

Structural

Proposed Code Modifications

This document created by the Florida Department of Community Affairs - 850-487-1824

TAC: Structural

Sub Code: Building

Total Mods for Structural: 168

Date Submitted	4/1/2010	**Section**	202	**Proponent**	Chuck Anderson
Chapter	2	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

4336

Summary of Modification

Includes Tubular Daylighting Devices in definition of unit skylights

Rationale

Provides direction on how to address TDD's

Fiscal Impact Statement

Impact to local entity relative to enforcement of code
clarifies how to classify TDD

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
minimal, request for this change comes from AAMA's skylight council.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public
Will require TDD to meet skylight requirements.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction
provides direction on how to classify TDD's

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities
provides a compliance path for TDD's, no discrimination of materials

Does not degrade the effectiveness of the code
no degradation

Replace proposed language with the following:

1. Add new definition:

SECTION 202

TUBULAR DAYLIGHTING DEVICE (TDD). A non-operable fenestration unit primarily designed to transmit daylight from a roof surface to an interior ceiling via a tubular conduit. The basic unit consists of an exterior glazed weathering surface, a light-transmitting tube with a reflective interior surface, and an interior-sealing device such as a translucent ceiling panel. The unit may be factory assembled, or field-assembled from a manufactured kit.

2. Modify as shown:

1715.6 Skylights and sloped glazing. Unit skylights and tubular daylighting devices (TDDs) shall comply with the requirements of Section 2405. All other skylights and sloped glazing shall comply with the requirements of Chapter 24.

3. Modify as shown:

2404.2 Sloped glass. …

…

Exception: Unit skylights ~~shall be designed in accordance with Section 2405.5.~~ and tubular daylighting devices (TDDs) shall comply with the requirements of Section 2405. The design of sloped glazing shall be based on the following equation:

Fg= Fga (**Equation 24-5**)

Fg = Total load on the glass determined from the load combinations above.

Fga = Short duration load resistance of the glass as determined according to ASTM E 1300 for Equations 24-2 and 24-3; or the long duration load resistance of the glass as determined according to ASTM E 1300 for Equation 24-4

Alternate Language

Proponent Roger LeBrun **Submitted** 5/22/2010 **Attachments** Yes

S4332-A1

Rationale

The above is to be consistent with results of today's 2012 IBC Final Action Hearings, referring to code change S144, Part I. These changes more thoroughly accomplish the intent of the originally filed FBC proposal, and are consistent with the IBC edition taking effect when the 2010 FBC becomes effective.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Same as original proposal.

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

Same as original proposal.

Impact to industry relative to the cost of compliance with code

Same as original proposal.

Requirements

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

Same as original proposal.

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

Same as original proposal.

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

Same as original proposal.

Does not degrade the effectiveness of the code

Same as original proposal.

SKYLIGHT, UNIT. A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof. Unit skylights include, but are not limited to, tubular daylighting devices (TDD).

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Replace proposed language with the following:

1. Add new definition:

SECTION 202

TUBULAR DAYLIGHTING DEVICE (TDD). A non-operable fenestration unit primarily designed to transmit daylight from a roof surface to an interior ceiling via a tubular conduit. The basic unit consists of an exterior glazed weathering surface, a light-transmitting tube with a reflective interior surface, and an interior-sealing device such as a translucent ceiling panel. The unit may be factory assembled, or field-assembled from a manufactured kit.

2. Modify as shown:

1715.6 Skylights and sloped glazing. Unit skylights and tubular daylighting devices (TDDs) shall comply with the requirements of Section 2405. All other skylights and sloped glazing shall comply with the requirements of Chapter 24.

3. Modify as shown:

2404.2 Sloped glass. ...

...

Exception: Unit skylights ~~shall be designed in accordance with Section 2405.5.~~ and tubular daylighting devices (TDDs) shall comply with the requirements of Section 2405. The design of sloped glazing shall be based on the following equation:

Fg= Fga **(Equation 24-5)**

Fg = Total load on the glass determined from the load combinations above.

Fga = Short duration load resistance of the glass as determined according to ASTM E 1300 for Equations 24-2 and 24-3; or the long duration load resistance of the glass as determined according to ASTM E 1300 for Equation 24-4

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SKYLIGHT, UNIT. A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof. Unit skylights include, but are not limited to, tubular daylighting devices (TDD).

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S4466

Date Submitted	4/2/2010	**Section**	1405.1	**Proponent**	Joseph Belcher
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

R703.12.3, Mod 4468

Summary of Modification

Proosal eliminates wind load provisions of AAMA 1402 which are contrary to the wind load provisions of the code.

Rationale

The wind design provisions are outdated. (e.g. ASCE 7-88) There are provisions related wind speeds not applicable in Florida (80 mph). There are unjustified reductions of 50% in the design pressure. The appendix states the decreases are based on a study conducted by AAMA. Discussion with AAMA reveals the study justifying the windload data cannot be found. AAMA has no plans to update the standard. The proposal removes the wind design data leaving the rest of the standard in place.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on cost. The standard contains provisions contrary to the FBC. When there is a conflict between the code and an adopted standard, the code prevails. Since AAMA 1402 is adopted in the 2004 and 2007 FBC, the code applied and the proposed changes to the standard should have no impact.

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

The standard contains provisions contrary to the FBC. When there is a conflict between the code and an adopted standard, the code prevails. Since AAMA 1402 is adopted in the 2004 and 2007 FBC, the code applied and the proposed changes to the standard should have no impact.

Impact to industry relative to the cost of compliance with code

No impact on cost. The standard contains provisions contrary to the FBC. When there is a conflict between the code and an adopted standard, the code prevails. Since AAMA 1402 is adopted in the 2004 and 2007 FBC, the code applied and the proposed changes to the standard should have no impact.

Requirements

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

The proposal benefits the public welfare by eliminating provisions adopted by the code which are contrary to the code. The continued adoption could lead to substandard designs in and important aspect of the weather resistance of buildings.

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

The proposal improves the code by eliminating provisions adopted by the code which are contrary to the code. The continued adoption could lead to substandard designs in and important aspect of the weather resistance of buildings.

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

The proposal increases the effectiveness of the code and the protection of the public by eliminating provisions adopted by the code which are contrary to the code. The continued adoption could lead to substandard designs in and important aspect of the weather resistance of buildings.

1404.5.1 Aluminum siding. Aluminum siding shall conform to the requirements of AAMA 1402.

AAMA 1402, shall be modified to read as follows:

Section 1 Standard Specifications for Aluminum Siding, Soffit, and Fascia, 2.0 Siding Specifications, 2.2 Performance Criteria, 2.2.1 Windload Resistance

2.2.1.1 Static Pressure Test

~~able to withstand structural loading conditions which occur in 36 m/s (80 mph) wind zone areas for elevations of 10 m (33 ft) and less, which is equivalent to 1040 Pa (21.7 psf) design pressure.~~ capable of resisting the design pressures specified for walls for components and cladding loads in accordance with Section 1609.1.1. To verify that the siding will perform under these conditions, it shall be tested in accordance with Test Method #1, "Standard for Testing of Aluminum Siding/Fastener for Windload Resistance" or in an approved manner. The static test pressure shall be ~~780 Pa (16.3 psf).~~ as required to demonstrate compliance with the provisions of 1609.1.

2.2.1.1.2 For applications where the effective design pressure as specified in ~~ASCE 7-88~~ Section 1609.1.1 is greater than 1040 Pa (21.7 psf) [e.g. wind zone areas greater than 36 m/s (80 mph) or elevations above 10 m (33 ft)] the product shall be tested in accordance with Test Method #1 under a static test pressure determined by the formula:

P_T = ~~0.5~~ ~~x~~1.5 x DP

Where:

P_T = Static Test Pressure [Pa (psf)]

DP = Design Pressure [Pa (psf)]

~~0.5 = Pressure Equalization Factor~~

1.5 = Safety Factor

~~NOTE: See Appendix for discussion of windloads on siding and for determination of design pressure.~~

~~2.2.1.2 Optional Criteria~~

~~In lieu of the test requirements specified in Section 2.2.1.1, siding is acceptable for use in applications where the design pressure is 1040 Pa (21.7 psf) or less and the siding is installed to solid walls with internal or external sheathing, if the metal has a minimum tensile strength of~~

~~138 MPa (20,000 psi) and conforms to the following:~~

Strike Table:

3.0 Soffit and Fascia Specifications, 3.2 Performance Criteria, 3.2.1 Windload Resistance

3.2.1.1 Static Pressure Test

3.2.1.1.1 All soffit products shall be ~~able to withstand structural loading conditions which occur in 36 m/s (80 mph) wind zone areas for elevations of 10 m (33 ft) and less, which is equivalent to 1040 Pa (21.7 psf) design pressure.~~ capable of resisting the design pressures specified for walls for components and cladding loads in accordance with Section 1609.1.1. To verify that the soffit will perform under these conditions, it shall be tested in the maximum unsupported length for which the manufacturer seeks

conformance when tested in accordance with Test Method #4, "Standard for Testing of Soffits and Windload Resistance."

The static test pressure shall be ~~780 Pa (16.3 psf).~~ as required to demonstrate compliance with the provisions of Section 1609.1.

~~NOTE: See Appendix for discussion of windloads on soffits.~~

3.2.1.1.2 For applications where the effective design pressure as specified in ~~ASCE 7-88~~ Section 1609.1.1 is greater than 1040 Pa (21.7 psf) [e.g. wind zone areas greater than 36 m/s (80 mph) or elevations above 10 m (33 ft)] the product shall be tested in accordance with Test Method #4 under a static test pressure determined by the formula:

P_T = ~~0.5~~ x 1.5 x DP_p

Where:

P_T = Static Test Pressure [Pa (psf)]

DP_p = Design Pressure [Pa (psf)]

~~0.5 = Pressure Equalization Factor~~

1.5 = Safety Factor

~~NOTE: See Appendix for discussion of wind loads on soffits and for determination of design pressure.~~

Section 3, Appendix, Windload Criteria is deleted in its entirety.

1404.5.1 Aluminum siding. Aluminum siding shall conform to the requirements of AAMA 1402.

AAMA 1402, shall be modified to read as follows:

Section 1 Standard Specifications for Aluminum Siding, Soffit, and Fascia, 2.0 Siding Specifications, 2.2 Performance Criteria, 2.2.1 Windload Resistance

2.2.1.1 Static Pressure Test

~~able to withstand structural loading conditions which occur in 36 m/s (80 mph) wind zone areas for elevations of 10 m (33 ft) and less, which is equivalent to 1040 Pa (21.7 psf) design pressure.~~ capable of resisting the design pressures specified for walls for components and cladding loads in accordance with Section 1609.1.1. To verify that the siding will perform under these conditions, it shall be tested in accordance with Test Method #1, "Standard for Testing of Aluminum Siding/Fastener for Windload Resistance" or in an approved manner. The static test pressure shall be ~~780 Pa (16.3 psf).~~ as required to demonstrate compliance with the provisions of 1609.1.

2.2.1.1.2 For applications where the effective design pressure as specified in ~~ASCE 7-88~~ Section 1609.1.1 is greater than 1040 Pa (21.7 psf) [e.g. wind zone areas greater than 36 m/s (80 mph) or elevations above 10 m (33 ft)] the product shall be tested in accordance with Test Method #1 under a static test pressure determined by the formula:

P_T = ~~0.5~~ x 1.5 x DP

Where:

P_T = Static Test Pressure [Pa (psf)]

DP = Design Pressure [Pa (psf)]

~~0.5 = Pressure Equalization Factor~~

1.5 = Safety Factor

~~*NOTE: See Appendix for discussion of windloads on siding and for determination of design pressure.*~~

~~2.2.1.2 Optional Criteria~~

~~In lieu of the test requirements specified in Section 2.2.1.1, siding is acceptable for use in applications where the design pressure is 1040 Pa (21.7 psf) or less and the siding is installed to solid walls with internal or external sheathing, if the metal has a minimum tensile strength of~~

~~138 MPa (20,000 psi) and conforms to the following:~~

Strike Table:

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	Minimum Thickness ± 0.05 mm (± .002 in)	Maximum Panel Width	Maximum Flat Area
Unbacked Siding	0.6 mm (0.024 in)	460 mm (18 in)	260 mm (10 in)
Unbacked Siding	0.5 mm (0.019 in)	260 mm (10 in)	210 mm (8 in)
Backed Siding	0.5 mm (0.019 in)	460 mm (18 in)	260 mm (10 in)

3.0 Soffit and Fascia Specifications, 3.2 Performance Criteria, 3.2.1 Windload Resistance

3.2.1.1 Static Pressure Test

3.2.1.1.1 All soffit products shall be ~~able to withstand structural loading conditions which occur in 36 m/s (80 mph) wind zone areas for elevations of 10 m (33 ft) and less, which is equivalent to 1040 Pa (21.7 psf) design pressure.~~ capable of resisting the design pressures specified for walls for components and cladding loads in accordance with Section 1609.1.1. To verify that the soffit will perform under these conditions, it shall be tested in the maximum unsupported length for which the manufacturer seeks

conformance when tested in accordance with Test Method #4, "Standard for Testing of Soffits and Windload Resistance."

The static test pressure shall be ~~780 Pa (16.3 psf).~~ as required to demonstrate compliance with the provisions of Section 1609.1.

~~NOTE: See Appendix for discussion of windloads on soffits.~~

3.2.1.1.2 For applications where the effective design pressure as specified in ~~ASCE 7-88~~ Section 1609.1.1 is greater than 1040 Pa (21.7 psf) [e.g. wind zone areas greater than 36 m/s (80 mph) or elevations above 10 m (33 ft)] the product shall be tested in accordance with Test Method #4 under a static test pressure determined by the formula:

P_T = ~~0.5~~ x 1.5 x DP_p

Where:

P_T = Static Test Pressure [Pa (psf)]

DP_p = Design Pressure [Pa (psf)]

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~~0.5 = Pressure Equalization Factor~~

1.5 = Safety Factor

~~*NOTE: See Appendix for discussion of wind loads on soffits and for determination of design pressure.*~~

Section 3, Appendix, Windload Criteria is deleted in its entirety.

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Date Submitted	3/24/2010	**Section**	1715.9	**Proponent**	Joseph Belcher
Chapter	17	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Mod3689
Add Section 1404.9.2 Soffit Labeling to provide a reference to the new 1715.9.
Add reference to new Section 1715.9 at Section 1609.1 which requires soffit to be designed as C & C.

Summary of Modification

Adds labeling requirements for soffits.

Rationale

The hurricanes of 2004 revealed a very weak link in the building water intrusion resistance system, soffits. In numerous cases severe water damage was caused by rain blown in through soffit spaces where the soffit was blown out or dislodged. In most cases the storms were below design wind speeds. In response, the Commission appointed a Soffit Work Group to study the issue and propose changes as deemed necessary. The proposed language embodies the recommendations of the Work Group.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Labeling will make the job of local enforcement easier to perform as they will have documentation to check the installation against.

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

There may be a slight increase in cost for the manufacturer to do the labeling. The cost presumably will be passed on to the contractor and then to the owner.

Impact to industry relative to the cost of compliance with code

Costs are not available from the soffit industry. However, similar provisions instituted for impact resistant coverings were estimated by that industry at less than 0.03¢ per unit.

Requirements

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

The proposal will benefit the public by improving the ability of soffits to resist water intrusion.

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

The proposal strengthens the code by providing requirements addressing a known weak area of the code, soffits and their installation.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by addressing a known weak area in the weather resistance provisions of the code.

1715.9 Soffit.

1715.9.1 Product Approval. Manufactured soffit materials and systems shall be subject to statewide or local product approval as specified in FAC Rule 9-B-72. The net free area of the manufactured soffit material or system shall be included in the product approval submittal documents.

1715.9.2 Labels. Individual manufactured soffit pieces shall be **permanently** marked at not more than four feet on center with a number or marking that ties the product back to the manufacturer.

1715.9.~~2~~**3** The following information shall be included on the manufactured soffit material packaging or on the individual manufactured soffit material or system pieces:

1. Product approval holder and/or manufacturer name and city and state of manufacturing plant.

2. Product model number or name.

3. Method of approval and approval numbers as applicable. Methods of approval include, but are not limited to: Florida Building Commission FL #; Miami-Dade NOA; TDI Product Evaluation; and, ICC-ES.

4. The test standard or standards specified in Chapter 14 used to demonstrate code compliance.

5. The net free area shall be included on the packaging or label.

1st Comment Period History 04/15/2010 - 06/01/2010

S3855-G1

Proponent	Dobson Matthew	Submitted	6/1/2010	Attachments	No

Comment:

Although as an industry we generally agree that soffits should be labeled as approved for specific use as approved under the prodcut approval program, the proponent makes statements from a work group that has yet to complete their work. Further there is clear recognition that current failures are due in large part to improper installation of soffit. This needs to be recognized more appropriately in the code, for example as proposed in the IRC code change 4200.

1715.9 Soffit.

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1. Product approval holder and/or manufacturer name and city and state of manufacturing plant.

2. Product model number or name.

3. Method of approval and approval numbers as applicable. Methods of approval include, but are not limited to: Florida Building Commission FL #; Miami-Dade NOA; TDI Product Evaluation; and, ICC-ES.

4. The test standard or standards specified in Chapter 14 used to demonstrate code compliance.

5. The net free area shall be included on the packaging or label.

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S4411

Date Submitted	4/2/2010	**Section**	1716.1	**Proponent**	Stuart Lewis
Chapter	17	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Subcode	Sec	Mod#	Why?
Building	2303.5		Replace 1716.1 reference with ASTM D 7147.
Building	35		Add ASTM D 7147-05, update D1761-06 line

Summary of Modification

Delete sec. 1716.1 in its entirety since referenced standard, D1761, is not relevant to joist hangers & content is in ASTM D 7147-05 so that should be referenced in sec. 2303.5.

Rationale

The 2009 IBC updated the referenced ASTM D 1761 from a prior edition to a 2006 edition which had all information on joist hangers removed. New ASTM D 7147-05 now contains provisions for joist hangers from the old D 1761, updated and revised to include the information in section 1716.1 of the 2009 IBC. The proposed change will reinstate hanger test requirements deleted by this inadvertent change and remove section 1716.1 to avoid confusion due to its redundancy to some, but not all, of D 7147.

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

Minimal (only if past testing not up to current standard)

Requirements

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

Yes, it pertains to structural safety of buildings.

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

Yes, it updates joist hanger testing to current standard.

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

It does not so discriminate.

Does not degrade the effectiveness of the code

It does not degrade the effectiveness of the code.

1715.1 Test standards for joist hangers and connectors. The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers and similar connectors shall be determined in accordance with either 1715.1.1 or 1715.1.2

1715.1.1 Test procedure using ASTM D 7147. The load capacity of joist hangers and similar connectors shall be permitted to be determined using ASTM D 7147.

1715.1.2 Test procedure using ASTM D 1761 ~~standards for joist hangers.~~ The ~~vertical~~ load-bearing capacity~~, torsional moment capacity and deflection characteristics~~ of joist hangers and similar connectors shall be permitted to be determined in accordance with ASTM D 1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.

Exception: The joist length shall not be required to exceed 24 inches (610 mm).

1715.1.2.1 Vertical load capacity for joist hangers. The vertical load capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load of the joist hanger shall be the lowest value determined from the following:

1. The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).

2. The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted).

3. The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of 0.125 inch (3.2 mm).

4. The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.

5. The allowable design load for the wood members forming the connection.

1715.1.~~3~~2.2 Torsional moment capacity for joist hangers. The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 0.125 inch (3.2 mm).

1715.1.42.3 Design value modifications for joist hangers. Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1715.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section 1715.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1715.1.2 and 2305.1 shall not be modified by duration of loading factors.

ADD in Chapter 35

ASTM D 1761-88 (2000) Standard Test Methods for Mechanical Fasteners in Wood

Alternate Language

Proponent Randall Shackelford **Submitted** 6/1/2010 **Attachments** Yes

S4411-A2

Rationale

This proposal needs to be modified for three reasons. 1. Test standard for hangers is being modified in the wood chapter instead of Chapter 17. Hangers are used for other materials besides wood. The test standard for hangers needs to stay in Chapter 17. 2. The test standard for hangers is being modified in the non-HVHZ section, but is not modified in the HVHZ section, Section 2314.4.4. This will result in inconsistencies in how manufacturers have to test products for approval in different

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact. Permits standard that is currently used. As written, will have major impact because existing approved connectors will no longer be able to be used.

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

No impact. Permits standard that is currently used. As written, will have major impact because existing approved connectors will no longer be able to be used.

Impact to industry relative to the cost of compliance with code

No impact. Permits standard that is currently used. As written, will have major impact because existing approved connectors will no longer be able to be used. Very high cost due to having to re-test thousands of connectors in a limited time and then have many evaluation reports re-written.

Requirements

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

Revised language maintains existing safety standards for connectors.

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

Revised language improves the code by providing options for manufacturers.

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

As proposed, this does significantly discriminate against existing manufacturers. Revised language does not discriminate.

Does not degrade the effectiveness of the code

Revised language does not degrade code because it simply allows for the same standard currently used to remain in use.

Delete Section 1716.1 in its entirety including all subsections. (or just retain "1716.1" and add "Reserved" to preserve later section numbers)

1716.1 Test standards for joist hangers and connectors.

1716.1.1 Test standards for joist hangers. The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with ASTM D 1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.

Exception: The joist length shall not be required to exceed 24 inches (610 mm).

1716.1.2 Vertical load capacity for joist hangers. The vertical load capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load of the joist hanger shall be the lowest value determined from the following:

1. The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).

2. The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted).

3. The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of $\pm 1/8$ inch (3.2 mm).

4. The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.

5. The allowable design load for the wood members forming the connection.

1716.1.3 Torsional moment capacity for joist hangers. The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is $\pm 1/8$ inch (3.2 mm).

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~~**1716.1.4 Design value modifications for joist hangers.** Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1716.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section 1716.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1716.1.2 shall not be modified by duration of loading factors.~~

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1715.1 Test standards for joist hangers and connectors. The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers and similar connectors shall be determined in accordance with either 1715.1.1 or 1715.1.2

1715.1.1 Test procedure using ASTM D 7147. The load capacity of joist hangers and similar connectors shall be permitted to be determined using ASTM D 7147.

1715.1.2 Test procedure using ASTM D 1761 ~~standards for joist hangers~~. The ~~vertical~~ load-bearing capacity~~, torsional moment capacity and deflection characteristics~~ of joist hangers and similar connectors shall be permitted to be determined in accordance with ASTM D 1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.

Exception: The joist length shall not be required to exceed 24 inches (610 mm).

1715.1.2.1 Vertical load capacity for joist hangers. The vertical load capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load of the joist hanger shall be the lowest value determined from the following:

1. The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).

2. The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted).

3. The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of 0.125 inch (3.2 mm).

4. The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.

5. The allowable design load for the wood members forming the connection.

1715.1.~~3~~2.2 Torsional moment capacity for joist hangers. The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 0.125 inch (3.2 mm).

1715.1.42.3 Design value modifications for joist hangers. Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1715.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section 1715.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1715.1.2 and 2305.1 shall not be modified by duration of loading factors.

ADD in Chapter 35

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ASTM D 1761-88 (2000) Standard Test Methods for Mechanical Fasteners in Wood

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ICC EVALUATION SERVICE, INC.
Evaluate ■ Inform ■ Protect

ACCEPTANCE CRITERIA FOR JOIST HANGERS AND SIMILAR DEVICES

AC13

Approved October 2006

Effective January 1, 2007

(Corrected March 2007; Editorially revised April 2008)

Previously approved October 2003, January 2003, January 2001

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

> The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (**I**) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (➔) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

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ACCEPTANCE CRITERIA FOR JOIST HANGERS AND SIMILAR DEVICES

1.0 INTRODUCTION

1.1 Purpose: The purpose of this criteria is to establish requirements for ICC Evaluation Service, Inc. (ICC-ES), recognition of joist hangers, framing anchors and similar devices under Section 2303.5 of the 2006 *International Building Code*® (IBC), Section R104.11 of the 2006 *International Residential Code*® (IRC), Section 2312 of the BOCA® *National Building Code*/1999 (BNBC), Section 1707.3 of the 1999 *Standard Building Code*® (SBC) and Sections 2304.3, 2304.4.2, and 2318.4 of the 1997 *Uniform Building Code*™ (UBC).

The reason for the development of this criteria is to provide a guideline for the evaluation of joist hangers and similar devices, since the IBC, IRC, BNBC, SBC, UBC and associated reference standards do not specify installation and quality requirements for these products.

1.2 Scope: The devices are used to support or attach wood members, such as joists, rafters, purlins, beams, girders, plates, posts, studs and headers, to wood, metal, concrete or masonry. Attachment may be by means of mechanical fastenings (nails, spikes, lag screws, wood screws, bolts, etc.)

A "device," as the word is used in this criteria, may consist of one or more pieces or units so arranged as to transfer load vertically or laterally, within safe limits, from the end of a supported member (hereinafter referred to as a "joist") to a supporting member (hereinafter referred to as a "header").

1.3 Referenced Standards:

1.3.1 2006 *International Building Code*®, International Code Council.

1.3.2 2006 *International Residential Code*®, International Code Council.

1.3.3 BOCA® *National Building Code*/1999.

1.3.4 1999 *Standard Building Code*®.

1.3.5 1997 *Uniform Building Code*™.

1.3.6 ANSI/AF&PA National Design Specification for Wood Construction (NDS) and Supplement, American Forest & Paper Association. (Refer to Table 1 of this acceptance criteria for edition date.)

1.3.7 ASTM D 1761-88(2000)$^{\varepsilon 1}$, Test Methods for Mechanical Fasteners in Wood, ASTM International.

1.3.8 ASTM D 7147-05, Standard Specification for Testing and Establishing Allowable Loads of Joist Hangers, ASTM International.

2.0 BASIC INFORMATION AND TEST REPORTS

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information pertaining to components, material specifications, and manufacturing processes. Materials shall comply with an appropriate recognized national standard(s).

2.1.2 Installation Instructions: Installation details and drawings, noting installation requirements and/or limitations.

2.1.3 Identification: Description of the method of identifying the product. Each device shall bear an imprint which clearly identifies the manufacturer. A registered trademark may serve as such identity. Labeling shall also include the ICC-ES evaluation report number.

2.2 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85. All test reports shall be prepared by an independent testing laboratory in accordance with Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports. Test reports shall include a complete description of devices tested; the dimensions of the specimens; the number, size, type, and method of installing fastenings; type of failure; and such other data as may be pertinent.

2.4 Sampling: Test specimens shall be sampled in accordance with Section 3.0 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 General: Every device shall be rated for direct (vertical) capacity under Allowable Stress Design (ASD) in accordance with Section 3.2 or 3.3 of this criteria. Joist hangers also shall be rated for torsional moment capacity in accordance with Section 3.4 of this criteria.

3.2 Direct (Vertical) Load Capacity Tests: The testing procedure to establish direct load capacity shall be in accordance with ASTM D 1761 and conform to the following provisions:

3.2.1 A minimum of three test specimens for each size of device shall be tested. If the ultimate load for any one of the test specimens varies more than 20 percent from the average, three additional tests shall be conducted.

3.2.2 A test specimen shall consist of an assembly of a joist and two headers of appropriate size fastened together by a device to be tested, as illustrated in Figure 7 of ASTM D 1761. The minimum length for joists and headers shall be 18 inches (457 mm). The joist length need not exceed 24 inches (610 mm). Headers shall have a length sufficient to provide the intended hanger-to-header contact for the hanger, that is, space for nailing and bearing as applicable.

For devices not readily adaptable to such assembly, an alternate assembly producing comparable results may be used.

3.2.3 The species of lumber used shall have a specific gravity not greater than 0.55 as determined in accordance with the NDS.

3.2.4 The moisture content at time of test shall be greater than 11 percent.

3.2.5 A specimen, when inserted in the testing machine, shall have the top of the joist level, and the sides vertical. Except for the restraint provided by the device, the joist shall be unrestricted for vertical movement.

3.2.6 A dial gauge reading to 0.001 inch (0.0254 mm) shall be used for the measurement of vertical movement of the joist with respect to the headers.

3.2.7 An initial load, ranging from 5 to 20 percent of ultimate load, shall be applied to the joist to seat the test

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assembly. This load shall then be removed and the gauges shall be set to zero and so recorded, with the amount of the initial load.

3.2.8 Load shall be applied at either a uniform crosshead rate between 0.03 to 0.10 inch (0.8 to 2.5 mm) per minute, or at a rate of loading which will result from approximately this machine head speed. The rate of loading shall be reported with the test data.

3.2.9 Both load and gauge readings shall be recorded at appropriate intervals of load.

3.2.10 Test results may be presented in tabular form or by means of a graph.

3.2.11 For compliance with the applicable code, each device shall be rated for direct load (vertical) capacity at the lowest value determined from the following:

3.2.11.1 The allowable vertical load for a normal duration of loading of the joist hanger or similar device shall be the lowest value determined from tests using the criteria given in Sections 3.2.11.1.1 through 3.2.11.1.3.

3.2.11.1.1 The lowest ultimate vertical load for a single device from any test divided by 3 (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).

3.2.11.1.2 The average ultimate vertical load for a single device from all tests divided by 3 (where six or more tests are conducted).

3.2.11.1.3 The average from all the tests of the vertical load that produces a vertical movement of the joist with respect to the header of 0.125 inch (3.2 mm).

3.2.11.2 The device shall have a direct load capacity rating no greater than calculated in accordance with the NDS for nails or other fasteners utilized to attach the joist hanger or similar device to the wood members and allowable bearing loads that contribute to the capacity of the hanger.

3.2.11.3 The device shall have a direct load capacity rating no greater than the allowable design load determined in accordance with the NDS for the wood members forming the connection.

3.3 Alternative Test Method for Direct (Vertical) Load Capacity Testing: As an alternative to ASTM D 1761, the provisions of ASTM D 7147 may be followed to establish direct load capacity, provided that analysis of test data and derivation of allowable loads are in accordance with Sections 13, 14 and 15 of ASTM D 7147.

3.4 Torsional Moment Capacity Test for Joist Hangers:

3.4.1 The torsional moment capacity for the joist hanger shall be determined in accordance with ASTM D 1761. At least three specimens of each size of device shall be tested. Specimens shall be prepared and tested in a manner that will show the torsional moment in inch-pounds required to deflect either the top or bottom of the joist 0.125 inch (3.2 mm) from its initial position, provided the moment is applied by rotating the joist at a distance of not less than 12 inches (305 mm) from the device.

EXCEPTION: Hangers supporting glued-laminated beams or hangers specifically designed to support only prefabricated wood I-joists.

3.4.2 The torsional moment capacity rating of the device shall be the average torsional load at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 0.125 inch (3.2 mm), such load to be the average for three or more tests.

3.4.3 Every device supporting a joist shall have a torsional moment capacity of not less than 75 pounds (334 N) times the depth of the joist. Any device supporting roof joists having one end twisted more than one-half of one degree per foot length relative to the other end (such as in framing a breached bay between a bowstring truss and a wall) shall have a torsional moment capacity of 200 pounds (890 N) times the depth of the joist, unless other means (such as solid blocking, etc.) are provided to satisfy this requirement.

4.0 ANALYSIS DETAILS

4.1 Compression Perpendicular to Grain: When the transfer of loads on the joist to the header is accomplished primarily by means of compression perpendicular to grain of the wood against the device, the allowable loads specified in the NDS shall not be exceeded.

4.2 Fastener Values: When the transfer of loads on the joist to the header is accomplished primarily by means of fasteners in wood, the allowable strength of fasteners specified in the NDS shall not be exceeded.

4.3 Multiple Devices: When more than one device is used at a joint, the devices shall be capable of operating in unison.

4.4 Provision for Shrinkage: Dimensions of devices, or methods of installation, shall make appropriate provisions for shrinkage of joist relative to header.

4.5 Design Value Modifications for Joist Hangers or Similar Devices: Allowable design values for joist hangers or similar devices that are determined by calculation (Sections 3.2.11.2 and 3.2.11.3) shall be permitted to be modified by the appropriate duration of loading factors as specified in the NDS, *except when limited by a test-based design value. Allowable design values determined by test results (Section 3.2.11.1) shall not be modified by duration of load factors*.

5.0 MATERIALS AND WORKMANSHIP

Materials shall be of uniform quality and shall comply with the provisions of each applicable code when specified, otherwise material shall be limited to the following:

5.1 Minimum thickness of steel shall be as follows:

Sheet—No. 18 gage, U.S. Standard Gage.

Wire—No. 18 gage, U.S. Steel Wire Gage.

EXCEPTION: Face-mounted joist hangers, supporting 2-by-4, 2-by-6, 2-by-8, and 2-by-10 wood joists or rafters, may be fabricated from minimum No. 20 gage sheet steel provided applicable sections of this criteria are complied with.

5.2 Steel shall be corrosion-resistant or shall be protected by galvanizing, electroplating, or with approved steel primer.

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5.3 The device, after forming, shall evidence no fracturing in either the protective coating or the base metal.

5.4 The radius of a 90-degree bend intended to fit the corner of a joist or header shall be no greater than two times the thickness of the steel.

6.0 QUALITY CONTROL

6.1 Documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

6.2 Welded joist hangers or similar devices shall be manufactured under an approved quality control program with inspections by an inspection agency accredited by the International Accreditation Service (IAS) or otherwise acceptable to ICC-ES.■

TABLE 1—REFERENCED STANDARDS

STANDARD	DATE OF STANDARD				
	2006 *International Building Code*®	2006 *International Residential Code*®	BOCA® *National Building Code*/1999	1999 *Standard Building Code*©	1997 *Uniform Building Code*™
ANSI/AF&PA National Design Specification for Wood Construction (NDS) and Supplement	2005	2005	1997	1997	1991 (revised)

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PROPOSAL:

1715.1 Test standards for joist hangers and connectors. The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers and similar connectors shall be determined in accordance with either 1715.1.1 or 1715.1.2

1715.1.1 Test procedure using ASTM D 7147. The load capacity of joist hangers and similar connectors shall be permitted to be determined using ASTM D 7147.

1715.1.2 Test procedure using ASTM D 1761 ~~**standards for joist hangers.**~~ The ~~vertical~~ load-bearing capacity~~, torsional moment capacity and deflection characteristics~~ of joist hangers and similar connectors shall be permitted to be determined in accordance with ASTM D 1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.

Exception: The joist length shall not be required to exceed 24 inches (610 mm).

1715.1.2.1 Vertical load capacity for joist hangers. The vertical load capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load of the joist hanger shall be the lowest value determined from the following:

1. The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).
2. The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted).
3. The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of 0.125 inch (3.2 mm).
4. The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.
5. The allowable design load for the wood members forming the connection.

1715.1.32.2 Torsional moment capacity for joist hangers. The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 0.125 inch (3.2 mm).

1715.1.42.3 Design value modifications for joist hangers. Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1715.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AF&PA NDS but shall not exceed the direct loads as determined

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by Item 1, 2 or 3 in Section 1715.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1715.1.2 and 2305.1 shall not be modified by duration of loading factors.

ADD in Chapter 35
ASTM D 1761-88 (2000) Standard Test Methods for Mechanical Fasteners in Wood

REASON STATEMENT

This proposal needs to be modified for three reasons.

1. Test standard for hangers is being modified in the wood chapter instead of Chapter 17. Hangers are used for other materials besides wood. The test standard for hangers needs to stay in Chapter 17.
2. The test standard for hangers is being modified in the non-HVHZ section, but is not modified in the HVHZ section, Section 2314.4.4. This will result in inconsistencies in how manufacturers have to test products for approval in different areas of the State. In order to use Section 2314.4.4, ASTM D 1761-88 (2000) must remain referenced in the FBC-Building.
3. This proposal aims to adopt a completely new standard for hangers and similar devices, while deleting one that has been used safely and effectively for many years and continues to be used. Established connector manufacturers have thousands of Florida product approvals (and evaluation reports from approved entities and certifications) based on testing to ASTM D 1761. Removing that standard will cause a hardship for existing manufacturers. It will be virtually impossible for major manufacturers to re-test all their products to the new test standard and have evaluation reports written by the time the code is adopted. In fact, the ICC-ES currently allows either ASTM D 1761 or D 7147 to be used (see attachment Acceptance Criteria 13). This proposal simply brings that option into the code. The proponent says this proposal does not discriminate. That is not true. This proposal does discriminate against existing manufacturers who have used ASTM D 17 for years. The proponent is a new manufacturer who is trying to shut existing manufacturers out of the market. The proponent also states this proposal has minimal impact to industry. That is only true if you are a new manufacturer. This will have a major impact on existing manufacturers.

By amending the code to offer the option of using the existing standard in addition to the new standard, the discrimination and impact are minimized, the HVHZ is still consistent with the non-HVHZ, the reference to test standards will remain in Chapter 17 where it belongs, and existing manufacturers will continue to be able to use existing ICC-ES reports to achieve Florida Product Approval.

There is precedence for referencing multiple editions of a standard. A quick look found ASTM D 3201, E 1886, and E 1996 having two different years referenced in Chapter 35.

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Date Submitted	4/2/2010	**Section**	2003.9	**Proponent**	Joseph Belcher
Chapter	20	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

The proposal adds provisions for sunrooms in the HVHZ section of the code.

Rationale

The HVHZ provisions of the code lack guidance for sunrooms and enforcement varies widely. Sunrooms may be habitable or nonhabitable; conditioned or unconditioned. Some owners want to add conditioned living space; other owners desire a bright, airy, and unconditioned recreation room. Sunrooms are a viable and popular construction method and the determination of how the space is used should be within the purview of the homeowner. (Please see attached support document for further discussion.)

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The changes provide guidance for the design and construction of sunrooms which may initially require longer plan review and inspection times initially while personnel become proficient in the new provisions.

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

The impact, if any, to the cost of compliance to building and property owners will be a reduction in time to permit and cost to construct sunrooms

Impact to industry relative to the cost of compliance with code

The impact to the cost of compliance to the industry will be a reduction in time to permit and the cost to construct unconditioned sunrooms.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public because it provides regulation for a popular method of construction currently lacking in the HVHZ section of the code.

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

The proposal improves the code by providing design and construction guidance for sunrooms by adopting a nationally recognized standard specifically written for sunrooms.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities and will ameliorate what many in the industry believe are discriminatory practices.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by providing design and construction guidance for sunrooms by adopting a nationally recognized standard specifically written for sunrooms.

2003.9 Sunrooms

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~~2003.9.1 Sunrooms. Sunrooms shall comply with AAMA/NPEA/NSA 2100 and the structural requirements and testing provisions of Chapter 5.~~

~~2003.9.1.1 AAMA 2100, Section 5.2.1 Wind Loads and Section 7.2 Foundations are modified as follows: Modify Section 5.2.1 as follows:~~

~~5.2.1~~ 2003.9.1 Wind Loads: Basic wind speed in miles per hour (mph) shall be determined in accordance with Section 1620~~.2.~~ Sunrooms including exposed structures, components, cladding, and roof covering shall be designed to resist the wind loads as established in Section 1620.1.

~~Modify Section 7.2 by striking the section and adding text as follows:~~

-

~~7.2 Foundations. Foundations shall be designed in accordance with Section 1819.~~

-

REMAINDER OF ORIGINAL MOD UNCHANGED

2003.9.~~1~~.2 Sunroom Categories. For the purpose of applying the criteria of the AAMA Standard for sunrooms based on the intended use, sunrooms shall be categorized in one of the following categories by the permit applicant, design professional, or the property owner where the sunroom is being constructed

Category I: A roof or a covering of an outdoor space. The openings shall be permitted to be enclosed with insect screening or 0.5 mm (20 mil) maximum thickness plastic film. The space is defined as nonhabitable and unconditioned.

-

Category II: A roof or a covering of an outdoor space with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The space is defined as nonhabitable and ~~u~~unconditioned.

-

Category III: A roof or a covering of an outdoor space with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The sunroom complies with additional requirements for forced-entry resistance, air-leakage resistance and water-penetration resistance. The space is defined as nonhabitable and unconditioned.

-

Category IV: A roof or a covering of an outdoor space with enclosed walls. The sunroom is designed to be heated and/or cooled by a separate temperature control or system and is thermally isolated from the primary structure. The sunroom complies with additional requirements for forced-entry resistance, water penetration resistance, air-leakage resistance, and thermal performance. The space is defined as habitable and conditioned.

-

Category V: A roof or a covering of an outdoor space with enclosed walls. The sunroom is designed to be heated and/or cooled and is open to the main structure. The sunroom complies with additional requirements for forced-entry resistance, water-penetration resistance, air-leakage resistance, and thermal performance. The space is defines as habitable and conditioned.

Fiscal Impact Statement [Provide documentation of the costs and benefits of the proposed modifications to the code for each of the following entities. Cost data should be accompanied by a list of assumptions and supporting documentation. Explain expected benefits.]:

1. Impact to local entity relative to enforcement of code: The changes provide guidance for the design and construction of sunrooms which may initially require longer plan review and inspection times initially while personnel become proficient in the new provisions.

2. Impact to building and property owners relative to cost of compliance with code: The impact, if any, to the cost of compliance to building and property owners will be a reduction in time to permit and cost to construct sunrooms.

3. Impact to industry relative to cost of compliance with code: The impact to the cost of compliance to the industry will be a reduction in time to permit and the cost to construct unconditioned sunrooms.

2003.9 Sunrooms

2003.9.1 Sunrooms. Sunrooms shall comply with AAMA/NPEA/NSA 2100 and the structural requirements and testing provisions of Chapter 5.

2003.9.1.1 AAMA 2100, Section 5.2.1 Wind Loads: Modify Section 5.2.1 as follows:

5.2.1 Wind Loads: Basic wind speed in miles per hour (mph) shall be determined in accordance with Section R4403.9.2. Sunrooms including exposed structures, components, cladding, and roof covering shall be designed to resist the wind loads as established in Section R4403.9.

2003.9.1.2 Sunroom Categories. For the purpose of applying the criteria of the AAMA Standard for sunrooms based on the intended use, sunrooms shall be categorized in one of the following categories by the permit applicant, design professional, or the property owner where the sunroom is being constructed.

Category I: A roof or a covering of an outdoor space. The openings shall be permitted to be enclosed with insect screening or 0.5 mm (20 mil) maximum thickness plastic film. The space is defined as nonhabitable and unconditioned.

Category II: A roof or a covering of an outdoor space with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The space is defined as nonhabitable and uunconditioned.

Category III: A roof or a covering of an outdoor space with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The sunroom complies with additional requirements for forced-entry resistance, air-leakage resistance and water-penetration resistance. The space is defined as nonhabitable and unconditioned.

Category IV: A roof or a covering of an outdoor space with enclosed walls. The sunroom is designed to be heated and/or cooled by a separate temperature control or system and is thermally isolated from the primary structure. The sunroom complies with additional requirements for forced-entry resistance, water penetration resistance, air-leakage resistance, and thermal performance. The space is defined as habitable and conditioned.

Category V: A roof or a covering of an outdoor space with enclosed walls. The sunroom is designed to be heated and/or cooled and is open to the main structure. The sunroom complies with additional requirements for forced-entry resistance, water-penetration resistance, air-leakage resistance, and thermal performance. The space is defined as habitable and conditioned.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4345_TextOfModification_1.png

Chapter 2 of the code defines sunrooms and habitable spaces. Since there is no specific exemption from the definitions for sunroom or habitable space contained in Chapter 2, the definitions are applicable in the HVHZ. Further, the HVHZ definitions section directs the code user to Chapter 2 for definitions outside the HVHZ definitions section. (FBCR, §R4402.2.1) The intent of this proposal is to provide guidance for regulating the construction of sunrooms in the HVHZ

The ambiguity of the current situation has lead to serious confusion. The confusion is caused by a lack of guidance in how to regulate sunroom structures. This lack of guidance has resulted in frustration for homeowners and code enforcers alike. Homeowners simply wanting to add some relatively inexpensive sheltered but unconditioned recreational space to their home are suddenly faced with a requirement to meet the energy code. Permit applications for nonhabitable unconditioned sunrooms have been rejected with the contractor directed to change the plans to reclassify the sunroom as an addition and submit energy calculations. The lack of guidance results in frustration of code officials as well as they do not have clear direction and tend to want to err on the side of caution. The intent of this proposal is to provide the guidance needed to properly regulate sunroom construction and allow the industry to operate.

The proposal does several things:

1. Adopts the nationally recognized standard addressing sunrooms, AAMA 2100, Voluntary Specifications for Sunrooms.

2. Modifies the wind loads portion of the standard to make it agree with the Florida Building Code.

3. Requires the designation of the category of the sunroom at the outset. This provision is intended to give the jurisdiction authority for taking action if the homeowner makes changes, such as adding air conditioning, to the sunroom, after the C of O is issued.

4. Contains a verbatim list of the five sunroom categories from AAMA 2100.

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Date Submitted	3/29/2010	**Section**	2107.5	**Proponent**	Joseph Belcher
Chapter	21	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Updates existing Florida Specific Amendment to incorporate section and equation number changes of TMS 402/ACI 530/ASCE 5-2008.

Rationale

1. The proposal makes no substantive changes, but modifies existing Florida Specific Amendments to reference the proper sections and equation numbers.
2. The order of the document numbers is changed to reflect TMS will be the lead organization responsible for the maintenance and updating of the documents.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal has no fiscal impact relative to local enforcement because it contains no substantive changes and merely updates an existing Florida Specific Amendment to account for changes in the reference document.

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

The proposal has no fiscal impact relative to local enforcement because it contains no substantive changes and merely updates an existing Florida Specific Amendment to account for changes in the reference document.

Impact to industry relative to the cost of compliance with code

The proposal has no fiscal impact relative to local enforcement because it contains no substantive changes and merely updates an existing Florida Specific Amendment to account for changes in the reference document.

Requirements

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

The proposal is connected to public health, safety, and welfare because it updates an existing Florida Specific Amendment which eliminates an unintended consequence mandating the compliance with provisions intended to address seismic loads in a seismically inactive region

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

The proposal strengthens and improves the code because it updates an existing Florida Specific Amendment which eliminates an unintended consequence mandating the compliance with provisions intended to address seismic loads in a seismically inactive region.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code because it updates an existing Florida Specific Amendment which eliminates an unintended consequence mandating the compliance with provisions intended to address seismic loads in a seismically inactive region.

2107.5 TMS 402/ ACI 530/ASCE 5/~~TMS 402~~, Section 2.1.~~10~~ 9.3, Development of bars in tension and compression. Modify Section 2.1.~~10~~ 9.3 as follows:

2.1.~~10~~ 9.3 The required development length of reinforcing bars shall be determined by Equation (2-~~9~~ 12), but shall not be less than 12 in. (305 mm), but need not be greater than 72 d_b.

EQUATION 2-~~9~~ 12 from TMS 402/ ACI 530/ASCE 5/ [UNCHANGED]

K shall not exceed the lesser of the masonry cover, clear spacing between adjacent reinforcement, nor 5 times d_b .

g = 1.0 for No. 3 (M#10) through No. 5 (M#16) bars;

g = 1.04 for No. 6 (M#19) through No. 7 (M#22) bars; and

g = 1.2 for No. 8 (M#25) through No. 11 (M#36) bars

g – Reinforcement size factor "Lamda"

Where epoxy coated bars are used, lap length shall be increased by 50 percent.

NOTE: The provided materials to use for code modifications use to develop this modification contained some of the stricken and underlined text. This proposal retains those changes and makes some further modifications.

2107.5 TMS 402/ ACI 530/ASCE 5/~~TMS 402~~, Section 2.1.~~10~~ 9.3, Development of bars in tension and compression. Modify Section 2.1.~~10~~ 9.3 as follows:

2.1.~~10~~ 9.3 The required development length of reinforcing bars shall be determined by Equation (2- ~~9~~ 12), but shall not be less than 12 in. (305 mm), but need not be greater than 72 d_b.

EQUATION 2- ~~9~~ 12 from TMS 402/ ACI 530/ASCE 5/ [UNCHANGED]

K shall not exceed the lesser of the masonry cover, clear spacing between adjacent reinforcement, nor 5 times d_b.

? = 1.0 for No. 3 (M#10) through No. 5 (M#16) bars;

? = 1.04 for No. 6 (M#19) through No. 7 (M#22) bars; and

? = 1.2 for No. 8 (M#25) through No. 11 (M#36) bars

Where epoxy coated bars are used, lap length shall be increased by 50 percent.

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NOTE: The provided materials to use for code modifications use to develop this modification contained some of the stricken and underlined text. This proposal retains those changes and makes some further modifications.

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Date Submitted	3/30/2010	**Section**	2122	**Proponent**	Joseph Belcher
Chapter	21	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

The modification updates the HVHZ provisions for the design and construction of reinforced unit masonry.

Rationale

The proposal updates the HVHZ provisions relative to reinforced unit masonry by allowing design in accordance with the latest nationally recognized standards from TMS, ACI, and ASCE. The proposal retains the HVHZ requirements for special inspection and addresses specific concerns contained in the section with references to the appropriate section of TMS 402/ ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6. See uploaded document for further discussion.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal has no fiscal impact relative to local enforcement beyond perhaps an increase in the time spent on plan review or inspection initially until personnel become familiar with the changes.

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

The proposal should result in a less costly and strengthened design for building and property owners because it adopts state of the art standards for the design and construction of reinforced unit masonry structures

Impact to industry relative to the cost of compliance with code

The proposal should result in a less costly and strengthened design for the building industry because it adopts state of the art standards for the design and construction of reinforced unit masonry structures.

Requirements

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

The proposal is connected to public health, safety, and welfare because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

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

The proposal strengthens and improves the code because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

2121.1.6 Minimum No. 9 gauge truss type horizontal joint reinforcing at every alternate course (16-inch (406 mm) spacing), ~~ladder type for reinforced masonry and truss type for all others~~ shall be provided. This reinforcement shall extend 4 inches (102 mm) into tie columns or be tied to structural columns with approved methods where structural columns replace the

tie columns. In addition, horizontal joint reinforcement shall comply with TMS

602/ACI530.1/ASCE 6 Sections 2.4C thru 2.4F and Section 3.4B.7.

SECTION 2122

HIGH-VELOCITY HURRICANE ZONES-REINFORCED UNIT MASONRY

2122.1 Standards. The provisions of TMS 402/ACI 530/ASCE 5 ~~, *Building Code Requirements F for Masonry Structures,*~~ and TMS 602/ACI 530.1/ASCE 6 ~~and the commentary on *Building Code Requirements for Masonry Structures,*~~ are hereby adopted as a minimum for the design and construction of reinforced unit masonry. ~~; however, the requirement of the standard shall not supersede the specific requirements of this chapter.~~ In addition to TMS 402/ ACI 530/ ASCE 5 and TMS 602/ACI 530.1/ASCE6 reinforced unit masonry structures shall comply with Sections 2122.2.

Exception: Unless otherwise specified by the designing architect or engineer, where plan review and inspections are performed by a local building department in accordance with Sections 107 and 110 ~~106 and 109~~, the provisions of TMS 402/ ACI 530/ASCE 5/TMS 402, Chapter 1, Section 1.18 and TMS 602/ ACI 530.1/ASCE 6/ Sections 1.5 and 1.6 shall not apply.

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2122.2 General.

2122.2.1 Tie columns and tie beams as set forth in Section 2121.2 shall be not required where design and construction are in accordance with the provisions of this section.

~~2122.2.2 Reinforced unit masonry shall be steel reinforced solid-unit masonry or steel reinforced grouted hollow-unit masonry as set forth herein.~~

2122.2.~~3~~ ~~1~~ 2The design of buildings and structures of reinforced unit masonry shall be by a professional engineer or registered architect.

2122.2.3 Minimum No. 9 gauge ladder type horizontal joint reinforcing at every alternate course (16-inch (406 mm) spacing), for reinforced masonry shall be provided. This reinforcement shall be tied to structural columns with approved methods. In addition, horizontal joint reinforcement shall comply with TMS 602/ACI530.1/ASCE 6 Sections 2.4C thru 2.4F and Section 3.4B.7.

2122. ~~3~~ ~~4~~ ~~2~~ 3 Special inspector. A Florida-registered architect or professional engineer shall furnish inspection of all reinforced unit masonry structures.

2122. ~~5~~ 3 Concrete masonry strength. Concrete masonry strength shall be determined by unit strength method from TMS 602/ACI 530.1/ ASCE 6 Section 1.4 or in accordance with ASTM C 1314.

~~2122.5.1 In each test of three prisms, the average of the three may be used as the assumed value of f 'm .~~

~~2122.5.2 In no case shall the value of f 'm exceed the lowest break multiplied by 1.25 in any test.~~

2122.2 ~~6~~ 4 ~~Reinforced masonry columns and walls.~~ Reinforcement. Reinforcement shall comply with TMS 402/ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6 except as modified herein.

2122.4.1 Development of bars in tension and compression shall be in accordance with TMS 402/ASCE 530/ ASCE5 Section 2.1.9.3 with the following changes to the factor y of Equation 2-12

? = 1.0 for No. 3 (M#10) through No. 5 (M#16) bars;

? = 1.04 for No. 6 (M#19) through No. 7 (M#22) bars; and

? = 1.2 for No. 8 (M#25) through No. 11 (M#36) bars

Where epoxy coated bars are used, lap length shall be increased by 50 percent.

2122.4.2 Splices of reinforcement shall be in accordance with TMS 402/ ACI 530/ ASCE 5. Lap splices, welded splices, or mechanical splices are permitted in accordance with the provisions of TMS 402/ ACI 530/ ASCE 5 Section 2.1.9.7. Welding shall conform to AWS D1.4.

2122.4.3 Lap splices shall be in accordance with TMS 402/ ACI 530/ ASCE 5, Section 2.1.9.7.1.1 with the modifications of Section 2122.4.1 to the factor y of Equation 2-12. In no case shall the length of the lapped splice be less than 48 bar diameters, but not less than 12 inches.

2122.4.4 Joint reinforcement. Horizontal joint reinforcement shall be provided at every other course. Joint reinforcement shall be a minimum of No. 9 gauge and shall comply with TMS 602/ACI 530.1/ ASCE 6 Sections 2.4C through 2.4F. Joint reinforcement shall be placed in accordance with TMS 602/ACI 530.1/ ASCE 6 Section 3.4 B.7.

~~2122.6.1 The minimum length of lap for deformed bars in grout, in tension or compression, shall be 48 bar diameters, but not less than 12 inches (305 mm).~~

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2122.~~6.2~~ 5 Concentrated loads shall be in accordance with TMS 402/ ACI 530/ ASCE 5 Sections 1.9.7.2 and 2.1.8 and shall not be assumed distributed across continuous vertical joints, including stack bond joints, unless reinforcing elements are designed and provided to distribute such loads.

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2122.6 ~~.3~~ Reinforced masonry bearing walls shall have a nominal thickness of ~~at least 1/30 of the unsupported height or width, whichever is the shorter, but~~ not less than 8 inches (203 mm).

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2122. 7 ~~6.4~~ Anchorage requirements. Anchorage shall be in accordance with TMS 402/ ACI 530/ ASCE 5. Loading shall comply with TMS 402/ ACI 530/ ASCE 5 Section 1.7 and the following.

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2122. 7.1 ~~6.4.1~~ Reinforced masonry walls shall be securely anchored to adjacent structural members such as roofs, floors, columns, pilasters, buttresses and intersection walls.

2122. 7.2 ~~6.4.2~~ Masonry walls shall be anchored to all floors and roofs that provide lateral support to such walls.

2122. 7.3 ~~6.4.3~~ Such anchorage shall provide a positive direct connection capable of resisting the horizontal forces as required in Chapter 16 (High-Velocity Hurricane Zones), or a minimum force of 200 pounds per lineal foot (2919 N/m) of wall, whichever is greater.

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2122.7.4 ~~.6.4.4~~ Required anchors shall be embedded in reinforced grouted cells. Anchor bolts shall be installed in accordance with TMS 602/ ACI 530.1/ ASCE 6 Section 3.4 D

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2122.7.5 ~~6.4.5~~ Wood framing connected by nails shall not be considered as acceptable anchorage.

2122.8 ~~6.5~~ Mortar and grout.

2122.8.1 ~~6.5.1~~ Mortar materials shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 2.1. Grout materials shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 2.2.

2122.8.2 Vertical cells to be grouted shall provided vertical alignment sufficient to maintain clear, unobstructed, continuous, vertical cores measuring not less than 2 ½ inches by 3 inches (51 mm by 76 mm) for fine aggregate grout and 3 inches by 3 inches for coarse aggregate grout as defined by ASTM C 476. The architect or engineer may specify other grout space sizes shall be permitted provided they comply with TMS 402/ ACI 530/ ASCE 5 Section 1.19 and TMS 602/ ACI 530.1/ ASCE 6 Section 3.5C.

2122.8.3 Placing of mortar and masonry units shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 3.3.

2122.8.4 Grout placement. Grout placement shall be in accordance with TMS 402/ ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6.

2122.8.5 ~~6.5.2 Vertical grout barriers or dams of solid masonry spaced not more than 25 feet (7.6 mm) apart shall be provided across the grout space in the entire height of the wall to control the flow of grout horizontally.~~ Confinement. Confine grout to the areas

indicated on the Project Drawings. Use material to confine

grout that permits bond between masonry units and mortar.

2122.8.6 ~~6.5.3 Grout shall be a plastic mix having a maximum slump of 9 inches +/- 1 inch (229 +/- 25 mm)~~ Unless otherwise required, mix grout other than self-consolidating grout to a consistency that has a

slump between 8 and 11 in. (203 and 279 mm). Self-consolidating grout shall comply with TMS 602/ ACI 530.1/ ASCE 6

2122.8.7 ~~6.5.4~~ Grout shall be placed before any initial set has occurred, but in no case more than 1-1/2 hours after the mix-designed water has been added.

2122.8.8 ~~6.5.5~~ Grouting shall be a continuous operation in lifts not exceeding ~~4~~ 5 feet (1.5 m) and a maximum pour of 12 feet 8 inches (3.8 m). Grout placement shall comply with TMS 602/ ACI 530.1/ ASCE 6.

2122.8.9 ~~6.5.6~~ Grouting shall be consolidated between lifts by puddling, rodding or mechanical vibration.

2122.8.10 ~~6.5.7 The grouting of any section of wall between control barriers shall be completed in one operation with no interruptions exceeding 1 hour.~~ Grout keys shall be formed between grout pours. Grout keys shall be formed between grout lifts when the first lift is permitted to set prior to placement of the subsequent lift.

1. Form a grout key by terminating the grout a minimum of 1½ in. (38.1 mm) below a mortar joint.

2. Do not form grout keys within beams.

3. At beams or lintels laid with closed bottom units, terminate the grout pour at the bottom of the beam or lintel without forming a grout key.

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2122.9 ~~6.6~~ Bearing. Precast floor and roof units supported on masonry walls shall provide minimum bearing of 3 inches (76 mm) and anchorage in accordance with Section 2122.7 ~~6.4~~.

2122.10 ~~6.7 Protection of masonry. Unfinished work shall be stopped back for joining with new work; toothing being permitted only with the approval of the special inspector.~~ Intersecting walls shall comply with TMS 402/ ACI 530/ ASCE 5 Section 1.9.4.

Fiscal Impact Statement [Provide documentation of the costs and benefits of the proposed modifications to the code for each of the following entities. Cost data should be accompanied by a list of assumptions and supporting documentation. Explain expected benefits.]:

A. Impact to local entity relative to enforcement of code: The proposal has no fiscal impact relative to local enforcement beyond perhaps an increase in the time spent on plan review or inspection initially until personnel become familiar with the changes.

B. Impact to building and property owners relative to cost of compliance with code: The proposal should result in a less costly and strengthened design for building and property owners because it adopts state of the art standards for the design and construction of reinforced unit masonry structures.

C. Impact to industry relative to cost of compliance with code: The proposal should result in a less costly and strengthened design for the building industry because it adopts state of the art standards for the design and construction of reinforced unit masonry structures.

Rationale [Provide an explanation of why you would like this Proposed Modification to the Florida Building Code.]:

The proposal updates the HVHZ provisions relative to reinforced unit masonry by allowing design in accordance with the latest nationally recognized standards from TMS, ACI, and ASCE. The proposal retains the HVHZ requirements for special inspection and addresses specific concerns contained in the section with references to the appropriate section of TMS 402/ ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6. See uploaded document for further discussion.

The proposal represents a much needed modernization of the reinforced unit masonry design requirements in the HVHZ. The changes will permit an architect or engineer to use the national standards in designing and construction such structures. The proposal:

1. Updates the standards by adopting the Specification for Masonry Structures, TMS 602/ ACI 530.1/ ASCE 6. The Specification contains the information needed to build the project and is designed to work with and compliment TMS 402/ ACI 530.1/ ASCE 5, Building Code Requirements for Masonry Structures.
2. Eliminates the name of the standard and the adoption of Commentary material. Commentary materials are intended to be explanatory material to assist in making decisions and educate the user of the document. They are not intended for adoption. The following note is from TMS 602/ ACI 530.1/ ASCE 6, Page 1:

"This Commentary is intended for guidance in designing, planning, executing, or inspecting construction and in preparing specifications. References to this document should not be made in the Project Specifications or Project Drawings. If items in this document are desired to be a part of the Project Specifications or Project Drawings, they should be phrased in mandatory language and incorporated into the Project Specifications or Project Drawings."

3. **The proposal modifies TMS 402/ ACI 530/ASCE 5, Chapter 1, Section 1.18 and TMS 602/ ACI 530.1/ASCE 6/ Sections 1.5 and 1.6 to recognize the role of building department plan review and inspection. The proposal provides the designer the option to specify the provisions.**
4. **The General section has been rewritten to update the provisions and refer to the appropriate sections of the adopted reference standards which address the issues covered in the existing language.**
5. **The proposal deletes Section 2122.2.1 as the Section referred to will not be applicable to a reinforced unit masonry structure designed and built in accordance with TMS 402/ ACI 530/ASCE 5 and TMS 602/ ACI 530.1/ASCE 6**
6. **The proposal deletes Section 2122.2.2 as the requirements are contained in TMS 402/ ACI 530/ASCE 5 and TMS 602/ ACI 530.1/ASCE 6.**
7. **The proposal retains the requirements for the professional design of reinforced unit masonry structures.**
8. **The proposal retains the requirements for special inspection by a Florida-registered architect or professional engineer.**
9. **The proposal modifies the concrete masonry strength provisions by adopting the unit strength method from TMS 402/ ACI 530/ASCE 5 and the ASTM Standard for prism testing.**
10. **The proposal adopts the reinforcement provisions of TMS 402/ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6 and modifies the factors for y used in the equation for determining the lap for reinforcement bars. The modifications to the equation are needed because the factors contained in TMS 402/ ACI 530/ ASCE 5 at 2122.41 are based on seismic design loads. This Florida Specific Amendment was in the FBCB 2004 Edition. The inclusion of these provisions from TMS 402/ ACI 530/ ASCE 5 creates an unintended consequence of mandating compliance with seismic provisions in a state that is not seismically active. The unmodified provisions of TMS 402/ ACI 530/ ASCE 5 in some cases unnecessarily increase the cost of construction for Florida with no demonstrated benefit. The intent of engineers from seismically active portions of the country promoting the TMS 402 provisions is to provide an elastic joint at reinforcement laps allowing flexure to resist seismic loads. Such joints are not necessary for resisting wind loads where weight and stiffness are beneficial. In fact, the current TMS 402 provisions have been shown to result in considerable over-design even for resisting seismic loads. The proposal permits the designer to use the lap spliced provisions of TMS 402/ ACI 530/ ASCE 5 or the lap splice provisions of TMS 402/ ACI 530/ ASCE 5 as modified by the Florida Building Code (FBC). There is considerable controversy on these issues within the MSJC and IBC processes. The involved organizations are working on the matter. Testing has been and is being conducted by NCMA. The modified y factors were provided by NCMA. For the State of Florida the provisions have the greatest impact where larger reinforcement bars are required. For example, a lap length of 8 feet is required where using No. 6 reinforcement bars or greater. This is well beyond any lap length required to resist wind loads even in the highest wind speed zones of the state. Approval of this proposal will result in the providing the designer the option of using the provisions of TMS 402/ ACI 530/ ASCE 5 as published or use the provisions as modified by the code for wind design instead of seismic design.**
11. **The proposal specifies the TMS 402/ ACI 530/ ASCE 5 increased lap requirements for epoxy coated bars.**
12. **The proposal lists the types of laps permitted, refers to the appropriate section of TMS 402/ ACI 530/ ASCE 5, and adopts a standard for welded splices.**
13. **The proposal retains the requirement for horizontal joint reinforcement and requires compliance with the appropriate sections of TMS 602/ACI 530.1/ ASCE 6.**
14. **The proposal retains the language addressing concentrated loads and adds the appropriate sections of TMS 402/ACI 530/ ASCE dealing with load distribution.**
15. **The proposal retains the language related to minimum wall thickness.**

16. **The proposal renumbers Section 2122.6.4 and subsequent sections and adds a reference for the installation of anchor bolts.**
17. **The proposal rewrites the section on mortar and grout.**
18. **The proposal deletes sections related to outdated methods of construction such as "toothing" which was removed from the national standards in the 2002 Edition of TMS 402/ ACI 530/ ASCE 5. The language has been replaced with a reference to the methods contained in the current edition of the standards.**

Please explain how the proposed modification meets the following requirements:

1. Has a reasonable and substantial connection with the health, safety, and welfare of the general public: The proposal is connected to public health, safety, and welfare because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

2. Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction: The proposal strengthens and improves the code because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

3. Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities: The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

4. Does not degrade the effectiveness of the code: The proposal increases the effectiveness of the code because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Mohammed Shaikh **Submitted** 5/20/2010 **Attachments** Yes

S4135-G1

Comment:

Sections 2122.1and2122.2 for Tie Beams and columns can not be deleted. this sections are there for clarification. Hrizontal proposed modification is weaker than required in HVHZ . Section 2121.1.6 is proposed to include the modification for horizontal reinforcement.

SECTION 2122

HIGH-VELOCITY HURRICANE ZONES-REINFORCED UNIT MASONRY

2122.1 Standards. The provisions of TMS 402/ACI 530/ASCE 5 ~~, *Building Code Requirements F for Masonry Structures,*~~ and TMS 602/ACI 530.1/ASCE6 ~~and the commentary on *Building Code Requirements for Masonry Structures,*~~ are hereby adopted as a minimum for the design and construction of reinforced unit masonry. ~~; however, the requirement of the standard shall not supersede the specific requirements of this chapter.~~ In addition to TMS 402/ ACI 530/ ASCE 5 and TMS 602/ACI 530.1/ASCE6 reinforced unit masonry structures shall comply with Sections 2122.2.

Exception: Unless otherwise specified by the designing architect or engineer, where plan review and inspections are performed by a local building department in accordance with Sections 106 and 109, the provisions of TMS 402/ ACI 530/ASCE 5/TMS 402, Chapter 1, Section 1.18 and TMS 602/ ACI 530.1/ASCE 6/ Sections 1.5 and 1.6 shall not apply.

2122.2 General.

~~2122.2.1 Tie columns and tie beams as set forth in Section 2121.2 shall be not required where design and construction are in accordance with the provisions of this section.~~

~~2122.2.2 Reinforced unit masonry shall be steel reinforced solid-unit masonry or steel reinforced grouted hollow-unit masonry as set forth herein.~~

2122.2.~~3~~ 1 The design of buildings and structures of reinforced unit masonry shall be by a professional engineer or registered architect.

2122.~~4~~ 2 Special inspector. A Florida-registered architect or professional engineer shall furnish inspection of all reinforced unit masonry structures.

2122. ~~5~~ 3 Concrete masonry strength. Concrete masonry strength shall be determined by unit strength method from TMS 602/ACI 530.1/ ASCE 6 Section 1.4 or in accordance with ASTM C 1314.

~~2122.5.1 In each test of three prisms, the average of the three may be used as the assumed value of f 'm .~~

~~2122.5.2 In no case shall the value of f 'm exceed the lowest break multiplied by 1.25 in any test.~~

2122.~~6~~ 4 ~~Reinforced masonry columns and walls.~~ Reinforcement. Reinforcement shall comply with TMS 402/ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6 except as modified herein.

2122.4.1 Development of bars in tension and compression shall be in accordance with TMS 402/ACI 530/ ASCE 5 Section 2.1.9.3 with the following changes to the factor y of Equation 2-12

y = 1.0 for No. 3 (M#10) through No. 5 (M#16) bars;

y = 1.04 for No. 6 (M#19) through No. 7 (M#22) bars; and

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y = 1.2 for No. 8 (M#25) through No. 11 (M#36) bars

Where epoxy coated bars are used, lap length shall be increased by 50 percent.

2122.4.2 Splices of reinforcement shall be in accordance with TMS 402/ ACI 530/ ASCE 5. Lap splices, welded splices, or mechanical splices are permitted in accordance with the provisions of TMS 402/ ACI 530/ ASCE 5 Section 2.1.9.7. Welding shall conform to AWS D1.4.

2122.4.3 Lap splices shall be in accordance with TMS 402/ ACI 530/ ASCE 5, Section 2.1.9.7.1.1 with the modifications of Section 2122.4.1 to the factor y of Equation 2-12. In no case shall the length of the lapped splice be less than 48 bar diameters, but not less than 12 inches.

2122.4.4 Joint reinforcement. Horizontal joint reinforcement shall be provided at every other course. Joint reinforcement shall be a minimum of No. 9 gauge and shall comply with TMS 602/ACI 530.1/ ASCE 6 Sections 2.4C through 2.4F. Joint reinforcement shall be placed in accordance with TMS 602/ACI 530.1/ ASCE 6 Section 3.4B.7.

~~2122.6.1 The minimum length of lap for deformed bars in grout, in tension or compression, shall be 48 bar diameters, but not less than 12 inches (305 mm).~~

2122.~~6.2~~ 5 Concentrated loads shall be in accordance with TMS 402/ ACI 530/ ASCE 5 Sections 1.9.7.2 and 2.1.8 and shall not be assumed distributed across continuous vertical joints, including stack bond joints, unless reinforcing elements are designed and provided to distribute such loads.

2122.6 ~~.3~~ Reinforced masonry bearing walls shall have a nominal thickness of ~~at least 1/30 of the unsupported height or width, whichever is the shorter, but~~ not less than 8 inches (203 mm).

2122. 7 ~~6.4~~ Anchorage requirements. Anchorage shall be in accordance with TMS 402/ ACI 530/ ASCE 5. Loading shall comply with TMS 402/ ACI 530/ ASCE 5 Section 1.7 and the following.

2122. 7.1 ~~6.4.1~~ Reinforced masonry walls shall be securely anchored to adjacent structural members such as roofs, floors, columns, pilasters, buttresses and intersection walls.

2122. 7.2 ~~6.4.2~~ Masonry walls shall be anchored to all floors and roofs that provide lateral support to such walls.

2122. 7.3 ~~6.4.3~~ Such anchorage shall provide a positive direct connection capable of resisting the horizontal forces as required in Chapter 16 (High-Velocity Hurricane Zones), or a minimum force of 200 pounds per lineal foot (2919 N/m) of wall, whichever is greater.

2122.7.4 ~~.6.4.4~~ Required anchors shall be embedded in reinforced grouted cells. Anchor bolts shall be installed in accordance with TMS 602/ ACI 530.1/ ASCE 6 Section 3.4D

2122.7.5 ~~6.4.5~~ Wood framing connected by nails shall not be considered as acceptable anchorage.

2122.8 ~~6.5~~ Mortar and grout.

2122.8.1 ~~6.5.1~~ Mortar materials shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 2.1. Grout materials shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 2.2.

2122.8.2 Vertical cells to be grouted shall provided vertical alignment sufficient to maintain clear, unobstructed, continuous, vertical cores measuring not less than 2 ½ inches by 3 inches (51 mm

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by 76 mm) for fine aggregate grout and 3 inches by 3 inches for coarse aggregate grout as defined by ASTM C 476. The architect or engineer may specify other grout space sizes shall be permitted provided they comply with TMS 402/ ACI 530/ ASCE 5 Section 1.19 and TMS 602/ ACI 530.1/ ASCE 6 Section 3.5C.

2122.8.3 Placing of mortar and masonry units shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 3.3.

2122.8.4 Grout placement. Grout placement shall be in accordance with TMS 402/ ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6.

2122.8.5 ~~6.5.2 Vertical grout barriers or dams of solid masonry spaced not more than 25 feet (7.6 mm) apart shall be provided across the grout space in the entire height of the wall to control the flow of grout horizontally.~~ Confinement. Confine grout to the areas indicated on the Project Drawings. Use material to confine grout that permits bond between masonry units and mortar.

2122.8.6 ~~6.5.3 Grout shall be a plastic mix having a maximum slump of 9 inches +/- 1 inch (229 +/- 25 mm)~~ Unless otherwise required, mix grout other than self-consolidating grout to a consistency that has a slump between 8 and 11 in. (203 and 279 mm). Self-consolidating grout shall comply with TMS 602/ ACI 530.1/ ASCE 6.

2122.8.7 ~~6.5.4~~ Grout shall be placed before any initial set has occurred, but in no case more than 1-1/2 hours after the mix-designed water has been added.

2122.8.8 ~~6.5.5~~ Grouting shall be a continuous operation in lifts not exceeding ~~4~~ 5 feet (1.5 m) and a maximum pour of 12 feet 8 inches (3.8 m). Grout placement shall comply with TMS 602/ ACI 530.1/ ASCE 6.

2122.8.9 ~~6.5.6~~ Grouting shall be consolidated between lifts by puddling, rodding or mechanical vibration.

2122.8.10 ~~6.5.7 The grouting of any section of wall between control barriers shall be completed in one operation with no interruptions exceeding 1 hour.~~ Grout keys shall be formed between grout pours. Grout keys shall be formed between grout lifts when the first lift is permitted to set prior to placement of the subsequent lift.

1. Form a grout key by terminating the grout a minimum of 1½ in. (38.1 mm) below a mortar joint.

2. Do not form grout keys within beams.

3. At beams or lintels laid with closed bottom units, terminate the grout pour at the bottom of the beam or lintel without forming a grout key.

2122.9 ~~6.6~~ Bearing. Precast floor and roof units supported on masonry walls shall provide minimum bearing of 3 inches (76 mm) and anchorage in accordance with Section 2122.7 ~~6.4.~~

2122.10 ~~6.7 Protection of masonry. Unfinished work shall be stopped back for joining with new work; toothing being permitted only with the approval of the special inspector.~~ Intersecting walls shall comply with TMS 402/ ACI 530/ ASCE 5 Section 1.9.4.

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2122.1 Exception Section 106 is typo error , it is for Live Load, revise this to section 105 for Permit section
2122.2 .1 and 2122.2. There are two methods for designing masonry walls, one is Tie Columns and Tie Beams Method and other is Reinforced Unit Masonry Method. These two sections clarify that if Reinforced Unit Masonry Method is used, Tie Columns and Tie beams are not required. Since reinforced Unit masonry method may have its own columns and beams which are designed and not prescriptive Tie beams and columns, it is essential that we keep 2122.1 and 2122.2 for clarity. I have answered this question to public and consultants and building officials numerous, times. Therefore deletion of these two sections will generate more inquiries these are required for clarification and should not be taken out to avoid confusion.
Revise numbering system of the proposed sections, since 2122.2.1 and 2122.2.2 are not to be eliminated.

Proposed 2122.4.4 Horizontal Joint Reinforcement conflicts with section 2121.1.6 and Proposed 2122.4.4 is incomplete, less effective and weakens the code. Eliminate proposed 2122.4.4 and revise 2121.1.6 as shown below to include provisions of 2122.4.4.

2121.1.6 Minimum No. 9 gauge horizontal joint reinforcing at every alternate course (16-inch (406 mm) spacing), ladder type for reinforced masonry and truss type for all others shall be provided. This reinforcement shall extend 4 inches (102 mm) into tie columns or be tied to structural columns with approved methods where structural columns replace the tie columns. In addition, horizontal joint reinforcement shall comply with TMS 602/ACI530.1/ASCE 6 Sections 2.4C thru 2.4F and Section 3.4B.7

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The proposal represents a much needed modernization of the reinforced unit masonry design requirements in the HVHZ. The changes will permit an architect or engineer to use the national standards in designing and construction such structures. The proposal:

1. **Updates the standards by adopting the Specification for Masonry Structures, TMS 602/ ACI 530.1/ ASCE 6. The Specification contains the information needed to build the project and is designed to work with and compliment TMS 402/ ACI 530.1/ ASCE 5, Building Code Requirements for Masonry Structures.**
2. **Eliminates the name of the standard and the adoption of Commentary material. Commentary materials are intended to be explanatory material to assist in making decisions and educate the user of the document. They are not intended for adoption. The following note is from TMS 602/ ACI 530.1/ ASCE 6, Page 1:**

   > **"This Commentary is intended for guidance in designing, planning, executing, or inspecting construction and in preparing specifications. References to this document should not be made in the Project Specifications or Project Drawings. If items in this document are desired to be a part of the Project Specifications or Project Drawings, they should be phrased in mandatory language and incorporated into the Project Specifications or Project Drawings."**

3. **The proposal modifies TMS 402/ ACI 530/ASCE 5, Chapter 1, Section 1.18 and TMS 602/ ACI 530.1/ASCE 6/ Sections 1.5 and 1.6 to recognize the role of building department plan review and inspection. The proposal provides the designer the option to specify the provisions.**
4. **The General section has been rewritten to update the provisions and refer to the appropriate sections of the adopted reference standards which address the issues covered in the existing language.**
5. **The proposal deletes Section 2122.2.1 as the Section referred to will not be applicable to a reinforced unit masonry structure designed and built in accordance with TMS 402/ ACI 530/ASCE 5 and TMS 602/ ACI 530.1/ASCE 6**
6. **The proposal deletes Section 2122.2.2 as the requirements are contained in TMS 402/ ACI 530/ASCE 5 and TMS 602/ ACI 530.1/ASCE 6.**
7. **The proposal retains the requirements for the professional design of reinforced unit masonry structures.**
8. **The proposal retains the requirements for special inspection by a Florida-registered architect or professional engineer.**
9. **The proposal modifies the concrete masonry strength provisions by adopting the unit strength method from TMS 402/ ACI 530/ASCE 5 and the ASTM Standard for prism testing.**
10. **The proposal adopts the reinforcement provisions of TMS 402/ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6 and modifies the factors for y**

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used in the equation for determining the lap for reinforcement bars. The modifications to the equation are needed because the factors contained in TMS 402/ ACI 530/ ASCE 5 at 2122.41 are based on seismic design loads. This Florida Specific Amendment was in the FBCB 2004 Edition. The inclusion of these provisions from TMS 402/ ACI 530/ ASCE 5 creates an unintended consequence of mandating compliance with seismic provisions in a state that is not seismically active. The unmodified provisions of TMS 402/ ACI 530/ ASCE 5 in some cases unnecessarily increase the cost of construction for Florida with no demonstrated benefit. The intent of engineers from seismically active portions of the country promoting the TMS 402 provisions is to provide an elastic joint at reinforcement laps allowing flexure to resist seismic loads. Such joints are not necessary for resisting wind loads where weight and stiffness are beneficial. In fact, the current TMS 402 provisions have been shown to result in considerable over-design even for resisting seismic loads. The proposal permits the designer to use the lap spliced provisions of TMS 402/ ACI 530/ ASCE 5 or the lap splice provisions of TMS 402/ ACI 530/ ASCE 5 as modified by the Florida Building Code (FBC). There is considerable controversy on these issues within the MSJC and IBC processes. The involved organizations are working on the matter. Testing has been and is being conducted by NCMA. The modified y factors were provided by NCMA.

For the State of Florida the provisions have the greatest impact where larger reinforcement bars are required. For example, a lap length of 8 feet is required where using No. 6 reinforcement bars or greater. This is well beyond any lap length required to resist wind loads even in the highest wind speed zones of the state. Approval of this proposal will result in the providing the designer the option of using the provisions of TMS 402/ ACI 530/ ASCE 5 as published or use the provisions as modified by the code for wind design instead of seismic design.

11. **The proposal specifies the TMS 402/ ACI 530/ ASCE 5 increased lap requirements for epoxy coated bars.**
12. **The proposal lists the types of laps permitted, refers to the appropriate section of TMS 402/ ACI 530/ ASCE 5, and adopts a standard for welded splices.**
13. **The proposal retains the requirement for horizontal joint reinforcement and requires compliance with the appropriate sections of TMS 602/ACI 530.1/ ASCE 6.**
14. **The proposal retains the language addressing concentrated loads and adds the appropriate sections of TMS 402/ACI 530/ ASCE dealing with load distribution.**
15. **The proposal retains the language related to minimum wall thickness.**

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16. The proposal renumbers Section 2122.6.4 and subsequent sections and adds a reference for the installation of anchor bolts.
17. The proposal rewrites the section on mortar and grout.
18. The proposal deletes sections related to outdated methods of construction such as "toothing" which was removed from the national standards in the 2002 Edition of TMS 402/ ACI 530/ ASCE 5. The language has been replaced with a reference to the methods contained in the current edition of the standards.

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Date Submitted	3/25/2010	**Section**	3501	**Proponent**	Rebecca Quinn
Chapter	35	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Modification to correct citations to Code of Federal Regulations.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IBC flood provisions IBC and make Florida-specific amendments. IBC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for 1612 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

FEMA

Federal Emergency Management Agency

Federal Center Plaza

500 C Street S.W.

Washington, DC 20472

Standard reference number	Title	Referenced in section number

Add to read as shown.

44CFR **Part** 59 National Flood Insurance Program ~~Emergency Management and Assistance~~, General Provisions 1612.2 ~~423.4.2, 3110.1.2~~

44CFR **Part** 60—~~97~~ Criteria for Land Management and Use 1612.2 ~~423.4.2, 3110.1.2~~

FEMA

Federal Emergency Management Agency

Federal Center Plaza

500 C Street S.W.

Washington, DC 20472

Standard reference number	Title	Referenced in section number

Add to read as shown.

44CFR59 National Flood Insurance Program ~~Emergency Management and Assistance~~, General Provisions		1612.2 ~~423.4.2, 3110.1.2~~
44CFR60~~—97~~	Criteria for Land Management and Use	1612.2 ~~423.4.2, 3110.1.2~~

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S4264

Date Submitted	4/1/2010	**Section**	35	**Proponent**	Chuck Anderson
Chapter	35	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

4342

Summary of Modification

Updates AAMA referenced standards, ASTM glass and impact standards.

Rationale

Updates referenced standards

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

very small, most are added as an option.

Requirements

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

better standards represent better science

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

better standards represent better science

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

none

Does not degrade the effectiveness of the code

does not degrade

AAMA

American Architectural Manufacturers Association

1827 Waldon Office Square, Suite 104

Schaumburg, IL 60173

Standard reference number Title Referenced in code section number

Add to read as shown.

