
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<td>Owens Corning Roofing and Asphalt, LLC is a manufacturer of roofing products and accessories that are approved for use in the HVHZ. After review of the proposed changes, we find that the change(s) to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is/are the subject of this code modification will improve the usability and consistency of the document significantly.</td>
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<td>Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the HVHZ, proposes to make the following editorial changes to the proposed mod:</td>
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<tr>
<td>1.3 - Leave as is do not delete/change</td>
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See attached file.
TESTING APPLICATION STANDARD (TAS) No. 100-95 TEST PROCEDURE FOR WIND AND WIND DRIVEN RAIN RESISTANCE OF DISCONTINUOUS ROOF SYSTEMS

1. Scope

1.1 This Protocol covers the determination of the water infiltration resistance of all discontinuous roof systems, consisting of a prepared roof covering and underlayment, when applied at slopes of 2 in:12 in. or greater over a nailable deck.

1.2 The test procedures outlined in this Protocol determine whether a discontinuous roof system, consisting of an underlayment and a prepared roof covering, provides sufficient wind driven rain resistance to allow no water infiltration through the deck sheathing during a predetermined test period.

1.3 All testing and calculations shall be conducted by an approved testing agency and all test reports, including calculations, shall be signed by a Registered Design Professional per F.S., Section 471 or 481.

2. Referenced Documents

2.1 ASTM Standards:

D 1079 Standard Definitions and Terms Relating to Roofing, Waterproofing and Bituminous Materials
E 380 Excerpts from the Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)

2.2 International Conference of Building Officials Acceptance Criteria for Special Roofing Systems

2.3 Florida Building Code: Building:

2.4 The American Plywood Association Performance Standards and Policies for Structural-Use Panels

2.5 Roof Consultants Institute Glossary of Terms

3. Terminology & Units

3.1 Definitions - For definitions of terms used in this specification, refer to ASTM D 1079, and Chapters 2 and 15 (High-Velocity Hurricane Zones) Florida Building Code, Building; and/or the RCI Glossary of Terms. The in the event of a conflict, the definitions from the Florida Building Code, Building shall take precedence.

3.2 Units - For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Significance and Use

4.1 The test procedure provides a means for establishing the resistance to wind driven rain of the discontinuous roof system, consisting of underlayment and a prepared roof covering. This test procedure has not been contemplated to measure the performance of the prepared roof covering and underlayment to maximum winds and/or uplift forces anticipated in Chapter 15, High-Velocity...
Hurricane Zone, of the Florida Building Code, Building.

5. Apparatus

5.1 The Test Frame

5.1.1 The test frame shall consist of a 10’ long x 8’ wide base structure, constructed from wood or steel framing, and a wood deck, constructed from plywood sheathing. Deck support joists shall be placed at 24 in. centers (See Figure 1, attached). The deck slope shall be adjustable or multiple interchangeable decks shall be available to test specimens at slopes of 2 in., 3 in., 3\(\frac{1}{2}\) in., 4 in., 5 in. and 6 in. in 12 in. The deck support assembly shall be capable of supporting not less than 55 lb per square foot of dead load.

5.1.2 The test frame shall not be constructed against the side of a wall or other structure which is taller than the frame.

5.1.3 The test frame shall be rigidly supported during the test period.

5.2 The Wind Generator(s)

5.2.1 The wind generator(s) shall provide a constant wind profile over the entire width of the test specimens for the specified time period to a maximum wind speed of 110 mph.

5.2.2 If the wind generator(s) is unable to provide the required constant profile, as determined by windstream calibration (Section 7.1), airflow from the wind generator(s) shall be directed and smoothed by suitably shaped baffles (see Figure 2, attached).

5.3 Water Supply

5.3.1 Water shall be supplied to the wind stream using a sprinkle-pipe system mounted on a movable frame capable of simulating a uniform 8.8 in. per hour of rainfall over the test specimen. The simulated rainfall and flow meters shall be calibrated and the water distribution shall be checked as noted in Sections 7.2 and 7.3, respectively.

6. Test Limitations and Precautions

6.1 During the test, all testing agency representatives and other test observers shall wear ear and eye protection and hard hats to prevent injury.

6.2 This Protocol may involve hazardous materials, operations and equipment. This Protocol does not purport to address all of the safety problems associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

7. Calibration

7.1 Windstream Calibration:

7.1.1 Prior to conducting the test, the windstream velocity shall be measured on a vertical plane grid, having dimensions of 8’ wide by 4’ high and grid dimensions of 24 in. x 24 in., located two feet in front of the test frame with the lower eight foot dimension in line with the front edge of the test frame (see Figure 2, attached).
7.1.2 The measured windstream velocity within each grid square shall be within ±10% of the required axial velocity for each wind speed. The windspeed shall be measured using a pitot tube connected directly to a U-tube or calibrated pressure sensing device such as a magna helix gauge. Convert the reading of inches of water to miles per hour (MPH). Pressure sensing device shall be capable of reading to the nearest 0.1 inch of water.

7.1.3 Calibration of the wind stream velocity shall be conducted every six months or whenever any change is made to any wind tunnel component.

7.2 Simulated Rainfall and Flow Meter Calibration - A maximum of three months prior to conducting the test, the flow meter(s) shall be calibrated using the following method:

7.2.1 Capture water from the exit of the flow meters in a five gallon bucket which has been weighed.

7.2.2 Allow water to flow through the flow meter into the tared 5 gallon bucket for a period of 1 minute. Set the flow meters to deliver 8.8 inches of water per hour and record the flow meter reading in gallons per minute during the process.

7.2.3 Convert the flow meter reading (gallons/minute) to rainfall simulation (inches/hour) using the following formula:

\[
\left( \frac{\text{gallons}}{\text{minute}} \times \frac{60 \text{ minutes}}{1 \text{ hour}} \times \frac{231 \text{ in}^3}{1 \text{ gallon}} \right) \quad \text{inches/hour}
\]

7.2.4 The quantity of rainfall simulation determined in 7.2.3 shall be within ±5% of the desired rainfall simulation of 8.8 inches/hour.

7.2.5 Measure the volume of water (in³) captured and convert this to rainfall simulation (inches/hour) using the following formula:

\[
\left( \frac{\text{inches}^3}{11,520 \text{ inches}^2} \right) \times \left( \frac{60 \text{ minutes}}{1 \text{ hour}} \right) = \text{y \ inches/hour}
\]

7.2.6 The rainfall simulation determined in 7.2.3 (x) shall be within ±5% of the rainfall simulation determined in 7.2.5 (y).

7.3 Water Distribution Check - The water distribution check over the (8 ft x 10 ft) flat test deck (without valley) shall be checked and calibrated every six months using the method outlined herein. Water distribution system must be adjusted so that the water introduced into the wind stream strikes the deck.

7.3.1 Prepare ten (10) 24 in. squares of thick absorptive material and weigh each sample. From this
data, determine the average weight of the samples.

7.3.2 Prepare twenty (20) numbered squares of absorptive material and lay out on deck four horizontally across the deck and five vertically up the deck. Place a hold-down frame over the test deck and squares of absorptive material.

7.3.3 Set the test frame to 2 inches per foot of slope.

7.3.4 Set the wind speed to 35 mph and add water to the windstream at a constant rate, as indicated on the flow meter, until the absorptive material is wet but not saturated, at which time the wind and water flow shall be terminated. Record the duration of time required to ‘wet’ the material.

7.3.5 Remove the hold-down frame from the deck and rapidly weigh the squares of wet absorptive material. Determine the weight of water striking each square sample at the particular wind speed and flow meter setting.

7.3.6 No one particular square sample shall exhibit rainfall simulation, measured in weight, greater than or less than 25% of the average weight of all twenty squares.

7.3.7 Repeat steps 7.3.2 through 7.3.5 at a wind speed of 70 mph.

7.3.7.1 No one particular square sample shall exhibit a rainfall simulation, measured in weight, greater than or less than 25% of the average weight of all 20 squares.

8. Test Specimens

8.1 Deck

8.1.1 The wood test deck shall consist of APA 32/16 span rated sheathing of 13/32 in. thickness installed over 2 in. x 6 in. perimeter supports and 2 in. x 6 in. intermediate supports spaced 24 in. apart. The sheathing shall be attached with 8d common nails at 6 in. o.c. at panel edges and 12 in. o.c. at intermediate supports. One valley shall be constructed into the test deck, located at the deck’s front edge, as noted on Figure 1, attached.

8.1.1.1 Other approved test deck configurations shall be permitted to be used.

8.1.2 The wood test deck shall be positioned at the minimum slope, as applicable in the High-Velocity Hurricane Zone jurisdiction, for the type of discontinuous roof system being tested, but not less than 2 in:12 in.

8.2 Underlayment and Prepared Roof Covering.

8.2.1 Underlayment and prepared roof covering shall be installed in strict-compliance with the manufacturer’s published installation instructions and the minimum installation requirements set forth in Section 1518 of the Florida Building Code, Building. The requirements of the Florida Building Code, Building shall take precedence.

8.3 The areas subject to the test criteria shall consist of the field area of the test deck, the eave, the valley, one rake section.

8.4 The test specimen shall be inspected by a Registered Design Professional per F.S., Section 471 or 481 or Registered Roof Consultant who shall confirm in the final report that the method of construction is in compliance with the specifications of this protocol.
9. **Conditioning** - conditioning need not be performed on mechanically attached, rigid, discontinuous roof systems.

9.1 Conditioning shall consist of three days of exposure to outside environmental conditions during which time the surface temperature of the prepared roof covering shall reach not less than 135°F for a period of six hours in each day. The surface temperature shall be measured with a surface mounted thermocouple and recorded to confirm that the specified surface temperature is attained for the specified period of time on each day.

9.2 Should the surface temperature fail to reach the specified temperature for the specified time period on each of three days, the test deck shall be conditioned for one additional day or until the surface temperature has been at 135°F for a total of 18 hours.

9.3 As an alternative, conditioning may consist of 16 continuous hours of deck exposure to minimum relative humidity of 80% ± 5% and a minimum temperature of 135°F to 140°F in a closed cell or room.

9.4 Care must be taken not to damage, twist or distort the test specimen during handling as this may affect the test specimen’s performance.

9.5 After the conditioning procedure is complete, the test deck shall be allowed to come to ambient temperature prior to testing.

10. **Test Procedure**

10.1 The test specimen shall be positioned on the test frame at the minimum slope proposed for installation but not less than 2 in:12 in.

10.2 The test specimen shall be positioned so that the exposed edge of the 8 foot eave is facing the wind generator(s) and to accommodate an observer under the deck for the duration of the test period.

10.3 The topside and underside of the test specimen shall be photographed immediately prior to starting the test.

10.4 The wind speed intervals shall be conducted as noted below.

<table>
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<th>Interval #</th>
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<tr>
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<td>35</td>
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<tr>
<td>2</td>
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<tr>
<td>8</td>
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The test shall terminate at the end of the final ten (10) minute 0 mph interval.

10.5 Water shall be added to the windstream upon commencement of the initial wind speed, upwind from the test deck, in an even spray, at a rate to simulate 8.8 in. per hour of rainfall over the test specimen. The flow of water shall be measured with a calibrated flow meter during the test procedure to confirm water flow. Water flow shall be stopped and started in conjunction with the air flow intervals noted in 10.4. Photographs shall be taken of the top side and underside of the test specimen 30 seconds prior to the completion of each interval noted in Section 10.4.

10.6 The observer shall monitor any water infiltration from the underside of the test specimen, recording approximate quantities penetrating the deck structure during the test period. Should the volume of water increase to a steady dripping in three or more places during the test period, the test shall be terminated prior to maximum wind speed. Water penetrating the test shall be contained and measured. The observer shall also monitor any damage to the test specimen or any component thereof.

10.7 The top side and underside of the test specimen shall be photographed immediately subsequent to test termination.

11. Report

11.1 The final test report shall include the following:

11.1.1 A description of the discontinuous roof system, including the manufacturer and type of underlayment; the manufacturer and type of prepared roof covering; the slope(s) at which the system was tested.

11.1.2 A detailed report of the method of construction, including a sketch of the test specimen; certification by a Registered Design Professional per F.S., Section 471 or 481 or Registered Roof Consultant that the test specimen was constructed in compliance with the specifications of this Protocol; and, a copy of the published application instructions provided by the prepared roof covering manufacturer.

11.1.3 A description of the method of conditioning used.

11.1.4 A description of the absorptive material used during the water distribution check.

11.1.5 Photographs of the top side and underside of the test specimen immediately prior and subsequent to commencement and termination of testing, respectively.

11.1.6 Photographs of the top side and underside of the test specimen 30 seconds prior to completion of each interval noted in Section 10.4.

11.1.7 All windstream calibration data (from Section 7.1); simulated rainfall and flow meter calibration data and calculations (from Section 7.2); and water distribution data and calculations (from Section 7.3).

11.1.8 Detailed observations of water infiltration through the sheathing and the times and locations of water infiltration.
11.1.9 The volume of water (if any) which infiltrated the sheathing in the area of the ridge vent on the second test specimen and was contained.

FIGURE 1 WIND-DRIVEN RAIN TEST FRAME

FIGURE 2 WIND DRIVEN RAIN WIND TUNNEL

11.1.10 Any test specimen which exhibits water infiltration through the sheathing shall be considered as failing the wind driven rain test.

11.1.11 Any test specimen which has the prepared roof covering or any portion thereof 'blow off',
tear or blow upward without reseating during the test shall be considered as failing the wind driven rain test.
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort. These proposed modifications include:

- Removal of references to withdrawn standards.
- Removal of references to legacy documents, including ICBO acceptance criteria.
- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
- Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

Fiscal Impact Statement

- Impact to local entity relative to enforcement of code: $0
- Impact to building and property owners relative to cost of compliance with code: $0
- Impact to industry relative to the cost of compliance with code: reduced product approval expense
- Impact to small business relative to the cost of compliance with code: $0

Requirements

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
- Updates important roofing requirements for HVHZ use.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
- Removes outdated references.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
- Does not require use of any specific type of product.
- Does not degrade the effectiveness of the code

Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? No

1st Comment Period History

- Proponent: Aaron Phillips
- Submitted: 2/10/2016
- Attachments: No

Comment:

TAMKO Building Products, Inc., a manufacturer of roofing products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
<table>
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<tr>
<th>Comment Period History</th>
<th>Proponent: Jaime Gascon</th>
<th>Submitted: 2/25/2016</th>
<th>Attachments: No</th>
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<td>Comment:</td>
<td>Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.</td>
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<th>Proponent: Greg Keeler</th>
<th>Submitted: 2/25/2016</th>
<th>Attachments: No</th>
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<tr>
<td>Comment:</td>
<td>Owens Corning Roofing and Asphalt, LLC is a manufacturer of roofing products and accessories that are approved for use in the HVHZ. After review of the proposed changes, we find that the change(s) to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is/are the subject of this code modification will improve the usability and consistency of the document significantly.</td>
<td></td>
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</table>
See attached file.
1. Scope

1.1 This test method covers the determination of the resistance to wind blow-up or blow-off of asphalt shingles, metal shingles or other non-rigid, discontinuous Roof System Assemblies when installed in compliance with the manufacturer’s current, published installation instructions.

2. Referenced Documents

2.1 ASTM Standards


E 380 Excerpts from the Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)

2.2 The Florida Building Code, Building.

2.3 Roof Consultants Institute Glossary of Terms

3. Terminology & Units

3.1 Definitions - For definitions of terms used in this specification refer to ASTM D 3161; and/or Chapters 2 and 15 (High-Velocity Hurricane Zones) of the Florida Building Code, Building; and/or the RCI-Glossary-of-Terms. Definitions from the Florida Building Code, Building shall take precedence.

3.2 Units - For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Types of Roof System Assemblies

4.1 Asphalt shingles are of two types:

4.1.1 Type I - Shingles with a factory-applied adhesive (self-sealing shingles).

4.1.2 Type II - Shingles of the lock-type, with mechanically interlocking tabs or ears.

4.2 Metal shingles or other non-rigid, discontinuous Roof System Assemblies shall be tested under this Protocol at the direction of the Authority Having Jurisdiction.