101/I.S.2—97 Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors 1008.1.6, 1714.5.2.1, 1714.5.2.2, 2411.3.2.1

101/I.S.2/NAFS—02 Voluntary Performance Specification for Windows, Skylights and Glass Doors 1714.5.2.1, 1714.5.2.1.1, 2405.5, 2612.2

Add to read as shown.

~~103.3—83~~ 103-09 Procedural Guide, Sec. 2 — Engineering Design Rules 2411.3.2.6

203—~~98~~ **-03** Procedural Guide for the Window Inspection and Notification System 1714.5.2.2

501—05 Method for Test for Exterior Wall 1714.5.2.1, 1714.5.2.1.1, 1714.5.3.3.1, 2405.5, 2411.3.2.1.1, 2612.2

AAMA/WDMA/CSA101/I.S. 2/A440-05 or 08 Specifications for Windows, Doors and Unit Skylights 1714.5.2.1

AAMA 450-06 or -10, Voluntary Performance Rating Method for Mulled Fenestration Assemblies 1714.5.5.1, 1714.5.5.1.2, 1714.5.5.1.3

AAMA 506-06 or -08,Voluntary Specifications for Hurricane Impact and Cycle Testing of Fenestration Products 1609.1.4

AAMA/NPEA/NSA 2100-02 Voluntary Specifications for Sunrooms 2002.6

AAMA 800—05 or -08 Voluntary Specifications and Test Methods for Sealants …… 2510.8

AAMA 812-04 Voluntary Practice for Assessment of Single Component Aerosol Expanding Polyurethane Foams for Sealing Rough Openings of Fenestration Installations …… 2510.8

ASTM E 283-04 Test Method for Determining Rate of Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen---------- 13-606.ABC.1.1, 13-606.ABC.1.2.4

E 330—02 Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference 1714.5.3, 2415.4, 2415.7.1

E 331—00 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 1403.2, 2415.4

E1300—04e01, 09a, or 98 (HVHZ) Practice for Determining Load Resistance of Glass in Buildings 1714.5.2.1, 2404.1, 2404.2, 2404.3, 2411.2.1.1, 2411.2.1.2, 2411.3.1.2

E1592—01 Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference 1504.3.2, 2411.2.1.2

E 1886-02 or ~~06~~ 05 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials 202, 1609.1.4

E 1996-02 or 06 or 09 Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors, and Storm Shutters Impact by Windborne Debris in Hurricanes 202, 1609.1.4

AAMA

American Architectural Manufacturers Association

1827 Waldon Office Square, Suite 104

Schaumburg, IL 60173

Standard reference number Title Referenced in code section number

Add to read as shown.

101/I.S.2—97 Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors 1008.1.6, 1714.5.2.1, 1714.5.2.2, 2411.3.2.1

101/I.S.2/NAFS—02 Voluntary Performance Specification for Windows, Skylights and Glass Doors 1714.5.2.1, 1714.5.2.1.1, 2405.5, 2612.2

Add to read as shown.

~~103.3—83~~ 103-09 Procedural Guide, Sec. 2 — Engineering Design Rules 2411.3.2.6

203—~~98~~ Procedural Guide for the Window Inspection and Notification System 1714.5.2.2

501—05 Method for Test for Exterior Wall 1714.5.2.1, 1714.5.2.1.1, 1714.5.3.3.1, 2405.5, 2411.3.2.1.1, 2612.2

AAMA/WDMA/CSA101/I.S. 2/A440-05 or 08 Specifications for Windows, Doors and Unit Skylights 1714.5.2.1

AAMA 450-06 or -10, Voluntary Performance Rating Method for Mulled Fenestration Assemblies 1714.5.5.1, 1714.5.5.1.2, 1714.5.5.1.3

AAMA 506-06 or -08,Voluntary Specifications for Hurricane Impact and Cycle Testing of Fenestration Products 1609.1.4

AAMA/NPEA/NSA 2100-02 Voluntary Specifications for Sunrooms 2002.6

AAMA 800—05 or -08 Voluntary Specifications and Test Methods for Sealants 2510.8

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AAMA 812-04 Voluntary Practice for Assessment of Single Component Aerosol Expanding Polyurethane Foams for Sealing Rough Openings of Fenestration Installations …… 2510.8

ASTM E 283-04 Test Method for Determining Rate of Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen---------- 13-606.ABC.1.1, 13-606.ABC.1.2.4

E 330—02 Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference 1714.5.3, 2415.4, 2415.7.1

E 331—00 Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 1403.2, 2415.4

E1300—04e01, 09a, or 98 (HVHZ) Practice for Determining Load Resistance of Glass in Buildings 1714.5.2.1, 2404.1, 2404.2, 2404.3, 2411.2.1.1, 2411.2.1.2, 2411.3.1.2

E1592—01 Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference 1504.3.2, 2411.2.1.2

E 1886-02 or ~~06~~ 05 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Storm Shutters Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials 202, 1609.1.4

E 1996-02 or 06 or 09 Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors, and Storm Shutters Impact by Windborne Debris in Hurricanes 202, 1609.1.4

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AAMA

American Architectural Manufacturers Association

1827 Waldon Office Square, Suite 104

Schaumburg, IL 60173

Standard reference number	Title	Referenced in code section number

Add to read as shown.

101/I.S.2—97	Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors	1008.1.6, 1714.5.2.1, 1714.5.2.2, 2411.3.2.1
101/I.S.2/NAFS—02	Voluntary Performance Specification for Windows, Skylights and Glass Doors	1714.5.2.1, 1714.5.2.1.1, 2405.5, 2612.2

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Date Submitted	4/2/2010	**Section**	Referenced Standards	**Proponent**	Joseph Belcher
Chapter	35	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Delete organization.

Rationale

The reference to the document has been removed from the code.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No cost impact

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

No cost impact

Impact to industry relative to the cost of compliance with code

No cost impact

Requirements

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

The referenced document has been removed from the code.

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

The referenced document has been removed from the code.

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

The referenced document has been removed from the code.

Does not degrade the effectiveness of the code

The referenced document has been removed from the code.

~~FCPA~~	~~Florida Concrete & Products Association, Inc. 3030 Dade Avenue~~ ~~Orlando, Florida 32804~~	
Masonry Association of Florida Need address	Masonry Association of Florida	
Standard reference number	**Title**	**Referenced in code section number**

~~FCPA~~	~~Florida Concrete & Products Association, Inc. 3030 Dade Avenue~~ ~~Orlando, Florida 32804~~	
Standard reference number	**Title**	**Referenced in code section number**

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Sub Code: Existing Building

Date Submitted	3/8/2010	**Section**	611.8.1.	**Proponent**	Jack Glenn
Chapter	6	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Notes are taken from Table R802.2.9.1 and are necessary to determine the actual uplift based on the roof span and overhang.

Rationale

The use of the provisions for the updating of roof-to-wall connections and be determine without first determining the uplift. The Table as printed does not provide guidance in how to determine the total uplift from the table.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There is no impact.

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

There is no impact to the building or owner.

Impact to industry relative to the cost of compliance with code

There is no fiscal impact. The ability to determine the uplift will be inhanced with this change.

Requirements

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

Corrects an oversight in the development of the mitigation criteria that left out the instructions on how to make the actual uplift determination.

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

Clarifies for the user the method of determining uplft for roof-to-wall connections.

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

No material discrimination.

Does not degrade the effectiveness of the code

Makes tocode work better.

Add notes to Table 611.8.1:

a. The uplift loads are pounds per lineal foot of building length. For roof uplift connections ~~**use the tables for 20 degrees and**~~ multiply by 1.33 for framing spaced 16 inches on center and multiply by 2 for framing spaced 24 inches on center.

b. The uplift loads do not account for the effects of overhangs. The magnitude of the above loads shall be increased by adding the overhang loads found in the table. The overhang loads are also based on framing spaced 12 inches on center. The overhang loads given shall be multiplied by the overhang projection and added to the roof uplift value in the table.

Add notes to Table 611.8.1:

a. The uplift loads are pounds per lineal foot of building length. For roof uplift connections use the tables for 20 degrees and multiply by 1.33 for framing spaced 16 inches on center and multiply by 2 for framing spaced 24 inches on center.

b. The uplift loads do not account for the effects of overhangs. The magnitude of the above loads shall be increased by adding the overhang loads found in the table. The overhang loads are also based on framing spaced 12 inches on center. The overhang loads given shall be multiplied by the overhang projection and added to the roof uplift value in the table.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3512_TextOfModification_1.png

Date Submitted	4/2/2010	**Section**	1605	**Proponent**	T Stafford
Chapter	16	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

New provisions are added to specify uplift loads for gable rake overhang outlookers.

Rationale

New provisions are added to the retrofit provisions that specify uplift loads for gable rake overhang outlookers.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local entities relative to enforcement of the code.

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

There may be a marginal impact to building and property owners relative to cost of compliance with the code.

Impact to industry relative to the cost of compliance with code

There may be a marginal impact to industry relative to cost of compliance with the code.

Requirements

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

The new provisions improve the wind resistance of existing buildings.

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

The modification strengthens the code by improving the wind resistance of existing buildings.

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

The proposed language is performance based and therefore, does not discriminate.

Does not degrade the effectiveness of the code

The modification strengthens the code by improving the wind resistance of existing buildings.

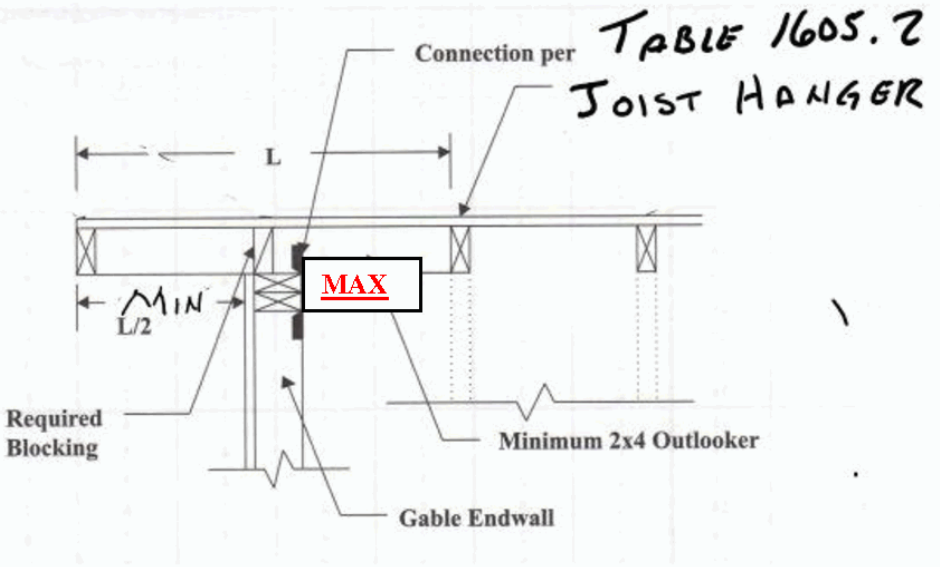
See attached

SECTION 1605

RETROFITTING RAKE OVERHANG OUTLOOKERS FOR UPLIFT LOADS

1605.1 Rake Overhangs. Rake overhang outlookers shall be a minimum nominal 2x4 lumber and the overhang overhangs shall not exceed ½ the total length of the outlooker. See Figure 1605.1.

1605.2 Rake Overhang Outlooker uplift connections. Rake overhang outlookers shall be connected to gable endwalls with a connection capable of resisting the loads specified in Table 1605.2. Rake overhang outlookers shall be connected to the first interior truss or rafter with a joist hanger having a vertical load capacity of ½ the applicable load in Table 1605.1.



Change MIN to MAX

Figure 1605.1

Rake Overhang Outlookers

Table 1605.2

Rake Overhang Outlooker Uplift Connection

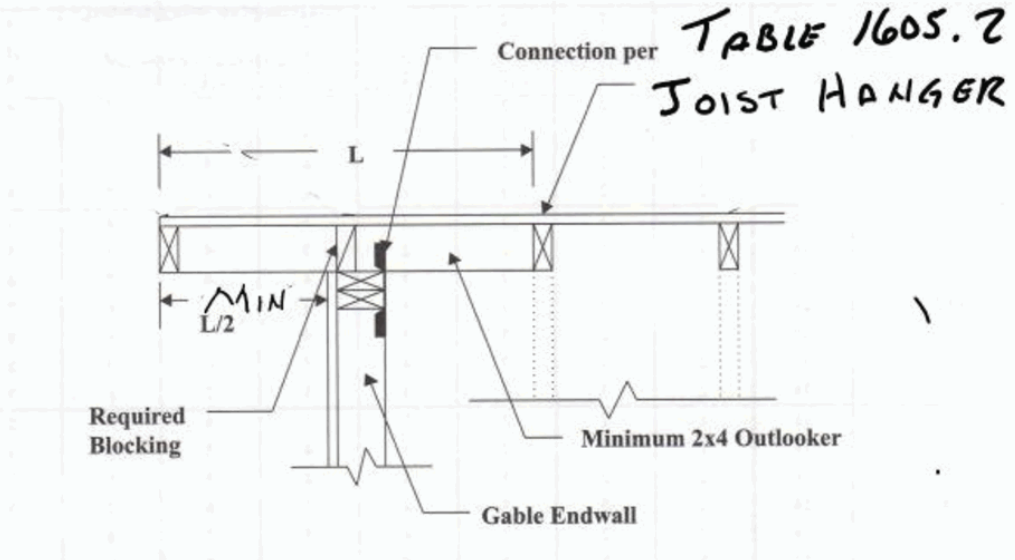
Basic Wind Speed (mph)	100	110	120	130	140	150
Outlooker Spacing (in.)	Uplift Connection Loads (lbs.)					
12	258	312	372	436	506	581
16	344	417	496	582	675	775
24	517	625	744	873	1012	1162

SECTION 1605

RETROFITTING RAKE OVERHANG OUTLOOKERS FOR UPLIFT LOADS

1605.1 Rake Overhangs. Rake overhang outlookers shall be a minimum nominal 2x4 lumber and the overhang overhangs shall not exceed ½ the total length of the outlooker. See Figure 1605.1.

1605.2 Rake Overhang Outlooker uplift connections. Rake overhang outlookers shall be connected to gable endwalls with a connection capable of resisting the loads specified in Table 1605.2. Rake overhang outlookers shall be connected to the first interior truss or rafter with a joist hanger having a vertical load capacity of ½ the applicable load in Table 1605.1.



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Figure 1605.1

Rake Overhang Outlookers

Table 1605.2

Rake Overhang Outlooker Uplift Connection

Basic Wind Speed (mph)	100	110	120	130	140	150
Outlooker Spacing (in.)	Uplift Connection Loads (lbs.)					
12	258	312	372	436	506	581
16	344	417	496	582	675	775
24	517	625	744	873	1012	1162

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4444_TextOfModification_2.png

Sub Code: Residential

Date Submitted	3/26/2010	**Section**	202	**Proponent**	Rebecca Quinn
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Florida-specific mods to retain I-Code flood provisions. Defines 'local floodplain management ordinance' where communities will adopt FIRMs and higher stnds for NFIP Community Rating System. FBC requested statutory authority so that local higher stnds do not sunset every 3 years.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IRC flood provisions IBC and make Florida-specific amendments. IRC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for R322 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

FLOODPLAIN MANAGEMENT ORDINANCE. An ordinance or regulation adopted pursuant to the authority granted to local governments by Title 44 Code of Federal Regulations, ~~**Sections**~~ **Parts** 59 and 60 for participation in the National Flood Insurance Program.

FLOODPLAIN MANAGEMENT ORDINANCE. An ordinance or regulation adopted pursuant to the authority granted to local governments by Title 44 Code of Federal Regulations, Sections 59 and 60 for participation in the National Flood Insurance Program.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3895_TextOfModification_1.png

Date Submitted	4/1/2010	**Section**	308.6.1	**Proponent**	Chuck Anderson
Chapter	3	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

4332

Summary of Modification

Includes Tubular Daylighting Devices in definition of unit skylights

Rationale

Provides direction on how to address TDD's

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

clarifies how to classify TDD

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

minimal, request for this change comes from AAMA's skylight council.

Requirements

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

Will require TDD to meet skylight requirements.

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

provides direction on how to classify TDD's

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

provides a compliance path for TDD's, no discrimination of materials

Does not degrade the effectiveness of the code

no degradation

1. **Modify as shown:**

R308.6.1 Definitions.

SKYLIGHTS AND SLOPED GLAZING. Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing materials in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls are included in this definition.

~~**UNIT SKYLIGHT**~~ **SKYLIGHT, UNIT**. A factory assembled, glazed fenestration unit, containing one panel of glazing material, that allows for natural daylighting through an opening in the roof assembly while preserving the weather resistant barrier of the roof.

2. **Add the following:**

R308.6.1 Definitions.

TUBULAR DAYLIGHTING DEVICE (TDD). A non-operable fenestration unit primarily designed to transmit daylight from a roof surface to an interior ceiling via a tubular conduit. The basic unit consists of an exterior glazed weathering surface, a light-transmitting tube with a reflective interior surface, and an interior-sealing device such as a translucent ceiling panel. The unit may be factory assembled, or field-assembled from a manufactured kit.

3. **Modify as shown:**

R308.6.9 Testing and labeling of skylights. Exterior unit skylights and tubular daylighting devices shall be tested by an approved independent testing laboratory, and shall be labeled to indicate compliance with the requirements of one of the following specification:

~~ANSI/AAMA/WDMA 101/I.S.2/NAFS or~~AAMA/WDMA/CSA 101/I.S.2/A440, or TAS 202 (HVHZ shall comply with TAS 202).

(No changes to remainder of section)

1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Roger LeBrun **Submitted** 5/23/2010 **Attachments** Yes

S4336-A1

Rationale

The above is to be consistent with results of today's 2012 ICC Final Action Hearings, refering to code change S144, Part II. These changes more thoroughly accomplish the intent of the originally filed FBC proposal.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Same as original proposal

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

Same as original proposal

Impact to industry relative to the cost of compliance with code

Same as original proposal

Requirements

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

Same as original proposal

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

Same as original proposal

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

Same as original proposal

Does not degrade the effectiveness of the code

Same as original proposal

1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Jack Glenn **Submitted** 6/1/2010 **Attachments** No

S4336-G1

Comment:

This change is more appropriate for the base code and If te ICC has approved this language for thre 2012 code Florida can address it in the next code cycle. The proponent has not demonstrated a "Florida-Specific Need" as required by part "G" of the standing motion for approval.

SKYLIGHT, UNIT. A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof. Unit skylights include, but are not limited to, tubular daylighting devices (TDD).

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4336_TextOfModification_1.png

Replace the original language changes with the following:

1. **Modify as shown:**

R308.6.1 Definitions.

SKYLIGHTS AND SLOPED GLAZING. Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing materials in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls are included in this definition.

~~**UNIT SKYLIGHT**~~ **SKYLIGHT, UNIT**. A factory assembled, glazed fenestration unit, containing one panel of glazing material, that allows for natural daylighting through an opening in the roof assembly while preserving the weather resistant barrier of the roof.

2. **Add the following:**

R308.6.1 Definitions.

TUBULAR DAYLIGHTING DEVICE (TDD). A non-operable fenestration unit primarily designed to transmit daylight from a roof surface to an interior ceiling via a tubular conduit. The basic unit consists of an exterior glazed weathering surface, a light-transmitting tube with a reflective interior surface, and an interior-sealing device such as a translucent ceiling panel. The unit may be factory assembled, or field-assembled from a manufactured kit.

3. **Modify as shown:**

R308.6.9 Testing and labeling of skylights. Exterior unit skylights and tubular daylighting devices shall be tested by an approved independent testing laboratory, and shall be labeled to indicate compliance with the requirements of one of the following specification:

~~ANSI/AAMA/WDMA 101/I.S.2/NAFS or~~ AAMA/WDMA/CSA 101/I.S.2/A440, or TAS 202 (HVHZ shall comply with TAS 202).

(No changes to remainder of section)

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4336_A1_TextOfModification_1.png

SKYLIGHT, UNIT. A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof. Unit skylights include, but are not limited to, tubular daylighting devices (TDD).

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4336_Text_FBC 202 TDD defn_1.png

S3896

Date Submitted	3/26/2010	**Section**	R301.1, 322.1.4, 322.1.7 & 3	**Proponent**	Rebecca Quinn
Chapter	3	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Florida-specific modifications to Chapter 3, related to retaining flood provisions of the I-Codes. Clarifies that structures seaward of the CCCL must also comply with R322 if also located in a flood hazard area.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IRC flood provisions IBC and make Florida-specific amendments. IRC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for R322 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

R301.1 Application. Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, ~~snow loads,~~ and wind loads ~~and seismic loads~~ as prescribed by this code. The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load-resisting elements to the foundation. Buildings and structures constructed as prescribed by this code are deemed to comply with the requirements of this section.

EXCEPTION: Buildings and structures located within the High Velocity Hurricane Zone shall comply ~~only~~ with Sections R302 to R326, inclusive and the provisions of Chapter R44. In addition, buildings and structures located in flood hazard areas established in Table R301.2(1) shall comply with Sections R301.2.4 and R322.

[In Table R301.2(1), in the cell under "Flood Hazards," delete ~~See R323~~ and restore and modify the footnote from IRC]

g. The applicable governing **body ~~authority~~** shall, by local floodplain management ordinance, specify ~~jurisdiction shall fill in this part of the table with~~ (a) the date of the jurisdiction's entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study and (c) the panel numbers and dates of all currently effective FIRM and FBFM, or other flood hazard map adopted by the authority having jurisdiction, as amended.

R322.1.7 Protection of water supply and sanitary sewage systems. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems in accordance with the plumbing provisions of this code. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into systems and discharges from systems into floodwaters in accordance with the plumbing provisions of this code and in accordance with Chapter 64E-6, Florida Administrative Code, Standards for Onsite Sewage Treatment and Disposal Systems. ~~and Chapter 3 of the International Private Sewage Disposal Code.~~

R322.1.9 Manufactured homes. In addition to the applicable requirements of the state agency with jurisdiction over installation of manufactured homes, installation of manufactured homes in flood hazard areas is subject to the applicable provisions of the local floodplain management ordinance. ~~New or replacement manufactured homes shall be elevated in accordance with Section R322.2 (flood hazard areas including A Zones) or Section R322.3 in coastal high hazard areas (V Zones). The anchor and tie-down requirements of Sections AE604 and AE605 of Appendix E shall apply. The foundation and anchorage of manufactured homes to be located in identified floodways shall be designed and constructed in accordance with ASCE 24.~~

R322.1.11~~R322.4~~ Structures seaward of a coastal construction line. In addition to the requirements of this section, ~~S~~ structures located in flood hazard areas and seaward of the coastal construction line shall be designed to resist the predicted forces of a 100-year storm event in accordance with Chapter R44, and the more restrictive provisions shall govern. ~~Section 3109 of the Florida Building Code, Building.~~

S3896-A1

Proponent Rebecca Quinn **Submitted** 5/24/2010 **Attachments** Yes

Rationale

I incorrectly cited the High Velocity Hurricane Zone; this alternate modifiation Restores reference to Sec. 3109 of the Building Code. Simple reference to Sec. 3109 is appropriate; the phrases proposed to be deleted are an over simplification of the requirements in SEc. 3109 and do not add anything. This modifiation also deletes the same phrase in R301.2.5 to maintain consistency. Other parts of the original proposal are retained.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Original statement stands as this modification does not change to the intent of the original proposal.

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

Original statement stands as this modification does not change to the intent of the original proposal.

Impact to industry relative to the cost of compliance with code

Original statement stands as this modification does not change to the intent of the original proposal.

Requirements

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

Original statement stands as this modification does not change to the intent of the original proposal.

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

Original statement stands as this modification does not change to the intent of the original proposal.

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

Original statement stands as this modification does not change to the intent of the original proposal.

Does not degrade the effectiveness of the code

Original statement stands as this modification does not change to the intent of the original proposal.

R301.1 Application. Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, ~~snow loads,~~ and wind loads ~~and seismic loads~~ as prescribed by this code. The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load-resisting elements to the foundation. Buildings and structures constructed as prescribed by this code are deemed to comply with the requirements of this section.

EXCEPTION: Buildings and structures located within the High Velocity Hurricane Zone shall comply ~~only~~ with Sections R302 to R326, inclusive and the provisions of Chapter R44. In addition, buildings and structures located in flood hazard areas established in Table R301.2(1) shall comply with Sections R301.2.4 and R322.

[In Table R301.2(1), in the cell under "Flood Hazards," delete ~~See R323~~ and restore and modify the footnote from IRC]

g. The applicable governing authority shall, by local floodplain management ordinance, specify ~~jurisdiction shall fill in this part of the table with~~ (a) the date of the jurisdiction's entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study and (c) the panel numbers and dates of all currently effective FIRM and FBFM, or other flood hazard map adopted by the authority having jurisdiction, as amended.

R322.1.7 Protection of water supply and sanitary sewage systems. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems in accordance with the plumbing provisions of this code. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into systems and discharges from systems into floodwaters in accordance with the plumbing provisions of this code and in accordance with Chapter 64E-6, Florida Administrative Code, Standards for Onsite Sewage Treatment and Disposal Systems. ~~and Chapter 3 of the International Private Sewage Disposal Code.~~

R322.1.9 Manufactured homes. In addition to the applicable requirements of the state agency with jurisdiction over installation of manufactured homes, installation of manufactured homes in flood hazard areas is subject to the applicable provisions of the local floodplain management ordinance. ~~New or replacement manufactured homes shall be elevated in accordance with Section R322.2 (flood hazard areas including A Zones) or Section R322.3 in coastal high hazard areas (V Zones). The anchor and tie-down requirements of Sections AE604 and AE605 of Appendix E shall apply. The foundation and anchorage of manufactured homes to be located in identified floodways shall be designed and constructed in accordance with ASCE 24.~~

R322.1.11~~**R322.4**~~ **Structures seaward of a coastal construction line.** In addition to the requirements of this section, ~~S~~ structures located in flood hazard areas and seaward of the coastal construction line shall be designed to resist the predicted forces of a 100-year storm event in accordance with Chapter R44, and the more restrictive provisions shall govern. ~~Section 3109 of the Florida Building Code, Building.~~

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Alternate for only one section of original proposal (R322.1.11), and a correlating change to a similar section (R301.2.5):

R301.2.5 Structures seaward of a coastal construction line. Structures located seaward of the coastal construction line shall be designed ~~to resist the predicted forces of a 100-year storm event~~ in accordance with Section 3109 of the FloridaBuilding Code, Building.

R322.1.11 ~~R322.4~~ **Structures seaward of a coastal construction line.** In addition to the requirements of this section, **s**tructures located in flood hazard areas and seaward of the coastal construction line shall also be designed ~~to resist the predicted forces of a 100-year storm event~~ in accordance with Section 3109 of the *Florida Building Code, Building*.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3896_A1_TextOfModification_1.png

Date Submitted	4/2/2010	**Section**	R301.2.1.1.2	**Proponent**	Joseph Belcher
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarifies the application of AAMA 2100 and that the design is in accordance with the wind speeds and wind loads of the Florida Building Code.

Rationale

The proposed change is intended to clarify the application of the provisions of AAMA 2100. The proposal ties design to the appropriate design provisions of the FBC. The purpose of the inclusion of the AAMA categories in the code is clarified. The intent is to use the categories in determining which of the AAMA 2100 provisions to apply based on the use of the sunroom. i.e. habitable versus non-habitable and conditioned versus unconditioned.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The change will have no impact on the cost of compliance relative to the enforcement of the code.

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

The change is intended for clarification and will have no impact on the cost of compliance for building and property owners.

Impact to industry relative to the cost of compliance with code

The change is intended for clarification and will have no impact on the cost of compliance for building and property owners.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by clarifying the application of adopted reference standards and clearly stating the wind loads are as required by the Florida Building Code.

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

The proposal strengthens and improves the code by clarifying the application of adopted reference standards and clearly stating the wind loads are as required by the Florida Building Code.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities and may remove a possible source of discrimination.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by clarifying the application of adopted reference standards and clearly stating the wind loads are as required by the Florida Building Code.

R301.2.1.1.2 Sunrooms. Sunrooms shall comply with AAMA/NPEA/NSA 2100 with the structural requirements and testing provisions of Chapter 5 . ~~modified to incorporate ASCE 7~~

AAMA 2100, Section 5.2.1 Wind Loads: Modify Section 5.2.1as follows:

5.2.1 Wind Loads: Basic wind speed **(V_{asd})** in miles per hour (mph) ~~or kilometer per hour (kph)~~ shall be determined ~~by the local or regional building authority~~ in accordance with Section R301.2.1. Sunrooms including exposed structures, components, cladding, and roof covering shall be designed to resist the wind loads as established in Section R301.2.1 ~~ASCE 7-98 or local wind load criteria.~~

For the purpose of applying the criteria of the AAMA Standard for sunrooms based on the intended use, ~~S~~ sunrooms shall categorized in one of the following categories by the permit applicant, design professional or the property owner where the sunroom is being constructed.

(Categories unchanged.)

R301.2.1.1.2 Sunrooms. Sunrooms shall comply with AAMA/NPEA/NSA 2100 with the structural requirements and testing provisions of Chapter 5 . ~~modified to incorporate ASCE 7~~

-

AAMA 2100, Section 5.2.1 Wind Loads: Modify Section 5.2.1as follows:

5.2.1 Wind Loads: Basic wind speed in miles per hour (mph) ~~or kilometer per hour (kph)~~ shall be determined ~~by the local or regional building authority~~ in accordance with Section R301.2.1. Sunrooms including exposed structures, components, cladding, and roof covering shall be designed to resist the wind loads as established in Section R301.2.1 ~~ASCE 7-98 or local wind load criteria.~~

For the purpose of applying the criteria of the AAMA Standard for sunrooms based on the intended use, ~~S~~ sunrooms shall categorized in one of the following categories by the permit applicant, design professional or the property owner where the sunroom is being constructed.

(Categories unchanged.)

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4346_TextOfModification_1.png

S4108

Date Submitted	3/30/2010	**Section**	R301.2.1.1	**Proponent**	Paul Coats
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

This modification replaces the outdated WPPC Guide to Wood Construction in High Wind Areas with the similar AF&PA WFCM Guide to Wood Construction in High Wind Areas.

Rationale

The WPPC Guide to Wood Construction in High Wind Areas is based on the 1995 WFCM and is out of date and unavailable. The AF&PA WFCM Guide to Wood Construction in High Wind Areas is similar in scope and purpose, is based on the current 2001 edition of the WFCM, and should be referenced here for the convenience of designers and builders. "Applicable" is necessary before the reference since the guides are published separately according to wind speed.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This will help the local entity by providing updated and available referenced standards.

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

No significant impact relative to cost.

Impact to industry relative to the cost of compliance with code

No significant impact relative to cost.

Requirements

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

These guides, as the most recent standards, will improve health, safety, and welfare.

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

Referencing these recent guides strengthens and improves the code.

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

These Guides and the WFCM are appropriate to material and do not discriminate.

Does not degrade the effectiveness of the code

Improves effectiveness of the code.

R301.2.1.1 Design criteria. Construction in regions where the basic wind speeds from Figure R301.2(4) equal or exceed 100 miles per hour (45 m/s) shall be permitted to be designed in accordance with one of the following:

1. American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM);

2. Minimum Design Loads for Buildings and Other Structures (ASCE-7);

3. American Iron and Steel Institute (AISI), Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings (AISI S230).

4. Concrete and concrete masonry construction shall be designed in accordance with the provisions of this code or in accordance with the applicable documents adopted in Section R301.2.1.1.

5. International Code Council (ICC) Standard for Residential Construction in High Wind Regions (ICC-600);

6. The FC&PA Guide to Concrete Masonry Residential Construction in High Wind Areas shall be permitted for applicable concrete masonry buildings for a basic wind speed **(V_{asd})** of 130 mph (58 m/s) or less in Exposure B and 110 mph (49 m/s) or less in Exposure C in accordance with Figure R301.2(4);

7. The ~~WPPC Guide to Wood Construction in High Wind Areas~~ applicable AF&PA WFCM Guide to Wood Construction in High Wind Areas shall be permitted for applicable wood-frame buildings in regions with ~~for~~ a basic wind speed **(V_{asd})** of 130 mph (58 m/s) or less in Exposure B ~~and 110 mph (49 m/s) or less in Exposure C~~ in accordance with Figure R301.2(4); ~~or.~~

8. The Florida Building Code, Building.

9. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.

R301.2.1.1 Design criteria. Construction in regions where the basic wind speeds from Figure R301.2(4) equal or exceed 100 miles per hour (45 m/s) shall be permitted to be designed in accordance with one of the following:

1. American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM);

2. Minimum Design Loads for Buildings and Other Structures (ASCE-7);

3. American Iron and Steel Institute (AISI), Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings (AISI S230).

4. Concrete and concrete masonry construction shall be designed in accordance with the provisions of this code or in accordance with the applicable documents adopted in Section R301.2.1.1.

5. International Code Council (ICC) Standard for Residential Construction in High Wind Regions (ICC-600);

6. The FC&PA Guide to Concrete Masonry Residential Construction in High Wind Areas shall be permitted for applicable concrete masonry buildings for a basic wind speed of 130 mph (58 m/s) or less in Exposure B and 110 mph (49 m/s) or less in Exposure C in accordance with Figure R301.2(4);

7. The ~~WPPC Guide to Wood Construction in High Wind Areas~~ applicable AF&PA WFCM Guide to Wood Construction in High Wind Areas shall be permitted for applicable wood-frame buildings in regions with ~~for~~ a basic wind speed of 130 mph (58 m/s) or less in Exposure B ~~and 110 mph (49 m/s) or less in Exposure C~~ in accordance with Figure R301.2(4); ~~or.~~

8. The Florida Building Code, Building.

9. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.

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Date Submitted	3/12/2010	**Section**	R703.8 Flashing	**Proponent**	Dick Wilhelm
Chapter	7	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

None

Summary of Modification

Defines who is responsible for flashing instructions while also clarifying that door and window installation be in accordance with manufacturer's instructions and window and door flashing in accordance to R703.8 adds by reference, FMA/AAMA and FMA/WDMA installation protocols.

Rationale

Clarifies that door and window installation be in accordance with manufacturer's installation instructions in Chapter 6 and flashing be done in accordance with Chapter 7. Will help avoid confusion over how installation and flashing requirements are to apply to doors and windows.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No fiscal impact to local entities

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

Will assure building and property owners that fenestration products have proper installation and flashing standards.

Impact to industry relative to the cost of compliance with code

Window and door installers will have to comply with flashing standards (AAMA 711-07). Sealants will have to comply.

Requirements

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

Proper installation of windows/doors in extreme wind and rain environments will result in cost savings to building owners due to reduced penetration of water.

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

Improves the Residential Code by separating the installation and flashing requirements as well as adding an industry consensus flashing standard.

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

Strengthens the code by adding references to perscriptive methods of fenestration installation and flashing.

R703.8 Flashing. Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashings shall be installed at all of the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. **Flashing at exterior window and door openings shall be installed in accordance with one or more of the following or other approved method:**

1.1 The fenestration manufacturer's written flashing instructions.

1.2 The flashing manufacturer's written installation instructions.

1.3 In accordance with FMA/AAMA 100, FMA/AAMA 200, or FMA/WDMA 250.

1.4 In accordance with the flashing method of a ~~**registered**~~**licensed** design professional.

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.

3. Under and at the ends of masonry, wood or metal copings and sills.

4. Continuously above all projecting wood trim.

5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.

6. At wall and roof intersections.

7. At built-in gutters.

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1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage.

1.1 The fenestration manufacturer's written flashing instructions.

1.2 The flashing manufacturer's written installation instructions.

1.3 In accordance with FMA/AAMA 100, FMA/AAMA 200, or FMA/WDMA 250.

1.4 In accordance with the flashing method of a registered design professional.

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.

3. Under and at the ends of masonry, wood or metal copings and sills.

4. Continuously above all projecting wood trim.

5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.

6. At wall and roof intersections.

7. At built-in gutters.

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Date Submitted	3/29/2010	**Section**	806.4	**Proponent**	J Glenn-BASF
Chapter	8	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language.

Rationale

The base code change provides more specific direction and restores the Florida Code to the nationally accepted practice.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impacton local enforcement.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice.

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

Does not discriminated against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**R806.4 Unvented attic assemblies**. Unvented attic assemblies shall be permitted if all the following conditions are met:~~

~~1. The unvented attic space is completely contained within the building thermal envelope.~~

~~2. No interior vapor retarder is installed on the ceiling side (attic floor) of the unvented attic assembly.~~

~~3.Where wood shingles or shakes are used, a minimum ¼ inch (6 mm) vented air space separates the shingles or shakes from the roofing underlayment.~~

~~4. One of the following: shall be met, depending on the air permeability of the insulation under the structural roof sheathing.~~

~~a. Air-impermeable insulation only. Insulation shall be applied in direct contact to the underside of the structural roof sheathing.~~

~~b. Air-permeable insulation only. In addition to air-permeable insulation installed directly below the structural sheathing, at least R-5 rigid board or sheet insulation shall be installed directly above the structural roof sheathing for condensation control.~~

~~c. Air-impermeable and air-permeable insulation. At least R-5 air-impermeable insulation shall be applied in direct contact to the underside of the structural roof sheathing for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.~~

Structural TAC

R806.4 Unvented attic assemblies. Unvented attic assemblies (spaces between the ceiling joists of the top story and the roof rafters) shall be permitted if all the following conditions are met:

1. The unvented attic space is completely contained within the building thermal envelope.

2. No interior vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly.

3. Where wood shingles or shakes are used, a minimum $^{1}/_{4}$ inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.

~~**4. In climate zones 5, 6, 7 and 8, any air-impermeable insulation shall be a vapor retarder, or shall have a vapor retarder coating or covering in direct contact with the underside of the insulation.**~~

~~**4**~~**5**. Either Items 5.1, 5.2 or 5.3 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.

~~**4**~~**5**.1. Air-impermeable insulation only. Insulation shall be applied in direct contact with the underside of the structural roof sheathing.

~~**4**~~**5**.2. Air-permeable insulation only. In addition to the air-permeable installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified in Table R806.4 for condensation control.

~~**4**~~**5**.3. Air-impermeable and air-permeable insulation. The air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing as specified in Table R806.4 for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.

~~45~~.3. Air-impermeable and air-permeable insulation. The air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing as specified in Table R806.4 for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.

TABLE R806.4

INSULATION FOR CONDENSATION CONTROL

[Non-Florida climate zones to be deleted]

CLIMATE ZONE	MINIMUM RIGID BOARD ON AIR-IMPERMEABLE INSULATION R-VALUE[a]
1, 2~~A, 2B, 3A, 3B, 3C~~	R-5

[a]Contributes to but does not supersede ~~Chapter 11 energy~~ requirements of the Florida Building Code, Energy Conservation.

~~**R806.4 Unvented attic assemblie**s. Unvented attic assemblies shall be permitted if all the following conditions are met:~~

~~1. The unvented attic space is completely contained within the building thermal envelope.~~

~~2. No interior vapor retarder is installed on the ceiling side (attic floor) of the unvented attic assembly.~~

~~3.Where wood shingles or shakes are used, a minimum continuous ¼ inch (6 mm) vented air space separates the shingles or shakes from the roofing underlayment.~~

~~4. One of the following: shall be met, depending on the air permeability of the insulation under the structural roof sheathing.~~

~~a. Air-impermeable insulation only. Insulation shall be applied in direct contact to the underside of the structural roof sheathing.~~

~~b. Air-permeable insulation only. In addition to air-permeable insulation installed directly below the structural sheathing, at least R-5 rigid board or sheet insulation shall be installed directly above the structural roof sheathing for condensation control.~~

~~c. Air-impermeable and air-permeable insulation. At least R-5 air-impermeable insulation shall be applied in direct contact to the underside of the structural roof sheathing for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.~~

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1. The unvented attic space is completely contained within the building thermal envelope.

2. No interior vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly.

3. Where wood shingles or shakes are used, a minimum $^{1}/_{4}$ inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.

4. In climate zones 5, 6, 7 and 8, any air-impermeable insulation shall be a vapor retarder, or shall have a vapor retarder coating or covering in direct contact with the underside of the insulation.

5. Either Items 5.1, 5.2 or 5.3 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.

5.1. Air-impermeable insulation only. Insulation shall be applied in direct contact with the underside of the structural roof sheathing.

5.2. Air-permeable insulation only. In addition to the air-permeable installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified in Table R806.4 for condensation control.

5.3. Air-impermeable and air-permeable insulation. The air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing as specified in Table R806.4 for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.

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Date Submitted	3/24/2010	**Section**	4403.7.8	**Proponent**	Mohammed Shaikh
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

3841

Summary of Modification

Clarification of required design Flood Loads for ASCE 7 in HVHZ

Rationale

Load combinations are specified in chapter 2 and Flood Loads are specified in chapter 5 of standard ASCE. This modification clarifies the Flood Loads to be used in design of buoldings and structures

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

none, Just a clarification

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

none, Just a clarification

Impact to industry relative to the cost of compliance with code

none, Just a clarification

Requirements

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

Improves code and thus welfare of people

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

Strengthens code

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 degrade

R4403.7.8 Load combination. The safety of structures shall be checked using the provisions of 2.3 and 2.4 of ASCE 7 with commentary. Flood Load Fa mentioned in these load combinations shall be in accordance with Chapter 5 of ASCE 7.

Exception: Increases in allowable stress shall be permitted in accordance with TMS 402/ACI 530/ASCE 5 provided the load reduction factor of 0.75 of combinations 4 and 6 of ASCE 7 Section 2.4.1 shall not be applied.

1st Comment Period History 04/15/2010 - 06/01/2010

S3843-G1

Proponent	Joy Duperault	Submitted	5/27/2010	Attachments	No

Comment:

This is a good clarification to remind users that flood loads should be according to ASCE 7.

R4403.7.8 Load combination. The safety of structures shall be checked using the provisions of 2.3 and 2.4 of ASCE 7 with commentary. Flood Load Fa mentioned in these load combinations shall be in accordance with Chapter 5 of ASCE 7.

Exception: Increases in allowable stress shall be permitted in accordance with ACI 530/ASCE 5/TMS 402 provided the load reduction factor of 0.75 of combinations 4 and 6 of ASCE 7 Section 2.4.1 shall not be applied.

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Date Submitted	4/1/2010	**Section**	R4403.12	**Proponent**	Joseph Belcher
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Proposal deletes an obsolete table no longer contained in ASCE 7 and permits the use of the AAF Guide to design screen enclosures.

Rationale

The change is to remove a obsolete table and permit the use of an engineered document for the design and construction of screen enclosures. As a prescriptive document, it is conservative when compared to engineered designs even when considering the differences in the deflection limits. (L/60 vs. L/80) A number of jurisdictions in the HVHZ have realized they are getting stronger structures when the design is based on the AAF Guide and are accepting signed and sealed designs based on the Guide.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The change will have no impact on the cost of compliance relative to the enforcement of the code. Reportedly a number of jurisdictions are currently permitting engineered designs using the AAF Guide as an alternate method.

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

The change will have no impact on the cost to building and property owners relative to compliance with the code. Reportedly a number of jurisdictions are currently permitting sealed engineered designs based the AAF Guide as an alternate method.

Impact to industry relative to the cost of compliance with code

The change will have no impact on the cost to industry relative to compliance with the code. Reportedly a number of jurisdictions are currently permitting sealed engineered designs based the AAF Guide as an alternate method.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by permitting designers to use a recognized engineered prescriptive document for the design of screen enclosures resulting in a stronger structure.

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

The proposal has a reasonable and substantial connection with the welfare of the general public by permitting designers to use a recognized engineered prescriptive document for the design of screen enclosures resulting in a stronger structure.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities,

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by permitting designers to use a recognized engineered prescriptive document for the design of screen enclosures resulting in a stronger structure.

SECTION R4403.12

HIGH-VELOCITY HURRICANE ZONES—

SCREEN ENCLOSURES

R4403.12.1 Screen enclosures.

R4403.12.1.1 The wind loads on screen surfaces shall be per ASCE 7 ~~Table 6-12~~ based on the ratio of solid to gross area.

R4403.12.1.2 Design shall be based on such loads applied horizontally inward and outward to the walls with a shape factor of 1.3 and applied vertically upward and downward on the roof with a shape factor of 0.7.

Exception: Screen enclosures shall be permitted to be designed in accordance with the AAF Guide to Aluminum Construction in High Wind Areas. Construction documents based on the AAF Guide to Aluminum Construction in High Wind Areas shall be prepared and signed and sealed by an Florida **licensed**~~**registered**~~ architect or engineer.

SECTION R4403.12

HIGH-VELOCITY HURRICANE ZONES—

SCREEN ENCLOSURES

R4403.12.1 Screen enclosures.

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Exception: Screen enclosures shall be permitted to be designed in accordance with the AAF Guide to Aluminum Construction in High Wind Areas. Construction documents based on the AAF Guide to Aluminum Construction in High Wind Areas shall be prepared and signed and sealed by an Florida registered architect or engineer.

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Date Submitted	4/1/2010	**Section**	R4403.12	**Proponent**	Joseph Belcher
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Adds aluminim screen enclosure design pressure table from Chapter 22. Add windbreaker provisions from Chapter 16, Section 1622.

Rationale

The tabular values are the result of testing conducted at Virginia Tech and Clemson. Dr. Dr, Timothy Reinhold, PE, developed the values from the raw data generated by the wind tunnel testing. The table has been “tweaked” through a number of code change cycles and a series of rigorous meetings over several years of a large group of engineers practicing in the field of aluminum design. Adds wind breaker provisions from FBCB.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The changes will have no impact on the cost of compliance relative to the enforcement of the code.

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

The changes will have no impact on the cost to building and property owners relative to compliance with the code.

Impact to industry relative to the cost of compliance with code

The changes will have no impact on the cost to building and property owners relative to compliance with the code.

Requirements

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

The proposal has a connection with the welfare of the general public by permitting designers in the HVHZ the flexibility to use wind pressure data developed from wind tunnel testing and consensus meetings for the design of screen enclosures with the end result an economical and stronger structure.

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

The proposal strengthens and improves the code by permitting designers in the HVHZ the flexibility to use wind pressure data developed from wind tunnel testing and numerous consensus meetings for the design of screen enclosures with the end result of a more economical and stronger structure.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by permitting designers in the HVHZ the flexibility to use wind pressure data developed from wind tunnel testing and numerous consensus meetings for the design of screen enclosures with the end result of a more economical and stronger structure.

SECTION R4403.12

HIGH-VELOCITY HURRICANE ZONES—

SCREEN ENCLOSURES

~~**R4403.12.1 Screen enclosures.**~~

~~**R4403.12.1.1The wind loads on screen surfaces shall be per ASCE 7 based on the ratio of solid to gross area or in accordance with Table R4403.12.1.1.**~~

–

~~**Tables Here**~~

~~**R4403.12.1.2 Designs**~~ **utilizing ASCE 7** ~~**shall be based on such loads applied horizontally inward and outward to the walls with a shape factor of 1.3 and applied vertically upward and downward on the roof with a shape factor of 0.7.**~~

~~**R4403.12.1.3 Structural members supporting screened enclosures designed utilizing the pressures of Table R4403.12.1.1 shall be designed for wind in both of two orthogonal directions using the pressures given in Table R4403.12.1.1. Each primary member shall also be designed for a 300 pound (1.33 kN) load applied vertically downward along any 1 foot (305 Mm) of any member, not occurring simultaneously with wind load.**~~

R4403.12.2 Windbreakers.

R4403.12.2.1 Vinyl and acrylic glazed panels shall be removable. Removable panels shall be identified as removable by a decal. The identification decal shall essentially state "Removable panel SHALL be removed when wind speeds exceed 75 mph (34 m/s)." Decals shall be placed such that the decal is visible when the panel is installed.

R4403.12.2.2 Permanent frame shall be designed per section 1620 and 1622.1.2, or 1622.1.3.

SECTION R4403.12

HIGH-VELOCITY HURRICANE ZONES—

SCREEN ENCLOSURES

R4403.12.1 Screen enclosures.

R4403.12.1.1 The wind loads on screen surfaces shall be per ASCE 7 based on the ratio of solid to gross area or in accordance with Table R4403.12.1.1.

Tables Here

R4403.12.1.2 Designs utilizing ASCE 7 shall be based on such loads applied horizontally inward and outward to the walls with a shape factor of 1.3 and applied vertically upward and downward on the roof with a shape factor of 0.7.

R4403.12.1.3 Structural members supporting screened enclosures designed utilizing the pressures of Table R4403.12.1.1 shall be designed for wind in both of two orthogonal directions using the pressures given in Table R4403.12.1.1. Each primary member shall also be designed for a 300 pound (1.33 kN) load applied vertically downward along any 1 foot (305 Mm) of any member, not occurring simultaneously with wind load.

R4403.12.2 Windbreakers.

R4403.12.2.1 Vinyl and acrylic glazed panels shall be removable. Removable panels shall be identified as removable by a decal. The identification decal shall essentially state "Removable panel SHALL be removed when wind speeds exceed 75 mph (34 m/s)." Decals shall be placed such that the decal is visible when the panel is installed.

R4403.12.2.2 Permanent frame shall be designed per section 1620 and 1622.1.2, or 1622.1.3.

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TABLE R4403.12.1.1

DESIGN WIND PRESSURES FOR ALUMINUM SCREENED ENCLOSURES[a,b,c]

SURFACE	BASIC WIND SPEED (mph)											
	100		110		120		130		140		150	
	Exposure Category (B or C) Design Pressure (psf)											
	B	C	B	C	B	C	B	C	B	C	B	C
Horizontal Pressure on Windward Surfaces	12	17	13	18	15	21	18	25	21	29	24	33
Horizontal Pressure on Leeward Surfaces	10	13	10	14	13	17	14	19	15	23	18	27
Vertical Pressure - Screen Surfaces	3	5	4	5	4	6	5	7	6	8	7	9
Vertical Pressure - Solid Surfaces	10	14	11	15	13	18	15	21	17	24	20	28

For SI: 1 pound per square foot = 9.479 kN/m^2.

NOTES:

a. Pressures include importance factors determined in accordance with ASCE 7 Table 1-1 and FBC Table 1604.5.

b. Pressures apply to enclosures with a mean enclosure roof height of 30 feet (10 m). For other heights, multiply the pressures in this table by the factors in Table R4403.12.1.2

c. Apply horizontal pressures to the area of the enclosure projected on a vertical plane normal to the assumed wind direction, simultaneously inward on the windward side and outward on the leeward side.

d. Apply vertical pressures upward and downward to the area of the enclosure projected on a horizontal plane.

e. Apply horizontal pressures simultaneously with vertical pressures.

f. Table pressures are MWFRS Loads. The design of solid roof panels and their attachments shall be based on component and cladding loads for enclosed or partially enclosed structures as appropriate.

g. Table pressures apply to 20×20×0.013" mesh screen. For 18 ×14 × 0.013" mesh screen, pressures on screen surfaces may be multiplied by 0.88. For screen densities greater than 20×20×0.013", use pressures for enclosed buildings.

h. Table pressures may be interpolated using ASCE 7 methodology.

TABLE R4403.12.1.2
HEIGHT ADJUSTMENT FACTORS

MEAN ROOF HEIGHT	EXPOSURE	
	B	C
15	1	0.86
20	1	0.92
25	1	0.96
30	1	1.00
35	1.05	1.03
40	1.09	1.06
45	1.12	1.09
50	1.16	1.11
55	1.19	1.14
60	1.22	1.16

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Date Submitted	3/26/2010	**Section**	R4403.13	**Proponent**	Rebecca Quinn
Chapter	44	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

Florida-specific modifications related to retaining flood provisions of the I-Codes. These mod clarifies that structures and foundations seaward of the CCCL must also comply with R322 if also located in a flood hazard area.

Rationale

Flood Resistant Stnds Workgroup recommended, Structural TAC concurred, to retain flood provisions w/ FL-specific mods. FL Dept State (Historic Bldgs) on Workgroup; concurs w/mod. FBC adopted recommendation Oct 09. Workgroup final report online at http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

SECTION 4403.13

~~RESERVED~~ FLOOD RESISTANCE

R4403.13.1 Flood resistance. Where the building or structure is located in a flood hazard areas established in Table 301.2(1), the building or structure, including enclosures below elevated buildings, shall be designed and constructed in accordance with Section R322 and this section~~, and the more restrictive provisions shall govern.~~

SECTION 4403.13

~~RESERVED~~ FLOOD RESISTANCE

R4403.13.1 Flood resistance. Where the building or structure is located in a flood hazard areas established in Table 301.2(1), the building or structure, including enclosures below elevated buildings, shall be designed and constructed in accordance with Section R322 and this section, and the more restrictive provisions shall govern.

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Date Submitted	4/2/2010	**Section**	R4403.13	**Proponent**	Joseph Belcher
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

The proposal adds provisions for sunrooms in the HVHZ section of the code.

Rationale

The HVHZ provisions of the code lack guidance for sunrooms and enforcement varies widely. Sunrooms may be habitable or nonhabitable; conditioned or unconditioned. Some owners want to add conditioned living space; other owners desire a bright, airy, and unconditioned recreation room. Sunrooms are a viable and popular construction method and the determination of how the space is used should be within the purview of the homeowner. (Please see attached support document for further discussion.)

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The changes provide guidance for the design and construction of sunrooms which may initially require longer plan review and inspection times initially while personnel become proficient in the new provisions.

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

The impact, if any, to the cost of compliance to building and property owners will be a reduction in time to permit and cost to construct sunrooms

Impact to industry relative to the cost of compliance with code

The impact to the cost of compliance to the industry will be a reduction in time to permit and the cost to construct unconditioned sunrooms.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public because it provides regulation for a popular method of construction currently lacking in the HVHZ section of the code.

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

The proposal improves the code by providing design and construction guidance for sunrooms by adopting a nationally recognized standard specifically written for sunrooms.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities and will ameliorate what many in the industry believe are discriminatory practices.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by providing design and construction guidance for sunrooms by adopting a nationally recognized standard specifically written for sunrooms.

SECTION R4403.13

~~RESERVED~~ SUNROOMS

R4403.13.1 Sunrooms. ~~Deflection shall be L/80.~~ ~~Sunrooms shall comply with AAMA/NPEA/NSA 2100 and the structural requirements and testing provisions of Chapter 5.~~

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~~R4403.13.1.1 AAMA 2100, Section 5.2.1 Wind Loads and Section 7.2 Foundations are modified as follows: Modify Section 5.2.1 as follows:~~

~~5.2.1~~ R4403.13.1 Wind Loads: Basic wind speed in miles per hour (mph) shall be determined in accordance with Section R4403.9.2. Sunrooms including exposed structures, components, cladding, and roof covering shall be designed to resist the wind loads as established in Section R4403.9.

~~Modify Section 7.2 by striking the section and adding text as follows:~~

-

~~7.2 Foundations. Foundations shall be designed in accordance with Section 4403.14~~

R4403.13.1.2 Sunroom Categories. For the purpose of applying the criteria of the AAMA Standard for sunrooms based on the intended use, sunrooms shall be categorized in one of the following categories by the permit applicant, design professional, or the property owner where the sunroom is being constructed.

Category I: A roof or a covering of an outdoor space. The openings shall be permitted to be enclosed with insect screening or 0.5 mm (20 mil) maximum thickness plastic film. The space is defined as nonhabitable and unconditioned.

-

Category II: A roof or a covering of an outdoor space with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The space is defined as nonhabitable and uunconditioned.

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Category III: A roof or a covering of an outdoor space with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The sunroom complies with additional requirements for forced-entry resistance, air-leakage resistance and water-penetration resistance. The space is defined as nonhabitable and unconditioned.

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Category IV: A roof or a covering of an outdoor space with enclosed walls. The sunroom is designed to be heated and/or cooled by a separate temperature control or system and is thermally isolated from the primary structure. The sunroom complies with additional requirements for forced-entry resistance, water penetration resistance, air-leakage resistance, and thermal performance. The space is defined as habitable and conditioned.

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Category V: A roof or a covering of an outdoor space with enclosed walls. The sunroom is designed to be heated and/or cooled and is open to the main structure. The sunroom complies with additional requirements for forced-entry resistance, water-penetration resistance, air-leakage resistance, and thermal performance. The space is defines as habitable and conditioned.

Fiscal Impact Statement [Provide documentation of the costs and benefits of the proposed modifications to the code for each of the following entities. Cost data should be accompanied by a list of assumptions and supporting documentation. Explain expected benefits.]:

1. Impact to local entity relative to enforcement of code: The changes provide guidance for the design and construction of sunrooms which may initially require longer plan review and inspection times initially while personnel become proficient in the new provisions.

2. Impact to building and property owners relative to cost of compliance with code: The impact, if any, to the cost of compliance to building and property owners will be a reduction in time to permit and cost to construct sunrooms.

3. Impact to industry relative to cost of compliance with code: The impact to the cost of compliance to the industry will be a reduction in time to permit and the cost to construct unconditioned sunrooms.

Rationale [Provide an explanation of why you would like this Proposed Modification to the Florida Building Code.]: The HVHZ provisions of the code lack guidance for sunrooms and enforcement varies widely. Sunrooms may be habitable or nonhabitable; conditioned or unconditioned. Some owners want to add conditioned living space; other owners desire a bright, airy, and unconditioned recreation room. Sunrooms are a viable and popular construction method and the determination of how the space is used should be within the purview of the homeowner. (Please see attached support document for further discussion.)

Chapter 2 of the code defines sunrooms and habitable spaces. Since there is no specific exemption from the definitions for sunroom or habitable space contained in Chapter 2, the definitions are applicable in the HVHZ. Further, the HVHZ definitions section directs the code user to Chapter 2 for definitions outside the HVHZ definitions section. (FBCR, §R4402.2.1) The intent of this proposal is to provide guidance for regulating the construction of sunrooms in the HVHZ

The ambiguity of the current situation has lead to serious confusion. The confusion is caused by a lack of guidance in how to regulate sunroom structures. This lack of guidance has resulted in frustration for homeowners and code enforcers alike. Homeowners simply wanting to add some relatively inexpensive sheltered but unconditioned recreational space to their home are suddenly faced with a requirement to meet the energy code. Permit applications for nonhabitable unconditioned sunrooms have been rejected with the contractor directed to change the plans to reclassify the sunroom as an addition and submit energy calculations. The lack of guidance results in frustration of code officials as well as they do not have clear direction and tend to want to err on the side of caution. The intent of this proposal is to provide the guidance needed to properly regulate sunroom construction and allow the industry to operate.

The proposal does several things:

1. Adopts the nationally recognized standard addressing sunrooms, AAMA 2100, Voluntary Specifications for Sunrooms.

2. Modifies the wind loads portion of the standard to make it agree with the Florida Building Code.

3. Requires the designation of the category of the sunroom at the outset. This provision is intended to give the jurisdiction authority for taking action if the homeowner makes changes, such as adding air conditioning, to the sunroom, after the C of O is issued.

4. Contains a verbatim list of the five sunroom categories from AAMA 2100.

Please explain how the proposed modification meets the following requirements:

1. Has a reasonable and substantial connection with the health, safety, and welfare of the general public: The proposal has a reasonable and substantial connection with the welfare of the general public because it provides regulation for a popular method of construction currently lacking in the HVHZ section of the code.

2. Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction: The proposal improves the code by providing design and construction guidance for sunrooms by adopting a nationally recognized standard specifically written for sunrooms.

3. Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities: The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities and will ameliorate what many in the industry believe are discriminatory practices.

4. Does not degrade the effectiveness of the code: The proposal increases the effectiveness of the code by providing design and construction guidance for sunrooms by adopting a nationally recognized standard specifically written for sunrooms.

SECTION R4403.13

~~RESERVED~~ SUNROOMS

R4403.13.1 Sunrooms. Sunrooms shall comply with AAMA/NPEA/NSA 2100 and the structural requirements and testing provisions of Chapter 5.

R4403.13.1.1 AAMA 2100, Section 5.2.1 Wind Loads: Modify Section 5.2.1 as follows:

5.2.1 Wind Loads: Basic wind speed in miles per hour (mph) shall be determined in accordance with Section R4403.9.2. Sunrooms including exposed structures, components, cladding, and roof covering shall be designed to resist the wind loads as established in Section R4403.9.

R4403.13.1.2 Sunroom Categories. For the purpose of applying the criteria of the AAMA Standard for sunrooms based on the intended use, sunrooms shall be categorized in one of the following categories by the permit applicant, design professional, or the property owner where the sunroom is being constructed.

Category I: A roof or a covering of an outdoor space. The openings shall be permitted to be enclosed with insect screening or 0.5 mm (20 mil) maximum thickness plastic film. The space is defined as nonhabitable and unconditioned.

Category II: A roof or a covering of an outdoor space with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The space is defined as nonhabitable and uunconditioned.

Category III: A roof or a covering of an outdoor space with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The sunroom complies with additional requirements for forced-entry resistance, air-leakage resistance and water-penetration resistance. The space is defined as nonhabitable and unconditioned.

Category IV: A roof or a covering of an outdoor space with enclosed walls. The sunroom is designed to be heated and/or cooled by a separate temperature control or system and is thermally isolated from the primary structure. The sunroom complies with additional requirements for forced-entry resistance, water penetration resistance, air-leakage resistance, and thermal performance. The space is defined as habitable and conditioned.

Category V: A roof or a covering of an outdoor space with enclosed walls. The sunroom is designed to be heated and/or cooled and is open to the main structure. The sunroom complies with additional requirements for forced-entry resistance, water-penetration resistance, air-leakage resistance, and thermal performance. The space is defined as habitable and conditioned.

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Chapter 2 of the code defines sunrooms and habitable spaces. Since there is no specific exemption from the definitions for sunroom or habitable space contained in Chapter 2, the definitions are applicable in the HVHZ. Further, the HVHZ definitions section directs the code user to Chapter 2 for definitions outside the HVHZ definitions section. (FBCR, §R4402.2.1) The intent of this proposal is to provide guidance for regulating the construction of sunrooms in the HVHZ

The ambiguity of the current situation has lead to serious confusion. The confusion is caused by a lack of guidance in how to regulate sunroom structures. This lack of guidance has resulted in frustration for homeowners and code enforcers alike. Homeowners simply wanting to add some relatively inexpensive sheltered but unconditioned recreational space to their home are suddenly faced with a requirement to meet the energy code. Permit applications for nonhabitable unconditioned sunrooms have been rejected with the contractor directed to change the plans to reclassify the sunroom as an addition and submit energy calculations. The lack of guidance results in frustration of code officials as well as they do not have clear direction and tend to want to err on the side of caution. The intent of this proposal is to provide the guidance needed to properly regulate sunroom construction and allow the industry to operate.

The proposal does several things:

1. Adopts the nationally recognized standard addressing sunrooms, AAMA 2100, Voluntary Specifications for Sunrooms.

2. Modifies the wind loads portion of the standard to make it agree with the Florida Building Code.

3. Requires the designation of the category of the sunroom at the outset. This provision is intended to give the jurisdiction authority for taking action if the homeowner makes changes, such as adding air conditioning, to the sunroom, after the C of O is issued.

4. Contains a verbatim list of the five sunroom categories from AAMA 2100.

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Date Submitted	3/31/2010	**Section**	R4407	**Proponent**	Joseph Belcher
Chapter	44	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

Summary of Modification

The modification brings the section on reinforced unit masonry up to date with the national masonry standards.

Rationale

The proposal updates the HVHZ provisions relative to reinforced unit masonry by allowing design in accordance with the latest nationally recognized standards from TMS, ACI, and ASCE. The proposal retains the HVHZ requirements for special inspection and addresses specific concerns contained in the section with references to the appropriate section of TMS 402/ ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6. See uploaded document for further discussion.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal has no fiscal impact relative to local enforcement beyond perhaps an increase in the time spent on plan review or inspection initially until personnel become familiar with the changes.

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

The proposal should result in a less costly and strengthened design for building and property owners because it adopts state of the art standards for the design and construction of reinforced unit masonry structures.

Impact to industry relative to the cost of compliance with code

The proposal should result in a less costly and strengthened design for the building industry because it adopts state of the art standards for the design and construction of reinforced unit masonry structures.

Requirements

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

The proposal is connected to public health, safety, and welfare because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

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

The proposal strengthens and improves the code because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code because it updates the HVHZ requirements for reinforced unit masonry to the latest national standards.

SECTION 4407.5

HIGH-VELOCITY HURRICANE ZONES-REINFORCED UNIT MASONRY

R4407.5.1 Standards. The provisions of TMS 402/ACI 530/ASCE 5 ~~, Building Code Requirements F for Masonry Structures~~, and TMS 602/ACI 530.1/ASCE6 ~~and the commentary on Building Code Requirements for Masonry Structures,~~ are hereby adopted as a minimum for the design and construction of reinforced unit masonry. ~~; however, the requirement of the standard shall not supersede the specific requirements of this chapter.~~ In addition to TMS 402/ ACI 530/ ASCE 5 and TMS 602/ACI 530.1/ASCE6 reinforced unit masonry structures shall comply with Sections ~~2122.2.~~4407.2

Exception: Unless otherwise specified by the designing architect or engineer, where plan review and inspections are performed by a local building department in accordance with Sections 106 and 109, the provisions of TMS 402/ ACI 530/ASCE 5/TMS 402, Chapter 1, Section 1.18 and TMS 602/ ACI 530.1/ASCE 6/ Sections 1.5 and 1.6 shall not apply.

R4407.5.2 General.

~~**R4407.5.2 .1Tie columns and tie beams as set forth in Section 2121.2 shall be not required where design and construction are in accordance with the provisions of this section.**~~

~~**R4407.5.2 .2Reinforced unit masonry shall be steel reinforced solid-unit masonry or steel reinforced grouted hollow-unit masonry as set forth herein.**~~

R4407.~~3~~ 5.3 The design of buildings and structures of reinforced unit masonry shall be by a professional engineer or registered architect.

R4407.~~4~~ 5.4 Special inspector. A Florida-registered architect or professional engineer shall furnish inspection of all reinforced unit masonry structures.

R4407. ~~5~~ 5.5 Concrete masonry strength. Concrete masonry strength shall be determined by unit strength method from TMS 602/ACI 530.1/ ASCE 6 Section 1.4 or in accordance with ASTM C 1314.

~~**R4407.5.5.1 In each test of three prisms, the average of the three may be used as the assumed value of f 'm .**~~

~~**R4407.5.5.2 In no case shall the value of f 'm exceed the lowest break multiplied by 1.25 in any test.**~~

R4407.5.6. ~~6 Reinforced masonry columns and walls.~~ Reinforcement. Reinforcement shall comply with TMS 402/ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6 except as modified herein.

R4407.5.6.1 Development of bars in tension and compression shall be in accordance with TMS 402/ASCE 530/ ASCE5 Section 2.1.9.3 with the following changes to the factor y of Equation 2-12

y = 1.0 for No. 3 (M#10) through No. 5 (M#16) bars;

y = 1.04 for No. 6 (M#19) through No. 7 (M#22) bars; and

y = 1.2 for No. 8 (M#25) through No. 11 (M#36) bars

Where epoxy coated bars are used, lap length shall be increased by 50 percent.

R4407.5.6.2 Splices of reinforcement shall be in accordance with TMS 402/ ACI 530/ ASCE 5. Lap splices, welded splices, or mechanical splices are permitted in accordance with the provisions of TMS 402/ ACI 530/ ASCE 5 Section 2.1.9.7. Welding shall conform to AWS D1.4.

R4407.5.6.3 Lap splices shall be in accordance with TMS 402/ ACI 530/ ASCE 5, Section 2.1.9.7.1.1 with the modifications of Section 2122.4.1 to the factor y of Equation 2-12. In no case shall the length of the lapped splice be less than 48 bar diameters, but not less than 12 inches.

R4407.5.6.4 Joint reinforcement. Horizontal joint reinforcement shall be provided at every other course. Joint reinforcement shall be a minimum of No. 9 gauge and shall comply with TMS 602/ACI 530.1/ ASCE 6 Sections 2.4C through 2.4F. Joint reinforcement shall be placed in accordance with TMS 602/ACI 530.1/ ASCE 6 Section 3.4 B.7.

~~**R4407.6.1 The minimum length of lap for deformed bars in grout, in tension or compression, shall be 48 bar diameters, but not less than 12 inches (305 mm).**~~

R4407.~~6.2~~ 5.7 Concentrated loads shall be in accordance with TMS 402/ ACI 530/ ASCE 5 Sections 1.9.7.2 and 2.1.8 and shall not be assumed distributed across continuous vertical joints, including stack bond joints, unless reinforcing elements are designed and provided to distribute such loads.

R4407.5.8 ~~.3~~ Reinforced masonry bearing walls shall have a nominal thickness of ~~at least 1/30 of the unsupported height or width, whichever is the shorter, but~~ not less than 8 inches (203 mm).

R4407.5.9 ~~6.4~~ Anchorage requirements. Anchorage shall be in accordance with TMS 402/ ACI 530/ ASCE 5. Loading shall comply with TMS 402/ ACI 530/ ASCE 5 Section 1.7 and the following.

R4407.5. 9.1 ~~6.4.1~~ Reinforced masonry walls shall be securely anchored to adjacent structural members such as roofs, floors, columns, pilasters, buttresses and intersection walls.

R4407. 5.9.2 ~~6.4.2~~ Masonry walls shall be anchored to all floors and roofs that provide lateral support to such walls.

R4407.5. 9.3 ~~6.4.3~~ Such anchorage shall provide a positive direct connection capable of resisting the horizontal forces as required in Chapter 16 (High-Velocity Hurricane Zones), or a minimum force of 200 pounds per lineal foot (2919 N/m) of wall, whichever is greater.

R4407.5.9.4 ~~.6.4.4~~ Required anchors shall be embedded in reinforced grouted cells.Anchor bolts shall be installed in accordance with TMS 602/ ACI 530.1/ ASCE 6 Section 3.4 D

R4407.5.9.5 ~~6.4.5~~ Wood framing connected by nails shall not be considered as acceptable anchorage.

R4407.5.10 ~~6.5~~ Mortar and grout.

R4407.5.10.1 ~~6.5.1~~ Mortar materials shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 2.1. Grout materials shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 2.2.

R4407.5.10.2 Vertical cells to be grouted shall provided vertical alignment sufficient to maintain clear, unobstructed, continuous, vertical cores measuring not less than 2 ½ inches by 3 inches (51 mm by 76 mm) for fine aggregate grout and 3 inches by 3 inches for coarse aggregate grout as defined by ASTM C 476. The architect or engineer may specify other grout space sizes shall be permitted provided they comply with TMS 402/ ACI 530/ ASCE 5 Section 1.19 and TMS 602/ ACI 530.1/ ASCE 6 Section 3.5C.

R4407.5.10.3 Placing of mortar and masonry units shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 3.3.

R4407.5.10.4 Grout placement. Grout placement shall be in accordance with TMS 402/ ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6.

R4407.5.10.5 ~~6.5.2 Vertical grout barriers or dams of solid masonry spaced not more than 25 feet (7.6 mm) apart shall be provided across the grout space in the entire height of the wall to control the flow of grout horizontally.~~ Confinement. Confine grout to the areas indicated on the Project Drawings. Use material to confine grout that permits bond between masonry units and mortar.

R4407.5.10.6 ~~6.5.3 Grout shall be a plastic mix having a maximum slump of 9 inches +/-1 inch (229 +/-25 mm)~~ Unless otherwise required, mix grout other than self-consolidating grout to a consistency that has a slump between 8 and 11 in. (203 and 279 mm). Self-consolidating grout shall comply with TMS 602/ ACI 530.1/ ASCE 6

R4407.5.10.7 ~~6.5.4~~ Grout shall be placed before any initial set has occurred, but in no case more than 1-1/2 hours after the mix-designed water has been added.

R4407.5.10.8 ~~6.5.5~~ Grouting shall be a continuous operation in lifts not exceeding ~~4~~ 5 feet (1.5 m) and a maximum pour of 12 feet 8 inches (3.8 m). Grout placement shall comply with TMS 602/ ACI 530.1/ ASCE 6.

R4407.5.10.9 ~~6.5.6~~ Grouting shall be consolidated between lifts by puddling, rodding or mechanical vibration.

R4407.5.10.10 ~~6.5.7 The grouting of any section of wall between control barriers shall be completed in one operation with no interruptions exceeding 1 hour.~~ Grout keys shall be formed between grout pours. Grout keys shall be formed between grout lifts when the first lift is permitted to set prior to placement of the subsequent lift.

1. Form a grout key by terminating the grout a minimum of 1½ in. (38.1 mm) below a mortar joint.

2. Do not form grout keys within beams.

3. At beams or lintels laid with closed bottom units, terminate the grout pour at the bottom of the beam or lintel without forming a grout key.

R4407.5.11 ~~6.6~~ Bearing. Precast floor and roof units supported on masonry walls shall provide minimum bearing of 3 inches (76 mm) and anchorage in accordance with Section 2122.7 ~~6.4~~.

R4407.5.12 ~~**6.7 Protection of masonry. Unfinished work shall be stopped back for joining with new work; toothing being permitted only with the approval of the special inspector.**~~ **Intersecting walls shall comply with TMS 402/ ACI 530/ ASCE 5 Section 1.9.4.**

SECTION 4407.5

HIGH-VELOCITY HURRICANE ZONES-REINFORCED UNIT MASONRY

R4407.5.1 Standards. The provisions of TMS 402/ACI 530/ASCE 5 ~~, *Building Code Requirements F for Masonry Structures,*~~ and TMS 602/ACI 530.1/ASCE6 ~~and the commentary on *Building Code Requirements for Masonry Structures*~~, are hereby adopted as a minimum for the design and construction of reinforced unit masonry. ~~; however, the requirement of the standard shall not supersede the specific requirements of this chapter.~~ In addition to TMS 402/ ACI 530/ ASCE 5 and TMS 602/ACI 530.1/ASCE6 reinforced unit masonry structures shall comply with Sections 2122.2.

Exception: Unless otherwise specified by the designing architect or engineer, where plan review and inspections are performed by a local building department in accordance with Sections 106 and 109, the provisions of TMS 402/ ACI 530/ASCE 5/TMS 402, Chapter 1, Section 1.18 and TMS 602/ ACI 530.1/ASCE 6/ Sections 1.5 and 1.6 shall not apply.

R4407.5.2 General.

~~**R4407.5.2 .1Tie columns and tie beams as set forth in Section 2121.2 shall be not required where design and construction are in accordance with the provisions of this section.**~~

~~**R4407.5.2 .2Reinforced unit masonry shall be steel reinforced solid-unit masonry or steel reinforced grouted hollow-unit masonry as set forth herein.**~~

R4407.~~3~~ 5.3 The design of buildings and structures of reinforced unit masonry shall be by a professional engineer or registered architect.

R4407.~~4~~ 5.4 Special inspector. A Florida-registered architect or professional engineer shall furnish inspection of all reinforced unit masonry structures.

R4407. ~~5~~ 5.5 Concrete masonry strength. Concrete masonry strength shall be determined by unit strength method from TMS 602/ACI 530.1/ ASCE 6 Section 1.4 or in accordance with ASTM C 1314.

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~~R4407.5.5.1 In each test of three prisms, the average of the three may be used as the assumed value of f 'm .~~

~~R4407.5.5.2 In no case shall the value of f 'm exceed the lowest break multiplied by 1.25 in any test.~~

R4407.5.6. ~~6 Reinforced masonry columns and walls.~~ Reinforcement. Reinforcement shall comply with TMS 402/ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6 except as modified herein.

R4407.5.6.1 Development of bars in tension and compression shall be in accordance with TMS 402/ASCE 530/ ASCE5 Section 2.1.9.3 with the following changes to the factor y of Equation 2-12

y = 1.0 for No. 3 (M#10) through No. 5 (M#16) bars;

y = 1.04 for No. 6 (M#19) through No. 7 (M#22) bars; and

y = 1.2 for No. 8 (M#25) through No. 11 (M#36) bars

Where epoxy coated bars are used, lap length shall be increased by 50 percent.

R4407.5.6.2 Splices of reinforcement shall be in accordance with TMS 402/ ACI 530/ ASCE 5. Lap splices, welded splices, or mechanical splices are permitted in accordance with the provisions of TMS 402/ ACI 530/ ASCE 5 Section 2.1.9.7. Welding shall conform to AWS D1.4.

R4407.5.6.3 Lap splices shall be in accordance with TMS 402/ ACI 530/ ASCE 5, Section 2.1.9.7.1.1 with the modifications of Section 2122.4.1 to the factor y of Equation 2-12. In no case shall the length of the lapped splice be less than 48 bar diameters, but not less than 12 inches.

R4407.5.6.4 Joint reinforcement. Horizontal joint reinforcement shall be provided at every other course. Joint reinforcement shall be a minimum of No. 9 gauge and shall comply with TMS 602/ACI 530.1/ ASCE 6 Sections 2.4C through 2.4F. Joint reinforcement shall be placed in accordance with TMS 602/ACI 530.1/ ASCE 6 Section 3.4 B.7.

~~R4407.6.1 The minimum length of lap for deformed bars in grout, in tension or compression, shall be 48 bar diameters, but not less than 12 inches (305 mm).~~

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R4407.~~6.2~~ 5.7 Concentrated loads shall be in accordance with TMS 402/ ACI 530/ ASCE 5 Sections 1.9.7.2 and 2.1.8 and shall not be assumed distributed across continuous vertical joints, including stack bond joints, unless reinforcing elements are designed and provided to distribute such loads.

R4407.5.8 ~~.3~~ Reinforced masonry bearing walls shall have a nominal thickness of ~~at least 1/30 of the unsupported height or width, whichever is the shorter, but~~ not less than 8 inches (203 mm).

R4407.5.9 ~~6.4~~ Anchorage requirements. Anchorage shall be in accordance with TMS 402/ ACI 530/ ASCE 5. Loading shall comply with TMS 402/ ACI 530/ ASCE 5 Section 1.7 and the following.

R4407.5. 9.1 ~~6.4.1~~ Reinforced masonry walls shall be securely anchored to adjacent structural members such as roofs, floors, columns, pilasters, buttresses and intersection walls.

R4407. 5.9.2 ~~6.4.2~~ Masonry walls shall be anchored to all floors and roofs that provide lateral support to such walls.

R4407.5. 9.3 ~~6.4.3~~ Such anchorage shall provide a positive direct connection capable of resisting the horizontal forces as required in Chapter 16 (High-Velocity Hurricane Zones), or a minimum force of 200 pounds per lineal foot (2919 N/m) of wall, whichever is greater.

R4407.5.9.4 ~~.6.4.4~~ Required anchors shall be embedded in reinforced grouted cells. Anchor bolts shall be installed in accordance with TMS 602/ ACI 530.1/ ASCE 6 Section 3.4 D

R4407.5.9.5 ~~6.4.5~~ Wood framing connected by nails shall not be considered as acceptable anchorage.

R4407.5.10 ~~6.5~~ Mortar and grout.

R4407.5.10.1 ~~6.5.1~~ Mortar materials shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 2.1. Grout materials shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 2.2.

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R4407.5.10.2 Vertical cells to be grouted shall provided vertical alignment sufficient to maintain clear, unobstructed, continuous, vertical cores measuring not less than 2 ½ inches by 3 inches (51 mm by 76 mm) for fine aggregate grout and 3 inches by 3 inches for coarse aggregate grout as defined by ASTM C 476. The architect or engineer may specify other grout space sizes shall be permitted provided they comply with TMS 402/ ACI 530/ ASCE 5 Section 1.19 and TMS 602/ ACI 530.1/ ASCE 6 Section 3.5C.

R4407.5.10.3 Placing of mortar and masonry units shall comply with TMS 602/ ACI 530.1/ ASCE 6 Section 3.3.

R4407.5.10.4 Grout placement. Grout placement shall be in accordance with TMS 402/ ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6.

R4407.5.10.5 ~~6.5.2 Vertical grout barriers or dams of solid masonry spaced not more than 25 feet (7.6 mm) apart shall be provided across the grout space in the entire height of the wall to control the flow of grout horizontally.~~ Confinement. Confine grout to the areas indicated on the Project Drawings. Use material to confine grout that permits bond between masonry units and mortar.

R4407.5.10.6 ~~6.5.3 Grout shall be a plastic mix having a maximum slump of 9 inches +/- 1 inch (229 +/- 25 mm)~~ Unless otherwise required, mix grout other than self-consolidating grout to a consistency that has a slump between 8 and 11 in. (203 and 279 mm). Self-consolidating grout shall comply with TMS 602/ ACI 530.1/ ASCE 6

R4407.5.10.7 ~~6.5.4~~ Grout shall be placed before any initial set has occurred, but in no case more than 1-1/2 hours after the mix-designed water has been added.

R4407.5.10.8 ~~6.5.5~~ Grouting shall be a continuous operation in lifts not exceeding ~~4~~ 5 feet (1.5 m) and a maximum pour of 12 feet 8 inches (3.8 m). Grout placement shall comply with TMS 602/ ACI 530.1/ ASCE 6.

R4407.5.10.9 ~~6.5.6~~ Grouting shall be consolidated between lifts by puddling, rodding or mechanical vibration.

R4407.5.10.10 ~~6.5.7 The grouting of any section of wall between control barriers shall be completed in one operation with no interruptions exceeding 1 hour.~~ Grout keys shall be formed

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between grout pours. Grout keys shall be formed between grout lifts when the first lift is permitted to set prior to placement of the subsequent lift.

1. Form a grout key by terminating the grout a minimum of 1½ in. (38.1 mm) below a mortar joint.

2. Do not form grout keys within beams.

3. At beams or lintels laid with closed bottom units, terminate the grout pour at the bottom of the beam or lintel without forming a grout key.

R4407.5.11 ~~6.6~~ Bearing. Precast floor and roof units supported on masonry walls shall provide minimum bearing of 3 inches (76 mm) and anchorage in accordance with Section 2122.7 ~~6.4~~.

R4407.5.12 ~~6.7 Protection of masonry. Unfinished work shall be stopped back for joining with new work; toothing being permitted only with the approval of the special inspector.~~ Intersecting walls shall comply with TMS 402/ ACI 530/ ASCE 5 Section 1.9.4.

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The proposal represents a much needed modernization of the reinforced unit masonry design requirements in the HVHZ. The changes will permit an architect or engineer to use the national standards in designing and construction such structures. The proposal:

1. Updates the standards by adopting the Specification for Masonry Structures, TMS 602/ ACI 530.1/ ASCE 6. The Specification contains the information needed to build the project and is designed to work with and compliment TMS 402/ ACI 530.1/ ASCE 5, Building Code Requirements for Masonry Structures.

2. Eliminates the name of the standard and the adoption of Commentary material. Commentary materials are intended to be explanatory material to assist in making decisions and educate the user of the document. They are not intended for adoption. The following note is from TMS 602/ ACI 530.1/ ASCE 6, Page 1:

"This Commentary is intended for guidance in designing, planning, executing, or inspecting construction and in preparing specifications. References to this document should not be made in the Project Specifications or Project Drawings. If items in this document are desired to be a part of the Project Specifications or Project Drawings, they should be phrased in mandatory language and incorporated into the Project Specifications or Project Drawings."