5. Significance and Use

5.1 Asphalt shingles, metal shingles or other non-rigid, discontinuous Roof System Assemblies that
have demonstrated wind resistance by this test have also performed well in use. Local wind conditions may differ from the test conditions both in intensity and duration, and should be taken into consideration. This method is suitable for use in specifications and regulatory statutes. This method, assisted by experience and engineering judgment, will also prove useful for development work.

6. Test Limitations and Precautions

6.1 This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

7. Apparatus

7.1 Test Machine

7.1.1 The “test machine” shall be capable of delivering a horizontal stream of air through a rectangular opening, 36 in. (914 mm) wide and 12 in. (305 mm) high, at a velocity of 110 mph (177 km/h) ± 5% as measured at the orifice.

7.1.2 The “test machine” shall be equipped with an adjustable stand on which a test panel is placed. The stand shall be adjustable to setting the test panel at any desired slope, at any horizontal distance from the lower edge of the duct opening, and at various angles incident to the wind direction.

7.2 Clock

7.3 Mechanical Circulation Conditioning Cell or Room

7.3.1 A mechanical circulation conditioning cell or room with a forced air circulation shall be utilized for self-sealing shingle conditioning. The cell or room shall be capable of receiving a minimum 50 in. (1.27 m) wide by 66 in. (1.68 m) long test panel at a slope of 2 in:12 in. and of maintaining a uniform temperature of 135 to 140°F (57 to 60°C).

8. Test Specimen

8.1 Deck

8.1.1 The wood test deck shall consist of APA 32/16 span rated sheathing of 15/32 in. thickness and not less than 50 in, by 66 in. (1.27 m by 1.68 m) in dimension. The wood test deck shall be of such rigidity that it will not twist or distort with normal handling, or vibrate from the wind velocity during the test.

8.2 Underlayment

8.2.1 Underlayment shall be two layers of 15 lb ASTM D 226, type I asphalt saturated felt
mechanically attached to the wood test deck, with 12 ga. roofing nails and 1\(\frac{1}{2}\) in. tin caps, in a 12 in.
grid pattern staggered in two rows in the field and 6 in. o.c. attachment at any laps.

8.3 Self-Sealing Asphalt Shingles

8.3.1 Apply self-sealing asphalt shingles to duplicate test decks, parallel to the short dimension of
the test deck, in compliance with the manufacturer’s instructions.

8.3.2 Asphalt shingles shall be attached using 12 ga. roofing nails, properly positioned in compliance
with the manufacturer’s instructions, to fasten each shingle. No cement, other than the factory-
applied adhesive, shall be used to fasten down the tabs. Do not apply pressure to the shingle tabs
either during or after application.

8.4 Lock-Type Asphalt Shingles

8.4.1 Apply lock-type asphalt shingles to not less than four test decks, parallel to the short dimension
of the panel, in compliance with the manufacturer’s instructions. Secure the shingles at the outer
edge of the test panel by exposed nailing to simulate anchoring at the rake edges of a roof deck.

8.5 Metal Shingles or Other

8.5.1 Apply metal shingles or other non-rigid, discontinuous components to duplicate test decks,
parallel to the short dimension of the test deck, in compliance with the manufacturer’s instructions.

8.6 Control the temperature at 80 ± 15°F (27 ± 8°C) and maintain the slope of the panel at 2 in:12 in.
(17% slope) during shingle application.

9. Conditioning

9.1 Maintain the test specimens at a slope of 2 in:12 in. and at a temperature of 80 ± 15°F (27 ± 8°C)
until the commencement of heat conditioning.

9.2 Place the test specimens in the conditioning cell or room at a slope of 2 in:12 in. and maintain at
a temperature of 135 to 140°F (57 to 60°C) for a continuous 16 hour period.

9.3 After completion of the conditioning period, allow the test specimens to come to room
temperature [80 ± 15°F (27 ± 8°C)] while at a slope of 2 in:12 in.

9.4 Exercise care to avoid pressure on shingle tabs by any twisting or distortion of the test
specimens during handling.

10. Procedure

10.1 Location of the Test Panel

10.1.1 Install the test specimen on the test carriage and adjust it in relation to the duct such that the
exposed edge of the target course is on the same level as the lower edge of the duct orifice at a horizontal distance of 7 in. ± 1/16 in. (178 ± 1 mm). The target course shall be the third course up from the bottom of the test specimen. The test incline shall be 2:12 in. for self-sealing shingles, and at the lowest incline recommended by the manufacturer for lock-type asphalt and metal shingles and other non-rigid, discontinuous systems.

10.1.2 Since the design of lock-type shingle may make it difficult to determine the most critical angle of wind direction, conduct the test at a minimum of three different angles: 1) head-on; 2) with the bottom of the target course parallel to and 7 in. (178 mm) away from the machine orifice; and, 3) with the test specimen rotated 30 and 60 degrees from the head-on position, with the bottom corner of the third-course tab nearest to the duct being 7 in. (178 mm) away from and in the same horizontal plane as the bottom of the machine orifice. Test another panel at the position judged to be most critical on the basis of the first three tests.

10.2 Performing the Test

10.2.1 Maintain the ambient temperature at 75 ± 5°F (24 ± 3°C) during the wind tests.

10.2.2 As soon as the test specimen is set in position, start the fan, adjust to produce a velocity of 110 mph (177 km/hr) ± 5% at the orifice, and maintain continuously for 2 hours, or until such lesser time as a failure occurs.

10.2.3 During the test, an observer shall note any lifting of shingle tabs or non-rigid components and shall record any damage to a full shingle or non-rigid component or the disengaging of a locking ear or tab, or a shingle tab, including any failure of adhesive. The time at which any of these “failures” occur shall be noted.

10.2.4 If failure occurs during the test, stop the air flow and record the exposure time. The end point for failure shall be taken as the time at which the sealing feature fails to restrain one or more full shingle tabs, or a locking ear or tab of a lock shingle tears loose or disengages from its locking position or a non-rigid component is damaged so as to affect the performance of the system. In addition, no free portion of a shingle or non-rigid component shall lift so as to stand upright or bend back on itself during the test.

11. Certification

11.1 A test report will be provided to the Authority Having Jurisdiction confirming successful compliance with the test provisions of this Protocol. Completion of this test Protocol is one in a series of Testing Application Standards required by the Florida Building Code, Building for Product Approval of non-rigid, discontinuous Roof System Assemblies.
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

These proposed modifications include:
- Removal of references to withdrawn standards.
- Removal of references to legacy documents, including ICBO acceptance criteria.
- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
- Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

### Fiscal Impact Statement

**Impact to local entity relative to enforcement of code**

$0

**Impact to building and property owners relative to cost of compliance with code**

$0

**Impact to industry relative to the cost of compliance with code**

- Reduced product approval expense.

**Impact to small business relative to the cost of compliance with code**

$0

### Requirements

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Updates important roofing requirements for HVHZ use.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Removes outdated references.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  - Does not require use of any specific type of product.
- **Does not degrade the effectiveness of the code**
  - Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? **No**
### Rationale
To update to current ANSI/SPRI/FM 4435 ES-1 standard

### Fiscal Impact Statement
**Impact to local entity relative to enforcement of code**
None

**Impact to building and property owners relative to cost of compliance with code**
None

**Impact to industry relative to the cost of compliance with code**
Reduce cost of compliance since this will update test requirements to what is currently used in the IBC.

**Impact to Small Business relative to the cost of compliance with code**
$0

### Requirements
**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
Yes, the standard has been revised and improved.

**Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
Yes

**Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
No

**Does not degrade the effectiveness of the code**
No

**Is the proposed code modification part of a prior code version?**
No

---

### Commentary
#### R7094-A1
**Proponent**
Mike Ennis

**Submitted**
2/25/2016

**Attachments**
Yes

**Comment:**

- To update to current ANSI/SPRI/FM 4435 ES-1 standard

**Fiscal Impact Statement**

**Impact to local entity relative to enforcement of code**
None

**Impact to building and property owners relative to cost of compliance with code**
None

**Impact to industry relative to the cost of compliance with code**
Reduce cost of compliance since this will update test requirements to what is currently used in the IBC.

**Impact to Small Business relative to the cost of compliance with code**
$0

**Requirements**

**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
Yes, the standard has been revised and improved.

**Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
Yes

**Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
No

**Does not degrade the effectiveness of the code**
No

**Is the proposed code modification part of a prior code version?**
No

---

#### R7094-G1
**Proponent**
Michael Fischer

**Submitted**
2/25/2016

**Attachments**
No

**Comment:**

- Please make the following editorial changes to the mod:
  - 1.3 – Leave as is do not delete reference to Florida Statute.
  - 2.4 – Retain this section.

---

#### R7094-G2
**Proponent**
Greg Keeler

**Submitted**
2/25/2016

**Attachments**
No

**Comment:**

Owens Corning Roofing and Asphalt, LLC is a manufacturer of roofing products and accessories that are approved for use in the HVHZ. After review of the proposed changes, we find that the change(s) to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is/are the subject of this code modification will improve the usability and consistency of the document significantly.

---

#### R7094-G3
**Proponent**
Jaime Gascon

**Submitted**
2/25/2016

**Attachments**
No

**Comment:**

Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the HVHZ, proposes to make the following editorial changes to the proposed mod:

- 1.3 – Leave as is do not delete/change.
- 2.4 – Leave as is do not delete/change.
See attached file.
Please see supporting file for proposed modifications
Comment:
Revise 2.4 to reference ANSI/SPRI/ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems with Low Slope Roofing Systems

Revise 7.1 as follows:
7.1 The minimum length of the membrane and edge shall be such that the edge sample contains three (3) attachment fasteners at the design fastener spacing, or is 3 ft. 0 in. (915 mm) in length, whichever is greater. The test specimen shall consist of a 42-inch wide "mock-up" of the termination system as it would be installed in an actual field application. Not less than five test specimens shall be constructed and tested.

Add new 8.1 that states:
8.1 Test per the requirements of the RE-1 test in ANSI/SPRI/ES-1 as modified herein. Renumber existing sections accordingly.

Revise current 8.1 as follows:
8.1 Mount the 42-inch wide test specimen to the base or holding device of the tensile tester such that the membrane is pulled at a 45-degree angle to the attachment substrate. This angle is chosen to simulate a "billowing" membrane.

Revise current 8.2 as follows:
8.2 Connect the tensile tester jaws to two bars which clamp the membrane edge creating an even load distribution across the 42-inch specimen width.

Revise Figure 1 to state 25° instead of 45°
TESTING APPLICATION STANDARD (TAS) No. 111(A)-95 TEST PROCEDURE FOR ROOF EDGE TERMINATION PERFORMANCE

1. Scope:

1.1 This protocol covers determination of the attachment performance of roof edge terminations.

1.2 The test procedures outlined in this protocol determine whether a roof edge termination, consisting of woodblocking, termination metal and the type of membrane being terminated, performs to resist an oblique load of 100 lbf/ft, as required in RAS 111.

1.3 All testing and calculations shall be conducted by an approved testing agency and all test reports, including calculations, shall be signed by a Registered Design Professional per F.S.; Section 471 or 484.

2. Referenced Documents:

2.1 ASTM Standards:

E 380 Excerpts from the Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)

2.2 The Florida Building Code, Building:

2.3 Application Standards:

RAS 111 Standard Requirements for Attachment of Perimeter Woodblocking and Metal Flashings

2.4 Single-Ply-Roofing-Institute:

SPRI Edge Design Guide, March 1994

2.5 Roof Consultants Institute:

Glossary of Terms

3. Terminology & Units:

3.1 Definitions—For definitions of terms used in this specification, refer to Chapter 2 and Section 1513 of the Florida Building Code, Building, and/or the RCI Glossary of Terms. The definitions from the Florida Building Code, Building shall take precedence.

3.2 Units—For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Significance and Use:

4.1 The method with which the edge of a roofing membrane is terminated (edge metal and woodblocking) is the last anchor point to hold the membrane in place should the membrane happen to separate from the roof deck during high winds. When this occurs, the membrane termination construction incurs a significant load.

4.2 The test procedure outlined herein provides a means for determining whether a particular membrane termination detail performs to resist an oblique load of 100 lbf/ft.

5. Apparatus:
5.1 The test apparatus shall consist of a tensile tester fitted with a suitable holding device for the membrane termination being tested. The load recording device attached to the tensile tester shall be capable of recording loads up to 300 lbf. (See Figures 1 and 2, herein.)

6. Test Limitations and Precautions:

6.1 This protocol may involve hazardous materials, operations and equipment. This protocol does not purport to address all of the safety problems associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

7. Test Specimen:

7.1 The test specimen shall consist of a 12 inch wide “mock-up” of the termination system as it would be installed in an actual field application. Not less than five test specimens shall be constructed and tested.

8. Procedure

8.1 Mount the 12 inch wide test specimen to the base or holding device of the tensile tester such that the membrane is pulled at a 45-degree angle to the attachment substrate. This angle is chosen to simulate a “billowing” membrane.

8.2 Photograph the test specimen prior to testing.

8.3 Connect the tensile tester jaws to two bars which clamp the membrane edge creating even load distribution across the 12 inch specimen width.

8.3.1 Failure is defined as any event which allows the membrane to come free of the edge termination or the termination to come free from the substrate.

8.4 Photograph the test specimen subsequent to failure.

8.5 Record the failure load for each of five test specimens and calculated an average failure load.

9. Interpretation of Results:

9.1 The membrane termination system shall record an average failure load not less than 100 lbf.

10. Report:

10.1 The final report shall include the following:

10.1.1 A complete description of the membrane termination system, including membrane type and attachment, edge metal type, material, thickness and attachment, and the attachment substrate (i.e., woodblocking, etc.).

10.1.2 Recorded failure loads for each of five test specimens and an average failure load.

10.1.3 Photographs of the test specimens prior and subsequent to failure.
FIGURE 1 MEMBRANE TERMINATION PERFORMANCE TEST CONFIGURATION OPTION

FIGURE 2 MEMBRANE TERMINATION PERFORMANCE TEST CONFIGURATION OPTION
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

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- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  
  $0

- **Impact to building and property owners relative to cost of compliance with code**
  
  $0

- **Impact to industry relative to the cost of compliance with code**
  
  - Reduced product approval expense

- **Impact to small business relative to the cost of compliance with code**
  
  $0

**Requirements**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  
  Updates important roofing requirements for HVHZ use.

- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  
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- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  
  Does not require use of any specific type of product.

- Does not degrade the effectiveness of the code
  
  Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? **No**
### Rationale
To update to current version of ANSI/SPRI/FM 4435 ES-1 where appropriate

### Fiscal Impact Statement

| Impact to local entity relative to enforcement of code | None |
| Impact to building and property owners relative to cost of compliance with code | None |
| Impact to industry relative to the cost of compliance with code | Reduce costs since test criteria similar to what is currently required in the IBC would be used. |

### Impact to Small Business relative to the cost of compliance with code
$0

### Requirements

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<td>Yes, includes improved test procedures</td>
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Is the proposed code modification part of a prior code version? No

### 1st Comment Period History

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<td>Mike Ennis</td>
<td>2/25/2016</td>
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#### Comment:

Please make the following editorial change to the mod:

2.4 – Retain this section.

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<td>Michael Fischer</td>
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#### Comment:

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- 2.4 – Leave as is do not delete/change.
See attached file.
See attached file for text of proposed modifications.
Comment:
Revise 2.4 to reference: ANSI/SPRI/FM 4435/ES-1 Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems with Low Slope Roofing Systems

Revise 5.2.1 to read:
The load transfer device shall consist of a 1 inch wide x 11 feet long x 1/8 inch thick steel bar that is 1 foot longer than the test specimen. The bar shall have 1/8 inch diameter predrilled holes spaced 12 inches o.c. with the two ends located 1/2 inch from each end of the bar.

Revise 5.2.2 to read:
The 11 feet long steel bar shall be mounted to the underside of the flange or load resisting component of the coping cap using 12 ga x 1 1/2 inch long annular ring shank nails.