3. The proposal modifies TMS 402/ ACI 530/ASCE 5, Chapter 1, Section 1.18 and TMS 602/ ACI 530.1/ASCE 6/ Sections 1.5 and 1.6 to recognize the role of building department plan review and inspection. The proposal provides the designer the option to specify the provisions.

4. The General section has been rewritten to update the provisions and refer to the appropriate sections of the adopted reference standards which address the issues covered in the existing language.

5. The proposal deletes Section R4407.5.2.1 as the Section referred to will not be applicable to a reinforced unit masonry structure designed and built in accordance with TMS 402/ ACI 530/ASCE 5 and TMS 602/ ACI 530.1/ASCE 6

6. The proposal deletes Section R4407.5..2.2 as the requirements are contained in TMS 402/ ACI 530/ASCE 5 and TMS 602/ ACI 530.1/ASCE 6.

7. The proposal retains the requirements for the professional design of reinforced unit masonry structures.

8. The proposal retains the requirements for special inspection by a Florida-registered architect or professional engineer.

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9. The proposal modifies the concrete masonry strength provisions by adopting the unit strength method from TMS 402/ ACI 530/ASCE 5 and the ASTM Standard for prism testing.

10. The proposal adopts the reinforcement provisions of TMS 402/ACI 530/ ASCE 5 and TMS 602/ ACI 530.1/ ASCE 6 and modifies the factors for γ used in the equation for determining the lap for reinforcement bars. The modifications to the equation are needed because the factors contained in TMS 402/ ACI 530/ ASCE 5 at R4407.5.1 are based on seismic design loads. This Florida Specific Amendment was in the FBCB 2004 Edition. The inclusion of these provisions from TMS 402/ ACI 530/ ASCE 5 creates an unintended consequence of mandating compliance with seismic provisions in a state that is not seismically active. The unmodified provisions of TMS 402/ ACI 530/ ASCE 5 in some cases unnecessarily increase the cost of construction for Florida with no demonstrated benefit. The intent of engineers from seismically active portions of the country promoting the TMS 402 provisions is to provide an elastic joint at reinforcement laps allowing flexure to resist seismic loads. Such joints are not necessary for resisting wind loads where weight and stiffness are beneficial. In fact, the current TMS 402 provisions have been shown to result in considerable over-design even for resisting seismic loads. The proposal permits the designer to use the lap splice provisions of TMS 402/ ACI 530/ ASCE 5 or the lap splice provisions of TMS 402/ ACI 530/ ASCE 5 as modified by the Florida Building Code (FBC). There is considerable controversy on these issues within the MSJC and IBC processes. The involved organizations are working on the matter. Testing has been and is being conducted by NCMA. The modified γ factors were provided by NCMA. For the State of Florida the provisions have the greatest impact where larger reinforcement bars are required. For example, a lap length of 8 feet is required where using No. 6 reinforcement bars or greater. This is well beyond any lap length required to resist wind loads even in the highest wind speed zones of the state. Approval of this proposal will result in the providing the designer the option of using the provisions of TMS 402/ ACI 530/ ASCE 5 as published or use the provisions as modified by the code for wind design instead of seismic design.

11. The proposal specifies the TMS 402/ ACI 530/ ASCE 5 increased lap requirements for epoxy coated bars.

12. The proposal lists the types of laps permitted, refers to the appropriate section of TMS 402/ ACI 530/ ASCE 5, and adopts a standard for welded splices.

13. The proposal retains the requirement for horizontal joint reinforcement and requires compliance with the appropriate sections of TMS 602/ACI 530.1/ ASCE 6.

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14. The proposal retains the language addressing concentrated loads and adds the appropriate sections of TMS 402/ACI 530/ ASCE 5 dealing with load distribution.

15. The proposal retains the language related to minimum wall thickness.

16. The proposal renumbers Section R4407.5.6.4 and subsequent sections and adds a reference for the installation of anchor bolts.

17. The proposal rewrites the section on mortar and grout.

18. The proposal deletes sections related to outdated methods of construction such as "toothing" which was removed from the national standards in the 2002 Edition of TMS 402/ ACI 530/ ASCE 5. The language has been replaced with a reference to the methods contained in the current edition of the standards.

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Date Submitted	3/22/2010	**Section**	R4410.2.1.11	**Proponent**	Jaime Gascon
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Modified
Commission Action Pending Review

Related Modifications

MOD3668

Summary of Modification

The modification clarifies that 'comparative' analysis is allowed, as opposed to the used term 'rational' analysis when the fixed glazing product differs from the one approved.

Rationale

The modification clarifies that 'comparative' analysis is allowed, as opposed to the used term 'rational' analysis when the fixed glazing product differs from the one approved. This correction clarifies that the proposed system must be 'compared' to the approved system and must follow the prescribed analysis when qualifying a particular job's condition(s).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None. Since the code already allows for an analysis, this modification clarifies the type of analysis and provides the missing guidance for same.

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

The clarification in this modification allows for a faster processing which should result in a cost savings. Further, by clarifying the procedure for the comparative analysis it eliminates the potential for confusion and delays.

Impact to industry relative to the cost of compliance with code

The clarification in this modification allows for a faster processing which should result in a cost savings. Further, by clarifying the procedure for the comparative analysis it eliminates the potential for confusion and delays.

Requirements

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

The modification better protects the public by clarifying the type of analysis allowed. It guards that the qualified condition is traceable to a tested system and not just 'rationalized' analytically.

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

The modification improves the code by clarifying the type of analysis allowed. It guards that the qualified condition is traceable to a tested system and not just 'rationalized' analytically.

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

The modification does not discriminate since all glazed products are allowed the same type of analysis. Reference sections R4410.2.3.2.5 and R4410.2.3.2.6.

Does not degrade the effectiveness of the code

The modification improves the code by clarifying the type of analysis allowed. It guards that the qualified condition is traceable to a tested system and not just 'rationalized' analytically.

SECTION R4410.2
HIGH-VELOCITY HURRICANE ZONES — WINDOWS, DOORS, GLASS AND GLAZING

R4410.2.1 General.
R4410.2.1.1 Windows, doors, glass and glazing shall be as set forth in this section.
R4410.2.1.2 Glass shall comply with ASTM C 1036 requirements for flat glass Type I and II and GSA DD-G-451c Standard for Glass, Flat and Corrugated, for Glazing Mirrors and Other Uses .
R4410.2.1.3 Tempered glass shall comply with 16 CFR 1201.
R4410.2.1.4 Transparent and obscure safety glazing shall conform to the Performance Specifications and Methods of Test for Transparent Safety Glazing Materials Used in Buildings , ANSI Z97.1.
R4410.2.1.5 Heat-strengthened and ceramic-coated spandrel glass shall comply with ASTM C 1048.
R4410.2.1.6 Wired glass shall comply with ANSI Z97.I and shall only be used in fire doors and in glazed panels where safety glazing is not required.
R4410.2.1.7 Installed glass shall not be less than single strength B quality unless otherwise approved by the building official, and where edges are exposed they shall be seamed or ground.
R4410.2.1.8 Where a light of glass is of such height above grade that the top 50 percent or more is in a zone of greater wind load, the area of the entire light shall be limited as for the greater height above grade.
R4410.2.1.9 Replacement of any glazing or part thereof shall be designed and constructed in accordance with Florida Existing Building Code .
R4410.2.1.10 Replacement of glazing of more than one light or more than 30 percent of the total area glazed shall conform to the requirements of the section.
R4410.2.1.11 Fixed glazing used as an exterior component shall require Product Approval. ~~Rational~~ Comparative analysis in compliance with R4410.2.3.2.6 by a Florida-~~**registered**~~**licensed** engineer or architect may be accepted when the actual pressure and geometry conditions differ from the conditions shown in the approval.

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R4410.2.1.11 Fixed glazing used as an exterior component shall require Product Approval. ~~Rational~~ Comparative analysis in compliance with R4410.2.3.2.6 by a Florida-registered engineer or architect may be accepted when the actual pressure and geometry conditions differ from the conditions shown in the approval.

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Sub Code: Building

Date Submitted	4/2/2010	**Section**	801.5	**Proponent**	Christopher Jones
Chapter	8	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

S3882

Summary of Modification

Clarify the elevation below which flood damage-resistant materials are required is the elevation specified in 1612.4.

Rationale

The purpose of this code change is to provide consistency between the elevations of buildings and structures that are specified in Section 1612.4 and the elevations required for materials, elements, and equipment in those buildings and structures. Approved by ICC in Baltimore for 2012 IBC (S92).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to Florida's communities that participate in the NFIP and administer floodplain management ordinances consistent with the NFIP regulations (44 CFR 60.3).

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

No impact. Owners must comply with local floodplain management ordinances adopted by Florida communities.

Impact to industry relative to the cost of compliance with code

No impact. Compliance with local floodplain management ordinances adopted by Florida communities is not affected.

Requirements

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

Achieves protection of health, safety, and welfare of the general public, the same bases for adoption and enforcement of local floodplain management ordinances.

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

Clarifies code requirements for materials, products, methods, and systems.

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

Materials, products, methods, and systems that comply with local floodplain management ordinances are not affected by this proposed modification.

Does not degrade the effectiveness of the code

Improves effectiveness of the code by clarifying the specific intent of the provision.

1st Comment Period History 04/15/2010 - 06/01/2010

S4398-G1

Proponent	Joy Duperault	**Submitted**	5/27/2010	**Attachments**	No

Comment:

The FL Division of Emergency Management, Floodplain Management Office, recommends support for this proposal. It is appropriate that equipment serving a building be at or above the elevation of the lowest floor, otherwise equipment may be damaged even if the building is not affected. This is the way most buildings are built. In addition, if equipment is lower than the lowest floor, federal flood insurance discounts for elevating the floor above the minimum required elevation don't apply.

801.5 Applicability. For buildings in flood hazard areas as established in Section 1612.3, interior finishes, trim and decorative materials that extend below the elevation required by Section 1612.4 ~~design flood elevation~~ shall be flood-damage-resistant materials.

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S4109

Date Submitted	3/30/2010	**Section**	1202.1	**Proponent**	Joseph Belcher
Chapter	12	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

The modifications clarify that roofs of sunrooms without sloped glazing are solid roofs and clarifies open areas are areas with operable windows or fixed glass or glass doors . The clarifications are needed to address confusion demonstrated during the permitting phase for sunroom projects.

Rationale

The term “structural “used with roof panel causes confusion. Some say composite or metal roof panels are not structural and claim it is not a sunroom. The substitution of the term solid clarifies intent and has no impact on the definition. Likewise, the term open results in confusion regarding if glass is permitted in sunrooms. The whole intent of sunrooms is a large glassed area. Language added clarifies the term “open area” refers to glazed openings of operable or fixed glass windows or doors.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The changes are to clarify the definition and pose no impact on the cost of compliance relative to the enforcement of the code.

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

The changes are to clarify the definition and pose no impact on the cost of compliance relative to the building and property owners.

Impact to industry relative to the cost of compliance with code

The changes are to clarify the definition and pose no impact on the cost of compliance relative to the industry and may result in savings due to faster turn-around on permit applications.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by clarifying terms for a popular method of providing additional recreational space to the homeowner.

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

The proposal improves the code by clarifying terms which experience has demonstrated cause confusion during the permitting phase for a popular method of construction providing additional conditioned or unconditioned recreational space to the homeowner.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by clarifying terms which experience has demonstrated cause confusion during the permitting phase for a popular method of construction providing additional conditioned or unconditioned recreational space to the homeowner.

SUNROOM 1. A room with roof panels that include sloped glazing that is a one-story structure added to an existing dwelling with an open or glazed area in excess of 40 percent of the gross area of the sunroom structure's exterior walls and roof. 2. A one-story structure added to a dwelling with ~~structural~~ solid roof panels without sloped glazing. The sunroom walls may have any configuration, provided the open areas with operable or fixed glass or windows or side hinged or sliding glass doors of the longer wall and one additional wall is equal to at least 65 percent of the area below 6 foot 8 inches of each wall, measured from the floor. For the purposes of this code the term sunroom as used herein shall include conservatories, sunspaces, solariums, and porch or patio covers or enclosures.

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Date Submitted	3/27/2010	**Section**	1203.3.2	**Proponent**	J Glenn-BASF
Chapter	12	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

1. Delete Florida Specific amendment to 1203.3.2 and retain IBC language. 2. Change code reference to Chapter 13 of the Florida Building Code, Building 3. Retain exception #5 and renumber to #6.

Rationale

Based code, IBC 1203.3.2 provides an effective method of ventilating crawl spaces. Retaining exception #5 and renumber to #6 will allow a Florida Design Professional to design an unvented crawl spaces.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the nationally practice.

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

Does not discriminate against materials

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1203.3.2 Exceptions.** The following are exceptions to Sections 1203.3 and 1203.3.1:~~

~~1. Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided.~~

~~2. The total area of ventilation openings is permitted to be reduced to 1/1,500 of the under-floor area where the ground surface is treated with an approved vapor retarder material and the required openings are placed so as to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.~~

~~3. Ventilation openings are not required where continuously operated mechanical ventilation is provided at a rate of 1.0 cubic foot per minute (cfm) for each 50 square feet (1.02 L/s for each 10 m2) of crawl space floor area and the ground surface is covered with an approved vapor retarder.~~

~~4. Ventilation openings are not required when the ground surface is covered with an approved vapor retarder, the perimeter walls are insulated and the space is conditioned in accordance with Chapter 13 of Florida Building Code, Building.~~

5. Crawl spaces, designed by a Florida-licensed engineer or registered architect to eliminate the venting.

1203.3.2 Exceptions. The following are exceptions to Sections 1203.3 and 1203.3.1:1. Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided.

2. The total area of ventilation openings is permitted to be reduced to 1/1,500 of the under-floor area where the ground surface is covered with a Class I vapor retarder material and the required openings are placed so as to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.

3. Ventilation openings are not required where continuously operated mechanical ventilation is provided at a rate of 1.0 cubic foot per minute (cfm) for each 50 square feet (1.02 L/s for each 10 m2) of crawl space floor area and the ground surface is covered with a Class I vapor retarder.

4. Ventilation openings are not required when the ground surface is covered with a Class I vapor retarder, the perimeter walls are insulated and the space is conditioned in accordance with the ~~International Energy Conservation Code~~**~~Chapter 13 of Florida Building Code, Building Florida~~ Florida Building Code, Energy Conservation.**

5. For buildings in flood hazard areas as established in Section 1612.3, the openings for under-floor ventilation shall be deemed as meeting the flood opening requirements of ASCE 24 provided that the ventilation openings are designed and installed in accordance with ASCE 24.

~~5~~ 6. Crawl spaces, designed by a Florida-licensed engineer or registered architect to eliminate the venting.

1st Comment Period History 04/15/2010 - 06/01/2010

S3986-G1

Proponent	Joy Duperault	Submitted	5/27/2010	Attachments	No

Comment:

It is important to note that item #6 of the exception pertains to venting for air ventilation purposes. For buildings located in flood hazard areas, allowing engineered crawlspaces per item #6 in the exception, does not obviate the requirement to comply with requirements for flood openings.

~~**1203.3.2 Exceptions.** The following are exceptions to Sections 1203.3 and 1203.3.1:~~

~~1. Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided.~~

~~2. The total area of ventilation openings is permitted to be reduced to 1/1,500 of the under-floor area where the ground surface is treated with an approved vapor retarder material and the required openings are placed so as to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.~~

~~3. Ventilation openings are not required where continuously operated mechanical ventilation is provided at a rate of 1.0 cubic foot per minute (cfm) for each 50 square feet (1.02 L/s for each 10 m2) of crawl space floor area and the ground surface is covered with an approved vapor retarder.~~

~~4. Ventilation openings are not required when the ground surface is covered with an approved vapor retarder, the perimeter walls are insulated and the space is conditioned in accordance with Chapter 13 of Florida Building Code, Building.~~

5. Crawl spaces, designed by a Florida-licensed engineer or registered architect to eliminate the venting.

1203.3.2 Exceptions. The following are exceptions to Sections 1203.3 and 1203.3.1:1. Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided.

2. The total area of ventilation openings is permitted to be reduced to 1/1,500 of the under-floor area where the ground surface is covered with a Class I vapor retarder material and the required openings are placed so as to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.

3. Ventilation openings are not required where continuously operated mechanical ventilation is provided at a rate of 1.0 cubic foot per minute (cfm) for each 50 square feet (1.02 L/s for each 10 m2) of crawl space floor area and the ground surface is covered with a Class I vapor retarder.

4. Ventilation openings are not required when the ground surface is covered with a Class I vapor retarder, the perimeter walls are insulated and the space is conditioned in accordance with the ~~International Energy Conservation Code~~Chapter 13 of Florida Building Code, Building.

5. For buildings in flood hazard areas as established in Section 1612.3, the openings for under-floor ventilation shall be deemed as meeting the flood opening requirements of ASCE 24 provided that the ventilation openings are designed and installed in accordance with ASCE 24.

~~5~~ 6. Crawl spaces, designed by a Florida-licensed engineer or registered architect to eliminate the venting.

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Date Submitted	3/27/2010	**Section**	1210.3	**Proponent**	J Glenn-BASF
Chapter	12	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Delete Florida Code language to 1210.2 and retain IBC language with the accessibility requirement in exception #2.

Rationale

Base code, IBC 1210.2 provides the same requirement for walls and partitions except the grammar was changed and adds reference to Section 2903.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None.

Requirements

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

No change

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

Brings the code in line with nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1210.2 Walls**. Walls within 2 feet (610 mm) of urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.~~

~~Exceptions:~~

~~1. Dwelling units and sleeping units.~~

~~2.Toilet rooms that are not accessible to the public and which have not more than one water closet.~~

~~Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.~~

1210.2 Walls and partitions. Walls and partitions within 2 feet (610 mm) of urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Exceptions:

1. Dwelling units and sleeping units.

2. Toilet rooms that are not accessible to the public and which have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture. For walls and partitions also see Section 2903.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3989_TextOfModification_1.png

Date Submitted	3/26/2010	**Section**	1403.2	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Delete Florida Code language to 1403.2 and retain IBC language.

Rationale

Base code, IBC deleted the word nonporous to Exception 1, changed the referenced code sections to Exception 2 and added a 3rd Exception regarding EFIS.

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the national base code.

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

Does not discriminate against anything

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1403.2 Weather protection.** Exterior walls shall provide the building with a weather-resistant *exterior wall envelope*. The *exterior wall envelope* shall include flashing, as described in~~

~~Section 1405.4. The *exterior wall envelope* shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a~~

~~*water-resistive barrier* behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. All exterior finishes shall be applied in accordance with the manufacturer's specifications or installation instructions. Protection against condensation in the *exterior wall* assembly shall be provided in accordance with Section 1405.3.~~

~~**Exceptions:**~~

~~1. A weather-resistant *exterior wall envelope* shall not be required over concrete or non-pourous masonry or masonry walls designed in accordance with Chapters 19 and 21, respectively.~~

~~2 – 3 No change.~~

1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing, as described in Section 1405.4. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistive barrier behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section 1405.3.

Exceptions:

1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.

2 - 3 No Change

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3909_TextOfModification_1.png

Date Submitted	4/2/2010	**Section**	1403.5	**Proponent**	Christopher Jones
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarify the elevation below which flood damage-resistant materials are required is the elevation specified in 1612.4.

Rationale

The purpose of this code change is to provide consistency between the elevations of buildings and structures that are specified in Section 1612.4 and the elevations required for materials, elements, and equipment in those buildings and structures. Approved by ICC in Baltimore for 2012 IBC (S92).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to Florida's communities that participate in the NFIP and administer floodplain management ordinances consistent with the NFIP regulations (44 CFR 60.3).

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

No impact. Owners must comply with local floodplain management ordinances adopted by Florida communities.

Impact to industry relative to the cost of compliance with code

No impact. Compliance with local floodplain management ordinances adopted by Florida communities is not affected.

Requirements

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

Achieves protection of health, safety, and welfare of the general public, the same bases for adoption and enforcement of local floodplain management ordinances.

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

Clarifies code requirements for materials, products, methods, and systems.

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

Materials, products, methods, and systems that comply with local floodplain management ordinances are not affected by this proposed modification.

Does not degrade the effectiveness of the code

Improves effectiveness of the code by clarifying the specific intent of the provision.

1st Comment Period History 04/15/2010 - 06/01/2010

S4399-G1

Proponent	Joy Duperault	**Submitted**	5/27/2010	**Attachments**	No

Comment:

The FL Division of Emergency Management, Floodplain Management Office, recommends support for this proposal. It is appropriate that equipment serving a building be at or above the elevation of the lowest floor, otherwise equipment may be damaged even if the building is not affected. This is the way most buildings are built. In addition, if equipment is lower than the lowest floor, federal flood insurance discounts for elevating the floor above the minimum required elevation don't apply.

1403.5 Flood resistance. For buildings in flood hazard areas as established in Section 1612.3, exterior walls extending below the elevation required by Section 1612.4 shall be constructed with flood damage resistant materials ~~design flood elevation shall be resistant to water damage~~. Wood shall be pressure-preservative treated in accordance with AWPA U1 for the species, product and end use using a preservative listed in Section 4 of APWA U1 or decay-resistant heartwood of redwood, black locust or cedar.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4399_TextOfModification_1.png

Date Submitted	3/28/2010	**Section**	1403.7	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain Florida Specific language

Rationale

Base code (IBC) does not contain these requirements.

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

None

Requirements

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

No change

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

Provides a better level of protection than the base code.

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

Does not discriminate aganist anything.

Does not degrade the effectiveness of the code

Does not degrade the cod

1403.7 In order to provide for inspection for termite infestation, clearance between exterior wall coverings and final earth grade on the exterior of a building shall not be less than 6 inches (152 mm).

Exceptions:

1. Paint or decorative cementitious finish less than 5/8 inch (17.1 mm) thick adhered directly to the masonry foundation sidewall.

2. Access or vehicle ramps which rise to the interior finish floor elevation for the width of such ramps only.

3. A 4-inch (102 mm) inspection space above patio and garage slabs and entry areas.

4. If the patio has been soil treated for termites, the finish elevation may match the building interior finish floor elevations on masonry construction only.

5. Masonry veneers.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3998_TextOfModification_1.png

S3914

Date Submitted	3/26/2010	**Section**	1404.10	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Change 1404.10 to correct terminology and reference the proper type of material.

Rationale

Retain IBC language to recognize the proper terminology and the type of material.

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the recognized base code while addressing Florida need.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1404.10 Fiber cement siding.** Fiber cement siding shall conform to the requirements of ASTM C 1186 and shall be so identified on labeling listing an approved quality control agency.~~

1404.10 Fiber-cement siding. Fiber-cement siding shall conform to the requirements of ASTM C 1186, Type A, and shall be so identified on labeling listing an approved quality control agency.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3914_TextOfModification_1.png

S3912

Date Submitted	3/26/2010	**Section**	1404.2	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Change 1404.2 to include language from IBC and add “Florida Specific language. Retain Florida Specific Language in Section 1404.2.1

Rationale

Add the language from IBC with a modification to address water-intrusion problem identified in earlier edition of FBC.

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

none

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the nationally recognized base code.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1404.2 Water-resistive barrier**. Exterior walls of frame construction receiving a veneer shall be provided with a water-resistive barrier. The water-resistive barrier shall be a minimum of one layer of No. 15 asphalt felt, complying with ASTM D 226 for Type 1 felt or other approved materials, shall be attached to the sheathing, with flashing as described in Section 1405.3, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer.~~

1404.2 Water-resistive barrier. Exterior walls of frame construction receiving a veneer shall be provided with a water-resistive barrier. The water-resistive barrier shall be a minimum of one layer of No. 15 asphalt felt, complying with ASTM D 226 for Type 1 felt or other approved materials, shall be attached to the sheathing, with flashing as described in Section 1405.4, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer.

1404.2.1 Where cement plaster (stucco) is to be applied to lath over frame construction, measures shall be taken to prevent bonding between the cement plaster and the water resistive barrier. A bond break shall be provided between the water resistive barrier and the cement plaster (stucco) consisting of one of the following:

1. Two layers of an approved water resistant barrier or

2. One layer of an approved water resistant barrier over an approved plastic house wrap, or

3. Other approved methods or materials applied in accordance with the manufacturer's installation instructions.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3912_TextOfModification_1.png

Date Submitted	3/26/2010	**Section**	1404.9	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Change 1404.9 title to include soffit and to include language from IBC and add “Florida Specific language.” Retain Florida Specific Language in Section 1404.9.1

Rationale

Retain FBC Florida Specific language to regulate soffit installation.

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the recognized base code while addressing Florida need.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

1404.9 Vinyl siding and Soffit. Vinyl Siding and soffit shall conform to the requirements of ASTM D 3679, ASTM D 4477 and the manufacturer's installation instructions.

1404.9.1 Labeling. Vinyl siding shall be labeled as conforming to the requirements of ASTM D 3679.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3913_TextOfModification_1.png

Date Submitted	3/24/2010	**Section**	1404	**Proponent**	Joseph Belcher
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Mod 3857, 1715.9 Mod #3855 Labeling requirements for manufactured soffits. Mod 3231, Mod 3858
1609.1 Reference to labeling requirements at section requiring soffits to be designed for C&C loads.

Summary of Modification

Adds reference to new section on labeling of soffits.

Rationale

The proposal will help assure compliance with the newly proposed labeling provisions of 1715.9 by providing a reference. The hurricanes of 2004 revealed a very weak link in the building water intrusion resistance system, soffits. In numerous cases severe water damage was caused by rain blown in through eaves where the soffit was blown out or dislodged. In most cases the storms were below design wind speeds.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal will help assure compliance with the newly proposed labeling by providing a reference to those requirements. Labeling will make the job of local enforcement easier to perform as they will have documentation to check the installation against.

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

There will be no impact as the proposal is merely a reference to another section of the code.

Impact to industry relative to the cost of compliance with code

There will be no impact as the proposal is merely a reference to another section of the code.

Requirements

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

The proposal will benefit the public by making certain provisions improving the ability of soffits to resist water intrusion are not overlooked in the building design.

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

The proposal strengthens the code by helping to make certain requirements improving the ability of soffits to resist water intrusion are not overlooked in the building design.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by addressing a known weak area in the weather resistance provisions of the code.

1st Comment Period History 04/15/2010 - 06/01/2010

S3856-G1

Proponent Dobson Matthew **Submitted** 6/1/2010 **Attachments** No

Comment:

Although as an industry we generally agree that soffits should be labeled as approved for specific use as approved under the prodcut approval program, the proponent makes statements from a work group that has yet to complete their work. Further there is clear recognition that current failures are due in large part to improper installation of soffit. This needs to be recognized more appropriately in the code, for example as proposed in the IRC code change 4200.

1404.9.2 Manufactured soffit materials and systems shall be labeled in accordance with the provisions of Section 1715.9 of this code.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3856_TextOfModification_1.png

S4002

Date Submitted	3/28/2010	**Section**	1405.10	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Change 1405.10 to retain base code (IBC) language.

Rationale

IBC changed the code section references and the order of the reference standards.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the recognized base code while addressing Florida need.

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

Does not discriminate againstanything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1405.9 Adhered masonry veneer.** Adhered masonry veneer shall comply with the applicable requirements in Section 1405.9.1 and Sections 6.1 and 6.3 of ACI 530/ASCE 5/TMS 402.~~

1405.10 Adhered masonry veneer. Adhered masonry veneer shall comply with the applicable requirements of Section 1405.10.1 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4002_TextOfModification_1.png

S4003

Date Submitted	3/28/2010	**Section**	1405.11.4	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Change 1405.11.4 to retain IBC language.

Summary of Modification

Change 1405.11.4 to retain base code (IBC) language.

Rationale

IBC added the words of this code and changed code section numbers.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the recognized base code while addressing Florida need.

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

Does not discriminate against anything

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1405.10.4 Grounding.** Grounding of metal veneers on buildings shall comply with the requirements of Chapter 27.~~

1405.11.4 Grounding. Grounding of metal veneers on buildings shall comply with the requirements of Chapter 27 of this code.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4003_TextOfModification_1.png

Date Submitted	3/28/2010	**Section**	1405.14.1	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Change 1405.14.1 to retain base code (IBC) language.

Rationale

IBC changed measuring units from decimal to fractional and changed the code section number.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No imopact on local enforecment

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the recognized base code while addressing Florida need.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1405.13.1 Application.** The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with the water-resistive barrier requirements in Section 1403. ....Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313-inch (7.9 mm) head diameter and 0.125-inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate the studs or nailing strip at least 0.75 inch (19 mm). Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically, the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.~~

1405.14.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with the water-resistive barrier requirements in Section 1403. ....Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313-inch (7.9 mm) head diameter and 1/8-inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate the studs or nailing strip at least 3/4 inch (19 mm). Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically, the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4004_TextOfModification_1.png

Date Submitted	3/28/2010	**Section**	1405.3.2	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Change 1405.3.2 to retain IBC language

Rationale

IBC added the words “in anchored veneer” and changed the reference section.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement of the code.

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the recognized base code while addressing Florida need.

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

Does no discriminate against anything

Does not degrade the effectiveness of the code

Does not degrade the code.

1405.4.2 Masonry. Flashing and weep holes in anchored veneer shall be located in the first course of masonry above finished ground level above the foundation wall or slab, and other points of support, including structural floors, shelf angles and lintels where anchored veneers are designed in accordance with Section ~~1405.5~~ 1405.6.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3999_TextOfModification_1.png

Date Submitted	3/28/2010	**Section**	1405.4	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Change 1405.4 to retain IBC language.

Rationale

IBC changed the words 40 ft from three stories, above grade from measured from the grade plane, and 60 ft in height above grade from four stories.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the recognized base code while addressing Florida need.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1405.4 Wood veneers**. Wood veneers on exterior walls of buildings of Type I, II, III and IV construction shall be not less than 1 inch (25 mm) nominal thickness, 0.438 inch (11.1 mm) exterior hardboard siding or 0.375 inch (9.5 mm) exterior type wood structural panels or particleboard and shall conform to the following:~~

~~1. The veneer shall not exceed three stories in height, measured from the grade plane. Where fire retardant treated wood is used, the height shall not exceed four stories.~~

~~2. The veneer is attached to or furred from a noncombustible backing that is fire resistance rated as required by other provisions of this code.~~

~~3. Where open or spaced wood veneers (without concealed spaces) are used, they shall not project more than 24 inches (610 mm) from the building wall.~~

1405.5 Wood veneers. Wood veneers on exterior walls of buildings of Type I, II, III and IV construction shall be not less than 1 inch (25 mm) nominal thickness, 0.438-inch (11.1 mm) exterior hardboard siding or 0.375-inch (9.5 mm) exterior-type wood structural panels or particleboard and shall conform to the following:

1. The veneer shall not exceed 40 feet (1219 mm) in height above grade. Where fire-retardant-treated wood is used, the height shall not exceed 60 feet (1829 mm) in height above grade.

2. The veneer is attached to or furred from a noncombustible backing that is fire-resistance rated as required by other provisions of this code.

3. Where open or spaced wood veneers (without concealed spaces) are used, they shall not project more than 24 inches (610 mm) from the building wall.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4000_TextOfModification_1.png

S4001

Date Submitted	3/28/2010	**Section**	1405.8	**Proponent**	J Glenn-BASF
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Change 1405.8 to retain IBC language.

Rationale

IBC changed measuring units from decimal to fractional and changed the code section number.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on locla enforcement

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

none

Requirements

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

There is no impact on health, safety or welfare.

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

Brings the code in line with the recognized base code while addressing Florida need.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**1405.8 Terra cotta.** Anchored terra cotta or ceramic units not less than 1.625 inches (41 mm) thick shall be anchored directly to masonry, concrete or stud construction. Tied terra cotta or ceramic veneer units shall be not less than 1.625 inches (41 mm) thick with projecting dovetail webs on the back surface spaced approximately 8 inches (203 mm) o.c. ....these anchors shall be secured to 0.25 inch (6.4 mm) corrosion resistant pencil rods that pass through the vertical aligned loop anchors in the backing wall. The veneer ties shall have sufficient strength to support the full weight of the veneer in tension. The facing shall be set with not less than a 2 inch (51 mm) space from the backing wall and the space shall be filled solidly with portland cement grout and pea gravel. Immediately prior to setting, the backing wall and the facing shall be drenched with clean water and shall be distinctly damp when the grout is poured.~~

1405.9 Terra cotta. Anchored terra cotta or ceramic units not less than 15/8 inches (41 mm) thick shall be anchored directly to masonry, concrete or stud construction. Tied terra cotta or ceramic veneer units shall be not less than 15/8 inches (41 mm) thick with projecting dovetail webs on the back surface spaced approximately 8 inches (203 mm) o.c....these anchors shall be secured to 1/4-inch (6.4 mm) corrosion-resistant pencil rods that pass through the vertical aligned loop anchors in the backing wall. The veneer ties shall have sufficient strength to support the full weight of the veneer in tension. The facing shall be set with not less than a 2-inch (51 mm) space from the backing wall and the space shall be filled solidly with portland cement grout and pea gravel. Immediately prior to setting, the backing wall and the facing shall be drenched with clean water and shall be distinctly damp when the grout is poured.

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Date Submitted	4/1/2010	**Section**	1609.1.2	**Proponent**	Joseph Belcher
Chapter	16	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

FBCEB s. 606.4
Mod # 3677

Summary of Modification

The proposal adds and Exception from impact protection for screen or removable vinyl and acrylic wind panels on exterior balconies and porches.

Rationale

The proposed Exception is intended to clarify that enclosing an exterior balcony or porch with screen or removable vinyl or acrylic wind break panels does invoke the opening protection requirements related to sunrooms. The proposal clearly states adding screen or removable vinyl or acrylic panels does not trigger opening protection requirements. The panels are required to be removable and to be removed when there is a threat of high winds. (Please see uploaded document for further discussion.)

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The change will have no impact on the cost of compliance relative to the enforcement of the code.

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

The change will reduce costs by clearly stating that screen and vinyl and acrylic wind break panels do not trigger impact resistance requirements on exterior balconies and porches.

Impact to industry relative to the cost of compliance with code

The change will reduce costs by clearly stating that screen and vinyl and acrylic wind break panels do not trigger impact resistance requirements on exterior balconies and porches.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by making available an affordable means to increase the recreational use of balconies and porches.

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

The proposal strengthens and improves the code by clearly stating provisions for enclosing exterior balconies and porches with screen or removable vinyl or acrylic wind break panels.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities and will remove what some in the industry consider to be discriminatory practices against a material and method of construction.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by clearly stating provisions for enclosing exterior balconies and porches with screen or removable vinyl or acrylic wind break panels.

1609.1.2 Protection of openings. Glazed openings in buildings located in wind-borne debris regions shall be protected from wind-borne debris. Glazed opening protection for wind-borne debris shall meet the requirements SSTD 12, ASTM E 1886 and ASTM E 1996, ANSI/DASMA 115 (for garage doors and rolling doors) or TAS 201, 202 and 203 or AAMA 506 referenced therein.

1. Glazed openings located within 30 feet (9.1 m) of grade shall meet the requirements of the Large Missile Test.

2. Glazed openings located more than 30 feet (9.1 m) above grade shall meet the provisions of the Small Missile Test.

3. Storage sheds that are not designed for human habitation and that have a floor area of 720 square feet (67 m2) or less are not required to comply with the mandatory windborne debris impact standards of this code.

4. Openings in sunrooms, balconies or enclosed porches constructed under existing roofs or decks are not required to be protected provided the spaces are separated from the building interior by a wall and all openings in the separating wall are protected in accordance with Section 1609.1.2 ~~4~~ above. Such spaces shall be permitted to be designed as either partially enclosed or enclosed structures

Exceptions:

1. Wood structural panels with a minimum thickness of 7/16 inch (11.1 mm) and a maximum span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings. Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed openings. Panels shall be predrilled as required for the anchorage method and all required hardware shall be provided. Attachment shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7, with permanent corrosion-resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2, with permanent corrosion resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 45 feet (13 716 mm) or less where wind speeds do not exceed 140 mph (63 m/s)

2. Glazing in Occupancy Category I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.

3. Glazing in Occupancy Category II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

4. Exterior balconies or porches under existing roofs or decks enclosed with screen or removable vinyl and acrylic panels complying with Section 2002.3.3 shall not be required to be protected and

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openings in the wall separating the unit from the balcony or porch shall not be required to be protected unless required by other provisions of this code.

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The industry has experienced some unintended consequences with the adoption of the sunroom categories of the AAMA 2100 Standard. Some officials treat the AAMA categories as definitions and classify exterior balconies or porches when enclosed with screen or removable vinyl or acrylic panels as sunrooms. The argument goes that the concrete floor of the deck above is the roof of the balcony being “enclosed” below and therefore does not meet the definition of screen enclosure. Classified thusly as sunrooms, the screen or removable vinyl or acrylic panels are required to be impact resistant or protected by impact resistant coverings. As an alternate any glazing in the wall separating the unit from the balcony or porch is required to be impact resistant or protected. This is a wholly unintended consequence of the inclusion of the AAMA 2100 Categories within the code.

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Date Submitted	3/24/2010	**Section**	1609.1	**Proponent**	Joseph Belcher
Chapter	16	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

1715.9 Mod #3855 Adds labeling requirments
1404 Mod #3856 Adds reference to new section 1715.9 Soffit labeling.

Summary of Modification

Adds reference to new section on Soffit labeling.

Rationale

The proposal will help assure compliance with the newly proposed labeling provisions by providing a reference to those requirements. The hurricanes of 2004 revealed a very weak link in the building water intrusion resistance system, soffits. In numerous cases severe water damage was caused by rain blown in through eaves where the soffit was blown out or dislodged. In most cases the storms were below design wind speeds.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal will help assure compliance with the newly proposed labeling by providing a reference to those requirements. Labeling will make the job of local enforcement easier to perform as they will have criteria to check the installation against.

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

Impact to building and property owners relative to cost of compliance with code: There will be no impact as the proposal is merely a reference to another section of the code.

Impact to industry relative to the cost of compliance with code

There will be no impact as the proposal is merely a reference to another section of the code.

Requirements

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

The proposal will benefit the public by helping to make certain provisions improving the ability of soffits to resist water intrusion are not overlooked in the building design.

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

The proposal strengthens the code by helping to make certain requirements improving the ability of soffits to resist water intrusion are not overlooked in the building design.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by addressing a known weak area in the weather resistance provisions of the code.

1609.1 Applications. Buildings, structures and parts thereof shall be designed to withstand the minimum wind loads prescribed herein. Decreases in wind loads shall not be made for the effect of shielding by other structures.

All exterior wall coverings and soffits shall be capable of resisting the design pressures specified for walls for components and cladding loads in accordance with Section 1609.1.1. Manufactured soffits shall be labeled in accordance with Section 1715.9 of this code.

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Date Submitted	3/21/2010	**Section**	1609.4.3	**Proponent**	Mo Madani
Chapter	16	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarify the intent of Section 1609.4.3 with regard to the 20% increase in uplift load regarding roof-to-wall connection.

Rationale

implement DCA08-DEC-184

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Improve enforcement.

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

Requirements

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

Clarify code provisions as per DEC-DEC-194

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

Improve code effectiveness.

1609.4.3 Exposure categories. An exposure category shall be determined in accordance with the following:

Exposure B. (No change)

Exposure C. Exposure C shall apply for all cases where Exposure B does not apply. Buildings located within a distance of 600 feet of inland bodies of water that present a fetch of 1 mile (1.61 km) or more or inland waterways or rivers with a width of 1 mile (1.61 km) or more shall be classified as Exposure C and roof sheathing uplift and roof-to-wall connection uplift loads shall be increased by 20 percent.

Exposure D. (No change)

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1609.4.3 Exposure categories. An exposure category shall be determined in accordance with the following:

Exposure B. (No change)

Exposure C. Exposure C shall apply for all cases where Exposure B does not apply. Buildings located within a distance of 600 feet of inland bodies of water that present a fetch of 1 mile (1.61 km) or more or inland waterways or rivers with a width of 1 mile (1.61 km) or more shall be classified as Exposure C and roof sheathing uplift and roof-to-wall connection uplift loads shall be increased by 20 percent.

Exposure D. (No change)

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STATE OF FLORIDA
BUILDING COMMISSION

In the Matter of

St. Johns County Building Department, Case #: DCA08-DEC-194

Petitioner.

_____/

DECLARATORY STATEMENT

The foregoing proceeding came before the Florida Building Commission (the Commission) by a Petition from Dan Arlington of the St. Johns County, Florida, Building Department which was received on July 9, 2008, and subsequently amended on July 21 and July 25, 2008. Based on the statements in the petition, the amendments thereto, and the information subsequently submitted, it is hereby ORDERED:

Findings of Fact

1. The petition is filed pursuant to, and must conform to the requirements of Rule 28-105.002, Florida Administrative Code.

2. The Petitioner enforces the Florida Building Code within St. Johns County, Florida.

3. The Petitioner has been called upon to review plans submitted subject to the 2007 Florida Building Code, for a building located within a distance of 600 feet of inland body of water that presents a fetch of more than 1 mile.

4. The Petitioner inquires whether section 1609.4.3 (Exposure C) requires a 20% increase to loads along the entire continuous load path from the trusses to the foundation, or whether the increased load is specific to roof sheathing and roof-to-wall connection?

Conclusions of Law

1. The Florida Building Commission has the specific statutory authority to interpret the provisions of the Florida Building Code and Rule 9B-72, Florida Administrative Code, by entering a declaratory statement.

2. Section 1609.4.3, Florida Building Code, Building Volume (2007) requires the following:

> Buildings located within a distance of 600 feet of inland bodies of water that present a fetch of 1 mile (1.61 km) or more or inland waterways or rivers with a width of 1 mile (1.61 km) or more shall be classified as Exposure C and roof sheathing uplift and roof-to-wall uplift loads shall be increased by 20 percent.

3. Despite the requirements within sections 1604.2 and 1604.9, Florida Building Code, Building Volume (2007), that might be applied to require the 20% increase applied to the entire load path, the explicit language quoted above, consistent with the stated intent during the proceedings leading to its adoption, restrict the increased loads to components and cladding roof sheathing uplift and roof-to-wall uplift loads.

4. Based on the foregoing, the answer to the Petitioner's question is no; section 1609.4.3 does not require an increase the entire continuous uplift path by 20%.

Petitioner and all other interested parties are hereby advised of their right to seek judicial review of this Order in accordance with Section 120.68(2)(a), Florida Statutes, and with Fla. R. App. 9.030(b)(1)(C) and 9.110(a). To initiate an appeal, a Notice of Appeal must be filed with Paula P. Ford, Clerk of the Commission, Sadowski Building, 2555 Shumard Oak Boulevard, Tallahassee, FL 32399-2100, and with the appropriate District Court of Appeal no later than thirty days after this Order is filed with the Clerk of the Commission. A Notice of Appeal filed with the District Court of Appeal shall be accompanied by the filing fee specified by section 35.22(3), Florida Statutes.

DONE AND ORDERED this _____ of _____, 2009, in Coral Gables, Miami-Dade County, State of Florida.

_____
Raul L. Rodriguez, AIA, Chair
Florida Building Commission
Department of Community Affairs
Sadowski Building
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was sent to the following by the method indicated on this _____ day of _____, 2009.

_____
PAULA P. FORD
Commission Clerk

Via U.S. Mail

Dan Arlington

Via Hand Delivery

Mo Madani, C.B.O. Manager

St. Johns County Building Department
Post Office Drawer 349
St. Augustine, Florida 32805

Codes and Standards Section
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

S3891

Date Submitted	3/25/2010	**Section**	1612	**Proponent**	Rebecca Quinn
Chapter	16	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Florida-specific modifications to Chapter 16, related to retaining flood provisions of the I-Codes. The Flood Resistant Standards Workgroup recommended a table to show where all flood provisions are located.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IBC flood provisions IBC and make Florida-specific amendments. IBC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for 1612 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

1612.1.1 Cross references. See Table 1612.1.

Table 1612.1

CROSS REFERENCES DEFINING FLOOD RESISTANT PROVISIONS OF THE FLORIDA BUILDING CODE

Florida Building Code – Building			
Section		Section	
Chapter 1	Administration	Chapter 14	Exterior Walls
102	Applicability	1403	Performance Requirements
107	Construction Documents		
110	Inspections	Chapter 16	Structural Design
111	Certificates of Occupancy and Completion	1601	General
		1603	Construction Documents
Chapter 2	Definitions	1605	Load Combinations
202	Definitions	1612	Flood Loads
Chapter 4	Special Detailed Requirements Based on Use and Occupancy	Chapter 18	Soils and Foundations
419	Hospitals	1801	General
420	Nursing Homes	1803	Excavation, Grading and Fill
424	Swimming Pools and Bathing Places (Public And Private)	1807	Dampproofing and Waterproofing
Chapter 8	Interior Finishes	Chapter 30	Elevators and Conveying Systems
801	General	3001	General
Chapter 12	Interior Environment		
1203	Ventilation		
Florida Building Code – Residential			
Section		Section	
Chapter 2	Definitions	Chapter 22	Special Piping and Storage Systems
202	Definitions	M2201	Oil Tanks
Chapter 3	Building Planning	Chapter 24	Fuel Gas
R301	Design Criteria	G2404 (301)	General
R309	Garages and Carports		
R322	Flood Resistant Construction	Chapter 26	General Plumbing Requirements
		P2601	General
Chapter 4	Foundations		
R401	General	Chapter 27	Plumbing Fixtures
R408	Under-Floor Space	P2705	Installation

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Chapter 13	General Mechanical System Requirements	Chapter 30	Sanitary Drainage
M1301	General	P3001	General
Chapter 14	Heating and Cooling Equipment	Chapter 31	Vents
M1401	General	P3101	Vent Systems
Chapter 16	Duct Systems	Chapter 41	Swimming Pools
M1601	Duct Construction	R4101	Private Swimming Pools
Chapter 17	Combustion Air	Chapter 44	High-Velocity Hurricane Zones
M1701	General	R4403	High-Velocity Hurricane Zones – General
Chapter 20	Boilers and Water Heaters		
M2001	Boilers		
Florida Building Code – Existing			
Section		Section	
Chapter 1	Administration	Chapter 10	Additions
101	General	1003	Structural
Chapter 3	Prescriptive Compliance Method	Chapter 11	Historic Buildings
302	Additions, Alterations or Repairs	1101	General
Chapter 5	Repairs	Chapter 12	Relocated or Moved Buildings
501	General	1202	Requirements
506	Structural		
		Chapter 13	Performance Compliance Methods
Chapter 6	Alterations – Level I	1301	General
601	General		
Florida Building Code – Mechanical			
Section		Section	
Chapter 3	General Regulations	Chapter 6	Duct Systems
M301	General	M602	Plenums
		M603	Duct Construction and Installation
Chapter 4	Ventilation		
M401	General	Chapter 12	Hydronic Piping
		M1206	Piping Installation
Chapter 5	Exhaust Systems		
M501	General	Chapter 13	Fuel Piping and Storage
		M1305	Fuel Oil System Installation

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Florida Building Code – Plumbing			
Section			
Chapter 3	General Regulations		
P309	Flood Hazard Resistance		
Florida Building Code – Fuel Gas			
Section			
Chapter 3	General Regulations		
FG301	General		

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Date Submitted	3/24/2010	**Section**	1618.4.6.3	**Proponent**	Jaime Gascon
Chapter	16	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

MOD3730

Summary of Modification

Correlates the HVHZ requirements on use of laminated glazing for glass railings used in the wind borne debris region with those of the 2009 IBC.

Rationale

This modification correlates the HVHZ requirements on use of laminated glazing for glass railings used in the wind borne debris region with those of the 2009 IBC section 2407.1.4.1 – Balusters and in-fill panels. Note the acceptance outlined in 2007 FBC 1618.4.6.3 is that for laminated glazing.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None. Enforcement of the section currently in place would still be required, and the established criteria correspond to the now specified laminated glazing type.

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

A cost increase for the glass of approximately 15% can be expected.

Impact to industry relative to the cost of compliance with code

A cost increase for the glass of approximately 15% can be expected. Further,the modification may help reduce manufacturer liabilities.

Requirements

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

The modification provides better protection from falling through the glazed area. It also assists in containing any shattered pieces of glass on the structure.

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

The modification strengthens the code by providing a safer condition for glazed railings used in the wind borne debris regions In this case strengthens the HVHZ requirements to that being introduced by the 2009 IBC.

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

The modification could discriminate against tempered glass, but if tempered glass were used, it would still be difficult to prove performance at the level currently specified in the code by conforming to ANSI Z97.1 requirements.

Does not degrade the effectiveness of the code

The modification improves the code by describing glazing types that will be able to perform to the performance levels presently called out in the code per ANS Z97.1.

1618.4.6 Railing.

1618.4.6.1 Railings, stair-railings and other similar safeguards shall be designed to resist a load of 50 pounds per lineal foot (74 kg/m) or a concentrated load of 200 pounds (690 N) applied in any direction at the top of such barriers at any location on the safeguard, whichever condition produces the maximum stresses. The reactions and stresses caused by the above referenced uniform and concentrated loads shall be considered not be acting simultaneously.

1618.4.6.2 Intermediate rails, balusters and panel fillers shall be designed for a uniform horizontal load of not less than 25 psf (1197 Pa) over the gross area of the guard, including the area of any openings in the guard, of which they are a part without restriction by deflection. Reactions resulting from this loading need not be added to the loading specified in Section 1618.4.6.1 in designing the main supporting members of guards.

1618.4.6.3 ~~Safety~~Laminated glazing will be permitted as an equal alternate to pickets, if tested by an accredited laboratory to satisfy the resistance requirements of this code for wind, live and kinetic energy impact loading conditions. The kinetic energy impact loading shall comply with ANSI Z97.1 using a 400 foot-pound (542 N) energy impact. The safety requirements of the impact test shall be judged to have been satisfactorily met if breakage does not occur or numerous cracks and fissures occur but no shear or opening through which a 3-inch (76 mm) diameter sphere may freely pass. The glass panel shall remain within the supporting frame.

1618.4.6.4 If the posts that support the top rail of exterior railings are substituted with glass, the assembly shall be tested to TAS 201, where the impacted glass continues to support the top rail and all applicable loads after impact.

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Date Submitted	3/24/2010	**Section**	1618.9	**Proponent**	Mohammed Shaikh
Chapter	16	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted

Commission Action Pending Review

Related Modifications

3843

Summary of Modification

Clarification of required design Flood Loads of ASCE 7

Rationale

Load combinations are specified in chapter 2 and Flood Loads are in chapter 5 of Standard ASCE 7. This modification clarifies which Flood loads to be used for the design of buildings and structures.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

none, just a clarification

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

none, just a clarification

Impact to industry relative to the cost of compliance with code

none, just a clarification

Requirements

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

It improves the code thus welfare.

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

improves code

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 degrade ,improves code.

1618.9 Load combination. The safety of structures shall be checked using the provisions of 2.3 and 2.4 of ASCE 7 with commentary. Flood Load Fa mentioned in these load combinations shall be in accordance with Chapter 5 of ASCE 7.

Exception: Increases in allowable stress shall be permitted in accordance with ACI 530/ASCE 5/TMS 402 provided the load reduction factor of 0.75 of combinations 4 and 6 of ASCE 7 Section 2.4.1 shall not be applied.

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S4296

Date Submitted	4/1/2010	**Section**	1622.1	**Proponent**	Joseph Belcher
Chapter	16	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

R4403.12, mod R4305

Summary of Modification

Modification proposes use of AAF Guide to Aluminum Construction in High Wind Areas by designers in the HVHZ.

Rationale

The proposed change is to permit the use of a recognized engineered document for the design and construction of screen enclosures in the HVHZ. As a prescriptive document, it is conservative when compared to engineered designs even when considering the differences in the deflection limits. (L/60 vs. L/80) A number of jurisdictions in the HVHZ have realized they are getting stronger structures when the design is based on the AAF Guide and are accepting signed and sealed designs based on the Guide.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The change will have no impact on the cost of compliance relative to the enforcement of the code. Reportedly a number of jurisdictions are currently permitting sealed engineered designs using the AAF Guide.

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

The change will have no impact on the cost to building and property owners relative to compliance with the code. Reportedly a number of jurisdictions are currently permitting sealed engineered designs based the AAF Guide.

Impact to industry relative to the cost of compliance with code

The change will have no impact on the cost to industry relative to compliance with the code. Reportedly a number of jurisdictions are currently permitting sealed engineered designs based the AAF Guide.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by permitting designers to use a recognized engineered prescriptive document for the design of screen enclosures resulting in a stronger structure.

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

The proposal has a reasonable and substantial connection with the welfare of the general public by permitting designers to use a recognized engineered prescriptive document for the design of screen enclosures resulting in a stronger structure.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by clarifying the application of adopted reference standards and clearly stating the wind loads are as required by the Florida Building Code.

SECTION 1622

HIGH-VELOCITY HURRICANE ZONES—

SCREEN ENCLOSURES

1622.1 Screen enclosures.

1622.1.1 The wind loads on screen surfaces shall be per ASCE 7 based on the ratio of solid to gross area.

1622.1.2 Design shall be based on such loads applied horizontally inward and outward to the walls with a shape factor of 1.3 and applied vertically upward and downward on the roof with a shape factor of 0.7.

Exception: Screen enclosures shall be permitted to be designed in accordance with the AAF Guide to Aluminum Construction in High Wind Areas. Construction documents based on the AAF Guide to Aluminum Construction in High Wind Areas shall be prepared and signed and sealed by an Florida registered architect or engineer.

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Date Submitted	4/2/2010	**Section**	1626.1	**Proponent**	Joseph Belcher
Chapter	16	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Adds provisions allowing the enclosure of balconies or porches with screen or removable vinyl or acrylic panels with invoking opening protection requirments.

Rationale

The proposed Exception is intended to clarify that enclosing an exterior balcony or porch with screen or removable panels of vinyl or acrylic wind break panels does not invoke the opening protection requirements. The panels are required to be removable and to be removed when there is a threat of high winds. (Please see uploaded document for further discussion.)

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The change will have no impact on the cost of compliance relative to the enforcement of the code

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

The change will reduce costs by clearly stating that screen and removable vinyl and acrylic wind break panels do not trigger impact resistance requirements on exterior balconies and porches.

Impact to industry relative to the cost of compliance with code

The change will reduce costs by clearly stating that screen and removable vinyl and acrylic wind break panels do not trigger impact resistance requirements on exterior balconies and porches.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by making available an affordable means to increase the recreational use of balconies and porches.

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

The proposal strengthens and improves the code by clarifying provisions for enclosing exterior balconies and porches with screen or removable vinyl or acrylic wind break panels.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities and may remove a possible source of discrimination.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by clarifying provisions for enclosing exterior balconies and porches with screen or removable vinyl or acrylic wind break panels.

1626.1 All parts or systems of a building or structure envelope such as, but not limited, to exterior walls, roof, outside doors, skylights, glazing and glass block shall meet impact test criteria or be protected with an external protection device that meets the impact test criteria. Test procedures to determine resistance to wind-borne debris of wall cladding, outside doors, skylights, glazing, glass block, shutters and any other external protection devices shall be performed in accordance with this section.

Exception: The following structures or portion of structures shall not be required to meet the provisions of this section:

a. Roof assemblies for screen rooms, porches, canopies, etc. attached to a building that do not breach the exterior wall or building envelope and have no enclosed sides other than screen.

b. Soffits, soffit vents and ridge vents. Size and location of such vents shall be detailed by the designer and shall not compromise the integrity of the diaphragm boundary.

c. Vents in a garage with four or fewer cars. Size and location of such vents shall be detailed by the designer and shall not exceed the minimum required area by more than 25 percent.

d. Exterior wall or roof openings for wall- or roof-mounted HVAC equipment.

e. Openings for roof-mounted personnel access roof hatches.

f. Storage sheds that are not designed for human habitation and that have a floor area of 720 square feet (67 m2) or less are not required to comply with the mandatory windborne debris impact standards of this code.

g. Louvers as long as they properly considered ASCE 7 in the design of the building.

h. Buildings and structures for marinas, cabanas, swimming pools, and greenhouses.

i. Exterior balconies or porches under existing roofs or decks enclosed with screen or removable vinyl and acrylic panels complying with Section 1622.1or Section 1622.2 shall not be required to be protected and openings in the wall separating the unit from the balcony or porch shall not be required to be protected unless required by other provisions of this code.

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The industry has experienced some unintended consequences with the adoption of the sunroom categories of the AAMA 2100 Standard. Some officials treat the AAMA categories as definitions and classify exterior balconies or porches when enclosed with screen or removable vinyl or acrylic panels as sunrooms. The argument goes that the concrete floor of the deck above is the roof of the balcony being “enclosed” below and therefore does not meet the definition of screen enclosure. Classified thusly as sunrooms, the screen or removable vinyl or acrylic panels are required to be impact resistant or protected by impact resistant coverings. As an alternate any glazing in the wall separating the unit from the balcony or porch is required to be impact resistant or protected. This is a wholly unintended consequence of the inclusion of the AAMA 2100 Categories within the code. The code change is intended to provided language giving clear guidance regarding impact resistance and screen or removable panels of vinyl or acrylic materials.

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Date Submitted	3/17/2010	**Section**	1715.5.3	**Proponent**	Jaime Gascon
Chapter	17	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Moves section 1715.5.3.3.1 on glazed curtain wall, window wall and storfront systems to a new section 1715.5.6; moves remaining 'exception' in 1715.5.3.3.1 to 1715.5.3 Exterior Door Assemblies.

Rationale

This modification is a direct result of recommendations from the 'Window Wall Workgroup' report to the Florida Building Commission of August 11, 2009, where this modification achieved consensus. This modification also makes the section read clearer as to the requirements for doors.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None. Simply moves the existing requirements around to make the code read clearer.

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

The modification may economize cost by eliminating confusion when trying to comply.

Requirements

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

None.

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

The modification improves the code by reorganizing sections, and making the code read clearer.

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

The modification does not discriminate.

Does not degrade the effectiveness of the code

The modification improves the effectiveness of the code.

Section 1715.5.3 Exterior door assemblies, add text to read as follows:

1715.5.3 Exterior door assemblies. Exterior door assemblies not covered by Section 1715.5.2or Section 1715.5.3.1 shall be tested for structural integrity in accordance with ASTM E 330 Procedure A, at a load of 1.5 times the required design pressure load. The load shall be sustained for 10 seconds with no permanent deformation of any main frame or panel member in excess of 0.4 percent of its span after the load is removed. High-velocity hurricane zones shall comply with TAS 202. After each specified loading, there shall be no glass breakage, permanent damage to fasteners, hardware parts, or any other damage which causes the door to be inoperable.

The minimum test sizes and minimum design pressures shall be as indicated in Table 1715.5.3.

The unit size tested shall qualify all units smaller in width and/or height of the same operation type and be limited to cases where frame, panels and structural members maintain the same profile as tested.

Exceptions:

1. Door assemblies installed in nonhabitable areas where the door assembly and area are designed to accept water infiltration, need not be tested for water infiltration.

2. Door assemblies installed where the overhang (OH) ratio is equal to or more than 1 need not be tested for water infiltration. The overhang ratio shall be calculated by the following equation:

OH ratio = OH Length/OH Height

where:

OH Length = The horizontal measure of how far an overhang over a door projects out from door's surface.

OH Height = The vertical measure of the distance from the door's sill to the bottom of the overhang over a door.

Table 1715.5.3 Minimum Test Sizes, Including Framing. Add to read as shown.

TABLE 1715.5.3

MINIMUM TEST SIZES, INCLUDING FRAMING

Performance Class1	Width × Height (mm)	Width × Height (in.)	Minimum

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			Performance Grade (Design Pressure)
Residential (R)	900 × 2000	(36 × 79)	720 Pa (15 psf)
Light Commercial (LC)	900 × 2100	(36 × 83)	1200 Pa (25 psf)
Commercial (C)	1000 × 2100	(40 × 83)	1440 Pa (30 psf)
Heavy Commercial (HC)	1200 × 2400	(48 × 95)	1920 Pa (40 psf)
Architectural (AW)	1200 × 2400	(48 × 95)	1920 Pa (40 psf)

1. Performance Class and Performance Grade per ANSI/AAMA/NWWDA 101/I.S.2.

1715.5.3.1 Add to read as shown.

1715.5.3.1 Sectional garage doors and rolling doors shall be tested for determination of structural performance under uniform static air pressure difference in accordance with ANSI/DASMA 108, ASTM E 330 Procedure A, or TAS 202. For products tested in accordance with ASTM E 330, testing shall include a load of 1.5 times the required design pressure load sustained for 10 seconds, and acceptance criteria shall be in accordance with ANSI/DASMA 108. (HVHZ shall comply with TAS 202.)

1715.5.3.2 Custom doors. **Add to read as shown.**

1715.5.3.2 Custom doors. Custom (one of a kind) exterior door assemblies shall be tested by an approved testing laboratory or be engineered in accordance with accepted engineering practices.

1715.5.3.3 Add to read as shown.

1715.5.3.3 Door components evaluated by an approved product evaluation entity, certification agency, testing laboratory or engineer may be interchangeable in exterior door assemblies provided that the door component(s) provide equal or greater structural performance as demonstrated by accepted engineering practices.

~~**1715.5.3.3.1 Add to read as shown.**~~

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~~**1715.5.3.3.1** Glazed curtain wall, window wall and storefront systems shall be tested in accordance with the requirements of this section and the Laboratory Test requirements of the American Architectural Manufacturers Association (AAMA) Standard 501, HVHZ shall comply with 2411.3.2.1.1.~~

~~**Exceptions:**~~

~~1. Door assemblies installed in nonhabitable areas where the door assembly and area are designed to accept water infiltration, need not be tested for water infiltration.~~

~~2. Door assemblies installed where the overhang (OH) ratio is equal to or more than 1 need not be tested for water infiltration. The overhang ratio shall be calculated by the following equation:~~

~~OH ratio = OH Length/OH Height~~

~~where:~~

~~OH Length = The horizontal measure of how far an overhang over a door projects out from door's surface.~~

~~OH Height = The vertical measure of the distance from the door's sill to the bottom of the overhang over a door.~~

1715.5.3.3.2~~1~~ Optional exterior door component testing. Add to read as shown.

1715.5.3.3.2~~1~~ Optional exterior door component testing. With the exception of HVHZ, exterior side-hinged door assemblies not covered by 1715.5.2 shall have the option to have the components of the assembly tested and rated for structural integrity in accordance with the following specification:

SDI A250.13

Following the structural testing of exterior door components, there shall be no permanent deformation of any perimeter frame or panel member in excess of 0.4 percent of its span after the load is removed. After each specified loading, there shall be no glass breakage, permanent damage to fasteners, hardware parts, or any other damage that causes the door to be inoperable, as applicable.

Section 1715.5.3.4 Garage Door Labeling. Add to read as shown.

1715.5.3.4 Garage Door Labeling. Garage doors shall be labeled with a permanent label provided by the manufacturer. The label shall identify the manufacturer, the garage door model/series number, the positive and negative design pressure rating, indicate impact rated if applicable, the installation instruction drawing reference number, the Florida Product Approval or Miami-Dade Product Approval number if applicable, and the applicable test standards.

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The required garage door components for an approved garage door assembly may be indicated using a checklist format on the label. If a checklist format is used on the label, the installer or manufacturer shall mark the selected components on the checklist that are required to assemble an approved garage door system.

The installation instructions shall be provided and available on the job site. [Mod 2375]

1715.5.4 Anchorage methods. Add to read as shown.

1715.5.4 Anchorage methods. The methods cited in this section apply only to anchorage of window and door assemblies to the main wind force resisting system.

1715.5.4.1 Anchoring requirements. Add to read as shown.

1715.5.4.1 Anchoring requirements. Window and door assemblies shall be anchored in accordance with the published manufacturer's recommendations to achieve the design pressure specified. Substitute anchoring systems used for substrates not specified by the fenestration manufacturer shall provide equal or greater anchoring performance as demonstrated by accepted engineering practice.

1715.5.4.2 Masonry, concrete or other structural substrate. Add to read as shown.

1715.5.4.2 Masonry, concrete or other structural substrate. Where the wood shim or buck thickness is less than 11/2 inches (38 mm), window and door assemblies shall be anchored through the main frame or by jamb clip or subframe system, in accordance with the manufacturer's published installation instructions. Anchors shall be securely fastened directly into the masonry, concrete or other structural substrate material. Unless otherwise tested, bucks shall extend beyond the interior face of the window or door frame such that full support of the frame is provided. Shims shall be made from materials capable of sustaining applicable loads, located and applied in a thickness capable of sustaining applicable loads. Anchors shall be provided to transfer load from the window or door frame to the rough opening substrate.

Where the wood buck thickness is 11/2 inches (38 mm) or greater, the buck shall be securely fastened to transfer load to the masonry, concrete or other structural substrate and the buck shall extend beyond the interior face of the window or door frame. Window and door assemblies shall be anchored through the main frame or by jamb clip or subframe system or through the flange to the secured wood buck in accordance with the manufacturer's published installation instructions. Unless otherwise tested, bucks shall extend beyond the interior face of the window or door frame such that full support of the frame is provided. Shims shall be made from materials capable of sustaining applicable loads, located and applied in a thickness capable of sustaining applicable loads. Anchors shall be provided to transfer load from the window or door frame assembly to the secured wood buck.

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1715.5.4.3 Wood or other approved framing materials. Add to read as shown.

1715.5.4.3 Wood or other approved framing materials. Where the framing material is wood or other approved framing material, window and glass door assemblies shall be anchored through the main frame or by jamb clip or subframe system or through the flange in accordance with the manufacturer's published installation instructions. Shims shall be made from materials capable of sustaining applicable loads, located and applied in a thickness capable of sustaining applicable loads. Anchors shall be provided to transfer load from the window or door frame to the rough opening substrate.

1715.5.5 Mullions occurring between individual window and glass door assemblies. Add to read as shown.

1715.5.5 Mullions occurring between individual window and glass door assemblies.

1715.5.5.1 Mullions. Add to read as shown.

1715.5.5.1 Mullions. Mullions or mulled fenestration assemblies shall be tested by an approved testing laboratory in accordance with either AAMA 450, ASTM E 330, or TAS 202 (HVHZ shall comply with TAS 202), or shall be engineered in accordance with AAMA 450 using accepted engineering practice. Mullions tested as stand-alone units or qualified by engineering shall use performance criteria cited in Sections 1715.5.5.2, 1715.5.5.3 and 1715.5.5.4. Mullions qualified by an actual test of an entire assembly shall comply with Section 1715.5.5.4, except that mullions in assemblies requiring a deflection limitation, as defined in AAMA/WDMA/CSA 101/I.S.2/A440, shall meet 1715.5.5.2 and 1715.5.5.3. Products not included within the scope of Section 1715.5.5.1 shall comply with Sections 1715.5.5.3 and 1715.5.5.4.

1715.5.5.2 Load transfer. Mullions shall be designed to transfer the design pressure loads applied by the window and door assemblies to the rough opening substrate.

1715.5.5.3 Deflection. Mullions shall be capable of resisting the design pressure loads applied by the window and door assemblies to be supported without deflecting more than L/175, where L is the span of the mullion in inches.

1715.5.5.4 Structural safety factor. Mullions that are tested by an approved testing laboratory shall be capable of resisting a load of 1.5 times the design pressure loads applied by the window and door assemblies to be supported. The 1.5 times the design pressure load shall be sustained for 10 seconds, and the permanent deformation shall not exceed 0.2 percent of the mullion span for assemblies requiring deflection limitations, as defined in AAMA/WDMA/CSA 101/I.S.2/A440 and 0.4 percent of the mullion span for all other assemblies after the 1.5 times design pressure load is removed. Mullions that are qualified by engineering shall be capable of resisting the design

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pressure loads applied by the window and door assemblies to be supported without exceeding the allowable stress of the mullion elements.

1715.5.6 Glazed curtain wall, window wall and storefront systems shall be tested in accordance with the requirements of this section and the Laboratory Test requirements of the American Architectural Manufacturers Association (AAMA) Standard 501, HVHZ shall comply with 2411.3.2.1.1.

1715.6 Test specimens. Add to read as shown.

1715.6 Test specimens. Test specimens and construction shall be representative of the materials, workmanship and details normally used in practice. The properties of the materials used to construct the test assembly shall be determined on the basis of tests on samples taken from the load assembly or on representative samples (when TAS 202 is used a minimum of three specimens) of the materials used to construct the load test assembly. Required tests shall be conducted or witnessed by an approved agency.

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Date Submitted	3/24/2010	**Section**	1715.9	**Proponent**	Joseph Belcher
Chapter	17	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Establishes installation criteria (manufacturer's installation instructions), requires instructions available for inspector, provides for interchangeability of components, fastners, etc., specifies C&C loads in accordance with 1609.1.1, and specifies factor of safety for testing.

Rationale

The proposal establishes installation criteria, provides guidance for interchanging components, provides a reference to design loads of Chapter 16, and specifies manufactured soffits will be tested at 1.5 times the design pressure as is required for windows and impact resistant coverings. Possibly the key weakness of manufactured soffit systems is the fact that there is no specified factor of safety for testing. This proposal corrects that serious flaw in the water intrusion resistance system.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal will make the job of local enforcement easier to perform as they will have documentation for plan review and in the field to check the installation against.

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

The proposal will result in little or no cost for compliance. The materials called for are generally available to the contractor when purchasing the manufactured soffit system. The language regarding interchangeability of parts will provide flexibility in the design and construction of the system.

Impact to industry relative to the cost of compliance with code

There will be little or no impact to the industry as the materials required are generally already available. There may be costs associated with the factor of safety for testing for products currently not tested to 1.5 times the design pressure for C & C loads.

Requirements

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

The proposal will benefit the public by establishing installation criteria and specifying a safety factor for manufactured soffit testing which will result in a better water intrusion resistance system.

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

The proposal strengthens the code by addressing a key weakness by establishing installation criteria and specifying a safety factor for manufactured soffit testing which will result in a better water intrusion resistance system.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by addressing a key weakness by establishing installation criteria and specifying a safety factor for manufactured soffit testing which will result in a better water intrusion resistance system.

1715.9.4 Installation. All manufactured soffit materials shall be installed in accordance with the manufacturer's installation instructions and in accordance with the product approval. Installation instructions shall be provided and shall be available to inspection personnel on the job site. Soffit pieces, components, fasteners, and other parts evaluated by an approved product evaluation entity, certification agency, testing laboratory, architect, or engineer and approved by the holder of the product approval may be interchangeable in manufactured soffit systems provided that the soffit system component or components provide equal or greater structural performance and durability as demonstrated by testing in accordance with approved test standards.

All exterior wall coverings and soffits shall be capable of resisting the design pressures specified for walls for components and cladding loads in accordance with Section 1609.1. Manufactured soffits shall be tested at 1.5 times the design pressure.

Note: This proposal is not related to the recommendations of the Soffit Work Group.

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Date Submitted	3/25/2010	**Section**	1801.1, 1804.4	**Proponent**	Rebecca Quinn
Chapter	18	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Florida-specific modifications to Chapter 18, related to retaining flood provisions of the I-Codes.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IBC flood provisions IBC and make Florida-specific amendments. IBC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for 1612 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

1801.1 Scope. The provisions of this chapter shall apply to building and foundation systems in those areas not subject to scour or water pressure by wind and wave action. Buildings and foundations subject to such scour or water pressure loads shall be designed in accordance with Chapter 16.

Exception: Buildings and structures located within the high-velocity hurricane zone shall comply with the provisions of Sections 1816 through 1834, and as applicable in flood hazard areas, Section 1612.

1804.4 Grading and fill in flood hazard areas. In flood hazard areas established in Section 1612.3, grading and/or fill shall not be approved:

1. Unless fill is placed, compacted and sloped to minimize shifting, slumping and erosion during the rise and fall of flood water and, as applicable, wave action; and

2. In floodways, unless it has been demonstrated through hydrologic and hydraulic analyses performed by a registered design professional in accordance with standard engineering practice that the proposed grading or fill, or both, will not result in any increase in flood levels during the occurrence of the design flood.

3. In flood hazard areas subject to high-velocity wave action, unless such fill is conducted and/or placed to avoid diversion of water and waves toward any building or structure.

4. Where design flood elevations are specified but floodways have not been designated, unless it has been demonstrated that the cumulative effect of the proposed flood hazard area encroachment, when combined with all other existing and anticipated flood hazard area encroachment, will not increase the design flood elevation more than one foot (305mm) at any point.

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Date Submitted	3/24/2010	**Section**	1801.1	**Proponent**	Mohammed Shaikh
Chapter	18	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted

Commission Action Pending Review

Related Modifications

Summary of Modification

Exception in 1801.1 Scope is proposed to revise as follows Exception: Buildings and and structures located within the high-velocity hurricane zone shall comply with the provisions of Sections 1816 through 1834 and 1805

Rationale

Dampproofing and Waterproofing is not specified in HVHZ sections 1816 thru 1834.. It is specified in non- HVHZ section 1805. Section 1805 can be applicable for HVHZ, therefore this modification is to add section 1805 in HVHZ for uniform application of dampproofing and waterproofing.

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

None

Requirements

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

It improves code therefore welfare

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

Improves code

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

Do not discriminate

Does not degrade the effectiveness of the code

Improves code

1801.1 Scope. The provisions of this chapter shall apply to building and foundation systems in those areas not subject to scour or water pressure by wind and wave action. Buildings and foundations subject to such scour or water pressure loads shall be designed in accordance with Chapter 16.

Exception: Buildings and structures located within the high-velocity hurricane zone shall comply with the provisions of Sections 1816 through 1834.and 1805

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Date Submitted	4/1/2010	**Section**	2002.4	**Proponent**	Joseph Belcher
Chapter	20	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted

Commission Action Pending Review

Related Modifications

Summary of Modification

Proposal reduces concentrated load on purlins from 300 # to the OSHA required load for fixed ladders, 200#. The reduction applies to purlins only.

Rationale

In the intermediate and higher wind speed zones the 300 pound load presents no problem because the wind design governs. However, in the lower wind speed zones the 300 pound concentrated load is financially punitive because meeting the load requires a heavier purlin than would be required by the wind design. The modification proposes to lower the concentrated load for purlins to the load required by OSHA for fixed ladders. (Please see uploaded document for further discussion.)

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The change will have no impact on the cost of compliance relative to the enforcement of the code.

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

The change will reduce costs in lower wind speed zones by eliminating over design.

Impact to industry relative to the cost of compliance with code

The change will reduce costs in lower wind speed zones by eliminating over design.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by making the concentrated load on purlins more reflective of the actual working conditions without sacrificing safety.

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

The proposal strengthens and improves the code by eliminating unnecessary overdesign and making the concentrated load on purlins more reflective of the actual working conditions without sacrificing safety.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by eliminating unnecessary overdesign and making the concentrated load on purlins more reflective of the actual working conditions without sacrificing safety.

2002.4 Loads. Structural members supporting screened enclosures shall be designed for wind in both of two orthogonal directions using the pressures given in Table 2002.4. Each primary member shall also be designed for a 300 pound (1.33 kN) load applied vertically downward along any 1 foot (305 Mm) of any member, not occurring simultaneously with wind load.

Exception: In addition to wind pressures, purlins shall also be designed for a 200 pound (0.89 kN) load applied vertically downward along any 1 foot (305 mm) of any member, not occurring simultaneously with wind load.

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The purpose of the concentrated load is to account for screen rollers or other workers walking on the primary roof members. Prior to enactment of the 300 pound concentrated load, the typical purlin was a 2 x 2 x 0.046" hollow, which is adequate for wind design in the lower wind speed zones. After adding the 300 pound concentrated load to the code, a larger purlin, 2 x 3 x 0.05" hollow, was required in the lower wind speed zones to meet the concentrated point load. Assuming the 2 X 2 purlin to be simply supported and 8 ft long, it will support a 250 lb concentrated load in the center of the span at yield stress.

Regarding the likelihood of even approaching the 300 pound load, individuals working on a screen roof are typically considerably smaller than 300 pounds and most likely weigh less than 200 pounds. In many cases they are chosen for the roof work because of their small stature. Additionally, workers on a screen roof are knowledgeable about the ability of the members to support them and do not step in the center of the purlin span and do not put their entire weight on a purlin. From the standpoint of walking the roof members, purlins typically provide no more than a balancing point, not complete support.

The proposal reduces the concentrated load to 200 pounds for purlins only. The 200 pound load is the same as the OSHA requirement for ladders and is adequate for the intended use. [29 CFR 1910.27(a)(1)(i)]

1910.27(a)(1)(ii)
The number and position of additional concentrated live-load units of 200 pounds each as determined from anticipated usage of the ladder shall be considered in the design.

1910.27(a)(1)(iii)
The live loads imposed by persons occupying the ladder shall be considered to be concentrated at such points as will cause the maximum stress in the structural member being considered.

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Date Submitted	4/1/2010	**Section**	2002.6	**Proponent**	Joseph Belcher
Chapter	20	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Proposal to clarify wind load design criteria for sunrooms and to clarify intent of inclusion of AAMA Categories for sunrooms in code.

Rationale

The proposed change is intended to clarify the application of the provisions of AAMA 2100. The proposal ties design to the appropriate design provisions of the FBC. The purpose of the inclusion of the AAMA categories in the code is clarified. The intent is to use the categories in determining which of the AAMA 2100 provisions to apply based on the use of the sunroom i.e. habitable versus non-habitable and conditioned versus unconditioned.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The change will have no impact on the cost of compliance relative to the enforcement of the code.

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

The change is intended for clarification and will have no impact on the cost of compliance for building and property owners.

Impact to industry relative to the cost of compliance with code

The change is intended for clarification and will have no impact on the cost of compliance for building and property owners.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by clarifying the application of adopted reference standards and clearly stating the wind loads are as required by the Florida Building Code.

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

The proposal strengthens and improves the code by clarifying the application of adopted reference standards and clearly stating the wind loads are as required by the Florida Building Code.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities and may remove a possible source of discrimination.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by clarifying the application of adopted reference standards and clearly stating the wind loads are as required by the Florida Building Code.

2002.6 Sunrooms. Sunrooms shall comply with AAMA/NPEA/NSA 2100 ~~with~~ and the structural requirements and testing provisions of Chapter 5. ~~modified to incorporate ASCE 7.~~

AAMA 2100, Section 5.2.1 Wind Loads: Modify Section 5.2.1 as follows:

5.2.1 Wind Loads: Basic wind speed in miles per hour (mph) or kilometer per hour (kph) shall be determined ~~by the local or regional building authority~~ in accordance with Section 1609.3. Sunrooms including exposed structures, components, cladding and roof covering shall be designed to resist the wind loads as established in Section 1609.1.1 ~~ASCE 7-98 or local wind load criteria~~.

For the purpose of applying the criteria of the AAMA Standard for sunrooms based on the intended use, ~~S~~ sunrooms shall be categorized in one of the following categories.

(No change to categories.)

(Proponent Note: The format for the modification to the AAMA Standard is taken from that used in the IBC 2009. The language stricken in Section 5.2.1 is from the Section of the standard being modified.)

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S4063

Date Submitted	3/29/2010	**Section**	2107.1	**Proponent**	Joseph Belcher
Chapter	21	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Further modifies Florida Specific Amendment related to inspection and lap splice provisions of TMS 402/ACI 530/ ASCE 5 and TMS 602/ACI 530.1/ ASCE 6 to make them current with 2008 Editions of the documents.

Rationale

1. The proposal carries forward Florida Specific Amendments addressing concerns with lap length. TMS 402/ACI 530/ASCE5 provisions for lap splices are based on seismic loads and are excessive for wind design which governs in Florida.
2. The order of the document numbers is changed to reflect TMS will be the lead organization responsible for the maintenance and updating of the documents.
3. The proposal modifies the referenced section numbers and adds Section 1.18 to agree with TMS 402-08.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There will be no economic impact on local enforcement entities as the proposal has no substantive changes and merely modifies an existing Florida Specific Amendment to update the provisions to agree with the new versions of the referenced codes.

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

On smaller commercial and residential jobs, the use of the modified provisions of TMS 402/ACI 530/ASCE 5 will result in no change or a slight reduction in costs. On larger jobs, the result will be a decrease in costs.

Impact to industry relative to the cost of compliance with code

On smaller commercial and residential jobs, the use of the modified provisions of TMS 402/ACI 530/ASCE 5 will result in no change or a slight reduction in costs. On larger jobs, the result will be a decrease in costs.

Requirements

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

The proposal is connected to public health, safety, and welfare because it eliminates an unintended consequence mandating the compliance with provisions intended to address seismic loads in a seismically inactive region.

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

The proposal strengthens and improves the code because it eliminates an unintended consequence mandating the compliance with provisions intended to address seismic loads in a seismically inactive region.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code because it eliminates an unintended consequence mandating the compliance with provisions intended to address seismic loads in a seismically inactive region.

2107.1 General. The design of masonry structures using *allowable stress design* shall comply with ~~Section 2106 and~~ the requirements of Chapters 1 and 2 of TMS 402/ACI 530/ASCE 5/~~TMS 402~~ except as modified by Section 2107.2 ~~through 2107.5~~. Lap splices shall be in accordance with TMS 402/ ACI 530/ ASC5/ ~~TMS 402~~ or in accordance with 2107.3 or 2107.4 as specified by the architect or engineer. Development of bars in tension and compression shall be in accordance with TMS 402/ACI 530/ASCE 5/ ~~TMS 402~~ or in accordance with 2107.5 as specified by the architect or engineer.

Exception: Where plan review and inspections are performed by a local building department in accordance with Sections ~~105~~ 106 and 109, the provisions of TMS 402/ ACI 530/ASCE 5/~~TMS 402~~, Chapter 1, Section ~~1.15~~ 1.18 and TMS 602/ ACI 530.1/ASCE 6/ ~~TMS 602~~ Sections 1.5 and 1.6 shall not apply unless specified by the architect or engineer.

NOTE: The provided materials to use for code modifications contained some of the stricken and underlined text. This proposal retains those changes and makes some further modifications.

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S4066

Date Submitted	3/30/2010	**Section**	2114.2	**Proponent**	Joseph Belcher
Chapter	21	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

This change should be made editorially throughout the code.

Summary of Modification

Changes the order of the organizations developing the masonry standards to agree with the foundation code.

Rationale

The proposal makes no substantive changes, but modifies the listing of the organizations responsible for developing the referenced documents. The revised order will make the FBC consistent with the IBC. The organizations have agreed The Masonry Society will be responsible for the maintenance and development of the masonry documents.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal has no fiscal impact relative to local enforcement because it contains no substantive changes and merely updates the order of the developing organizations of the reference document to be consistent with the foundation code.

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

The proposal has no fiscal impact relative to building and property owners because it contains no substantive changes and merely updates the order of the developing organizations of the reference document to be consistent with the foundation code.

Impact to industry relative to the cost of compliance with code

The proposal has no fiscal impact relative to industry because it contains no substantive changes and merely updates the order of the developing organizations of the reference document to be consistent with the foundation code.

Requirements

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

The proposal is connected to public health, safety, and welfare because it updates the order of the developing organizations of the reference document to be consistent with the foundation code.

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

The proposal strengthens and improves the code because it updates the order of the developing organizations of the reference document to be consistent with the foundation code.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code because it updates the order of the developing organizations of the reference document to be consistent with the foundation code.

2114.2 Concrete bearing ledge. Brick, stone or other veneer shall be supported by a concrete bearing ledge at least equal to the total thickness of the brick, stone or other veneer, which is poured integrally with the concrete foundation. No supplemental concrete foundation pours which will create a hidden cold joint shall be used without supplemental treatment in the foundation unless there is an approved physical barrier. An approved physical barrier shall also be installed from below the wall sill plate or first block course horizontally to embed in a mortar joint. If masonry veneer extends below grade, a termite protective treatment must be applied to the cavity created between the veneer and the foundation, in lieu of a physical barrier.

Exception: Veneer supported by a shelf, angle or lintel secured to the foundation sidewall in accordance with TMS 402/ ACI 530/ASCE 5 ~~/TMS 402~~, provided at least a 6-inch (152 mm) clear inspection space of the foundation sidewall exterior exist between the veneer and the top of any soil, sod, mulch or other organic landscaping component, deck, apron, porch, walk or any other work immediately adjacent to or adjoining the structure.

Note: This change is applicable and should be accomplished editorially throughout the code.

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S3460

Date Submitted	3/1/2010	**Section**	2214 and 2222	**Proponent**	Thomas Sputo
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Update versions of design references for HVHZ within Sections 2214 and 2222.

Rationale

Update three existing reference documents to current versions of the same documents.

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 cost impact.

Impact to industry relative to the cost of compliance with code

No cost impact.

Requirements

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

Provides current design standard for steel deck construction, based on most current and up-to-date publications.

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

Provides most current and updated design publications.

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

Does not discriminate against any other method of construction.

Does not degrade the effectiveness of the code

Improves effectiveness of code by providing current and up-to-date publications.

Chapter 35 - References

Steel Deck Institute

PO Box 25

Fox River Grove, IL 60021

SDI

DDP Deck Damage and Penetrations 2214.3

~~DDM 02~~ DDM-03 Diaphragm Design Manual 2214.3, 2222.4

Number ~~30~~ 31 Design Manual For Composite Decks, Form Decks and Roof Decks 2214.3

~~MOC1~~ MOC2 Manual of Construction with Steel Deck 2214.3

SPD2 Standard Practice Details 2214.3

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Date Submitted	3/17/2010	**Section**	2214.3	**Proponent**	Mohammed Shaikh
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Approved as Submitted

Commission Action Pending Review

Related Modifications

3638, 3670, 3671

Summary of Modification

Section 2214.3 requiires modification due to adoption of Manual of Steel Construction Thirteenth edition

Rationale

Specification for Structural Steel Buildings 360-05 (2005 edition) and Manual of Steel Construction, 2005 Thirteenth edition have been adopted in 2007 FBC code. Therfore these modifications are proposed,360-05 first time combines ASD and LRFD specifications, eliminates plastic design, Allowable stress and LRFD design manuals.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Enforcement of code is easier, combines both LRFD and ASD methods.

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

None

Requirements

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

It improves the code and thus welfare of general public.

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

Improves and updates code with latest standard and eliminates obsolete specifications and manuals

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

It improves the code

2214.3 The following standards, as set forth in Chapter 35 of this code, are hereby adopted.

1. American Institute of Steel Construction, AISC:

a. Manual of Steel Construction, ~~Allowable Stress Design ASD,~~ 2005, Thirteenth Edition, AISC, including ~~Supplement No.1 to the Specification for Structural Steel Buildings, 2001~~. Specification for Structural Steel Buildings.360-05.

_____ ~~b. Manual of Steel Construction, Load Resistance Factor Design LRFD, AISC~~.

~~c. Simple Shear Connection, ASD, AISC~~.

~~d. Simple Shear Connections, LRFD, AISC~~.

~~e~~ b. Serviceability Design Considerations for Low-Rise Buildings, AISC.

~~f. Plastic Design in Steel, AISC.~~

~~g~~ c. Engineering for Steel Construction, AISC.

~~h~~ d. Detailing for Steel Construction, AISC.

~~i~~ e. Iron and Steel Beams - 1873 to 1952, AISC.

~~j Plastic Design of Braced Multistory Steel Frames, AISC.~~

~~k.~~ f Torsional Analysis of Steel Members, AISC.

2. American Iron and Steel Institute, AISI:

a. Specification for the Design of Cold-Formed Steel Structural Members, AISI.

b. Fire-Resistant Steel-Frame Construction, AISI.

c. Fire-Safe Structural Steel & #150; A Design Guide, AISI.

d. Designing Fire Protection for Steel Trusses, AISI.

e. Cold-Formed Steel Design Manual, AISI

f. Specifications for the Design of Light-Gage Cold-Formed Stainless Structural Members, AISI.

g. Specification for the Criteria for Structural Application of Steel Cables for Buildings, AISI.

h. Designing Fire Protection for Steel Columns, AISI.

i. Design Manual for Structural Tubing, AISI.

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2214.3 The following standards, as set forth in Chapter 35 of this code, are hereby adopted.

1. American Institute of Steel Construction, AISC:
a. Manual of Steel Construction, ~~Allowable Stress Design ASD,~~ 2005, Thirteenth Edition, AISC, including ~~Supplement No.1 to the *Specification for Structural Steel Buildings*, 2001~~. Specification for Structural Steel Buildings.360-05.
~~b. Manual of Steel Construction, Load Resistance Factor Design LRFD, AISC~~.
~~c. Simple Shear Connection, ASD, AISC~~.
~~d. Simple Shear Connections, LRFD, AISC~~.
e b. Serviceability Design Considerations for Low-Rise Buildings, AISC.
~~f. Plastic Design in Steel, AISC.~~
~~g~~ c. Engineering for Steel Construction, AISC.
~~h~~ d. Detailing for Steel Construction, AISC.
~~i~~ e. Iron and Steel Beams - 1873 to 1952, AISC.
~~j Plastic Design of Braced Multistory Steel Frames, AISC.~~
~~k.~~ f Torsional Analysis of Steel Members, AISC.
2. American Iron and Steel Institute, AISI:
a. Specification for the Design of Cold-Formed Steel Structural Members, AISI.
b. Fire-Resistant Steel-Frame Construction, AISI.
c. Fire-Safe Structural Steel & #150; A Design Guide, AISI.
d. Designing Fire Protection for Steel Trusses, AISI.
e. Cold-Formed Steel Design Manual, AISI
f. Specifications for the Design of Light-Gage Cold-Formed Stainless Structural Members, AISI.
g. Specification for the Criteria for Structural Application of Steel Cables for Buildings, AISI.
h. Designing Fire Protection for Steel Columns, AISI.
i. Design Manual for Structural Tubing, AISI.

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S4248

Date Submitted	4/1/2010	**Section**	2218.3	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

The proposal cleans up vague code language and more appropriately references the welder qualification requirements of the AWS Code rather than AWS certification of welders.

Rationale

The intent of Section 2218.3 is to ensure that welds are performed by qualified welders. The current language, "may be done only by..." is not mandatory language. Furthermore, while AWS does certify welders, it is more appropriate that welders be qualified using the appropriate procedures of AWS which is more routinely done by most fabricators and erectors. This gives the same assurance of qualified welders and makes sure the welder is qualified for the appropriate welding task.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Clarifies the intent of the code.

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

No impact and/or no additional building cost.

Impact to industry relative to the cost of compliance with code

Offers more flexibility with regard to welder certification.

Requirements

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

Clarifying the requirements are in the best interest of the general public.

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

Improvement in the code language.

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 degrade the effectiveness of the code.

2218.3 Welding in the shop or field ~~may be done only by AWS certified welders~~ shall be performed by welders who have been qualified under the applicable AWS code.

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Date Submitted	4/1/2010	**Section**	2222.3.4	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

The proposal deletes a subsection in the cold-formed steel construction section that belongs only in Section 2223.10 with respect to metal building systems.

Rationale

This section is not applicable to "cold formed steel construction". Furthermore, it is in conflict with existing Section 2223.10.2, which more appropriately references the Product Approval requirements for doors and windows in metal building systems.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Clarifies and removes a potential conflict with the code.

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.

Requirements

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

Better clarifies the code in the best interest of the general public.

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

Provide equivalent products.

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 degrade the effectivenss of the code.

~~**2222.3.4** Doors and windows in preengineered metal building systems shall be designed as a structural component member and shall conform to all requirements in this chapter.~~

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Date Submitted	4/1/2010	**Section**	2223.10.2; 2223.10.5	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal removes outdated terminology with respect to this form of construction.

Rationale

The outdated term "pre-engineered" is removed to be more accurate in describing these metal buildings which are engineered for the specific application.

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.

Requirements

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

No impact.

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

Improves the use of current industry terminology related to metal building systems.

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 degrade the effectiveness of the code, but improves the terms used in the code.

2223.10.2 Doors and windows in ~~preengineered~~ metal building systems shall have Product Approval.

2223.10.5 See Section 2222 for additional requirements for ~~pre-engineered~~ metal building systems and components.

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S4278

Date Submitted	4/1/2010	**Section**	2223.10.4	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal deletes a redundant section that is already covered elsewhere in the code.

Rationale

This provision is already covered in Section 2222.3.6 and is redundant here, especially considering 2223.10.5 that refers back to Section 2222.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Removes redunancy in the code. No cost 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.

Requirements

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

Clarifies the intent of the code.

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

Improves the code by removing the redundancy covered elsewhere in Section 2222.

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 degrade the effectiveness of the code.

~~**2223.10.4** No increase in strength shall be allowed for the effect of cold work.~~

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Date Submitted	3/26/2010	**Section**	2304.11.6	**Proponent**	J Glenn-BASF
Chapter	23	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Using base code language for termite protection.

Rationale

Provision is adequately covered by existing language in the base code.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local enforcement is created by this change

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

2304.11.6 Termite protection. ~~Termite protection shall be provided by floor framing of naturally durable or preservative treated wood, soil treatment or other approved methods of termite protection.~~ In geographical areas where hazard of termite damage is known to be very heavy, wood floor framing shall be of naturally durable species (termite resistant) or preservative treated in accordance with AWPA U1 for the species, product preservative and end use or provided with approved methods of termite protection.

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S4107

Date Submitted	3/30/2010	**Section**	2314.0	**Proponent**	Paul Coats
Chapter	23	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal updates the currently referenced standards to their current editions. In addition, it adds the ANSI/AF&PA Special Design Provisions for Wind and Seismic (SDPWS-2008).

Rationale

This proposal updates the currently referenced standards to their current editions. In addition, it adds the ANSI/AF&PA Special Design Provisions for Wind and Seismic (SDPWS-2008). The SDPWS-2008 was added to the 2009 IBC as the referenced standard for the design of shear walls and diaphragms and the primary reference is in Section 2305.1 of the 2009 IBC. The new reference to the SDPWS in this section, like the reference to the NDS, is a needed reference for designers.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No significant impact.

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

No significant cost impact.

Impact to industry relative to the cost of compliance with code

No significant cost impact.

Requirements

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

Referencing the most current standards assures all of these.

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

Referencing the most current standards strengthens and improves the code.

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

These standards are appropriate to the material and this chapter, and do not dicriminate.

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code.

2314.4.7 American Forest and Paper Association, 1111 19 Street NW, Washington, D.C. 20036

1. ANSI/AF&PA National Design Specification for Wood Construction, ~~2001~~ 2005

2. ANSI/AF&PA Design Values for Wood Construction, ~~2001~~ 2005

3. Wood Structural Design Data, 1992

4. Span Tables for Joists and Rafters, ~~1993~~ 2005

5. ~~Working Stresses for Joists and Rafters, 1993~~ Design Values for Joists and Rafters, 2005

6. Wood Construction Data No. 1, Details for Conventional Wood Frame Construction, 2001

7. Wood Construction Data No. 4, Plank-and-Beam Framing for Residential Building, ~~1989~~ 2003

8. Wood Construction Data No. 5, Heavy Timber Construction Details, ~~1989~~ 2004

9. Wood Construction Data No. 6, Design of Wood Frame Structures for Permanence, ~~1988~~ 2006

10. ~~Technical Report No. 7, The Permanent Wood Foundation System, 1987~~ ANSI/AF&PA PWF-2007 Permanent Wood Foundation (PWF) Design Specification, 2007

11. ANSI/AF&PA WFCM-2001, Wood Frame Construction Manual for one and Two-Family Dwellings, 2001

~~12. All-Weather Wood Foundation System, Design, Fabrication, Installation Manual, 1987~~

~~13. Technical Report No. 7, All-Weather Wood Foundation System Basic Requirements with Supplements, 1987~~

12. ANSI/AF&PA SDPWS-2008 Special Design Provisions for Wind and Seismic, 2008

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Date Submitted	3/22/2010	**Section**	2411.1.11	**Proponent**	Jaime Gascon
Chapter	24	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

MOD3669

Summary of Modification

The modification clarifies that 'comparative' analysis is allowed, as opposed to the used term 'rational' analysis when the fixed glazing product differs from the one approved.

Rationale

The modification clarifies that 'comparative' analysis is allowed, as opposed to the used term 'rational' analysis when the fixed glazing product differs from the one approved. This correction clarifies that the proposed system must be 'compared' to the approved system and must follow the prescribed analysis when qualifying a particular job's condition(s).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None. Since the code already allows for an analysis, this modification clarifies the type of analysis and provides the missing guidance for same.

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

The clarification in this modification allows for a faster processing which should result in a cost savings. Further, by clarifying the procedure for the comparative analysis it eliminates the potential for confusion and delays.

Impact to industry relative to the cost of compliance with code

The clarification in this modification allows for a faster processing which should result in a cost savings. Further, by clarifying the procedure for the comparative analysis it eliminates the potential for confusion and delays.

Requirements

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

The modification better protects the public by clarifying the type of analysis allowed. It guards that the qualified condition is traceable to a tested system and not just 'rationalized' analytically.

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

The modification improves the code by clarifying the type of analysis allowed. It guards that the qualified condition is traceable to a tested system and not just 'rationalized' analytically.

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

The modification does not discriminate since all glazed products are allowed the same type of analysis. Reference sections 2411.3.2.5 and 2411.3.2.6.

Does not degrade the effectiveness of the code

The modification improves the code by clarifying the type of analysis allowed. It guards that the qualified condition is traceable to a tested system and not just 'rationalized' analytically.

SECTION 2411
HIGH-VELOCITY HURRICANE ZONES—WINDOWS, DOORS, GLASS AND GLAZING

2411.1 General.
2411.1.1 Windows, doors, glass and glazing shall be as set forth in this section.
2411.1.2 Glass shall comply with ASTM C 1036 requirements for flat glass Type I and II and GSA DD-G-451c Standard for Glass, Flat and Corrugated, for Glazing Mirrors and Other Uses.
2411.1.3 Tempered glass shall comply with 16 CFR 1201.
2411.1.4 Transparent and obscure safety glazing shall conform to the Performance Specifications and Methods of Test for Transparent Safety Glazing Materials Used in Buildings, ANSI Z 97.1.
2411.1.5 Heat-strengthened and ceramic-coated spandrel glass shall comply with ASTM C 1048.
2411.1.6 Wired glass shall comply with ANSI Z 97.I and shall only be used in fire doors and in glazed panels where safety glazing is not required.
2411.1.7 Installed glass shall not be less than Single-Strength B quality unless otherwise approved by the building official, and where edges are exposed they shall be seamed or ground.
2411.1.8 Where a light of glass is of such height above grade that the top 50 percent or more is in a zone of greater wind load, the area of the entire light shall be limited as for the greater height above grade.
2411.1.9 Replacement of any glazing or part thereof shall be designed and constructed in accordance with Chapter 34, Existing Buildings Provisions for High-Velocity Hurricane Zones.
2411.1.10 Replacement of glazing of more than one light or more than 30 percent of the total area glazed shall conform to the requirements of the section.
2411.1.11 Fixed glazing used as an exterior component shall require product approval. ~~Rational~~ Comparative analysis in compliance with 2411.3.2.6 by a Florida-registered engineer or architect may be accepted when the actual pressure and geometry conditions differ from the conditions shown in the approval.

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Date Submitted	3/17/2010	**Section**	2411.1	**Proponent**	Jaime Gascon
Chapter	24	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

This modification moves section 2411.3.3.7 on the requirements for 'exterior safety glazed lite', to a new section - 2411.1 General.

Rationale

The original intent of this language was for it to apply to all glazing installed in the designated area, yet its current location in the code is being misinterpreted to only apply to fixed glass. Placing it in the 'general' section makes it applicable to 'all' glazed fenestration products.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None, since these products already fall under product approval rules, and the inspections for glazing are already being performed.

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

Minimal to none. Tempered or laminated exterior lites of approved products I.G. products will already meet this requirement. This clarifies that the requirement is applicable to all glazing units installed in the areas of the building specified.

Impact to industry relative to the cost of compliance with code

The modification will require manufacturers to revise their system drawings and approvals that do not comply with this requirement. Retesting of an already approved system may not be required if simply changing the callout of the exterior lite's heat treatment.

Requirements

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

Not allowing large pieces of glass fragments to come off a building during a high wind/impact event will help minimize the hazard to the health, safety and welfare of the general public. Evidence of guillotine-size glass fragments falling off 30 story towers urged the filing of this code change.

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

The clarification makes the code stronger and safer for Floridians by minimizing debris in the event of glass failure.

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

The clarification does not discriminate, since the requirement is performance based. Products that meet this requirement are already available, and those not meeting it can be easily modified.

Does not degrade the effectiveness of the code

The clarification enhances the code by making this provision applicable to all glazing installed in the designated area, thereby enhancing the protection of health, life and safety of the public.

SECTION 2411 HIGH-VELOCITY HURRICANE ZONES-WINDOWS, DOORS, GLASS AND GLAZING

2411.1 General.

2411.1.1 Windows, doors, glass and glazing shall be as set forth in this section.

2411.1.2 Glass shall comply with ASTM C 1036 requirements for flat glass Type I and II and GSA DD-G-451c Standard for Glass, Flat and Corrugated, for Glazing Mirrors and Other Uses.

2411.1.3 Tempered glass shall comply with 16 CFR 1201.

2411.1.4 Transparent and obscure safety glazing shall conform to the Performance Specifications and Methods of Test for Transparent Safety Glazing Materials Used in Buildings, ANSI Z 97.1.

2411.1.5 Heat-strengthened and ceramic-coated spandrel glass shall comply with ASTM C 1048.

2411.1.6 Wired glass shall comply with ANSI Z 97.I and shall only be used in fire doors and in glazed panels where safety glazing is not required.

2411.1.7 Installed glass shall not be less than Single-Strength B quality unless otherwise approved by the building official, and where edges are exposed they shall be seamed or ground.

2411.1.8 Where a light of glass is of such height above grade that the top 50 percent or more is in a zone of greater wind load, the area of the entire light shall be limited as for the greater height above grade.

2411.1.9 Replacement of any glazing or part thereof shall be designed and constructed in accordance with Chapter 34, Existing Buildings Provisions for High-Velocity Hurricane Zones.

2411.1.10 Replacement of glazing of more than one light or more than 30 percent of the total area glazed shall conform to the requirements of the section.

2411.1.11 Fixed glazing used as an exterior component shall require product approval. Rational analysis by a Florida-registered engineer or architect may be accepted when the actual pressure and geometry conditions differ from the conditions shown in the approval.

2411.1.12 Exterior lite of glass in an insulated glass unit shall be safty glazed.

Exceptions:

1. Large missile impact-resistant glazed assemblies.

2. Nonmissile impact units protected with shutters.

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2411.3.3 Construction details. Construction details for fixed glass shall comply with the requirements of this paragraph except that structural glazing as defined in Section 202 need not comply with this section, but shall comply with Section 2415.

2411.3.3.1 Each light of fixed glass more than 3 feet (914 mm) in width shall have two approved setting blocks or approved suspension clamps. Setting blocks shall be Neoprene 70-90 Shore A durometer hardness or approved equal.

2411.3.3.2 Fixed glass lights shall be set in corrosion-resistant metal frames and shall comply with applicable requirements of Chapter 16 (High-Velocity Hurricane Zones) for wind loads, allowable stresses and load tests. Fixed glass lights may be set in wood, metal or concrete frames as permitted for the types of construction by Chapter 3 through Chapter 6.

2411.3.3.3 Wood shall have been preservative treated or shall be of a durable species as defined in Section 2326.2.

-

2411.3.3.4 Attachment shall be as set forth in Chapter 16 (High-Velocity Hurricane Zones) and shall be corrosion-resistant.

2411.3.3.5 Glass in fixed lights shall be securely and continuously supported at the perimeter of each sheet unless the design is based on one or more unsupported edges. Supporting members such as division bars and mullions shall be designed by rational analysis to support the wind pressures set forth in Chapter 16 (High-Velocity Hurricane Zones). Supporting bars shall be attached at the ends to resist the loads set forth in Chapter 16 (High-Velocity Hurricane Zones).

2411.3.3.6 The depth of the glazing rabbet and depth of engagement in the rabbet, for fixed glass, shall be based on consideration of the dimensional reduction from deflection and the dimensional changes caused by temperature.

~~**2411.3.3.7** Exterior lite of glass in an insulated glass unit shall be safty glazed.~~

~~**Exceptions:**~~
~~**1. Large missile impact-resistant glazed assemblies.**~~
~~**2. Nonmissile impact units protected with shutters.**~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3580_TextOfModification_2.png

Date Submitted	3/2/2010	**Section**	2411.1.10	**Proponent**	William Dumbaugh
Chapter	26	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Delete Section 2411.1.10

Rationale

Conflicts with the Existing Building Code

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

NONE

Requirements

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

YES omits onflicting code

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

YES omits conflicting code

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

Does not discriminaten

Does not degrade the effectiveness of the code

No

~~2411.1.10 Replacement of glazing of more than one light or more than 30 percent of the total area glazed shall conform to the requirements of the section.~~

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Date Submitted	3/26/2010	**Section**	2603.8	**Proponent**	J Glenn-BASF
Chapter	26	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Using base code language for termite protection for foam plastic.

Rationale

Base code provides the same level of protection.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Does not impact on local enforcement of the code.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Dores not degrade the code.

~~**2603.8 Protection from termite damage.**~~

~~**2603.8.1** Foam plastic insulation including, but not limited to, extruded or expanded polystyrene or polyisocyanurate shall not be installed below grade on foundation walls or below grade on the exterior of slab foundations.~~

~~**Exceptions:**~~

~~1. When in addition to the requirements of Section 2304.11.6, an approved method of protecting the foam plastic and structure from subterranean termite damage is provided.~~

~~2. Within Types I and II B construction.~~

~~3. On the interior side of basement walls.~~

~~**2603.8.2 Clearance between earth and foam plastics applied to the exterior wall shall be not less than 6 inches (152 mm).**~~

2603.8 Protection against termites. In Florida ~~areas where the probability of termite infestation is very heavy in accordance with Figure 2603.8~~, extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or preservative-treated wood.

2. An approved method of protecting the foam plastic and structure from subterranean termite damage is provided.

3. On the interior side of basement walls.

~~**FIGURE 2603.8**~~

~~**TERMITE INFESTATION PROBABILITY MAP**~~

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S3961

Date Submitted	3/27/2010	**Section**	3105.1	**Proponent**	J Glenn-BASF
Chapter	31	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Use base code language for awning provisions

Rationale

Covered by existing language in the base code.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local enforcement is created by this change

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything

Does not degrade the effectiveness of the code

Does not degrade the code

~~**3105.1** Fabric awnings and fabric-covered frames. Fabric awnings and fabric-covered frames shall comply with the provisions of Section 3105 as applicable.~~

3105.1 General. Awnings or canopies shall comply with the requirements of this section and other applicable sections of this code.

(Retain Provisions of 3105.1.1 thru 3105.1.5)

3105.1.1 Location.

3105.1.1.1 Fabric awnings and fabric-covered frames located over public property or in areas accessible to the general public shall be constructed so that no rigid part of such fabric awnings or fabric-covered frames shall be less than 7 feet, 6 inches (2286 mm) from the grade directly below, and no part of the cloth drop shall be less than 7 feet (2134 mm).

3105.1.1.2 A fixed fabric awning or fabric-covered frame shall not extend over public property more than two-thirds the distance from the property line to the nearest curb line in front of the building site as measured from the exterior face of the building nor shall any portion be closer than 18 inches (457 mm) to the curb line.

Exceptions:

1. If installed over 14 feet (4267 mm) in height, it may occupy the entire width of the sidewalk.

2. Unless otherwise regulated by local zoning requirements.

3105.1.1.3 Fabric-covered framework in whole or in part of fabric, erected in connection with gasoline service stations may not be erected within 15 feet (4572 mm) of where flammable liquids are transferred.

3105.1.1.4 Movable fabric awnings or fabric covered frames may extend over public property for a distance of not more than 5 feet (1524 mm), provided such awnings or any part thereof maintain a clear height of 8 feet (2438 mm) above the sidewalk. All such movable awnings shall be supported on metal frames attached to the building.

3105.1.1.5 Every fabric awning or fabric-covered frame shall be located not to interfere with the operation of any exterior standpipe, stairway, fire escape or any means of egress to and from the building.

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Date Submitted	3/27/2010	**Section**	3304.1.4	**Proponent**	J Glenn-BASF
Chapter	33	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Restore reference to 1804.5 as the correct reference. Section 1803.5 Deals with soil investigation while Section 1804.5 deals with compacted fill. Delete the special inspector language.

Rationale

I believe the reference is incorrect 3304.1.4 deals with fill and Section 1804.5 is the companion that addresses fill in Chapter 18 while Section 1803.5 is requirements for soil investigation. Special Inspection provisions in Chapter 17 have been deleted from the code.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything

Does not degrade the effectiveness of the code

Does not degrade the code

~~**3304.1.4 Fill supporting foundations.** Fill to be used to support the foundations of any building or structure shall comply with Section 1803.5.~~

-

3304.1.4 Fill supporting foundations. Fill to be used to support the foundations of any building or structure shall comply with Section 1804.5. ~~Special inspections of compacted fill shall be in accordance with Section 1704.7.~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3959_TextOfModification_1.png

Date Submitted	3/30/2010	**Section**	1.0	**Proponent**	Paul Coats
Chapter	35	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted

Commission Action Pending Review

Related Modifications

Summary of Modification

This proposed modification updates the referenced standards to the latest versions referenced in the 2009 IBC, and corrects some out of date references.

Rationale

This proposal updates referenced AF&PA standards to their current editions; PWF-07 replaces T.R. 7 and also the AF&PA-87 Manual; WCD3 is no longer referenced in the code; others are updates without signficant technical changes.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No significant cost impact.

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

No significant cost impact.

Impact to industry relative to the cost of compliance with code

No significant cost impact.

Requirements

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

The most recent standards are advisable for all of these.

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

Referencing the most recent standards strengthens and improves construction by these standards.

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

These standards are appropriate to material and methods, they do not discriminate.

Does not degrade the effectiveness of the code

Improves the code.

Proposal:

Update the proposed Florida Building Code as follows:

Chapter 35 Referenced Standards

AF&PA

American Forest & Paper Association

1111 19th St, NW Suite 800

Washington, DC 20036

Standard reference number Title Referenced in code section number

Add to read as shown.

AF&PA—92 Wood Structural Design Data 2314.4.7

~~AF&PA—93 Working Stresses for Joists and Rafters~~ AF&PA—05 Design Values for Joists and Rafters 2314.4.7

Change to read as shown.

NDS—05 National Design Specification (NDS) for Wood Construction— with 2005 Supplement 721.6.3.2, 1715.1.1, 1715.1.4, 1805.4.5, 1808.1, 1823.1.8.1, 2306.1, 2306.2.1, 2306.3.2, Table 2306.3.1, Table 2306.4.1, 2306.3.4, 2306.3.5, 2306.4.1, Table 2308.9.3(4), 2314.4.7, 2315.4.1, 319.17.2.2.1, 2319.17.2.1.3, 2319.17.2.1.5

Add to read as shown.

~~T.R. No. 7—87 Permanent Wood Foundation System~~ PWF--07 Permanent Wood Foundation (PWF) Design Specification 1805.4.6, 1807.2, 2304.9.5, 2314.4.7

WCD 1—01 Wood Construction Data No. 1, Details for Conventional Wood Frame Construction 2314.4.7

~~WCD 3—83 Wood Construction Data No. 3, Design of Wood Formwork for Concrete Structures 2314.4.7~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4099_TextOfModification_1.png

WCD 4—~~89~~ 03 Wood Construction Data No. 4, Plank and Beam Framing for Residential Buildings 2306.1.2, 2314.4.7

~~AF&PA—87 All Weather Wood Foundation System, Design, Fabrication, Installation Manual 2314.4.7~~

WCD 5—89 Wood Construction Data No. 5, Heavy Timber Construction Details 2314.4.7

WCD 6—~~88~~ 06 Wood Construction Data No. 6, Design of Wood Frame Structures for Permanence 314.4.7, 2326.2.11

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Date Submitted	3/18/2010	**Section**	AISC	**Proponent**	Mohammed Shaikh
Chapter	35	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

modification 3633 section 2214.3 and R4408

Summary of Modification

Chapter 35 AISC requires modification due to adoption of Manual of steel construction Thirteenth edition

Rationale

See Modification # 3633 sub code building

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

see Modification # 3633

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

None

Requirements

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

Improves code and thus welfare of people

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

See Mode # 3633 , sub code Building

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

Does not descriminate

Does not degrade the effectiveness of the code

Improves code

Alternate Language

1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Mohammed Shaikh **Submitted** 5/15/2010 **Attachments** Yes

S3638-A1

Rationale

Original Modification language is not the correct, the attached is the correct 2010 language

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Same as original

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

Same as original

Impact to industry relative to the cost of compliance with code

Same as original

Requirements

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

Same as original

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

Same as original

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

Same as original

Does not degrade the effectiveness of the code

Same as original

1st Comment Period History 04/15/2010 - 06/01/2010

S3638-G1

Proponent Mohammed Shaikh **Submitted** 5/18/2010 **Attachments** No

Comment:

Provide underline which is missing in S3638-A1 to "2005 Thirteenth Edition Including Specifications for Structural Steel Buildings 360-05"

AISC	American Institute of Steel Construction One East Wacker Drive, Suite 3100 Chicago, IL 60601-2001	
Standard reference number	Title	
341-05	Seismic Provisions for Structural Steel Buildings, including Supplement No. 1 dated 2006	1613.6.2, 1707.2, 2205.2.2
360-05	Specification for Structural Steel Buildings	1604.3.3, Table 17(2203.2,2205.1, 220
AISC	Tort sional Analysis of Steel Members	
AISC	Detailing for Steel Construction	
AISC	Engineering for Steel Construction	
AISC	Iron and Steel Beams -1873 to 1952	
~~AISC~~	~~Plastic Design in Steel~~	
~~AISC~~	~~Plastic Design of Braced Multistory Steel Frames~~	
AISC	Serviceability Design Considerations for Low-Rise Buildings	
~~AISC~~	~~Simple Shear Connection, ASD~~	
~~AISC~~	~~Simple Shear Connections, LRFD~~	
AISC	~~Allowable Stress Design,~~ Manual of Steel Construction, 2005,Thirteenth Edition	
~~AISC~~	~~Load Resistance Factor Design, Manual of Steel Construction~~	
AISC	Metal Building Certification Program, Category MB Certified	

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AISC	Torsional Analysis of Steel Members	2214.3

Change to read as shown:

AISC	Detailing for Steel Construction	2214.3
AISC	Engineering for Steel Construction	2214.3
AISC	Iron and Steel Beams - 1873 to 1952	2214.3
~~AISC~~	~~Plastic Design in Steel~~	~~2214.3~~
~~AISC~~	~~Plastic Design of Braced Multistory Steel Frames~~	~~2214.3~~
AISC	Serviceability Design Considerations for Low-Rise Buildings	2214.3, 2223.5.2
~~AISC~~	~~Simple Shear Connection, ASD~~	~~2214.3~~
~~AISC~~	~~Simple Shear Connections, LRFD~~	~~2214.3~~
AISC	~~Allowable Stress Design~~, Manual of Steel Construction, 2005 Thirteenth Edition Including Specifications for Specifications Structural Steel Buildings 360-05	2214.3
~~AISC~~	~~Load Resistance Factor Design, Manual of Steel Construction~~	~~2214.3~~
AISC	Metal Building Certification Program, Category MB Certified	2223.11.2

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Date Submitted	4/2/2010	**Section**	ASTM	**Proponent**	Stuart Lewis
Chapter	35	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Subcode	Sec	Mod#	Why?
Building	1716.1	4411	Deleted as section replaced by ASTM D 7147.
Building	2303.5	4414	Replace 1716.1 reference with ASTM D 7147.

Summary of Modification

Add ASTM D 7147-05, update D1761-06 line.

Rationale

The 2009 IBC updated the referenced ASTM D 1761 from a prior edition to a 2006 edition which had all information on joist hangers removed. New ASTM D 7147-05 now contains provisions for joist hangers from the old D 1761, updated and revised to include the information in section 1716.1 of the 2009 IBC. The proposed change will reinstate hanger test requirements deleted by this inadvertent change and remove section 1716.1 to avoid confusion due to its redundancy to some, but not all, of D 7147.

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

Minimal (only if past testing not up to current standard)

Requirements

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

Yes, it pertains to structural safety of buildings.

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

Yes, it updates joist hanger testing to current standard.

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

It does not so discriminate.

Does not degrade the effectiveness of the code

It does not degrade the effectiveness of the code.

In Chapter 35 under ASTM, make 2 changes as shown by A and B below:

A) Add the following standard and cite referenced location as section 2303.5, as shown below:

D 7147-05, Standard Specification for Testing and Establishing Allowable Loads of Joist Hangers…….2303.5

B) For the existing line for ASTM D1761-06, delete the section numbers for the section 17 subsections as illustrated in line below (which are incorrectly shown in the Florida Supplement to the 2009 IBC as sections 1715.1._ below, rather than 1716.1._ as shown in the 2009 IBC):

D1761—06 Test Method for Mechanical Fasteners in Wood ~~1715.1.1, 1715.1.2, 1715.1.3,~~ 1834.3.3, 2314.4.4

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S4034

Date Submitted	4/1/2010	**Section**	Referenced Standards	**Proponent**	Amanda Hickman
Chapter	35	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Add AMCA Standard 540 to section 1609.1.2.1 - Mod 4033

Summary of Modification

Add AMCA 540 to Chapter 35 - Referenced Standards

Rationale

see attached

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Approval of this modification will have no financial impact to local code enforcement authority.

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

Approval of this modification will have no financial impact to local code enforcement authority.

Impact to industry relative to the cost of compliance with code

Industries that manufacture impact resistant louvers will be affected by this modification because they will be required to test to the new standard.

Requirements

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

Yes. It improves the durability of the building envelope in hurricane prone regions.

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

Yes. It facilitates consistency in product performance and capability by requiring testing to a standard that was specifically developed for louvers and specific to the geographic and climatic conditions of Florida.

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

No.

Does not degrade the effectiveness of the code

This modification eliminates the ambiguity of how to test louvers for impact resistance. The current code language references a standard that was intended for the testing of glazing and fenestration products.

AMCA 540-08 Test Method for Louvers Impacted by Wind Borne Debris

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ANSI/AMCA Standard 540-08

Test Method for Louvers Impacted by Wind Borne Debris

An American National Standard
Approved by ANSI on December 22, 2008



AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.

The International Authority on Air System Components

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ANSI/AMCA Standard 540-08

Test Method for Louvers Impacted by Wind Borne Debris



Air Movement and Control Association International, Inc.
30 W. University Drive
Arlington Heights, Illinois
60004

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AMCA Standards

Authority

ANSI/AMCA Standard 540-07 was adopted by the membership of the Air Movement and Control Association International, Inc. on October 11, 2007. It was approved by ANSI as an American National Standard on December 22, 2008.

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Related Publications

ANSI/AMCA Standard 500-L	*Laboratory Methods of Testing Louvers for Rating*
AMCA Publication 501	*Application Manual for Louvers*
AMCA Publication 511	*Certified Ratings Program - Product Rating Manual for Air Control Devices*

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Vince Kreglewicz	Arrow United Industries
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Mike Watz	Greenheck Fan Corporation
Timothy Orris	AMCA International, Inc.

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ANSI/AMCA 540-08
Test Method for Louvers Impacted by Wind Borne Debris

1. Purpose

The purpose of this standard is to establish uniform methods for laboratory testing of louvers that are impact tested with the large missile described in ASTM E 1996-04 [1] and E 1886-05 [2].

2. Scope

The scope of this standard is for impact testing of louvers used on the outside of buildings as required by the ICC International Building Code [3] and the ICC International Residential Code [4].

The following precautionary statement pertains only to the test method portion, Section 5, of this specification: *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 the regulatory limitations prior to use*.

3. Definitions

3.1 Enhanced protection (Essential Facilities)

Buildings and other structures designated as essential facilities, including, but not limited to, hospitals; other health care facilities having emergency treatment facilities; jails and detention facilities; fire, rescue and police stations, and emergency vehicle garages; designated emergency shelters; communication centers and other facilities required for emergency response; power generating stations; other public utility facilities required in an emergency; and buildings and other structures having critical national defense functions.

3.2 Basic protection

Any building or structure that is not an Essential Facility as described in Section 3.1.

4. Test Specimens

4.1 Number of specimens

4.1.1
A minimum of one test specimen shall be submitted for the large missile impact testing. Additional specimens may be submitted to cover the complete range of louver sizes.

4.1.2
One additional, identical specimen may be submitted for the large missile testing should the specimen described in Section 4.1 fail any portion of the testing. This is described in Section 8.2.

4.2 Size of specimens

The test specimen selected is intended to evaluate the critical failure area of the louver and provide guidance for blade support requirements. The critical failure area for louvers is the connection between the louver blade end and the perimeter louver frame. Failures in this area result in loose material that can result in projectiles in high wind events. The most stringent test specimen for this connection is a section where the blade has no additional support between these end connections. Energy from the impact is transferred to the connection with little absorption by blade flexure. This test specimen also provides guidance regarding the maximum unsupported blade length that will not allow the projectile to pass through the louver blades. Louvers manufactured with blade spans greater than that of the test specimen shall have blade supports at a spacing that matches the tested specimen blade length. These supports are typically located behind the blade running perpendicular to the axis of the blade and are attached to the perimeter frame of the louver or to the surrounding building structure. Due to the fact that the test specimen is used to qualify support locations in this way, the manufacturer may wish to test an additional specimen with a width narrower than desirable support spacing to establish a smaller minimum section width.

The size of the test specimen shall be as defined in Section 4.2.1.1, 4.2.1.2, 4.2.1.3, or 4.2.1.4.

4.2.1 Single section louver qualification

4.2.1.1 Horizontal blade
The test specimen shall consist of a single section. The section width shall be equal to the maximum blade span the manufacturer would supply without providing a blade support plus the added width of the specimen jamb frames. The minimum height of the test specimen shall be 36 inches. The test specimen shall also contain a minimum of five blades. This specimen shall qualify single sections of widths greater than the specimen, provided the manufacturer supports the louver blades at a spacing equal to the blade length of the specimen. The tested width becomes the minimum section certified by the impact test. The specimen qualifies all single section heights. If the manufacturer wishes to certify a width narrower than the test specimen,

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an additional test specimen shall be provided. The minimum height of this narrower test specimen shall also be 36 inches, and it shall contain a minimum of five blades. See Annex A, Figure 4.

4.2.1.2 Vertical blade
The test specimen shall consist of a single section. The section height shall be equal to the maximum blade span the manufacturer would supply without providing a blade support plus the added thickness of the specimen head and sill frames. The minimum width of the test specimen shall be 36 inches. The test sample shall also contain a minimum of five blades. This specimen shall qualify single sections of heights greater than the specimen, provided the manufacturer supports the louver blades at a spacing equal to the blade length of the specimen. The tested height becomes the minimum section certified by the impact test. The specimen qualifies all single section widths. If the manufacturer wishes to certify a height less than the test specimen, an additional test specimen shall be provided. The minimum width of this smaller test specimen shall also be 36 inches, and it shall contain a minimum of five blades. See Figure 5 in Annex A.

4.2.2 Multi-section louver qualification

4.2.2.1 Horizontal blade
The test specimen shall consist of a minimum of two sections. Each section width shall be equal to the maximum blade span the manufacturer would supply without providing a blade support plus the added width of the specimen jamb frames. The height of the louver specimen shall be equal to the maximum height the manufacturer desires to be certified as impact resistant, or the maximum height allowed by the testing facility (rotation of the test sample 90° is permissible to overcome lab width/height limitations). This specimen shall qualify sections of widths greater than the specimen sections, provided the manufacturer supports the louver blades at a spacing equal to the blade length of the specimen. The tested width becomes the minimum multi-section certified by the impact test. If the manufacturer wishes to certify a smaller width, an additional test specimen shall be tested. The height of the narrower specimen shall be equal to the maximum height the manufacturer desires to be certified as impact resistant, or the maximum height allowed by the testing facility (rotation of the test sample 90° is permissible to overcome lab width/height limitations). See Figure 6 in Annex A.

4.2.2.2 Vertical blade
The test specimen shall consist of a minimum of two sections. Each section height shall be equal to the maximum blade span the manufacturer would supply without providing a blade support plus the added thickness of the specimen head and sill frames. The width of the louver specimen shall be equal to the maximum width the manufacturer desires to be certified as impact resistant, or the maximum width allowed by the testing facility (rotation of the test sample 90 is permissible to overcome lab width/height limitations). This specimen shall qualify sections of heights greater than the specimen sections, provided the manufacturer supports the louver blades at a spacing equal to the blade length of the specimen. The tested height becomes the minimum multi-section certified by the impact test. If the manufacturer wishes to certify a smaller height, an additional test specimen shall be tested. The width of the louver specimen shall be equal to the maximum width the manufacturer desires to be certified as impact resistant, or the maximum width allowed by the testing facility (rotation of the test sample 90 is permissible to overcome lab width/height limitations). See Annex A, Figure 7.

4.2.2.3
Testing of a multi-section louver shall qualify a single section louver. Each connection joint design needs to be tested.

5. Test Methods

5.1 Specimens

The specimens shall be tested according to test method, ASTM E1886-05, for large-missile impact testing only.

5.2 Missile

Determine the missile based upon building classification according to Section 6.

5.3 Location of impact

5.3.1 Single section impact locations

5.3.1.1 Horizontal blade impact locations
Impact each louver three times as shown in Figure 1.

The first impact shall be on the front edge of the blade closest to a point 6 ± 2.5 inches from the jamb and 6 inches from the sill. The impact shall not contact the jamb or sill frame.

The second impact shall be on a center blade and shall hit the front edge of the blade at the centerline of the blade, ± 2.5 inches.

The third impact shall be on the front edge of the blade closest to a point 6 ± 2.5 inches from the jamb and 6 inches from the head. This impact shall be adjacent to the jamb, opposite the first impact. The impact shall not contact the jamb or head frame.

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5.3.1.2 Vertical blade impact locations
Impact each louver three times as shown in Figure 2.

The first impact shall be on the front edge of the blade closest to a point 6 ± 2.5 inches from the sill and 6 inches from the jamb. The impact shall not contact the jamb or sill frame.

The second impact shall be on a center blade and shall hit the blade at the centerline of the blade, ± 2.5 inches.

The third impact shall be on the front edge of the blade closest to a point 6 ± 2.5 inches from the head and 6 inches from the jamb. This impact shall be adjacent to the jamb, opposite the first impact. The impact shall not contact the jamb or head frame.

5.3.2 Multi-section impact locations
Each section of a multi-section louver shall be impacted as required in Section 5.3.1.1 for single section louvers.

In addition, the final impact shall be at the center of the mullion, as shown in Figure 3. It is not required to impact the same blade with more than one impact. It is permissible to offset center blade impacts by one blade.

5.4
The louvers shall be rigidly mounted to the test frame using a continuous angle to support the louver perimeter.

6. Missiles

The missile used shall be that described in Table 1. For Basic Protection listings, the missile shall have an impact speed of Missile Level 'D'. For Essential Facilities Protection listings, the missile shall have an impact speed of Missile Level 'E'.

7. Pass/Fail Criteria

7.1
There shall be no penetration of the innermost plane of the test specimen by the applicable missile(s) during the impact test(s).

7.2
Louver components shall remain attached to adjacent parts or components. Adjacent parts or components are defined as attached as long as the component is connected to the adjacent part or component by a fastener or part of a weld.

7.3
Upon completion of the missile impact(s), there shall be no horizontally projected opening formed through which a 76 mm (3 in.) diameter solid sphere can pass.

8. Product Qualification

8.1
When all test specimens submitted have met the requirements of the specification based on the pass/fail criteria described in Section 7, except in the case of Section 8.2, the set of test specimens shall be accepted according to the designated building classification (Basic Protection or Essential Facilities).

8.2
If any test specimen fails to meet the requirements of this specification as described in Section 6, it shall be rejected. One additional, identical test shall be performed on the additional specimen specified in Section 4.1.1, if provided. Any additional failures shall constitute failure of the entire set of test specimens and shall be rejected.

8.3
A qualification at the Essential Facilities speed automatically includes qualification for the Basic Protection speed.

9. Limitations

9.1
The maximum height tested for multiple section sizes will determine the overall allowed height of multiple section units.

9.2
The minimum width tested is the narrowest size that will be allowed to qualify by the test report.

9.3
Shaped louvers shall be qualified, provided the mounting method, material of construction and attachment are the same as the tested configuration. (Caution - narrow blades may be present in the shape of louvers and the narrow blade may control resistance to impact).

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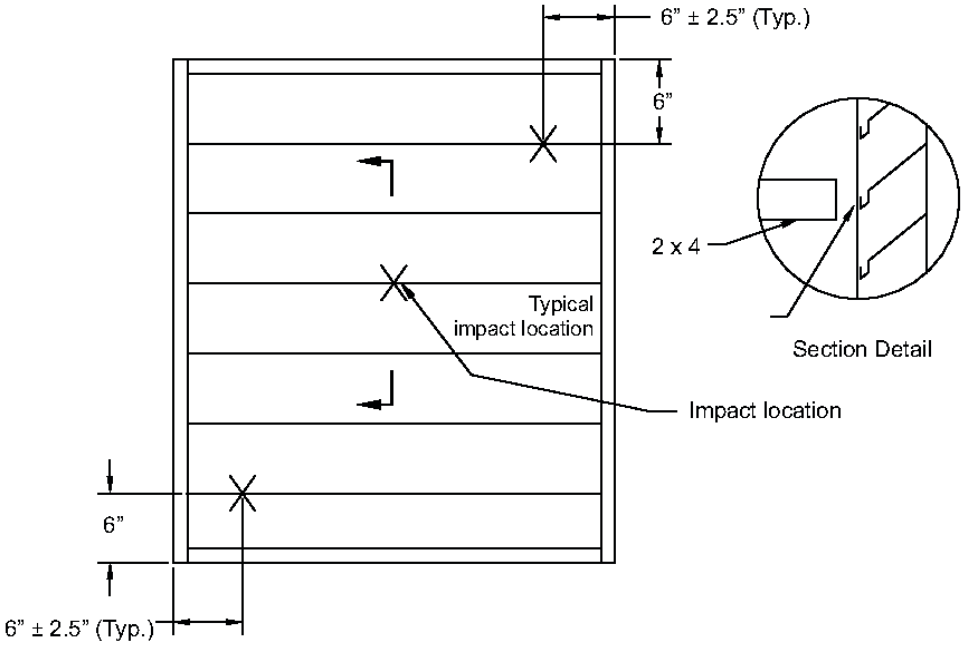


Figure 1 - Impact Locations for Testing Single Section, Horizontal Blade Louver

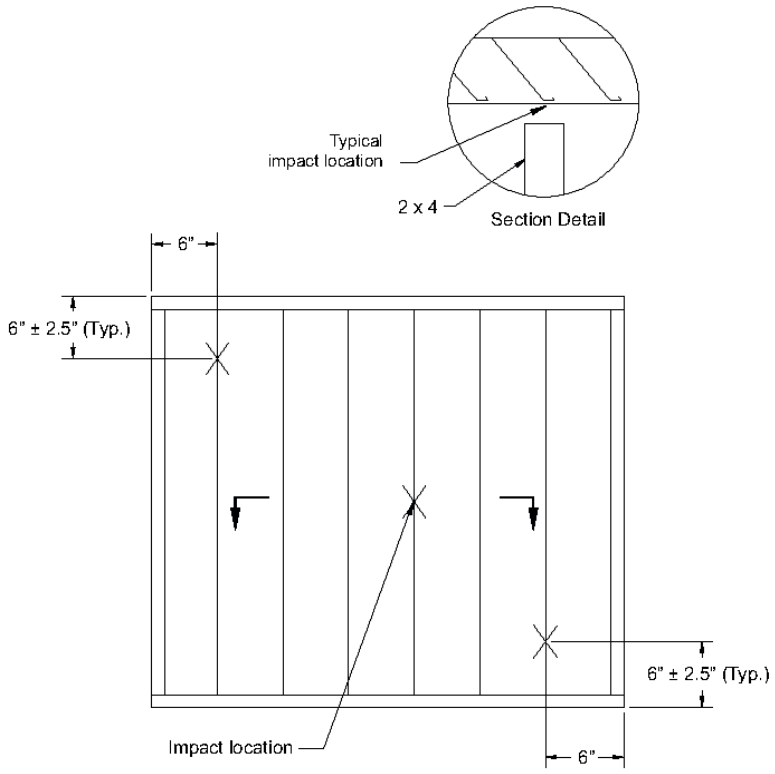


Figure 2 - Impact Locations for Testing Single Section, Vertical Blade Louver

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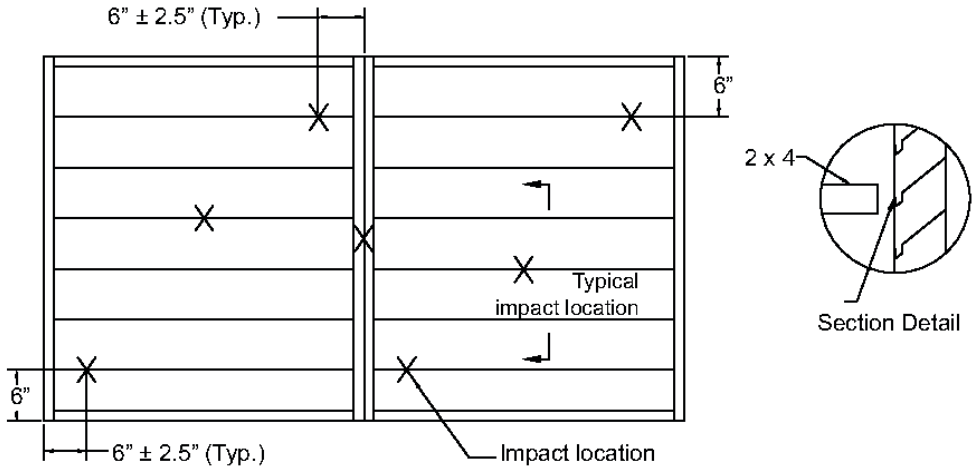


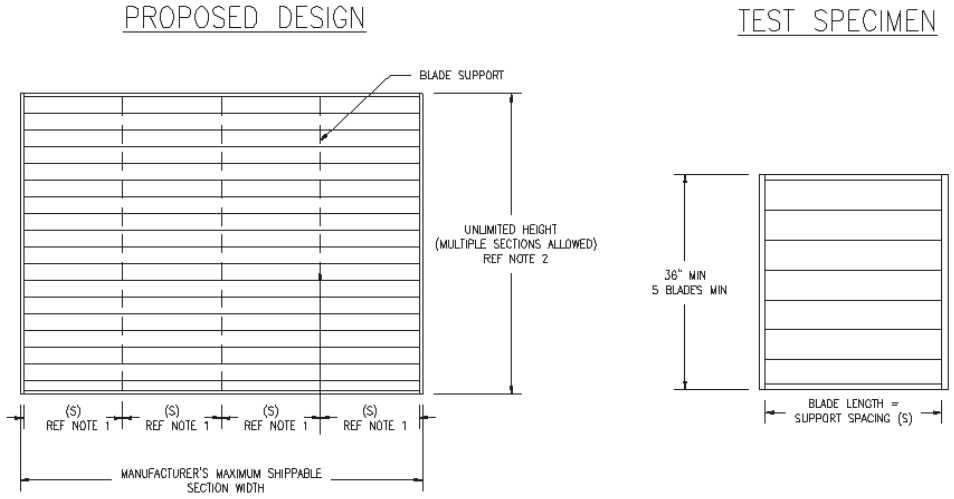
Figure 3 – Impact Locations for Testing Multi-Section, Horizontal Blade Louver

Table 1 - Missiles

Missile Level	Missile	Impact Speed (m/s)
D	4100 g ± 100 g (9.0 lb ± .25 lb) 2x4 in. 2.4 m ± 100 mm (8 ft ± 4 in.) lumber	15.25 (50 ft/s)
E	4100 g ± 100 g (9.0 lb ± .25 lb) 2x4 in. 2.4 m ± 100 mm (8 ft ± 4 in.) lumber	24.38 (80 ft/s)

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Annex A
Test Specimen Reference Figures



Notes:

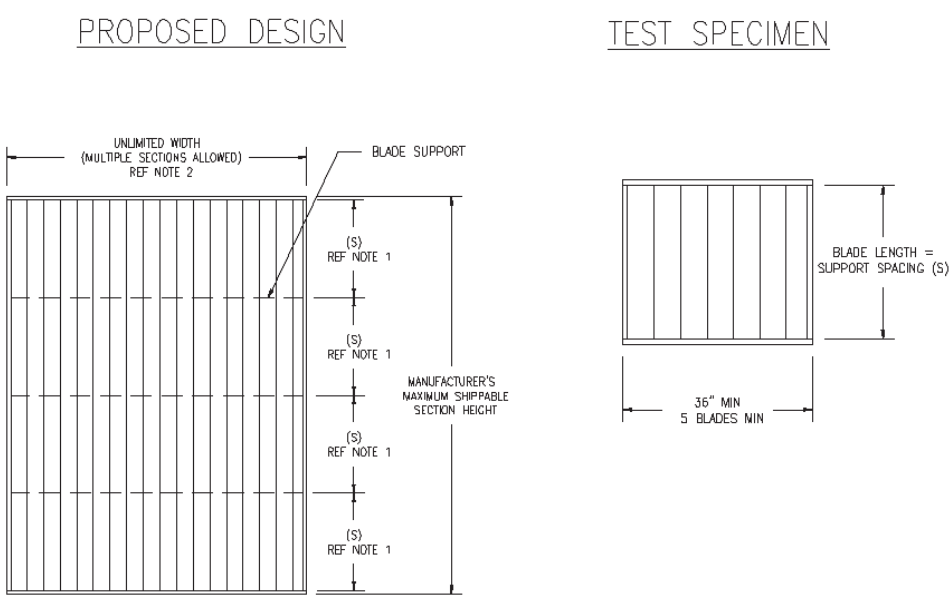
1. Support spacing (S) shall be designed for the wind pressure rating of the louver.

2. When stacking multiple vertical sections, blade supports shall be moment spliced at ship sections or supported by other structures.

3. Qualification of widths smaller than test specimen requires additional test. See Section 4.2.1.1.

Figure 4 - Example of Single Section, Horizontal Blade Louver Qualification

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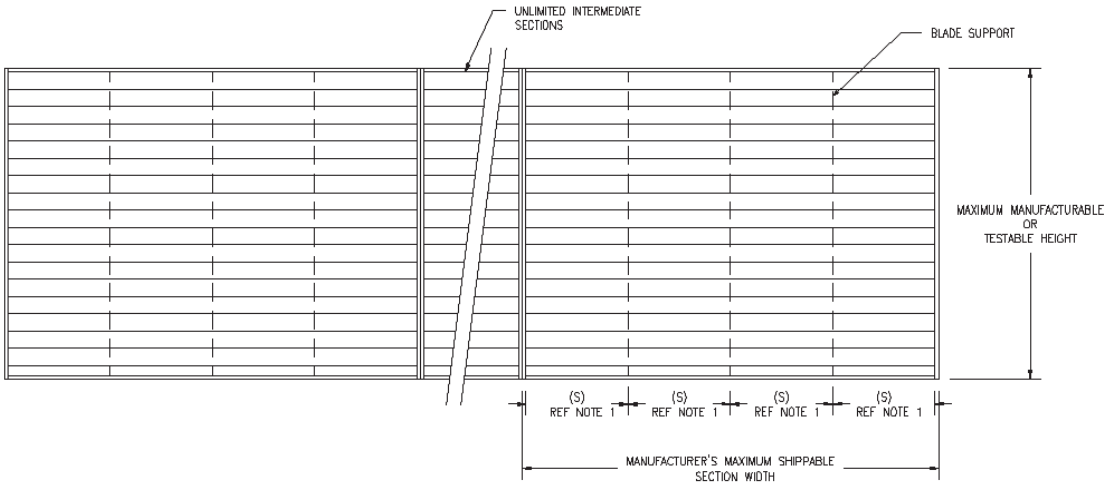
Notes:

1. Support spacing (S) shall be designed for the wind pressure rating of the louver.
2. When stacking multiple horizontal sections, blade supports shall be moment spliced at ship sections or supported by other structures.
3. Qualification of widths smaller than test specimen requires additional test. See Section 4.2.1.2.

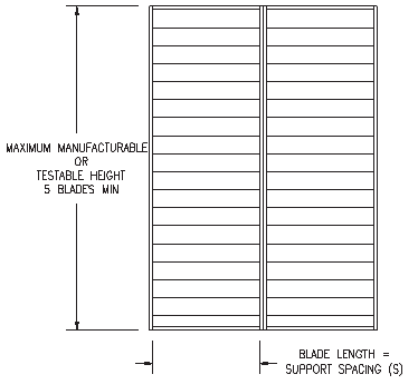
Figure 5 - Example of Single Section, Vertical Blade Louver Qualification

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PROPOSED DESIGN



TEST SPECIMEN – NOTE 4



Notes:

1. Support spacing (S) shall be designed for the wind pressure rating of the louver.

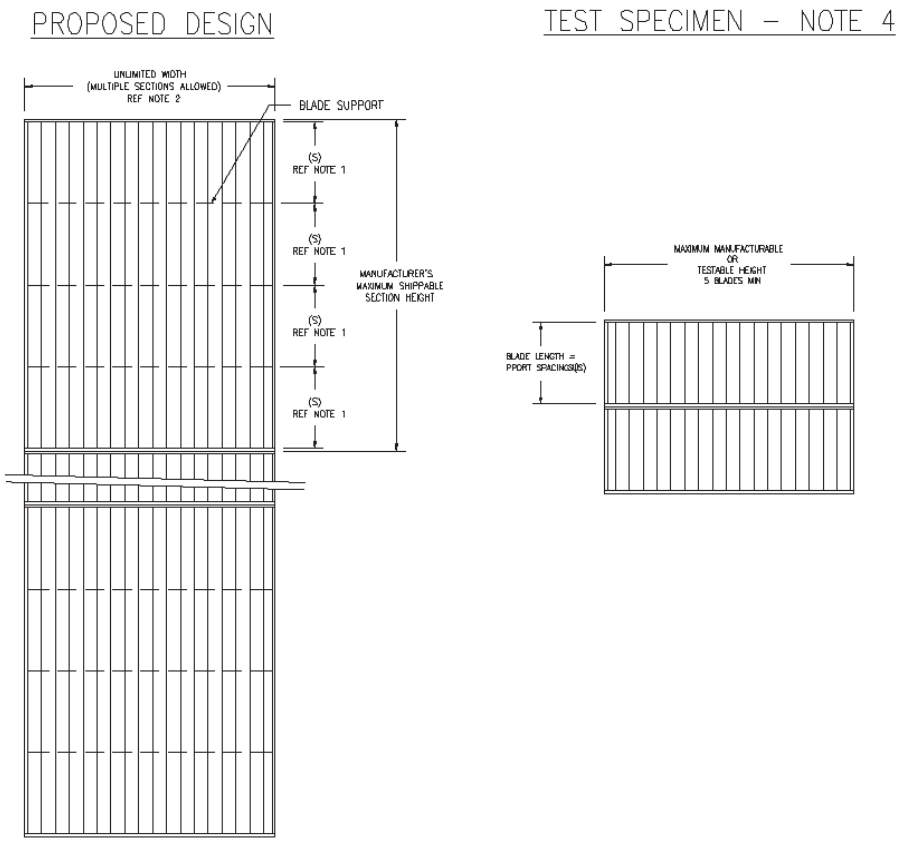
2. When stacking multiple horizontal sections, blade supports shall be moment spliced at ship sections or supported by other structures.

3. Qualification of widths smaller than test specimen requires additional test. See Section 4.2.2.1.

4. Minimum two sections shown. Three or more sections may be tested to allow qualification of multiple mullion types with one test. For example, when trying to obtain qualification for an architectural, recessed, and visible mullion types with a single test.

Figure 6 - Example of Multi-Section, Horizontal Blade Louver Qualification

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Notes:

1. Support spacing (S) shall be designed for the wind pressure rating of the louver.
2. When stacking multiple vertical sections, blade supports shall be moment spliced at ship sections or supported by other structures.
3. Qualification of widths smaller than the test specimen requires an additional test. See Section 4.2.2.2.
4. Minimum two sections shown. Three or more sections may be tested to allow qualification of multiple mullion types with one test.

Figure 7 - Example of Multi-Section, Vertical Blade Louver Qualification

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Annex B
Louver to Building Structure Attachments

The attachments of the louver to the building structure vary widely per installation and are typically not the responsibility of the louver manufacturer. The connection of the louver to the testing fixture shall consist of a continuous extruded aluminum or steel angle securely attached to the buck. The legs of the angle shall not protrude beyond the inside frame members (jamb, sill, and head), which if allowed could restrict a blade from becoming detached. Another connection can be designed to deflect less than *L*/60 (*L* is the leg length of the angle) when impacted with the missile described in Section 6 of this document when traveling at 24.38 m/s (80 ft/s) with no permanent deformation. This rigid connection is used to create the worst possible impact load on the blade to frame connection by limiting the energy lost to hysteresis in the attachment to the condition.

This standard does not evaluate the fastening method or fasteners used to attach the louver to the building structure.

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Annex C
Bibliography

[1] ASTM E 1996-04
Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

[2] ASTM E 1886-05
Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials

[3] International Code Council
2006 International Building Code

[4] International Code Council
2006 International Residential Code

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Reason Statement for AMCA 540

The ICC Structural Committee unanimously approved this exact code change in at the ICC hearing in Baltimore last November. No one spoke in opposition to this change and no public comments were filed. This change will be incorporated into the 2012 IBC.

ASTM E 1886 & ASTM E 1996 only addresses exterior windows, glazed curtain walls, doors, and storm shutters in buildings located in hurricane prone regions. It does not cover the impact testing of louvers. In the absence of an appropriate specification and test method for louvers, jurisdictions have based their product approvals on the performance criteria of the large missile test of ASTM E 1886 and ASTM E 1996. The Air Movement Control Association (AMCA) has developed a standard specification for louvers that provides a uniform set of guidelines and provides a consistent basis for evaluating the ability of the louver to maintain its integrity during the large missile test of ASTM E 1886 and ASTM E 1996.

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Date Submitted	4/1/2010	**Section**	Referenced Standards	**Proponent**	Joseph Belcher
Chapter	35	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Adds a reference to a new section addressing the use of the AAF Guide to Aluminum Construction in High Wind Areas in the HVHZ.

Rationale

The proposal adds a reference to a proposed new section referencing the AAF Guide to Aluminum Construction in High Wind Areas.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The changes are to provide sections where the adopted standard is referenced and pose no impact on the cost of compliance relative to the enforcement of the code.

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

The changes are to provide sections where the adopted standard is referenced and pose no impact to building and property owners to the cost of compliance with the code.

Impact to industry relative to the cost of compliance with code

The changes are to provide sections where the adopted standard is referenced and pose no impact to industry to the cost of compliance relative with the code.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public because it simplifies the use of the code.

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

The proposal improves the code because it simplifies the use of the code.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code because it simplifies the use of the code.

AAF—07-1 Guide to Aluminum Construction in High Wind Areas 2007-1 1622.1.2

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Sub Code: Existing Building

Date Submitted	4/1/2010	**Section**	606.5	**Proponent**	Joseph Belcher
Chapter	6	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

The proposal adds and Exception from impact protection for screen or removable vinyl and acrylic wind panels on exterior balconies and porches and relocates the HVHZ provision as an Exception.

Rationale

The proposed Exception is intended to clarify that enclosing an exterior balcony or porch with screen or removable vinyl or acrylic wind break panels does invoke the opening protection requirements related to sunrooms. The proposal clearly states adding screen or removable vinyl or acrylic panels does not trigger opening protection requirements. The panels are required to be removable and to be removed when there is a threat of high winds. (Please see uploaded document for further discussion.)

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The change will have no impact on the cost of compliance relative to the enforcement of the code.

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

The change will reduce costs by clearly stating that screen and vinyl and acrylic wind break panels do not trigger impact resistance requirements on exterior balconies and porches.

Impact to industry relative to the cost of compliance with code

The change will reduce costs by clearly stating that screen and vinyl and acrylic wind break panels do not trigger impact resistance requirements on exterior balconies and porches.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by making available an affordable means to increase the recreational use of balconies and porches.

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

The proposal strengthens and improves the code by clearly stating provisions for enclosing exterior balconies and porches with screen or removable vinyl or acrylic wind break panels.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities and will remove what some in the industry consider to be discriminatory practices against a material and method of construction.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by clearly stating provisions for enclosing exterior balconies and porches with screen or removable vinyl or acrylic wind break panels.

606.5 Openings in sunrooms, enclosed balconies and enclosed porches constructed under existing roofs or decks are not required to be protected, provided the space is separated from the building interior by a wall and all openings in the separating wall are protected in accordance with Section 1609.1.4 of the *Florida Building Code, Building*. Such spaces shall be permitted to be designed as enclosed or partially enclosed.

Exceptions:

1. Exterior balconies or porches under existing roofs or decks enclosed with screen or removable vinyl and acrylic panels complying with the Florida Building Code, Building, Section 2002.3.3 shall not be required to be protected and openings in the wall separating the unit from the balcony or porch shall not be required to be protected unless required by other provisions of this code. ~~(High Velocity Hurricane Zones must comply with Chapter 16 of the *Florida Building Code, Building*.)~~

2. ~~(~~High Velocity Hurricane Zones must comply with Chapter 16 of the *Florida Building Code, Building*.~~)~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4233_TextOfModification_1.png

The industry has experienced some unintended consequences with the adoption of the sunroom categories of the AAMA 2100 Standard. Some officials treat the AAMA categories as definitions and classify exterior balconies or porches when enclosed with screen or removable vinyl or acrylic panels as sunrooms. The argument goes that the concrete floor of the deck above is the roof of the balcony being "enclosed" below and therefore does not meet the definition of screen enclosure. Classified thusly as sunrooms, the screen or removable vinyl or acrylic panels are required to be impact resistant or protected by impact resistant coverings. As an alternate any glazing in the wall separating the unit from the balcony or porch is required to be impact resistant or protected. This is a wholly unintended consequence of the inclusion of the AAMA 2100 Categories within the code.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4233_Rationale_Ext_Rationale_Balc_as_Sunroom_EB_s.606.4_1.png

Date Submitted	4/2/2010	**Section**	611.8.1.4	**Proponent**	Randall Shackelford
Chapter	6	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Similar proposal to 611.8.1.6, Mod 4471

Summary of Modification

Changes fastener specification for connector to that recommended by the manufacturer.

Rationale

This change is to modify the fastener in the 500 pound connector so that it is installed with the fastener that is recommended by the manufacturer to achieve 500 pounds. As a prescriptive requirement, the 2-1/2" masonry screw is left in. In most cases, this will allow shorter fasteners to be used. See the test attached that uses 2-1/4" screws

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact. Existing requirement is left as an alternate

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

Cost may be lowered when manufacturer recommends use of a shorter masonry screw.

Impact to industry relative to the cost of compliance with code

Cost may be lowered when manufacturer recommends use of a shorter masonry screw.

Requirements

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

Will ensure that connectors used for wind retrofits are installed in accordance with manufacturer's recommendations.

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

Improves the code, allows more economical products that still meet code load requirements. Will ensure that connectors used for wind retrofits are installed in accordance with manufacturer's recommendations.

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

Does not discriminate against any materials.

Does not degrade the effectiveness of the code

Does not degrade effectiveness of the code. Connector will still have to be rated for 500 pounds

611.8.1.4 Prescriptive method for gable roofs on a masonry wall. The anchorage of each of the exposed rafters or truss within 6 ft of the corner along the exterior wall on each side of each gable end shall be inspected. Wherever a strap is missing or an existing strap has fewer than four fasteners on each end, approved straps, ties or right angle gusset brackets with a minimum uplift capacity of 500 lbs shall be installed that connect each rafter or truss to the top plate below or directly to the masonry wall using approved masonry screws of a length and diameter recommended by the manufacturer. In the absence of manufacturer's recommendations, screws shall ~~that will~~ provide at least a 2-1/2 embedment into the concrete or masonry. When the straps or right angle gusset brackets are attached to a wood sill plate, the sill plate shall be anchored to the concrete masonry wall below. This anchorage shall be accomplished by installing ¼-inch diameter masonry screws, each with supplementary ¼-inch washer, having sufficient length to develop a 2-1/2 inch embedment into the concrete and masonry. These screws shall be installed within 4-inches of the truss or rafter on both sides of each interior rafter or truss and on the accessible wall side of the gable end truss or rafter

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Testing Engineers, Inc.

Quality Assurance Services
Materials Consulting
Since 1954

September 2, 1999

TEI Project No.: 99001.137
Simpson Test No.: H311

Mr. Gregg Summers, P.E., Manager of Testing
Simpson Strong-Tie Company, Inc.
4637 Chabot Drive, Suite 200
Pleasanton, CA 94588

SUBJECT: Simpson Strong-Tie H9M Attached to CMU – Uplift Test (HM9)

Dear Mr. Summers:

In accordance with your request, we witnessed the tests described below at the Simpson Strong-Tie R&D facility located at 2955 Merced Street, San Leandro, on September 1, 1999.

TEST SAMPLES

According to Simpson Strong-Tie material specifications, the H9M is made from 18-gauge (0.0468") G60 galvanized ASTM A653 steel with a minimum yield strength of 28 ksi and a minimum ultimate strength of 38 ksi. The samples tested conformed to the attached production drawing H9, dated 6/10/99. Connectors, fasteners and lumber were randomly selected from existing stock. Note: H9M has the same configuration as H9.

TEST ASSEMBLY

An H9M was attached to an 8" x 8" x 16" grout-filled CMU block with five 1/4" x 2-1/4" Titen Masonry screws and the upper half of the connector was attached to a 1-1/2" x 7-1/2" x 42" Douglas Fir rafter with four SDS ¼" x 1-1/2" screws. The average compressive strength of the grout was 2680 psi at the time of the test; see attached compressive test report. The test assembly is shown in the attached detail drawing and photos and the fastener schedule is listed in the attached table.

PROCEDURE

Each test assembly was placed inverted on the bed of a Dake 75-ton testing machine. The blocks were supported above the test bed. Dial indicators accurate to 0.001" were mounted on the test blocks to measure deflection of the rafter. The load was applied at 0.035"/min.±50% and gauge readings were recorded at 500-pound intervals until a deflection of 0.125" was reached. The load was increased at the same rate until failure.

Corporate Office - 2811 Adeline Street, Oakland, California 94608 - (510) 835-3142 - FAX (510) 834-3777
South/West Bay - 2123 Bering Drive, Suite E - San Jose, California 95131 - (408) 451-2420 - FAX (408) 451-2425
East/North Bay - 827 Arnold Drive, Bay 4 -Martinez, California 94553 - (925) 370-7000 - FAX (925) 229-2961

RESULTS

The results are tabulated on the enclosed Table A.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned.

TEI CONSULTING ENGINEERS

Sokho Yim
Staff Engineer

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
PAUL E. COX
No. C045152
Exp.
CIVIL
STATE OF CALIFORNIA

Paul Cox
C.E. No. 45152, Exp. 09-30-02

NH
Enclosure

Testing Engineers, Inc.
Quality Assurance Services
Materials Consulting

Page: 2
http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4470_Text_HM9 Test_2.png

Simpson Strong-Tie Company, Inc.
Mr. Gregg Summers
Page 3

TEI Project No.: 99001.137
September 2, 1999

SIMPSON TEST # H311 TABLE A DATE OF TEST: 9-1-99

SUBJECT: H9M - Uplift Test

SPECIMEN GAUGE: 18 THICKNESS (AS MEASURED, INCLUDING GALVANIZING): 0.046"

TOP PLATES: 8" x 8" x 16" CMU, Grout-Filled
RAFTER: 1-1/2" x 7-1/2" x 42" Douglas Fir

TOP PLATE FASTENERS: (5) Titen 1/4" x 2-1/4"
RAFTER FASTENERS: (4) SDS 1/4" x 1-1/2"

TITEN SCREW DIAMETER (AS MEASURED): 0.243"
TITEN SCREW LENGTH (AS MEASURED): 2-1/4"

SDS SCREW DIAMETER (AS MEASURED): 0.251"
SDS SCREW LENGTH (AS MEASURED): 1-1/2"

LOAD	DEFLECTION					
	TEST NO. 1		TEST NO. 2		TEST NO. 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
500	0.001	0.001	0.003	0.003	0.005	0.003
1000	0.003	0.002	0.010	0.020	0.015	0.011
1500	0.006	0.007	0.021	0.031	0.026	0.019
2000	0.012	0.015	0.037	0.045	0.031	0.025
2500	0.018	0.025	0.059	0.059	0.034	0.030
3000	0.024	0.032	0.072	0.098	0.045	0.035
3500	0.027	0.064			0.061	0.041
LOAD AT 1/8" DEFLECTION	3990		3420		3560	
ULTIMATE LOAD	3990		4370		3560	
FAILURE MODE	Block broke.		Block broke.		Block broke.	
RAFTER AVERAGE MOISTURE	24		22		20	
ELAPSED TIME TO 1/8"	4:20		3:02		3:45	
TOTAL ELAPSED TIME TO ULTIMATE	4:20		4:14		3:45	

LEAST VALUE AT 1/8" DEFLECTION (3420) /2 = 1710#
LOWEST ULTIMATE (3560) /2/ 3 = 593# (Factor of Safety = 3)
AVERAGE ULTIMATE (3973) /2 = 1987#

DEFLECTION GAUGE: 545967, 550230
LOAD CELL: 410970
MOISTURE METER: Mini LIGNO XL/C - Lignomat

WITNESS (S) PRESENT: J. Sandoval, M. Nguyen, S. Yim

Testing Engineers, Inc.
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Photo 2: Typical View of Test Failure

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4470_Text_HM9 Test_4.png

Date Submitted	4/2/2010	**Section**	611.8.1.6	**Proponent**	Randall Shackelford
Chapter	6	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Similar proposal to 611.8.1.4

Summary of Modification

Changes fastener specification for connector to that recommended by the manufacturer.

Rationale

This change is to modify the fastener in the 500 pound connector so that it is installed with the fastener that is recommended by the manufacturer to achieve 500 pounds. As a prescriptive requirement, the 2-1/2" masonry screw is left in. In most cases, this will allow shorter fasteners to be used. See the test attached that uses 2-1/4" screws

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact. Existing requirement is left as an alternate

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

Cost may be lowered when manufacturer recommends use of a shorter masonry screw.

Impact to industry relative to the cost of compliance with code

Cost may be lowered when manufacturer recommends use of a shorter masonry screw.

Requirements

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

Yes. Will ensure that connectors used for wind retrofits are installed in accordance with manufacturer's recommendations.

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

Improves the code, allows more economical products that still meet code load requirements. Will ensure that connectors used for wind retrofits are installed in accordance with manufacturer's recommendations.

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

Does not discriminate against any materials.

Does not degrade the effectiveness of the code

Does not degrade effectiveness of the code. Connector will still have to be rated for 500 pounds

611.8.1.6 Prescriptive method for hip roofs on a masonry wall. Unless it is possible to verify through non-destructive inspection or from plans prepared by a design professional that the roof structure is anchored at least as well as outlined below, access shall be provided at a minimum to the hip rafter (commonly known as a "king jack"), to the hip girder and at each corner of the hip roof. The hip rafter (commonly known as a "king jack"), the hip girder and the rafters/trusses adjacent to the hip girder that are not anchored with a strap having at least four fasteners on each end, shall be connected to the concrete masonry wall below using approved straps or right angle gusset brackets with a minimum uplift capacity of 500 lbs. Adding fasteners to existing straps shall be allowed in lieu of adding a new strap provided the strap is manufactured to accommodate at least 4 fasteners at each end. The straps or right angle gusset brackets shall be installed such that they connect each rafter or truss to the top plate below or directly to the masonry wall using approved masonry screws of a length and diameter recommended by the manufacturer. In the absence of manufacturer's recommendations, screws shall ~~that will~~ provide at least a 2-1/2 inches embedment into the concrete or masonry. When the straps or right angle gusset brackets are attached to a wood sill plate, the sill plate shall be anchored to the concrete masonry wall below. This anchorage shall be accomplished by installing ¼-inch diameter masonry screws, each with supplementary ¼-inch washer, with sufficient length to develop a 2-1/2 inch embedment into the concrete and masonry. These screws shall be installed within 4-inches of the truss or rafter on both sides of each interior rafter or truss and on the accessible wall side of the gable end truss or rafter

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Testing Engineers, Inc.

Quality Assurance Services
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Since 1954

September 2, 1999

TEI Project No.: 99001.137
Simpson Test No.: H311

Mr. Gregg Summers, P.E., Manager of Testing
Simpson Strong-Tie Company, Inc.
4637 Chabot Drive, Suite 200
Pleasanton, CA 94588

SUBJECT: Simpson Strong-Tie H9M Attached to CMU – Uplift Test (HM9)

Dear Mr. Summers:

In accordance with your request, we witnessed the tests described below at the Simpson Strong-Tie R&D facility located at 2955 Merced Street, San Leandro, on September 1, 1999.

TEST SAMPLES

According to Simpson Strong-Tie material specifications, the H9M is made from 18-gauge (0.0468") G60 galvanized ASTM A653 steel with a minimum yield strength of 28 ksi and a minimum ultimate strength of 38 ksi. The samples tested conformed to the attached production drawing H9, dated 6/10/99. Connectors, fasteners and lumber were randomly selected from existing stock. Note: H9M has the same configuration as H9.

TEST ASSEMBLY

An H9M was attached to an 8" x 8" x 16" grout-filled CMU block with five 1/4" x 2-1/4" Titen Masonry screws and the upper half of the connector was attached to a 1-1/2" x 7-1/2" x 42" Douglas Fir rafter with four SDS ¼" x 1-1/2" screws. The average compressive strength of the grout was 2680 psi at the time of the test; see attached compressive test report. The test assembly is shown in the attached detail drawing and photos and the fastener schedule is listed in the attached table.

PROCEDURE

Each test assembly was placed inverted on the bed of a Dake 75-ton testing machine. The blocks were supported above the test bed. Dial indicators accurate to 0.001" were mounted on the test blocks to measure deflection of the rafter. The load was applied at 0.035"/min.±50% and gauge readings were recorded at 500-pound intervals until a deflection of 0.125" was reached. The load was increased at the same rate until failure.

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RESULTS

The results are tabulated on the enclosed Table A.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned.

TEI CONSULTING ENGINEERS

Sokho Yim
Staff Engineer

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
PAUL E. COX
No. C045152
Exp.
CIVIL
STATE OF CALIFORNIA

Paul Cox
C.E. No. 45152, Exp. 09-30-02

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Simpson Strong-Tie Company, Inc.
Mr. Gregg Summers
Page 3

TEI Project No.: 99001.137
September 2, 1999

SIMPSON TEST # H311 TABLE A DATE OF TEST: 9-1-99

SUBJECT: H9M - Uplift Test

SPECIMEN GAUGE: 18 THICKNESS (AS MEASURED, INCLUDING GALVANIZING): 0.046"

TOP PLATES: 8" x 8" x 16" CMU, Grout-Filled
RAFTER: 1-1/2" x 7-1/2" x 42" Douglas Fir

TOP PLATE FASTENERS: (5) Titen 1/4" x 2-1/4"
RAFTER FASTENERS: (4) SDS 1/4" x 1-1/2"

TITEN SCREW DIAMETER (AS MEASURED): 0.243"
TITEN SCREW LENGTH (AS MEASURED): 2-1/4"

SDS SCREW DIAMETER (AS MEASURED): 0.251"
SDS SCREW LENGTH (AS MEASURED): 1-1/2"

LOAD	DEFLECTION					
	TEST NO. 1		TEST NO. 2		TEST NO. 3	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
500	0.001	0.001	0.003	0.003	0.005	0.003
1000	0.003	0.002	0.010	0.020	0.015	0.011
1500	0.006	0.007	0.021	0.031	0.026	0.019
2000	0.012	0.015	0.037	0.045	0.031	0.025
2500	0.018	0.025	0.059	0.059	0.034	0.030
3000	0.024	0.032	0.072	0.098	0.045	0.035
3500	0.027	0.064			0.061	0.041
LOAD AT 1/8" DEFLECTION	3990		3420		3560	
ULTIMATE LOAD	3990		4370		3560	
FAILURE MODE	Block broke.		Block broke.		Block broke.	
RAFTER AVERAGE MOISTURE	24		22		20	
ELAPSED TIME TO 1/8"	4:20		3:02		3:45	
TOTAL ELAPSED TIME TO ULTIMATE	4:20		4:14		3:45	

LEAST VALUE AT 1/8" DEFLECTION (3420) /2 = 1710#
LOWEST ULTIMATE (3560) /2/ 3 = 593# (Factor of Safety = 3)
AVERAGE ULTIMATE (3973) /2 = 1987#

DEFLECTION GAUGE: 545967, 550230
LOAD CELL: 410970
MOISTURE METER: Mini LIGNO XL/C - Lignomat

WITNESS (S) PRESENT: J. Sandoval, M. Nguyen, S. Yim

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http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4471_Text_HM9 Test_3.png



Photo 2: Typical View of Test Failure

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4471_Text_HM9 Test_4.png

Sub Code: Residential

S4014

Date Submitted	3/28/2010	**Section**	202 Accessible	**Proponent**	J Glenn-BASF
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language as it provides better direction

Rationale

The extra wording is not needed. Accessible, Readily show for information to help to make the distinction between to two.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

No chage

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

ACCESSIBLE. ~~Having access to but which first may require the removal of a panel, door or similar covering of the item described (see Readily Accessible)~~ Signifies access that requires the removal of an access panel or similar removable obstruction.