Replace text in 7.1 to read:
All parts of the test specimen shall be full size in width and all other dimensions, using the same materials, details and methods of construction and anchoring devices (such as clips or cleats) as used on the actual building. Sample length shall be a minimum of 8 ft. (2.4 m). When the anchoring means at the ends of the edge flashing are normally used to restrain other additional lengths of edge flashing, then the anchoring means shall be modified so that only that percentage that might restrain rotational movement in the test specimen is used. A minimum of 1 face/top test and 1 top/back test shall be performed.

Revise 7.2 to read:
Prior to installation of the coping cap test specimen to its substrate, install the 11 feet long steel bar (load resisting device) through the back of the flange or load resisting component which is to be tested (i.e. top, inner, or outer vertical flange or cleat/hook strip) using 12 ga. by 1 1/2 inch long annular ring shank nails such that the points of the nails are directed outwardly normal from the load resisting component. (See Figures 1 and 2, herein.)

Add new 8.1 that states:
8.1 Test per the requirements of the RE-3 test in ANSI/SPRI/FM 4435/ES-1 as modified herein. Renumber existing sections accordingly.
TESTING APPLICATION STANDARD (TAS) No. 111(C)-95 TEST PROCEDURE FOR COPING CAP PULL-OFF PERFORMANCE

1. Scope:

1.1 This protocol covers determination of the pull-off resistance performance of various coping cap configurations when subjected to uniform loading.

1.2 The test procedures outlined in this protocol determine the resistance to uniform loading of a coping cap configuration, as required in RAS 111. Resistance to uniform loading is determined for the top face (upward loading) and both vertical (face) flanges (outward loading) of the coping cap.

1.3 All testing and calculations shall be conducted by an approved testing agency and all test reports, including calculations, shall be signed by a Registered Design Professional per F.S., Section 471 or 481.

2. Referenced Documents:

2.1 ASTM Standards:

E 380 Excerpts from the Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)

2.2 The Florida Building Code, Building.

2.3 Application Standards:

RAS 111 Standard Requirements for Attachment of Perimeter Woodblocking and Metal Flashings

2.4 Single Ply Roofing Institute:

ANSI/SPRI ES-1

2.5 Roof Consultants Institute:

Glossary of Terms

3. Terminology & Units:

3.1 Definitions—For definitions of terms used in this specification, refer to Chapter 2 and Section 1513 of the Florida Building Code, Building; and/or the RCI Glossary of Terms. The definitions from the Florida Building Code, Building shall take precedence.

3.2 Units—For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Significance and Use:

4.1 The test procedure outlined herein provides a means for determining the maximum upward and outward pressures which a coping cap and its attachment can resist without failure.

4.2 Results from this testing are used to determine whether a proposed coping cap and corresponding attachment method will provide sufficient resistance to upward and outward pressures to meet or exceed corresponding design pressures for perimeter and corner areas of a particular building, determined in compliance with Section 6 of RAS 111.
5. Apparatus:

5.1 Load application device

5.1.1 The load application device shall consist of a tensile tester, or other device capable of providing uniform load, fitted with a load cell capable of recording loads up to 10,000 lbf.

5.1.2 The load application device shall be fitted with an 11 foot long clamp or a series of ten 2 inch wide clamps capable of grasping a series of ten 12 ga. annular ring shank nails which form part of the load transfer device.

5.2 Load transfer device

5.2.1 The load transfer device shall consist of a 1 inch wide x 11 foot long by 1/8 inch thick steel bar with 1/8 inch diameter predrilled holes spaced 12 inches o.c. with the two end holes located 1/2 inch from each end of the bar.

5.2.2 The 11 foot long steel bar shall be mounted to the underside of the flange or load resisting component of the coping cap using 12 ga. by 1 1/2 inch long annular ring shank nails.

5.3 A schematic of the test apparatus is provided in Figures 1 and 2, herein.

5.4 The description of the test apparatus is general in nature and may be altered for ease of testing, provided the intent of the test is maintained.

6. Test Limitations and Precautions:

6.1 This protocol may involve hazardous materials, operations and equipment. This protocol does not purport to address all of the safety problems associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

7. Test Specimen:

7.1 The test specimen shall consist of a 10 foot long “mock-up” of the coping cap as it would be installed in an actual field application. Not less than five test specimens shall be constructed and tested for each directional load (i.e., upward load resistance from the top and outward load resistance from each vertical flange).

7.2 Prior to installation of the coping cap test specimen to its substrate, install the 11 foot long steel bar (load transfer device) through the back of the flange or load resisting component which is to be tested (i.e., top, inner or outer vertical flange or cleat/hook strip) using 12 ga. by 1 1/2 inch long annular ring shank nails such that the points of the nails are directed outwardly normal from the load resisting component. (See Figures 1 and 2, herein.)

8. Procedure:

8.1 Photograph the test specimen prior to testing.

8.2 Position the test specimen, fitted with the load transfer device, in front of the load application device (tensile tester) and attach the 11-foot long clamp or series of ten clamps to the ends of the load transfer nails such that the clamp(s) do not interfere with the movement of the coping cap.
whichever and load generated from the load application device is normal to the surface of the coping cap flange or load resisting component being tested.

8.3 Apply an initial load of 300 lbf to the load transfer device and hold the applied load for a period of one minute. At the end of one minute, reduce the load to zero and allow the test specimen to sit at zero-load for a period of two minutes. Thereafter, increase the applied load to 350 lbf and hold the applied load for a period of one minute. At end of one minute, reduce the load to zero-load and allow the test specimen to sit at zero-load for a period of two minutes. Continue this procedure in load increments of 50 lbf until failure, as defined below, occurs.

8.3.1 Failure is defined as any occurrence of the following:

• loss of securement;

• permanent deformation; or,

• component failure that will not allow the coping cap to perform as designed.

8.4 Photograph the test specimen subsequent to failure.

8.5 Record the failure load and the time at which failure occurred for each of five test specimens and calculated an average failure load.

9. Interpretation of Results:

9.1 Convert the average failure load to pressure using the following equation:

\[
P = \frac{F}{A}
\]

where:

P = maximum pressure (psf);
F = average failure load (lbf); and,
A = area of flange or load resistance component.

9.2 The maximum pressure (outward or upward) shall meet or exceed corresponding design pressures for perimeter and corner areas of a particular building, determined in compliance with Section 6 of RAS 111.

10. Report:

10.1 The final report shall include the following:

10.1.1 A complete description of the coping cap system, including coping cap type, material, thickness and attachment, cleat or hook strip type, material, thickness, dimensions and attachment (if any), and the attachment substrate (i.e. woodblocking, etc.).

10.1.2 Recorded failure loads for each of five test specimens, an average failure load and a maximum pressure of the coping cap system.
10.1.3 Photographs of the test specimens prior and subsequent to failure.

FIGURE 1 VIEW OF OUTWARD LOADING OF COPING CAP VERTICAL FLANGE (OUTWARD LOADING OF OTHER VERTICAL FLANGE ALSO REQUIRED)
FIGURE 2 VIEW OF OUTWARD LOADING OF COPING CAP VERTICAL FLANGE (UPWARD LOAD RESISTANCE)
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

These proposed modifications include:
- Removal of references to withdrawn standards.
- Removal of references to legacy documents, including ICBO acceptance criteria.
- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
- Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

**Fiscal Impact Statement**

- Impact to local entity relative to enforcement of code: $0
- Impact to building and property owners relative to cost of compliance with code: $0
- Impact to industry relative to the cost of compliance with code: Reduced product approval expense.
- Impact to small business relative to the cost of compliance with code: $0

**Requirements**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
- Updates important roofing requirements for HVHZ use.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
- Removes outdated references.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
- Does not require use of any specific type of product.
- Does not degrade the effectiveness of the code
- Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? No

**1st Comment Period History**

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<th>Proponent</th>
<th>Submitted</th>
<th>Attachments</th>
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<tr>
<td>Aaron Phillips</td>
<td>2/10/2016</td>
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Comment:

TAMKO Building Products, Inc., a manufacturer of roofing products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
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TESTING APPLICATION STANDARD (TAS) 121-95 STANDARD REQUIREMENTS FOR TESTING AND APPROVAL OF ROOFING ADHESIVES, MASTICS AND COATINGS

1. Scope:

1.1 This protocol cover the procedures for testing of adhesives, mastics and coatings used in roofing applications and the approval process for all products which have successfully met the testing criteria.

1.2 This protocol applies to all products used in both low and steep slope roofing applications, other than sealants (see TAS 132 for sealant requirements).

1.3 All testing shall be conducted by an approved testing agency, which provides a listing service. All test reports shall be executed by a professional engineer and an authorized signatory of the testing/listing agency.

1.4 This protocol establishes the testing and listing program required of these products to confirm continuing compliance with the ASTM or Testing Application Standards.

1.5 This protocol has not been contemplated to measure the performance of the adhesives, mastics and coatings in conjunction with all approved roof system assemblies.

2. Referenced Documents:

2.1 The Florida Building Code, Building.

2.2 ASTM Standards:

D 140 Standard Practice for Sampling Bituminous Materials
C 1021 Standard Practice for Laboratories Engaged in the Testing of Building Sealants
D 1079 Standard Definitions and Terms Relating to Roofing, Waterproofing and Bituminous Materials
E 380 Excerpts from the Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)

2.3 Application Standards

TAS 110 Testing Requirements for Physical Properties of Roof Membranes, Insulation Coatings and Other Roofing Components.

2.4 Roof Consultants Institute:

Glossary of Terms

3. Terminology:

3.1 Definitions – For definitions of terms used in this Protocol, refer to ASTM D 16; and/or ASTM D 1079 and/or Chapter 2 of the Florida Building Code, Building; and/or the RCI Glossary of Terms. Definitions from the Florida Building Code, Building shall take precedence.
3.2 Units—For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Test Specimens:

4.1 Sampling of all bituminous products under this Protocol shall be in compliance with ASTM D 140.

4.2 Unless otherwise noted in the specific ASTM Test Standard, sampling of all non-bituminous products under this protocol shall be in compliance with ASTM C 1021. Particular reference is made to Subsection 5.2.1 of this test standard.

5. Listing Services:

5.1 All products which require testing shall be tested by an approved testing agency which provides an annual listing service.

5.2 All products shall be listed in the testing agency’s annual directory and shall be subject to unannounced manufacturing audits to insure compliance with manufacturing guidelines.

6. Testing Requirements:

6.1 All products noted herein which successfully obtain Product Approval shall have been tested in compliance with all applicable ASTM or Testing Application Standards enumerated in TAS 110.

6.2 All applicable test data and test reports shall be submitted with the roofing component manufacturer’s application for Product Approval.

6.3 When a roofing component Product Approval is attained, the approved product shall have its Product Approval number imprinted on it or its packaging, along with the approved testing/listing agency’s name and logo, as noted in Section 6.3 herein.

7. Packaged Material:

7.1 Packaged material shall bear a label indicating certified by the manufacturer to be in compliance with this specification and shall be labeled in compliance with Section 1517 of the Florida Building Code, Building. Product Approval documents shall be provided to the purchaser or end user upon request.

7.2 Shipping containers—Packaging materials shall be marked by the manufacturer as required by the approval entity with the name of the material, stock number, lot number, year of issue and quantity therein and the name of the manufacturer or supplier.

8. Rejection and Reinspection

8.1 The authority having jurisdiction may periodically purchase commercial quantities of the approved product for testing at approved Testing Agencies to confirm compliance with the provisions
of the ASTM Standard or Testing Application Standards. Failure to meet the minimum physical property and performance properties of the test standard shall constitute grounds for rejection of the lots and suspension of the Product Approval. In cases of rejection the Authority Having Jurisdiction shall request removal of the rejected lot number(s) from commercial sale.

8.2 The Authority Having Jurisdiction may, after rejection of one or more lots, require third-party quality control inspection as a provision to lifting of approval suspension.
### Comments

| General Comments | No | Alternate Language | No |

### Related Modifications

- RAS TAS

### Summary of Modification

- HVHZ roofing updates

### Rationale

The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort. These proposed modifications include:

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ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

### Fiscal Impact Statement

- Impact to local entity relative to enforcement of code: $0
- Impact to building and property owners relative to cost of compliance with code: $0
- Impact to industry relative to the cost of compliance with code: Reduced product approval expense.
- Impact to small business relative to the cost of compliance with code: $0

### Requirements

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Updates important roofing requirements for HVHZ use.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Removes outdated references.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Does not require use of any specific type of product.
- Does not degrade the effectiveness of the code
  - Ensures that the code is up to date with available research and referenced standards.

### Is the proposed code modification part of a prior code version? No

### 1st Comment Period History

| Proponent | Aaron Phillips | Submitted | 2/10/2016 | Attachments | No |

**Comment:**

TAMKO Building Products, Inc., a manufacturer of roofing products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
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<th>Michael Fischer</th>
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TESTING APPLICATION STANDARD (TAS) 124-11 TEST PROCEDURE FOR FIELD UPLIFT RESISTANCE OF EXISTING MEMBRANE ROOF SYSTEMS AND IN SITU TESTING FOR REEROOF AND NEW CONSTRUCTION APPLICATIONS

1. Scope:

1.1 This protocol covers the determination of the resistance to uplift pressure of newly installed, adhered, built-up, bituminous roofing systems over mechanically attached or adhered rigid board insulation over various deck types.

1.2 The test procedures outlined herein are intended to determine the performance of a new roof system assembly when installed over an existing roof system assembly or directly over a roofing substrate.

1.3 The test procedures outlined herein are intended to determine whether the uplift resistance performance of an existing Roof System Assembly meets the design pressure requirements of ASCE 7, as required in Section 1609 of the Florida Building Code, Building. The design pressure requirements for the building in question are listed on Section II of the Uniform Building Permit.

1.4 Tests shall be conducted prior to full-scale test assemblies to ensure that the specific maximum pressures set forth in the built-up roofing manufacturer’s Product Approval can be achieved utilizing the specified components (i.e., fasteners, insulation, etc.).

1.5 When insulation boards are mechanically attached or adhered to the deck, the test shall be conducted not less than 7 days after roofing work is complete. Systems containing cold adhesive shall be in place not less than 14 days prior to conducting the test.

1.6 All testing shall be conducted by an approved testing agency and all test reports shall be signed by a Registered Design Professional per F.S., Section 471 or 481 or Registered Roof Consultant.

1.7 Design pressures calculated in accordance with ASCE 7 are permitted to be multiplied by 0.6 for the purposes of comparing to tested pressures in TAS 124.

2. Referenced Documents:

2.1 ASTM Standards

D 41 Standard Specification for Asphalt Primer used in Roofing, Damp proofing, and water proofing
D 1079 Definitions and Terms Related to Roofing, Waterproofing and Bituminous Materials
E 380 Excerpts from Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)
E 575 Practice for Reporting Data from Structural Tests of Building Constructions, Elements, Connections and Assemblies.
E 907 Test Method for Field Testing Uplift Resistance of Roofing Systems Employing Steel Deck, Rigid Insulation and Bituminous Built-Up Roofing

2.2 Factory Mutual Engineering Corporation:
Loss Prevention Data Sheet 1-28(S), November, 1991
Loss Prevention Data Sheet 1-48, June, 1986
Loss Prevention Data Sheet 1-52, February, 1986
2.3 National Roofing Contractors Association:
NRCA/ARMA Manual of Roof Maintenance and Repair
NRCA Roofing and Waterproofing Manual

2.4 The Florida Building Code, Building:
Chapter 16 (High-Velocity Hurricane Zones) Design Loads
Chapter 19 (High-Velocity Hurricane Zones)
Reinforced Gypsum Concrete and Insulating Concrete
Chapter 21 (High-Velocity Hurricane Zones) Masonry
Chapter 22 (High-Velocity Hurricane Zones) Steel and Iron
Chapter 23 (High-Velocity Hurricane Zones) Wood
Chapter 15 (High-Velocity Hurricane Zones) Roof Assemblies and Rooftop Structures, Covering and Application

2.5 Application Standards:
TAS 105 Test Procedure for Field Withdrawal Resistance Testing
TAS 114 Test Procedures for Roof System Assemblies in the High-Velocity Hurricane Zone Jurisdiction

2.6 Application Standards:
RAS 111 Standard Requirements for Attachment of Perimeter Woodblocking and Perimeter Flashing
RAS 117 Standard Requirements for Bonding or Mechanical Attachment of Insulation Panels to and
RAS 117 Mechanical Attachment of Anchor or Base Sheets to Various Substrates

2.7 Roof Consultants Institute:
Glossary of Terms

3. Terminology & Units:
3.1 Definitions—For definitions of terms used in this Protocol, refer ASTM D 1079; Chapter 2 and
Section 1513 of the Florida Building Code; Building and/or the RCI Glossary of Terms. Definitions from the Florida Building Code, Building shall take precedence.