-

(FYI) ACCESSIBLE, READILY. Signifies access without the necessity for removing a panel or similar obstruction.

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S4015

Date Submitted	3/28/2010	**Section**	202 Basic wind speed	**Proponent**	J Glenn-BASF
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language as it provides better direction.

Rationale

The wording is per the base code and provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local enforcement is created by this change

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

Noe

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

BASIC WIND SPEED. Three-second gust speed at 33 feet (10,058 MM) above the ground in Exposure C as given in Figure R301.2(4).

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4015_TextOfModification_1.png

S4110

Date Submitted	3/30/2010	**Section**	R202	**Proponent**	Joseph Belcher
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarifies terms related to roofs and to open areas. Current language has caused confusion at the permitting phase of sunroom construction projects.

Rationale

The term “structural “used with roof panel causes confusion. Some say composite or metal roof panels are not structural and claim it is not a sunroom. The substitution of the term solid clarifies and has no impact on the definition. Likewise, the term open results in confusion regarding if glass is permitted in sunrooms. The whole intent of sunrooms is a large glassed area. Language is added clarifying the term open area refers to glazed openings of operable or fixed glass windows or doors.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The changes are to clarify the definition and pose no impact on the cost of compliance relative to the enforcement of the code.

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

The changes are to clarify the definition and pose no impact on the cost of compliance relative to the building and property owners.

Impact to industry relative to the cost of compliance with code

The changes are to clarify the definition and pose no impact on the cost of compliance relative to the industry and may result in savings due to faster turn-around on permit applications.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public by clarifying terms for a popular method of providing additional recreational space to the homeowner.

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

The proposal improves the code by clarifying terms which experience has demonstrated cause confusion during the permitting phase for a popular method of construction providing additional conditioned or unconditioned recreational space to the homeowner.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by clarifying terms which experience has demonstrated cause confusion during the permitting phase for a popular method of construction providing additional conditioned or unconditioned recreational space to the homeowner.

SUNROOM

1. A room with roof panels that include sloped glazing that is a one-story structure added to an existing dwelling with an open or glazed area in excess of 40 percent of the gross area of the sunroom structure's exterior walls and roof.

2. A one-story structure added to a dwelling with ~~structural~~ solid roof panels without sloped glazing. The sunroom walls may have any configuration, provided the open areas with operable or fixed glass or windows or side hinged or sliding glass doors of the longer wall and one additional wall is equal to at least 65 percent of the area below 6 foot 8 inches of each wall, measured from the floor. For the purposes of this code the term sunroom as used herein shall include conservatories, sunspaces, solariums, and porch or patio covers or enclosures

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4110_TextOfModification_1.png

Date Submitted	3/31/2010	**Section**	301.2.1.4.3	**Proponent**	J Glenn-BASF
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Language is redundant as the exposure categories are previously defined

Rationale

The wording is defined in the previous section

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

No change

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

The wording is defined in the previous section

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

R301.2.1.4.3 Exposure categories. An exposure category shall be determined in accordance with the following:

1. Exposure B. Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the upwind direction for a distance of at least 2,600 feet (792 m) or 20 times the height of the building, whichever is greater.

Exception: For buildings whose mean roof height is less than or equal to 30 feet (9144 mm), the upwind distance is permitted to be reduced to 1,500 feet (457 m).

2. Exposure C. Exposure C shall apply for all cases where Exposure B does not apply.Buildings located within a distance of 600 feet of inland bodies of water that present a fetch of 1 mile (1.61 km) or more or inland waterways or rivers with a width of 1 mile (1.61 km) or more shall be classified as Exposure C and roof sheathing uplift and roof-to-wall uplift loads shall be increased by 20 percent.

3. Exposure D. This exposure category is not applicable in Florida.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4196_TextOfModification_1.png

Date Submitted	3/31/2010	**Section**	301.2	**Proponent**	T Stafford
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal updates the component and cladding loads table for consistency with ASCE 7-05.

Rationale

The proposal simply updates the component and cladding wind pressures prescribed by the FBCR to the current requirements in ASCE 7-05. The component and cladding loads have undergone some changes over the last few update cycles of ASCE 7. However, these changes were not picked up by the FBCR. This proposal simply seeks consistency with the base design requirements of the FBCB and the FBCR.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This modification will benefit local entities with enforcement of the code as it makes the component and cladding loads in the FBCR consistent with ASCE 7-05.

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

This modification will have a negligible impact to building and property owners with respect to compliance with the code.

Impact to industry relative to the cost of compliance with code

This modification will have a negligible impact to industry with respect to compliance with the code.

Requirements

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

This modification benefits the health, safety, and welfare of the general public by specifying updated component and cladding pressures that are consistent with ASCE 7-05.

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

This modification strengthens the code by specifying component and cladding loads that are consistent with the base wind design standard.

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

The proposed language is performance based and therefore does not discriminate against any other material, product, method, or system of construction.

Does not degrade the effectiveness of the code

This modification improves the effectiveness of the code by specifying component and cladding loads that are consistent with the base wind design standard.

Delete Existing Table R301.2(2) and Figure R301.2(7) and replace with the following

TABLE R301.2(2)

COMPONENT AND CLADDING LOADS FOR A BUILDING WITH A MEAN ROOF HEIGHT OF 30 FEET LOCATED IN EXPOSURE B (psf)[a,b,c,d,e]

	Zone	Effective wind area (sf)	Basic Wind Speed V (mph)																	
			85		90		100		110		120		130		140		150		170	
Roof 0 to 7 degrees	1	10	5.3	-13.0	5.9	-14.6	7.3	-18.0	8.9	-21.8	10.5	-25.9	12.4	-30.4	14.3	-35.3	16.5	-40.5	21.1	-52.0
	1	20	5.0	-12.7	5.6	-14.2	6.9	-17.5	8.3	-21.2	9.9	-25.2	11.6	-29.6	13.4	-34.4	15.4	-39.4	19.8	-50.7
	1	50	4.5	-12.2	5.1	-13.7	6.3	-16.9	7.6	-20.5	9.0	-24.4	10.6	-28.6	12.3	-33.2	14.1	-38.1	18.1	-48.9
	1	100	4.2	-11.9	4.7	-13.3	5.8	-16.5	7.0	-19.9	8.3	-23.7	9.8	-27.8	11.4	-32.3	13.0	-37.0	16.7	-47.6
	2	10	5.3	-21.8	5.9	-24.4	7.3	-30.2	8.9	-36.5	10.5	-43.5	12.4	-51.0	14.3	-59.2	16.5	-67.9	21.1	-87.2
	2	20	5.0	-19.5	5.6	-21.8	6.9	-27.0	8.3	-32.6	9.9	-38.8	11.6	-45.6	13.4	-52.9	15.4	-60.7	19.8	-78.0
	2	50	4.5	-16.4	5.1	-18.4	6.3	-22.7	7.6	-27.5	9.0	-32.7	10.6	-38.4	12.3	-44.5	14.1	-51.1	18.1	-65.7
	2	100	4.2	-14.1	4.7	-15.8	5.8	-19.5	7.0	-23.6	8.3	-28.1	9.8	-33.0	11.4	-38.2	13.0	-43.9	16.7	-56.4
	3	10	5.3	-32.8	5.9	-36.8	7.3	-45.4	8.9	-55.0	10.5	-65.4	12.4	-76.8	14.3	-89.0	16.5	-102.2	21.1	-131.3
	3	20	5.0	-27.2	5.6	-30.5	6.9	-37.6	8.3	-45.5	9.9	-54.2	11.6	-63.6	13.4	-73.8	15.4	-84.7	19.8	-108.7
	3	50	4.5	-19.7	5.1	-22.1	6.3	-27.3	7.6	-33.1	9.0	-39.3	10.6	-46.2	12.3	-53.5	14.1	-61.5	18.1	-78.9
	3	100	4.2	-14.1	4.7	-15.8	5.8	-19.5	7.0	-23.6	8.3	-28.1	9.8	-33.0	11.4	-38.2	13.0	-43.9	16.7	-56.4
Roof > 7 to 27 degrees	1	10	7.5	-11.9	8.4	-13.3	10.4	-16.5	12.5	-19.9	14.9	-23.7	17.5	-27.8	20.3	-32.3	23.3	-37.0	30.0	-47.6
	1	20	6.8	-11.6	7.7	-13.0	9.4	-16.0	11.4	-19.4	13.6	-23.0	16.0	-27.0	18.5	-31.4	21.3	-36.0	27.3	-46.3
	1	50	6.0	-11.1	6.7	-12.5	8.2	-15.4	10.0	-18.6	11.9	-22.2	13.9	-26.0	16.1	-30.2	18.5	-34.6	23.8	-44.5
	1	100	5.3	-10.8	5.9	-12.1	7.3	-14.9	8.9	-18.1	10.5	-21.5	12.4	-25.2	14.3	-29.3	16.5	-33.6	21.1	-43.2
	2	10	7.5	-20.7	8.4	-23.2	10.4	-28.7	12.5	-34.7	14.9	-41.3	17.5	-48.4	20.3	-56.2	23.3	-64.5	30.0	-82.8
	2	20	6.8	-19.0	7.7	-21.4	9.4	-26.4	11.4	-31.9	13.6	-38.0	16.0	-44.6	18.5	-51.7	21.3	-59.3	27.3	-76.2
	2	50	6.0	-16.9	6.7	-18.9	8.2	-23.3	10.0	-28.2	11.9	-33.6	13.9	-39.4	16.1	-45.7	18.5	-52.5	23.8	-67.4
	2	100	5.3	-15.2	5.9	-17.0	7.3	-21.0	8.9	-25.5	10.5	-30.3	12.4	-35.6	14.3	-41.2	16.5	-47.3	21.1	-60.8
	3	10	7.5	-30.6	8.4	-34.3	10.4	-42.4	12.5	-51.3	14.9	-61.0	17.5	-71.6	20.3	-83.1	23.3	-95.4	30.0	-122.5
	3	20	6.8	-28.6	7.7	-32.1	9.4	-39.6	11.4	-47.9	13.6	-57.1	16.0	-67.0	18.5	-77.7	21.3	-89.2	27.3	-114.5
	3	50	6.0	-26.0	6.7	-29.1	8.2	-36.0	10.0	-43.5	11.9	-51.8	13.9	-60.8	16.1	-70.5	18.5	-81.0	23.8	-104.0
	3	100	5.3	-24.0	5.9	-26.9	7.3	-33.2	8.9	-40.2	10.5	-47.9	12.4	-56.2	14.3	-65.1	16.5	-74.8	21.1	-96.0
Roof > 27 to 45 degrees	1	10	11.9	-13.0	13.3	-14.6	16.5	-18.0	19.9	-21.8	23.7	-25.9	27.8	-30.4	32.3	-35.3	37.0	-40.5	47.6	-52.0
	1	20	11.6	-12.3	13.0	-13.8	16.0	-17.1	19.4	-20.7	23.0	-24.6	27.0	-28.9	31.4	-33.5	36.0	-38.4	46.3	-49.3
	1	50	11.1	-11.5	12.5	-12.8	15.4	-15.9	18.6	-19.2	22.2	-22.8	26.0	-26.8	30.2	-31.1	34.6	-35.7	44.5	-45.8
	1	100	10.8	-10.8	12.1	-12.1	14.9	-14.9	18.1	-18.1	21.5	-21.5	25.2	-25.2	29.3	-29.3	33.6	-33.6	43.2	-43.2
	2	10	11.9	-15.2	13.3	-17.0	16.5	-21.0	19.9	-25.5	23.7	-30.3	27.8	-35.6	32.3	-41.2	37.0	-47.3	47.6	-60.8
	2	20	11.6	-14.5	13.0	-16.3	16.0	-20.1	19.4	-24.3	23.0	-29.0	27.0	-34.0	31.4	-39.4	36.0	-45.3	46.3	-58.1
	2	50	11.1	-13.7	12.5	-15.3	15.4	-18.9	18.6	-22.9	22.2	-27.2	26.0	-32.0	30.2	-37.1	34.6	-42.5	44.5	-54.6
	2	100	10.8	-13.0	12.1	-14.6	14.9	-18.0	18.1	-21.8	21.5	-25.9	25.2	-30.4	29.3	-35.3	33.6	-40.5	43.2	-52.0
	3	10	11.9	-15.2	13.3	-17.0	16.5	-21.0	19.9	-25.5	23.7	-30.3	27.8	-35.6	32.3	-41.2	37.0	-47.3	47.6	-60.8
	3	20	11.6	-14.5	13.0	-16.3	16.0	-20.1	19.4	-24.3	23.0	-29.0	27.0	-34.0	31.4	-39.4	36.0	-45.3	46.3	-58.1
	3	50	11.1	-13.7	12.5	-15.3	15.4	-18.9	18.6	-22.9	22.2	-27.2	26.0	-32.0	30.2	-37.1	34.6	-42.5	44.5	-54.6
	3	100	10.8	-13.0	12.1	-14.6	14.9	-18.0	18.1	-21.8	21.5	-25.9	25.2	-30.4	29.3	-35.3	33.6	-40.5	43.2	-52.0
Wall	4	10	13.0	-14.1	14.6	-15.8	18.0	-19.5	21.8	-23.6	25.9	-28.1	30.4	-33.0	35.3	-38.2	40.5	-43.9	52.0	-56.4
	4	20	12.4	-13.5	13.9	-15.1	17.2	-18.7	20.8	-22.6	24.7	-26.9	29.0	-31.6	33.7	-36.7	38.7	-42.1	49.6	-54.1
	4	50	11.6	-12.7	13.0	-14.3	16.1	-17.6	19.5	-21.3	23.2	-25.4	27.2	-29.8	31.6	-34.6	36.2	-39.7	46.6	-51.0
	4	100	11.1	-12.2	12.4	-13.6	15.3	-16.8	18.5	-20.4	22.0	-24.2	25.9	-28.4	30.0	-33.0	34.4	-37.8	44.2	-48.6
	4	500	9.7	-10.8	10.9	-12.1	13.4	-14.9	16.2	-18.1	19.3	-21.5	22.7	-25.2	26.3	-29.3	30.2	-33.6	38.8	-43.2
	5	10	13.0	-17.4	14.6	-19.5	18.0	-24.1	21.8	-29.1	25.9	-34.7	30.4	-40.7	35.3	-47.2	40.5	-54.2	52.0	-69.6
	5	20	12.4	-16.2	13.9	-18.2	17.2	-22.5	20.8	-27.2	24.7	-32.4	29.0	-38.0	33.7	-44.0	38.7	-50.5	49.6	-64.9
	5	50	11.6	-14.7	13.0	-16.5	16.1	-20.3	19.5	-24.6	23.2	-29.3	27.2	-34.3	31.6	-39.8	36.2	-45.7	46.6	-58.7
	5	100	11.1	-13.5	12.4	-15.1	15.3	-18.7	18.5	-22.6	22.0	-26.9	25.9	-31.6	30.0	-36.7	34.4	-42.1	44.2	-54.1

NOTES:

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a. The effective wind area shall be equal to the span length multiplied by an effective width. This width shall be permitted to be not be less than one-third the span length. For cladding fasteners, the effective wind area shall not be greater than the area that is tributary to an individual fastener.

b. For effective areas between those given above, the load may be interpolated; otherwise, use the load associated with the lower effective area.

c. Table values shall be adjusted for height and exposure by multiplying by the adjustment coefficient in Table R301.2(3).

d. See Figure R301.2(7) for location of zones.

e. Plus and minus signs signify pressures acting toward and away from the building surfaces.

f. Positive design wind pressures shall not be less than +10 psf and negative design wind pressures shall not be less than -10 psf.

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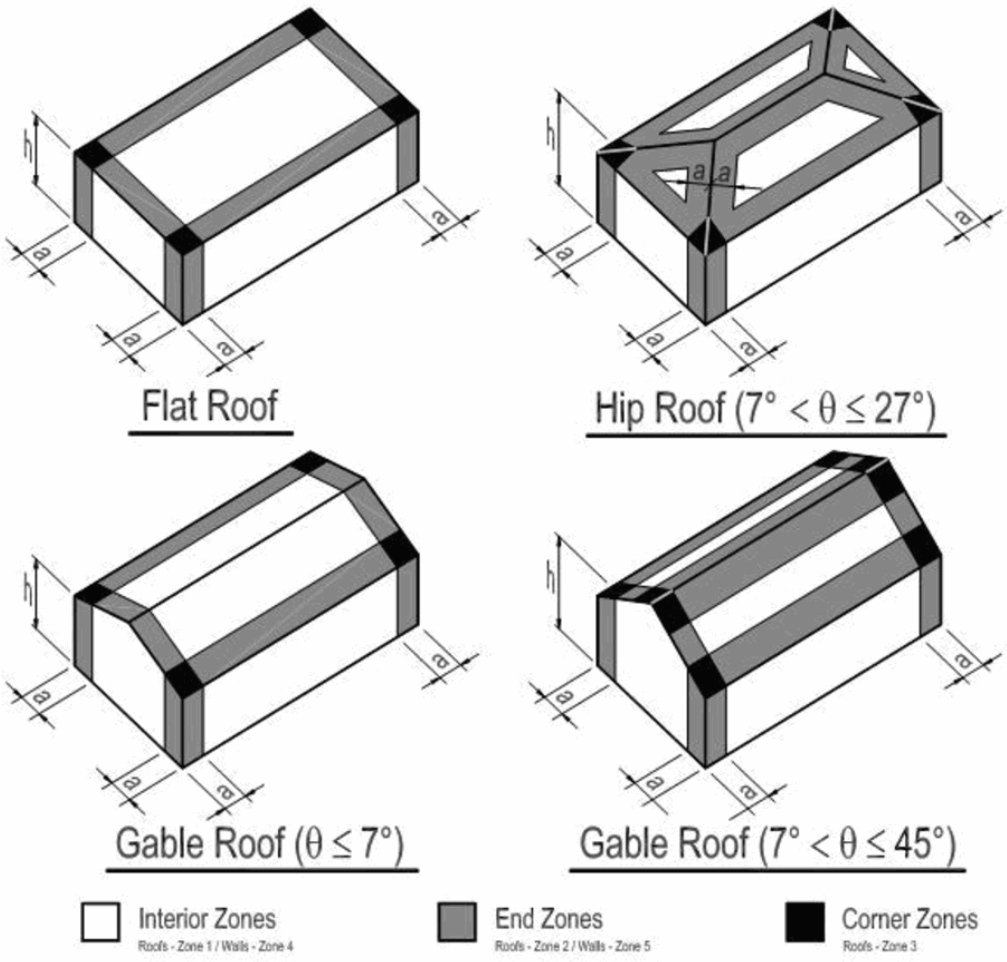


Figure R301.2(7)

Component and Cladding Pressure Zones

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S4118

Date Submitted	3/30/2010	**Section**	316.5.12	**Proponent**	J Glenn-BASF
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language

Rationale

The base code change provides more specific direction and restores the Florida Code to the nationally accepted practice.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

none

Requirements

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

No change

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

The base code (IRC) change provides more specific direction and restores the Florida Code to the nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**R316.5.12 Sheathing.** Foam plastic insulation used as sheathing, as referenced in Table R703.4, shall comply with Sections R316.3 and Section R316.4. Where the foam plastic sheathing is used at a gable and is exposed to the attic space, the provisions of Section R316.5.3 shall apply.~~

R316.5.12 Sheathing. Foam plastic insulation used as sheathing shall comply with Section R316.3 and Section R316.4. Where the foam plastic sheathing is exposed to the attic space at a gable or kneewall, the provisions of Section R316.5.3 shall apply.

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Date Submitted	3/30/2010	**Section**	318.4	**Proponent**	J Glenn-BASF
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language

Rationale

The base code change provides more specific direction and restores the Florida Code to the nationally accepted practice.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

none

Requirements

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

No change

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

The base code change provides more specific direction and restores the Florida Code to the nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**R318.5.4 Foam plastic protection.** Extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).~~

~~Exceptions:~~

~~1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or pressure-preservative-treated wood.~~

~~2. When in addition to the requirements of Section R320.1, an approved method of protecting the foam plastic and structure from subterranean termite damage is used.~~

~~3. On the interior side of basement walls.~~

-

R318.4 Foam plastic protection. In areas where the probability of termite infestation is "very heavy" as indicated in Figure R301.2(6), extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or pressure-preservative-treated wood.

2. When in addition to the requirements of Section R318.1, an approved method of protecting the foam plastic and structure from subterranean termite damage is used.

3. On the interior side of basement walls.

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Date Submitted	3/25/2010	**Section**	R301.1	**Proponent**	Mohammed Shaikh
Chapter	3	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

3457

Summary of Modification

Exception in section R301.1 is proposed to be revised to include Section R406 Foundation Dampproofing and Waterproofing of Non – HVHZ, since there is no provision in HVHZ.

Rationale

Dampproofing and Waterproofing for Foundation is not specified in HVHZ. It is specified in Non-HVHZ section R406. Section R406 can be applicable for HVHZ for uniform application of Dampproofing and Waterproofing.

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

None

Requirements

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

Improves code and uniform application of code thus welfare of people

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

Improves code and uniform application of code

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 degrade

R301.1 Application. Buildings and structures, and all parts thereof, shall be constructed to safely support all loads, including dead loads, live loads, roof loads, flood loads, ~~snow loads,~~ and wind loads ~~and seismic loads~~ as prescribed by this code. The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load-resisting elements to the foundation. Buildings and structures constructed as prescribed by this code are deemed to comply with the requirements of this section.

EXCEPTION: Buildings and structures located within the High Velocity Hurricane Zone shall comply only with Sections R302 to R326, inclusive and the provisions of Chapter R44 and section R406.

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Date Submitted	4/2/2010	**Section**	R301.2.1.1	**Proponent**	Joseph Belcher
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Updates the name of the organization responsible for the document.

Rationale

The document has been taken over by the Masonry Association of Florida from the Florida Concrete and Products Association.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No cost impact.

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

No cost impact.

Impact to industry relative to the cost of compliance with code

No cost impact.

Requirements

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

The change updates the title to reflect the organization responsible for its maintenance.

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

The change updates the title to reflect the organization responsible for its maintenance.

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

The change updates the title to reflect the organization responsible for its maintenance.

Does not degrade the effectiveness of the code

The change updates the title to reflect the organization responsible for its maintenance.

R301.2.1.1 Design criteria. Construction in regions where the basic wind speeds from Figure R301.2(4) equal or exceed 100 miles per hour (45 m/s) shall be permitted to be designed in accordance with one of the following:

Change to Number 6 only.

6. The ~~FC&PA~~ MAF Guide to Concrete Masonry Residential Construction in High Wind Areas shall be permitted for applicable concrete masonry buildings for a basic wind speed of 130 mph (58 m/s) or less in Exposure B and 110 mph (49 m/s) or less in Exposure C in accordance with Figure R301.2(4);

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Date Submitted	4/2/2010	**Section**	R301.2.4.1, R322.1.1	**Proponent**	Christopher Jones
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

4406

related proposal submitted just for Coastal A Zone.

Summary of Modification

Allow use of ASCE 24 as an alternative in any flood hazard area, including A zones (see R322.2).

Rationale

Commission adopted Flood Resistant Standards Workgroup recommendation to "2. Adopt ASCE 24 by reference as the flood provisions in each of the codes" which is consistent w/ Hurricane Research Advisory Committee (May 05) to "Adopt ASCE 24-05 for elevation rqmts and flood resistant materials, equip."

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact because the provision allows – does not require – use of ASCE 24 as alternative to the prescriptive provisions of R322.2.

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

None, or positive, impact. Provision is an alternative, not a requirement. Where alternate is employed, 2006 and 2008 studies for FEMA have shown benefits (to owners) of freeboard required by ASCE 24 exceed costs of providing that freeboard.

Impact to industry relative to the cost of compliance with code

No impact. Provision is an alternate, not a requirement.

Requirements

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

Achieves protection of health, safety, and welfare of the general public, in all flood hazard areas.

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

Electing to construct according to ASCE 24 provides improved methods and systems of construction in areas subject to flooding.

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

Materials, products, methods, and systems that comply with local floodplain management ordinances are not affected by this proposed modification.

Does not degrade the effectiveness of the code

Improves effectiveness of the code by clarifying the specific intent of the provision.

1st Comment Period History 04/15/2010 - 06/01/2010

S4404-G1

Proponent	Joy Duperault	**Submitted**	5/27/2010	**Attachments**	No

Comment:

The FL Division of Emergency Management, Floodplain Management Office, recommends support for this proposal. This change only offers an alternative, which both designers and code officials made deem appropriate in some areas, for example where the flood depths or velocities are expected to be relatively high in which case prescriptive solutions may not be as applicable.

R301.2.4.1 Alternative provisions. As an alternative to the requirements in Section R322.2~~3~~ for buildings and structures located in whole or in part in flood hazard areas (A Zones) or the requirements of Section 322.3 in coastal high-hazard areas (V Zones), ASCE 24 is permitted subject to the limitations of this code and the limitations therein.

R322.1.1 Alternative provisions. As an alternative to the requirements in Section R322.2 ~~.3~~ for buildings and structures located in whole or in part in flood hazard areas (A Zones) or the requirements of Section 322.3 in coastal high-hazard areas (V Zones), ASCE 24 is permitted subject to the limitations of this code and the limitations therein.

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Date Submitted	3/26/2010	**Section**	R322.2.4 and R322.3.3.1 (new)	**Proponent**	Rebecca Quinn
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Florida-specific modifications to the flood provisions retained in the residential code, to add provisions for pools that are found in Appendix G of the IRC. The Workgroup recommended moving the provisions into the body of the code.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IRC flood provisions IBC and make Florida-specific amendments. IRC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for R322 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

R322.2.4 Pools in flood hazard areas. Pools that are located in flood hazard areas established by Table R301.2(1), including above-ground pools, on-ground pools, and in-ground pools that involve placement of fill, shall comply with Sections R322.2.4.1 or RB322.2.4.2.

Exception: Pools located in riverine flood hazard areas which are outside of designated floodways.

R322.2.4.1 Pools located in designated floodways. Where pools are located in designated floodways, documentation shall be submitted to the building official, which demonstrates that the construction of the pool will not increase the design flood elevation at any point within the jurisdiction.

R322.2.4.2 Pools located where floodways have not been designated. Where pools are located where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction.

R322.3.3.1 Pools. Pools in coastal high-hazard areas shall be designed and constructed in conformance with ASCE 24.

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Date Submitted	4/2/2010	**Section**	R322.3.3	**Proponent**	Christopher Jones
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Add NFIP-requirement that elevated buildings in V zones are to have the area underneath “free of obstruction.”

Rationale

NFIP regs §60.3(e)(5) require space below elevated buildings either be free of obstruction or have breakaway walls (R322.3.4). Obstructions increase loads on foundations and contribute to debris load. NFIP’s guidance is Technical Bulletin #5 (2008). ICC approved in Baltimore for 2012 IRC (RB68).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to Florida’s communities that participate in the NFIP and administer floodplain management ordinances consistent with the NFIP regulations (44 CFR 60.3).

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

No impact. Owners must comply with local floodplain management ordinances adopted by Florida communities.

Impact to industry relative to the cost of compliance with code

No impact. Compliance with local floodplain management ordinances adopted by Florida communities is not affected.

Requirements

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

Achieves protection of health, safety, and welfare of the general public, the same bases for adoption and enforcement of local floodplain management ordinances.

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

Clarifies code requirements for areas below elevated buildings in high hazard (V zone) areas.

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

Materials, products, methods, and systems that comply with local floodplain management ordinances are not affected by this proposed modification.

Does not degrade the effectiveness of the code

Improves effectiveness of the code by clarifying the specific intent of the provision.

1st Comment Period History 04/15/2010 - 06/01/2010

S4395-G1

Proponent Joy Duperault **Submitted** 5/27/2010 **Attachments** No

Comment:

The FL Division of Emergency Management, Floodplain Management Office, recommends support for this proposal. This is not a new requirement. Communities with V Zones on their FIRMs already have the "free of obstruction" requirement in their floodplain management ordinances.

1st Comment Period History 04/15/2010 - 06/01/2010

S4395-G2

Proponent Jack Glenn **Submitted** 6/1/2010 **Attachments** No

Comment:

While the change has been approved for inclusion in the 2012 I-code it should be considered in the next FBC edition.

R322.3.3 Foundations. Buildings and structures erected in coastal high-hazard areas shall be supported on pilings or columns and shall be adequately anchored to those pilings or columns. The space below the elevated building shall be either free of obstruction or, if enclosed with walls, the walls shall meet the requirements of Section R322.3.4. Pilings shall have adequate soil penetrations to resist the combined wave and wind loads (lateral and uplift). Water loading values used shall be those associated with the design flood. Wind loading values shall be those required by this code. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile systems design and installation shall be certified in accordance with Section R322.3.6. Mat, raft or other foundations that support columns shall not be permitted where soil investigations that are required in accordance with Section R401.4 indicate that soil material under the mat, raft or other foundation is subject to scour or erosion from wave-velocity flow conditions. Slabs, pools, pool decks and walkways shall be located and constructed to be structurally independent of buildings and structures and their foundations to prevent transfer of flood loads to the buildings and structures during conditions of flooding, scour or erosion from wave-velocity flow conditions, unless the buildings and structures and their foundation are designed to resist the additional flood load.

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Date Submitted	3/25/2010	**Section**	R703.1.1	**Proponent**	Joseph Belcher
Chapter	7	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

R617 Mod #3858 Adds manufactured soffit labeling requirements.

Summary of Modification

Provids reference to new labeling requirements.

Rationale

The proposal will help assure compliance with the newly proposed labeling provisions by providing a cross reference. The hurricanes of 2004 revealed a very weak link in the building water intrusion resistance system, soffits. Severe water damage was repeatedly caused by rain blown in through eaves where the soffit was blown out or dislodged. In most cases the storms were below design wind speeds. The referenced section contains changes embodying recommendations of the Soffit Work Group.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal will help assure compliance with the newly proposed labeling by providing a reference to those requirements. Labeling will make the job of local enforcement easier to perform as they will have documentation to check the installation against.

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

There will be no impact on cost as the proposal is merely a reference to another section of the code.

Impact to industry relative to the cost of compliance with code

There will be no impact as the proposal is merely a reference to another section of the code.

Requirements

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

The proposal will benefit the public by making certain provisions improving the ability of soffits to resist water intrusion are not overlooked in the building design.

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

The proposal strengthens the code by helping to make certain requirements improving the ability of soffits to resist water intrusion are not overlooked in the building design.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by addressing a known weak area in the weather resistance provisions of the code.

R703.1.1 Load resistance. All exterior walls, wall coverings and soffits shall be capable of resisting the design pressures specified in Table R301.2(2) for walls. Manufactured soffits shall be labeled in accordance with Section R617 of this code.

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Date Submitted	3/29/2010	**Section**	802.1.6.3	**Proponent**	J Glenn-BASF
Chapter	8	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain the base code (IRC) language.

Rationale

Utilize the base code as it provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

Alternate Language

1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Jim Vogt **Submitted** 5/17/2010 **Attachments** Yes

S4046-A1

Rationale

Updates the reference to the current edition of the document and harmonizes text in section R802.1.6.3 with that of Section R802.10.3 of the 2012 IRC. The document titled, “BCSI 1-03” was shortened to “BCSI” in 2006. The Structural Building Components Association, which includes the Wood Truss Council, tried to incorporate this change into the 2009 IRC. Unfortunately this revision was included with a proposal that also introduced several new terms that were not defined in the IRC. As a res

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No fiscal impact to local enforcement is created by this change.

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

None

Requirements

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

No Change

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

Brings Florida in-line with most current nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

R802.1.6.3 [IRC R802.10.3] Bracing. Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the construction documents for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with ~~TPI/WTCA BCSI~~ the Building Component Safety Information (BCSI 1-03) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses.

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R802.1.6.3 [IRC R802.10.3] Bracing. Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the construction documents for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as, ~~TPI/WTCA BCSI~~ the Building Component Safety Information (BCSI ~~1-03~~) Guide to Good Practice for Handling, Installing, Restraining & Bracing of Metal Plate Connected Wood Trusses.

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RB96-09/10

Committee Action: **Approved as Modified**

Modify the proposal as follows:

R502.11.2 Bracing. Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the *construction documents* for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as, the Building Component Safety Information (BCSI) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses.

R505.1.3 Floor trusses. Cold-formed steel trusses shall be designed, braced and installed in accordance with AISI S100, Section D4. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as, the Cold-Formed Steel Building Component Safety Information (CFSBCSI), Guide to Good Practice for Handling, Installing & Bracing of Cold-Formed Steel Trusses. Truss members shall not be notched, cut or altered in any manner without an *approved* design.

R802.10.3 Bracing. Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the *construction documents* for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as, the Building Component Safety Information (BCSI) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses.

R804.3.7 Roof trusses. Cold-formed steel trusses shall be designed and installed in accordance with AISI S100, Section D4. In the absence of specific bracing requirements, trusses shall be braced in accordance with accepted industry practices, such as, the Cold-Formed Steel Building Component Safety Information

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(CFSBCSI), Guide to Good Practice for Handling, Installing & Bracing of Cold-Formed Steel Trusses. Trusses shall be connected to the top track of the load-bearing wall in accordance with Table R804.3, either with two No.10 screws applied through the flange of the truss or by using a 54 mil (1.37 mm) clip angle with two No.10 screws in each leg.

Committee Reason: Based on the proponent's published reason. The modification clarifies these documents are acceptable industry practice with respect to bracing of trusses.

Assembly Action: **None**

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Date Submitted	3/29/2010	**Section**	804.1.1	**Proponent**	J Glenn-BASF
Chapter	8	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language.

Rationale

Utilizes base code language as it provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

R804.1.1 Applicability limits. The provisions of this section shall control the construction of cold-formed steel roof framing for buildings not greater than 60 feet (18 288 mm) ~~in length~~ perpendicular to the joist, rafter or truss span, not greater than ~~36~~40 feet (12 192 mm) in width parallel to the joist span or truss, less than or equal to three stories above grade plane ~~with each story not greater than 10 feet (3048 mm) high~~and with roof slopes not less than 3:12 (25-percent slope) or greater than 12:12 (100 percent slope). Cold-formed steel roof framing constructed in accordance with the provisions of this section shall be limited to sites subjected to a maximum design wind speed of 110 miles per hour (49 m/s), Exposure B or C ~~and a maximum ground snow load of 70 pounds per square foot (3350 Pa).~~

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Date Submitted	3/31/2010	**Section**	1.0	**Proponent**	Paul Coats
Chapter	43	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted

Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal updates referenced AF&PA standards to their current editions.

Rationale

This proposal updates referenced AF&PA standards to their current editions; PWF-07 replaces T.R. 7 and also the AF&PA-87 Manual; the current edition of the WFCM is '01, reference to an '08 edition in the IRC is an error; others are updates without significant technical changes.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Will enable local entity to enforce current standards.

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

No significant cost impact.

Impact to industry relative to the cost of compliance with code

No significant cost impact.

Requirements

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

Referencing of current and up-to-date standards is essential to health, safety, and welfare.

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

Referencing of current standards improves and strengthens the code.

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

These standards are appropriate to material and do not discriminate.

Does not degrade the effectiveness of the code

Improves the effectiveness of the code.

AFPA American Forest and Paper Association (American Wood Council Division) 1111 19th Street, NW, #800 Washington, DC 20036

Standard reference number	Title	Referenced in code section number
NDS—05	National Design Specification (NDS) for Wood Construction with 2001 Supplement	R404.2.2, R502.2, Table R503.1, R602.2, R802.2, R4404.7.1.8.1, R4409.1.4.7, R4409.2.4.1, R4409.6.17.2.1.3, R4409.6.17.2.1.3, R4409.6.17.2.1.5
AFPA—~~01~~ 05	Design Values for Wood Construction	R4409.1.4.7, R4409.6.17.2.2.1
~~AFPA—87~~	~~All-Weather Wood Foundation System, Design, Fabrication, Installation Manual~~	~~R4409.1.4.7~~
AFPA—92	Wood Structural Design Data	R4409.1.4.7
AFPA—~~93?~~ 05	~~Working stresses for Joists and Rafters~~ Design Values for Joists and Rafters	R4409.1.4.7
AFPA—~~93~~ 05	Span Tables for Joists and Rafters	R502.2.2, R802.2.2, R802.2.3, R4409.1.4.7, R4409.4.1.1
~~T.R. No. 7—87~~	~~Basic Requirements for Permanent Wood Foundation System~~ PWF--07 Permanent Wood Foundation (PWF) Design Specification	R401.1, R4409.1.4.7
WCD 1—01	Wood Construction Data No. 1, Details for Conventional Wood Frame Construction	R4409.1.4.7
WCD 4—03	Wood Construction Data number 4, Plank and Beam Framing for Residential Building	4409.1.4.7
WCD 5—04	Wood Construction Data No. 5, Heavy Timber Construction Details	R4409.1.4.7

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WCD 6—~~01~~ 06 Wood Construction Data No.6, Design of Wood Frame structures for Permanence R4409.1.4.7, R4409.13.2.11

WFCM— ~~08~~ 01 Wood Frame Construction Manual for One- and Two-family Dwellings R301.2.1.1, R404.1.4, R614.2.5, R614.3.1, R802.2, R4409.1.4.7

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Date Submitted	3/26/2010	**Section**	4301	**Proponent**	Rebecca Quinn
Chapter	43	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Florida-specific modifications related to retaining flood provisions of the I-Codes. This mod updates a reference to a FEMA publication and conforms the form of the references to the I-Codes.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IRC flood provisions IBC and make Florida-specific amendments. IRC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for R322 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

Chapter 43 Referenced Standards

FEMA **Federal Emergency Management Agency**

500 C Street, SW

Washington, DC20472

Standard reference number	Title	Referenced in code section number
FEMA-TB-2-08 ~~TB-2—93~~	Flood Damage-Resistant Materials Requirements	R322.1.8
FEMA ~~FIA~~-TB-11—01	Crawlspace Construction for Buildings Located in Special Flood Hazard Areas	R408.7

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Date Submitted	3/22/2010	**Section**	AISC	**Proponent**	Mohammed Shaikh
Chapter	43	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

3670, 3633, 3638

Summary of Modification

New AISC reference standard is adopted tHirteenth edition manual -2005. This mod. is proposed to delete old manual references

Rationale

Specification for Structural Steel Buildings 360-05 (2005 edition) and Manual of Steel Construction, 2005 Thirteenth edition have been adopted in 2007 FBC code. These modifications are proposed since 360-05 first time combines ASD and LRFD specifications and integrates both methods of designand eliminates ASD and LRFD.

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

None

Requirements

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

Improves code and thus safety

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

Improves code

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

Does not

Does not degrade the effectiveness of the code

Improves code

Alternate Language

1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Mohammed Shaikh **Submitted** 5/16/2010 **Attachments** Yes

S3671-A1

Rationale

The text language used in original mod. is incorrecet This mod. has correct text language.For remaining rationale, see original 3671.

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

None

Requirements

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

Imfproves code and thus safety

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

Improves code

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

Does not descriminate

Does not degrade the effectiveness of the code

Improves code

1st Comment Period History 04/15/2010 - 06/01/2010

S3671-G1

Proponent Mohammed Shaikh **Submitted** 5/18/2010 **Attachments** No

Comment:

ADD "2005" before Thirteenth edition including specification for Structural Steel Buildings 360-05 and provide missing underline.

AISC **American Institute of Steel Construction**

One East Wacker Drive Suite 3100

Chicago, IL 60601-2001

Standard reference number	Title	Referenced in code section number
AISC	Detailing for Steel Construction	R4408.1.3
AISC	Engineering for Steel Construction	R4408.1.3
AISC	Iron and Steel Beams 1873 to 1952	R4408.1.3
~~AISC~~	~~Plastic Design in Steel~~	~~R4408.1.3~~
~~AISC~~	~~Plastic Design of Braced Multistory Steel Frames~~	~~R4408.1.3~~
AISC	Serviceability Design Considerations for Low Rise Buildings	R4408.1.3
~~AISC~~	~~Simple Shear Connection, ASD~~	~~R4408.1.3~~
~~AISC~~	~~Simple Shear Connection, LRFD~~	~~R4408.1.3~~
AISC	Torsional Analysis of Steel Members	R4408.1.3
AISC	Manual of Steel Construction, ~~Allowable Stress Design~~ 2005, Thirteenth edition,including Specification for Structural Steel Buildings	R4408.1.3
~~AISC~~	~~Manual of Steel Construction, Allowable Stress Design LRFD~~	~~R4408.1.3~~

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AISC American Institute of Steel Construction

One East Wacker Drive Suite 3100

Chicago, IL 60601-2001

Standard reference number	Title	Referenced in code section number
AISC	Detailing for Steel Construction	R4408.1.3
AISC	Engineering for SteelConstruction	R4408.1.3
AISC	Iron and Steel Beams 1873 to 1952	R4408.1.3
~~AISC~~	~~Plastic Design in Steel~~	~~R4408.1.3~~
~~AISC~~	~~Plastic Design of MultistorySteelFrames~~	~~R4408.1.3~~
AISC	Serviceability Design Considerations for Low Rise Buildings	R4408.1.3
~~AISC~~	~~Simple Shear Connection, ASD~~	~~R4408.1.3~~
~~AISC~~	~~Simple Shear Connection, LRFD~~	~~R4408.1.3~~ AISC
AISC	Torsional Analysis of Steel Members	R4408.1.3
AISC	Manual of Steel Design ~~Allowable stress design~~	Thirteenth Edition including Specifiction for Structural Steel Building 360-05 R4408.1.3
~~AISC~~	~~Manual of steel design Alloable stress design LRFD edition~~	

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S3586

Date Submitted	3/12/2010	**Section**	Chapter 43	**Proponent**	Dick Wilhelm
Chapter	43	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

S3584

Summary of Modification

Adds FMA/AAMA 100-07, FMA/AAMA 200-09 and FMA/WDMA 250-10 installation protocols to Chapter 43, Referenced Standards.

Rationale

Adding reference standards to Chapter 43 to assist user in gleaning necessary technical information to install and flash windows/doors.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Will positively assist building official/installer in determining prescriptive method of window/door installation.

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

Will result in a positive impact by providing prescriptive language based on consensus for window/door installation.

Impact to industry relative to the cost of compliance with code

Window and exterior door installers who select the protocols may have an additional cost due to sealant and flashing upgrades.

Requirements

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

Adds flashing and installation standards by reference.

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

Improves the code through providing a prescriptive method for fenestration installations in extreme rain/win environments.

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

No discrimination

Does not degrade the effectiveness of the code

No degradation of code.

Chapter 43 - Referenced Standards

Text of Modificaiton:

- FMA/AAMA 100-07 - Standard Practice for the Installation of Windows with Flanges or Mounting Fins in Wood Frame Construction
- FMA/AAMA 200-09 - Standard Practice for the Installation of WIndows with Frontal Flanges for Surface Barrier Masonry Construction for Extreme Wind/Water Conditions
- FMA/WDMA 250-10 - Standard Practice for the Installation of Windows with Non-Frontal Flanges for Surface Barrier Masonry Construction for Extreme Wind/Water Conditions
- AAMA 711-07 - Voluntary Specification for Self-Adhering Flashing used for Installation of Exterior Wall Fenestration Products

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3586_TextOfModification_1.png

Date Submitted	4/1/2010	**Section**	NA	**Proponent**	Chuck Anderson
Chapter	43	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Updates AAMA standards and ASTM impact standards

Rationale

Updates AAMA standards and ASTM Impact standards

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

uses up to date standards

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

none

Requirements

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

updated standards represent the latest and best science

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

updated standards represent the latest and best science

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

no degradation

AAMA

American Architectural Manufacturers Association
1827 Walden Office Square, Suite 550
Schaumburg, IL 60173

Standard reference number	Title	Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A440-08	North American Fenestration Standards/Specifications for Windows, Doors and Skylights	N1102.4.4, R308.6.9, R613.6
450-06 or 450-10	Voluntary Performance Rating Method for Mulled Fenestration Assemblies	R612.11.1
506-06 or 506-08	Voluntary Specifications for Hurricane Impact and Cycle Testing of Fenestration Products	R612.9.1
711-07	Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products	R703.8

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken , PA 19428

Standard reference number	Title	sect
E 1886-~~06~~ 05	Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missles and Exposed to Cyclic Pressure Differentials	
E 1996-06 or -08	Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes	

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4342_TextOfModification_1.png

AAMA

American Architectural Manufacturers Association
1827 Walden Office Square, Suite 550
Schaumburg, IL 60173

Standard reference number	Title	Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A440-08	North American Fenestration Standards/Specifications for Windows, Doors and Skylights	N1102.4.4, R308.6.9, R613.6
450-06 or 450-10	Voluntary Performance Rating Method for Mulled Fenestration Assemblies	R612.11.1
506-06 or 506-08	Voluntary Specifications for Hurricane Impact and Cycle Testing of Fenestration Products	R612.9.1
711-07	Voluntary Specification for Self Adhering Flashing Used for Installation of Exterior Wall Fenestration Products	R703.8

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken , PA 19428

Standard reference number	Title	Referenced in code section number
E 1886-~~06~~ 05	Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missles and Exposed to Cyclic Pressure Differentials	R301.2.1.2, R612.9.1
E 1996-06 or -08	Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes	R301.2.1.2, R612.9.1

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4342_Text_FBC Res REF std_1.png

Date Submitted	4/1/2010	**Section**	R301.2.1.1	**Proponent**	David Miller
Chapter	43	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Updating the 2007 edition of the AAF Guide to Aluminum Construction in High Wind Areas to the 2010 edition

Rationale

Please be referred to attached Adobe Acrobat (pdf).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The proposal brings the AAF Guide to Aluminum Construction in High Wind Areas, 2007, (Guide) into agreement with the revisions to Chapter 20 approved in the 2009 Supplement and will have no impact on the cost to local enforcement entities.

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

The industry estimates no increase in the cost of structures complying with the provisions of the updated Guide.

Impact to industry relative to the cost of compliance with code

The industry estimates no increase in the cost of structures complying with the provisions of the updated Guide.

Requirements

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

The proposal to update the Guide reflects the latest knowledge related to the design of wind resistant aluminum structures.

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

The proposal to update the Guide strengthens and improves the code by incorporating the latest knowledge related to the design of wind resistant aluminum structures.

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

The proposal does not discriminate against materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by providing prescriptive provisions for the construction of wind resistant aluminum structures.

Referenced Standard number: AAF-~~2007~~ 2010

Title: **Guide to Aluminum Construction in High Wind Areas ~~2007~~ 2010**

Publisher's Address: ~~1650 Dixie Hwy, Suite 500 Boca Raton, FL 33432~~

3165 McCrory Place, Suite 185; Orlando, FL 32803

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4291_TextOfModification_1.png

Proposed Modification to the Florida Building Code

Name: David W. Miller
Address: 8455 Beverly Lane, St. Augustine, FL 32092
E-mail: dwm@specialtystructure.com
Phone: 904-260-4242
Fax: 904-260-6797
Code: Residential

Section #: Chapter 43

Rationale:

The proposed change incorporates the addendum approved in the 2009 Supplement which recognized the industry wide adoption of higher strength aluminum extrusion alloys (6005T5 and/or 6061T6 replaced the previous industry standard alloy 6063T6). Additionally, tables have been added to those chapters which involve support to screen surfaces by aluminum extrusions. The 2009 Supplement added to Note g to Table 2002.4 which affords a design pressure multiplier of 0.88 for screen surfaces utilizing less dense screen mesh. Tables were added to the pertinent chapters.

AAF GUIDE TO ALUMINUM CONSTRUCTION IN HIGH WIND AREAS
SYNOPSIS OF 2010 REVISION

With the exception of those items specifically noted below, the book is primarily unchanged.

CHAPTER 1 – SCREEN ENCLOSURES:

Addendum 1.1 which was approved by the Florida Building Commission during the 2008 "Glitch Cycle" has been incorporated into the main body of the volume. In addition, tables were added pertinent to the design pressures associated with the use of 18/14 screen mesh, Table 2002.4 (2009 Amendments).

CHAPTER 2 – SCREEN ROOMS:
Supplements the allowable span tables based upon the use of 18/14 screen mesh of FBC, B 2009 Supplement Table 2002.4.

CHAPTER 3 – SCREENED WALLS AND BALCONIES:
Supplements the allowable span tables based upon the use of 18/14 screen mesh of FBC, B 2009 Supplement Table 2002.4.

APPENDIX C – EXPOSURE C TABLES: Reflects changes in individual chapters a listed above.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4291_Rationale_Rationale 2010 FBC R Code Change AAF Guide_1.png

Date Submitted	4/1/2010	**Section**	Referenced Standards	**Proponent**	Joseph Belcher
Chapter	43	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Corrects incorrect code citation and adds new reference to new section addressing the use of the AAF Guide to Aluminum Construction in High Wind Areas in the HVHZ.

Rationale

In the first case, the modification corrects an incorrect section citation. In the second case, the proposal adds a reference to a proposed new section related to adoption of the AAF Guide to Aluminum Construction in High Wind Areas.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The changes are to provide sections where the adopted standard is referenced and pose no impact on the cost of compliance relative to the enforcement of the code.

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

The changes are to provide sections where the adopted standard is referenced and pose no impact to building and property owners to the cost of compliance with the code.

Impact to industry relative to the cost of compliance with code

The changes are to provide sections where the adopted standard is referenced and pose no impact to industry to the cost of compliance relative with the code.

Requirements

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

The proposal has a reasonable and substantial connection with the welfare of the general public because it simplifies the use of the code.

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

The proposal improves the code because it simplifies the use of the code.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code because it simplifies the use of the code.

AAF—07-1 Guide to Aluminum Construction in High Wind Areas 2007-1 ~~2002.4.1~~, R301.2.1.1.1, R4403.12.1.2

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4340_TextOfModification_1.png

Date Submitted	4/2/2010	**Section**	Referenced Standards	**Proponent**	Joseph Belcher
Chapter	43	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Update organization.

Rationale

The document has been taken over by the Masonry Association of Florida from the Florida Concrete and Products Association.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No cost impact

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

No cost impact

Impact to industry relative to the cost of compliance with code

No cost impact

Requirements

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

The change updates the organization responsible for its maintenance.

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

The change updates the organization responsible for its maintenance.

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

The change updates the organization responsible for its maintenance.

Does not degrade the effectiveness of the code

The change updates the organization responsible for its maintenance.

~~FCPA~~ MAF	~~Florida Concrete & Products Association, Inc. 3030 Dade Avenue~~ ~~Orlando, Florida 32804~~ - Masonry Association of Florida 398 Camino Gardens Blvd. Suite 108 Boca Raton, FL 33432	
Standard reference number	**Title**	**Referenced in code section number**
~~FCPA-97~~ MAF-97	**Guide to Concrete Masonry Residential Construction in High Wind Areas**	**R301.2.1.1**

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4349_TextOfModification_1.png

Date Submitted	3/22/2010	**Section**	4408.1.3	**Proponent**	Mohammed Shaikh
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

3633, 3638

Summary of Modification

This section requires modification due to adoption of -2005 Manual of Steel Construction, Thirteenth edition

Rationale

Specification for Structural Steel Buildings 360-05 (2005 edition) and Manual of Steel Construction, 2005 Thirteenth edition have been adopted in 2007 FBC code. These modifications are proposed since 360-05 first time combines ASD and LRFD specifications and integrates both methods of design

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Nope

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

None

Requirements

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

Improves safety

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

Improves code, delete obsolete standards

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

Does not

Does not degrade the effectiveness of the code

Improves code

R4408.1.3 The following standards, as set forth in Chapter 43 of this code, are hereby adopted.

1. American Institute of Steel Construction, AISC:

a. Manual of Steel Construction, ~~Allowable Stress Design ASD~~ 2005 Thirteenth Edition AISC, including Specification for Structural Steel Buildings, 360-05

~~b.Manual of Steel Construction, Load Resistance Factor Design LRFD, AISC.~~

~~c. Simple Shear Connection, ASD, AISC.~~

~~d. Simple Shear Connections, LRFD, AISC~~.

~~e~~. b. Serviceability Design Considerations for Low-Rise Buildings, AISC.

~~f. Plastic Design in Steel, AISC~~.

~~g.~~ c.Engineering for Steel Construction, AISC.

~~h.~~ d. Detailing for Steel Construction, AISC.

~~i.~~ e.Iron and Steel Beams - 1873 to 1952, AISC.

~~j. Plastic Design of Braced Multistory Steel Frames, AISC.~~

~~k~~. f Torsional Analysis of Steel Members, AISC.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3670_TextOfModification_1.png

Date Submitted	3/31/2010	**Section**	4409.1.4.7	**Proponent**	Paul Coats
Chapter	44	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted

Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal updates the currently referenced standards to their current editions.

Rationale

This proposal updates the currently referenced standards to their current editions. Technical Report No. 7 and the 1987 All-Weather Wood Foundation System Design Manual have been replaced by the new ANSI/AF&PA PWF standard.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Will enable local entity to enforce current standards.

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

No significant cost impact.

Impact to industry relative to the cost of compliance with code

No significant cost impact.

Requirements

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

Referencing current standards will improve health, safety, and welfare.

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

Referencing current standards strengthens and improves the code.

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

The standards are appropriate to material and do not discriminate.

Does not degrade the effectiveness of the code

This will improve effectiveness of the code.

R4409.1.4.7 American Forest and Paper Association 1111 19 Street NW, Washington, D.C. 20036 ??

1. ANSI/AF&PA National Design Specification for Wood Construction, ~~2001~~ 2005

2. ANSI/AF&PA Design Values for Wood Construction, ~~2001~~ 2005

3. Wood Structural Design Data, 1992

4. Span Tables for Joists and Rafters, ~~1993~~ 2005

5. ~~Working Stresses for Joists and Rafters, 1993~~ Design Values for Joists and Rafters, 2005

6. Wood Construction Data No. 1, Details for Conventional Wood Frame Construction, 2001

7. Wood Construction Data No. 4, Plank-and-Beam Framing for Residential Building, ~~1989~~ 2003

8. Wood Construction Data No. 5, Heavy Timber Construction Details, ~~1989~~ 2004

9. Wood Construction Data No. 6, Design of Wood Frame Structures for Permanence, ~~1988~~ 2006

10. ~~Technical Report No. 7, The Permanent Wood Foundation System, 1987~~ ANSI/AF&PA PWF-2007 Permanent Wood Foundation (PWF) Design Specification, 2007

11. ANSI/AF&PA WFCM-2001, Wood Frame Construction Manual for one and Two-Family Dwellings, 2001

~~12. All-Weather Wood Foundation System, Design, Fabrication, Installation Manual, 1987~~

~~13. Technical Report No. 7, All-Weather Wood Foundation System Basic Requirements with Supplements, 1987~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4157_TextOfModification_1.png

S3701

Date Submitted	3/23/2010	**Section**	R4402.10.21, R4402.13.1.7	**Proponent**	chris schulte
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarification

Rationale

Rationale R4402.10.21 - Building code section 1521.21 allows for the exception
Rationale R4402.13.1.7 - Building code section 1524.1.7 allows for the exception

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

Requirements

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

Clarification

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

Clarification

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 degrade

R4402.10.21 Existing ventilation. Ridge ventilation is recommended whenever possible to create airflow entering the soffit and exiting the ridge. Ridge ventilation shall not be installed without adequate soffit ventilation to draw outside air through the ridge void. When recovering, repairing or reroofing, the existing amount of attic ventilation shall not be reduced.

Exception: Attic spaces designed by a Florida-licensed engineer or registered architect to eliminate the attic venting.

R4402.13.1 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 Section R4402 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.

7. **Ventilation:** Most roof structures should have some ability to vent natural airflow through the interior of the structural assembly (the building itself). The existing amount of attic ventilation shall not be reduced. It may be beneficial to consider additional venting which can result in extending the service life of the roof.

Exception: Attic spaces, designed by a Florida-licensed engineer or registered architect to eliminate the attic venting, venting shall not be required.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3701_TextOfModification_1.png

Date Submitted	3/24/2010	**Section**	R4403.7.3.6.3	**Proponent**	Jaime Gascon
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

MOD3725

Summary of Modification

Correlates the HVHZ requirements on use of laminated glazing for glass railings used in the wind borne debris region with those of the 2009 IBC.

Rationale

This modification correlates the HVHZ requirements on use of laminated glazing for glass railings used in the wind borne debris region with those of the 2009 IBC section 2407.1.4.1 – Balusters and in-fill panels. Note the acceptance outlined in 2007 FBC R4403.7.3.6.3 is that for laminated glazing.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None. Enforcement of the section currently in place would still be required, and the established criteria correspond to the now specified laminated glazing type.

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

A cost increase for the glass of approximately 15% can be expected.

Impact to industry relative to the cost of compliance with code

A cost increase for the glass of approximately 15% can be expected. Further, the modification may help reduce manufacturer liabilities.

Requirements

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

The modification provides better protection from falling through the glazed area. It also assists in containing any shattered pieces of glass on the structure.

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

The modification strengthens the code by providing a safer condition for glazed railings used in the wind borne debris regions In this case strengthens the HVHZ requirements to that being introduced by the 2009 IBC.

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

The modification could discriminate against tempered glass, but if tempered glass were used, it would still be difficult to prove performance at the level currently specified in the code by conforming to ANSI Z97.1 requirements.

Does not degrade the effectiveness of the code

The modification improves the code by describing glazing types that will be able to perform to the performance levels presently called out in the code per ANS Z97.1.

R4403.7.3.6 Railing.

R4403.7.3.6.1 Railings, stair-railings and other similar safeguards shall be designed to resist a load of 50 pounds per lineal foot (74 kg/m) or a concentrated load of 200 pounds (690 N) applied in any direction at the top of such barriers at any location on the safeguard, whichever condition produces the maximum stresses. The reactions and stresses caused by the above referenced uniform and concentrated loads shall be considered not be acting simultaneously.

R4403.7.3.6.2 Intermediate rails, balusters and panel fillers shall be designed for a uniform horizontal load of not less than 25 pounds per square foot (1197 Pa) over the gross area of the guard, including the area of any openings in the guard, of which they are a part without restriction by deflection. Reactions resulting from this loading need not be added to the loading specified in R4403.3.6.1 in designing the main supporting members of guards.

R4403.7.3.6.3 ~~Safety~~Laminated glazing will be permitted as an equal alternate to pickets, if tested by an accredited laboratory to satisfy the resistance requirements of this code for wind, live and kinetic energy impact loading conditions. The kinetic energy impact loading shall comply with ANSI Z97.1-1984 using a 400 foot-pound (542 N-m) energy impact. The safety requirements of the impact test shall be judged to have been satisfactorily met if breakage does not occur or numerous cracks and fissures occur but no shear or opening through which a 3-inches (76 mm) diameter sphere may freely pass. The glass panel shall remain within the supporting frame.

R4403.7.3.6.4 If the posts that support the top rail of exterior railings are substituted with glass, the assembly shall be tested to TAS 201, where the impacted glass continues to support the top rail and all applicable loads after impact.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3730_TextOfModification_1.png

Sub Code: Test Protocols

Date Submitted	3/10/2010	**Section**	10.4.8	**Proponent**	Jaime Gascon
Chapter	1	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Related Modifications

Summary of Modification

Deletion of reference to a nonexistent protocol - TAS100(B), and clarifying the section.

Rationale

TAS100(B) does not exist, and the reference needs clarification. It directs the manufacturer to seek guidance from the AHJ to qualify units larger than limited by TAS100(A).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The modification provides clarity for easier enforcement and interpretation of the requirements.

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

There is no impact since the currently referenced standard does not exist.

Impact to industry relative to the cost of compliance with code

There is no impact since the currently referenced standard does not exist, and provides industry with additional guidance on the requirements.

Requirements

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

The modification provides better safety by assuring that the correct tests are referenced.

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

The modification improves the code by assuring that the correct tests are referenced. It further provides direction on what to do when the product falls outside the size limitations of TAS100(A).

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

The modification does not discriminate against other products. It provides clearer guidance and specifies the correct tests.

Does not degrade the effectiveness of the code

The modification improves the code by removing a non-existent protocol from the references, and improves enforceability.

10.4.8 Manufacturers of ~~S~~static vents, turbines, powered vents or other protruding roof top components, having a height greater than 12 in. or any other dimension greater than 18 in. shall contact the authority having jurisdiction for additional testing requirements such as but not limited to ~~be tested for~~ resistance to wind induced pressures ~~in compliance with TAS 100(B)~~.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3528_TextOfModification_1.png

Date Submitted	3/10/2010	**Section**	5.2.7	**Proponent**	Jaime Gascon
Chapter	1	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Approved as Submitted

Commission Action Pending Review

Related Modifications

Summary of Modification

Deletion of ASTM E283's standard year in the text of the protocol. Year of standard is already in chapter 35.

Rationale

The correct year of the adopted ASTM E283 is 2004 as currently adopted in chapter 35 of the 2007 FBC.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There should be no impact as this modification is a clean-up/correlation with a current and already adopted standard.

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

There should a positive impact as this modification is a clean-up/correlation with a current and already adopted standard. Since this is an air infiltration standard for energy, and it is already being used by industry, property owners benefit from this clarification.

Impact to industry relative to the cost of compliance with code

There should be no impact as this modification is a clean-up/correlation with a current and already adopted standard. Industry has been using the 2004 version since its adoption into the FBC.

Requirements

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

This modification serves to clear up a potential confusion with use of different, outdated, versions of a standard.

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

This modification serves to improve the code by clearing up a conflict in a test standard's versions.

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

The modification does not discriminate against other products since all manufacturers and testing labs are using the version currently referenced in chapter 35.

Does not degrade the effectiveness of the code

This modification enhances the code by eliminating a potential conflict.

5.2.7 Air Infiltration - Shall comply with ASTM E283-~~91~~.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3464_TextOfModification_1.png

Sub Code: Building

Date Submitted	3/25/2010	**Section**	202	**Proponent**	J Glenn-BASF
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IBC) language as it provides better direction.

Rationale

Based code language provides language keeping in line with natoinally standards. Provides more clarity.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No fiscal impact is created by this change.

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

No impact to local enforcement is created by this change.

Impact to industry relative to the cost of compliance with code

None

Requirements

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

None

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

None

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

AWNING. ~~Any rigid or movable (retractable) roof like structure, cantilevered, or otherwise entirely supported from a building.~~ An architectural projection that provides weather protection, identity or decoration and is wholly supported by the building to which it is attached. An awning is comprised of a lightweight rigid or removable skeleton structure over which an approved cover is attached.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3874_TextOfModification_1.png

Date Submitted	4/1/2010	**Section**	202	**Proponent**	Daniel Walker
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

4313

Summary of Modification

Updates the definition of Habitable Space to include revised information from AAMA/NPEA/NSA 2100-10 for sunrooms. This document now defines a Category IV sunroom as a non-habitable space.

Rationale

The referenced document, AAMA/NPEA/NSA 2100-02 has been updated by the three authoring groups and released as a 2010 edition. The definitions of a Category IV sunroom has been changed in the referenced document to be non-habitable.

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.

Requirements

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

This proposal has reasonable and substantial connection with the health, safety and welfare of the general public.

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

This proposal strengthens and improves the code.

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

This proposal does not discriminate against any materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

HABITABLE SPACE. A space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, screen enclosures, sunroom Categories I, II, ~~and~~ III and IV as defined in the AAMA/NPEA/NSA 2100, storage or utility space and similar areas are not considered habitable space.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4314_TextOfModification_1.png

Date Submitted	3/25/2010	**Section**	801.5	**Proponent**	Rebecca Quinn
Chapter	8	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

S4398

Summary of Modification

Florida-specific modifications to Chapter 8, related to retaining flood provisions of the I-Codes which require materials below the DFE to be flood damage-resistant materials specified in 1612.4 by reference to ASCE 24.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IBC flood provisions IBC and make Florida-specific amendments. IBC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for 1612 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

801.5 Applicability. For buildings in flood hazard areas as established in Section 1612.3, interior finishes, trim and decorative materials shall comply with Section 1612.4. ~~that extend below the design flood elevation shall be flood-damage-resistant materials.~~

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Date Submitted	3/25/2010	**Section**	1403.5	**Proponent**	Rebecca Quinn
Chapter	14	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Florida-specific modifications to 1403.5, related to retaining flood provisions of the I-Codes which require materials below the DFE to be flood damage-resistant materials specified in 1612.4 by reference to ASCE 24.

Rationale

Modifications recommended by FBC Flood Resistant Standards Workgroup, with concurrence by Structural TAC, to retain IBC flood provisions IBC and make Florida-specific amendments. IBC flood provisions are consistent with the NFIP. The FBC adopted the recommendation at its October 2009 meeting. Workgroup's final report is attached to the modification for 1612 and http://consensus.fsu.edu/FBC/Flood-Resistant-Standards.html

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; 454 Florida communities participate in the NFIP and administer ordinance that include NFIP requirements (44 CFR 60.3).

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

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Impact to industry relative to the cost of compliance with code

No impact; building and property owners already are required to comply with local floodplain management ordinances.

Requirements

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

Compliance with flood-resistant provisions reduces flood damage and protects life, property and general welfare.

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

Improves the code by having all load requirements addressed; provides equivalency with requirements of local floodplain management ordinances. The requested statutory authority will allow locally-adopted higher standards to preserve better protection and insurance discounts.

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

Includes provisions for flood damage-resistant materials and methods, consistent with the NFIP and current floodplain management ordinances.

Does not degrade the effectiveness of the code

Improves effectiveness by requiring buildings to be designed and constructed with consideration of all applicable codes.

1403.5 Flood resistance. For buildings in flood hazard areas as established in Section 1612.3, exterior walls ~~extending below the design flood elevation~~ shall comply with Section 1612.4. ~~be resistant to water damage~~. Wood shall be pressure-preservative treated in accordance with AWPA U1 for the species, product and end use using a preservative listed in Section 4 in APWA Standard U1 or decay-resistant heartwood of redwood, black locust or cedar.

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Date Submitted	3/22/2010	**Section**	1602.1 Definitions	**Proponent**	Mark Speckin
Chapter	16	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

3688

Summary of Modification

Add the requirement that exterior mounted cooling towers, fluid coolers, and evaporative condensers, which are subjected to wind forces be designed as a structure, to the FBC Building Code, volume.

Rationale

See attached.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No financial impact. Proposed modification is making an existing code requirement more visible.

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

No financial impact. Proposed modification is making an existing code requirement more visible.

Impact to industry relative to the cost of compliance with code

No financial impact. Proposed modification is making an existing code requirement more visible.

Requirements

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

Increases the health, safety, and welfare of the general public. Addding the proposed amendment to the Building Code makes it more visible to the people who must design and enforce the code.

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

Will result in better adherence to the code..

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

The proposed code modification makes no distinction as to material, products, or types of material.

Does not degrade the effectiveness of the code

Improves effectiveness of code by adding the wind load requirement to exterior mounted mechanical equipment to the Building Code. This improves the visibility of the requirement to the structural engineers and code official officials.

OTHER STRUCTURES. Structures, other than buildings, for which loads are specified in this chapter. Other structures include exterior mounted cooling towers, fluid coolers, and evaporative condensers, which are subject to wind forces.

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STATE OF FLORIDA
BUILDING COMMISSION

In the Matter of

SPX COOLING TECHNOLOGIES, INC., Case #: DCA07-DEC-182

Petitioner.

_____/

DECLARATORY STATEMENT

The foregoing proceeding came before the Florida Building Commission (the Commission) by a Petition from Mark S. Speckin of SPX COOLING TECHNOLOGIES, INC. (Petitioner) which was received on September 12, 2007. Based on the statements in the petition and the material subsequently submitted, it is hereby ORDERED:

Findings of Fact

1. The petition is filed pursuant to, and must conform to the requirements of, Rule 28-105.002, Florida Administrative Code.

2. The Petitioner is working on a project in Naples, Florida that is subject to the requirements of the Florida Building Code and in conjunction therewith, has a direct and substantial interest in the design of the cooling towers to be installed for use by a newly constructed 16 story condominium.

3. The Petitioner inquires whether the structure and anchorage of exterior mounted cooling towers that are subject to the forces of wind are required to be designed to withstand the applied wind force; and whether the wind design data for those towers, if required by the code, must be included within the construction documents submitted to the local authority having jurisdiction?

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Conclusions of Law

1. The Florida Building Commission has the specific statutory authority to interpret the provisions of the FBC by entering a declaratory statement.

2. Section 301.13, Florida Building Code, Mechanical Volume (2007 as amended), states, in pertinent part, that: "(m)echanical equipment, appliances and supports that are exposed to wind shall be designed and installed to resist the wind pressures on the equipment and the supports as determined in accordance with the Florida Building Code, Building."

3. Section 908.1 of the Florida Building Code, Mechanical Volume (2007 as amended), states that "(a) cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's installation instructions. The design of such cooling towers shall be in accordance with the requirements of the Florida Building Code, Building Volume, for a structure.

4. . Section 1603.1.4 of the Florida Building Code, Building Volume (2007 as amended), relating to construction documents, states that:

> "(t)he following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral-force-resisting system of the building:
>
> 1. Basic wind speed (3-second gust), miles per hour (km/hr).
>
> 2. Wind importance factor, IW, and building classification from table 1604.5 or Table 6-1, ASCE 7 and building classification in Table 1-1, ASCE 7.
>
> 3. Wind exposure, if more than one wind exposure is utilized, the wind exposure and applicable wind direction shall be indicated.
>
> 4. The applicable enclosure classifications and, if designing with ASSCE 7, internal pressure coefficient.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3687_Rationale_DCA07-DEC-182_2.png

5. Components and cladding. The design wind pressures in terms of psf (kN/m2) to be used for the selection of exterior components and cladding materials not specifically designed by the registered design professional.

5. Section 1609.1 of the Florida Building Code, Building Volume (2007 as amended), states that "structures and parts thereof shall be designed to withstand the minimum wind loads prescribed herein. Decreases in wind loads shall not be made for the effect of shielding by other structures."

6. On the basis of the foregoing, the answer to each of the Petitioner's questions is "**YES;**" the Code requires the structure and anchorage of exterior mounted cooling towers that are subject to the forces of wind to be designed to withstand the applied wind force; and the wind design data for those towers must be included within the construction documents submitted to the local authority having jurisdiction.

Petitioner and all other interested parties are hereby advised of their right to seek judicial review of this Order in accordance with Section 120.68(2)(a), Florida Statutes, and with Fla. R. App. 9.030(b)(1)(C) and 9.110(a). To initiate an appeal, a Notice of Appeal must be filed with Paula P. Ford, Clerk of the Commission, Sadowski Building, 2555 Shumard Oak Boulevard, Tallahassee, FL 32399-2100, and with the appropriate District Court of Appeal no later than thirty days after this Order is filed with the Clerk of the Commission. A Notice of Appeal filed with the District Court of Appeal shall be accompanied by the filing fee specified by section 35.22(3), Florida Statutes.

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DONE AND ORDERED this 6TH of FEBRUARY, 2008, in Coral Gables, Miami-Dade County, State of Florida.

Raul L. Rodriguez, AIA, Chair
Florida Building Commission
Department of Community Affairs
Sadowski Building
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was sent to the following by the method indicated on this 8th day of Feb, 2008.

PAULA P. FORD
Commission Clerk

Via U.S. Mail

Mark S. Speckin, P.E.
SPX Cooling Technologies
7401 West 129 Street
Overland Park, Kansas 66213

Via Hand Delivery

Mo Madani, C.B.O. Manager
Codes and Standards Section
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

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STATE OF FLORIDA
BUILDING COMMISSION

In the Matter of

SPX COOLING TECHNOLOGIES, INC., Case #: DCA07-DEC-183

Petitioner.

_____/

DECLARATORY STATEMENT

The foregoing proceeding came before the Florida Building Commission (the Commission) by a Petition from Mark S. Speckin of SPX COOLING TECHNOLOGIES, INC. (Petitioner) which was received on September 12, 2007. Based on the statements in the petition and the material subsequently submitted, it is hereby ORDERED:

Findings of Fact

1. The petition is filed pursuant to, and must conform to the requirements of, Rule 28-105.002, Florida Administrative Code.

2. The Petitioner is working on a project in Naples, Florida, that is subject to the requirements of the Florida Building Code, and in conjunction therewith, has a direct and substantial interest in the design of the cooling towers to be installed for use in a 12 story condominium undergoing a level one alteration which was permitted when the mechanical equipment was not required to be designed for wind forces.

3. The Petitioner inquires whether the wind forces that the mechanical equipment applies to the building to be determined from the wind design criteria that was in effect when the building was originally permitted, or is the current Florida Building Code criteria for mechanical equipment to be used; and whether the 2004 Florida Building

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Code requires both the structure and anchorage of mechanical equipment to be designed for the applied wind forces?

Conclusions of Law

1. The Florida Building Commission has the specific statutory authority to interpret the provisions of the FBC by entering a declaratory statement.

2. Section 407.1.2 of the Florida Building Code, Existing Building Volume (2007 as amended), states: "Wind design. Wind design of existing buildings shall be in accordance with the building codes that were in effect when the building was permitted." Section 407.1.2 of the FBC-Existing Building applies to Repairs, not Level 1 Alterations.

3. Section 503.3 of the Florida Building Code, Existing Building Volume (2007 as amended), states: "Materials and methods. All new work shall comply with materials and methods requirements in the Florida Building Code and the Florida Fire Prevention Code as applicable, that specify material standards, detail of installation and connection, joints, penetrations, and continuity of any element, component, or system in the building."

4. Section 507.1 of the Florida Building Code, Existing Building Volume (2007 as amended), states: "General. Where alteration work includes replacement of equipment that is supported by the building or where a reproofing permit is required, the structural provisions of this section shall apply."

5. Section 507.2.1 of the Florida Building Code, Existing Building Volume (2007 as amended), states:

> "Where replacement of roofing or equipment results in additional dead loads, structural components supporting such reproofing or equipment shall comply with the vertical load requirements of the Florida Building Code, Building.

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Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.

2. Buildings constructed in accordance with the conventional construction methods of the Florida Building Code, Building and where the additional dead load from the equipment is not increased by more than 5 percent."

6. Pursuant to the Declaratory Statement entered by the Commission in Case Number DCA07-DEC-182 and the provisions of the Code cited therein, the Code requires the structure and anchorage of exterior mounted cooling towers that are subject to the forces of wind to be designed to withstand the applied wind force.

7. On the basis of the foregoing and in response to Petitioner's first question, mechanical equipment and supports being replaced during a level 1 alteration shall meet the wind design criteria of the current code, not the code in effect when the building was originally constructed. Section 407.1.2 of the Florida Building Code, Existing Building Volume (2007 as amended), is not applicable for level 1 alterations. Regarding the Petitioner's second question, the answer is **"YES,"** the new mechanical equipment needs to be designed for wind forces for both the structure and anchorage of mechanical equipment as specified in the code in effect at the time that application is made for a permit for the alteration.

Petitioner and all other interested parties are hereby advised of their right to seek judicial review of this Order in accordance with Section 120.68(2)(a), Florida Statutes, and with Fla. R. App. 9.030(b)(1)(C) and 9.110(a). To initiate an appeal, a Notice of Appeal must be filed with Paula P. Ford, Clerk of the Commission, Sadowski Building, 2555 Shumard Oak Boulevard, Tallahassee, FL 32399-2100, and with the appropriate

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3687_Rationale_DCA07-DEC-183_3.png

District Court of Appeal no later than thirty days after this Order is filed with the Clerk of the Commission. A Notice of Appeal filed with the District Court of Appeal shall be accompanied by the filing fee specified by section 35.22(3), Florida Statutes.

DONE AND ORDERED this 6th of February, 2008, in Coral Gables, Miami-Dade County, State of Florida.

Raul L. Rodriguez, AIA, Chair
Florida Building Commission
Department of Community Affairs
Sadowski Building
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was sent to the following by the method indicated on this 7th day of Feb, 2008.

PAULA P. FORD
Commission Clerk

Via U.S. Mail

Mark S. Speckin, P.E.
SPX Cooling Technologies
7401 West 129 Street
Overland Park, Kansas 66213

Via Hand Delivery

Mo Madani, C.B.O. Manager
Codes and Standards Section
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3687_Rationale_DCA07-DEC-183_4.png

Florida Building Code – Proposed building Code Modifications – Rationale

The FBC requires that exterior mounted cooling towers, fluid coolers, and evaporative condensers, which are subjected to wind forces be designed as a structure. This structural requirement is part of the FBC Mechanical Code. There is no reference to this requirement in the FBC Building Code. This results in a situation where the mechanical engineers and code officials do not understand what structural requirement is and the structural engineers and code officials do not know the requirement exists.

Adding the proposed amendment to the Florida Building Code, Building Volume will help make the structural engineers and code officials aware of this requirement.

Sections 301.13 and 908.1 of the Florida Building Code, Mechanical Volume (2007 as amended, require that exterior mounted cooling towers, fluid coolers, and evaporative condensers, which are subjected to wind forces be designed as structure. This means both the structure and anchorage of the above components must be capable of withstanding the design wind forces. Refer to Declaratory Statements DCA07-DEC-182 and DCA07-DEC-183.

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Date Submitted	3/22/2010	**Section**	1603.1.4 Wind design data	**Proponent**	Mark Speckin
Chapter	16	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

3687

Summary of Modification

Add the requirement that the wind load requirement of Other Structures in terms of psf be shown on the Construction Documents

Rationale

See attached. It is the Engineer of Records responsibility to define the wind load criteria for all aspects of a project. Manufacturers of mechanical equipment should no be determining the wind load requirement of their rquipment.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No financial impact. Proposed modification is making an existing code requirement more visible.

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

No financial impact. Proposed modification is making an existing code requirement more visible.

Impact to industry relative to the cost of compliance with code

No financial impact. Proposed modification is making an existing code requirement more visible.

Requirements

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

Increases the health, safety, and welfare of the general public. Addding the proposed amendment to the Building Code makes it more visible to the people who must design and enforce the code.

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

Will result in better adherence to the code..

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

The proposed code modification makes no distinction as to material, products, or types of material.

Does not degrade the effectiveness of the code

Improves effectiveness of code by adding the wind load requirement to exterior mounted mechanical equipment to the Building Code. This improves the visibility of the requirement to the structural engineers and code official officials.

1603.1.4 Wind design data. The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral-force-resisting system of the building:

1. Basic wind speed (3-second gust), miles per hour (km/hr).

2. Wind importance factor, I_W, and building classification from Table 1604.5 or Table 6-1, ASCE 7 and building classification in Table 1-1, ASCE 7.

3. Wind exposure, if more than one wind exposure is utilized, the wind exposure and applicable wind direction shall be indicated.

4. The applicable enclosure classifications and, if designing with ASCE 7, internal pressure coefficient.

5. Components and cladding. The design wind pressures in terms of psf (kN/m^2) to be used for the selection of exterior components and cladding materials not specifically designed by the registered design professional.

6. Other Structures. The design wind pressures in terms of psf (kN/m^2) to be used for the design of exterior located other structures.

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STATE OF FLORIDA
BUILDING COMMISSION

In the Matter of

SPX COOLING TECHNOLOGIES, INC., Case #: DCA07-DEC-182

Petitioner.

_____/

DECLARATORY STATEMENT

The foregoing proceeding came before the Florida Building Commission (the Commission) by a Petition from Mark S. Speckin of SPX COOLING TECHNOLOGIES, INC. (Petitioner) which was received on September 12, 2007. Based on the statements in the petition and the material subsequently submitted, it is hereby ORDERED:

Findings of Fact

1. The petition is filed pursuant to, and must conform to the requirements of, Rule 28-105.002, Florida Administrative Code.

2. The Petitioner is working on a project in Naples, Florida that is subject to the requirements of the Florida Building Code and in conjunction therewith, has a direct and substantial interest in the design of the cooling towers to be installed for use by a newly constructed 16 story condominium.

3. The Petitioner inquires whether the structure and anchorage of exterior mounted cooling towers that are subject to the forces of wind are required to be designed to withstand the applied wind force; and whether the wind design data for those towers, if required by the code, must be included within the construction documents submitted to the local authority having jurisdiction?

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Conclusions of Law

1. The Florida Building Commission has the specific statutory authority to interpret the provisions of the FBC by entering a declaratory statement.

2. Section 301.13, Florida Building Code, Mechanical Volume (2007 as amended), states, in pertinent part, that: "(m)echanical equipment, appliances and supports that are exposed to wind shall be designed and installed to resist the wind pressures on the equipment and the supports as determined in accordance with the Florida Building Code, Building."

3. Section 908.1 of the Florida Building Code, Mechanical Volume (2007 as amended), states that "(a) cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's installation instructions. The design of such cooling towers shall be in accordance with the requirements of the Florida Building Code, Building Volume, for a structure.

4. . Section 1603.1.4 of the Florida Building Code, Building Volume (2007 as amended), relating to construction documents, states that:

> "(t)he following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral-force-resisting system of the building:
>
> 1. Basic wind speed (3-second gust), miles per hour (km/hr).
>
> 2. Wind importance factor, IW, and building classification from table 1604.5 or Table 6-1, ASCE 7 and building classification in Table 1-1, ASCE 7.
>
> 3. Wind exposure, if more than one wind exposure is utilized, the wind exposure and applicable wind direction shall be indicated.
>
> 4. The applicable enclosure classifications and, if designing with ASSCE 7, internal pressure coefficient.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3688_Rationale_DCA07-DEC-182_2.png

5. Components and cladding. The design wind pressures in terms of psf (kN/m2) to be used for the selection of exterior components and cladding materials not specifically designed by the registered design professional.

5. Section 1609.1 of the Florida Building Code, Building Volume (2007 as amended), states that "structures and parts thereof shall be designed to withstand the minimum wind loads prescribed herein. Decreases in wind loads shall not be made for the effect of shielding by other structures."

6. On the basis of the foregoing, the answer to each of the Petitioner's questions is "**YES;**" the Code requires the structure and anchorage of exterior mounted cooling towers that are subject to the forces of wind to be designed to withstand the applied wind force; and the wind design data for those towers must be included within the construction documents submitted to the local authority having jurisdiction.

Petitioner and all other interested parties are hereby advised of their right to seek judicial review of this Order in accordance with Section 120.68(2)(a), Florida Statutes, and with Fla. R. App. 9.030(b)(1)(C) and 9.110(a). To initiate an appeal, a Notice of Appeal must be filed with Paula P. Ford, Clerk of the Commission, Sadowski Building, 2555 Shumard Oak Boulevard, Tallahassee, FL 32399-2100, and with the appropriate District Court of Appeal no later than thirty days after this Order is filed with the Clerk of the Commission. A Notice of Appeal filed with the District Court of Appeal shall be accompanied by the filing fee specified by section 35.22(3), Florida Statutes.

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DONE AND ORDERED this 6TH of FEBRUARY, 2008, in Coral Gables, Miami-Dade County, State of Florida.

Raul L. Rodriguez, AIA, Chair
Florida Building Commission
Department of Community Affairs
Sadowski Building
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was sent to the following by the method indicated on this 8th day of Feb, 2008.

PAULA P. FORD
Commission Clerk

Via U.S. Mail

Mark S. Speckin, P.E.
SPX Cooling Technologies
7401 West 129 Street
Overland Park, Kansas 66213

Via Hand Delivery

Mo Madani, C.B.O. Manager
Codes and Standards Section
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

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STATE OF FLORIDA
BUILDING COMMISSION

In the Matter of

SPX COOLING TECHNOLOGIES, INC., Case #: DCA07-DEC-183

Petitioner.

_____/

DECLARATORY STATEMENT

The foregoing proceeding came before the Florida Building Commission (the Commission) by a Petition from Mark S. Speckin of SPX COOLING TECHNOLOGIES, INC. (Petitioner) which was received on September 12, 2007. Based on the statements in the petition and the material subsequently submitted, it is hereby ORDERED:

Findings of Fact

1. The petition is filed pursuant to, and must conform to the requirements of, Rule 28-105.002, Florida Administrative Code.

2. The Petitioner is working on a project in Naples, Florida, that is subject to the requirements of the Florida Building Code, and in conjunction therewith, has a direct and substantial interest in the design of the cooling towers to be installed for use in a 12 story condominium undergoing a level one alteration which was permitted when the mechanical equipment was not required to be designed for wind forces.

3. The Petitioner inquires whether the wind forces that the mechanical equipment applies to the building to be determined from the wind design criteria that was in effect when the building was originally permitted, or is the current Florida Building Code criteria for mechanical equipment to be used; and whether the 2004 Florida Building

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3688_Rationale_DCA07-DEC-183_1.png

Code requires both the structure and anchorage of mechanical equipment to be designed for the applied wind forces?

Conclusions of Law

1. The Florida Building Commission has the specific statutory authority to interpret the provisions of the FBC by entering a declaratory statement.

2. Section 407.1.2 of the Florida Building Code, Existing Building Volume (2007 as amended), states: "Wind design. Wind design of existing buildings shall be in accordance with the building codes that were in effect when the building was permitted." Section 407.1.2 of the FBC-Existing Building applies to Repairs, not Level 1 Alterations.

3. Section 503.3 of the Florida Building Code, Existing Building Volume (2007 as amended), states: "Materials and methods. All new work shall comply with materials and methods requirements in the Florida Building Code and the Florida Fire Prevention Code as applicable, that specify material standards, detail of installation and connection, joints, penetrations, and continuity of any element, component, or system in the building."

4. Section 507.1 of the Florida Building Code, Existing Building Volume (2007 as amended), states: "General. Where alteration work includes replacement of equipment that is supported by the building or where a reproofing permit is required, the structural provisions of this section shall apply."

5. Section 507.2.1 of the Florida Building Code, Existing Building Volume (2007 as amended), states:

> "Where replacement of roofing or equipment results in additional dead loads, structural components supporting such reproofing or equipment shall comply with the vertical load requirements of the Florida Building Code, Building.

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Exceptions:

1. Structural elements whose stress is not increased by more than 5 percent.

2. Buildings constructed in accordance with the conventional construction methods of the Florida Building Code, Building and where the additional dead load from the equipment is not increased by more than 5 percent."

6. Pursuant to the Declaratory Statement entered by the Commission in Case Number DCA07-DEC-182 and the provisions of the Code cited therein, the Code requires the structure and anchorage of exterior mounted cooling towers that are subject to the forces of wind to be designed to withstand the applied wind force.

7. On the basis of the foregoing and in response to Petitioner's first question, mechanical equipment and supports being replaced during a level 1 alteration shall meet the wind design criteria of the current code, not the code in effect when the building was originally constructed. Section 407.1.2 of the Florida Building Code, Existing Building Volume (2007 as amended), is not applicable for level 1 alterations. Regarding the Petitioner's second question, the answer is **"YES,"** the new mechanical equipment needs to be designed for wind forces for both the structure and anchorage of mechanical equipment as specified in the code in effect at the time that application is made for a permit for the alteration.

Petitioner and all other interested parties are hereby advised of their right to seek judicial review of this Order in accordance with Section 120.68(2)(a), Florida Statutes, and with Fla. R. App. 9.030(b)(1)(C) and 9.110(a). To initiate an appeal, a Notice of Appeal must be filed with Paula P. Ford, Clerk of the Commission, Sadowski Building, 2555 Shumard Oak Boulevard, Tallahassee, FL 32399-2100, and with the appropriate

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District Court of Appeal no later than thirty days after this Order is filed with the Clerk of the Commission. A Notice of Appeal filed with the District Court of Appeal shall be accompanied by the filing fee specified by section 35.22(3), Florida Statutes.

DONE AND ORDERED this 6th of February, 2008, in Coral Gables, Miami-Dade County, State of Florida.

Raul L. Rodriguez, AIA, Chair
Florida Building Commission
Department of Community Affairs
Sadowski Building
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was sent to the following by the method indicated on this 7th day of Feb, 2008.

PAULA P. FORD
Commission Clerk

Via U.S. Mail

Mark S. Speckin, P.E.
SPX Cooling Technologies
7401 West 129 Street
Overland Park, Kansas 66213

Via Hand Delivery

Mo Madani, C.B.O. Manager
Codes and Standards Section
Department of Community Affairs
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

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Florida Building Code – Proposed building Code Modifications – Rationale

The FBC requires that exterior mounted cooling towers, fluid coolers, and evaporative condensers, which are subjected to wind forces be designed as a structure. This structural requirement is part of the FBC Mechanical Code. There is no reference to this requirement in the FBC Building Code. This results in a situation where the mechanical engineers and code officials do not understand what structural requirement is and the structural engineers and code officials do not know the requirement exists.

Adding the proposed amendment to the Florida Building Code, Building Volume will help make the structural engineers and code officials aware of this requirement.

Sections 301.13 and 908.1 of the Florida Building Code, Mechanical Volume (2007 as amended, require that exterior mounted cooling towers, fluid coolers, and evaporative condensers, which are subjected to wind forces be designed as structure. This means both the structure and anchorage of the above components must be capable of withstanding the design wind forces. Refer to Declaratory Statements DCA07-DEC-182 and DCA07-DEC-183.

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Date Submitted	3/22/2010	**Section**	1609.1.2	**Proponent**	Michael Hemmer
Chapter	16	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

4232

Summary of Modification

This section is modified to imply that all openings into a roof structure, whether vertical or horizontal, need to be protected in the event of a hurricane or high event from debris as well as wind and rain. This will reduce structural, wind, water, and personal belonging damage in such an event.

Rationale

Opening protection is critical when it comes to protection of life and porperty during a wind/rain event. Structural damage as well as personal property damage will be substantially reduced if wind, rain, and debris can be kept out of a structure. This in turn will reduce the cost of structural repair, clean up, occupant relocation, insurance claims, and personal property damage.

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

The cost factor is mimimal compared to the cost of repairs if the openigs are not covered in a high wind/rain event.

Impact to industry relative to the cost of compliance with code

Industry will benefit with regards to staying in business after a major high wind/rain event. This same business will also benefit with a reduction in repairs as well as mold removal caused by such an event. Insurance companies will benefit with a reduction in claims.

Requirements

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

Protecting openings which allow wind, rain, and/or debris into a structure will directly effect the health and safety of the structure's occupants (especially residential) in relation to structural, mold and/or water damage. Also, the stress related factor in such a disaster will be reduced.

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

This code modification will strengthen the code in relation to opening up the door for new inovative products, designs, and construction methods which will improve the strength and integrity of a new or existing structure.

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

In essence, this modification will make the code more effective in accomplishing the goal of the Building Code which is to make a Stronger and more Safe structure no matter if it is a new or existing structure.

1609.1.2 Protection of openings. Glazed openings in buildings located in wind-borne debris regions shall be protected from wind-borne debris. Glazed opening protection for wind-borne debris shall meet the requirements SSTD 12, ASTM E 1886 and ASTM E 1996, ANSI/DASMA 115 (for garage doors and rolling doors) or TAS 201, 202 and 203 or AAMA 506 referenced therein.

1. Glazed openings located within 30 feet (9.1 m) of grade shall meet the requirements of the Large Missile Test.

2. Glazed openings located more than 30 feet (9.1 m) above grade shall meet the provisions of the Small Missile Test.

3. Storage sheds that are not designed for human habitation and that have a floor area of 720 square feet (67 m2) or less are not required to comply with the mandatory windborne debris impact standards of this code.

4. Openings in sunrooms, balconies or enclosed porches constructed under existing roofs or decks are not required to be protected provided the spaces are separated from the building interior by a wall and all openings in the separating wall are protected in accordance with Section 1609.1.4 above. Such spaces shall be permitted to be designed as either partially enclosed or enclosed structures.

(5) Vertical openings into an attic space in buildings located in windborne debris regions shall have opening protection from windborne debris. Vertical opening protection into an attic space shall meet the requirements of the Large Missile Test of ASTM E 1996 and ASTM 1886, SSTD 12 or TAS 201, 202, and 203 or AAMA 506 referenced therein. This opening protection must carry a current product approval and/or meet the requirements of an approved impact resisting standard.

(6) Vertical opening protection located more than 30 feet (9.1m) above grade must also meet the provisions of the Small Missile Test.

(7) Horizontal openings into an attic space in buildings in this region are required to have opening protection. The horizontal opening protection is not required to meet the standards set forth for the Large Missile Test however must meet the requirements set forth in TAS 202 and 203 or have a current product approval as set forth by these standards.

Exceptions: No change.

Section 1609.1.2.3 Impact resistant coverings. Add text to read as shown.

1609.1.2.3 Impact resistant coverings.

1609.1.2.3.1 Impact resistant coverings shall be tested at 1.5 times the design pressure (positive or negative) expressed in pounds per square feet as determined by the Florida Building Code, Building Section 1609 for which the specimen is to be tested.

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1609.1.2.3.2 Impact resistant coverings. Impact resistant coverings shall be labeled in accordance with the provisions of Section 1714.8.

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S3677 Text Modification



HURRICANE IKE & IN TEXAS & LOUISIANA

D Hurricane Ike Recovery Advisories

FEMA has prepared a series of Recovery Advisories that present guidance for design, construction, and restoration of buildings in areas subject to coastal flooding and high winds from Hurricane Ike. To date, eight advisories have been prepared and are included in this appendix:

- Attachment of Brick Veneer in High-Wind Regions ([December, 2005]; revised 2009)
- Design and Construction in Coastal A Zones ([December, 2005]; revised 2009)
- Designing for Flood Levels above the BFE ([July, 2006]; revised 2009)
- Enclosures and Breakaway Walls
- Erosion, Scour, and Foundation Design
- Minimizing Water Intrusion Through Roof Vents in High-Wind Regions
- Metal Roof Systems in High-Wind Regions
- Siding Installation in High-Wind Regions

These Advisories are also available online at http://www.fema.gov/library/viewRecord.do?id=3539 where future Advisories will also be posted.

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Attachment of Brick Veneer in High-Wind Regions

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend practices for installing brick veneer that will enhance wind resistance in high-wind areas (i.e., greater than 90-mph gust design wind speed).

Key Issues

- Brick veneer is frequently blown off walls of residential and non-residential buildings during hurricanes (Figure 1). When brick veneer fails, wind-driven water can enter and damage buildings, and building occupants can be vulnerable to injury from windborne debris (particularly if walls are sheathed with plastic foam insulation or wood fiberboard in lieu of wood panels). Pedestrians in the vicinity of damaged walls can also be vulnerable to injury from falling veneer (Figure 2).
- Common failure modes include tie (anchor) corrosion (Figure 3), tie fastener pull-out (Figure 4), failure of masons to embed ties into the mortar (Figure 5), and poor bonding between ties and mortar and mortar of poor quality (Figure 6).
- Ties are often installed before brick laying begins. When this is done, ties are often improperly placed above or below the mortar joints. When misaligned, the ties must be angled up or down in order for the ties to be embedded into the mortar joints (Figure 7). Misalignment not only reduces embedment depth, but also reduces the effectiveness of the ties because wind forces do not act parallel to the ties themselves.
- Corrugated ties typically used in residential veneer construction provide little resistance to compressive loads. Use of compression struts would likely be beneficial, but off-the-shelf devices do not currently exist. Two-piece adjustable ties (Figure 8) provide significantly greater compressive strength than corrugated ties and are, therefore, recommended. However, if corrugated ties are used, it is recommended that they be installed as shown in Figures 9 and 10 in order to enhance their wind performance.



Figure 1. Failed brick veneer over plywood. Many of the ties are still attached to the substrate, but several of the tie fasteners pulled out of the substrate and the ties are embedded in the collapsed veneer. Estimated wind speed: 107 miles per hour (peak gust, Exposure C, at 33 feet).



Figure 2. The upper portion of the brick veneer at this apartment building collapsed. Pedestrian and vehicular traffic in the vicinity of the damaged wall are vulnerable to injury and damage if remaining portions of the wall were to collapse during subsequent storms.



Figure 3. Significant tie corrosion caused the brick at a fire station to fail, even though the building is not near the coast. Note that metal is missing for half of of width of the tie at two locations (red arrows). The left end of the tie was still embedded into a concrete masonry unit back-up wall. The right end is where the tie failed in tension, thus leaving a portion of the tie embedded in the collapsed brick.

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- Buildings that experience veneer damage typically do not comply with current building codes. Building code requirements for brick veneer have changed over the years. Model codes prior to 1995 permitted brick veneer in any location, with no wind speed restrictions. Also, some older model codes allowed brick veneers to be anchored with fewer ties than what is required by today's standards.

  The American Concrete Institute's (ACI's) 530/American Society of Civil Engineers (ASCE) 5/The Masonry Society (TMS) 402 (ACI 530) *Building Code Requirements for Masonry Structures* is the current masonry standard referenced by model building codes. The 2006 International Building Code® (IBC®) and the 2006 International Residential Code® (IRC®) both reference the 2005 edition of ACI 530. The latest ACI 530 is the 2008 edition.

  ACI 530 addresses brick veneer in two manners: rational design and a prescriptive approach. Nearly all brick veneer in residential and low-rise construction follows the prescriptive approach. The first edition of ACI 530 limited the use of prescriptive design to areas with a basic wind speed of 110 mph or less. The 2005 and the 2008 editions of ACI 530 extend the prescriptive requirements to include a basic wind speed of 130 mph, but limit the amount of brick that can be anchored with veneer ties to 70 percent of that allowed in lower wind speed regions. Both the 2005 and the 2008 editions require rational design approaches in locations where the basic wind speeds exceed 130 mph.

  Some noteworthy distinctions exist in the requirements for anchored brick veneer between the 2005 and the 2008 editions of ACI 530. For lower wind speed regions (110 mph and below), ACI 530-05 limited the vertical spacing of ties to 18"; the 2008 edition allows vertical ties to be spaced up to 25", provided the amount of veneer anchored per tie does not exceed 2.7 square feet. In ACI's high-wind regions (over 110 mph and up to 130 mph), both editions of the code limit vertical spacing to 18". ACI 530-08 also limits the space between veneer anchored with corrugated ties and the wall sheathing to 1". This is to avoid compression failures in the corrugated ties when they are exposed to positive pressures.



Figure 4. This tie remained embedded in the mortar joint while the smooth-shank nail pulled out from the stud.



Figure 5. These four ties were never embedded into the mortar joint.



Figure 6. This tie was embedded in the mortar, but the bond was poor.

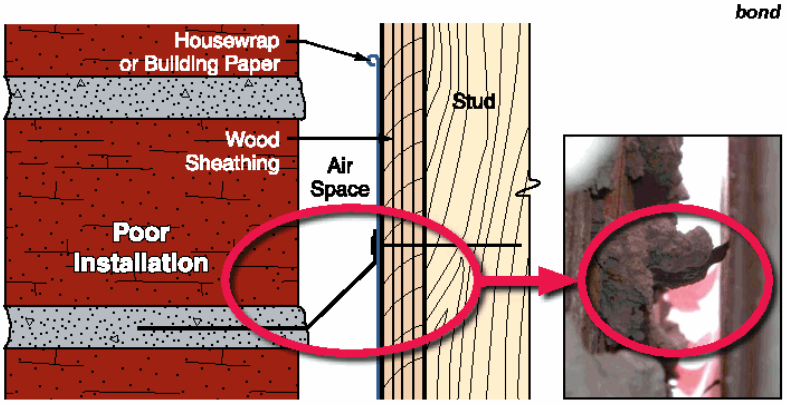


Figure 7. Misalignment of the tie reduces the embedment and promotes veneer failure.

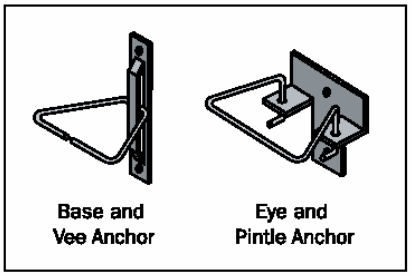


Figure 8. Examples of two-piece adjustable ties.

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- The following Brick Industry Association (BIA) Technical Notes provide guidance on brick veneer: Technical Notes 28 – Anchored Brick Veneer, Wood Frame Construction; Technical Notes 28B – Brick Veneer/Steel Stud Walls; and Technical Notes 44B – Wall Ties (available online at http://www.bia.org). These Technical Notes provide attachment recommendations, but the recommendations are not specific for high-wind regions and are, therefore, inadequate.

Sustainability

Brick veneer can offer a very long service life, provided the ties are not weakened by corrosion. To help ensure that brick veneer achieves its long life potential, in addition to properly designing and installing the ties, stainless steel ties are recommended.

Construction Guidance

The brick veneer wall system is complex in its behavior. There are limited test data on which to draw. The following guidance is based on professional judgment, wind loads specified in ASCE 7-05, *Minimum Design Loads for Buildings and Other Structures*, fastener strengths specified in the American Forest and Paper Association's (AF&PA's) National Design Specification (NDS) for Wood Construction, and brick veneer standards contained in ACI 530-05. In addition to the general guidance given in BIA Technical Notes 28 and 28B, the following are recommended:

Note: In areas that are also susceptible to high seismic loads, brick veneer should be evaluated by an engineer to ensure it can resist seismic and wind design loads.

Stud Spacing: For new construction, space studs 16" on center, so that ties can be anchored at this spacing.

Tie Fasteners: Ring-shank nails are recommended in lieu of smooth-shank nails. A minimum embedment of 2" into framing is suggested.

Ties: For use with wood studs, two-piece adjustable ties are recommended. However, where corrugated steel ties are used, use 22-gauge minimum, 7/8" wide by 6" long, complying with American Society for Testing and Materials (ASTM) A 366 with a zinc coating complying with ASTM A 153 Class B2. For ties for use with steel studs, see BIA Technical Notes 28B – Brick Veneer/Steel Stud Walls. Stainless steel ties should be used in areas within 3,000 feet of the coast.

Tie Installation

- Install ties as the brick is laid so that the ties are properly aligned with the mortar joints.
- Install brick ties spaced per Table 1. Studs should be installed at 16" spacing. Veneer tie locations for 24" stud spacing are included for repairing damaged veneer on existing buildings with the wider stud spacing. In areas where the 2006 Editions of the IBC/IRC are adopted, install brick veneer ties spaced no more than 18" vertically to satisfy the requirements of ACI 530-05.
- Locate ties within 8" of door and window openings and within 12" of the top of veneer sections.
- Bend the ties at a 90-degree angle at the nail head in order to minimize tie flexing when the ties are loaded in tension or compression (Figure 9).
- Embed ties in joints so that mortar completely encapsulates the ties. Embed a minimum of 1 1/2" into the bed joint, with a minimum mortar cover of 5/8" to the outside face of the wall (Figure 10).

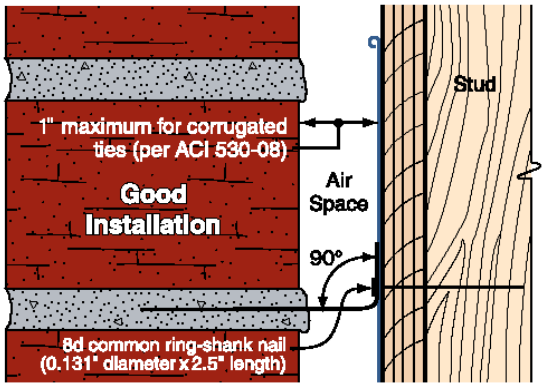


Figure 9. Bend ties at nail heads.

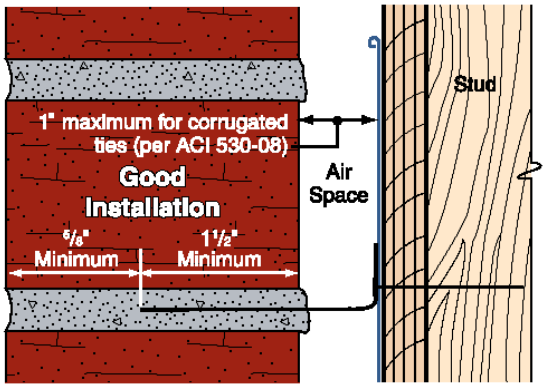


Figure 10. Tie embedment.

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Table 1. Brick Veneer Tie Spacing

Wind Speed (mph) (3–Second Peak Gust)	Wind Pressure (psf)	Maximum Vertical Spacing for Ties (inches)	
		16" stud spacing	24" stud spacing
90	–19.5	24[a,b]	16[a]
100	–24.1	24[a,b]	16[a]
110	–29.1	20½ [b]	13½
120	–34.7	17	NA[c]
130	–40.7	15	NA[c]
140	–47.2	13	NA[c]
150	–54.2	11	NA[c]

Notes:

1. The tie spacing is based on wind loads derived from Method 1 of ASCE 7-05, for the corner area of buildings up to 30' high, located in Exposure B with an importance factor (I) of 1.0 and no topographic influence. For other heights, exposures, or importance factors, engineered designs are recommended.
2. Spacing is for 2½" long 8d common (0.131" diameter) ring-shank fasteners embedded 2" into framing. Fastener strength is for wall framing with a Specific Gravity G=0.55 with moisture contents less than 19 percent and the following adjustment factors, C_t=0.8; and C_D, C_M, C_{eg}, and C_{tn}=1.0. Factored withdrawal strength W'= 65.6#.
3. The brick veneer tie spacing table is based on fastener loads only and does not take into account the adequacy of wall framing, sheathing, and other building elements to resist wind pressures and control deflections from a high-wind event. Prior to repairing damaged brick veneer, the adequacy of wall framing, wall sheathing, and connections should be verified by an engineer.

[a] Maximum spacing allowed by ACI 530-08.

[b] In locales that have adopted the 2006 IBC/IRC, the maximum vertical spacing allowed by ACI 530-05 is 18".

[c] 24" stud spacing exceeds the maximum horizontal tie spacing of ACI 530-08 prescribed for wind speeds over 110 mph.

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Design and Construction in Coastal A Zones

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend design and construction practices in coastal areas where wave and flood conditions during the base flood will be less severe than in V zones, but still cause significant damage to typical light-frame construction.

Key Issues

- Recent post-storm investigations have shown that typical A-zone construction techniques (e.g., wood-frame, light gauge steel, or masonry walls on shallow footings or slabs, etc.) are subject to damage or destruction when exposed to less than 3' waves, which is the current threshold for V-zone conditions.
- Coastal A-zone buildings that employ typical residential and light commercial walls to elevate and support habitable space above the flood level will be susceptible to flood damage (Figure 1). Laboratory tests and recent field investigations confirm that breaking wave heights as small as 1.5' will cause failure of these types of walls (Figure 2).
- Other flood hazards associated with coastal waves (e.g., floating debris, high velocity flow, erosion and scour) also damage A-zone type construction in coastal areas (Figure 3).
- National Flood Insurance Program (NFIP) flood hazard mapping is generally divided into two categories, V and A zones. In coastal areas, the A-zone category could be subdivided into "Coastal A zone" and "A



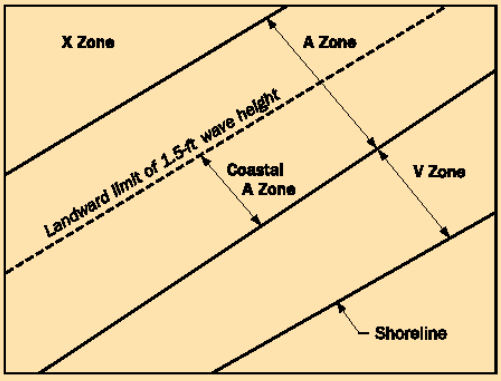
Figure 1. Failure of wood-frame walls used to support a coastal building, which was subjected to shallow flooding, small waves, and floating debris (Fort Walton Beach, FL, Hurricane Opal).

The Hurricane Ike Mitigation Assessment Team (MAT) observed small wave damage consistent with Coastal A-zone conditions throughout the area affected by Ike, including portions of west Galveston Island (Figure 4), communities situated along portions of Galveston Bay (Figure 5), Orange County (Figure 6), and portions of coastal Louisiana (Figure 7).

Coastal A Zone, Defined

Coastal A Zone: area landward of a V zone, or landward of an open coast without mapped V zones. In a Coastal A zone, the principal source of flooding will be astronomical tides, storm surges, seiches or tsunamis, not riverine flooding. During base flood conditions, the potential for wave heights between 1.5 and 3.0' will exist. At least 2 to 4' of stillwater depth is necessary to support these wave heights.

Coastal A-zone design and construction practices described herein are not mandated by the NFIP, but are recommended for communities that wish to adopt higher floodplain management standards. Community Rating System (CRS) credits are available for doing so. Note that some Coastal A-zone practices may be required by the International Building Code®, through its reference to ASCE 24, *Standard for Flood Resistant Design and Construction*.



Plan view showing a Coastal A zone landward of a V zone (source: ASCE 24-05).

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zone." Base flood conditions in the Coastal A zone will be similar to, but less severe than, those in the V zone; base flood conditions in the A zone will be similar to those in riverine or lake floodplains.

- The Coastal A zone is not shown on the Flood Insurance Rate Maps (FIRMs) presently adopted by communities. Communities, designers, and owners will have to determine whether a site lies within a Coastal A zone, either by wave height estimation or by consultation with FEMA regarding the LiMWA (see text box).

Flood insurance studies produced after Hurricane Katrina may include an advisory line indicating the limit of the 1.5' wave height during the base flood. This line is known as the Limit of Moderate Wave Action (LiMWA), and the area between this line and the VE zone boundary is the Coastal A zone.

- **In general, V-zone design and construction standards are recommended in Coastal A zones subject to erosion, high velocity flow, and/or wave heights greater than 1.5'.**



Figure 2. Failure of wood-frame wall, brick veneer, and windows as a result of 4' of stillwater flooding and small waves (Bay St. Louis, MS, Hurricane Katrina).



Figure 3. Failure of A-zone type foundation in coastal area, not subject to V-zone conditions (Topsail Island, NC, Hurricane Fran).



Figure 4. Coastal A-zone flood conditions are sufficient to cause failure of solid breakaway walls and garage doors (west Galveston Island, TX, Hurricane Ike).

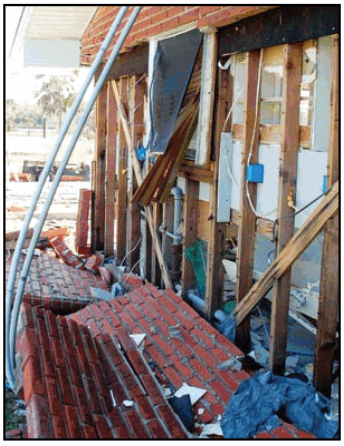
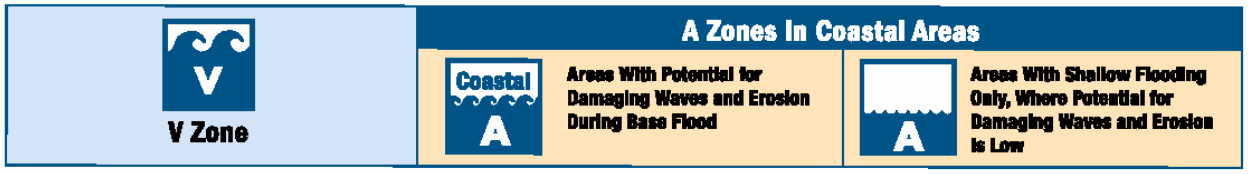


Figure 5. Damage to brick veneer walls due to shallow flooding, floating debris, and small waves. The damaged home was on a sheltered bay shoreline (Baytown, TX, Hurricane Ike).



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Figure 6. Damage attributed to small waves and approximately 5' of stillwater depth (Bridge City, TX, Hurricane Ike).



Figure 7. Damage believed to have resulted from Coastal A-zone conditions (Johnson Bayou, LA, Hurricane Ike).

Coastal A-Zone Construction Guidance

Because of the presence of damaging waves, V-zone design, construction, and certification practices are recommended for Coastal A zones.

Coastal A-zone construction should include:

- Use of open foundations (pile or pier) designed to resist all base flood conditions, including small waves, high velocity flow, erosion and scour, and floodborne debris (see Table 1).
- Elevation of the bottom of the lowest horizontal structural member supporting the lowest floor above the base flood wave crest elevation (Figure 8). Since waves and debris will be impacting on the floor joists and other foundation elements during the base flood, do not follow current NFIP minimum requirements that allow the lowest floor's walking surface to be set at the wave crest elevation in Zone A. **The 2009 International Residential Code® (IRC®) will require 1' of freeboard in V zones and Coastal A zones.**

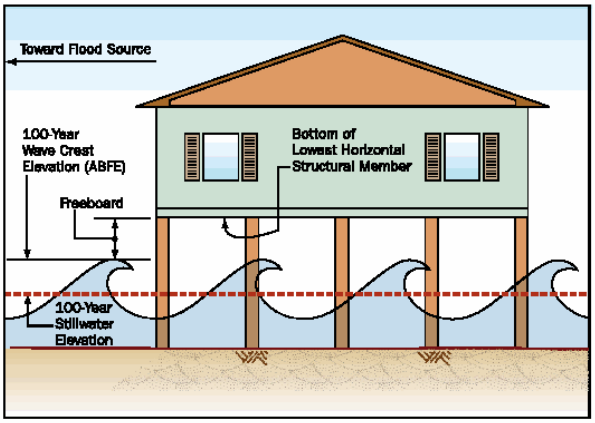


Figure 8. Recommended post-Katrina building standards in Coastal A zones.

- Use of flood-resistant materials above the level of the walking surface of the lowest floor (in the event that future flooding exceeds the lowest floor level and any freeboard incorporated into the building design).
- Specification of connections between the foundation and the elevated building that are capable of withstanding simultaneous wind and flood forces. Post-hurricane investigations typically find many foundation-to-building connections that are deficient.
- Use of space below the lowest horizontal structural member for parking, access, or storage only. Adding sufficient freeboard to allow parking beneath the building will not only reduce future flood damages, but will also lower flood insurance premiums.

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- Use of screen, lattice, louvers, or solid breakaway walls if space below the elevated floor is enclosed (see Hurricane Ike Recovery Advisory, *Enclosures and Breakaway Walls*). Note: unless flood regulations are changed, solid breakaway walls in Coastal A zones must be equipped with flood openings.

Additional guidance for design and construction in Coastal A zones can be found in FEMA 499, *Home Builder's Guide to Coastal Construction* (http://www.fema.gov/library/viewRecord.do?id=1570). The publication is a series of 31 fact sheets that provide recommended design and construction practices for foundations, connections, building envelope, etc. Fact Sheet 2 summarizes recommended practices for Coastal A zones, and references other fact sheets that provide more details.

Table 1. Foundation Recommendations for Coastal A Zones (Users should read across from a foundation type to see under what soil and base flood conditions that foundation is acceptable. A foundation must be capable of resisting all base flood conditions likely to exist at the site, or it should not be used. For example, a properly constructed pier on a shallow footing will generally withstand 1.5 to 3.0' wave heights, but should not be used where soils are erodible, and where high velocity flow is possible.)

Foundation Type	Base Flood Condition Present	
	Wave Heights Between 1.5 and 3.0 Feet*	Velocity Flow, Erodible Soils
Fill	no	no
Slab on grade	no	no
Crawlspace, shallow footing	no	no
Foundation walls, shallow footing	no	no
Stem wall**	no	no
Pier, shallow footing	yes	no
Pier, deep footing***	yes	yes
Post, shallow embedment	no	no
Pile/Column, deep embedment***	yes	yes

* Wave heights greater than 3.0' mapped as V zone: fill, slab, crawlspace, wall foundations not permitted.

** Typical stem wall foundations are vulnerable to damage from small waves or undermining and are, therefore, not recommended for use in Coastal A zones.

*** Deep means sufficiently deep to withstand erosion and scour, including that induced by the presence of the foundation itself.

Identifying Coastal A Zones

Coastal A zones are not shown on present day FIRMs or mentioned in a community's Flood Insurance Study (FIS) Report. Those maps and studies show Zones VE, AE, and X (or older designations V1-30, A1-30, B, and C). Therefore, until Coastal A-zone designations or wave height contours are incorporated into FISs, the community official, designer, or owner will have to determine whether or not a site will be subject to Coastal A-zone conditions during the base flood.

In order for a Coastal A zone to be designated, two conditions are required:

1) a water depth sufficient to support waves between 1.5 and 3.0' high, and

2) the actual presence of wave heights between 1.5 and 3.0'.

Condition 1 requires stillwater depths (vertical distance between the 100-year stillwater elevation and the ground elevation) of at least 2 to 4' at the site.

Condition 2 requires wave heights at the shoreline greater than 1.5 to 3.0' (under the 100-year flood conditions), sufficient water depth between the shoreline and the site and few, if any obstructions (buildings, dense tree stands, etc.) that may block or dampen the waves, between the shoreline and the site.

Figure 9 illustrates the procedure that was used following Hurricane Katrina to estimate Advisory Base Flood Elevations (ABFEs) and corresponding Coastal A zones, knowing only the ground elevation and the 1-percent annual chance stillwater level.

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Communities, designers, and owners can obtain the information necessary to make a post-Ike Coastal A-zone determination by observing the site and its surroundings, knowing site ground elevations, and using 1-percent annual chance stillwater elevations (from the FIS report or as determined by a government agency). Figure 10 shows how site and surrounding conditions would influence a Coastal-A zone determination.

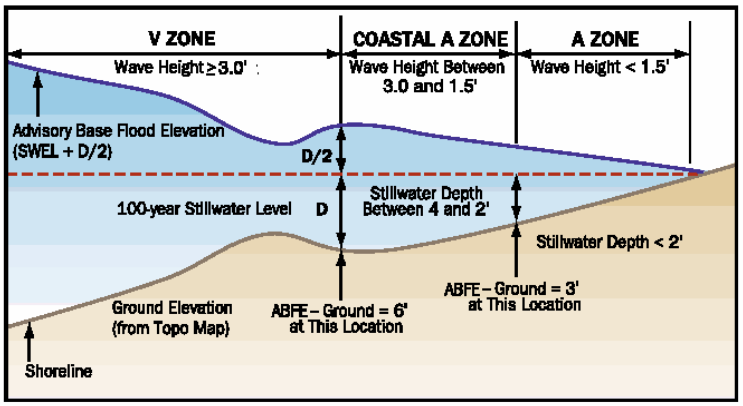


Figure 9. Post-Katrina Coastal A-zone methodology cross-section showing 1 percent annual chance stillwater elevation, stillwater depth and ABFE, and inland limits of an V zone and a Coastal A zone.





Figure 10. The site on the left is mapped Zone AE, and lies directly along the Gulf of Mexico shoreline. Limited obstructions to waves indicate the site could be classified as a Coastal A zone. The site on the right is over ½ mile from the Gulf shoreline, is mapped as Zone AE, and has a base flood stillwater level sufficient to support >1.5' wave heights – but obstructions to waves (e.g., trees and other buildings between the site and the shoreline) and distance from the source of flooding would indicate the area is not a Coastal A zone.

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Designing for Flood Levels Above the BFE

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend design and construction practices that reduce the likelihood of flood damage in the event that flood levels exceed the Base Flood Elevation (BFE).

Key Issues

- BFEs are established at a flood level, including wave effects, that has a 1-percent chance of being equaled or exceeded in any given year, also known as the 100-year flood or base flood. Floods more severe and less frequent than the 1-percent flood can occur in any year.
- Flood levels during some recent storms have exceeded BFEs depicted on the Flood Insurance Rate Maps (FIRMs), sometimes by several feet. In many communities, flooding extended inland, well beyond the 100-year floodplain (Special Flood Hazard Area (SFHA)) shown on the FIRM (see Figure 1).
- Flood damage increases rapidly once the elevation of the flood extends above the lowest floor of a building, especially in areas subject to coastal waves. In a V zone, a coastal flood with a wave crest 3 to 4' above the bottom of the floor beam (approximately 1 to 2 feet above the walking surface of the floor) will be sufficient to substantially damage or destroy most light-framed residential and commercial construction (see Figure 2).
- There are design and construction practices that can eliminate or minimize damage to buildings when flood levels exceed the BFE. The most common approach is to add freeboard to the design (i.e., to elevate the building higher than required by the FIRM).
- There are other benefits of designing for flood levels above the BFE: reduced building damage and maintenance: longer building life; reduced flood insurance premiums; reduced displacement and dislocation of building occupants after floods (and need for temporary shelter and assistance); reduced job loss; and increased retention of tax base.
- The cost of adding freeboard at the time of home construction is modest, and reduced flood insurance premiums will recover the freeboard cost in a few years time.



Figure 1. Bridge City, TX, homes were flooded during Ike, even though they were constructed outside the SFHA and in Zone B. The flood level was approximately 4' above the closest BFE.



Figure 2. Bolivar Peninsula, TX, V-zone house constructed with the lowest floor (bottom of floor beam) at the BFE (dashed line). The estimated wave crest level during Ike (solid line) was 3 to 4' above the BFE at this location.

How High Above the BFE Should a Building be Elevated?

Ultimately, the building elevation will depend on several factors, all of which must be considered before a final determination is made:

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- **The accuracy of the BFE shown on the FIRM:** If the BFE is suspect, it is probably best to elevate several feet above the BFE; if the BFE is deemed accurate, it may only be necessary to elevate a couple of feet above the BFE.
- **Availability of Advisory Base Flood Elevations (ABFEs):** ABFEs have been produced for coastal areas following Hurricanes Ivan, Katrina, and Rita. These elevations are intended to be interim recommendations until new FISs can be completed.
- **Availability of Preliminary Digital Flood Insurance Rate Maps (DFIRMS):** As new Flood Insurance Studies (FISs) are completed for Louisiana and Texas communities, preliminary DFIRMs will be produced and available for use, even before they are officially adopted by those communities.
- **Future conditions:** Since the FIRM reflects conditions at the time of the FIS, some owners or jurisdictions may wish to consider future conditions (such as sea level rise, subsidence, wetland loss, shoreline erosion, increased storm frequency/intensity, and levee settlement/failure) when they decide how high to elevate.
- **State or local requirements:** The State or local jurisdiction may require a minimum freeboard through its floodplain management requirements or building code.
- **Building code requirements:** The International Building Code® (IBC®) requires buildings be designed and constructed in accordance with American Society of Civil Engineers (ASCE) 24 (*Standard for Flood Resistant Design and Construction*). ASCE 24 requires between 0 and 2' of freeboard, depending on the building importance and the edition of ASCE 24 referenced.[1] The 2009 IRC will require 1 foot of freeboard in V and Coastal A zones.
- **Critical and essential facilities:** Given the importance of these facilities, some of which must remain operational during a hurricane, they should be elevated higher than commercial and residential buildings.
- **Building owner tolerance for damage, displacement, and downtime:** Some building owners may wish to avoid building damage and disruption, and may choose to elevate far above the BFE.

The Hurricane Ike MAT report recommends that critical and essential facilities be elevated to the 500-year flood elevation or to the requirements of ASCE 24-05, whichever is higher. This recommendation may also be appropriate for residential and commercial structures, as well.

The 500-year wave crest elevation can be approximated as 1.5 times the 500-year stillwater depth (500-year stillwater elevation minus the ground elevation) added to the ground elevation. This procedure is similar to the procedure used to calculate ABFEs, but with a different stillwater level.

If the 500-year stillwater elevation (feet North American Vertical Datum of 1988 [NAVD] or feet National Geodetic Vertical Datum of 1929 [NGVD]) is not available, a rule of thumb can be used to approximate it as 1.25 times the 100-year stillwater elevation (feet NAVD or feet NGVD).

MAT Elevation Recommendation

The Hurricane Ike MAT recommends new and reconstructed residential and commercial buildings be elevated above the effective BFEs with freeboard equal to that specified in ASCE 24-05, plus 3 feet. Once new DFIRMs are available and adopted, the MAT recommends new and reconstructed residential and commercial buildings be elevated to or above the freeboard elevation specified by ASCE 24-05. Critical and essential facilities should be elevated higher than residential and commercial buildings.

Flood Insurance Rate Maps and Flood Risk

Hurricanes Ivan (2004), Katrina (2005), Rita (2005), and Ike (2008) have demonstrated that constructing a building to the minimum National Flood Insurance Program (NFIP) requirements – or constructing a building outside the SFHA shown on the FIRMs – is no guarantee that the building will not be damaged by flooding. This is due to two factors: 1) flooding more severe than the base flood occurs, and 2) some FIRMs, particularly older FIRMs, may no longer depict the true base flood level and SFHA boundary.

Even if the FIRM predicted flood levels perfectly, buildings constructed to the elevations shown on the FIRM will offer protection only against the 1-percent annual chance flood level (BFE). Some coastal storms will result in flood levels

[1] The 1998 edition of ASCE 24 is referenced by the 2003 edition of the IBC, and requires between 0 and 1' of freeboard. The 2005 edition of ASCE 24 is referenced by the 2006 edition of the IBC, and requires between 0 and 2' of freeboard.

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that exceed the BFE, and buildings constructed to the minimum elevation could sustain flood damage. The black dashed line in Figure 3 shows the probability that the level of the flood will exceed the 100-year flood level during time periods between 1 year and 100 years; there is an 18-percent chance that the 100-year flood level will be exceeded in 20 years, a 39-percent chance it will be exceeded in 50 years, and a 51-percent chance it will be exceeded in 70 years. As the time period increases, the likelihood that the 100-year flood will be exceeded also increases.

Figure 3 also shows the probabilities that floods of other severities will be exceeded. For example, taking a 30-year time period where there is a 26-percent chance that the 100-year flood level will be exceeded, there is an 18-percent chance that the 150-year flood will be exceeded, a 14-percent chance that the 200-year flood will be exceeded, and a 6-percent chance that a flood more severe than the 500-year flood will occur.

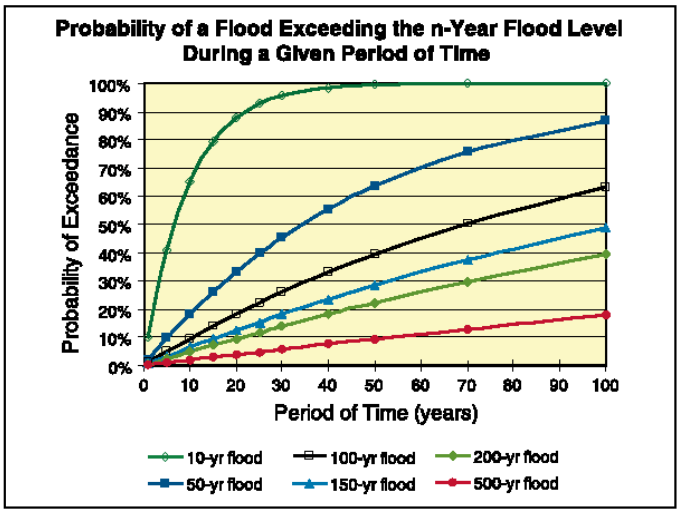


Figure 3. Probability that a flood will exceed the n-year flood level over a given period of time. (Note: this analysis assumes no shoreline erosion, and no increase in sea level or storm frequency/severity over time.)

FIRMs depict the limits of flooding, flood elevations, and flood hazard zones during the base flood. As seen in Figure 3, buildings elevated only to the BFEs shown on the FIRMs have a significant chance of being flooded over a period of decades. Users should also be aware that the flood limits, flood elevations, and flood hazard zones shown on the FIRM reflect ground elevations, development, and flood conditions at the time of the FIS.[2]

Consequences of Flood Levels Exceeding the BFE

Buildings are designed to ***resist*** most environmental hazards (e.g., wind, seismic, snow, etc.), but are generally designed to ***avoid*** flooding by elevating the building above the anticipated flood elevation. The difference in design approach is a result of the sudden onset of damage when a flood exceeds the lowest floor elevation of a building. Unlike wind – where exposure to a wind speed slightly above the design speed does not generally lead to severe building damage – occurrence of a flood level even a few inches above the lowest floor elevation generally leads to significant flood damage, therefore, the recommendation to add freeboard.

This is especially true in cases where waves accompany coastal flooding. Figure 4 illustrates the expected flood damage (expressed as a percent of a building's pre-damage market value) versus flood depth above the bottom of the lowest horizontal structural member supporting the lowest floor (e.g., bottom of the floor beam), for a V-zone building and for a riverine A-zone building.[3]

FIRMs do not account for the following:

- Shoreline erosion, wetland loss, subsidence, and relative sea level rise
- Upland development or topographic changes
- Degradation or settlement of levees and floodwalls
- Changes in storm climatology (frequency and severity)
- The effects of multiple storm events

Thus, what was once an accurate depiction of the 100-year floodplain and flood elevations may no longer be so.

One striking difference between the two curves is that a V-zone flood depth (wave crest elevation) 3 to 4' above the bottom of the floor beam (or approximately 1 to 2' above the top of the floor) is sufficient to cause substantial (>50 percent) damage to a building. In contrast, A zone riverine flooding (without waves and high velocity) can submerge a structure without causing substantial damage. This difference in building damage is a direct result of the energy contained in coastal waves striking buildings – something obvious to those who saw the wave damage that Hurricane Ike caused in Texas and Louisiana (see Figure 5).

[2] Sections 7.8.1.3 and 7.9 of FEMA's *Coastal Construction Manual* (FEMA 55, 2000 edition) provide guidance on evaluating a FIRM to determine whether it still provides an accurate depiction of base flood conditions, or whether it is obsolete.

[3] Since the normal floor reference for A-zone buildings is the top of the lowest floor, the A-zone curve was shifted for comparison with the V-zone curve.

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In cases where buildings are situated behind levees, a levee failure can result in rapid flooding of the area. Buildings near a levee breach may be exposed to high velocity flows, and damages to those buildings will likely be characterized by the V-zone damage curve in Figure 4. Damages to buildings farther away from the breach will be a result of inundation by floodwaters, and will likely resemble the A-zone curve in Figure 4.

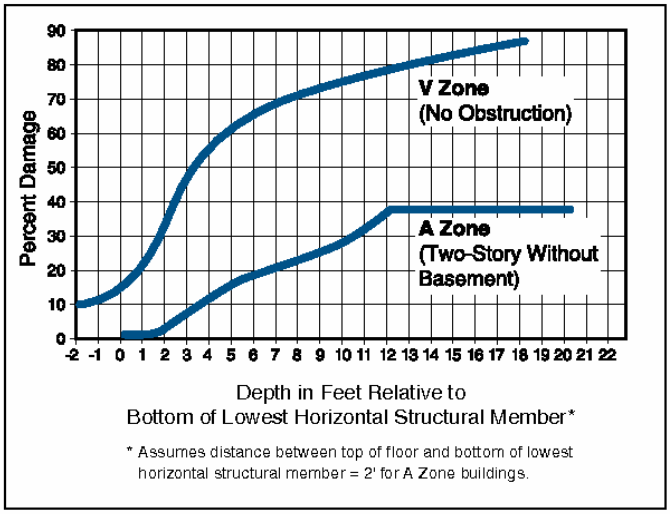


Figure 4. Flood depth versus building damage curves for V zones and riverine A zones (Source: FEMA 55, Coastal Construction Manual).



Figure 5. Hurricane Ike damage to buildings. The upper left and upper right photos are of buildings that were close to the Gulf of Mexico shoreline and subjected to storm surge and large waves above the lowest floor. The lower left photo is of a building close to Galveston Bay shoreline and subjected to storm surge and small waves. The lower right photo is of a Cameron Parish, Louisiana, school that was approximately 1.3 miles from the Gulf shoreline, but subjected to storm surge and small waves.

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General Recommendations

The goal of this Advisory is to provide methods to minimize damage to buildings in the event that coastal flood levels rise above the BFE. Achieving this goal will require adherence to one or more of the following general recommendations:

- **In all areas where flooding is a concern**, inside and outside the SFHA, **elevate the lowest floor so that the bottom of the lowest horizontal structural member is at or above the Design Flood Elevation (DFE)**. Do not place the top of the lowest floor at the DFE, since this guarantees flood damage to wood floor systems, wood floors, floor coverings, and lower walls during the design flood, and may lead to mold/contamination damage (see Figure 6).
- **In flood Zones V and A**, use a DFE that results in **freeboard** (elevate the lowest floor above the BFE) (see Figure 7).
- In flood Zones V and A, **calculate design loads and conditions** (hydrostatic loads, hydrodynamic loads, wave loads, floating debris loads, and erosion and scour) under the assumption that the flood level will exceed the BFE.
- In an A zone subject to moderate waves (1.5 to 2.9 ft high) and/or erosion (i.e., a Coastal A zone), use a pile or column foundation (see Figure 7). See the Hurricane Ike Recovery Advisory at http://www.fema.gov/library/viewRecord.do?id=3539 for details on Coastal A zones.
- Outside the SFHA (in **flood Zones B, C, and X**), **adopt flood-resistant design and construction practices** if historical evidence or a review of the available flood data shows the building could be damaged by a flood more severe than the base flood (see Figure 8).
- **Design and construct buildings using the latest model building code, ASCE 7-05,** *Minimum Design Loads for Buildings and Other Structures* and **ASCE 24-05,** *Standard for Flood Resistant Design and Construction*.
- **Follow the recommendations in FEMA 499,** *Home Builder's Guide to Coastal Construction Technical Fact Sheets* Series (available at: http://www.fema.gov/rebuild/mat/mat_fema499.shtm).
- **Use the pre-engineered foundations shown in FEMA 550,** *Recommended Residential Construction for the Gulf Coast: Building on Strong and Safe Foundations* (available at: http:\\www.fema.gov\library\viewRecord.do?id=1853).
- Use **strong connections between the foundation and the elevated building** to prevent the building from floating or washing off the foundation, in the event that flood levels do rise above the lowest floor.



Figure 6. Other concerns when flood levels rise above the lowest floor are mold and biological/chemical contamination. These may render an otherwise repairable building unrepairable, or will at least make the cleanup, restoration, and repairs much more expensive and time-consuming.

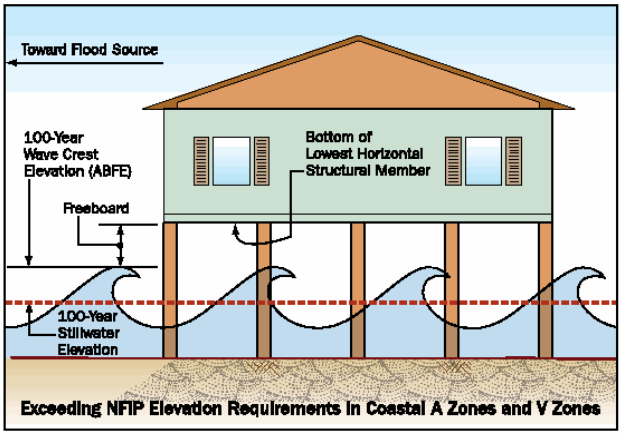


Figure 7. Recommended construction in Coastal A zones and V zones.

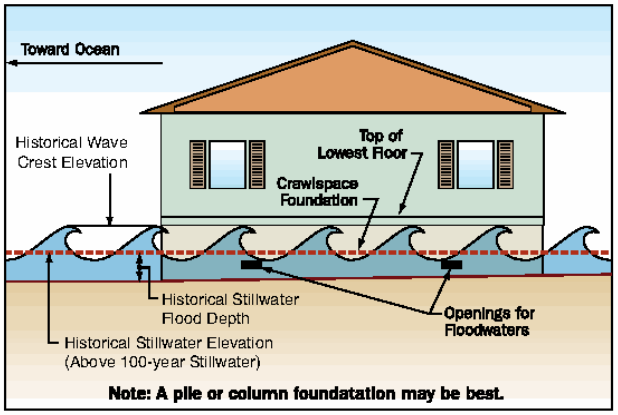


Figure 8. Recommended construction in Zones B, C, and X.

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- Use **flood damage-resistant building materials and methods** above the lowest floor. For example, consider using drainable, dryable interior wall assemblies (see Figure 9). This allows interior walls to be opened up and dried after a flood above the lowest floor, minimizing damage to the structure. For cavity and mass wall assemblies, the methods and materials in Figures 10 and 11 are recommended.

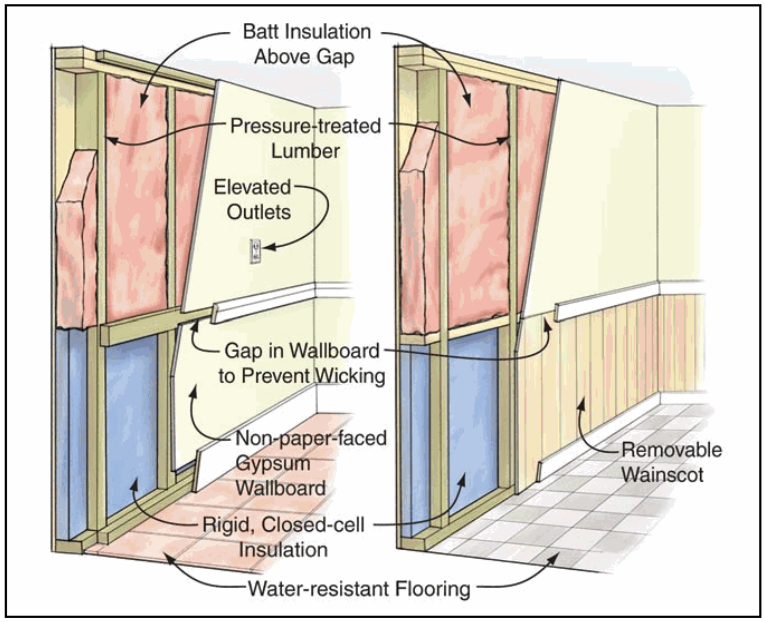


Figure 9. Recommended wet floodproofing techniques for interior wall construction. The following flood damage-resistant materials and methods will prevent wicking and limit flood damage: 1) construct walls with horizontal gaps in wallboard; 2) use non-paper-faced gypsum wallboard below gap, painted with latex paint; 3) use rigid, closed-cell insulation in lower portion of walls; 4) use water-resistant flooring with waterproof adhesive; and 5) use pressure treated wood framing (Source: LSU AgCenter and Coastal Contractor Magazine).

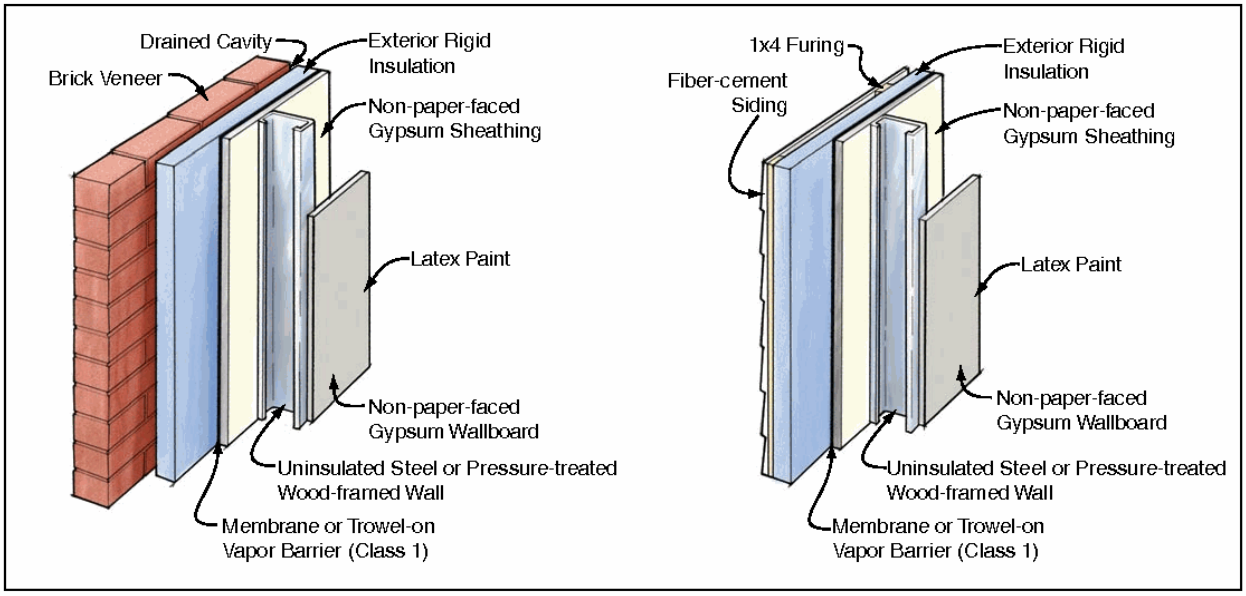


Figure 10. Recommended flood-resistant exterior cavity wall construction. The following materials and methods will limit flood damage to exterior cavity walls: 1) use brick veneer or fiber-cement siding, with non-paper-faced gypsum sheathing (vinyl siding is also flood-resistant but is less resistant to wind damage); 2) provide cavity for drainage; 3) use rigid, closed-cell insulation; 4) use steel or pressure-treated wood studs and framing; and 5) use non-paper-faced gypsum wallboard painted with latex paint (Source: Coastal Contractor Magazine and Building Science Corporation).

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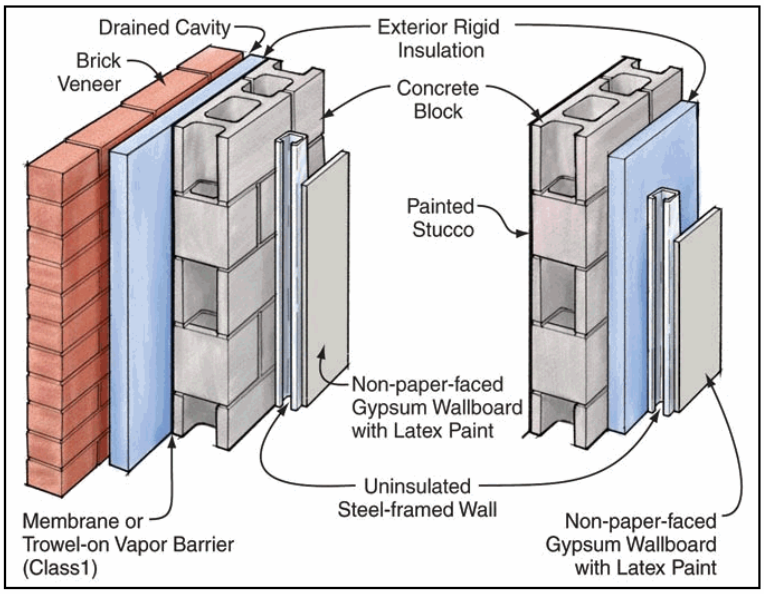


Figure 11. Recommended flood-resistant exterior mass wall construction. The following materials and methods will limit flood damage to exterior mass walls: 1) use concrete masonry with stucco or brick veneer (provide drainage cavity if brick veneer is used); 2) use rigid, closed-cell insulation; 3) use steel framing; and 4) use non-paper-faced gypsum wallboard painted with latex paint (Source: Coastal Contractor Magazine and Building Science Corporation).

- **New and replacement manufactured homes should be installed in accordance with the provisions of the 2009 edition of the National Fire Protection Association (NFPA) 225**, *Model Manufactured Home Installation Standard* (http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=225&cookie_test=1). The standard provides flood, wind, and seismic-resistant installation procedures. It also calls for elevating A-zone manufactured homes with the bottom of the main chassis frame beam at or above the BFE, not with the top of the floor at the BFE.

Other Considerations

As previously stated, in addition to reduced building damage, there are other reasons to design for flood levels above the BFE:

- Reduced building maintenance and longer building life
- Reduced flood insurance premiums
- Reduced displacement and dislocation of building occupants after floods (and need for temporary shelter and assistance)
- Reduced job loss
- Increased retention of tax base

Until flooded, many homeowners and communities don't think about these benefits. However, one of the most persuasive (to homeowners) arguments for elevating homes above the BFE is the reduction in annual flood insurance premiums. In most cases, flood premiums can be cut in half by elevating a home 2 feet above the BFE, saving several hundred dollars per year in A zones, and $2,000 or more per year in V zones. In V zones, savings increase with added freeboard.

A comprehensive study of freeboard (American Institutes for Research, 2006) demonstrated that adding freeboard at the time of house construction is cost-effective. Reduced flood damage yields a benefit/cost ratio greater than 1 over a wide range of scenarios, and flood insurance premium reductions make adding freeboard even more beneficial to the homeowner. **Reduced flood insurance premiums will pay for the cost of incorporating freeboard in a Zone V house in 1 to 3 years; for a Zone A house, the payback period is approximately 6 years.**

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Flood Insurance Premium Reductions Can Be Significant

Example 1: V-zone building, supported on piles or piers, no below-BFE enclosure or obstruction. $250,000 building coverage, $100,000 contents coverage.		**Example 2:** A-zone building, slab or crawlspace foundation (no basement). $200,000 building coverage, $75,000 contents coverage.	
Floor Elevation Above BFE	**Reduction in Annual Flood Premium***	**Floor Elevation Above BFE**	**Reduction in Annual Flood Premium***
1 foot	25%	1 foot	39%
2 feet	50%	2 feet	48%
3 feet	62%	3 feet	48%
4 feet	67%	4 feet	48%

* Compared to flood premium with lowest floor at BFE

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Enclosures and Breakaway Walls

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To discuss requirements and recommendations for enclosures and breakaway walls below the Base Flood Elevation (BFE).

Key Issues

- Spaces below elevated buildings can be used only for building access, parking, and storage.
- Areas enclosed by solid walls below the BFE ("enclosures") are subject to strict regulation under the National Flood Insurance Program (NFIP). Note that some local jurisdictions enforce stricter regulations for enclosures.
- Enclosures in V-zone buildings must be breakaway (non-breakaway enclosures are prohibited). Breakaway enclosures in V zones must be built with flood-resistant materials, meet specific design requirements, and be certified by a registered design professional.
- Enclosures (breakaway and non-breakaway) in A-zone buildings must be built with flood-resistant materials and equipped with flood openings that allow water levels inside and outside to equalize.
- Breakaway enclosure walls should be considered expendable, and the building owner could incur significant costs when the walls are replaced. Breakaway wall replacement is not covered by the flood insurance policy.
- For V zones, breakaway wall enclosures below an elevated building will result in higher flood insurance premiums; however, surrounding below-BFE space with insect screening, open lattice, slats, or shutters (louvers) can result in much lower flood insurance premiums (Figure 1). Use of these materials will allow floodwaters to pass into and out of the enclosed space and minimize damage to the enclosure "walls." Although not required by the NFIP, installation of flood openings in breakaway walls may also reduce damage to the walls.

Space Below the BFE — What Can It Be Used For?

NFIP regulations state that the area below an elevated building can be used only for parking, building access,

WARNING

Designers and owners should realize that: (1) enclosures and items within them are likely to be destroyed even during minor flood events; (2) enclosures, and most items within them, are not covered by flood insurance and can result in significant costs to the building owner; and (3) even the presence of properly constructed breakaway wall enclosures will increase flood insurance premiums for the entire building (the premium rate will increase as the enclosed area increases). Including enclosures in a building design can have significant cost implications.

The Hurricane Ike Mitigation Assessment Team (MAT) observed some breakaway walls in excess of 11' high. While FEMA promotes elevating homes above the BFE (i.e., adding freeboard), one of the unintended consequences appears to be the increasing size of floodborne debris elements due to taller breakaway walls.



Figure 1. Wood louvers installed beneath an elevated house in a V zone are a good alternative to solid breakaway walls.

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and storage. These areas must not be finished or used for recreational or habitable purposes. No mechanical, electrical, or plumbing equipment is to be installed below the BFE.

What is an Enclosure?

An "**enclosure**" is formed when any space below the BFE is enclosed on all sides by walls or partitions. Enclosures can be divided into two types, breakaway and non-breakaway.

- **Breakaway** enclosures are designed to fail under base flood conditions without jeopardizing the elevated building (Figure 2) – **any below-BFE enclosure in a V zone must be breakaway.** Breakaway enclosures are permitted in A zones, but must be equipped with flood openings.
- **Non-breakaway** enclosures can be constructed in an A zone. They may be used to provide structural support to the elevated building. All A-zone enclosures must be equipped with flood openings to allow the automatic entry and exit of floodwaters. **This Recovery Advisory recommends their use only in A-zone areas subject to shallow, slow-moving floodwaters without breaking waves.**

Breakaway Walls

Breakaway walls must be designed to break free under the larger of: 1) the design wind load, 2) the design seismic load, or 3) 10 pounds per square foot (psf), acting perpendicular to the plane of the wall (see Figure 3 for an example of a compliant breakaway wall). If the loading at which the breakaway wall is intended to collapse exceeds 20 psf, **the breakaway wall design must be certified.** When certification is required, a registered engineer or architect must certify that the walls will collapse under a water load associated with the base flood and that the elevated portion of the building and its foundation will not be subject to collapse, displacement, or lateral movement under simultaneous wind and water loads. **Breakaway walls must break away cleanly and must not damage the elevated building when they do so** (Figure 4). **Utilities should not be attached to or pass through breakaway walls.** See FEMA (2008a) Technical Bulletin 9, Design and *Construction Guidance for Breakaway Walls* for more information.



Figure 2. Breakaway walls beneath this building failed as intended under the flood forces of Hurricane Ike.

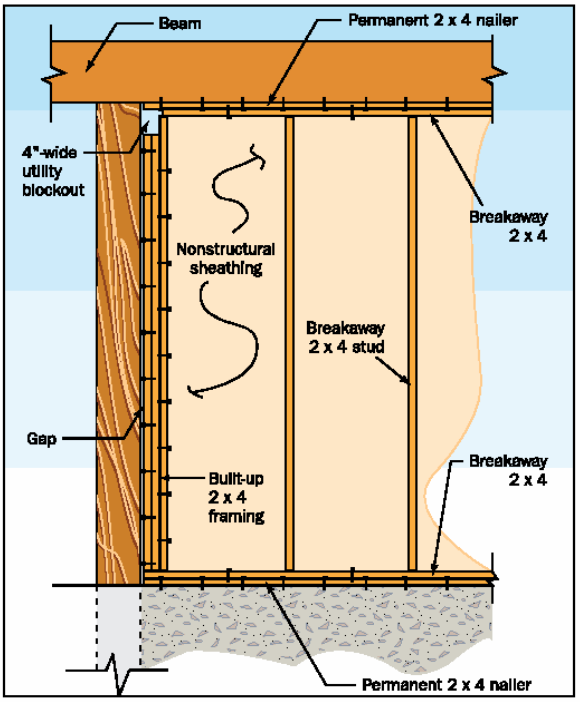


Figure 3. NFIP-compliant breakaway wall construction.



Figure 4. Building siding extended down and over the breakaway wall. Lack of a clean separation allowed damage to spread upward as the breakaway wall failed.

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Obstruction Considerations

A V-zone building, elevated on an open foundation without an enclosure or other obstructions below the BFE, is said to be free of obstructions, and enjoys favorable flood insurance premiums (see FEMA (2008b) Technical Bulletin 5, *Free-of-Obstruction Requirements* for more information).

The following building scenarios are also classified by the NFIP as free of obstructions:

- Below BFE space is surrounded by insect screening and/or by wooden or plastic lattice, slats, or shutters (louvers), if at least 40 percent of the lattice and louver area is open. Lattice can be no thicker than ½"; slats or louvers can be no thicker than 1".
- Below BFE space is surrounded by a combination of one solid breakaway wall (or garage door), and all other sides of the enclosure are insect screening, or wooden or plastic lattice, slats, or louvers.

The following building scenarios are classified by the NFIP as with obstructions:

- Below BFE space is fully enclosed by solid breakaway walls.
- Below BFE space is enclosed by a combination of two or more solid breakaway walls, with the remaining sides of insect screening, or wooden or plastic lattice, slats, or louvers.

Flood Openings

Foundation walls and other enclosure walls of A-zone buildings (including Coastal A-zone buildings) must be equipped with openings that allow the **automatic entry and exit of floodwaters** (Figure 5).



Figure 5. Flood opening in a below-BFE enclosure wall.

A-zone opening requirements are as follows:

- Flood openings must be provided in **at least two of the walls** forming the enclosure.
- **The bottom of each flood opening must be no more than 1' above the higher of the interior or exterior adjacent grade.**
- **Louvers, screens, or covers** may be installed over flood openings as long as they do not interfere with the operation of the openings during a flood.
- Flood openings may be **sized** according to either a prescriptive method (1 square inch of flood opening per square foot of enclosed area) or an engineering method (which must be certified by a registered engineer or architect).

Details concerning flood openings can be found in FEMA (2008c) Technical Bulletin 1, *Openings in Foundation Walls and Walls of Enclosures*.

Other Considerations

Enclosures are strictly regulated because, if not constructed properly, they can transfer flood forces to the main structure (possibly leading to structural collapse). There are other considerations as well:

- Owners may be tempted to convert enclosed areas below the BFE into habitable space, leading to life-safety concerns and uninsured losses. Construction without enclosures should be encouraged. Contractors **should not stub out utilities in enclosures** (utility stub-outs make it easier for owners to finish and occupy the space).
- Siding used on the elevated portions of a building should not extend down over breakaway walls. Instead, a clean separation should be provided so that any siding installed on breakaway walls is structurally independent of siding elsewhere on the building. Without such a separation, the failure of breakaway walls can result in damage to siding elsewhere on the building (see Figure 4).
- Solid breakaway wall enclosures in V zones will result in **significantly higher flood insurance premiums** (especially where the enclosed area is 300 square feet or greater). Insect screening or lattice, slats, or louvers are recommended instead.

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- If enclosures are constructed in **Coastal A zones** (see the Hurricane Ike Recovery Advisory, *Design and Construction in Coastal A Zones*), **open foundations with breakaway enclosures are recommended** in lieu of foundation walls or crawlspaces. If solid breakaway walls are used, they must be equipped with flood openings that allow floodwaters to enter and exit the enclosure. Use of breakaway enclosures in Coastal A zones (or any A zone) will not lead to higher flood insurance premiums.

This Recovery Advisory recommends the use of insect screening, or open wood or plastic lattice, slats, or louvers, instead of solid breakaway walls beneath elevated residential buildings.

- Garage doors installed in below-BFE enclosures of V-zone buildings – even reinforced and high-wind-resistant doors – must meet the performance requirement discussed in the *Breakaway Walls* section of this Recovery Advisory. Specifically, the doors must be designed to break free under the larger of the design wind load, the design seismic load, or 10 psf, acting perpendicular to the plane of the door. If the loading at which the door is intended to collapse is greater than 20 psf, **the door must be designed and certified to collapse under base flood conditions.** See the *Breakaway Walls* section for information about certification requirements.

This Recovery Advisory recommends that flood openings be considered for solid breakaway walls in V zones, even though they are not required by the NFIP. The presence of flood openings may relieve flood forces against the solid breakaway walls and reduce damage to the walls.

References

FEMA. 2008a. *Design and Construction Requirements for Breakaway Walls*. Technical Bulletin 9, available at: http://www.fema.gov/library/viewRecord.do?id=1722.

FEMA. 2008b. *Free-of-Obstruction Requirements*. Technical Bulletin 5, available at: http://www.fema.gov/library/viewRecord.do?id=1718.

FEMA. 2008c. *Openings in Foundation Walls and Walls of Enclosures*. Technical Bulletin 1, available at: http://www.fema.gov/library/viewRecord.do?id=1579.

FEMA. 2009. Hurricane Ike Recovery Advisory, *Design and Construction in Coastal A Zones*.

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Erosion, Scour, and Foundation Design

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To discuss how any lowering of the ground surface can affect the ability of a building foundation to resist design loads, and to provide additional guidance for coastal foundation design.

Key Issues

- Coastal buildings are often subject to flood loads and conditions that do not affect inland buildings. These include waves, high velocity storm surge flow, floodborne debris, and **erosion** and **scour**. This Recovery Advisory will focus on erosion and scour. See FEMA 499, *Home Builder's Guide to Coastal Construction* (2005), Fact Sheets 11 through 15 at: http://www.fema.gov/library/viewRecord.do?id=1570, and FEMA 55, *Coastal Construction Manual* (2000) at: http://www.fema.gov/library/viewRecord.do?id=1671 for discussion of other foundation issues.

> **Erosion** refers to a general lowering of the ground surface over a wide area.
>
> **Scour** refers to a localized loss of soil, often around a foundation element.

- Foundations must transfer all loads imposed on the building into the ground. If the foundation is not strong enough or deep enough to do this, the building will be destroyed. If the foundation embedment into the ground is not sufficient to account for erosion and scour that may occur over the life of the building, the building is vulnerable to collapse under design flood and wind conditions.
- Predicting the incidence, location, and magnitude of coastal erosion and scour is difficult, and present-day building codes and standards do not prescribe clear-cut solutions for designers. Therefore, designers should be conservative with their foundation designs. This means foundations may need to be stronger, deeper, and higher than what has historically been used. Lessons learned from Hurricane Ike and other recent coastal storm events should be incorporated into foundation designs.

Erosion and Scour Basics

Erosion is defined by the International Building Code® (ICC, 2006) as the "wearing away of the ground surface as a result of the movement of wind, water or ice." Section 7.5 of FEMA's *Coastal Construction Manual* describes erosion as "the wearing or washing away of coastal lands." Since the exact configuration of the soil loss is important for foundation design purposes, a more specific definition is used in this Recovery Advisory (see text box and Figure 1).

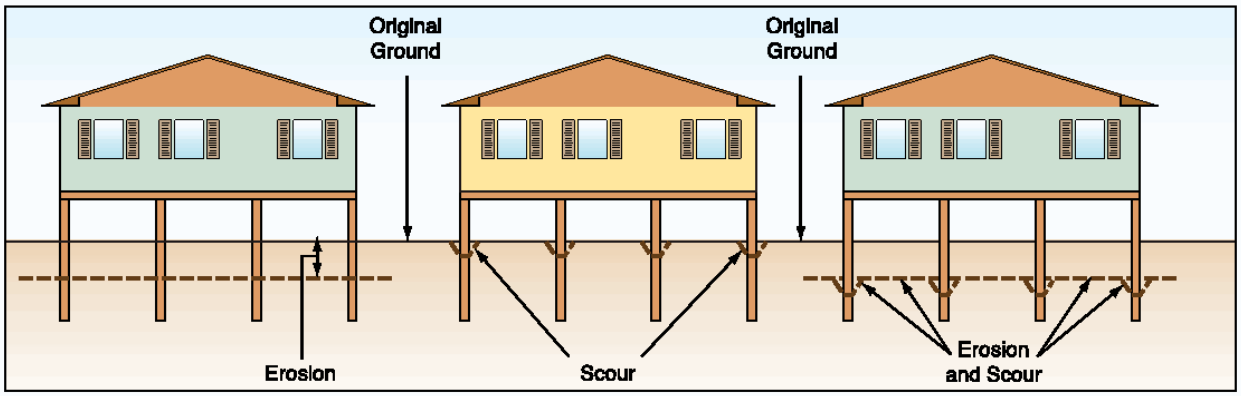


Figure 1. Distinguishing between coastal erosion and scour. A building may be subject to either or both, depending on the building location, soil characteristics, and flood conditions.

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Erosion can occur across a wide range of timeframes – it can be gradual, occurring over a long period of time (many years); more rapid, occurring over a relatively short period of time (weeks or months); or episodic, occurring during a single coastal storm event over a short period of time (hours or days). Figure 2 shows the result of erosion occurring over a long timeframe – buildings that were formerly on upland property, but now stand on the active beach. Figure 3 shows episodic erosion that occurred during Hurricane Ike. In both cases, the recession of the shoreline resulted in a horizontal translation of the beach profile and a lowering of the ground elevation under and near the affected buildings. The closer a building is to the shoreline, the more likely erosion will occur and the greater the erosion depth will be.

Scour occurs when floodwater passes around obstructions in the water column. As the water flows around an object, it must change direction and accelerate. Soil can be loosened and suspended by this process or by waves striking the object, and be carried away. Pilings, pile caps, columns, walls, footings, slabs, and other objects found under a coastal building can lead to localized scour. Scour effects increase with increasing flow velocity and turbulence, and with increasing soil erodibility.

Scour effects are generally **localized**, ranging from small, shallow conical depressions in the sand around individual piles (Figure 4) to larger and deeper depressions around individual piles (Figure 5), to a building-sized shallow depression around a group of piles (Figure 6), to a large and deep depression around a building foundation (Figure 7). Scour depressions like that shown in Figure 7 were observed frequently following Hurricane Ike, and many of these reportedly were 6 to 10' deep and required hundreds of cubic yards of soil to fill. The presence of large, non-frangible concrete slabs and deep grade beams under the buildings may be a contributing factor to the large local scour depressions observed.

In some cases, buildings may settle due to inadequate pile embedment, coupled with some combination of erosion, scour, and soil liquefaction that leads to loss of bearing. This type of failure was observed by the Huricane Ike FEMA Mitigation Assessment Team (MAT) at Surfside Beach, TX (Figure 8) and Holly Beach, LA.



Figure 2. Long-term erosion has caused the shoreline to retreat and has left homes standing on the beach (Surfside Beach, TX). July 2007 Texas General Land Office photo.



Figure 3. Storm-induced erosion beneath an elevated coastal building (Galveston Island, TX, Hurricane Ike).



Figure 4. Local scour around foundation piles (Pensacola Beach, FL, Hurricane Ivan).



Figure 5. Local scour around foundation piles (Holly Beach, LA, Hurricane Ike).

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Figure 6. Local scour around a 3rd row house's pile foundation (Bolivar Peninsula, TX, Hurricane Ike).



Figure 7. Extreme local scour around a Gulf-front pile foundation (Bolivar Peninsula, TX, Hurricane Ike).



Figure 8. Differential settlement of buildings thought to be a result of inadequate foundation embedment coupled with erosion, scour, and/or soil liquefaction (Surfside Beach, TX, Hurricane Ike).



Figure 9. Linear scour and erosion patterns aligning with canals and roads (Bolivar Peninsula, TX, Hurricane Ike).

There is one other erosion and scour scenario to consider in foundation design – the loss of soil around or under a building as a result of storm surge flow being channeled or directed across a building site. This process usually takes place where storm surge flow is constrained between large buildings or gaps in shore protection, or when return flow to the sea follows paths of least resistance, such as along canals and roads (Figure 9).

Erosion and Scour – Impacts on Foundations

Erosion and scour have several adverse impacts on coastal foundations:

- Erosion and scour reduce the embedment of the foundation into the soil, causing shallow foundations to collapse and making buildings on deep foundations more susceptible to settlement, lateral movement, or overturning from lateral loads.
- Erosion and scour increase the unbraced length of pile foundations, increase the bending moment to which they are subjected, and can overstress piles.
- Erosion over a large area between a foundation and a flood source exposes the foundation to increased lateral flood loads (i.e., greater stillwater depths, possible higher wave heights, and higher flow velocities).
- Local scour around individual piles or a building foundation will not generally expose foundations to greater flood loads, but linear scour across a building site may do so.

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Resisting *higher bending moments* brought about by erosion and scour may necessitate a larger pile cross-section or decreased pile spacing (i.e., more piles) or, in some cases, use of a different pile material (e.g., concrete or steel instead of wood). Resisting increased lateral flood loads brought about by erosion (and possibly by linear scour) would necessitate a similar approach. However, designers must remember that increasing the number of piles or increasing the pile diameter will, in turn, also increase lateral flood loads on the foundation.

Resisting *increased unbraced lengths* brought about by erosion and scour will require additional embedment of the foundation into the ground.

To illustrate these points, calculations were made to examine the effects of erosion and scour on foundation design for a simple case – a 32' x 32', two-story house (10' story height), situated away from the shoreline and elevated 8' above grade on 25 square timber piles (spaced 8' apart), on medium dense sand. The house was subjected to a design wind event with a 130-mph (3-second gust) wind speed and a 4' stillwater depth above the uneroded grade, with storm surge and broken waves passing under the elevated building. Lateral wind and flood loads were calculated in accordance with ASCE/SEI 7-05 *Minimum Design Loads for Buildings and Other Structures* (model codes and related prescriptive standards, such as the International Building Code (IBC), the International Residential Code® (IRC®), and ICC-600 *Standard for Residential Construction in High Wind Areas*, are based on ASCE 7 loads). For this illustration, the piles were analyzed under lateral wind and flood loads only; dead, live and wind uplift loads were neglected. If these neglected loads are included in the analysis, deeper pile embedment and possibly larger piles may be needed.

Three different timber pile sizes (8" square, 10" square, and 12" square) were evaluated using pre-storm embedment depths of 10', 15', and 20', and five different erosion and scour conditions (Erosion = 0' or 1'; Scour ranges from 2.0 times the pile diameter to 4.0 times the pile diameter). The results of the analysis are shown in Table 1. A shaded cell indicates the combination of pile size, pre-storm embedment, and erosion/scour does not provide the bending resistance and/or embedment required to resist lateral loads. The reason(s) for a foundation failure is indicated in each shaded cell, using "P" for failure due to bending and overstress within the pile and "E" for an embedment failure from the pile/soil interaction. An unshaded cell with "OK" indicates bending and foundation embedment criteria are both satisfied by the particular pile size/pile embedment/erosion-scour combination.

Table 1. Example foundation adequacy calculations for a two-story house supported on square timber piles and situated away from the shoreline, storm surge and broken waves passing under the building, 130-mph wind zone, soil = medium dense sand. Shaded cells indicate the foundation fails to meet bending (P) and/or embedment (E) requirements.