3.2 Units—For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Significance and Use:
4.1 The field test procedures specified herein provide a means for determining the uplift resistance of a new, adhered, built-up, bituminous roof system assembly, as stated in applicable specification
bid documents, installed on a building within the high-velocity hurricane zone. The test procedures
are intended to confirm and supplement the uplift resistance performance of roofing systems as
determined under laboratory conditions and confirm that a given installation meets the design
pressure requirements under ASCE 7, as required in Section 1609 of the Florida Building Code,
Building.

4.1.1 Field testing of an assembly may be used to support the uplift resistance performance of a
specific roof system assembly when the required number of samples noted in Section 7.1 and 7.2
have been tested, and averaged. A margin of safety of 1.45:1 shall be applied to the sample
average.

4.1.2 Laboratory conditions may enable uplift investigations to include:

- examination of the critical components and their orientation within the roof system assembly;

- examination of the roof system assembly’s long-term uplift resistance; and

- examination of the roof system assembly’s uplift resistance from the dynamic affect of variable wind velocities.

4.2 A contractor licensed to install roofing in the high-velocity hurricane zone shall be present during all tests should roof repairs be necessary. Any roofing component damaged during testing shall be repaired immediately subsequent to test completion.

4.3 When new construction will require a tear off of the existing roof system assembly, areas of existing roofing shall be removed to deck level. Sample assemblies shall be applied including a lifting panel, as detailed in Section 5.2 when the bonded pull test procedure is utilized. Sample panels shall be covered and waterproofed with a membrane roof covering to return the existing assembly to a waterproof condition.

5. Apparatus:

5.1 Bell chamber tests:

5.1.1 Square Uplift Chamber

- The square pressure chamber shall be 60 + 1/2 inch (1500 ± 15 mm) in size with a maximum height in the center of the bell of 18 inches.

- The chamber shall be of sufficient strength to withstand not less than 125 pounds per square foot without collapsing.

5.1.2 Pressure measurement device:

- The pressure within the square uplift chamber shall be measured with a manometer which is calibrated to indicate negative pressures in increments of 15 ± 0.5 pound foot per square foot (720 ± 20 Pa).

5.1.3 Vacuum pump:

- Negative pressures shall be created within the pressure chamber with a vacuum pump of sufficient capacity to create the negative pressures specified in Section 8.9.

- The vacuum pump shall also be equipped with controls to maintain a constant pressure at each test pressure increment, as noted in Section 8.9.

5.1.4 Dial indicator:

- Membrane deflections shall be measured using an analog dial indicator with a reset face graduated in units not greater than 0.002 inch (0.05 mm) and having a range not less than 2 inches (50 mm).

- The analog dial indicator shall be mounted at the center of a 2 inch by 2 inch (50 mm by 50 mm)
aluminum (or material of equivalent stiffness) bar having a length of 60 inches (1500 mm). The bar shall be supported with support legs which clear the roof membrane by not less than 2 inches (50 mm).

5.2 Bonded pull test:

5.2.1 Load transfer device:

- The load transfer device shall consist of two pieces of 2 feet square, $\frac{7}{16}$ inch thick plywood fastened together using 12 each, $1\frac{1}{4}$ inch long wood screws to form a 2 feet by 2 feet by $1\frac{3}{4}$ inch panel. Screw placement shall be as noted in Figure 1, below.

![Figure 1 Screw and Eye-Bolt Locations](http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_7098_Text_TAS_124-11_4.png)

**FIGURE 1 SCREW AND EYE-BOLT LOCATIONS**

- Alternatively the top plywood panel may be substituted with a $\frac{3}{8}$ inch thick steel panel reinforced with two 2 inch sections of angle iron welded to the top face of the panel. The steel panel shall have $\frac{7}{16}$ inch diameter holes drilled at locations noted in Figure 1, above, through which $\frac{1}{8}$ inch countersunk machine screws shall be installed through the base of the plywood panel and secured to the steel plate with a washer and wing nut. (See Figure 2, below.)
FIGURE 2 ALTERNATE LOAD TRANSFER DEVICE

- One \( \frac{3}{4} \) inch diameter eye-bolt shall be installed in the center of the test panel and shall be secured to the underside with a lock nut and washers, as noted in Figure 1, above. Alternatively a ring shall be welded to the steel panel.

- A block and tackle or chain hoist shall be attached to the eye-bolt or welded ring with the opposite end attached to the top of a tripod, or equivalent support system, capable of withstanding a minimum of 1200 lbf downward load. The hoist assembly shall be capable of an incremental rise of \( \frac{1}{4} \) inch.

5.2.2 Load cell:

- A load cell, or equivalent load measurement device, capable of recording loads up to 2000 lbf to an accuracy of 0.5 lbf, shall be attached between the hoist assembly and the eye-bolt or welded ring to measure the applied load.

6. Test Limitations and Precautions:

6.1 General:

6.1.1 Conduct tests when the roof’s surface temperature is within a range of 40°F to 100°F (4°C to 38°C) as measured by a surface thermometer. The surface temperature shall be noted on the test report.

6.1.2 For safety considerations, it is recommended that tests not be conducted when the wind speed at the roof level is greater than 15 miles per hour (6.5 m/s). (A portable anemometer to measure wind speed may be utilized.)

6.2 Bell chamber tests:

6.2.1 The manometer shall serve as a safety device to prevent negative pressures that could cause the plastic or fiberglass dome to shatter. The maximum negative pressure for the dome shall be clearly marked on the manometer. Alternatively other safety features shall be added to the test chamber to eliminate negative pressure greater than the design capabilities of the dome.

6.2.2 Safety goggles or face shield shall be worn by persons operating the equipment or observing its operation as a precaution against injury that could be caused by sudden failure of the test chamber or roofing system.

6.2.3 Care shall be taken to ensure that movement of persons and/or equipment during the test does not lead to movement of the analog dial indicator. During the test, all persons not involved shall stay far enough away from the test area to not influence the analog dial indicators.

6.2.4 Testing under this protocol shall be conducted on mechanically attached roof system assemblies.

6.3 Bonded pull test:

6.3.1 Testing shall only be conducted on fully adhered roof coverings.

6.3.2 Proper safety equipment shall be utilized and proper safety procedures followed during the
application of hot asphalt or coal tar pitch. Application of roofing products shall be in compliance with the safety guidelines published and recommended by the roof membrane manufacturer and by the National Roofing Contractors Association.

7. Sampling:

7.1 The total number of tests to be conducted when testing over an existing roof assembly is listed in Table 1, below. Of these tests, half shall be conducted at selected locations within the perimeter area of the roof and half shall be conducted at selected locations within the field area of the roof.

### TABLE 1 NUMBER OF BELL CHAMBER OR BONDED PULL TESTS TO BE CONDUCTED PER ROOF AREA

<table>
<thead>
<tr>
<th>Roof Area (A)</th>
<th>Number of Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 squares $&lt; A &lt; 50$ squares $(100 \text{ m}^2 &lt; A &lt; 450 \text{ m}^2)$</td>
<td>2</td>
</tr>
<tr>
<td>50 squares $&lt; A &lt; 100$ squares $(450 \text{ m}^2 &lt; A &lt; 1000 \text{ m}^2)$</td>
<td>4</td>
</tr>
<tr>
<td>$A &gt; 100$ squares $(A &gt; 1000 \text{ m}^2)$</td>
<td>4 plus 1 additional test for each additional 100 squares $(1000 \text{ m}^2)$ or portion thereof</td>
</tr>
</tbody>
</table>

$1 \text{ square} = 100 \text{ ft}^2 = 9.3 \text{ m}^2$

7.2 Three test samples are required for all assemblies tested on any size roof deck when the test assembly is applied directly to the substrate for confirmation of design pressure performance. (See Section 4.1.1.)

8. Acceptable Roof Deck Constructions:

8.1 Acceptable deck types for testing under this protocol are as follows:

* minimum $\frac{15}{32}$ inch plywood or wood plank;
* cementitious wood fiber;
* poured gypsum concrete;
* structural poured concrete;
* structural concrete plank;
* aggregate lightweight insulating concrete;
* cellular insulating lightweight concrete;
* aggregate/cellular insulating lightweight;
* 18-22 gage steel;
• > 22 gage steel; and
• composite deck system (e.g. load master).

9. Procedure:

9.1 Bell chamber tests over an existing roof system assembly:

9.1.1 The test area's membrane surface shall be clean, smooth and dry to provide a continuous contact surface for the edges of the pressure chamber. For roof surfaces which contain surfacing such as gravel, slag or granules, the test areas shall be prepared as follows:

• Remove the loose gravel surfacing; sweeping a 12 inch (300 mm) wide square in which the chamber perimeter will be placed.

• Apply a heavy pouring of hot asphalt over the swept area and allow to completely cool.

• This test area preparation is intended to provide a continuous, smooth surface to which the edges of the test chamber make contact such that accurate pressure measurements are taken.

9.1.2 Place the bar with attached dial indicator such that the tip of the dial indicator is in contact with the roof membrane at the center of the test area.

9.1.3 Place the assembled chamber over the roof test area such that the bar with attached dial indicator is centered within the chamber and is perpendicular to the sides of the chamber. The edges of the chamber shall be in complete contact with the roof surface. Position the chamber such that its edges are parallel with the direction of the structural framing of the building.

9.1.4 Install the pressure measurement device to the uplift pressure chamber and calibrate to zero pressure.

9.1.5 Position the vacuum pump over the hole provided in the chamber, insuring that the bypass valve on the pump is open before starting the pump or, if a rheostat is used, that it is in the OFF position.

9.1.6 Raise the pressure within the chamber to $15 + 0.5 \text{ lb/ft}^2 (720 + 20 \text{ Pa})$ and hold this pressure level for one minute.

9.1.7 Continuously observe the deflection and pressure measurement device throughout the vacuum pumping process for sudden or variable rates of movement.

9.1.8 At the end of the first one minute interval, increase the pressure within the chamber in increments of $15 + 0.5 \text{ lb/ft}^2 (720 + 20 \text{ Pa})$, holding each pressure level for a period of one minute, until:

• the roof system assembly fails, as noted in Section 10.1; or,

• the pressure within the chamber is held at the design pressure for the particular roof area (i.e., field, perimeter or corner area) for a period of one minute. These design pressures are determined in compliance with ASCE 7, as specified in Section 1609 of the Florida Building Code, Building and are listed on Section II of the Uniform Building Permit.

9.1.9 If “failure,” as defined in Section 10.1, occurs, record the applied load and time.
R7098 Text Modification

Roofing

2017 Triennial

9.2 Bell chamber test for a new roof system assembly applied directly to the substrate:

9.2.1 Remove the existing roofing membrane to the deck in an area of 8 feet by 8 feet, thoroughly cleaning the deck of all existing roofing material.

9.2.2 If the new assembly is to be adhered, prime the deck with ASTM D 41 primer and allow to completely dry.

9.2.3 Install the proposed roof system assembly utilizing the precise materials proposed for the reroof application. Install the test assemblies in strict compliance with published application recommendations.

9.2.4 Provide the testing agency with two copies of manufacturer’s literature and application instructions.

9.2.5 Allow the test panel to cure for 48 hours if applied in hot asphalt or 28 days if solvent or waterbased adhesives are employed.

9.2.6 Do not apply aggregate surfacing to the test assembly. If an aggregate surface or coating is to be applied to the final assembly finish the test assembly with a flood coat of asphalt at an application rate of 384 pounds ± 10 pounds.

9.2.7 Seal the test assembly by strip flashing the test panel to the existing roof system assembly.

9.2.7.1 If the test assembly is lower than the existing roof system assembly the test assembly area shall be filled with a loose insulation material and the test area shall be covered for the cure period.

9.2.8 Testing of the panel shall be as noted in Section 9.1

9.3 Bonded pull test over existing roof system assemblies:

9.3.1 The test area’s membrane surface shall be clean, smooth and dry to provide a continuous contact surface for test panel adhesion.

9.3.2 Cut an indentation in the center of the test area to accommodate the nut and washer on the underside of the test panel where a double plywood panel is used. Outline the test area perimeter, assign a reference number and photograph.

9.3.3 Suspend the wood or wood and steel test panel, with eye-bolt or welded ring installed, from the load application apparatus and record the downward load.

9.3.4 Apply a flood coat of hot steep asphalt or coal tar pitch over the marked test area at an application rate of 4 lb/ft² and float the test panel into place. Allow a curing time of 24 hours for hot asphalt and 48 hours for coal tar pitch applications. Curing time may vary due to atmospheric conditions.

9.3.4.1 Report any variation in cure time.

9.3.4.2 The flood coat application rate may be increased for unusual conditions to ensure a complete bond of the test assembly.

9.3.4.3 Report any variation in the adhesive application rate.
9.3.5 Determine the required uplift force (F) to be applied using information determined in Section 9.3.3 and the following equation:

\[ F = (4 \times P) + W \]

where,

- \( F \) = required uplift force (lbf);
- \( P \) = design pressure (lbf/ft²); and
- \( W \) = weight of test panel (lbf).

9.3.6 When the flood coat, noted in Section 9.3.4, has fully cured, cut a 2 inch to 3 inch wide strip through the roof covering around the test panel down to deck level. The intent is to fully isolate the test sample from surrounding roofing materials.

9.3.7 Position the support system over the test panel and attach the load application and measurement devices to the eye-bolt or welded ring.

9.3.8 Apply an initial load of 40 lbf plus the weight of the test panel \((W + 40)\) and hold for 1 minute. After the initial 1 minute, increase the applied load by 40 lbf increments in 1 minute time intervals until the design pressure \((P)\) is attained, as noted in Table 2, below.

**TABLE 2 APPLIED LOAD INCREMENTS**

<table>
<thead>
<tr>
<th>Load (lbf)</th>
<th>Pressure (psf)</th>
<th>Hold Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( W + 80 )</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>( W + 120 )</td>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>( W + 160 )</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>( W + 200 )</td>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>( F )</td>
<td>( P )</td>
<td>1</td>
</tr>
</tbody>
</table>

9.3.9 If "failure," as defined in Section 10.2, occurs, record the applied load and time.

**10. Interpretation of Results:**

10.1 Bell chamber test:

10.1.1 Most roof system assemblies subjected to a negative pressure will exhibit an upward deflection that will increase as the negative pressure increases. Poorly adhered systems will exhibit relatively large increases in upward deflections with relatively small increases in applied pressure. For roof system assemblies that are well adhered, the increase in deflection will be gradual and at a relatively constant rate up to a point at or near failure. The upward deflection may slowly increase while maintaining the pressure within the chamber. When failure occurs due to lack of adhesive or cohesive resistance of the roof system assembly, there will be a sudden increase in the upward deflection, and most likely the deflection will exceed the capacity of the dial indicator.

10.1.2 Any roof system assembly which exhibits an upward deflection greater than or equal to 1 inch
(25 mm) during any of the tests shall be considered as failing at the point where 1 inch (25 mm) of deflection is recorded.

10.1.3 An upward deflection in excess of 1/4 inch (6 mm) or a sudden increase in deflection, as measured by the dial indicator, may indicate an attachment and/or adhesion problem in the roof system assembly and may require further investigation.

10.1.4 Upward deflection of the roof system assembly due to negative pressure may vary at different locations due to varying stiffness of the roof system assembly. Stiffness of a roof system assembly is influenced by the thickness of insulation; stiffness of decking; and by the type, proximity and rigidity of connections between the decking and framing system.

10.2 Bonded pull test:

10.2.1 Any roof system assembly which exhibits delamination of any portion of the test sample prior to the full 1 minute duration at an applied load equal to the design load (F) shall be considered as failing the bonded pull test.

10.2.2 If delamination occurs between the plywood test panel and the roof covering, the test panel shall be re-adhered to the test area, increasing the curing period of the hot steep asphalt coal tar pitch or such other adhesive material that may better adhere the test panel to the roof membrane.

11. Report:

11.1 Refer to ASTM E 575 for general use in reporting structural performance tests of building assemblies.

11.2 For either bell chamber tests or bonded pull tests, the final report shall include the following:

11.2.1 A copy of the roof system assembly manufacturer’s Product Approval, indicating the maximum design pressure for the system, product data sheets and published application instructions.

11.2.2 A copy of Section II of the Uniform Building Permit for the project in question indicating design pressures for the field area, perimeter area, and if applicable, corner and extended corner areas of the structure.

11.2.3 The area, height, and plan view of the roof showing the location of the test areas, numbered to correspond with the test report.

11.2.4 A complete detailed description of the roof system assembly construction being tested. Include the type of steel roof deck and method of attachment, deck support spacing, vapor retarder and adhesive (if any), types and thicknesses of insulation and methods of attachment, and the type of adhered roof membrane including surfacing.

11.2.5 Dates of tests, air and roof surface temperatures, wind velocity.
11.2.6 Names, signatures and affiliations of all persons observing the tests.

11.2.7 Photographs documenting all pertinent aspects of the test, including test assembly construction, actual testing, failure examination (if applicable), and repair procedures (if applicable).

11.3 For bell chamber tests, the final report shall include the following:

11.3.1 A brief description of the test procedure, including the negative pressure increments, hold times for each pressure increment and the maximum applied pressure.

11.3.2 Tabulated results recorded at each pressure increment including observations and deflection measurements. Deflection shall be recorded at the start and end of each pressure increment.

11.3.3 If “failure” occurs during any of the bell chamber tests, the test area shall be cut and thoroughly examined and the complete record should include:

• the negative pressure at which the failure occurred;

• the type of failure and its location within the roof system assembly; and,

• other observations of the roof system assembly conditions that may be attributed to the failure.

The cut area of roofing should be repaired after examination of the failed area or where roofing has been removed to deck level for the purpose of testing. Insulated assemblies shall be filled with like insulation prior to membrane repair.

11.3.4 The attached “Bell Chamber Test Results” sheet completed in full. Make photocopies of the “Data Recording Sheet” and indicate on each sheet the “Level #” and the “Test #.”

11.4 For bonded pull tests, the final report shall include the following:

11.4.1 A brief description of the test procedure, including the applied load increments, hold times for each load increment, the maximum applied load and the calculated maximum applied pressure.

11.4.2 Tabulated results recorded at each applied load increment including observations.

11.4.3 If “failure” occurs during any of the bonded pull tests, the test area shall be cut and thoroughly examined and the complete record should include:

• the applied load and calculated applied pressure at which the failure occurred;

• the type of failure and its location within the roof system assembly; and

• other observations of the roof system assembly conditions that may be attributed to the failure.
The cut area of roofing should be repaired after examination of the failed area or where roofing has been removed to deck level for the purpose of testing. Insulated assemblies shall be filled with like insulation prior to membrane repair.

11.4.4 The attached “Bonded Pull Test Results” sheet completed in full. Make photocopies of the “Data Recording Sheet” and indicate on each sheet the “Level #” and the “Test #.”
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

These proposed modifications include:
- Removal of references to withdrawn standards.
- Removal of references to legacy documents, including ICBO acceptance criteria.
- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
- Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

Impact to local entity relative to enforcement of code
$0

Impact to building and property owners relative to cost of compliance with code
$0

Impact to industry relative to the cost of compliance with code
Reduced product approval expense.

Impact to small business relative to the cost of compliance with code
$0

Requirements
- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  Updates important roofing requirements for HVHZ use.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  Removes outdated references.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  Does not require use of any specific type of product.
- Does not degrade the effectiveness of the code
  Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? No

Comment: TAMKO Building Products, Inc., a manufacturer of roofing products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
See attached file.
TESTING APPLICATION STANDARD (TAS) 132-95 STANDARD REQUIREMENTS FOR TESTING AND APPROVAL OF SEALANTS USED IN ROOFING

1. Scope:

1.1 This Protocol covers the procedures for testing of sealants used in roofing applications and the approval process for all products which have successfully met the test criteria.

1.2 All testing shall be conducted by an approved testing agency, and all test reports shall be signed by an authorized signer of the testing/listing agency.

1.3 This Protocol has not been contemplated to measure the performance of the sealants in conjunction with any particular Roof System Assembly.

2. Referenced Documents:

2.1 The Florida Building Code, Building.

2.2 ASTM Standards

C 661 Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer
C 679 Test Method for Tack-Free Time of Elastomeric Sealants
C 719 Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement
C 792 Test Method for Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants
C 793 Test Method for Effects of Accelerated Weathering on Elastomeric Joint Sealants
C 794 Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
C 1021 Standard Practice for Laboratories Engaged in the Testing of Building Sealants
D 140 Standard Practice for Sampling Bituminous Materials
D 412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers – Tension
D 624 Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
D 1079 Method for Rubber Property – Tear Resistance.
D 1149 Standard Definitions and Terms Relating to Roofing, Waterproofing and Bituminous Materials
D 2122 Test Methods for Rubber Deterioration – Cracking in an Ozone Controlled Environment
E 388 Excerpts from the Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)
D 16-14 Standard Terminology for Paint, Related Coatings, Materials, and Applications

2.3 Application Standards

TAS 110 Standard Requirements for Physical Properties of Roof Membranes, Insulation, Coatings and Other Roofing Components.

2.4 Roof-Consultants Institute
Glossary of Terms

3. Terminology:

3.1 Definitions - For definitions of terms used in this Protocol, refer to ASTM D 16 and/or ASTM D 1079 and/or Chapter 2 of the Florida Building Code, Building and/or the RCI Glossary of Terms. Definitions from the Florida Building Code, Building shall take precedence.

3.2 Units - For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Limitations and Precautions:

4.1 This Protocol may involve hazardous materials, operations and equipment. This Protocol does not purport to address all of the safety problems associated with its use. It is the responsibility of whomever uses this Protocol to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

5. Sampling:

5.1 Unless otherwise noted in the specific ASTM Test Standard, sampling of all non-bituminous products under this Protocol shall be in compliance with ASTM C 1021. Particular reference is made to Subsection 5.2.1 of this ASTM Test Standard.

6. Materials and Manufacture:

6.1 Composition - Sealants shall consist of an elastomeric material that can be applied in a bead to create a homogenous sealant joint, such as, but not limited to:

- one-part, low modulus, neutral-curing silicone;
- one-part, architectural grade polyurethane;
- one-part, architectural grade butyl rubber sealant;
- one-part, architectural grade poly sulfide; or,
- acrylic.

7. Performance Requirements:

7.1 Physical Properties - Sealants products used in roofing shall be in compliance with the minimum physical property requirements listed below:

**PHYSICAL PROPERTY REQUIREMENTS**

<table>
<thead>
<tr>
<th>Physical Property</th>
<th>Test Standard</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint Movement</td>
<td>C 719</td>
<td>min. ± 25%</td>
</tr>
<tr>
<td>Capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UV Resistance</td>
<td>C 793</td>
<td>Good</td>
</tr>
<tr>
<td>Heat Aging</td>
<td>C 792</td>
<td>Good</td>
</tr>
<tr>
<td>Modulus of</td>
<td>D 412</td>
<td>min. 50 psi</td>
</tr>
<tr>
<td>Elongation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>Test Ref</td>
<td>Requirement</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>D 412</td>
<td>min. 125 psi</td>
</tr>
<tr>
<td>Elongation</td>
<td>D 412</td>
<td>min. 500%</td>
</tr>
<tr>
<td>Tear Strength</td>
<td>D 624</td>
<td>min. 25 pli</td>
</tr>
<tr>
<td>Peel Strength</td>
<td>C 794</td>
<td>min. 18 pli (aluminum)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>min. 16 pli (concrete)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>min. 18 pli (steel)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>min. 20 pli (vinyl)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>min. 20 pli (wood)</td>
</tr>
<tr>
<td>Shore “A” Hardness</td>
<td>C 661</td>
<td>min. 30</td>
</tr>
<tr>
<td>Ozone Resistance</td>
<td>D 1149</td>
<td>Good</td>
</tr>
</tbody>
</table>

7.2 Performance - Sealant products used in roofing shall be in compliance with the minimum performance requirements listed below:

**PERFORMANCE REQUIREMENTS**

<table>
<thead>
<tr>
<th>Performance Characteristic</th>
<th>Test Standard</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelf Life</td>
<td>see Section 7.2.1</td>
<td>min. 1 year</td>
</tr>
<tr>
<td>Tool/Work Time</td>
<td></td>
<td>min. 20-30 minutes</td>
</tr>
<tr>
<td>Tack Free Time</td>
<td>C 679</td>
<td>max. 2 hours</td>
</tr>
<tr>
<td>Curing Time @ 77° F (25°C)</td>
<td></td>
<td>2-14 days</td>
</tr>
<tr>
<td>Full Adhesion Development</td>
<td></td>
<td>14-21 days</td>
</tr>
</tbody>
</table>

7.2.1 Shelf Storage Life - One tube or container of sealant shall be stored for 12 months from the date of manufacture at 77° ± 2° F (25° ± 1.1° C) and a relative humidity of 50 ± 5% and then shall be tested to determine compliance with the requirements of Section 7.2.

7.2.2 Product shall be approved by the manufacturer for application in a temperature range of 40°F to 100°F (4.4°C to 37.8°C).

8. Installation:

8.1 Sealant shall be installed to create two-point adhesion and in accordance with the manufacturer's installation instructions. Bond breakers and backer rods shall be applied in compliance with manufacturer's instructions.

9. Packaged Material:

9.1 Packaged material shall bear a label indicating certified by the manufacturer to be in compliance with this specification and shall be labeled in compliance with Section 1517 of the Florida Building Code, Building. Product Approval documents shall be provided to the purchaser or end user upon request.
9.2 Packaging materials shall be marked by the manufacturer as required by the approval entity. Shipping containers shall be marked with the name of the material, stock number, lot number, year of issue and quantity therein and the name of the manufacturer or supplier.

9.3 Packaging shall provide coverage for bead size, storage requirements, limitations of use, and safety precautions.

9.4 Not all sealants are compatible for all roofing materials and adjoining substrates. The Sealant manufacturer shall provide a Product Data Sheet detailing applicable use and non-compatible substrates.

9.4.1 Product Data Sheet shall also include detailed instructions for substrate adhesion tests.

9.4.2 Product Data Sheets shall note any substrates that require primer before sealant application. Product Data Sheets shall note the name of the primer used for a specific substrate.

10. Rejection and Reinspection:

10.1 The Authority Having Jurisdiction may periodically purchase commercial quantities of the approved product for testing at Approved Testing Agencies to confirm compliance with the provisions of this Protocol. Failure to meet the minimum requirements set forth in Section 5 shall constitute grounds for rejection of the lots and suspension of the Product Approval. In cases of rejection the Authority Having Jurisdiction shall request removal of the rejected lot number(s) from commercial sale.

10.2 The Authority Having Jurisdiction may, after rejection of one or more lots, require third party quality control inspection as a provision to lifting of Approval suspension.

10.3 Shipping containers shall be marked with the name of the material, the stock number, lot number, quantity therein, and the name of the manufacturer or supplier.
The Asphalt Roofing Manufacturers Association staff and volunteers and the Miami-Dade roofing product staff team worked together over the past year to perform a thorough review of the HVHZ requirements for asphalt roofing, and underlayment materials, as well as related RAS and TAS protocols. Many of these requirements have not been updated in decades; this review is an attempt to correlate the FBC with other changes that have occurred within the FBC, at ASCE, and with other standards developers including ASTM International. ARMA has submitted a series of code modifications that reflect that effort.

These proposed modifications include:

- Removal of references to withdrawn standards.
- Removal of references to legacy documents, including ICBO acceptance criteria.
- Updates to referenced standards, including name changes.
- Updates to performance criteria to reflect changes in referenced standards.
- Modifications to certain initial and aged performance values for test requirements to more accurately reflect the intent of the code.
- Removal of redundant or unnecessary requirements.
- Editorial changes and grammatical corrections.

ARMA would like to thank the staff at Miami-Dade for their efforts in working through this very tedious process.

**Fiscal Impact Statement**

- Impact to local entity relative to enforcement of code: $0
- Impact to building and property owners relative to cost of compliance with code: $0
- Impact to industry relative to the cost of compliance with code: Reduced product approval expense.
- Impact to small business relative to the cost of compliance with code: $0

**Requirements**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
- Updates important roofing requirements for HVHZ use.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
- Removes outdated references.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
- Does not require use of any specific type of product.
- Does not degrade the effectiveness of the code
- Ensures that the code is up to date with available research and referenced standards.

Is the proposed code modification part of a prior code version? No

**1st Comment Period History**

- **Proponent:** Aaron Phillips
- **Submitted:** 2/10/2016
- **Attachments:** No
Comment:
Miami-Dade Product Control, a Certification and Quality Assurance entity of building products that are recognized for use in the 
HVHZ, encourages acceptance of the proposed changes to the Roofing Application Standard (RAS) or Testing Application 
Standard (TAS) that is the subject of this code modification. This proposal will significantly improve the RAS/TAS document.
See attached file.
TESTING APPLICATION STANDARD (TAS) 138-95 STANDARD REQUIREMENTS FOR ALUMINUM PIGMENTED EMULSIFIED ASPHALT USED AS A PROTECTIVE COATING FOR ROOFING

1. Scope:

1.1 This Protocol covers aluminum pigmented emulsified asphalt suitable for application as a protective coating for built-up roofs and other exposed surfaces by brush, roller or spray application.

1.2 All testing shall be conducted by an approved testing agency and all test reports shall be signed by an authorized signer of the testing agency and/or Professional Engineer.

2. Referenced Documents:

2.1 ASTM Standards

B 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate
D 16 Terminology Relating to Paint, Varnish, Lacquer and Related Products
D 562 Standard Test Method for Consistency of Paints Using the Stormer Viscometer
D 1079 Definitions of Terms Relating to Roofing, Waterproofing, and Bituminous Materials
D 2824 Specification for Aluminum-Pigmented Asphalt Roof Coatings
D 2939 Standard Test Method of Testing Emulsified Bitumens Used as Protective Coatings
D 4798 Standard Test Method for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon - ARC Method)
D 4799 Standard Test Method for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Fluorescent UV and Condensation Method)
E 380 Excerpts from Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)
G 154 Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
G 155 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials

2.2 The Florida Building Code, Building

2.3 Roof Consultants Institute
Glossary of Terms

3. Terminology & Units:

3.1 Definitions - For definitions of terms used in this Protocol, refer to ASTM D 16; and/or ASTM D 1079; and/or Chapter 2 of the Florida Building Code, Building and/or the RCI Glossary of Terms. Definitions from the Florida Building Code, Building shall take precedence.

3.2 Units - For conversion of U.S. customary units to SI units, refer to ASTM E 380.

4. Limitations and Precautions:

4.1 This Protocol may involve hazardous materials, operations and equipment. This Protocol does
not purport to address all of the safety problems associated with its use. It is the responsibility of
whomever uses this Protocol to consult and establish appropriate safety and health practices and
determine the applicability of regulatory limitations prior to use.

4.2 The user is cautioned that aluminum pigmented emulsified asphalt may generate a reaction
resulting in the evolution of Hydrogen gas. Use caution when opening containers.