Pile Embedment Before Erosion and Scour	Erosion and Scour Conditions	Pile Diameter, a		
		8 inch	10 inch	12 inch
10 feet	Erosion = 0, Scour = 0	P, E	E	OK
	Erosion = 1 foot, Scour = 2.0 a	P, E	E	E
	Erosion = 1 foot, Scour = 2.5 a	P, E	E	E
	Erosion = 1 foot, Scour = 3.0 a	P, E	E	E
	Erosion = 1 foot, Scour = 4.0 a	P, E	P, E	E
15 feet	Erosion = 0, Scour = 0	P	OK	OK
	Erosion = 1 foot, Scour = 2.0 a	P	OK	OK
	Erosion = 1 foot, Scour = 2.5 a	P	OK	OK
	Erosion = 1 foot, Scour = 3.0 a	P	OK	OK
	Erosion = 1 foot, Scour = 4.0 a	P, E	P, E	E
20 feet	Erosion = 0, Scour = 0	P	OK	OK
	Erosion = 1 foot, Scour = 2.0 a	P	OK	OK
	Erosion = 1 foot, Scour = 2.5 a	P	OK	OK
	Erosion = 1 foot, Scour = 3.0 a	P	OK	OK
	Erosion = 1 foot, Scour = 4.0 a	P	P	OK

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Review of the table shows several key points:

- Increasing pile embedment will not offset foundation inadequacy (bending failure) resulting from too small a pile cross-section or too weak a pile material.
- Increasing pile cross-section (or material strength) will not compensate for inadequate pile embedment
- Given the building and foundation configuration used in the example, the 8" square pile is not strong enough to resist the lateral loads resulting from the 130-mph design wind speed under any of the erosion and scour conditions evaluated, even if there is no erosion or scour. Homes supported by 8" square timber piles, with embedment depths of 10' or less, will likely fail in large numbers when subjected to design or near-design loads and conditions. Homes supported by deeper 8" piles may still be lost during a design event due to pile (bending) failures



WARNING

The results in Table 1 should not be used in lieu of building- and site-specific engineering analyses and foundation design. The table is for illustrative purposes only and is based upon certain assumptions and simplifications, and for the combinations of building characteristics, soil conditions, and wind and flood conditions described above. Registered design professionals should be consulted for foundations designs.

- The 10" square pile is strong enough to resist bending under all but the most severe erosion and scour conditions analyzed.
- The 12" pile is the only pile size evaluated that satisfies bending requirements under all erosion and scour conditions analyzed. The 12" pile works with 10' of embedment under the no erosion and scour condition. However, introducing as little as 1' of erosion, and scour equal to twice the pile diameter, was enough to render the foundation too shallow.
- 15' of pile embedment is adequate for both 10" and 12" piles subject to 1' of erosion and scour up to three times the pile diameter. However, when the scour is increased to four times the pile diameter (frequently observed following Hurricane Ike), 15' of embedment is inadequate for both piles. In general terms, approximately 11' of embedment is required in this example house to resist the loads and conditions after erosion and scour are imposed.
- The 12" pile with 20' of embedment was the only foundation that worked under all erosion and scour conditions analyzed. This pile design may be justified for the sample house analyzed when expected erosion and scour conditions are unknown or uncertain.

NFIP and Building Code Requirements

One of the requirements of **Section 60.3(a)(3)** of the NFIP regulations that applies to all flood hazard zones (V, VE, V1-30, A, AE, A1-30, AO, AH, etc.) within the Special Flood Hazard Area (SFHA) is:

> "If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy."

A requirement in **Section 60.3(e)(4)** states that all new construction and substantial improvements in V zones must be elevated on pilings and columns so that:

> "(i) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the base flood level; and
>
> (ii) the pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.
>
> Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of paragraphs (e)(4)(i) and (ii) of this section."

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The International Residential Code (2006) has similar requirements:

"**R324.1.1 [Flood Resistant Construction] Structural systems.** All structural systems of all buildings and structures shall be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses from flooding equal to the design flood elevation.

R324.3.3 [Coastal high-hazard areas] Foundations. All buildings and structures erected in coastal high-hazard areas shall be supported on pilings or columns and shall be adequately anchored to such pilings or columns. Pilings shall have adequate soil penetration to resist the combined wave and wind loads (lateral and uplift). Water loading values used shall be those associated with the design flood. Wind loading values used shall be those required by this code. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile systems design and installation shall be certified in accordance with Section R324.3.6. Mat, raft or other foundations that support columns shall not be permitted where soils investigations that are required in accordance with Section R401.4 indicate that soil material under the mat, raft or other foundation is subject to scour or erosion from wave-velocity flow conditions.

Buildings and structures, and all parts thereof, shall be constructed to support safely all loads, including dead loads, live loads, roof loads, flood loads, snow loads, wind loads and seismic loads as prescribed in this code. The construction of buildings and structures shall result in a system that provides a complete load path capable of transferring all loads from their point of origin through the load-resisting elements of the foundation."

Thus, designers are responsible for ensuring that a foundation for a building in any flood hazard area must be adequate to support a building under applicable design loads and load combinations. Designers must consider the effects of erosion and scour when foundations are designed. Designers must certify the foundations.

There may also be other (State or local) foundation design and certification requirements.

Erosion and Scour Design Guidance

Given that the design requirements listed above are performance requirements, designers must translate those into practice. This can be difficult with respect to estimating erosion and scour conditions at a particular site, since definitive guidance for estimating coastal erosion and scour is not present in building codes and standards.

FEMA's *Coastal Construction Manual* (FEMA, 2000) provides some information and guidance, but even this should be considered preliminary and subject to improvement as we learn more from post-storm investigations. The pertinent CCM sections and guidance are summarized below:

CCM Section 7.5: this section summarizes the causes of erosion, its impacts on coastal lands and buildings, and how it is measured. Section 7.5.2.5 discusses local scour. One key point is a procedure outlined in the note on page 7-28 and illustrated in *CCM* Figure 7-66 – three steps that a designer should use to estimate future ground elevations and flood conditions at a site:

Step 1: determine the most landward shoreline location expected during the life of the building

Step 2: define the lowest expected ground elevation during the life of the building

Step 3: define the highest expected BFE during the life of the building

Designers in Texas and Louisiana can obtain erosion data and other related information from various state agencies (see References).

CCM Section 7.8.1.4 discusses FEMA's current procedures for estimating storm-induced erosion.

CCM Section 7.9.2 discusses how designers can update an obsolete flood hazard description for a site by accounting for long-term (Step 1 above) and storm-induced erosion (Step 2 above). *CCM* Figure 7-67 (Figure 10) provides an example, illustrating the use of published long-term erosion information and simple storm erosion calculations to estimate future ground elevations at a building site.

CCM Section 11.6.11 discusses local scour and presents a simple method for calculating erosion around a single pile. The method predicts the depth of a scour depression below the eroded ground elevation

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is equal to 2.0 times the pile diameter, unless non-erodible soil lies beneath the ground surface (Figure 11).

Designers should use the CCM scour depth relationship (Smax = 2.0 a) with caution. Observations after Hurricane Ike showed scour exceeded twice the pile diameter at many locations. This could have been due to deeper scour depths around entire pile foundations (Figures 6 and 7), or to the presence of concrete slabs and deep grade beams that channeled flow between the bottom of the slab and the soil, or to other factors. Given the uncertainty over the exact cause of local scour during Hurricane Ike, foundation designs for reconstruction along the Gulf shoreline should be very conservative, and an assumed scour depth of 6 to 8' would not be unreasonable. Designers should investigate local soils and Hurricane Ike-induced scour at nearby locations before selecting a scour depth. Post-hurricane aerial photographs, such as those obtained after Hurricane Ike by NOAA and USGS (see References) will provide a good source of data for designers.

The *CCM* mentions linear scour channels occurring between large buildings or in-line with roads, canals, and drainage features (see *CCM* Section 8.3.2), but does not provide design guidance for estimating linear scour depths. As was the case with local scour, designers should utilize post-hurricane data when they estimate linear scour likelihood and depth.

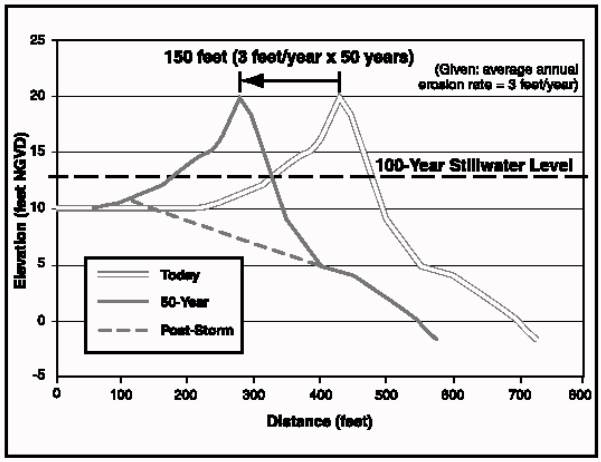


Figure 10. CCM Figure 7-67 illustrating a simple procedure to account for long-term erosion and storm erosion.

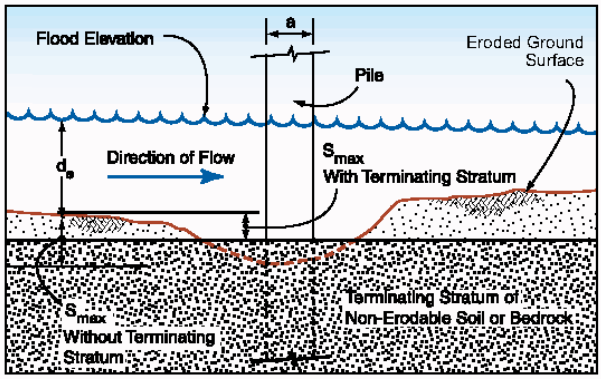


Figure 11. CCM Figure 11-12 illustrating scour estimate around a single pile – Hurricane Ike showed this method may underestimate local scour.

Existing Homes: Are the Pile Foundations Adequate?

The owner of an existing home may wonder whether the pile foundation is adequate to withstand erosion and scour during a design event. The builder or building official may have permit records, building plans, or foundation design information for the house, or may be able to provide information about typical design requirements, construction practices, and probable pile embedment depths for houses of the same age. A licensed engineer can perform an inspection of the foundation, provide information about non-destructive testing methods to determine pile embedment depth, review available foundation data, and analyze the foundation.

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Minimizing Water Intrusion Through Roof Vents in High-Wind Regions

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend practices for minimizing water intrusion through roof vent systems that can lead to interior damage and mold growth in high-wind regions (i.e., greater than 90-miles per hour [mph] gust design wind speed).

Key Issues

- Hurricane winds can drive large amounts of water through attic ventilation openings. The accumulating water soaks insulation, which can lead to mold growth and, in some cases, to the collapse of ceilings.
- Attic ventilation can be provided by a number of devices, most of which have been observed to allow water intrusion under certain conditions and some of which have been observed to blow off. These devices include:
  - Soffit vents
  - Ridge vents
  - Gable end vents
  - Off-ridge vents
  - Gable rake vents
  - Turbines
- Adequate ventilation of attics is generally required to promote the health of wood structural members and sheathing in the attic.
- Attic ventilation can reduce the temperatures of roof coverings, which will typically prolong the life of the roof covering. However, roof color can have more of an impact on roof covering temperature than the amount of ventilation that is or is not provided.
- An unventilated attic can be an effective way to prevent water intrusion and this type of attic is gaining popularity for energy efficiency reasons, provided the air conditioning system is sized appropriately. However, an unventilated attic is best accomplished when it is specifically designed into the house and all of the appropriate details are handled properly. On an existing house, any attempt to change to an unventilated attic configuration needs to be done very carefully with the advice of knowledgeable experts. There are a number of changes that have to be made to produce a successful transition from a ventilated to an unventilated attic. One side effect of going to an unventilated attic may be to void the warranty for the roof covering.
- The following information is intended to help minimize water intrusion through new and existing attic ventilation systems, not to change from a ventilated to an unventilated system. With the exception of the plugging of gable rake vents, all other shuttering of openings or plugging of vents should be done on a temporary basis and removed once the storm threat is over so that the attic is once again properly ventilated.

The Unventilated Attic

The most conservative approach to preventing wind-driven rain from entering the attic is to eliminate attic ventilation, but unventilated attics are controversial. Although allowed by the International Residential Code® (IRC®), provided the Code's criteria are met, unventilated attics may not comply with local building codes.

However, when unventilated attics are allowed by the building code or code compliance is not an issue, and when climatic and interior humidity conditions (e.g., no indoor swimming pools) are conducive to an unventilated design, an unventilated attic is a reliable way to prevent wind-driven rain from entering the attic.

Air barrier: Refer to the *Siding Installation in High-Wind Regions*, Hurricane Ike Recovery Advisory for recommendations regarding attic air barriers.

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Mitigation Guidance

Soffit Vents

Key Issues

- First and foremost, it is important to keep the soffit material in place. While some water can be blown into the attic through almost any type of soffit vent, the amount of water intrusion increases dramatically when the soffit material is missing (Figure 1).
- Plywood or wood soffits are generally adequately anchored to wood framing attached to the roof structure and/or the walls. However, it has been common practice for vinyl and aluminum soffit panels to be installed in tracks that are frequently very poorly connected to the walls and fascia at the edge of the roof overhang. When these poorly anchored soffits are blown off, water intrusion increases significantly. Properly installed vinyl and aluminum soffit panels are fastened to the building structure or to nailing strips placed at intervals specified by the manufacturer.



Figure 1. Missing soffit material.

Proper Installation

The details of proper installation of vinyl and aluminum soffits depend on the type of eave to which they are attached. The key elements are illustrated in Figure 2.

A. Roof truss or rafter framing should extend across the bottom of the eaves, or be added to create a structural support for the soffit. As an alternative, soffits can be attached directly to the undersides of the angled rafters.

B. Nailing strips should be provided, if necessary, to allow attachment of the soffit at the ends. Intermediate nailing strips may be needed, depending on the maximum span permitted for the soffit. If this is not known, the span between attachment points should not exceed 12" in high-wind regions.

C. A J-channel (illustrated), F-channel, or other receiver as specified by the manufacturer should cover the ends of the soffit panels. Fasteners should be those specified by the manufacturer. Fasteners should be used through the nailing strip of each panel and at any other points (such as in the "valleys" of the soffit) if specified.

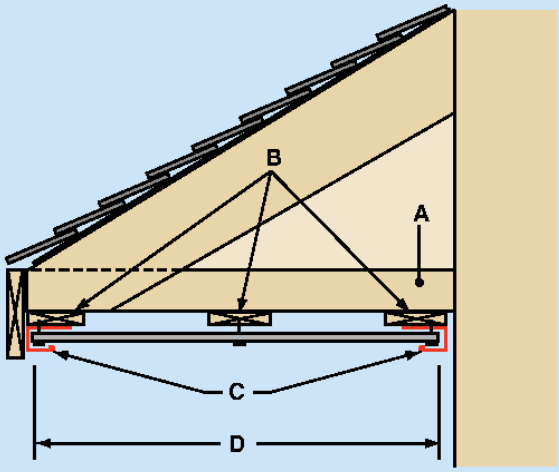


Figure 2. Key soffit installation points.

D. The overall span (eave depth) of the soffit should not exceed any limits specified by the manufacturer, and any required intermediate attachment points should be used.

Checking Soffit Material Installation

As noted above, the most critical soffit installations to check are those where vinyl or aluminum soffit panels are used. Soffits should be fastened to the eave structure; they should not be loose in the channels. Pushing up on the soffit material and the channels used to support the material can be revealing. If it moves

Soffits can receive positive and negative (suction) loads; therefore, soffits need to be designed and installed to resist loads that push up and pull down on the soffit.

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readily or is easy to deform, it probably is not attached very well. Similarly, if the width of the overhang is greater than 12", there should be an intermediate support running along the middle of the soffit and the panels should be attached to this support in addition to the supports at the ends of the panels. If you are concerned about the installation but can't be sure, there are a couple of tools with a viewing screen connected to a small camera lens and light mounted at the end of a flexible tube that can be used to observe the connections. These devices allow inspection through a small hole that is drilled in an inconspicuous location that can be later filled with sealant. In order to ensure that you have a strong connection at the wall, there should be wood blocking running along the wall above the track where the soffit channel is attached and the channel should be fastened to that blocking. If you do not find wood blocking and either see no vertical nailing surface on the channel or see occasional tabs that have been cut and bent up to allow fastening to the wall, strengthening of the anchorage of the soffit material is clearly indicated.

Remedial Measures

If the inspection indicates a poorly attached soffit, the best way to ensure that the soffit material is adequately anchored in place is to remove it and install adequate wood blocking to allow solid anchorage of the soffit material. In some cases, it may be possible to remove the soffit material and reinstall it. However, it is also likely that some or all of the material will need to be replaced, so make sure that it can be matched before it is removed. Short of removing and properly reinstalling the soffit material, testing has shown that the anchorage can be greatly improved by applying a bead of sealant (Figure 3) along the bottom edge of the wall channel to adhere it to the wall surface below followed by applying large dabs of sealant in indentations between the soffit panels and the wall channel at one end (Figure 4) and the fascia flashing at the other end. Surfaces receiving sealant should be cleaned in order to facilitate bonding. Extra resistance can be gained by installing screws that mechanically tie the soffit panels to both the fascia flashing and to the wall channel (Figure 5). Note that use of sealant is a remedial measure only and is not a substitute for proper installation and fastening of soffits in a new installation.

Wind-driven rain penetration: Currently there is no adequate standard test method to evaluate the potential for wind-driven rain to enter attics through soffit vent openings, such as those shown in Figure 6. To avoid water entry at soffit vents, options include eliminating soffit vents and providing an alternate method for air to enter the attic, or design for an unventilated attic. Another approach is to place filter fabric (like that used for heating, ventilation, or cooling



Figure 3. Applying a bead of sealant. (Note: Black sealant was used so that it would be visible in the photograph. Normally a matching sealant color would be used.)



Figure 4. Applying dabs of sealant.



Figure 5. Screws through wall channel.

Rain screen wall venting: In lieu of providing soffit vents, another method to provide attic air intake is through a pressure-equalized rain screen wall system as discussed in *Siding Installation in High-Wind Regions*, Hurricane Ike Recovery Advisory. This alternative approach eliminates soffit vents and their susceptibility to wind-driven rain entry.

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[HVAC] system filters) above the vent openings; however, such an approach needs to be custom designed.

Fascia cover: Field investigations after Hurricane Ike showed many cases where the aluminum fascia cover (fascia cap) from the fascia board was blown off (Figure 7). The fascia cover normally covers the ends of vinyl and aluminum soffits. When the fascia cover is blown off, the ends of the soffit panels are exposed to wind and wind-driven rain.

The IRC currently has no guidelines for the installation of fascia covers. Aluminum fascia covers are typically tucked under the roof drip edge and face-nailed every few feet. More frequent nailing would help secure the fascia cover, but would also inhibit normal thermal movement, which can cause unattractive warping and dimpling of the cover. Vinyl fascia covers are available, which are attached to a continuous strip of utility trim placed underneath the drip edge. This provides a somewhat more secure, continuous attachment and allows for thermal movement. Aluminum fascia covers can also be field-notched and installed with utility trim.



Figure 6. Fiber cement soffit with ventilation slots (red arrow).



Figure 7. Loss of fascia cover exposes ends of vinyl soffit to direct entry of wind-driven rain.



Figure 8. This metal ridge vent was attached with widely spaced roofing nails.

Ridge Vents

Key Issues

- Ridge vents are frequently fastened down using ordinary roofing nails since these are normally handy. It is pretty common to find ridge vents dislodged or blown off during a hurricane (Figure 8). Even a partially dislodged ridge vent can begin to act like a scoop that collects wind-driven rain and directs it into the attic.
- Most roofing manufacturers now make ridge vents that have passed wind-driven water tests. They are identified as having passed Florida Building Code's Product Approvals or Testing Application Standard (TAS) 100(A). Typically, they include a baffle in front of the vent tubes that provide the passageway for hot attic gasses to escape. This baffle is intended to trip any flow of wind and water blowing up the surface of the roof and deflect it over the top of the roof ridge.

Slotting the Deck

When ridge venting is being added to a roof that previously did not have it, it is necessary to cut a slot through the decking. When doing so, it is important to set the depth of the saw blade so that it only slightly projects below the bottom of the decking. At the residence shown in Figure 8, the saw blade cut approximately 1½" into the trusses and cut a portion of the truss plate (red arrow).

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Checking Ridge Vents and Their Installation

When they are used, ridge vents are the last part of the roof to be installed. Consequently, the connection is readily accessible and frequently visible without having to pry up the edge of the vent cover top. Check the type and condition of the fasteners. If the fasteners are nails, replacement of the fasteners is in order. If the vent has clear holes or slots without any baffle or trip next to the edge of the vent channels, the vent is probably not one that is resistant to water intrusion and you should consider replacing the ridge vent with one that has passed the wind-driven water intrusion tests.

Remedial Measures

Replace nails with gasketed stainless steel wood screws that are slightly larger than the existing nails and, if possible, try to add fasteners at locations where they will be embedded in the roof structure below and not just into the roof sheathing. Close spacing of fasteners is recommended (e.g., in the range of 3 to 6" on center, commensurate with the design wind loads). If the ridge vents are damaged or are one of the older types that are not resistant to water intrusion, they should be replaced with vents that have passed the wind-driven water intrusion tests.



Figure 9. Gable end vent.

Gable End Vents

Key Issues

- Virtually all gable end vents (Figure 9) will leak when the wall they are mounted on faces into the wind-driven rain. The pressures developed between the outside surface of the wall and the inside of the attic are sufficient to drive water uphill for a number of inches and, if there is much wind flow through the vent, water carried by the wind will be blown considerable distances into the attic.

Remedial Measures

If it is practical and possible to shutter gable end vents from the outside of the house, this is the preferable way to minimize water intrusion through gable end vents (Figure 10). Install permanent anchors in the wood structure around the gable vent and precut, pre-drill, and label plywood or other suitable shutter materials so that they are ready for installation by a qualified person just before a storm approaches. If installation of shutters from the outside is difficult because of the height or other considerations, but there is access through the attic, the gable vent opening can be shuttered from the inside. However, careful attention needs to be paid to sealing around the shutter and making sure that any water that accumulates in the cavity can drain to the outside of the house and not into the wall below.



Figure 10. Shuttered gable end vent.

Off-ridge Vents

Key Issues

- Poorly anchored off-ridge vents can flip up and become scoops that direct large amounts of wind-driven rain into the attic (Figure 11).



Figure 11. Two off-ridge vents are shown in this photograph. The vent that is covered with roofing felt flipped up and allowed a substantial amount of water to enter the residence. Carpeting, kitchen cabinets, and a large amount of gypsum board had to be replaced because of the water intrusion.

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- Some vents are also prone to leaking when winds blow from certain directions. This will depend on the location of the vent on the roof surface and the geometry of the roof, as well as the geometry of the particular vent.

Checking Off-ridge Vent Installations

Off-ridge vents typically have a flange that lies against the top surface of the roof sheathing and is used to anchor the vent to the roof sheathing. Frequently, roofing nails are used to attach the flange to the roof sheathing. The off-ridge vents should be checked to make sure that they are well anchored to the roof sheathing. If they seem loose, or there are not many fasteners holding them down, it could be a weak link in preventing water intrusion when a storm occurs. Since the flange and fasteners are hidden below the roof covering, it is not possible to simply add nails or screws to improve the anchorage as these will create holes through the roof covering.

Remedial Measures

If the off-ridge vent is attached to the roof sheathing with long, thin nails, it may be possible to improve the anchorage by cinching the nails (bending them over against the underside of the roof sheathing). However, if they are short and/or thick, trying to bend them over may cause more harm than good. Some homeowners have had covers made that can be installed from the inside of the attic over the hole where the off-ridge vent is installed. This will be easiest if the vent is larger than the hole and the cover can be attached to the sheathing in an area where the fasteners can't be driven through the roof covering. Otherwise, it will be important to ensure that the fasteners are short enough that they won't extend through the roof sheathing and damage the roof cover. If the edge of the hole in the roof deck is flush with the inside edge of the vent, it may be possible to install metal straps that are screwed into the walls of the vent and attached with short screws to the bottom surface of the roof sheathing. Again, it is critical to use screws that are short enough that they won't extend through the roof sheathing and damage the roof covering. The strapping should be connected to the walls of the vent with short stainless steel sheet metal screws.

Gable Rake Vents

Key Issues

- Gable rake vents are formed when porous soffit panels or screen vents are installed on the bottom surface of the roof overhang at the gable end and there is a clear path for wind to blow into the attic. This usually happens when the gable overhang is supported by what are called outriggers. Outriggers are typically used when gable overhangs exceed 12". In these cases, the last roof truss or rafter (the gable end truss or rafter) is smaller than the trusses or rafters at the next location inside the attic. Outriggers (2x4s) are installed over top of the last gable truss or rafter, one end is anchored to the second truss or rafter back from the gable end, and the other end sticks out past the gable end wall to support the roof sheathing on the overhang.

Finding Out if You Have Gable Rake Vents and Whether You Still Need Them

The easiest way to tell if your roof has gable rake vents is to look in the attic on a cool sunny day and see if light is visible in gaps just below the sheathing at the gable end. The presence of the outriggers (2x4s running perpendicular to the gable truss and disappearing into the gable overhang) should also be visible. If you also have a gable end vent or a ridge vent, then you probably don't need the gable rake vent in order to provide adequate venting for your attic.



Figure 12. Metal plugs (red arrows) in gable rake vents.

Remedial Measures

The best solution if you don't actually need the venting provided by the gable rake vents is to simply plug them up with metal flashing (Figure 12) or pieces of wood that are cut and anchored so that they are well attached and completely seal as many of the openings as possible and particularly those near the gable peak. Sealant can be used to seal around the edges of the metal or wood plugs.

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Turbines

Key Issues

- The rotating top portion of many turbines is not designed to withstand high-wind conditions and they are frequently installed with just a friction fit to the short standpipe that provides the venting of the attic. It is possible to find high-wind rated turbines on store shelves in hurricane-prone regions but, in hurricane winds, the turbines will be rotating at tremendous speeds and can be easily damaged by windborne debris.
- The flange on the standpipe that provides the connection of the pipe to the roof sheathing may also be poorly anchored to the roof sheathing.

Checking Turbines and Their Installation

Check any turbines to make sure that the stand pipes are not loose and that the turbine head is anchored to the stand pipe by sheet metal screws and not simply by a friction fit (Figure 13).

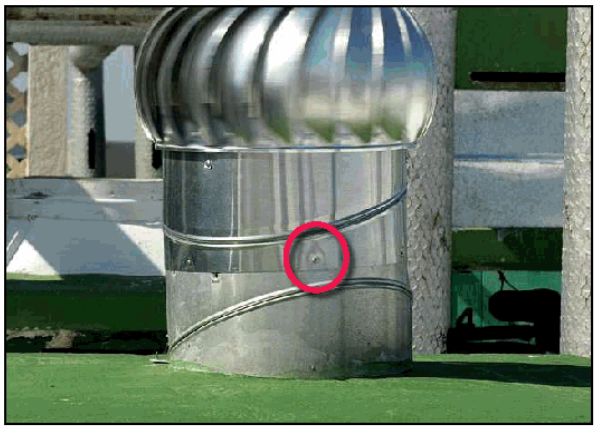


Figure 13. This turbine head is attached to the standpipe with dimple punches. Sheet metal screws should be added to strengthen the connection.

Remedial Measures

Loose standpipes should be securely anchored to the roof sheathing. If the standpipe is attached to the roof sheathing with long, thin nails, it may be possible to improve the anchorage by cinching the nails (bending them over against the underside of the roof sheathing). However, if they are short and/or thick, trying to bend them over may cause more harm than good. Some homeowners have had covers made that can be installed from the inside of the attic over the hole where the standpipe is installed. This will be easiest if the standpipe is larger than the hole and the cover can be attached to the sheathing in an area where the fasteners can't be driven through the roof cover. Otherwise, it will be important to ensure that the fasteners are short enough that they won't extend through the roof sheathing and damage the roof cover. If the edge of the hole in the roof deck is flush with the inside edge of the standpipe, it may be possible to install metal straps that are screwed into the walls of the standpipe and attached with short screws to the bottom surface of the roof sheathing. Again, it is critical to use screws that are short enough that they won't extend through the roof sheathing and damage the roof cover. The strapping should be connected to the walls of the standpipe with short stainless steel sheet metal screws. Beyond any remedial measures taken to anchor the standpipe to the roof sheathing or to plug the hole from the attic side, it is also important to try and seal the standpipe from the outside so that water doesn't build up in the pipe and leak into the roof sheathing around the hole. The best approach is to have a qualified person remove the top active portion of the turbine vent before the storm and plug the hole at the top of the standpipe. A wooden plug can be used that covers the entire hole and has blocks that rest against the walls of the standpipe where screws can be installed to anchor the plug to the standpipe. Some homeowners have had the entire turbine wrapped in plastic to keep water out during a storm (Figure 14). This can work as long as the turbine or wrapping doesn't get dislodged. The smaller area provided by removing the turbine top and plugging the hole is considered preferable.



Figure 14. Plastic wrapped turbine.

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Metal Roof Systems in High-Wind Regions

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend practices for designing and installing metal roof systems that will enhance wind resistance in high-wind regions (i.e., greater than 90-miles per hour [mph] gust design wind speed). This Advisory is applicable to residential and commercial/industrial buildings and critical facilities.

Metal Roofing Options

A variety of metal panel systems (including composite foam panels) are available for low-slope (i.e., 3:12 or less) and steep-slope (i.e., greater than 3:12) roofs. Metal shingles are also available for steep-slope roofs. Common metal roofing options are:

Standing-Seam Hydrostatic (i.e., water-barrier) Systems: These panel systems are designed to resist water infiltration under hydrostatic pressure. They have standing seams, which raise the joint between panels above the water line. The seam is sealed with sealant tape or sealant in case it becomes inundated with water backed up by an ice dam or driven by high wind.

Most hydrostatic systems are structural systems (i.e., the roof panel has sufficient strength to span between purlins or nailers). A hydrostatic architectural panel (which cannot span between supports) may be specified, however, if continuous or closely spaced decking is provided.

An advantage of exposed fastener panels (versus panels with concealed clips) is that, after installation, it is easy to verify that the correct number of fasteners was installed. If fastening was not sufficient, adding exposed fasteners is easy and economical.

For attachment of corrugated metal panels, see FEMA 55, *Coastal Construction Manual*, Appendix K, available online at: http://www.fema.gov/library/viewRecord.do?id=1671.

Hydrokinetic (i.e., water-shedding) panels: These panel systems are not designed to resist water infiltration under hydrostatic pressure and therefore require a relatively steep slope (typically greater than 3:12) and the use of an underlayment to provide secondary protection against water that infiltrates past the panels. Most hydrokinetic panels are architectural systems, thus requiring continuous or closely spaced decking to provide support for gravity loads.

This Recovery Advisory addresses wind and wind-driven rain issues. For general information on other aspects of metal roof system design and construction (including seam types, metal types, and finishes), see:

Architectural Sheet Metal Manual (Sheet Metal and Air Conditioning Contractors National Association, 2003: http://www.smacna.org/bookstore

Copper and Common Sense: http://www.reverecopper.com/candcs.html

Copper Development Association: http://www.copper.org/publications/pub_list/architecture.html

Metal Construction Association: http://www.metalconstruction.org/pubs

Metal Roofing Systems Design Manual (Metal Building Manufacturers Association, 2000, http://www.mbma.com/display.cfm?p=44&pp6&i=47

National Institute of Building Sciences, Whole Building Design Guide: http://www.wbdg.org/design/env_roofing.php

The NRCA Roofing Manual: Metal Panel and SPF Roof Systems (National Roofing Contractors Association, 2008, http://www.nrca.net/rp/technical/manual/default.aspx

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Some hydrokinetic panels have standing ribs and concealed clips (Figure 1), while others (such as 5V-crimp panels, R-panels [box-rib] and corrugated panels) are through-fastened (i.e., attached with exposed fasteners). Panels are available that simulate the appearance of tile.

Metal Shingles: Metal shingles are hydrokinetic products and therefore also require a relatively steep-slope and the use of an underlayment. Metal shingles are available that simulate the appearance of wood shakes and tiles.

Key Issues

Damage investigations have revealed that some metal roofing systems have sufficient strength to resist extremely high winds (Figure 2), while other systems have blown off during winds that were well below design wind speeds given in ASCE 7. When metal roofing (or hip, ridge, or rake flashings) blow off during hurricanes, water may enter the building at displaced roofing; blown-off roofing can damage buildings and injure people. Guidance for achieving successful wind performance is presented below:

1. Always follow manufacturer's installation instructions and local building code requirements.

2. Calculate loads on the roof assembly in accordance with ASCE 7 or the local building code, whichever procedure results in the highest loads.

3. Specify/purchase a metal roof system that has sufficient uplift resist resistance to meet the design uplift loads.

- For standing seam and through-fastened metal panel systems, the International Building Code® (IBC®) requires test methods UL 580 or ASTM E 1592. For standing seam systems, it is recommended that design professionals specify E 1592 testing, because it gives a better representation of the system's uplift performance capability.

  For safety factor determination, refer to Chapter F in standard NAS-01, published by the American Iron and Steel Institute (available online at: http://www.professionalroofing.net/article.aspx?id=266).

- For through-fastened steel panel systems, the IBC allows uplift resistance to be evaluated by testing or by calculations in accordance with standard NAS-01.

- For architectural panels with concealed clips, test method UL 580 is commonly used. However, it is recommended that design professionals specify E 1592 because it gives a better representation of the system's uplift performance capability. When testing architectural panel systems via E 1592, the deck joints need to be unsealed in order to allow air flow to the underside of the metal panels. Therefore, underlayment should be eliminated from the test specimen, and a



Figure 1. This architectural panel system has concealed clips. The panels unlatched from the clips. The first row of clips (just above the red line) was several inches from the end of the panels. The first row of clips should have been closer to the eave.



Figure 2. This structural standing seam roof system survived Hurricane Andrew (Florida, 1992), but some hip flashings were blown off. The estimated wind speed was 170 mph (peak gust, Exposure C at 33 feet).

For observations of metal roofing performance during Hurricanes Charley (2004, Florida), Ivan (2004, Alabama and Florida), and Katrina (Alabama, Louisiana, and Mississippi, 2005), respectively; see Chapter 5 in FEMA MAT reports 488, 489, and 549, available on-line at:

FEMA 488: http://www.fema.gov/library/viewRecord.do?id=1444

FEMA 489: http://www.fema.gov/library/viewRecord.do?id=1569

FEMA 549: http://www.fema.gov/library/viewRecord.do?id=1857

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1/8" minimum gap between deck panel side and end joints should be specified.

For safety factor determination, refer to Chapter F in standard NAS-01.

- For copper roofing testing, see "NRCA analyzes and tests metal," Professional Roofing, May 2003 (available online at: http://www.professionalroofing.net/article.aspx?id=266).
- For metal shingles, it is recommended that uplift resistance be based on test method UL 580 or 1897.
- Specify the design uplift loads for field, perimeter, and corners of the roof. Also specify the dimension of the width of the perimeter. (Note: For small roof areas, the corner load can be used throughout the entire roof area.)

4. Suitably design the roof system components (see the construction guidance below).

5. Obtain the services of a professional roofing contractor to install the roof system.

Construction Guidance

- Consult the local building code and manufacturer's literature for specific installation requirements. Requirements may vary locally.
- Underlayment: If a robust underlayment system is installed, it can serve as a secondary water barrier if the metal roof panels or shingles are blown off (Figures 1 and 3). For enhanced underlayment recommendations, see Technical Fact Sheet No. 19 in FEMA 499, *Home Builder's Guide to Coastal Construction Technical Fact Sheet Series* (available online at: http://www.fema.gov/library/viewRecord.do?id=1570). Fact Sheet 19 pertains to underlayment options for asphalt shingle roofs. For metal panels and tiles, where Fact Sheet 19 recommends a Type I (#15) felt, use a Type II (#30) felt because the heavier felt provides greater resistance to puncture by the panels during application. Also, if a self-adhering modified bitumen underlayment is used, specify/purchase a product that is intended for use underneath metal (such products are more resistant to bitumen flow under high temperature).
- Where the basic (design) wind speed is 110 mph or greater, it is recommended that two clips be used along the eaves, ridges, and hips. Place the first eave clip within 2 to 3" of the eave, and place the second clip approximately 3 to 4" from the first clip. Figures 1 and 4 illustrate ramifications of clips being too far from the eave.
- For copper panel roofs in areas with a basic wind speed greater than 90 mph, it is recommended that Type 316 stainless steel clips and stainless steel screws be used in lieu of the much more malleable copper clips.



Figure 3. These architectural panel system have snap-lock seams. One side of the seam is attached with a concealed fastener. Although a large number of panels blew away, the underlayment did not.



Figure 4. These eave clips were too far from the panel ends. The clip at the left was 13" from the edge of the deck. The other clip was 17" from the edge. It would have been prudent to install double clips along the eave.



Figure 5. The panels blew off the upper roof and landed on the lower roof of this house. The upper asphalt shingle roof shown had been re-covered with 5V-Crimp panels that were screwed to nailers. The failure was caused by inadequate attachment of the nailers (which had widely-spaced nails) to the sheathing. Note that the hip flashing on the lower roof blew off.

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Figure 6. Blow-off of nailers caused these panels to progressively fail. The nailers were installed directly over the trusses. In an assembly such as this where there is no decking, there is no opportunity to incorporate an underlayment. With loss of the panels, rainwater was free to enter the building.



Figure 7. This residence had metal shingles that simulated the appearance of tile. The shingles typically blew off the battens, but some of the battens were also blown away.

- When clip or panel fasteners are attached to nailers (Figures 5, 6, and 7), detail the connection of the nailer to the nailer support (including the detail of where nailers are spliced over a support).
- When clip or panel fasteners are loaded in withdrawal (tension), screws are recommended in lieu of nails.
- For roofs located within 3,000' of the ocean line, stainless steel clips and fasteners are recommended.
- For concealed clips over a solid substrate, it is recommended that chalk lines be specified so that the clips are correctly spaced.
- Hip, ridge, and rake flashings: Because exposed fasteners are more reliable than cleat attachment, it is recommended that hip, ridge, and rake flashings be attached with exposed fasteners. Two rows of fasteners are recommended on either side of the hip/ridge line. Close spacing of fasteners is recommended (e.g., spacing in the range of 3 to 6" on center, commensurate with the design wind loads), as shown in Figure 8 in order to avoid flashing blow-off as shown in Figure 9.

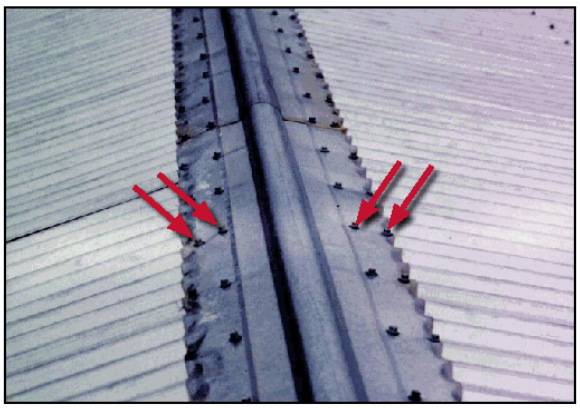


Figure 8. The ridge flashing on these corrugated metal panels had two rows of fasteners on each side of the ridge line.



Figure 9. The ridge flashing fasteners were placed too far apart. A significant amount of water leakage can occur when ridge flashings are blown away.

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Critical Facilities

For metal roofs on critical facilities in hurricane-prone regions (as defined in ASCE 7), see the recommendations in FEMA 543, Section 3.4.3.4 (available online at http://www.fema.gov/library/viewRecord.do?id=2441). (For facilities located outside of hurricane-prone regions, see Section 3.3.3.4.) For load calculation recommendations, see Section 3.3.1.2.

For metal roofs on hospitals in hurricane-prone regions, see the recommendations in FEMA 577, Section 4.3.3.8 (available online at http://www.fema.gov/library/viewRecord.do?id=2739). (For hospitals located outside of hurricane-prone regions, see Section 4.3.3.7.) For load calculation recommendations, see Section 4.3.1.2.

Sustainable Design

Cool Roofs: Use metal roofs with a solar reflectance Index (SRI) equal to or greater than 78 for low-slope and 29 for steep-sloped roofs. The higher solar reflectance will reduce the heat-island effect (thermal gradient differences between developed and undeveloped areas), minimizing the impact buildings have on microclimate and human and wildlife habitat. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, greenhouse gas emissions and air pollution, heat-related illness and mortality, and water quality (http://www.EPA.gov/heatisland).

Recycled Content: Use metal roof systems with recycled content. Many roofing products have recycled scrap content generated both from consumer and industrial users. Recycled content is defined in the International Organization of Standards (ISO) document, ISO 14021 (http://www.iso.org/iso/catalogue_detail?csnumber=23146). Using recycled products reduces impacts from extraction and processing of new materials.

For further information pertaining to sustainable design aspects of metal roofing, see: http://www.metalconstruction.org/design.

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Siding Installation in High-Wind Regions

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To provide basic design and installation tips for various types of siding that will enhance wind resistance in high-wind regions (i.e., greater than 90-mph gust design wind speed).

Key Issues

- Siding is frequently blown off walls of residential and non-residential buildings during hurricanes. Also, wind-driven rain is frequently blown into wall cavities (even when the siding itself is not blown off). Guidance for achieving successful wind performance is presented below.
- To avoid wind-driven rain penetration into wall cavities, an effective moisture barrier (housewrap or building paper) is needed. For further information on moisture barriers, see Technical Fact Sheet No. 9 in FEMA 499, *Home Builder's Guide to Coastal Construction*, Technical Fact Sheet Series (available online at: http://www.fema.gov/library/viewRecord.do?id=1570). For further information on housewrap, see Technical Fact Sheet No. 23.
- Always follow manufacturer's installation instructions and local building code requirements.
- Use products that are suitable for a coastal environment. Many manufacturers do not rate their products in a way that makes it easy to determine whether the product will be adequate for the coastal environment. Use only siding products where the supplier can provide specific information on product performance in coastal or high-wind environments.
- For buildings located within 3,000' of the ocean line, stainless steel fasteners are recommended.
- Avoid using dissimilar metals together.
- The installation details for starting the first (lowest) course of lap siding can be critical. Loss of siding often begins at the lowest course and proceeds up the wall (Figures 4 and 12). This is particularly important for elevated buildings, where the wind blows under the building as well as against the sides.
- When applying new siding over existing siding, use shims or install a solid backing to create a uniform, flat surface on which to apply the siding, and avoid creating gaps or projections that could catch the wind.
- Coastal buildings require more maintenance than inland buildings. This maintenance requirement needs to be considered in both the selection and installation of siding.

Moisture barrier (also known as a water-resistive barrier): In the context of residential walls, the moisture barrier is either housewrap or building paper (felt). The moisture barrier occurs between the wall sheathing and the siding. It is a dual-purpose layer that sheds water that gets through the siding and limits air flow through the wall. When properly sealed, housewrap is considered an air barrier. Although building paper provides some resistance to air flow, it is not considered an air barrier. Moisture barriers shed water, but they allow water vapor to pass through them.

For further guidance on principles, materials, and procedures for the design and construction of walls to make them resistant to water intrusion, see American Society for Testing and Materials (ASTM) E 2266, *Standard Guide for Design and Construction of Low-Rise Frame Building Wall Systems to Resist Water Intrusion*.

Vinyl Siding

Vinyl siding can be used successfully in a coastal environment if properly designed and installed.

- Windload resistance:

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- Vinyl siding is required by the International Building Code® (IBC®) and the International Residential Code® (IRC®) to comply with ASTM D 3679, *Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding*, which requires the siding to withstand wind pressures equivalent to 110 mph on a building up to 30' in height in Exposure B. Most vinyl siding has also been tested for higher wind pressures, and can be used in locations with a higher basic wind speed, greater building height, more open exposure, or some combination of those. The design wind pressure or wind speed for which these products are rated is available from product literature, installation instructions, or listings of agencies such as the International Code Council® (ICC®) Evaluation Service.

Definition of Wind Exposure Zones

Exposure B: Urban, suburban, wooded areas.

Exposure C: Open terrain, flat open country, grasslands, all water surfaces in hurricane-prone regions.

- For design wind speeds greater than 110 mph, or building heights greater than 30', or Exposure C, choose a model of siding rated for those conditions or higher. The manufacturer's product literature or installation instructions should specify the fastener type, size and spacing, and any other installation details needed to achieve this rating.

- Products that have been rated for high winds typically have an enhanced nailing hem and are sometimes made from thicker vinyl (Figure 1). Thick, rigid panels provide greater wind resistance, withstand dents, and lie flatter and straighter against the wall. Optimum panel thickness should be 0.040 to 0.048", depending on style and design. Thinner gauge vinyl works well for stable climates; thicker gauge vinyl is recommended for areas with high winds and high temperature changes.

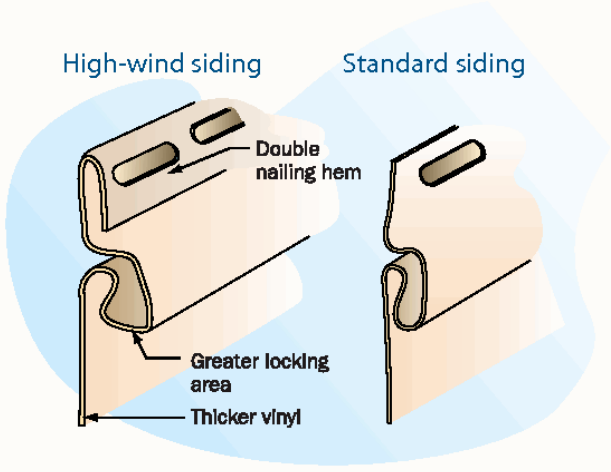


Figure 1. Features of typical high-wind siding and standard siding.

- Position nails in the center of the nailing slot (Figure 2).
- To allow for thermal movement of the siding, do not drive the head of the nail tight against the nail hem (unless the hem has been specifically designed for this). Allow approximately 1/32" (which is about the thickness of a dime) clearance between the fastener head and the siding panel (Figure 3).

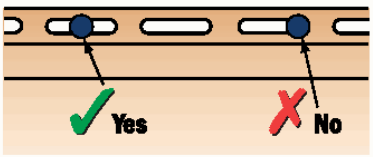


Figure 2. Proper and improper fastener locations.

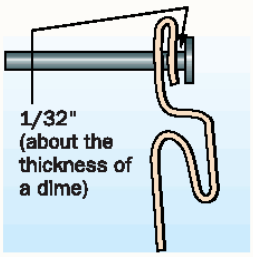


Figure 3. Allow 1/32" clearance between the fastener head and the siding panel.

- Drive nails straight and level to prevent distortion and buckling in the panel.
- Do not caulk the panels where they meet the receiver of inside corners, outside corners, or J-trim. Do not caulk the overlap joints.
- Do not face-nail or staple through the siding.
- Use aluminum, galvanized steel, or other corrosion-resistant nails when installing vinyl siding. Aluminum trim pieces require aluminum or stainless steel fasteners.
- Nail heads should be 5/16" minimum in diameter. Shank should be 1/8" in diameter.
- Use the manufacturer-specified starter strip to lock in the first course; do not substitute other accessories such as a J-channel or utility trim (Figure 4) unless specified by the manufacturer. If the manufacturer specifies a particular strip for high-wind applications, use it. Make sure that the starter strip is designed to positively lock the panel, rather than just hooking over a bulge in the strip; field test the interlock before proceeding with the installation.

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- Make sure that every course of siding is positively locked into the previous course (Figure 5). Push the panel up into the lock from the bottom before nailing rather than pulling from the top. Do not attempt to align siding courses with adjacent walls by installing some courses loosely.
- Make sure that adjacent panels overlap properly, about half the length of the notch at the end of the panel, or approximately 1". Make sure the overlap is not cupped or gapped, which is caused by pulling up or pushing down on the siding while nailing. Reinstall any panels that have this problem.
- Use utility trim under windows or anywhere the top nail hem needs to be cut from siding to fit around an obstacle. Be sure to punch snap-locks into the siding to lock into the utility trim. Do not overlap siding panels directly beneath a window (Figure 6).



Figure 4. Utility trim was substituted for the starter strip and the bottom lock was cut off the siding. Siding was able to pull loose under wind pressure.

- At gable end walls, it is recommended that vinyl siding be installed over wood sheathing rather than over plastic foam sheathing, as was done at the house shown in Figure 7.
- Install vinyl siding in accordance with manufacturer's installation instructions and local building code requirements.
- It is recommended that vinyl siding installers be certified under the VSI Certified Installer Program sponsored by the Vinyl Siding Institute. For more information, go to http://www.vinylsiding.org/aboutsiding/installation/certinstaller.



Figure 5. The siding panel was not properly locked into the panel below.



Figure 6. Proper detailing around windows and other obstacles is important. Use utility trim, punch snap-locks into siding, and don't overlap directly beneath a window.



Figure 7. The vinyl siding at this gable was installed over plastic foam insulation. Without wood sheathing, the wind pressures on the vinyl are increased. Also, if the siding blows away, the foam insulation is very vulnerable to blow-off. With loss of the foam insulation, wind-driven rain can freely enter the attic, saturate the ceiling insulation, and cause collapse of the ceiling.

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Wood Siding

- Use decay-resistant wood such as redwood, cedar, or cypress. See the Sustainable Design section regarding certified wood.
- To improve longevity of paint, back-prime wood siding before installation.
- Carefully follow manufacturer's detailing instructions to prevent excessive water intrusion behind the siding.
- For attachment recommendations, see *Natural Wood Siding: Selection, Installation and Finishing*, published by the Western Wood Products Association (http://www.wwpa.org).

  This publication recommends an air gap between the moisture barrier and the backside of the siding to promote drainage and ventilation. Such a wall configuration is referred to as a rain screen wall. See the text box on page 5.
- Follow the installation details shown in Figure 8. (Note: Although these details do not show a rain screen, inclusion of vertical furring strips to create a rain screen is recommended.)

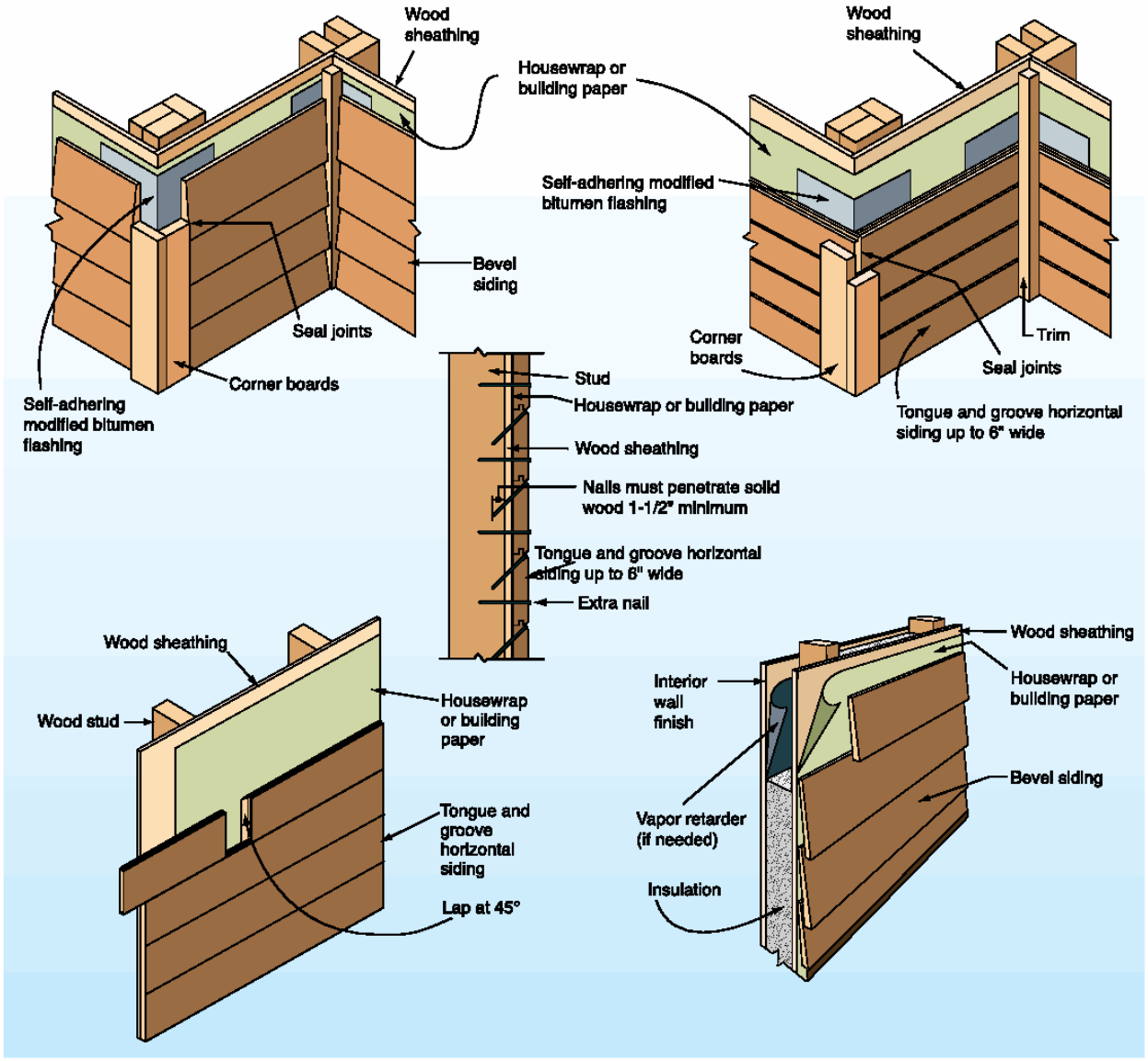


Figure 8. Wood siding installation details.

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Pressure-equalized rain screen wall system

In areas that experience frequent wind-driven rain and areas susceptible to high winds, it is recommended that a rain screen design be considered when specifying wood or fiber cement siding. (Typical vinyl siding products inherently provide air cavities behind the siding that facilitate drainage. Therefore, incorporation of vertical furring strips is normally not applicable to this type of wall covering.) A rain screen design is accomplished by installing suitable vertical furring strips between the moisture barrier and siding material (see Figure 9). The cavity facilitates drainage of water from the space between the moisture barrier and backside of the siding and it facilitates drying of the siding and moisture barrier.

Furring strip attachment: For 1" x 2" furring strips, tack strips in place and use siding nails that are ¾" longer than would be required if there were no strips (thereby maintaining the minimally required siding nail penetration into the studs). For thicker furring strips, an engineered attachment is recommended.

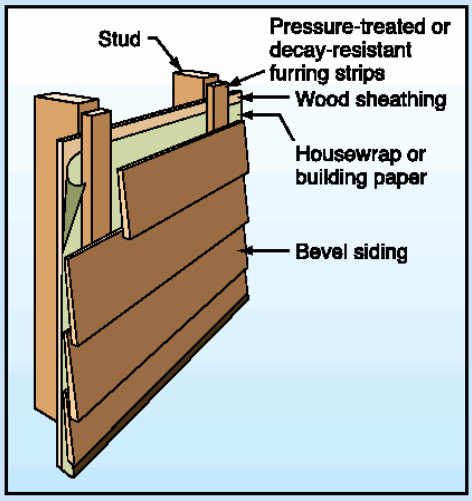


Figure 9. Pressure-equalized rain screen system.

At the bottom of the wall, the cavity should be open to allow water drainage. However, the opening should be screened to avoid insect entry.

At the wall/soffit juncture, the top of the cavity can open into the attic space to provide inlet air ventilation, thereby eliminating soffit vents and their susceptibility to wind-driven rain entry. If the rain screen cavity vent path is used in lieu of soffit vents, the depth of the cavity needs to be engineered to ensure that it provides sufficient air flow to ventilate the attic.

Fiber Cement Siding

Installation procedures are similar to those for wood siding, but require specialized cutting blades and safety precautions because of the dust produced during cutting with power tools. Manufacturer's installation recommendations should be strictly adhered to, and particular attention paid to the painting and finishing recommendations for a high-quality installation.

- Always seal field-cut ends according to the manufacturer's instructions. Properly gap the intersection between siding edges and other building components and fill the gap with sealant.
- Always consult and follow the manufacturer's installation requirements for the needed wind speed rating or design pressure (refer to the manufacturer's building code compliance evaluation report). Observe the manufacturer's fastener specifications, including fastener type and size, spacing, and penetration requirements. Do not over drive or under drive.
- At gable end walls, it is recommended that fiber cement siding be installed over wood sheathing rather than over plastic foam sheathing.
- Keep blind nails between ¾ and 1" from the top edge of the panel (Figure 10). Be sure to drive nails at least 3/8" from butt ends, or use manufacturer-specified joiners.
- Face nailing (Figure 11) instead of blind nailing is recommended where the basic (design) wind speed is 100 miles per hour or greater. If the local building code or manufacturer specifies face nailing at a lower wind speed, install accordingly.
- Do not leave the underside of the first course exposed or extending beyond the underlying material (Figure 12). Consider the use of a trim board to close off the underside of the first course.

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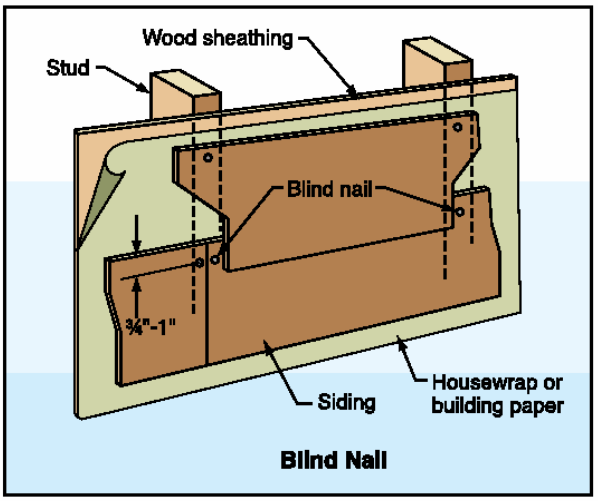


Figure 10. Blind nailing.

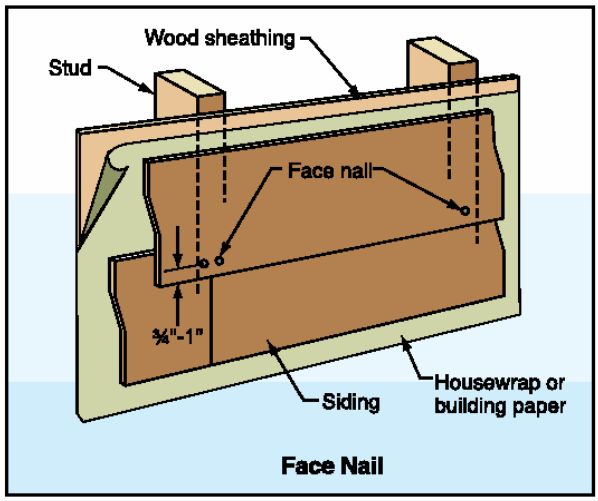


Figure 11. Face nailing.

Sustainable Design

Material selection for sustainable sources and durability

For wood products, select a Forest Stewardship Council (FSC) certified product. The FSC seeks to ensure that wood is harvested in a more responsible fashion, including protecting forest ecosystems, and avoids the use of chemicals and genetic engineering. While redwood, cedar, and cypress are decay-resistant and recommended for durability, they are generally cut from old growth timber. You can determine if the manufacturer is FSC certified by going to http://www.fsc-info.org.

For other siding products, consider long-term life spans for coastal environments, recycled content, and post-consumer use.



Figure 12. Blind nailed siding installed with exposed gap at bottom (red circle) is vulnerable to failure.

The following publications discuss sustainable aspects of vinyl siding:

A Dozen Things You Might Not Know That Make Vinyl Siding Green (available online at http://www.vinylsiding.org/aboutsiding/greenpaper/080919_VSI_Green_Paper_for_web.pdf).

Siding with the Environment (available online at http://www.vinylsiding.org/publications/final_Enviro_single_pg.pdf).

Energy Conservation and Air Barriers: Uncontrolled air leakage through the building envelope is often overlooked. The U.S. Department of Energy estimates that 40 percent of the cost of heating or cooling the average American home is lost to uncontrolled air leakage. In warmer climates, it is a lower percentage of loss. An air barrier system can reduce the heating, ventilation, and cooling (HVAC) system size, resulting in reduced energy use and demand.

Uncontrolled air leakage can also contribute to premature deterioration of building materials, mold and moisture problems, poor indoor air quality, and compromised occupant comfort. When uncontrolled air flows through the building envelope, water vapor moves with it. Controlling the movement of moisture by air infiltration requires controlling the air pathways and/or the driving force.

To effectively control air leakage through the building envelope, an effective air barrier is required. To be effective, it needs to be continuous; therefore, air barrier joints need to be sealed and the barrier needs to be sealed at penetrations through it. The Air Barrier Association of America recommends that materials used

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as a component of a building envelope air barrier be tested to have an air infiltration rate of less than 0.004 cfm/square foot, assemblies of materials that form the air barrier be tested to have an air infiltration rate of less than 0.04 cubic feet per minute (cfm)/square foot, and the whole building exterior enclosure have an air infiltration rate of less than 0.4 cfm/square foot.

Air barrier systems installed behind siding:

Housewrap is the most common air barrier material for residential walls. To be effective, it is critical that the joints between sheets of housewrap be sealed as recommended by the manufacturer, and penetrations (other than fasteners) should also be sealed. At transitions between the housewrap and door and window frame, use of self-adhering modified bitumen flashing tape is recommended.

An air barrier should be installed over a rigid material, or it will not function properly. It also needs to be restrained from pulling off of the wall under negative wind pressures. For walls, wood sheathing serves as a suitable substrate, and the siding (or furring strips in a rain screen wall system) provide sufficient restraint for the air barrier.

At the base of the wall, the wall air barrier should be sealed to the foundation wall. If the house is elevated on piles, the wall barrier should be sealed to an air barrier installed at the plane of the floor.

If the building has a ventilated attic, at the top of the wall, the wall air barrier should be sealed to an air barrier that is installed at the plane of the ceiling.

If the building has an unventilated attic or no attic, at the top of the wall, the wall air barrier should be sealed to an air barrier that is installed at the plane of the roof (the roof air barrier may be the roof membrane itself, or a separate air barrier element).

Siding maintenance:

For all siding products, it is very important to periodically inspect and maintain the product especially in a coastal environment. This includes recoating on a scheduled maintenance plan that is necessary according to the manufacturer's instructions and a periodic check of the sealant to ensure its durability. Check the sealant for its proper resiliency and that it is still in place. Sealant should be replaced before it reaches the end of its service life.

Air barrier: A component installed to provide a continuous barrier to the movement of air through the building envelope. Housewrap is a common air barrier material for residential walls. Although very resistant to airflow, housewrap is very vapor permeable and therefore is not suitable for use as a vapor retarder.

Vapor retarder: A component installed to resist diffusion of water vapor and provide a continuous barrier to movement of air through the building envelope. Polyethylene is a common vapor retarder material for residential walls. To determine whether or not a vapor retarder is needed, refer to the Moisture Control section of the *NRCA Roofing and Waterproofing Manual*, published by the National Roofing Contractors Association (NRCA) (http://www.nrca.net).

ASTM E 1677, *Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls*: This specification covers the minimum performance and acceptance criteria for an air barrier material or system for framed walls of low-rise buildings with the service life of the building wall in mind. The provisions contained in this specification are intended to allow the user to design the wall performance criteria and increase air barrier specifications to accommodate a particular climate location, function, or design of the intended building.

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R4402.1.2.2 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.

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Section R202, Definitions. Add the following definitions:

OPENINGS. Apertures or holes in the building envelope which allow air to flow through the building envelope and which are designed as "open" during design winds as defined by these provision.

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Update on Soffit Mitigation Research: Soffit Vent Covers as a Mitigation Option

Prepared by: Forrest Masters, Ph.D., and David O. Prevatt, Ph.D.
Department of Civil and Coastal Engineering
University of Florida

BACKGROUND

The University of Florida is currently engaged in research to evaluate and improve the performance of soffit during extreme wind and wind-driven rain events. Assessments conducted after Hurricane Charley revealed that more than 80% of newer homes exposed to the highest winds experienced soffit failures. Both suction and pressure failures were observed. While most of these homes suffered very little structural damage, many experienced enough rain penetration from soffits, roof covering failures and leakage around windows and doors to require interior restoration and occupant displacement until the completion of repairs. While there are some indications that much of the damage to soffits was due to lack of attention to this area of building construction, a sound technical basis—in the form of design requirements—is needed to guide the development of solutions for both existing and new homes.

SOFFIT VENT COVERS

The Soffit Vent Cover is manufactured and sold by Vent Covers Inc. of Sunrise, Florida. It was designed by Michael Hemmer, Vent Covers Inc. President, for the purpose of providing protection of attics in residential buildings from wind-driven rain during hurricanes. The cover is formed out .080 aluminum sheet bent to fit over several standard sized soffit and gable vents. The vent covers are designed to be installed by the homeowner in advance of an approaching hurricane and its intent is to eliminate of reduce water intrusion due to wind-driven rain. Installation is done by two screws into the soffit material, (plywood). A video record of this test provides additional details.

Testing was conducted on 20 March 2008 at the East Campus Laboratories of the University of Florida. Using the Hurricane Simulator to produce typical design level winds the comparative test will evaluate the quantity of water entering the attic areas through a) an open and b) soffit vent during simulated extreme wind events. Static and dynamic pressure measurements were made use Pitot tubes attached to Dwyer MS-131 differential pressure sensor (10 in. w.c. FSO).

TESTING PROCEDURE

1. One 7.5 in. by 24.5 in. soffit vent was installed under the 12" overhang of a 6:12 roof. The centerline of the narrow dimension of the vent was concurrently located with the rafter (seen through the vent in Figure 1a)
2. Foam board catch basins were installed in the attic space (see Figure 1b). The perimeter of the basin extended to the sheathing to create an enclosed space
3. A second vent was installed on the rear-facing wall of the catch basin to allow for airflow through the basin. Thus the free net area of the windward opening matched the free net area of the basin

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4. The test subject then received a steady wind load (up to 120 mph ~35 psf) for a period of three minutes. The unobstructed wind-driven rain intensity was set to 35 in/hr. Based on a local effect factor of 0.3, the test subject received on the order of 35 x 0.3 = 10.5 in/hr of wetting.
5. Next, the vent cover was installed (see Figure 2) and the test was repeated



(a) Exterior of House Mockup



(b) Interior of House Mockup

Figure 1. First Test Configuration





Figure 2. Vent Cover Installation

OBSERVATIONS

Figure 3 shows a sketch of the experimental setup and location of the Pitot tubes and soffit vent

Table 1: Summary Results

Test/ Location	Differential Pressure		Mean Wind Speed (mph)
	Inches w.c.	psf	
Both tests/Pitot Tube #1 – exterior surface	6.2 in.	32.2	113
Test 1 (open soffit vent) Pitot Tube #2 – 2 in. above vent opening	3.3 in.	17.2	82.7
Test 2 (vent cover installed) Pitot Tube #2 – 2 in. above opening	0.02 in.	N/A	0

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3677_Text_Update on Soffit Mitigation Research - Soffit Vent Covers_2.png

No Vent Cover - During the tests with no vent cover the peak wind speed measured within the attic was 50 mph. –In this condition, water was blown into the attic space, wetting the underside of the roof sheathing. We recorded a wind speed of 82 mph just inboard of the vent opening and a static pressure of 18 psf. A discontinuous stream of water was blown by this wind.

With Vent Cover Installed – The vent cover remained firmly in place during the test and there was a significant reduction in wind-driven rain entering the attic as the wind speed was reduced to 0 mph. Water collected within the pan of the vent cover, pooling to about 1/8 in. to ¼ in. but the vent cover practically eliminated the blown water from wetting the underside of the roof or blowing into the attic.

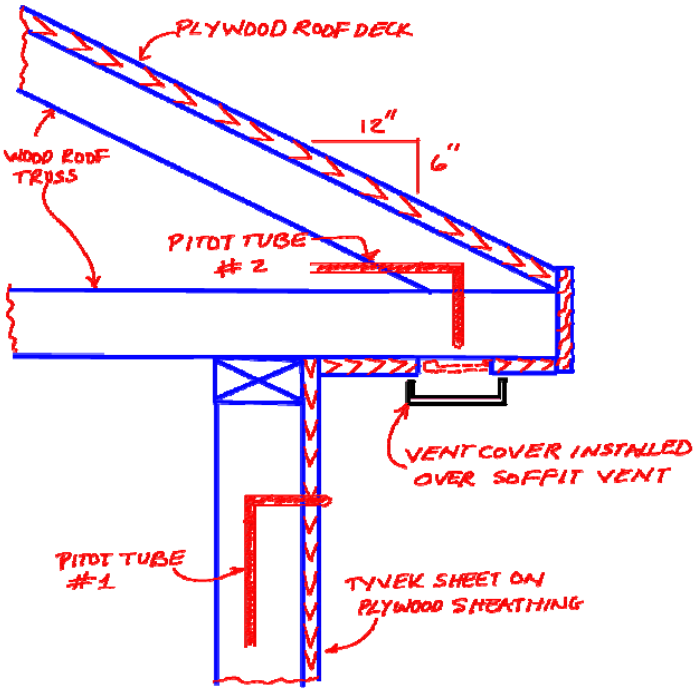


Figure 3. Section through Experimental Section showing instrumentation

SUMMARY

This easy to install soffit vent cover provides protection to the interior attic space from wind-driven rain during extreme wind events. The tested sample remained secured to the soffit during our 3 minute test at hurricane strength wind speeds, while substantially reducing the quantity of wind-driven water entering the attic. Although we observed water ponding within the vent cover, the reduction of wind speed pressure within the attic significantly reduced the wetting potential to adjacent attic materials. Installing one or two weepholes in the vent cover would provide a path for this collected water to drain to the exterior of the building, thereby improving overall performance of the vent cover in retrofit applications.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3677_Text_Update on Soffit Mitigation Research - Soffit Vent Covers_3.png

Date Submitted	3/21/2010	**Section**	1618.4.6.1 and 1618.4.6.2	**Proponent**	Thomas Sputo
Chapter	16	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

None

Summary of Modification

Coordinate structural design criteria for pedestrian guards and handrails between HVHZ and non-HVHZ for non-wind related loading.

Rationale

Pedestrian imposed loadings on guards and handrails are independant of wind loadings and should not vary across the state. This proposal seeks to unify these design loadings for HVHZ and non-HVHZ applications. The proposal specifically requires that guards exposed to wind in the HVHZ be designed to resist wind forces.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Impact will be minimal, if any.

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

The potential exists that cost of these componants may be reduced because manufacturers of generic guardrail systems can use one design across the state (except where required to resist wind), rather than one design for the HVHZ and another for the non-HVHZ.

Impact to industry relative to the cost of compliance with code

The potential exists that cost of these componants may be reduced because manufacturers of generic guardrail systems can use one design across the state (except where required to resist wind), rather than one design for the HVHZ and another for the non-HVHZ.

Requirements

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

Poses no decrease to the health, safety, or welfare of the general public.

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

Improves the FBC by consolidating design requirements.

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

Does not discriminate against any materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code. Enhances the code by consolidating design requirements.

1618.4.6.1 Railings, stair-railings and other similar safeguards shall be designed in accordance with Section 1607.7.1. Components exposed to wind forces shall be designed in accordance with Section 1607.7.1 and Section 1620. ~~to resist a load of 50 pounds per lineal foot (74 kg/m) or a concentrated load of 200 pounds (690 N) applied in any direction at the top of such barriers at any location on the safeguard, whichever condition produces the maximum stresses. The reactions and stresses caused by the above referenced uniform and concentrated loads shall be considered not be acting simultaneously.~~

~~1618.4.6.2 Intermediate rails, balusters and panel fillers shall be designed for a uniform horizontal load of not less than 25 psf (1197 Pa) over the gross area of the guard, including the area of any openings in the guard, of which they are a part without restriction by deflection. Reactions resulting from this loading need not be added to the loading specified in Section 1618.4.6.1 in designing the main supporting members of guards.~~

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Date Submitted	4/2/2010	**Section**	1714.5.3.3.2	**Proponent**	Kurt Roeper
Chapter	17	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Section 1609.1.3, mod 4447
Chapter 35 - Referenced Standards, mod 4449

Summary of Modification

Delete section 1714.5.3.3.2 in its entirety without substitution.

Rationale

Correlation with 2009 International Building Code

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

None

Requirements

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

Deletion of the optional Standard provides consistency of use of assembly test methods SSTD 12, ASTM E1886 / E1996, Protocols TAS 201, 202 and 203, and AAMA 506

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

Strengthens the code via consistency of test methods based on complete product assemblies. Provides correlation with the 2009 IBC.

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

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

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code

1st Comment Period History 04/15/2010 - 06/01/2010

S4448-G1

Proponent	Kurt Roeper	**Submitted**	6/1/2010	**Attachments**	Yes

Comment:

Public comment file attached

~~**1714.5.3.3.2 Optional exterior door component testing**. With the exception of HVHZ, exterior side-hinged door assemblies not covered by Section 1714.5.2 shall have the option to have the components of the assembly tested and rated for structural integrity in accordance with the following specification:~~

~~SDI A250.13~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4448_TextOfModification_1.png

Public Comment - FBC Proposed Change S4448

1) ANSI A250.13 was proposed for the 2012 edition of the IBC and rejected by a vote of the ICC Governmental members on May 22, 2010. It was proposed in two changes, S90 and S143, both of which were disapproved.

2) ANSI A250.13 was proposed for the 2009 edition of the IBC and rejected by a vote of the ICC Governmental members on September 20, 2008. It was proposed in two changes, S83 and S143, both of which were disapproved.

3) The current edition of ANSI A250.13 - 2008, contains significant reductions in impact energies, compared to the 2003 version, and is no longer equivalent with test protocol TAS201. ANSI A250.13 Section 6.1.1.2 – Hinges, and Section 7.1.1.3 – Latching Hardware, have impact energy requirements reduced to 125 foot-pounds. This represents a 64% reduction from the 350 foot-pounds large-missile impact energy requirements of the Florida Building Code.

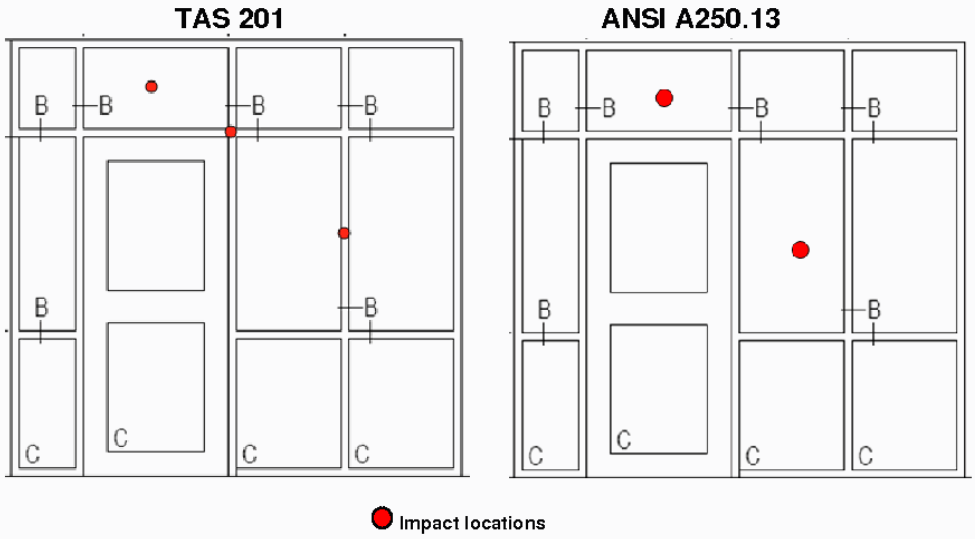
4) ANSI A250.13 - 2008 section 10.1 prohibits missile impacts to framing members of glazed transom / sidelite openings, as is applied under ASTM 1996 or Florida Building Code protocol TAS 201, section 6.3.2.2.

TAS 201 - section 6.3.2.2.
"6.3.2.2 When testing any specimen with more than one component, in addition to complying with the impacts required by Section 1626.2 of the Florida Building Code, the framing member connecting these components shall be impacted at one half the span of such member with the large missile at a speed indicated in Section 1626.2.4 of the Florida Building Code."

ANSI A250.13 - section 10.1
“10.1 Sidelights and/or transoms shall be tested with doors, to the largest total size (maximum area, height and width) to be rated. Testing shall be performed per ASTM E1886 and ASTM E1996 with the impacts applied only to the glazed portion of the assembly.”

A graphic comparison of impact test methods follows;

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4448_G1_General_Public Comment - FBC Proposed Change S4448_1.png



In summary, ANSI A250.13 is not equivalent to TAS 201 or ASTM E1886 / E1996, and has been disapproved by four votes of the ICC membership. As such, it should no longer be recognized by the Florida Building Code as a means of compliance for debris impact ratings.

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Date Submitted	3/31/2010	**Section**	1715.5.3.3.1	**Proponent**	Chuck Anderson
Chapter	17	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This section deals with glazed curtain walls, window wall and storefront systems; it is currently hidden as a subsection of a section on door components. This modification is simply to move it.

Rationale

Curtainwalls should not be in a subsection of door components.

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

none

Requirements

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

none

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

improves the code by making it easier to find the requirements for curtain walls

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

none

Does not degrade the effectiveness of the code

none

~~1715.5.3.3.1~~ **1715.6** Glazed curtain wall, window wall and storefront systems shall be tested in accordance with the requirements of this section and the Laboratory Test requirements of the American Architectural Manufacturers Association (AAMA) Standard 501, HVHZ shall comply with 2411.3.2.1.1.

Intent is to reposition this section on curtainwalls so that it is not a subsection of door components.

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~~1715.5.3.3.1~~ 1715.6 Glazed curtain wall, window wall and storefront systems shall be tested in accordance with the requirements of this section and the Laboratory Test requirements of the American Architectural Manufacturers Association (AAMA) Standard 501, HVHZ shall comply with 2411.3.2.1.1.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4179_Text_1715 curtainwall_1.png

Date Submitted	3/22/2010	**Section**	1715.9	**Proponent**	Michael Hemmer
Chapter	17	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This modification is designed for the language set forth in Section 1715.8 to be consistant with regards to opening protection on soffit vents in Hurricane Prone Areas.

Rationale

Labling and the language set forth in 1715.8 needs to be consistant for all Approved Products which are designed to protect the integrity of a structure during a high wind event.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

By having the proper labels with the proper documentation on the opening protection devices will make the enforcement of the code easier to understand by the Building Officials and the Field Inspectors.

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

Minimal impact.

Impact to industry relative to the cost of compliance with code

Minimal impact.

Requirements

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

The Public will know that the Opening Protection on their structure will have all the proper testing and documentation to insure that their welfare as well as their building is protected.

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

This modification will strenthen the code because it will provide quality products with proper testing and documentation.

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 degrade the effectiveness of the code.

1715.8 Impact resistant coverings.

1715.8.1 Labels. A permanent label shall be provided by the product approval holder on all impact resistant coverings.

1715.8.2 The following information shall be included on the labels on impact resistant coverings:

1. Product approval holder name and address.

2. All applicable methods of approval. Methods of approval include, but are not limited to Miami-Dade NOA; Florida Building Commission, TDI Product Evaluation; ICC-ES.

3. The test standard or standards specified at Section 1609.1.4, including standards referenced within the test standards specified at Section 1609.1.4 used to demonstrate code compliance.

4. For products with a Florida Product Approval Number or a Miami-Dade County Building Code Compliance Office Notice of Acceptance Number (NOA), such numbers shall be included on the label.

1715.8.3 Location of label. The location of the label on the impact resistant covering shall be as follows:

1. Accordions: Bottom of the locking bar or center mate facing the exterior or outside.

2. Rollup: On the bottom of the hood facing the exterior or outside or on the bottom slat facing the exterior or outside.

3. Bahama Awning or Colonial Hinged: On the bottom, placed on the back of the shutter.

4. Panels: For metal and plastic panels the label may be embossed or printed spaced not more than every three (3) lineal feet on each panel. The label shall be applied by the holder of the product approval and shall face the exterior or outside.

5. Framed products: The label shall be on the side or bottom facing the exterior or outside.

6. Labels on all other products shall face the exterior or outside.

1715.8.4 Installation. All impact resistant coverings shall be installed in accordance with the manufacturer's installation instructions and in accordance with the product approval. Installation instructions shall be provided and shall be available to inspection personnel on the job site. Opening protection components, fasteners, and other parts evaluated by an approved product evaluation entity, certification agency, testing laboratory, architect, or engineer and approved by the holder of the product approval may be interchangeable in opening protection assemblies provided that the opening protection component(s) provide equal or greater structural performance and durability as demonstrated by testing in accordance with approved test standards.

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1715.9 Opening Protection.

1715.9.1 General. All approved soffit and/or horizontal opening protection which is designed to protect the integrity of an attic space in a building shall meet the criteria set forth in Section 1715.8 and have met the standard set forth in TAS 202 and TAS 203.

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Date Submitted	3/25/2010	**Section**	1816.1.7	**Proponent**	Sid Funk
Chapter	18	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Modify 1816.1.7 regarding the use of approved termite baits for new construction termite control to agree with FSS Chapter 482 which establishes requirements for new construction termite control contracts. Modification would change requirement for 5 year contract to 1 year plus 4 renewal years.

Rationale

Florida Department of Agriculture and Consumer Services (FDACS) regulates the pest control industry and mandates through Florida State Statute Chapter 482 / FAC 5E-14.105.3 the requirements for a new construction termite control contract. Currently, FBC 1816.1.7 imposes different requirements for approved termite baits versus approved liquid treatments or wood treatments.

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

Requirements

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

Approved termite baiting products are recognized as more environmentally friendly than liquid termite treatments and do not use large volumes of water for application. There is little to no risk of off target application or ground water contamination.

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

Approved termite baiting products have been shown to deliver equal or superior protection from subterranean termite damage to new construction.

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

Proposed modification would eliminate a discrimination against an approved termite treatment.

Does not degrade the effectiveness of the code

Proposed modification would remove a possible cause of confusion and reconcile FBC 1816.1.7 with FSS Chapter 482. All termite control products must demonstrate efficacy to be accepted for FLDACS and approved as per FBC.

1816.1.7

If a registered termiticide formulated and registered as a bait system is used for subterranean termite prevention, Sections 1816.1.1 through 1816.1.6 do not apply; however, a signed contract assuring the installation, maintenance and monitoring of the baiting system ~~for a minimum of five years~~ for one year with the option for automatic renewal for up to four additional years upon the payment of an annual renewal fee, with no increase in the renewal fee for the first four renewals from the issue of the certificate of occupancy shall be provided to the building official prior to the pouring of the slab, and the system must be installed prior to final building approval. If the baiting system directions for use require a monitoring phase prior to installation of the pesticide active ingredient, the installation of the monitoring phase components shall be deemed to constitute installation of the system.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3872_TextOfModification_1.png

Date Submitted	4/2/2010	**Section**	1910.2	**Proponent**	Joseph Belcher
Chapter	19	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Proposal adds additiona fiber materials and adopts a new Acceptance Criteria.