5. Sampling:

5.1 Sampling shall be in compliance with requirements set forth in ASTM D 2939.

6. Materials and Manufacture:

6.1 Aluminum pigmented emulsified asphalts covered by this Protocol are of general types such as:

6.1.1 Type I Nonfibred
6.1.2 Type III Fibred (containing no asbestos fiber)

6.2 Composition - The aluminum pigmented emulsified asphalt shall conform to composition
requirements as follows:

7. Performance Requirements:

<table>
<thead>
<tr>
<th>COMPONENT PROPERTY</th>
<th>TEST STANDARD</th>
<th>ALL TYPES</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight per U.S. Gallon, (lbs.)</td>
<td>D 2939 Section 5</td>
<td>8.4</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Weight per Liter, (g)</td>
<td>D 2939 Section 5</td>
<td>1.008</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>Residue by Evaporation (mass %)</td>
<td>D 2939 Section 8</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Content (volume %)</td>
<td>D 2939 Section 11</td>
<td>—</td>
<td>70.00</td>
<td></td>
</tr>
<tr>
<td>Consistency, 77°F (25°C), Krebs units (Ku)</td>
<td>D 562 Procedure A or B</td>
<td>50</td>
<td>125</td>
<td></td>
</tr>
</tbody>
</table>

7.1 Physical Properties - The aluminum pigmented emulsified asphalt shall conform to physical
property requirements as follows:

7.2 Uniformity - After a thoroughly stirred sample has stood for 72 hours at room temperature 77°F ± 2.0°F (25°C ± 1.1°C) the aluminum emulsion shall be of smooth, uniform consistency without
separation or settlement in storage to the extent that it cannot be readily dispersed by moderate
stirring.

<table>
<thead>
<tr>
<th>PHYSICAL PROPERTY</th>
<th>REFERENCE SECTION</th>
<th>ALL TYPES</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference, initial (%)</td>
<td>See Section 8.1</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflectance, 500 hours, (% retained)</td>
<td>See Section 8.4.5</td>
<td>90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.3 Workability - The aluminum pigmented emulsified asphalt shall be of suitable consistency for application above freezing by brush, roller, or suitable spray equipment without thinning with water or heating, and shall bond to either damp or dry surfaces to produce a film in which the aluminum pigment forms a bright reflective surface on smooth surfaced emulsion, sheet metal, conventional BUR and modified bitumen systems when applied according to manufacturers recommendations.

7.4 Application of the aluminum pigmented emulsified asphalt shall be between 50°F (10°C) and 100°F (37.8°C) surface temperature. At temperatures above 100°F (37.8°C), a fine water mist to aid cooling of the roof surface to be coated prior to application is recommended.

7.5 The product is not intended for use where ponding water conditions exist.

8. Test Methods:

8.1 Reflectance - Test Method D 2824, Section 8.6

8.2 Firm Set - Test Method D 2939, Section 14

8.2.1 No reference lines shall be drawn across the faces of the panel.

8.2.2 Cure period shall be 24 hours.

8.3 Resistance to Water - Test Method D 2939, Section 17, Alternative B (17.3)

8.4 Accelerated Weathering - Test Method G 154 or G 155 (Test Method-A)

8.4.1 Apparatus

8.4.1.1 For information on the test apparatus, refer to Section 9 of this Protocol.

8.4.2 Procedure

8.4.2.1 Thoroughly stir the sample to homogeneity. Clean the aluminum panels with industrial grade 1,1,1-trichloroethane, xylol, or an aliphatic solvent such as hexane followed by acetone prior to preparation of test specimens.

8.4.2.2 Prepare two (2) test specimens by spreading with a spatula through masks centered over two (2) metal, aluminum or aluminum alloy panels as described in Table 2 of Specification B 209 under alloy 3003-H14. Doctor off excess level with a flat scraper. The mask shall have openings 2 1/2 by 4 1/2 in. (63.5 by 104.8 mm). The wet film thickness of non fibrated coating shall be 0.015 in. (0.38 mm) and fibrated coating shall be 0.020 in. (0.51 mm). Allow specimens to dry 48 hours at room temperature of 75.0° ± 3.0°F (23.9° ± 1.7°C).

8.4.2.3 Measure the initial percent luminous reflectance of each panel using Test Method D 2824, Section 8.6.

8.4.2.4 Place the coated panels into the weatherometer immediately after reflectance measurements.
8.4.2.5 Specimens shall always be placed in the QUV/Condensation chamber during the UV cycle.

8.4.2.6 Specimens shall always be placed in the Xenon-ARC during the "Light Only Time."

8.4.3 Evaluation Test Results

8.4.3.1 Inspect specimens at the end of a daily cycle during the UV period when the panels are thoroughly dry.

8.4.3.2 If using Xenon-ARC Method inspect specimens at the end of a complete cycle, 24 hours, during the light only period when the panels are thoroughly dry.

8.4.3.3 Periodically during, and at the conclusion of 500 hours, visually inspect specimens to determine physical changes. Accelerated weathering at 500 hours shall be as prescribed in Section 8.4, herein.

8.4.3.4 Repeat reflectance measurement as in Section 8.4.2.3, herein.

8.4.4 Accelerated Weathering Failures

8.4.4.1 Cracking At no time during the exposure cycles shall the film exhibit surface cracking as determined by viewing the weathered area through a microscope at 40x magnification.

8.4.4.2 Sagging/Sliding At no time during the exposure cycles shall the film show any signs of sagging or sliding beyond the exposed area of the draw down.

8.4.4.3 Loss of Adhesion Adhesion to the aluminum panels shall be maintained at 100 percent during the exposure cycles.

8.4.4.4 Blistering At no time during the exposure cycles shall the film exhibit development of blistering.

8.4.4.5 Loss of Reflectance At the conclusion of 500 hours exposure, the cured film shall maintain 90 percent of initial reflectance.

8.4.5 Reflectance Retained Calculation

8.4.5.1 Calculate the % reflectance retained after 500 hours as follows:

\[
\% \text{ retained } = \left(\frac{A}{B}\right) \times 100
\]

where,

A = reflectance at 500 hours, and
B = initial reflectance.

8.4.6 Report
8.4.6.1 If failure occurs, designate the failure end point of the specimens as the exposure hours where cracking, sagging, sliding, loss of adhesion, blistering, or loss of more than 10% of initial reflectance first occurred.

9. Apparatus:

9.1 Operating light and water exposure apparatus (Fluorescent, UV Condensation Type) for Exposure of Nonmetallic Materials as described in Section 6 of Recommended Practice G 154. Unless otherwise specified, the lamps shall be UV-B lamps with a peak emission at 313 nm and a spectral energy distribution as shown in Figure X1.2 of Recommended Practice G 154.

9.2 Calibration and Standardization, G 154-Section-6.

9.3 Procedure, G 154-Section-9.

9.4 Test Conditions.

9.4.1 Unless otherwise specified, the apparatus shall be operated 7 days each week, two cycles per day, according to the following schedule. Each cycle shall consist of the following:

<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Hours</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultra Violet (UV)</td>
<td>8</td>
<td>140.0°F ± 3°F (60°C ± 1.7°C)</td>
</tr>
<tr>
<td>Condensation</td>
<td>4.00</td>
<td>122.0°F ± 3°F (50°C ± 1.7°C)</td>
</tr>
</tbody>
</table>

9.5 Xenon-Arc Type as described in Section 6 of Procedure of Practice G 155, Test Cycle 1.

10. Package and Package Marking:

10.1 Packaged material shall bear a label indicating certified by the manufacturer to be in compliance with this specification and shall be labeled in compliance with Section 1517 of the Florida Building Code, Building. Product Approval documents shall be provided to the purchaser or end user upon request.

10.2 Shipping containers. Packaging materials shall be marked by the manufacturer as required by the approval entity with the name of the material, stock number, lot number, year of issue and quantity therein and the name of the manufacturer or supplier.

11. Rejection and Reinspection:

11.1 The Authority Having Jurisdiction may periodically purchase commercial quantities of the approved product for testing at Approved Testing Agencies to confirm compliance with the provisions of this Protocol. Failure to meet the minimum requirements set forth in Sections 6 and 7 shall constitute grounds for rejection of the lots and suspension of the Product Approval. In cases of rejection the Authority Having Jurisdiction shall request removal of the rejected lot number(s) from commercial sale.
11.2 The Authority Having Jurisdiction may, after rejection of one or more lots, require third party quality control inspection as a provision to lifting of Approval suspension.

11.3 Shipping containers shall be marked with the name of the material, the stock number, lot number, quantity therein, and the name of the manufacturer or supplier.
R6373

Date Submitted: 7/14/2015

Chapter: 15

Affects HVHZ: Yes

TAC Recommendation: No Affirmative Recommendation with a Second

Commission Action: Pending Review

Proponent: Matthew Durrett

Attachments: Yes

Comments

General Comments: No

Alternate Language: No

Related Modifications

Chapter 35 Reference Standards, FBC. Change remove ASTM 5957-98 and replace with ASTM D7877.

Summary of Modification

The proposed change would be to eliminate ASTM 5957 Flood testing an include Low Voltage testing as described in ASTM D7877 "Standard GUIDE for Electronic Methods of detecting and locating leaks in Waterproof Membranes."

Rationale

Although flood-testing is widely used to prove the capability of a waterproofing membrane to hold water, it cannot verify the absence of breaches any more than it can locate them. Flood-testing only proves whether a membrane leaks water in amounts visually observable from a limited perspective within a given time. Since Low Voltage leak detection works by locating the actual points of entry of any water leakage, it verifies the presence or absence of breaches. Flood-testing results are not conclusive. Flood-testing relies on observable signs that water has flowed inside the building or under the membrane. By loading an area of membrane with several inches of water and waiting a sufficient time (often measured in days) the observer decides if a membrane is water tight by watching for symptoms of leakage. The flood-testing observer watches for water flowing into observable locations behind the membrane or within the membrane system. In either case, a certain amount of water must flow to become noticeable; far more than required with a Low Voltage leak detection test. Pinholes and minor seam defects usually escape detection. With flood-testing there is always the possibility of small leaks going undetected. Undetected leaks are still leaks and can cause mold and structural decay. Flood testing takes time and is prone to limitations of human perception. The observer seeks out suspicious seams and scours the surface for punctures. Residual dirt may hide defects. Seams that appear tight may conceal small voids. No holes (breaches) are missed Low Voltage leak detection when in the hands of a properly trained testing consultant.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Impact would be negligible. Proposed change only seeks to change existing test method for another, more accurate method. Low Voltage testing as per ASTM Guide D7877.

Impact to building and property owners relative to cost of compliance with code

A flood test cost $.40 a sqft with labor, dam construction and cost of water. Not included is cost for schedule delays since a flood test takes 1 day to set up, 48 hour to test and 1 day to tear down. Low Voltage testing per ASTM D7877 would cost approx. $.35 a sqft.

Impact to industry relative to the cost of compliance with code

With a more accurate test method in place, we would expect the overall quality of installations to improve as the proposed testing method can locate many more deficiencies than the current method of compliance. See above for pricing information.

Impact to small business relative to the cost of compliance with code

Small business would see a cost reduction with the new code compliance as the more accurate test method would decrease failure rate, increase system life span and decrease the amount of water infiltration over the life of the system.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes. With an increase in quality control with the proposed Low Voltage testing, there would be expected longevity in waterproofing systems which will reduce structural deterioration, potential mold and other conditions associated with uncontrolled water infiltration.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes. A more accurate testing method would create an environment for more watertight structures.
Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

There are few materials in the waterproofing market that would not be testable. Black EPDM would be one product, but this is roofing product and would not be common in a waterproofing application.

Does not degrade the effectiveness of the code

No. It would only work to improve the QC as deemed by the Florida Building Code and municipalities in the state that reference this code as standard for construction.

Is the proposed code modification part of a prior code version? No
1519.16.6 The waterproofing system shall be flood tested using Low Voltage leak detection in accordance with ASTM D-5957 ASTM Guide 7877.

1519.16.6.1 The flood Low Voltage leak detection test shall take place after installation of the waterproofing membrane and prior to the installation of any above membrane components, wearing surface or overburden.

1519.16.6.2 An approved testing lab consultant shall provide written verification report, drawing and photographic documentation to the building official confirming that the flood Low Voltage leak detection test was performed along with the results, prior to final inspection.

Chapter 35 Reference Standards, FBC. Change remove ASTM 5957-98 and replace with ASTM D7877.

1. Scope

1.1 This guide describes standard procedures for using electrical conductance measurement methods to locate leaks in exposed or covered waterproof membranes.

1.2 This guide addresses the need for a general technical description of the current methods and procedures that are used to test and verify the integrity of waterproof membranes.

1.3 This guide is not intended to replace visual, infrared, or other methods of inspection. It is to be used in conjunction with other methods of roof inspection when specified.

1.4 This guide recommends that the leak location equipment, procedures, and survey parameters used are calibrated to meet established minimum leak detection sensitivity. The leak detection sensitivity calibration should be verified on a regular basis according to the manufacturer’s recommendations.

1.5 Leak location surveys can be used on waterproofing membranes installed in roofs, plaza decks, pools, water features, covered reservoirs and other waterproofing applications.

1.6 The procedures are applicable for membranes made of materials such as polyethylene, polypropylene, polyvinyl chloride, bituminous material, and other electrically insulating materials.

1.7 This guide provides a general description of the equipment and methods for locating membrane breaches using electric conductance. Refer to the manufacturer’s instructions for the proper operation and use of the equipment described in this guide.

1.8 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 ASTM Standards:

D1079 Terminology Relating to Roofing and Waterproofing
D5957 Guide for Flood Testing Horizontal Waterproofing Installations
D6747 Guide for Selection of Techniques for Electrical Detection of Leaks in Geomembranes

2.2 NFPA Standards:

NFPA 70 National Electric Code

3. Terminology

3.1 For definitions of terms, see Terminology D1079.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 breach—as defined for this guide, a membrane breach is a defect in the membrane that allows surface water to reach the substrate below.

3.2.2 conductance—the ability of a material to pass electrons. The unit of conductance is the Siemens (S), the relationship that exists between resistance (R) and conductance (G) is a reciprocal one. In terms of resistance and conductance:

\[ R = 1/G \text{ ohms, } G = 1/R \text{ Siemens} \]  

3.2.3 deck—the structural surface to which the roofing or waterproofing system (including insulation) is applied.

3.2.4 electric current—the flow of electric charge. The electric charge that flows is carried by mobile electrons in a conductor measured in amps.

3.2.5 electric gradient—the potential difference between two points measured in volts.

3.2.6 high voltage—for purposes of this guide, the United States 2005 National Electrical Code (NEC) defines high voltage as any voltage over 600 V (article 490.2).

3.2.7 leak—any unintended opening, perforation, slit, tear, puncture, crack, hole, cut, or similar breaches through an
installed waterproofing membrane which may allow the passage of liquid. Scratches, gouges, or other aberrations that do not completely penetrate the membrane are not considered to be leaks as the term is used in this guide although they may be defects requiring attention.

3.2.8 leak detection sensitivity—the smallest size liquid water leak that the leak location equipment and survey methodology are capable of detecting under a given set of conditions. The leak detection sensitivity specification is usually stated as the minimum electrical leakage current that can be detected and is directly related to the area of the smallest liquid water leak that can be reliably detected.

3.2.9 low voltage—for purposes of this guide, the United States 2005 National Electrical Code (NEC) defines low voltage as 0 – 49 volts.

3.2.10 potential—electrical voltage measured relative to a reference point.

3.2.11 sensitive voltmeter—a voltmeter that is capable of reading voltage levels in the millivolt or microvolt range.

3.2.12 substrate—the surface upon which the roofing or waterproofing membrane is placed (structural deck or insulation).

3.2.13 waterproof membrane—an element of the exterior enclosure of a building intended to provide a continuous barrier to prevent the passage of water under hydrostatic pressure.

Note 1—Waterproof membranes tested by electrical conductance methods may be horizontal, sloped, or vertical.

Note 2—Examples of waterproof membranes included in this guide are: below-grade waterproofing membranes, above-grade waterproofing membranes, waterproof membranes covered by wearing courses, vegetative roof membranes, planter waterproofing membranes, protected roof membranes, and roofing membranes.

4. Significance and Use

4.1 The failure to correct membrane defects during and as soon as possible after its installation can cause premature failure of the membrane. Problems include design deficiencies, faulty application of the membrane system, and damage by subsequent trades. Roof designs incorporating a waterproof membrane under overburden such as a vegetative roof, insulation layer, wear-course, or topping slab greatly exacerbate the problem of leak locating.

4.2 This guide describes methods for using electric conductance testing to locate breaches in waterproof membranes. The methods described include testing procedures designed to provide a part of the construction quality control of membrane installations.

4.3 The methods described in this guide may also be used for integrity or forensic testing of existing waterproof membranes, specific limitations apply.

4.4 The electric conductance methods described in this guide require a conductive substrate under the membrane to serve as a ground return path for the test currents. In roof assemblies where the membrane is installed over electric insulating material such as insulating foam or a protection board, or both, the electric path to any conductive deck is interrupted. The situation can be remedied by placing a conductive material directly under the membrane. The conductive material provides the return path for the test currents.

5. Summary of Conductance Leak Location

5.1 The principle of the conductance leak location method is the establishment of an electrical potential between the electrically insulting waterproof membrane and the underlying substrate.

5.2 For methods employing low voltage electrical potential, a controlled covering of water on the surface forms the conductive path horizontally across the membrane to any membrane breach. At a breach location, an electrical path to the deck is formed through the water leaking to the deck below. A sensitive receiver detects the leakage current and alerts the operator.

5.3 For methods using a high voltage potential, an electrode is swept across the surface of the membrane. The electrode is charged to a high potential relative to the deck below. At a breach location an electrical arc occurs from the electrode to the deck below. The arc discharge is electronically detected and the operator alerted.

5.4 The leak-locate methods in this guide describe the electrical conductance techniques used to detect and locate membrane breaches. These methods while accurate and effective are subject to noted limitations.

5.5 Electric conductance leak location requires that the deck material directly below the membrane be sufficiently conductive for the test method employed. In most instances, a concrete substrate is sufficiently conductive to allow this method. In certain membrane assemblies, where the substrate is nonconductive, it may be possible to install a conductive material directly under the membrane to facilitate testing.

6. Low Voltage Horizontal Membrane Scanning Platform

6.1 The principle of the scanning platform method is to establish a voltage potential between the platform and the roof deck and track any leakage current passing through the membrane. This is accomplished by wetting the surface of the membrane under test, generating a voltage with respect to the deck and then locating areas where electrical current flows from the platform through membrane breaches to the deck.

6.2 The basic circuit and application of a dual sweep scanning platform is shown in Fig. 1. The platform is constructed with two sets of metal sweeps which make continuous
6.3 The positive terminal of the voltage source is attached to the building electrical ground or the roof (concrete or metal) deck/substrate and the negative terminal connects to the conductive sweep of the platform through the measuring and indicator unit. Since the majority of roofing/waterproofing membranes are non-conductive (excluding high carbon black loaded materials such as certain types of EPDM) the electrical potential applied to the platform sweeps is provided a path through the water over the wetted area of the membrane to any breach thus completing the circuit to the substrate and back to the generator.

6.4 During the membrane scan, a light spray of water is applied to the membrane in front of the advancing platform (Fig. 2). The outer sweep responds to and displays any leakage current in the test area. The inner sweep, which is electrically shielded by the outer sweep, will detect a leakage current when the sweep platform is directly over the membrane defect. This will result in a noticeable deflection on the inner sweep meter accompanied by an audible alert. This is precisely the location where moisture is penetrating the membrane.

6.5 Limitations—The conductance leak locate method using the scanning platform cannot be carried out on conductive membranes such as EPDM. The deck material directly below the membrane must be sufficiently conductive for purposes of this test method (concrete decks typically meet this criterion). Drains and other grounding penetrations can cause a false reading if not isolated from the applied water spray. This method is not suited to scanning membranes with overburden. The equipment manufacturer’s instructions provide recommendation for addressing these issues.

Note 3—Certain scanning equipment designs provide built-in isolation of the sweep from drains and other grounds thereby lowering the potential for false readings.

7. Low Voltage Membrane Electric Field Vector Mapping

7.1 The electric field vector mapping technique employs an electric potential gradient across the membrane surface along with a sensitive voltmeter and probes to locate membrane leaks. As illustrated in Fig. 3, a conductor cable loop is installed around the perimeter of the area to be tested. A signal generator is connected to the loop cable and the building ground. The area within the loop is covered with a spray of water to form a continuous conductive surface in the test area. Since most roofing/waterproofing membranes are non-conductive the electrical signal from the perimeter cable loop looks for an electrical path over the wet area of the roof to any breach within the wetted area thus completing the circuit to the substrate. The resulting current from the breach location to the perimeter cable sets up a voltage gradient in the water within the perimeter.

7.2 A sensitive voltmeter and a pair of hand held electrical probes long enough to reach the membrane surface are used to detect, measure, and track the leakage current to its source at the breach.

7.3 A signal generator is connected to the building ground or concrete roof deck and the perimeter cable that is placed around the area to be tested. Metal penetrations and drains must be isolated by looping a separate cable around them and then connecting these isolating cables to the perimeter cable. The meter response is read at an initial location within the perimeter area and the operator carefully moves the pair of probes left or right while reading the signal level (Fig. 4). The probe positions that result in the maximum meter reading, and, if equipped, the strongest audio response points toward the breach. The probes are then repositioned towards the indicated direction and the process repeated. The location of maximum signal strength will coincide with the breach location.

7.4 Electric Field Vector mapping can be used to locate membrane breaches through overburden within the limitations described in 7.5.
7.5 Limitations—The proper operation of the electric field vector mapping system requires a continuous layer of water on the membrane within the test perimeter and must always reach from any breach to the conductor cable. Gaps in the water coverage can result in missed areas and possibly missed breaches. This limitation is particularly apparent on new clean membranes where water beading occurs thereby impeding the formation of a continuous wet surface. Locating breaches on the top layer of a protected membrane roof systems covered with additional layers including insulation, root barriers, and drainage mats can interrupt the leak-locating signal. The root-barrier and thermal insulating layers form an electrical insulating layer. These layers can interrupt the locating signal or cause offset errors in the leak locate position. Operator skill and knowledge is an important factor in obtaining the accurate results.

8. Low Voltage Vertical Membrane Surface Scanning

8.1 Vertical scanning is a leak testing and locating system that picks up where horizontal scanning methods leave off. The
vertical test method provides leak testing on vertical surfaces, corners, parapet walls, seams, etc. ensuring that difficult to inspect details are watertight.

8.2 As illustrated in Fig. 5, the vertical leak scanning system employs a sensitive receiver, water moistened sensor, audible alert, and ground lead. The receiver supplies the power source referenced to ground for testing the membrane integrity.

8.3 In operation, the moistened sensor, which is connected through a cable to the voltage source in the receiver, is pressed against the surface under test (Fig. 6). This action forces water onto the membrane surface and into any breaches. A leakage current will flow from the ground connection through breach location, returning to the receiver through the moistened sensor. The receiver will register a deflection on the signal level meter accompanied by an audible alert.

8.4 The vertical surface leak locator is used to test the membrane integrity of corners, parapet walls, and seams.

8.5 Limitations—The vertical surface leak locate method cannot be carried out on conductive membranes such as EPDM or heavy carbon black loaded material. The material directly underneath the membrane must be sufficiently conductive for purposes of this test method.

9. High Voltage Membrane Testing

9.1 High voltage testing is performed on a dry horizontal or vertical surface using a limited current at relatively high voltage. One lead from the portable current generator is grounded to the roof deck with a sufficiently conductive substrate. The other lead is attached to a special electrode brush made with conductive metal bristles. The brush electrode is then swept over the surface of the roof membrane (Fig. 7). An electric arc will jump from the electrode through any breach in the membrane thereby completing a circuit between the brush and the roof deck. Where there are no breaches, the membrane acts as an insulator and prevents the flow of current to the deck.

9.2 Using a variable source voltage source of up to 40 kV a membrane up to a maximum thickness of 26 mm can be tested. For the test to be effective, the membrane must be adhered to a conductive deck or have a conductive backing.

9.3 Limitations—The test can only be carried out on non-conductive roof membranes which have a conductive substrate. The surface must be known so that the test voltage can be calculated. Excessive voltage settings can damage the membrane. The operator must be isolated and protected from the voltage source.

10. Record Keeping and Reporting

10.1 Daily field notes should be written entries describing the areas scanned, the number and location of any breach,
along with weather conditions, date, and name of scan operator. It is recommended that the field notes should include a plan view drawing of the total area to be scanned. At the end of each day, the area scanned should be marked on this drawing by crosshatching or shading the areas scanned.

10.2 If the entire area to be scanned cannot be completed in one day, the area scanned each day should be identified on the membrane. This identification should be made with clearly visible markings using a marker compatible with the membrane.

10.3 The operator shall copy and submit daily field notes to the designated receiver. The daily field notes shall be transferred to a Periodic Field Report for submittal and digital storage.

10.4 A periodic field report should describe the work performed, persons contacted on the site, items discussed, and any additional remarks. The report should include the project information, weather conditions, and date of the report and should be submitted digitally by the end of the following day.

10.5 The operator should maintain a breach location and repair log which records a running tally of the breaches located and repaired. Information on this log should include the breach identification numbers, date of locate, date of repair, notes, and square footage of area scanned.

11. Keywords

11.1 electronic detection; leak detection; leaks; membranes; waterproofing
<table>
<thead>
<tr>
<th>Date Submitted</th>
<th>12/31/2015</th>
<th>Section</th>
<th>1506.5</th>
<th>Proponent</th>
<th>Randall Shackelford</th>
</tr>
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<tbody>
<tr>
<td>Chapter</td>
<td>15</td>
<td>Affects HVHZ</td>
<td>No</td>
<td>Attachments</td>
<td>No</td>
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<tr>
<td>TAC Recommendation</td>
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<td>Commission Action</td>
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**Comments**

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**Related Modifications**

- FBC-R R904.4

**Summary of Modification**

Carry over requirements for corrosion resistance of roofing fasteners from 5th Edition FBC

**Rationale**

Corrosion of roofing fasteners has been identified as an issue of concern and research by the Florida Building Commission. Florida’s environment is especially hard on steel elements, including fasteners. Corroded roofing fasteners will not hold the roofing material on the roof. This change will carry over the existing requirements for corrosion resistance from the current Florida Building Code.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  
  No change in impact. Carry over from current code.

- **Impact to building and property owners relative to cost of compliance with code**
  
  No change in impact. Carry over from current code.

- **Impact to industry relative to the cost of compliance with code**
  
  No change in impact. Carry over from current code.

- **Impact to small business relative to the cost of compliance with code**
  
  No change in impact. Carry over from current code.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  
  Yes. The roof covering is the first line of defense against moisture and wind-driven rain. Corrosion resistant roofing fasteners are necessary to ensure proper performance of the roof covering.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  
  Improves the code. Base code does not have good specific requirements for corrosion resistance of roofing fasteners.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  
  Does not discriminate. Continuation of current requirements.

- **Does not degrade the effectiveness of the code**
  
  does not degrade.

**Is the proposed code modification part of a prior code version?**

No
1506.4 Nails.
Nails shall be corrosion resistant nails conforming to ASTM F 1667. The corrosion resistance shall meet ASTM A 641, Class 1 or an equal corrosion resistance by coating, electro galvanization, mechanical galvanization, hot dipped galvanization, stainless steel, nonferrous metal and alloys or other suitable corrosion-resistant material.

1506.5 Screws.
Wood screws conform to ANSI/ASME B 18.6.1. Screws shall be corrosion resistant by coating, galvanization, stainless steel, nonferrous metal or other suitable corrosion-resistant material. The corrosion resistance shall be demonstrated through one of the following methods:

1. Corrosion resistance equivalent to ASTM A 641, Class 1; or

2. Corrosion resistance in accordance with TAS114, Appendix E; or

3. Corrosion resistant coating exhibiting not more than 5-percent red rust after 1000 hours exposure in accordance with ASTM B 117.

1506.6 Clips.
Clips shall be corrosion-resistant clips. The corrosion resistance shall meet 0.90 ounce per square foot (0.458 kg/m²) measured according to ASTM A 90/A 90M, TAS 114 Appendix E or an equal corrosion-resistance coating, electro galvanization, mechanical galvanization, hot dipped galvanization, stainless steel, nonferrous metals and alloys or other suitable corrosion resistant material. Stainless steel clips shall conform to ASTM A167, Type 304.
**Sub Code: Residential**

<table>
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<th>12/31/2015</th>
<th>Section</th>
<th>904.4</th>
<th>Proponent</th>
<th>Randall Shackelford</th>
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**Comments**

| General Comments | No | Alternate Language | No |

**Related Modifications**

FBC 1506.4

**Summary of Modification**

Carry over requirements for corrosion resistance of roofing fasteners from 5th Edition FBC-R

**Rationale**

Corrosion of roofing fasteners has been identified as an issue of concern and research by the Florida Building Commission. Florida's environment is especially hard on steel elements, including fasteners. Corroded roofing fasteners will not hold the roofing material on the roof. This change will carry over the existing requirements for corrosion resistance from the current Florida Building Code-Residential

**Fiscal Impact Statement**

- Impact to local entity relative to enforcement of code
  - No change in impact. Carry over from current code.
- Impact to building and property owners relative to cost of compliance with code
  - No change in impact. Carry over from current code.
- Impact to industry relative to the cost of compliance with code
  - No change in impact. Carry over from current code.
- Impact to small business relative to the cost of compliance with code
  - No change in impact. Carry over from current code.

**Requirements**

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Yes. The roof covering is the first line of defense against moisture and wind-driven rain. Corrosion resistant roofing fasteners are necessary to ensure proper performance of the roof covering.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Improves the code. Base code does not have good specific requirements for corrosion resistance of roofing fasteners.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Does not discriminate. Continuation of current requirements.
- Does not degrade the effectiveness of the code
  - does not degrade.

**Is the proposed code modification part of a prior code version?**

YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**

NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**

YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**
R904.4 Fasteners.

R904.4.1 Nails.
Nails shall be corrosion-resistant nails conforming to ASTM F 1667. The corrosion resistance shall meet ASTM A 641, Class I or an equal corrosion resistance by coating, electro galvanization, mechanical galvanization, hot dipped galvanization, stainless steel, nonferrous metal and alloys or other suitable corrosion-resistant material. Metal or plastic cap nails shall have a head diameter of not less than 1 inch (25.4 mm) with a thickness of at least 32-gauge sheet metal. Metal tin-tabs shall be not less than 1⅞ inches (41 mm) and not more than 2 inches (51 mm) in diameter and of not less than 32 gage (0.010 inch) sheet metal in compliance with the corrosion-resistance requirements.

R904.4.2 Screws.
Wood screws shall conform to ANSI/ASME B 18.6.1. Screws shall be corrosion resistant by coating, galvanization, stainless steel, nonferrous metal or other suitable corrosion-resistant material. The corrosion-resistance shall be demonstrated through one of the following methods:

1. Corrosion resistance equivalent to ASTM A 641, Class 1;

2. Corrosion resistance in accordance with TAS 114, Appendix F;

3. Corrosion-resistant coating exhibiting not more than 5-percent red rust after 1000 hours exposure in accordance with ASTM B 117.

R904.4.3 Clips.
Clips shall be corrosion-resistant clips. The corrosion resistance shall meet 0.90 ounce per square foot (0.458 kg/m²) measured according to ASTM A 90/A 90M, TAS 114 Appendix E or an equal corrosion-resistance coating, electro galvanization, mechanical galvanization, hot dipped galvanization, stainless steel, nonferrous metals and alloys or other suitable corrosion-resistant material. Stainless steel clips shall conform to ASTM A167, Type 304.

R904.4.4 Product identification.
Roof covering materials shall be delivered in packages bearing the manufacturer’s identifying marks and approved testing agency labels when required. Bulk shipments of materials shall be accompanied by the same information issued in the form of a certificate or on a bill of lading by the manufacturer.
TAC: Roofing

Total Mods for Roofing in Withdrawn: 5

Total Mods for report: 106

Sub Code: Building

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**R6645**

<table>
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<tr>
<th>Date Submitted</th>
<th>Section</th>
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<td>12/19/2015</td>
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<td>Mark Zehnal</td>
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<th>Alternate Language</th>
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</thead>
<tbody>
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<td>No</td>
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</table>

**Related Modifications**

| No               | No                 |

**Summary of Modification**

Provides current Florida-specific criteria

**Rationale**

To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

**Fiscal Impact Statement**

**Impact to local entity relative to enforcement of code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to building and property owners relative to cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to industry relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Impact to small business relative to the cost of compliance with code**

No impact. Current 2014 FBC code language without any new requirements being established.

**Requirements**

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities


Does not degrade the effectiveness of the code


Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES
The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
1507.4 Metal roof panels. The installation of metal roof panels shall comply with the provisions of this section.

1507.4.1 Deck requirements. Metal roof panel roof coverings shall be applied to a solid or closely fitted deck, except where the roof covering is specifically designed to be applied to spaced supports.

1507.4.2 Deck slope. Minimum slopes for metal roof panels shall comply with the following:

1. The minimum slope for lapped, non-soldered seam metal roof panels without applied lap sealant shall be three units vertical in 12 units horizontal (25-percent slope).

2. The minimum slope for lapped, non-soldered seam metal roof panels with applied lap sealant shall be one-half unit vertical in 12 units horizontal (4-percent slope). Lap sealants shall be applied in accordance with the approved manufacturer’s installation instructions.

3. The minimum slope for standing-seam metal roof panel systems shall be one-quarter unit vertical in 12 units horizontal (2-percent slope).

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).

<table>
<thead>
<tr>
<th>TABLE 1507.4.3(1) METAL ROOF COVERINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ROOF COVERING TYPE</strong></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Aluminum</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>Aluminum-zinc alloy coated steel</td>
</tr>
<tr>
<td>Cold-rolled copper</td>
</tr>
<tr>
<td>Copper</td>
</tr>
<tr>
<td>Galvanized steel</td>
</tr>
<tr>
<td>Hard lead</td>
</tr>
<tr>
<td>Lead-coated copper</td>
</tr>
<tr>
<td>Prepainted steel</td>
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<td>Soft lead</td>
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<tr>
<td>Stainless steel</td>
</tr>
<tr>
<td>Steel</td>
</tr>
<tr>
<td>Terne and terne-coated stainless</td>
</tr>
<tr>
<td>Zinc</td>
</tr>
</tbody>
</table>

For SI: 1 ounce per square foot = 0.305 kg/m²,
1 pound per square foot = 4.882 kg/m²,
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-60.
TABLE 1507.4.3(2)

MINIMUM CORROSION RESISTANCE

<table>
<thead>
<tr>
<th>Material</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>55% Aluminum-zinc alloy coated steel</td>
<td>ASTM A 792 AZ 50</td>
</tr>
<tr>
<td>5% Aluminum alloy-coated steel</td>
<td>ASTM A 875 GF60</td>
</tr>
<tr>
<td>Aluminum-coated steel</td>
<td>ASTM A 463 T2 65</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>ASTM A 653 G-90</td>
</tr>
<tr>
<td>Pre-painted steel</td>
<td>ASTM A 755a</td>
</tr>
</tbody>
</table>

a. Paint systems in accordance with ASTM A 755 shall be applied over steel products with corrosion-resistant coatings complying with ASTM A 792, ASTM A 875, ASTM A 463 or ASTM A 653

1507.4.4 Attachment. Metal roof panels shall be secured to the supports in accordance with the approved manufacturer’s fasteners. In the absence of manufacturer recommendations, the following fasteners shall be used:

1. Galvanized fasteners shall be used for steel roofs.
2. Copper, brass, bronze, copper alloy or 300 series stainless-steel fasteners shall be used for copper roofs.
3. Stainless-steel fasteners are acceptable for all types of metal roofs.
4. Aluminum fasteners are acceptable for aluminum roofs attached to aluminum supports.

1507.4.5 Underlayment and high wind. Underlayment applied in areas subject to high winds [$V_{100}$ greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer’s installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where $V_{100}$, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type
IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps.
Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $\frac{3}{14}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted. Reserved.

1507.4.5.1 Underlayment.
Underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV or ASTM D 1970 or ASTM D 6757.

1507.4.5.2 Underlayment Application.

Underlayment shall be installed using one of the following methods:

1. Two layer underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV or ASTM D 6757: Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm), and fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with one row in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). Synthetic underlayment shall be fastened in accordance with this section and the manufacturer's recommendations.

2. One layer underlayment shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV or ASTM D 6757: Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened with
1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). Synthetic underlayment shall be fastened in accordance with this section and the manufacturer’s recommendations. End laps shall be offset by 6 feet (1829 mm).

3. As an alternative, the entire roof deck shall be covered with an approved self-adhering polymer modified bitumen sheet meeting ASTM D 1970 or an approved self-adhering synthetic underlayment installed in accordance with the manufacturer’s installation instructions.
**Comments**

**General Comments**

No

**Alternate Language**

No

**Related Modifications**

**Summary of Modification**

- Remove section

**Rationale**

This section is redundant since this is a built-up system and would require a product approval.

**Fiscal Impact Statement**

- **Impact to local entity relative to enforcement of code**
  
  No impact. Still within current 2014 FBC code language without any new requirements being established.

- **Impact to building and property owners relative to cost of compliance with code**
  
  No impact. Still within current 2014 FBC code language without any new requirements being established.

- **Impact to industry relative to the cost of compliance with code**
  
  No impact. Still within current 2014 FBC code language without any new requirements being established.

- **Impact to small business relative to the cost of compliance with code**
  
  No impact. Still within current 2014 FBC code language without any new requirements being established.

**Requirements**

- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  
  Still within current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  
  Still within current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
  
  Does not discriminate. Still within current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

- **Does not degrade the effectiveness of the code**
  
  Does not degrade. Still within current, Commission approved 2014 FBC performance proven code language without any new requirements being established.

Is the proposed code modification part of a prior code version?

YES

The provisions contained in the proposed amendment are addressed in the applicable international code?

NO

The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?

YES

The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?

NO
See attached PDF file.
1507.6 Mineral-surfaced roll roofing. RESERVED
The installation of mineral-surfaced roll roofing shall comply with this section.

1507.6.1 Deck requirements.
Mineral-surfaced roll roofing shall be fastened to solidly sheathed roofs.

1507.6.2 Deck slope.
Mineral-surfaced roll roofing shall not be applied on roof slopes below one unit vertical in 12 units horizontal (8 percent slope).

1507.6.3 Underlayment.
Underlayment shall comply with ASTM D- 226, Type I or ASTM D- 4869.

1507.6.3.1 Underlayment and high wind.
Underlayment applied in areas subject to high winds ($V_{100}$, greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1) shall be applied with corrosion resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where $V_{100}$, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D- 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32 gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $\frac{3}{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D-1970 shall be permitted.

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 lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.
### Comments

| General Comments | No | Alternate Language | No |

#### Related Modifications
- this is second option if first Section 1507.17 is not approved

#### Summary of Modification
- Provides current Florida-specific criteria

#### Rationale
- To carry forward previous Commission approved code language providing continuity for the proper installation of roofing systems and components from one code edition to the next connected to Florida’s unique environmental conditions including extreme temperatures, enduring tropical rain events and life/property threatening high wind events.

#### Fiscal Impact Statement
- **Impact to local entity relative to enforcement of code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to building and property owners relative to cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to industry relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.
- **Impact to small business relative to the cost of compliance with code**
  - No impact. Current 2014 FBC code language without any new requirements being established.

#### Requirements
- **Has a reasonable and substantial connection with the health, safety, and welfare of the general public**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction**
  - Current, Commission approved 2014 FBC performance proven code language without any new requirements being established.
- **Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities**
- **Does not degrade the effectiveness of the code**

**Is the proposed code modification part of a prior code version?**
- YES

**The provisions contained in the proposed amendment are addressed in the applicable international code?**
- NO

**The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state?**
- YES

**The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process?**
- NO
See attached PDF file.
1507.17 Photovoltaic shingles.
The installation of photovoltaic shingles shall comply with the provisions of this section, the manufacturer's instructions, and NFPA 70.

1507.17.1 Deck requirements.
Photovoltaic shingles shall be applied to a solid or closely fitted deck, except where the shingles are specifically designed to be applied over spaced sheathing.

1507.17.2 Deck slope.
Photovoltaic shingles shall not be installed on roof slopes less than three two units vertical in 12 units' horizontal (25.16667-percent slope).

1507.17.3 Underlayment.
Unless otherwise noted, required underlayment shall conform to ASTM D-226, ASTM D 4869 or ASTM D 6757. Underlayment shall comply and be installed in accordance with Section 1507.1.1.

1507.17.4 Underlayment application. Underlayment shall be applied shingle fashion, parallel to and starting from the eave, lapped 2 inches (51 mm) and fastened sufficiently to hold in place. RESERVED

1507.17.4.1 High wind attachment.
Underlayment applied in areas subject to high winds \( V_{acd} \) greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1 shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied along the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where \( V_{acd} \) is not less than 120 mph (54 m/s) shall comply with ASTM D-226, Type II, ASTM D-4869, Type IV or ASTM D-6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12-gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of \( \frac{3}{4} \) inch (19.1 mm) into the roof sheathing.
Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.  RESERVED

1507.17.4.2 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 instead of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building.

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

1507.17.5 Fasteners.
Fasteners for photovoltaic shingles shall be galvanized, stainless steel, aluminum or copper roofing nails, minimum 12-gage [0.105 inch (2.67 mm)] shank with a minimum 3/16-inch-diameter (9.5 mm) head, of a length to penetrate through the roofing materials and a minimum of 3/4 inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than 3/4 inch (19.1 mm) thick, the nails shall penetrate through the sheathing. Fasteners shall comply with ASTM F 1667.

1507.17.6 Material standards.
Photovoltaic shingles shall be listed and labeled in accordance with UL 1703.

1507.17.7 Attachment.
Photovoltaic shingles shall be attached in accordance with the manufacturer’s installation instructions.

1507.17.8 Wind resistance.
Photovoltaic shingles shall be tested in accordance with procedures and acceptance criteria in ASTM D 3161 or TAS 107. Photovoltaic shingles shall comply with the classification requirements of Table 1504.1.1 for the appropriate maximum nominal design wind speed. Photovoltaic shingle packaging shall bear a label to indicate compliance with the procedures in ASTM D 3161, TAS 107 and the required classification from Table 1504.1.1.
To insure the metal roof shingles and metal roof panels are manufactured to demonstrate compliance with the structural windload requirements of the Florida Building Code and Florida Statute(s) 553.8425 Local Product Approval.

Rationale
To insure the metal roof shingles and metal roof panels are consistently manufactured in compliance with the requirements of the Florida Building Code(s), Florida Statute(s) 553.8425 Local Product Approval and 61G20-3 statewide Product Approval.

Fiscal Impact Statement
Impact to local entity relative to enforcement of code
No impact.

Impact to building and property owners relative to cost of compliance with code
No impact.

Impact to industry relative to the cost of compliance with code
No impact.

Impact to small business relative to the cost of compliance with code
No impact.

Is the proposed code modification part of a prior code version? No

1st Comment Period History
Proponent Angie Taylor Submitted 2/23/2016

Comment:
Companies with no FPA using false FPA....Something needs to be done with roofing contractors using machines with no florida product approvals. They are able to pull anyone#39;s FPA info and submit stating they are using this product when in fact its coming off a machine that hasn#39;t been tested or through the Quality Assurance Company. The manufacturers out there that pay out all this money for testing, and updating for FPA gets taken advantage of when there are companies out there that are cheating the system.

there needs to be away to have FPA ONLY come from the manufacturer itself and signed off by the manufacturer that in fact is their panel on that said project.

1st Comment Period History
Proponent Jon Hill Submitted 2/24/2016

Comment:
Keystone Certifications supports this Code Modification because it clarifies metal roof manufacturer responsibility to demonstrate that products are manufactured as approved, regardless of product approval method (statewide or local). We continue to receive complaints from legitimate manufacturers regarding competitors that do not employ quality assurance without consequence because building officials are not clear on the requirement, leading to inconsistent enforcement and opening the door for the installation of inferior roof products in the state of Florida.

Implementation of this Code Mod in conjunction with Mods 6730 &amp; 6779, which further clarify who is the manufacturer of metal roof products (not equipment suppliers), will provide code officials the understanding necessary to consistently implement the requirements of the Florida Building Codes.
Building Code

1502.1 Definitions.
The following terms are defined in Chapter 2:

METAL ROOF PANEL.

METAL ROOF SHINGLE.

METAL ROOF PANEL, METAL ROOF SHINGLE MANUFACTURER

Section 1507.4:

The installation of metal roof panels shall comply with the provisions of this section. Approved metal roof panel manufacturers shall be subject to periodic inspection, at the manufacturing plant if necessary, by an approved agency to verify the metal roof panels are continuously manufactured as approved.

Section 1507.5:

The installation of metal roof shingles shall comply with the provisions of this section. Approved metal roof shingle manufacturers shall be subject to periodic inspection, at the manufacturing plant if necessary, by an approved agency to verify the metal roof shingles are continuously manufactured as approved.
### R6690

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<td>Section</td>
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<td>Proponent</td>
<td>Mark Zehnal</td>
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#### Comments

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#### Related Modifications

- Remove section

#### Summary of Modification

This section is redundant since this is a built-up system and would require a product approval.

#### Rationale

Impact to local entity relative to enforcement of code

No impact. Still within current 2014 FBC code language without any new requirements being established.

Impact to building and property owners relative to cost of compliance with code

No impact. Still within current 2014 FBC code language without any new requirements being established.

Impact to industry relative to the cost of compliance with code

No impact. Still within current 2014 FBC code language without any new requirements being established.

Impact to small business relative to the cost of compliance with code

No impact. Still within current 2014 FBC code language without any new requirements being established.

#### Fiscal Impact Statement

- Has a reasonable and substantial connection with the health, safety, and welfare of the general public
  - Still within current, commission approved 2014 FBC performance proven code language without any new requirements being established.
- Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
  - Still within current, commission approved 2014 FBC performance proven code language without any new requirements being established.
- Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
  - Does not discriminate. Still within current Commission approved 2014 FBC requirements.
- Does not degrade the effectiveness of the code
  - Does not degrade. Still within current Commission approved 2014 FBC requirements.

#### Requirements

- The proposed code modification part of a prior code version? YES

- The provisions contained in the proposed amendment are addressed in the applicable international code? NO

- The amendment demonstrates by evidence or data that the geographical jurisdiction of Florida exhibits a need to strengthen the foundation code beyond the needs or regional variation addressed by the foundation code and why the proposed amendment applies to the state? YES

- The proposed amendment was submitted or attempted to be included in the foundation codes to avoid resubmission to the Florida Building Code amendment process? NO
See attached PDF file.
R905.5-Mineral-surfaced roll roofing—RESERVED
The installation of mineral-surfaced roll roofing shall comply with this section.

R905.5.1-Deck requirements—
Mineral-surfaced roll roofing shall be fastened to solidly sheathed roofs.

R905.5.2-Deck slope—
Mineral-surfaced roll roofing shall not be applied on roof slopes below one unit vertical in 12 units horizontal (8 percent slope).

R905.5.3-Underlayment—
Underlayment shall comply with Section R905.1.1.

R905.5.3.1-Ice barrier—
Where required, ice barriers shall comply with Section R905.1.2.

R905.5.4-Material standards—
Mineral-surfaced roll roofing shall conform to ASTM D 3000 or ASTM D 6380, Class M.

R905.5.5-Application—
Mineral-surfaced roll roofing shall be installed in accordance with this chapter and the manufacturer’s instructions.