Rationale

The proposasl updates the organization from ICBO to ICC for AC 32 and adopts an additional ICC document, ICC AC 217, Acceptance Criteria for Concrete with Virgin Cellulose Fibers. The criteria was first adopted in 2003 and governs an additional type of fiber used in concrete slabs.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The will be no fiscal impact to local enforcement entities because the modification merely provides another option.

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

The will be no fiscal impact to building and property owners because the modification merely provides another option.

Impact to industry relative to the cost of compliance with code

The will be no fiscal impact to industry because the modification merely provides another option.

Requirements

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

The proposal has a connection to the welfare of the public by providing an additional product for use in the crack control of concrete slabs.

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

The proposal improves the code by providing an additional product for use in the crack control of concrete slabs.

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

The proposal does not discriminate.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by providing an additional product of demonstrated capability for use in the crack control of concrete slabs.

1910.2 Joints. Concrete slabs on ground shall be provided with joints in accordance with ACI 224.3R or other approved methods. Joints shall be designed by an architect or engineer.

Exception: Joints are not required in unreinforced plain concrete slabs on ground or in slabs for one- and two-family dwellings complying with one of the following:

1. Concrete slabs on ground containing synthetic fiber reinforcement or other fiber reinforcement meeting compliance criteria. Fiber lengths and dosage amounts shall comply with one of the following and/or manufacturer's that meets performance criteria

1.1 Fiber lengths shall be 1/2 inch to 2 inches (1.5 to 51 mm) in length or other lengths that meet performance criteria. Dosage amounts shall be from 0.75 to 1.5 pounds per cubic yard (0.45 to 0.89 kg/m3) in accordance with the manufacturer's recommendations. Synthetic fibers and others meeting performance criteria shall comply with ASTM C 1116. The manufacturer or supplier shall provide certification of compliance with ASTM C 1116 when requested by the building official; or,

1.2 Fiber length shall be from 1/2 inch to 2 inches (13 mm to 51 mm) in length, monofilament or fibrillated. Dosage amounts shall be from 0.5 to 1.5 pounds per cubic yard (0.30 to 0.89 kg/m3) to achieve minimum 40 percent reduction of plastic shrinkage cracking of concrete versus a control mix in accordance with ~~ICBO~~ ICC AC32 or ICC AC 217. Independent test results using minimum six test specimens shall be provided to the building official showing compliance with ~~ICBO~~ ICC A32 or ICC ~~AC 217~~. Synthetic or other certified fiber shall comply with ASTM C 1116, Paragraph 4.1.3, Type III or Type IV.

The manufacturer or supplier shall provide certification of compliance with ASTM C 1116 when requested by building official.

2. Concrete slabs on ground containing 6 × 6 W1.4 × W1.4 welded wire reinforcement fabric located in the middle to the upper one-third of the slab. Welded wire reinforcement fabric shall be supported with approved materials or supports at spacings not to exceed 3 feet (914 mm) or in accordance with the manufacturer's specifications. Welded plain wire reinforcement fabric for concrete shall conform to ASTM A 185, Standard Specification for Steel Welded Wire Reinforcement Fabric, Plain, for Concrete Reinforcement

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ICC EVALUATION SERVICE, INC.
Evaluate ■ Inform ■ Protect

ACCEPTANCE CRITERIA FOR CONCRETE WITH VIRGIN CELLULOSE FIBERS

AC217

Approved June 2007

Effective July 1, 2007

Previously approved July 2003

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

> The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (**|**) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (➜) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

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ACCEPTANCE CRITERIA FOR CONCRETE WITH VIRGIN CELLULOSE FIBERS

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for virgin cellulose fibers to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 *International Building Code*® (IBC), the 2006 *International Residential Code*® (IRC), the BOCA® *National Building Code*/1999 (NBC), the 1999 *Standard Building Code*® (SBC), and the 1997 *Uniform Building Code*™ (UBC). The bases of recognition are IBC Section 104.11, IRC Section R104.11, NBC Section 106.4, SBC Section 103.7 and UBC Section 104.2.8. Applicable code sections are IBC Sections 1909 (Structural Plain Concrete) and 1910 (Minimum Slab Provisions), and IRC Table R402.2 (Minimum Specified Compressive Strength of Concrete) and Section R506 [Concrete Floors (On Ground)]. Applicable code sections in the NBC are Sections 1901.0, 1902.0, and 1905; in the SBC are Sections 1901 and 1909; and in the UBC are Sections 1907.12, 1922 and 1922.3.

The reason for the development of this criteria is to set requirements for evaluation of virgin cellulose fibers for use in concrete, since the code does not provide requirements for evaluation of virgin cellulose fibers for use in concrete.

1.2 Scope: Virgin cellulose fibers are added to concrete to reduce plastic shrinkage cracking of reinforced concrete and structural plain concrete and/or to reduce shrinkage and temperature cracking in structural plain concrete slabs on grade.

1.2.1 Consideration shall be given to the volume, size and type of cellulose fibers used. Extrapolation to other volumes, sizes and types of fibers shall be documented in accordance with this acceptance criteria or by an engineering evaluation, signed, sealed and dated by a registered design professional.

1.2.2 The fibers are regarded as an admixture and are used in addition to any structural reinforcement, shrinkage and temperature reinforcement and joints required in the applicable code.

1.2.3 The cellulose fibers may be used in concrete over steel deck construction.

1.2.4 The cellulose fibers may be used in fire-resistive construction.

1.2.5 Cellulose fibers when used in concrete slabs exposed to abrasive and impact traffic conditions (e.g., forklifts), shall be used only for reduction of plastic shrinkage cracking.

1.3 Reference Standards: Where standards are referenced in this criteria, these standards shall be applied consistently with the code upon which compliance is based. Standard editions applicable to each code are summarized in Table 1.

1.3.1 Codes:

1.3.1.1 2006 *International Building Code*® (IBC), International Code Council.

1.3.1.2 2006 *International Residential Code*® (IRC), International Code Council.

1.3.1.3 BOCA® *National Building Code*/1999 (NBC).

1.3.1.4 1999 *Standard Building Code*® (SBC).

1.3.1.5 1997 *Uniform Building Code*™ (UBC).

1.3.2 ASTM International Standards:

1.3.2.1 ASTM C 31 [see Table 1], Standard Practice for Method of Making and Curing Concrete Test Specimens in the Field.

1.3.2.2 ASTM C 39 [see Table 1], Test Method for Compressive Strength of Cylindrical Concrete Specimens.

1.3.2.3 ASTM C 78-02, Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).

1.3.2.4 ASTM C 94 [see Table 1], Standard Specification for Ready-Mixed Concrete.

1.3.2.5 ASTM C 172 [see Table 1], Standard Practice for Sampling Freshly Mixed Concrete.

1.3.2.6 ASTM C 192 [see Table 1], Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.

1.3.2.7 ASTM C 234-91a, Test Method for Bond Strength[1].

1.3.2.8 ASTM C 403-06, Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.

1.3.2.9 ASTM C 494-05a, Standard Specification for Chemical Admixtures for Concrete.

1.3.2.10 ASTM C 470-02a, Standard Specification for Molds for Forming Concrete Test Cylinders Vertically.

1.3.2.11 ASTM C 666-03, Test Method for Resistance of Concrete to Rapid Freezing and Thawing.

1.3.2.12 ASTM C 1018-97, Test Method for Flexural Toughness and First-Crack Strength of Fiber-Reinforced Concrete (Using Beam with Third-Point Loading).

1.3.2.13 ASTM C 1116-06 Specification for Fiber-Reinforced Concrete and Shotcrete.

1.3.2.14 ASTM D 698-00ae1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.

1.3.2.15 ASTM D 1557 [see Table 1], Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

1.3.2.16 ASTM D 1695-96 (2001), Standard Terminology of Cellulose and Cellulose Derivatives.

1.3.2.17 ASTM D 6942-03, Standard Test Method for Stability of Cellulose Fibers in Alkaline Environments

1.3.2.18 ASTM E 119 [see Table 1], Test Methods for Fire Tests of Building Construction Materials.

1.3.2.19 ASTM E 136 [see Table 1], Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C.

1.3.3 American Concrete Institute (ACI) Committee Reports:

[1]Discontinued by ASTM International. Available from Global Engineering Documents [telephone (800) 854-7179; web site http://www.global.ihs.com.

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1.3.3.1 ACI 305R-99, Specification on Hot Weather Concreting.

1.3.3.2 ACI 318- (05 IBC and IRC, -95 NBC, SBC and UBC), Building Code Requirements for Structural Concrete.

1.3.3.3 ACI 544.2R-89 (1999), Measurement of Properties of Fiber-reinforced Concrete.

1.3.3.4 ACI 544.1R-96, State-of-the-Art Report on Fiber Reinforced Concrete.

1.3.4 ANSI/ASCE 3-91, Standard for the Structural Design of Composite Slabs, American Society of Civil Engineers.

1.4 Definitions:

1.4.1 Admixture: Admixture is material other than water, aggregate, or hydraulic cement used as an ingredient of concrete and added to concrete before or during its mixing to modify its properties.

1.4.2 Plastic Shrinkage Cracking: Plastic shrinkage cracking is cracking that occurs in the surface of fresh concrete soon after it is placed and while it is still plastic.

1.4.3 Reinforced Concrete: Reinforced concrete is defined in Section 2.2 of ACI 318.

1.4.4 Structural Plain Concrete: Structural plain concrete is defined in ACI 318.

1.4.5 Shrinkage and Temperature Cracking: Shrinkage and temperature cracking is cracking in tension due to a decrease in length or volume.

1.4.6 Virgin Cellulose Fibers: Virgin cellulose fibers are fibers composed partly or completely of cellulose. Cellulose is a naturally occurring organic polymer. The term "virgin" means that the fibers have been manufactured from the original natural raw material (i.e., trees, etc.) and are being used for the first time in a final product for consumer/commercial use and are not post-consumer recycled cellulose fiber. For more definitions of these and related words, ASTM D 1695, "Standard Terminology of Cellulose and Cellulose Derivatives," shall be referenced.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information concerning material specifications, cellulose fiber type and source, size and fiber tensile strength as measured by zero-span tensile method.

2.1.2 Installation Instructions: Printed instructions for mixing and dosage rates as provided with the packaging of the product.

2.1.3 Packaging and Identification: A description of the method of packaging and field identification of product. Identification provisions shall include the evaluation report number.

2.2 Testing Laboratories: Testing laboratories shall comply with the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85.

2.3.1 Test reports shall include the following:

2.3.1.1 Description of type and source of cellulose fiber (e.g. hardwood, softwood, grass, hemp, cotton).

2.3.1.2 Description of test procedure.

2.3.1.3 Statement on passing or failing, where applicable.

2.4 Product Sampling: Products shall be sampled in accordance with Section 3.0 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 General: Consideration must be given to the volume ratio, size and type of fibers used. Extrapolation to other volumes, sizes and types of cellulose fibers shall be justified. Recognition in evaluation reports of cellulose fibers in concrete are divided into the following categories:

3.1.1 Where cellulose fibers are used in controlling plastic shrinkage cracking of reinforced concrete and structural plain concrete, the fibers are regarded as an admixture and are used in addition to any structural reinforcement, and to any shrinkage and temperature reinforcement required in Section 1907.12 of the IBC, or joints required in Section 1909.3 of the IBC.

3.1.2 Where cellulose fibers are used to help reduce shrinkage and temperature cracking in structural plain concrete slabs on grade, the fibers are used in addition to joints required in Section 1909.3 of the IBC.

3.1.3 Cellulose fibers used in concrete over steel deck construction. Refer to Section 4.9.

3.1.4 Cellulose fibers used in fire-resistive concrete over steel deck construction. Refer to Section 4.10.

3.2 Test Requirements:

3.2.1 For recognition under Section 3.1.1, results of tests conducted in accordance with Sections 4.1 through 4.6, inclusive, are required.

3.2.2 For recognition under Section 3.1.2, results of tests conducted in accordance with Sections 4.1 through 4.7, inclusive, are required.

3.2.3 For recognition under Section 3.1.3, results of tests conducted in accordance with Sections 4.1 to 4.9, inclusive, are required. For noncomposite concrete placement over steel deck, compliance with Section 4.9 may be omitted.

3.2.4 For recognition under Section 3.1.4, results of tests conducted in accordance with Sections 4.1 to 4.10, inclusive, are required. For noncomposite concrete placement over steel deck, compliance with Section 4.9 may be omitted.

4.0 TEST METHODS

All tests shall be conducted using appropriate sections of the reference mix outlined in Sections 11 through 15 of ASTM C 494.

4.1 Concrete Flexural Strength: Purpose of the test is to evaluate whether the addition of cellulose fibers to a concrete mix adversely affects the flexural strength of concrete.

4.1.1 Comparative tests shall be conducted in accordance with ASTM C 78.

4.1.2 Sampling and conditioning shall comply with ASTM C 31 and ASTM C 192 as referenced in Section 7.2 of ASTM C 1018.

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4.1.3 Tests shall be conducted on three specimens with proprietary fibers in the concrete mix and three specimens without fibers (control).

4.1.4 Conditions of Acceptance: The average flexural strength of the three specimens with fibers shall be at least equal to the average flexural strength of the control specimens, at 28 days. Slight deviations, due to variations in testing, may be considered.

4.2 Concrete Compressive Strength: Purpose of the test is to evaluate whether the addition of cellulose fibers to a concrete mix adversely affects the compressive strength.

4.2.1 Comparative tests shall be conducted in accordance with ASTM C 39.

4.2.2 Tests shall be conducted on three concrete specimens with proprietary fibers and three specimens without fibers (control).

4.2.3 Conditions of Acceptance:

4.2.3.1 The average compressive strength of the three specimens with the fibers shall be at least equal to the average compressive strength of the control specimens at 28 days. Slight deviations, due to variations in testing, may be considered.

4.3 Freeze-thaw Durability: Purpose of the test is to evaluate whether the addition of cellulose fibers to a concrete mix adversely affects the freeze-thaw durability of the concrete.

4.3.1 Comparative tests shall be conducted in accordance with Procedure A of ASTM C 666.

4.3.2 Tests shall be conducted on three concrete specimens with proprietary fibers and three specimens without fibers (control). Air content of each mixture shall be as specified in Section 12.2.2 of ASTM C 494.

4.3.3 Conditions of Acceptance: The average durability factor of the three specimens containing the fibers shall be at least equal to the average durability factor of the control specimens. The number of cycles should be 300 or until the average relative dynamic modulus of elasticity (MOE) of the fiber specimens or the control specimens reaches 60 percent of the respective initial modulus, whichever occurs first.

4.3.4 In lieu of providing test information in accordance with ASTM C 666, a proven record of freeze-thaw performance in accordance with Section 21.4 of ASTM C 1116 may be provided. The field test report shall be prepared by a recognized independent agency, and include the size, quantity, trade name and type of fiber along with the concrete mix design. Test reports from at least three separate locations are required.

4.4 Effect on Reinforcement Bond Strength: (May be omitted if use of fibers is limited to plain concrete slabs on grade.) Purpose of the test is to determine whether the addition of cellulose fibers to a concrete mix adversely affects the bond strength between the reinforcement and concrete.

4.4.1 Comparative tests shall be conducted in accordance with ASTM C 234. Steel reinforcement shall be evaluated horizontally in accordance with Section 4.3 of ASTM C 234. Concrete shall be cured a minimum of 28 days.

4.4.2 Tests shall be conducted on three concrete specimens with cellulose fibers and three specimens without fibers (control).

4.4.3 Conditions of Acceptance: The average bond strength for the steel reinforcement embedded in the concrete with the fibers shall be equal to or exceed the average bond strength for the steel reinforcement embedded in the control specimen. Slight deviations, due to variations in testing, may be considered.

4.5 Plastic Shrinkage Cracking: Purpose of the test is to show that cellulose fibers decrease the plastic shrinkage cracking of concrete. Test must be conducted in accordance with Annex A. Conditions of acceptance are noted in Annex A.

4.6 Compatibility with Concrete: The purpose of the test is to evaluate the long-term resistance of the cellulose fiber to deterioration when in contact with moisture and alkalis present in cement paste or the substances present in air-entraining and chemical admixtures.

4.6.1 Alkaline Stability Test Procedure: This test is conducted in accordance with ASTM D 6942.

4.6.2 Test Conditions: ASTM D 6942 shall be run at time intervals of 1, 3, 7, 14, 21, 28 and 35 days, treating the fibers with saturated calcium hydroxide and 1N sodium hydroxide in open containers. For each sample, the zero-span tensile value shall be the average from testing eight strips cut from four handsheets.

4.6.3 Conditions of Acceptance: The Average Zero-Span Stability Ratio (ZSSR) reported from ASTM D 6942 shall not fall below 90 percent for both alkali environments tested.

4.7 Post-crack Integrity:

4.7.1 General: The Impact test is used to evaluate the integrity of concrete with cellulose fibers after cracking:

4.7.2 Impact Resistance: This test compares the impact resistance of concrete with and without cellulose fibers. The test must be conducted in accordance with the procedure outlined in Annex B.

Conditions of Acceptance: The number of blows to ultimate failure for fiber concrete specimens shall exceed the blows to plain concrete specimens by 40 percent at seven days and 40 percent at 28 days.

4.8 Noncombustible Building Material (Optional):

4.8.1 General: Concrete with virgin cellulose fibers used in building construction required to be noncombustible in accordance with the applicable code shall be tested in accordance with ASTM E 136.

4.8.2 Conditions of Acceptance: The specimens of concrete with virgin cellulose fibers shall satisfy the requirements set forth in ASTM E 136.

4.9 Concrete over Steel Deck Composite Construction Test:

4.9.1 General: The purpose of the tests is to evaluate whether the addition of fibers to a concrete mix placed over steel deck adversely affects the shear bond between the concrete and steel deck construction.

Results of full-scale superimposed load tests providing comparative load capacity and deflection information, shall be submitted. A minimum of two decks for each reinforcement method shall be tested. Consideration shall be given to the volume, type and size of fibers used. Testing shall be conducted using No. 20 gage [0.0359 inch (0.91 mm)] steel

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deck (ASTM A 653 Structural Grade 33), 3 inches (76 mm) deep with 12-inch (304.8 mm) rib spacing, designed for composite use and filled with $2^{1}/_{2}$ inches (63.5 mm) of concrete fill having a specified compressive strength of 3,000 psi (20.7 MPa). Specimens shall include:

1. One set of specimens shall contain concrete fill with 6 x 6-W1.4 x W1.4 (WWF), 1 inch (25.4 mm) below the top of the slab.

2. One set of specimens shall contain concrete fill with cellulose fibers.

4.9.2 Test Procedure: Concrete with virgin cellulose fibers used in composite steel deck construction shall be evaluated in accordance with one of the following procedures:

4.9.2.1 Testing and conditions of acceptance in accordance with Section 4.8.2 of AC32.

4.9.2.2 Testing and evaluation of test results in accordance with Section 3.2 of ANSI/ASCE 3-91.

4.10 Fire-resistance-rated Construction Test:

4.10.1 The purpose of the test is to evaluate whether the addition of the virgin cellulose fibers in a concrete mix will adversely affect the fire-resistance-rating of concrete-filled steel deck assemblies.

Consideration shall be given to the volume ratio, type and size of fiber used.

Testing shall be conducted in accordance with ASTM E 119 (UBC Standard 7-1).

4.10.2 Conditions of Acceptance: The conditions of acceptance shall be in accordance with ASTM E 119. The assembly shall be rated for a minimum of 1 hour. The fire-resistance-rated assembly shall be detailed in the evaluation report.

5.0 QUALITY CONTROL

5.1 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

5.2 Third-party follow-up inspections are not required under this acceptance criteria.

5.3 The quality documentation shall identify that the cellulose fibers are original natural fibers, "virgin." Also refer to section 1.4.6.

6.0 EVALUATION REPORT RECOGNITION

6.1 If the applicant/holder of an evaluation report purchases the fibers from a fiber manufacturer, evidence is needed of an agreement between the fiber manufacturer and the applicant/holder indicating that the manufacturer will inform the applicant/holder of any changes to the fiber. The applicant/holder shall then notify ICC-ES.

6.2 The evaluation report shall include the condition that use of the fibers is approved by the project engineer or architect.

6.3 For structural plain concrete, the evaluation report shall indicate that control joints, as required by Section 1909.3 of the IBC, are to be provided.

6.4 For reinforced concrete, the evaluation report must indicate that structural reinforcement and shrinkage and temperature reinforcement in accordance with Section 1907.12 of the IBC are to be provided.

6.5 A batch ticket, signed by a ready-mix representative, shall be available to the code official upon request. The delivery ticket shall include, in addition to the items noted in Section 16.1 of ASTM C 94, the type and amount of fibers added to the concrete mix.

6.6 If recognition for other types of concrete, such as lightweight, is desired, results of tests conducted in accordance with this criteria shall be submitted for each type. ■

TABLE 1

ASTM	DATE OF STANDARD				
	IBC	IRC	BNBC	SBC	UBC
C 31	98	03a	-98	-91	-91
C 39	-96	03	-96	-93a	-93a
C 94	04	04	-98b	-94	-94
C 172	04	04	-97	-90	-90
C 192	02	02	90a	-90a	-90a
D 1557	02	02	91	-91	91
E 119	00	00	–98	-95a	-83 (UBC 7-1)
E 136	-99e1	99e01	-98e1	-94a	-79 (UBC 2-1)

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ANNEX A

TEST METHOD FOR EVALUATING PLASTIC SHRINKAGE CRACKING OR RESTRAINED CONCRETE WITH CELLULOSE FIBERS

A1.0 INTRODUCTION

This test method compares the surface cracking of a concrete panel containing cellulose fiber with the surface cracking of a control concrete panel without fibers. Both concretes are subjected to prescribed conditions of moisture loss severe enough to produce cracking. Both concretes can also be subjected to anticipated job conditions of temperature and humidity to obtain the difference between the cracking potentials of plain concrete and concrete with cellulose fibers in the field.

Shrinkage cracking is quantified by computing the area of surface cracks in each panel specimen to obtain a value in square inches, which represents the assumed total area of crack opening on the surface of the concrete panels.

The effect of fibers on the development of shrinkage cracking is determined by expressing the cracking value for the concrete with cellulose fibers as a percentage of the value for the control concrete (without fibers) when subjected to the identical and simultaneous drying conditions.

Values of shrinkage cracking stated in square inches are regarded as the standard. This method attempts to control or duplicate atmospheric variables to quantify the performance of the fiber variable in a given concrete mixture. Since many other variables such as cement fineness, aggregate gradation and surface finishes also influence cracking potential and cannot be precisely duplicated, this method may not be suitable for interlaboratory evaluations.

A2.0 SUMMARY OF METHOD

Following casting and screeding, the surfaces of concrete test panels with and without fibers are subjected to airflow produced by a fan or fans. The use of a fan box is a method for producing a uniform airflow over the panel surface (see Figure A1). A clear cover over the specimen in conjunction with the fan box will aid in obtaining uniform airflow and allow for specimen observation.

The test is conducted using a method shown in Figure A1, by exposing the panels to an evaporation rate of 0.2 pound of water per square foot of surface per hour (0.975 kg/m^2/h) or more. (See ACI 305.)

Referring to the evaporation graph in ACI 305R, evaporative variables are set in the laboratory for the comparison test to obtain a minimum of the critical rate, i.e., 0.2 pound of water per square foot of surface per hour (0.975 kg/m^2/h). The evaporation rate is monitored by a 1-square-foot (0.0929 m^2) pan of water that is weighed initially and thereafter periodically until the termination of the test to determine the evaporation rate (Annex Note 1).

Annex Note 1: A principal determinant in this method is evaporative water loss that is controlled by the atmospheric environment of the test specimens. Since the concrete specimens will not always provide the same rate of free water evaporation as is available from the pan of water, the rate of evaporation from the pan of water is the standard for this test.

The drying conditions are intended to induce shrinkage in cracking which will occur due to internal or external restraints on volume reduction. End of test shall be determined when final set of the concrete is reached. Final set will be determined according to ASTM C 403.

The specimens should be uncovered and exposed to the same conditions. The total area of crack opening at the end of the test is computed for each test panel. The shrinkage of the concrete is expressed as the total area of crack opening for the panel in square inches.

During the setting stage, from initial through final set, “plastic” shrinkage cracks occur. Because it is difficult to measure cracks in the plastic state, all cracks are measured after the termination of the test period.

The test specimens and monitoring pan are inserted into an environmental chamber designed for this purpose (see Figures A1 and A2). The atmospheric variables set, achieve the minimum prescribed evaporation rate, are not critical in the comparison test because the average evaporative rate is the determining factor of the test.

Before casting of the concrete panels, it is expeditious to check the atmospheric variables in the laboratory test facility to determine that the necessary conditions can be achieved.

Cracking values are determined by counting the number of cracks in each panel and recording the approximate length and width of each crack. The accumulated crack area is computed based on these measurements to determine the cracking value for each test panel. The ratio of the cracking values for fiber reinforced versus control panels is the fiber effectiveness ratio expressed as a percentage. Refer to Section A6.0, Quantification of Cracking.

A3.0 APPARATUS

Molds: A mold with a depth of 4 inches (102 mm), a minimum surface area of 1.75 square feet (0.16 m^2) and rectangular dimensions of 14 inches by 22 inches (356 mm by 559 mm), with internal restraint and stress risers as shown in the figure. The mold may be fabricated from metal, plastic or plyform (Annex Note 2). Fabricate the internal restraints and stress riser for a separate sheet metal piece. This sheet metal piece shall seat snugly at the bottom of the mold (see Figure A2).

Annex Note 2: The use of plyform, with very little absorption, is appropriate for constructing lightweight, stiff molds.

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Restraint: Two 1.25-inch (31.7 mm) risers, placed 4 inches (102 mm) inward from each end of the mold, provide restraint to the concrete. The center 2.5-inch (63.5 mm) stress riser serves as an initiation point for plastic shrinkage cracking.

The sheet metal stress riser insert is lightly oiled to provide appropriate debonding of the concrete from the bottom of the sheet. The insert is considered to be properly oiled when the entire surface is coated and all excess oil has been removed. The sides of the mold are oiled in the same manner as the insert.

Fan(s): Adjustable-speed fan(s) capable of achieving a minimum 10 mph (16.1 km/h) airflow over the entire test specimen surface area.

Sensors: Temperature, humidity, air velocity sensor means of recording ambient air and concrete temperatures to the nearest 1°F (0.5°C) and relative humidity to the nearest 1 percent near the test specimen surface during testing. An anemometer capable of measuring air velocity to the nearest 1 mph (1.61 km/h) shall be used.

Vibrating Platform: Any device that can fully consolidate the test panels within 12 seconds and that meets minimum frequency requirements for an external vibrator is suitable.

Monitoring Pan: A pan suitable for holding water in the air stream between the concrete test panels. The sides of the pan shall be vertical and shall expose precisely 1 square foot (0.0929 m^2) of water ±1 percent to the atmosphere. This size of pan will expedite the calculation of evaporation rate. The exposed lip of the pan shall not extend more than $^1/_8$ inch (3.2 mm) above the water level at the start of the test. A 12-inch-by-

12-inch-by-1-inch (305 mm by 305 mm by 25 mm) or 8-inch-by-18-inch-by-1-inch (203 mm by 457 mm by 25 mm) configuration is appropriate.

Scale: A balance or scale for weighing the monitoring pan shall have a capacity of at least 5 pounds (2.2 kg) and accurate to within 0.1 percent of its capacity.

Optional: A scale for weighing the test panels shall have a capacity of at least 200 pounds (90.7 kg) and accurate to within 1 percent of the test load.

A4.0 SAMPLING, TEST SPECIMENS AND TEST UNITS

General Requirements: The preferred specimen depth for concrete is 4 inches (102 mm). Maximum coarse aggregate size when using stress risers is $^3/_4$ inch (19 mm).

Test Specimens: The specimens are cast in the laboratory in accordance with the applicable provisions of ASTM C 192.

Test Units: A test unit is at least six test specimens. Three are control specimens without fibers. The other specimens are identical except they contain specified amounts and types of fiber. Control concrete specimens may be compared to more than one series of fiber-reinforced concrete specimens.

A5.0 PROCEDURE

The molds are filled with concrete and subjected to a source of external vibration until the concrete is consolidated and approximately level with the top of the mold. Each specimen is then screeded three times with an angle iron screed. The total vibration time is limited to 12 seconds, to avoid material segregation.

Optional: The molds are weighed prior to filling the concrete. Following removal of any waste concrete adhering to the outside of the mold, each specimen while in the mold is weighed prior to testing so that evaporation in the form of water loss during testing may be determined at the end of the test by subsequent weighing.

After vibration and screeding, the surface of the concrete is floated with a magnesium float to embed the aggregate and compact the surface. The number of passes shall be determined for each mixture and material source used during testing. Float specimens of the same mixture and material using equal number of passes.

The fiber reinforced and control specimens are placed in the selected exposure area downstream from the fan(s). (See arrangement in Figure A1.)

The fan(s), preset to achieve a minimum airflow velocity of 10 mph (16.1 km/h) are turned on, and the time of day is recorded. Simultaneously, the specimens are exposed to identical drying conditions. The evaluation of cracking commences at this time.

Air and concrete temperatures, relative humidity and airflow velocity, at a location 4 inches (102 mm) above the specimen, are recorded at the start and at 30 minute intervals. The time at which cracking is first observed is also recorded for each specimen.

Observations are continued at 30-minute intervals until final set or for a minimum of three hours. Measurement of cracking commences only at the completion of the drying period.

The evaporation rate is determined by initially weighing the full monitoring pan at the start of the test and at 30-minute intervals thereafter. The weight loss in pounds is recorded to the nearest 0.01 pound (4.53 g) at each weighing in the air stream to prevent an interruption in evaporation losses.

Annex Note 3: Adjustments should be made if necessary to maintain the standard evaporation rate at the prescribed level. It is suggested that the monitoring pan be placed on a scale in the air stream for continuous monitoring without periodic removal during testing.

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After final set, or a minimum of three hours under the test conditions, atmospheric variables are recorded, and the fans are stopped, the total water loss from the monitoring pan is determined. The test is not valid if the total standard evaporation rate was less than 0.2 pound of water per square foot of surface per hour (0.975 kg/m^2/h).

Optional: If mass loss of test panels is desired, test panels are weighed at this time.

A6.0 QUANTIFICATION OF CRACKING

Cracks are quantified by computing the crack opening area at the surface of the panels. The unit of measurement is square inches (mm^2).

Measurement of cracks commences after the end of drying. Each crack is identified and measured in a progressive order from one side of the panel to the other. As each crack is measured, it shall be identified with a bright, felt-tipped pen to prevent duplication. The approximate length of a crack is determined by laying a string along its length and subsequently recording the straight-line distance of string from end to end. It is important to use the same care and measuring methodology on each specimen. Average crack width is computed by recording and averaging widths measured along the crack at a minimum of 1-inch (25.4 mm) intervals (Annex Note 4). When all measurements have been taken and all cracks have been marked, this step is complete.

Annex Note 4: A crack comparator or crack microscope available from many sources is required to determine the width of the cracks.

It is very important to use the same care and measuring methodology on each specimen. The cracking values of each panel are computed by multiplying crack lengths by their associated average widths and accumulating these products to determine the specimen's total cracking value.

A7.0 CONDITIONS OF ACCEPTANCE

The results should be evaluated on the basis of averaging the test results and any peculiar individual test results should be noted.

The minimum accepted for the final results should be that cellulose fibers decrease the plastic shrinkage cracking of concrete by 50 percent.

A8.0 REPORT

The report shall include the following:

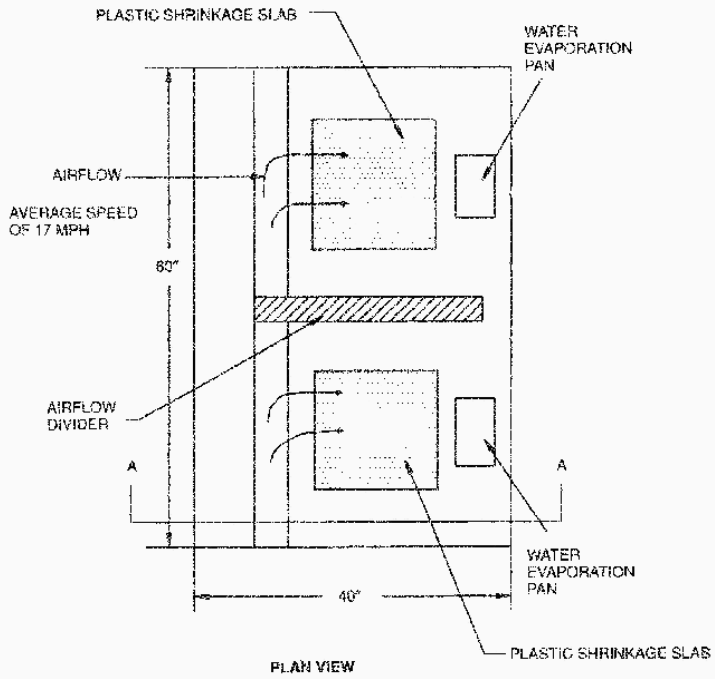
- Concrete strength, unit weight, and the amount of air entrainment (if applicable).
- The amount in lb./yd^3(kg/m^3) of water, aggregates with aggregate gradation and fibers; admixture in fluid oz./yd^3 (mL/m^3); water-cement ratio and slump for each concrete mixture evaluated.
- The fiber volume percentage (%) and type of fiber in each concrete mixture evaluated.
- Depth and dimensions of specimens.
- Cracking value of each specimen determined in square inches (mm^2).
- Total the measured rate of moisture loss in pounds per square foot (kg/m^2).
- Cracking ratio relative to control without fibers:

  Cracking value (FRC)/Cracking value (control) X 100%

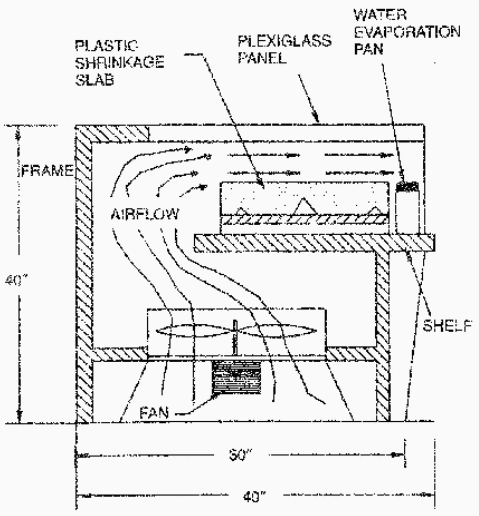
- Mass loss of specimens (optional)
- Calculated moisture loss of each panel in pounds of water per square foot (kg/m^2) of surface (optional).

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ACCEPTANCE CRITERIA FOR CONCRETE WITH VIRGIN CELLULOSE FIBERS



PLAN VIEW



SECTION A-A

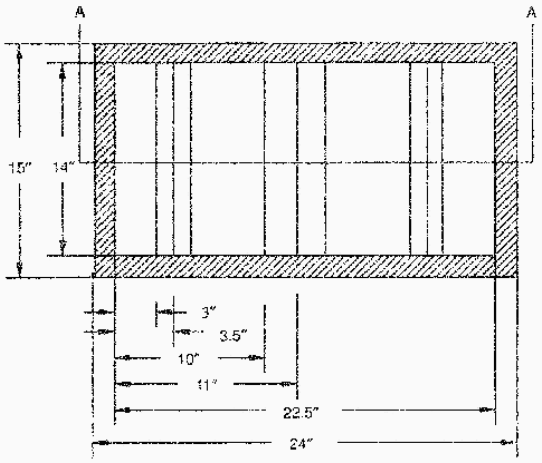
(FIGURE NOT TO SCALE)

For **SI:** 1 inch = 25.4 mm.

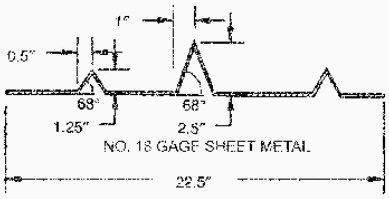
FIGURE A1—SCHEMATIC OF FAN BOX USED WITH PLASTIC SHRINKAGE SLAB TO TEST FIBERS

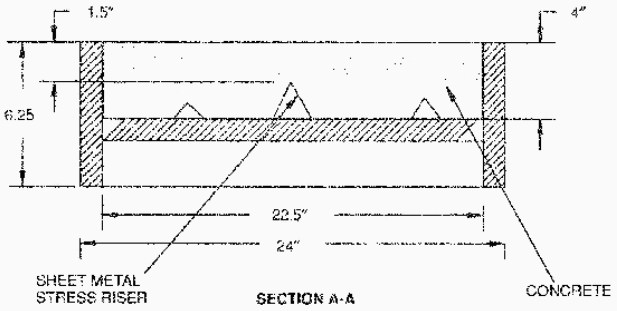
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ACCEPTANCE CRITERIA FOR CONCRETE WITH VIRGIN CELLULOSE FIBERS



PLAN VIEW





SECTION A-A

(FIGURE NOT TO SCALE)

For **SI:** 1 inch = 25.4 mm.

FIGURE A2—SCHEMATIC OF PLASTIC SHRINKAGE MOLD USED FOR FIBER TESTS

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ANNEX B
TEST METHOD FOR EVALUATING IMPACT RESISTANCE OF CONCRETE WITH CELLULOSE FIBERS

B1.0 SCOPE

The test method compares the impact resistance of concrete with and without cellulose fibers. Impact resistance is characterized by the measure of: (a) the energy consumed to fracture a specimen; (b) the number of blows in a "repeated impact" test to achieve a prescribed level of distress, and (c) the extent of damage.

B2.0 APPARATUS

The equipment for the drop weight impact test consists of:

B2.1 A standard, manually or mechanically operated 10-pound (4.54 kg) compaction hammer with an 18 inches (457 mm) drop as specified in ASTM D 698 or ASTM D 1557.

B2.2 A $2^1/_2$-inch-diameter (63.5 mm) hardened steel ball.

B2.3 A flat base plate with four lugs welded to it (refer to Figures B1 and B2).

B2.4 Molds to cast 6-inch-diameter (152 mm) by $2^1/_2$-inch (63.5 mm) $\pm^1/_8$-inch (±3 mm) concrete specimens. This is accomplished with molds complying with ASTM C 31 or C 470.

B3.0 TEST PROCEDURE

The $2^1/_2$-inch-thick-by-6-inch-diameter (63.5 mm by 152 mm) concrete samples are prepared using external vibration. The method, frequency, amplitude and time of vibration shall be recorded. Test specimens of $2^1/_2$ inch (63.5mm) thickness are cast in a single layer to avoid fiber orientation and fiber-free planes. The molds are filled partially to the $2^1/_2$-inch (63.5 mm) depth and float finished.

The specimens are tested at 7 and 28 days of age. Specimen thickness is recorded to the nearest $^1/_{16}$ inch (1.6 mm). The reported thickness is determined by averaging the measured thickness at the center and each edge of the specimen along any diameter across the top surface. The samples are coated on the bottom with a thin layer of petroleum jelly or a heavy grease and placed on the base plate within the positioning lugs with the finished face up. The base plate shall be bolted to a rigid base such as a concrete floor or cast concrete block. The hardened steel ball is placed on top of the specimen within the bracket. Foamed elastomer pieces are placed between the specimen and positioning lugs to restrict movement of the specimen during testing to first visible crack.

The drop hammer is placed with its base upon the steel ball and held there with enough down pressure to keep it from bouncing off the ball during the test. The hammer is repeatedly dropped 18 inches (457 mm), and the number of blows required to cause the first visible crack on the top and to cause ultimate failure are both recorded. The foam elastomer is removed after the first visible crack is observed. Ultimate failure occurs when the test specimen comes in contact with three of the four lugs welded to the base plate. Illustrative details are in Figures B1 and B2.

B4.0 SAMPLING, TEST SPECIMENS AND TEST UNITS

B4.1 Sampling: Five specimens are molded for each test age and test condition. Specimens involving a given variable can be made on any given day. When it is possible to make at least one specimen for each variable on a given day, the mixing of the entire series of specimens must be completed in as few days as possible, and one of the mixtures must be repeated each day as a standard comparison.

B4.2 Test Specimens: The test specimens are cast in accordance with ASTM C 192, the Standard Method for Making and Curing Concrete Test Specimens in the Laboratory.

B4.3 Test Units: A test unit is at least five test specimens of each variation. One unit is the control concrete without fibers. The other units are the same concrete mixture with specified amounts and types of fiber.

B5.0 CONDITIONS OF ACCEPTANCE

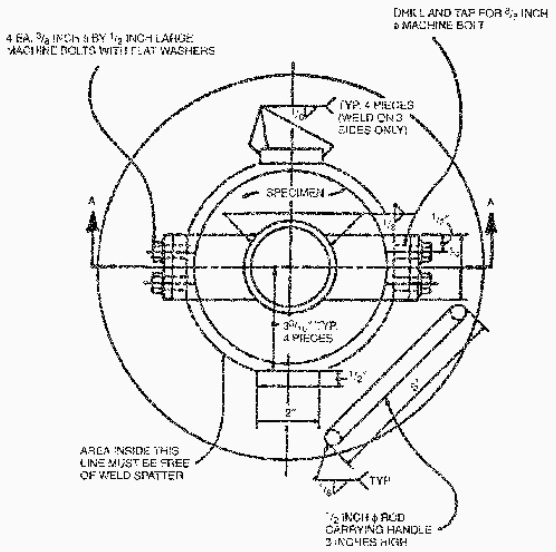
The results are evaluated on the basis of averaging the test results. Any individual peculiarities among test results shall be noted. The minimum acceptance for the final results is that the cellulose fibers increased the impact of concrete by 40 percent at 7 days and 40 percent at 28 days.

B6.0 REPORT

In addition to the requirements of AC85, the report shall include the following:

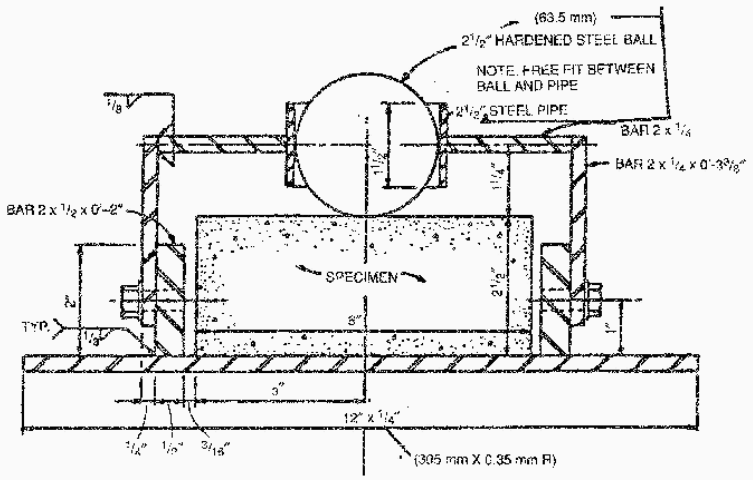
- The concrete design mix for all variations.
- Fiber dosage for each set of specimens, by weight.
- Fiber length for each of set specimens.
- Thickness and dimension of specimen.
- Height of hammer drop.
- Number of blows to first visible crack.
- Number of blows to ultimate failure.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4469_Rationale_ac217_11.png



For **SI:** 1 inch = 25.4 mm.

FIGURE B1—PLAN VIEW OF TEST DEVICE



For **SI:** 1 inch = 25.4 mm.

FIGURE B2—SECTIONAL VIEW A-A OF TEST DEVICE

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4469_Rationale_ac217_12.png

Date Submitted	3/2/2010	**Section**	2002.2	**Proponent**	John Kissell
Chapter	20	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This change updates the aluminum construction standard referenced to 2010.

Rationale

This change updates the reference to the Specification for Aluminum Structures. The Specification Parts IA and IB have been consolidated into a unified specification that includes both allowable strength design and load and resistance factor design.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This change will improve code enforcement by reflecting the most current standard for aluminum construction.

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

This change will reduce costs to owners by using the most current aluminum construction standard.

Impact to industry relative to the cost of compliance with code

This change will reduce costs to industry by using the most current aluminum construction standard.

Requirements

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

This change will improve the health, safety, and welfare of the general public.

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

This change strengthens the code.

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

This change does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

This change does not degrade the effectiveness of the code.

2002.2 Structural aluminum construction. The design, fabrication and assembly of structural aluminum for buildings or structures shall conform to AA ASM 35 and Specifications for Aluminum Structures, Aluminum Design Manual, Part 1~~-A and 1-B,~~ of the Aluminum Association. The use of aluminum alloys not listed in the manual shall be permitted provided their standard of performance is not less than those required in the manual and the performance is substantiated to the satisfaction of the building official.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3467_TextOfModification_1.png

Date Submitted	4/1/2010	**Section**	2002.6	**Proponent**	Daniel Walker
Chapter	20	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This code change proposal updates the sunroom categories to be consistent with the revised edition of AAMA/NPEA/NSA 2100-10.

Rationale

The referenced document, AAMA/NPEA/NSA 2100-02 has been updated by the three authoring groups and released as a 2010 edition. The definitions of the various sunroom categories have been updated in the revised document and thus should be updated in the 2010 Florida Building Code.

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.

Requirements

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

This proposal has reasonable and substantial connection with the health, safety and welfare of the general public.

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

This proposal strengthens and improves the code.

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

This proposal does not discriminate against any materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

Category I: A Thermally Isolated Sunroom with walls that are either open, or enclosed with insect screening or, ~~roof or a covering of an outdoor space. The openings shall be permitted to be enclosed with insect screening or~~ 0.5 mm (20 mil) maximum thickness plastic film. Category I shall meet the structural requirements as outlined in Section 5 of AAMA/NPEA/NSA 2100. The space is defined as a non-habitable and ~~un~~non-conditioned sunroom.

Category II: A Thermally Isolated Sunroom ~~A roof or a covering of an outdoor space~~ with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. Category II shall meet the structural requirements as outlined in Sections 4 and 5 of AAMA/NPEA/NSA 2100. The space is defined as a non-habitable, ~~and un~~non-conditioned sunroom.

Category III: A Thermally Isolated Sunroom ~~A roof or a covering of an outdoor space~~ with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The sunroom fenestration complies with additional requirements for air infiltration resistance and water penetration resistance as outlined in Sections 4 and 5 of AAMA/NPEA/NSA 2100. The sunroom complies with the structural requirements as outlined in Sections 4 and 5 of AAMA/NPEA/NSA 2100.~~forced-entry resistance, air-leakage resistance and water-penetration resistance.~~ The space is defined as a non-habitable, ~~and un~~non-conditioned sunroom.

Category IV: A Thermally Isolated Sunroom ~~A roof or a covering of an outdoor space~~ with enclosed walls. The sunroom is designed to be heated and/or cooled by a separate temperature control or system and is thermally isolated from the primary structure. The sunroom complies with additional requirements for ~~forced-entry resistance, water-penetration resistance, air-leakage resistance, and~~ air infiltration resistance, water penetration resistance, thermal performance, and the structural requirements as outlined in Sections 4, 5 and 6 of AAMA/NPEA/NSA 2100. The space is defined as a non-habitable and conditioned sunroom.

Category V: A ~~roof or a covering of an outdoor space~~ sunroom with enclosed walls. The sunroom is designed to be heated and/or cooled and is open to the main structure. The sunroom complies with additional requirements for ~~forced-entry resistance, water-penetration resistance, air-leakage resistance, and~~ air infiltration resistance, water penetration resistance, thermal performance, and the structural requirements as outlined in Sections 4, 5 and 6 of AAMA/NPEA/NSA 2100. The space is defined as a habitable and conditioned sunroom.

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Date Submitted	3/2/2010	**Section**	2003.1, 2003.2, 2003.3	**Proponent**	John Kissell
Chapter	20	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This proposed modification updates the references for HVHZ aluminum construction to the 2010 Aluminum Design Manual.

Rationale

This change updates the HVHZ aluminum construction standard to the 2010 Aluminum Design Manual (ADM), consistent with the rest of the state. It is unecessary to require rational analysis and reference AWS's Aluminum Structural Welding Code separately, since these are both specifically required by the ADM.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This change makes code enforcement easier by updating the standards referenced.

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

This change reduces owners' costs by updating the standards referenced.

Impact to industry relative to the cost of compliance with code

This change reduces industry's costs by updating the standards referenced.

Requirements

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

This change improves the health, safety, and welfare of the general public.

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

This change strengthens the code by updating to the most current standard.

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

This change does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

This change does not degrade the effectiveness of the code.

~~**2003.1 Design.** Aluminum members shall be designed by methods admitting of rational analysis according to established principles of mechanics.~~

General. The design, fabrication, and assembly of structural aluminum for buildings or structures shall conform to the Aluminum Association's Aluminum Design Manual Part I, Specification for Aluminum Structures.

~~**2003.2 Standards.** The design, fabrication, and erection of structural aluminum shall conform to the Aluminum Design Manual.~~

~~**2003.3 Workmanship.** Aluminum construction shall be in conformance with the tolerances, quality and methods of construction as set forth in Section 2003.2 and the American Welding Society's Structural Welding Code-Aluminum (D1.2).~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3455_TextOfModification_1.png

Date Submitted	4/2/2010	**Section**	1615.3, 2222.4.4	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

The proposal revises the requirements for the deflection of structural roofing and siding made of formed metal sheets to be more consistent with current testing requirements in the Florida Building Code. The proposal also removes a reference to this requirement that is redundant in Chapter 22.

Rationale

This proposal provides uniform, consistent deflection criteria for all materials, taking into account the serviceability requirements for brittle or flexible finishes. It maintains the additional conservatism in the deflection criteria desired for the high velocity hurricane zone (HVHZ) for wall panels and wall structural members.

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

More consistent requirements will make material selections mor equitable and benefit building and property owners.

Impact to industry relative to the cost of compliance with code

Industry will be able to provide more cost effective solutions that have the required performance.

Requirements

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

Yes, this will be in the best interest of the public in giving consistent requirements and more equitable material selection with the desired performance.

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

Strengthens the code and provides products that meet the strength requirements as well as appropriate serviceability requirements.

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

Removes a discrimination.

Does not degrade the effectiveness of the code

Does not degrade the effectiveness.

1st Comment Period History 04/15/2010 - 06/01/2010

S4370-G1

Proponent Mohammed Shaikh **Submitted** 5/31/2010 **Attachments** Yes

Comment:

Proposed additional allowable deflections of l/60, l/150, and l/90 do not meet Florida Building Code and other Standards's requirements.

1615.3 Allowable deflections. The deflection of any structural member or component when subjected to live, wind and other superimposed loads set forth herein shall not exceed the following:

[preceding items remain]

12. For structural roofing made of formed metal sheets.....L/60

13. For secondary roof structural members supporting formed metal roofing.....L/150

14. For structural siding made of formed metal sheets.....L/90

15. For secondary wall structural members supporting formed metal siding.....L/135

[Delete as shown and renumber remaining items]

2222.4 Structural sheets. Decks and panels with or without an approved fill material may be designed as diaphragms in accordance with *Diaphragm Design Manual of the Steel Deck Institute*, provided other limitations in this code are complied with.

~~2222.4.4~~ Deflection ~~of metal siding and roof panels shall not exceed L/240.~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4370_TextOfModification_1.png

Comments by Mohammed Shaikh, Modification 4370

By allowing deflection for structural roofing made of formed metal sheets to be l/60, the designer will provide a very weak and flexible roofing system. This deflection is four times allowable deflection of l/240 for roof deck and six times allowable deflection of l/360 for composite steel floor deck as mentioned in SDI publication #31 section 2.4 (4).

Section 1615.3 of the Florida Building Code limits deflection of roof members and secondary members supporting plaster under to l/360 and not supporting plaster under to l/240.

AISC limits deflection of all roof members to l/240

l/50, l/150, l/90 proposed deflections are not according to any standards and must not be adopted.

This modification weakens HVHZ code tremendously.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4370_G1_General_Comments by Mohammed Shaikh, Modification 4370_1.png

Florida Code Proposal - Metal Construction Association & Metal Building Manufacturers Association

Sub Code: Florida Building Code: Building
Chapter & Topic: Chapter 16, Allowable Deflections; Chapter 22, Metal Building Systems

Section #: 1615.3; 2222.4.4

Rationale: Deflection criteria are serviceability limit states. They are to ensure that excessive deflections do not cause cracking in brittle materials or otherwise compromise the building envelope. There were conclusions drawn after Hurricane Andrew, by the Building Code Evaluation Task Force, that failures of metal roofing and siding were in part due to the fact that the lighter materials deflect, or flutter too much and that more stringent deflection criteria would lead to better performance. Since that time, further research and testing has improved the design and testing requirements that are now incorporated in the AISI Cold-Formed Specification as well as FL Product Testing Requirements. There are impact test requirements, minimum thickness requirements, and full scale uplift test requirements for standing seam roofs. The more stringent deflection criteria on top of this is overly conservative and just adds additional cost to a metal roofing system and does not necessarily increase the performance or reliability in a hurricane.

This proposal provides uniform, consistent deflection criteria for all materials, taking into account the serviceability requirements for brittle or flexible finishes. It maintains the additional conservatism in the deflection criteria desired for the high velocity hurricane zone (HVHZ) for wall panels and wall structural members.

If one examines the deflection criteria that is currently required for the HVHZ for standard building construction, it can be divided into the roof and floor requirements and the wall requirements. The roof and floor requirements in the HVHZ are identical to those required for the rest of Florida (i.e. Section 1613.1, items 1, 2 and 3 are identical to the corresponding entries in Table 1604.3). However, for vertical members and wall members or components, the HVHZ deflection limits are 50% more stringent than the corresponding entries in Table 1604.3 (i.e. for brittle finishes wall criteria is L/360 vs. L/240 in Table 1604.3 and for flexible finishes L/180 vs. L/120 in Table 1604.3).

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4370_Rationale_MCA MBMA Florida Code Proposal Deflections - Rationale_1.png

Therefore, this proposal is consistent by bringing in the requirements of Table 1604.3 for the roofs and making the wall deflection limits in the HVHZ 50% more stringent than Table 1604.3. This translates into breaking note a of Table 1604.3 into 4 additional deflection criteria in Section 1615.3.

In addition to consistency, it is important to discuss why the proposed deflection criteria for metal roofing and siding and the supporting members are appropriate and their impact on performance. This proposal does not decrease the performance of metal roofs because an L/60 deflection criteria does not create "permanent set" during the required ASTM E 1592 (or TAS-125) wind uplift test. It is also important to note that the uplift pressure during this test is sustained for 1-minute. The current overly stringent HVHZ deflection criteria does not represent a safer roof because deflection during the static wind uplift test method does not replicate actual wind exposure. In hurricanes it is not the roof deflection, but rather the clip and seam strength that determines the survivability of a metal roof system. These attributes are already evaluated in the static roof uplift test, but an overly restrictive deflection criteria will not allow for the full evaluation of these roof systems for strength because the test stops once the deflection criteria is met.

The proposed L/60 deflection criteria is for the metal roof panel ribs and is evaluated through physical wind uplift testing in accordance with TAS-125 (ASTM E 1592 method). Since the spacing of the clips that support the roof panels in structural standing seam systems is typically not more than 60" o.c., the overall deflection at L/60 is only 1" and would not result in permanent deformation.

While the fenestration industry also uses static pressure testing for their products, they use a safety factor of only 1.5. Metal roof systems are designed with a higher safety factor of 2.0 based on the structural failure load during the static uplift test. This is far more important in evaluating expected performance than arbitrary deflection limits, especially for a system that has no brittle finishes attached.

The deflection limit given in Section 2222.4.4 would also need to be deleted, as Section 1615.3 would now provide the appropriate limits.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4370_Rationale_MCA MBMA Florida Code Proposal Deflections - Rationale_2.png

Date Submitted	3/1/2010	**Section**	2209.2.1	**Proponent**	Thomas Sputo
Chapter	22	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Add additional current reference standard for composite steel deck design.

Rationale

Add current ANSI design standard for composite steel deck design. This ANSI/SDI C1.0-2006 standard is current, supported, widely used by designers, and is available for free download from www.sdi.org

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact. This standard is available for free download from www.sdi.org for any interisted user.

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

No cost impact.

Impact to industry relative to the cost of compliance with code

No cost impact. This standard is the design standard used by most steel deck manufacturers.

Requirements

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

Provides current design standard for steel deck construction, based on most current and up-to-date knowledge.

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

Provides most current and updated design standard.

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

Does not discriminate against any other method of construction.

Does not degrade the effectiveness of the code

Improves effectiveness of code by providing a design standard that is available for free download for any user.

SECTION 2209

COLD-FORMED STEEL

2209.2.1 Composite slabs on steel decks. Composite slabs of concrete and steel deck shall be permitted to be designed and constructed in accordance with ASCE 3 or ANSI/SDI-C1.0, *Standard for Composite Steel Floor Deck.*

Chapter 35 - References

Steel Deck Institute

PO Box 25

Fox River Grove, IL 60021

SDI

DDP Deck Damage and Penetrations 2214.3

DDM—02 Diaphragm Design Manual 2214.3, 2222.4

Number 30 Design Manual For Composite Decks, Form Decks and Roof Decks 2214.3

MOC1 Manual of Construction with Steel Deck 2214.3

SPD2 Standard Practice Details 2214.3

ANSI/SDI C1.0-2006 "Standard for Composite Steel Floor Deck" 2209.2.1

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3459_TextOfModification_1.png

AMERICAN NATIONAL STANDARDS INSTITUTE/ STEEL DECK INSTITUTE

C1.0 - 2006 Standard for

Composite Steel Floor Deck



copyright 2009 steel deck institute

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3459_Text_C1-2006_1.png

Date Submitted	9/4/2009	**Section**	2218.3	**Proponent**	scott wilson
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

2218.3 Welding in the shop or field may only be done by AWS certified welders. The code should read “AWS qualified” or “a welder whom has successfully performed a qualification test, per AWS D1.1 protocol and administered by an AWS certified welding inspector (CWI).

Rationale

The code reads "AWS Certified". The only way to be "AWS Certified" is to go to one of four in the state of Florida, AWS Certified labs to be tested. This contridicts the the AWS D1.1 code, the AISC code and SJI. All fabricators and erectors use the services of a AWS Certified Welding Inspector, to perform their welder "Qualification" test and as an AISC certified fabricator and erector, we keep continuity reports for all of our welders.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Their is a substancial impact. The cost of each welding test is $300 and $60 per year, every year and it will go up. This can cost a mid size fabricator or erector about $20,000 a year initially and then $5000 per year after that.

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

This cost will need to be passed on the the GC's and owners of the structures that are fabricated and erected.

Impact to industry relative to the cost of compliance with code

Over $1,000,000.00 total for the first year for every fabricator and erector in Florida and $200,000.00 annually

Requirements

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

This proposal can effect the general public financially by driving up the cost of construction, therefore making construction less feasible in a troubled economy.

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

This proposal is the equivalent, because it applies the same test, inspection and result as the code.

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

This proposal does not discriminate. The code in place causes undue expense to small companies or CSBE, SBE and DBE.

Does not degrade the effectiveness of the code

This proposal does not degrade the code. We feel that our proposal is the intent of the code.

1st Comment Period History 04/15/2010 - 06/01/2010

S3365-G1

Proponent Mohammed Shaikh **Submitted** 5/30/2010 **Attachments** No

Comment:

This modification has two different texts.The language with "may" is too vague. Modification 4248 has better language with "shall"and recommendation is to approve 4248.

2218.3 Welding in the shop or field may only be done by AWS certified welders.

The code should read "AWS qualified" or "a welder whom has successfully performed a qualification test, per AWS D1.1 protocol and administered by an AWS certified welding inspector (CWI).

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3365_TextOfModification_1.png

2218.3 Welding in the shop or field may only be done by AWS ~~certified~~ welders.

The code should read "AWS qualified" or "a welder whom has successfully performed a qualification test, per AWS D1.1 protocol and administered by an AWS certified welding inspector (CWI).

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3365_Text_2218_1.png

Date Submitted	4/1/2010	**Section**	2222.3.3	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

3597

Summary of Modification

The proposal deletes a subsection in the cold-formed steel construction section that belongs only in Section 2223.10 with respect to metal building systems.

Rationale

This section is not applicable to "cold formed steel construction". Neither cables nor rods are cold-formed steel, and it is confusing to repeat this requirement here. This same requirement is correctly located in Section 2223.10.1, where it applies to metal building systems.

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

Requirements

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

No Impact

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

Removes unnessary redundancy.

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

Yes

Does not degrade the effectiveness of the code

Yes

1st Comment Period History 04/15/2010 - 06/01/2010

S4241-G1

Proponent Mohammed Shaikh **Submitted** 5/30/2010 **Attachments** Yes

Comment:

The intent of this section is not to allow cables and rods which are not cold formed steel members to be used in cold formed structures.

~~**2222.3.3** Cables and rods shall not be used as lateral bracing in habitable structures. Lateral bracing, when used, shall have a slenderness ratio of 300 or less, unless restricted by any other section of this code.~~

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4241_TextOfModification_1.png

2010 Comments on Modification **4241** by Mohammed Shaikh

This section **2222.3** is misunderstood by Mr. Shoemaker. Of course cables and rods are not cold formed members. This section prohibits them to be used in habitable structures. Therefore this section is required and shall not be deleted. See Modification **3597** for Building volume and **3866** for Residential volume which delete the word habitable. First, there is no definition of habitable structures. Second, cables and rods shall not be allowed for just habitable spaces but for entire building.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4241_G1_General_2010 Comments on Modification 4241 by Mohammed

Date Submitted	4/1/2010	**Section**	2223.10.1	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal seeks to clarify the intent of the applicability of the restriction on cables and rod bracing in metal buildings.

Rationale

This restriction on cable and rod bracing is not justified because it was based on observations after Hurricane Andrew on a small number of metal buildings that had improperly installed bracing. Our contention is that cables and rods can brace a building against extreme winds if properly installed. Having said that, we are more concerned in this code cycle of making sure this requirement is clarified with respect to its applicability.

See Upload Support File for additional Rationale.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Clarifies the intent of the code.

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

No impact to the cost of compliance with code.

Impact to industry relative to the cost of compliance with code

Code proposal helps clarify bracing requirement.

Requirements

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

Clarifying the requirements are in the best interest of the general public.

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

Improvement in the code language helps to clarify the intent of the code.

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 degrade the effectiveness of the code.

2223.10.1 In portions of buildings with habitable spaces, c~~C~~ables and rods shall not be used as lateral wind bracing ~~in habitable structures~~. Lateral wind bracing, when used, shall have a slenderness ratio of 300 or less, unless restricted by any other section of this code.

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Florida Building Code Informal Interpretation

Date: Thu May 31 2007

Report #: 5110

Code: Building

Section: 2223.10.1

Question:

Is it the intent of this section of the code to prohibit using cables or rods to brace buildings for all occupancies? If this is the case, what is the minimum structural section that can be used to braced a building in the High-Velocity Hurricane Zones?

Answer:

Yes. Habitable Pre-Engineered buildings (Section 2223.10.1) and habitable buildings with Cold- Formed steel construction framing(Section 2222.3.3) are not allowed to have lateral bracing with cables and rods in HVHZ.

Commentary:

There is no minimum structural section requirement given in the code. The cables and rods are usually torqued with turnbuckles. Due to racking conditions created by wind blowing in different directions,they become loose and flexible and due to poor maintenance, the buildings become prone to failure in hurricane winds.

Notice:
The Building Officials Association of Florida, in cooperation with the Florida Building Commission, the Florida Department of Community Affairs, SBCCI, and industry and professional experts offer interpretations of the Florida Building Codes in the interest of consistency in their application statewide. They are informal, non-binding and subject to acceptance and approval by the local building official.

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Florida Code Proposal - Metal Building Manufacturers Association

Sub Code: Florida Building Code: Building
Chapter & Topic: Chapter 22 Steel

Section #: 2223.10.1

Rationale:

This restriction on cable and rod bracing is not justified because it was based on observations after Hurricane Andrew on a small number of metal buildings that had improperly installed bracing. Our contention is that cables and rods can brace a building against extreme winds if properly installed. Having said that, we are more concerned in this code cycle of making sure this requirement is clarified with respect to its applicability.

Habitable structures are not defined anywhere in the code. It is more appropriate to refer to "habitable spaces", which are defined in the code, and meet the same intent. The clarification to lateral "wind" bracing is to emphasize that the concern is with the lateral wind bracing of the building as a whole. This clarification is also supported by Florida Building Code Informal Interpretation No. 5110, Dated May 31, 2007 which discusses racking conditions in a building with cable or rod braces that may become loose from high wind blowing in different directions.

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Date Submitted	4/1/2010	**Section**	2223.11.1	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal would eliminate the requirements for inspections of metal building systems. While inspections can serve a useful purpose, it is inconsistent to require special inspections of metal building systems when other construction types are not subjected to this same scrutiny.

Rationale

While inspections can serve a useful purpose, it is inconsistent to require special inspections of metal building systems when other construction types are not subjected to this same scrutiny.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Removes burdensome and unnecessary inspection requirement.

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

Reduces inspection cost.

Impact to industry 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

Establishes consistent inspection guidelines, which is in the best interest of the general public.

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

Improves the code by providing consistent inspection requirements.

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

Removes the discrimination that currently exists.

Does not degrade the effectiveness of the code

Yes, it does not degrade the effectiveness of the code.

1st Comment Period History 04/15/2010 - 06/01/2010

S4243-G1

Proponent Mohammed Shaikh **Submitted** 5/31/2010 **Attachments** Yes

Comment:

HVHZ Section 2223.11.1 must be not be deleted.

~~**2223.11.1** Metal system buildings shall be inspected by a Florida registered architect or professional engineer.~~

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Comments by Mohammed Shaikh, Modification 4243

This section keeps the quality control in the hands of architects and engineers instead of manufacturers.

This modification weakens the code tremendously. A Florida registered architect or professional engineer knows what to inspect like members with connections for main wind-force resisting systems including shear walls, braces, diaphragms, collectors, hold downs. They also know to periodically inspect welding, bolting at factory or at site, screw attachments, unusual deflections. They also check for cables and rods, which are not allowed in HVHZ.

Metal System Buildings that are not erected and constructed properly are more prone to failure than reinforced concrete, structural steel or concrete masonry system. Therefore, it is important that Florida Registered architects or professional engineers inspect them.

Section 1706 is kept as reserved and not proposed to be adopted in 2010 code.

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Florida Code Proposal - Metal Building Manufacturers Association

Sub Code: Florida Building Code: Building
Chapter & Topic: Chapter 22 Steel

Section #: 2223.11.1

Rationale: While inspections can serve a useful purpose, it is inconsistent to require special inspections of metal building systems when other construction types are not subjected to this same scrutiny. And, what are they inspecting? An inspection program has to be more specific and consistent. This is why we would prefer to see the special inspection requirements of Chapter 17 of the IBC brought into the FL Building Code, where it can be more uniformly applied and enforced for all forms of construction. This would include the use of Section 1706 which has specific inspection requirements for wind requirements which should be adhered to for all structures in high-velocity hurricane zones.

We have a separate proposal that attempts to bring in the appropriate requirements of Chapter 17, but if that proposal is unsuccessful, Section 2223.11.1 should be deleted as proposed herein.

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Date Submitted	4/1/2010	**Section**	2223.8.4	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal deletes redundant requirements that are covered by other sections in the code.

Rationale

This requirement is not necessary because the minimum thickness of a standing seam roof is already covered by Section 2222.4.3, which sets 24 gauge as the minimum for all metal roof panels.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Remove redundancy. No cost 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.

Requirements

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

Removing the redundancy is in the best interest of the general public.

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

Improves the code by removing unnecessary redundancy.

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 degrade the effectiveness of the code.

~~**2223.8.4** Structural standing seam roof sheets shall be a minimum of 24 gauge [0.0239 inch (.6 mm) nominal] in thickness.~~

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S4244

Date Submitted	4/1/2010	**Section**	Ch. 17 and 2223.11	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal seeks to put more specificity into what the inspection requirements are in Section 2223.11.1 by invoking the appropriate inspection requirements of Chapter 17 of the IBC.

Rationale

The existing provision gives no guidance on what should be inspected. An inspection program has to be more specific and consistent. This is why we would prefer to see the requirements of Ch. 17 of the IBC in the FL Building Code, where it can be more uniformly applied and enforced for all construction. This would include the use of Section 1706 which has specific inspection requirements for wind requirements which should be adhered to for all structures in high-velocity hurricane zones.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Makes inspection requirements uniform, clear, and more consistently enforceable.

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

No substaintial impact.

Impact to industry 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

Establishes consistent inspection guidelines, which is in the best interest of the general public.

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

Improves the code by providing consistent inspection requirements.

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

Removes the discrimination that currently exists.

Does not degrade the effectiveness of the code

Yes, it does not degrade the effectiveness of the code.

1st Comment Period History 04/15/2010 - 06/01/2010

S4244-G1

Proponent Mohammed Shaikh **Submitted** 5/31/2010 **Attachments** Yes

Comment:

Section 1704 and 1706 are not adopted to 2010 Florida Building Code. Therefore, Section 2223.11 must be kept in its entirety.

Chapter 17 - Unreserve the appropriate sections from Chapter 17 that cover special inspections, including Section 1704 and Section 1706. (See attached for specific Chapter 17 provisions that would need to be added to the FL code).

2223.11 Inspection.

2223.11.1 Metal ~~system~~ building~~s~~ systems shall be inspected by a Florida-registered architect or professional engineer in accordance with the Special Inspection requirements of Sections 1704 and 1706.

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Chapter 17 - Structural Tests and Special Inspections

SECTION 1704 SPECIAL INSPECTIONS

1704.1 General. Where application is made for construction as described in this section, the owner or the *registered design professional in responsible charge* acting as the owner's agent shall employ one or more *approved agencies* to perform inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections identified in Section 110.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the *building official*, for the inspection of the particular type of construction or operation requiring *special inspection*. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the *building official*. The special inspector shall provide written documentation to the building official demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

Exceptions:

1. *Special inspections* are not required for work of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. *Special inspections* are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

1704.1.1 Statement of special inspections. The applicant shall submit a statement of *special inspections* prepared by the *registered design professional in responsible charge* in accordance with Section 107.1 as a condition for issuance. This statement shall be in accordance with Section 1705.

Exceptions:

1. A statement of *special inspections* is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.
2. The statement of *special inspections* is permitted to be prepared by a qualified person *approved* by the *building official* for construction not designed by a *registered design professional*.

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1704.1.2 Report requirement. Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the *building official*, and to the *registered design professional in responsible charge*. Reports shall indicate that work inspected was or was not completed in conformance to *approved construction documents*. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the *building official* and to the *registered design professional in responsible charge* prior to the completion of that phase of the work. A final report documenting required *special inspections* and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the applicant and the *building official*.

1704.2 Inspection of fabricators. Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator's shop, *special inspection* of the fabricated items shall be required by this section and as required elsewhere in this code.

1704.2.1 Fabrication and implementation procedures. The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to *approved construction documents* and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

Exception: *Special inspections* as required by Section 1704.2 shall not be required where the fabricator is *approved* in accordance with Section 1704.2.2.

1704.2.2 Fabricator approval. *Special inspections* required by Section 1704 are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved special inspection* agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the *building official* stating that the work was performed in accordance with the *approved construction documents*.

1704.3 Steel construction. The *special inspections* for steel elements of buildings and structures shall be as required by Section 1704.3 and Table 1704.3.

Exceptions:

1. *Special inspection* of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication

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process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.

2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.

2.1. Single-pass fillet welds not exceeding $^{5}/_{16}$ inch (7.9 mm) in size.

2.2. Floor and roof deck welding.

2.3. Welded studs when used for structural diaphragm.

2.4. Welded sheet steel for cold-formed steel members.

2.5. Welding of stairs and railing systems.

TABLE 1704.3 REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
1. Material verification of high-strength bolts, nuts and washers:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	-	X	AISC 360, Section A3.3 and applicable ASTM material standards	-
b. Manufacturer's certificate of compliance required.	-	X	-	-
2. Inspection of high-strength bolting:				
a. Snug-tight joints.	-	X	AISC 360, Section M2.5	1704.3.3
b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation.	-	X		
c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation.	X	-		
3. Material verification of structural steel and cold-formed steel deck:				
a. For structural steel, identification markings to conform to AISC 360.	-	X	AISC 360, Section M5.5	-
b. For other steel, identification markings to conform to ASTM standards	-	X	Applicable ASTM material standards	

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specified in the approved construction documents.				
c. Manufacturer's certified test reports.	-	X	-	-
4. Material verification of weld filler materials:				
a. Identification markings to conform to AWS specification in the approved construction documents.	-	X	AISC 360, Section A3.5 and applicable AWS A5 documents	-
b. Manufacturer's certificate of compliance required.	-	X	-	-
5. Inspection of welding:				
a. Structural steel and cold-formed steel deck:				
1) Complete and partial joint penetration groove welds.	X	-	AWS D1.1	1704.3.1
2) Multipass fillet welds.	X	-		
3) Single-pass fillet welds > $^5/_{16}$"	X	-		
4) Plug and slot welds.	X	-		
5) Single-pass fillet welds ≤ $^5/_{16}$"	-	X		
6) Floor and roof deck welds.	-	X	AWS D1.3	-

(continued)

TABLE 1704.3-continued REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
b. Reinforcing steel:	-	-	-	
1) Verification of weldability of reinforcing steel other than ASTM A 706.	-	X	AWS D1.4 ACI 318: Section 3.5.2	-
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of	X	-		

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special structural walls of concrete and shear reinforcement.				
3) Shear reinforcement.	X	-		
4) Other reinforcing steel.	-	X		
6. Inspection of steel frame joint details for compliance:				
a. Details such as bracing and stiffening.	-	X	-	1704.3.2
b. Member locations.	-	X		
c. Application of joint details at each connection.	-	X		

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.

1704.3.1 Welding. Welding inspection and welding inspector qualification shall be in accordance with this section.

1704.3.1.1 Structural steel. Welding inspection and welding inspector qualification for structural steel shall be in accordance with AWS D1.1.

1704.3.1.2 Cold-formed steel. Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks shall be in accordance with AWS D1.3.

1704.3.1.3 Reinforcing steel. Welding inspection and welding inspector qualification for reinforcing steel shall be in accordance with AWS D1.4 and ACI 318.

1704.3.2 Details. The special inspector shall perform an inspection of the steel frame to verify compliance with the details shown on the *approved construction documents*, such as bracing, stiffening, member locations and proper application of joint details at each connection.

1704.3.3 High-strength bolts. Installation of high-strength bolts shall be inspected in accordance with AISC 360.

1704.3.3.1 General. While the work is in progress, the special inspector shall determine that the requirements for bolts, nuts, washers and paint; bolted parts and installation and tightening in such standards are met. For bolts requiring pretensioning, the special inspector shall observe the preinstallation testing and calibration procedures when such procedures are required by the installation method or by project plans or specifications; determine that all plies of connected materials have been drawn together and properly snugged and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to the

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snug-tight condition, the special inspector need only verify that the connected materials have been drawn together and properly snugged.

1704.3.3.2 Periodic monitoring. Monitoring of bolt installation for pretensioning is permitted to be performed on a periodic basis when using the turn-of-nut method with matchmarking techniques, the direct tension indicator method or the alternate design fastener (twist-off bolt) method. Joints designated as snug tight need be inspected only on a periodic basis.

1704.3.3.3 Continuous monitoring. Monitoring of bolt installation for pretensioning using the calibrated wrench method or the turn-of-nut method without matchmarking shall be performed on a continuous basis.

1704.3.4 Cold-formed steel trusses spanning 60 feet or greater. Where a cold-formed steel truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

1704.4 Concrete construction. The *special inspections* and verifications for concrete construction shall be as required by this section and Table 1704.4.

Exception: *Special inspections* shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less above *grade plane* that are fully supported on earth or rock.
2. Continuous concrete footings supporting walls of buildings three stories or less above *grade plane* that are fully supported on earth or rock where:
2.1. The footings support walls of light-frame construction;
2.2. The footings are designed in accordance with Table 1809.7; or
2.3. The structural design of the footing is based on a specified compressive strength, f'_c, no greater than 2,500 pounds per square inch (psi) (17.2 MPa), regardless of the compressive strength specified in the *construction documents* or used in the footing construction.
3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (1.03 MPa).
4. Concrete foundation walls constructed in accordance with Table 1807.1.6.2.
5. Concrete patios, driveways and sidewalks, on grade.

TABLE 1704.4 REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
1. Inspection of reinforcing	-	X	ACI 318: 3.5,	1913.4

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steel, including prestressing tendons, and placement.			7.1-7.7	
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5b.	-	-	AWS D1.4 ACI 318: 3.5.2	-
3. Inspection of bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased or where strength design is used.	X	-	ACI 318: 8.1.3, 21.2.8	1911.5, 1912.1
4. Inspection of anchors installed in hardened concrete.	-	X	ACI 318: 3.8.6, 8.1.3, 21.2.8	1912.1
5. Verifying use of required design mix.	-	X	ACI 318: Ch. 4, 5.2-5.4	1904.2.2, 1913.2, 1913.3
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	-	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1913.10
7. Inspection of concrete and shotcrete placement for proper application techniques.	X	-	ACI 318: 5.9, 5.10	1913.6, 1913.7, 1913.8
8. Inspection for maintenance of specified curing temperature and techniques.	-	X	ACI 318: 5.11-5.13	1913.9
9.Inspection of prestressed concrete: a. Application of prestressing forces. b. Grouting of bonded prestressing tendons in the seismic-force-resisting system.	- X X	-	- ACI 318: 18.20 ACI 318: 18.18.4	-
10. Erection of precast concrete members.	-	X	ACI 318: Ch. 16	-
11. Verification of in-situ concrete strength, prior to stressing of tendons in posttensioned concrete and prior to removal of shores and forms from beams and	-	X	ACI 318: 6.2	-

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structural slabs.				
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	-	X	ACI 318: 6.1.1	-

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.

1704.4.1 Materials. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318. Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the requirements of Section 3.5.2 of ACI 318.

1704.5 Masonry construction. Masonry construction shall be inspected and verified in accordance with the requirements of Sections 1704.5.1 through 1704.5.3, depending on the *occupancy category* of the building or structure.

Exception: *Special inspections* shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 6 or 7 of TMS 402/ACI 530/ASCE 5, respectively, when they are part of structures classified as *Occupancy Category* I, II or III in accordance with Section 1604.5.

2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

1704.5.1 Empirically designed masonry, glass unit masonry and masonry veneer in Occupancy Category IV. The minimum *special inspection* program for empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 6 or 7 of TMS 402/ACI 530/ASCE 5, respectively, in structures classified as *Occupancy Category* IV, in accordance with Section 1604.5, shall comply with Table 1704.5.1.

TABLE 1704.5.1 LEVEL 1 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION

VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	CONTINUOUS	PERIODIC	IBC	TMS	TMS

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			SECTION	402/ACI 530/ASCE 5[a]	602/ACI 530.1/ASCE 6[a]
1. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	-	X	-	-	Art. 1.5
2. Verification of f'_m and f_{AAC} prior to construction except where specifically exempted by this code.	-	X	-	-	Art. 1.4B
3. Verification of slump flow and VSI as delivered to the site for self-consolidating grout.	X	-	-	-	Art. 1.5B.1.b.3
4. As masonry construction begins, the following shall be verified to ensure compliance:					
a. Proportions of site-prepared mortar.	-	X	-	-	Art. 2.6A
b. Construction of mortar joints.	-	X	-	-	Art. 3.3B
c. Location of reinforcement, connectors, prestressing tendons and anchorages.	-	X	-	-	Art. 3.4, 3.6A
d. Prestressing technique.	-	X	-	-	Art. 3.6B
e. Grade and size of prestressing tendons and anchorages.	-	X	-	-	Art. 2.4B, 2.4H
5. During construction the inspection program shall verify:					
a. Size and location of structural elements.	-	X	-	-	Art. 3.3F
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	-	X	-	Sec. 1.2.2(e), 1.16.1	-
c. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages.	-	X	-	Sec. 1.15	Art. 2.4, 3.4
d. Welding of	X	-	-	Sec.	-

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reinforcing bars.				2.1.9.7.2, 3.3.3.4(b)	
e. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	-	X	Sec. 2104.3, 2104.4	-	Art. 1.8C, 1.8D
f. Application and measurement of prestressing force.	X	-	-	-	Art. 3.6B

(continued)

TABLE 1704.5.1-continued LEVEL 1 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION

VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	CONTINUOUS	PERIODIC	IBC SECTION	TMS 402/ACI 530/ASCE 5[a]	TMS 602/ACI 530.1/ASCE 6[a]
6. Prior to grouting, the following shall be verified to ensure compliance:					
a. Grout space is clean.	-	X	-	-	Art. 3.2D
b. Placement of reinforcement and connectors, and prestressing tendons and anchorages.	-	X	-	Sec. 1.13	Art. 3.4
c. Proportions of site-prepared grout and prestressing grout for bonded tendons.	-	X	-	-	Art. 2.6B
d. Construction of mortar joints.	-	X	-	-	Art. 3.3B
7. Grout placement shall be verified to ensure compliance:	X	-	-	-	Art. 3.5
a. Grouting of prestressing bonded tendons.	X	-	-	-	Art. 3.6C
8. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	-	X	Sec. 2105.2.2, 2105.3	-	Art. 1.4

For SI: °C = [(°F) - 32]/1.8.

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a. The specific standards referenced are those listed in Chapter 35.

1704.5.2 Engineered masonry in Occupancy Category I, II or III. The minimum *special inspection* program for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of TMS 402/ACI 530/ASCE 5 in structures classified as *Occupancy Category* I, II or III, in accordance with Section 1604.5, shall comply with Table 1704.5.1.

1704.5.3 Engineered masonry in Occupancy Category IV. The minimum *special inspection* program for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of TMS 402/ACI 530/ASCE 5 in structures classified as *Occupancy Category* IV, in accordance with Section 1604.5, shall comply with Table 1704.5.3.

TABLE 1704.5.3 LEVEL 2 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE FOR CRITERIA		
			IBC SECTION	TMS 402/ACI 530/ASCE 5[a]	TMS 602/ACI 530.1/ASCE 6[a]
1. Compliance with required inspection provisions of the construction documents and the approved submittals.	-	X	-	-	Art. 1.5
2. Verification of f'_m and f_{AAC} prior to construction and for every 5,000 square feet during construction.	-	X	-	-	Art 1.4B
3. Verification of proportions of materials in premixed or preblended mortar and grout as delivered to the site.	-	X	-	-	Art. 1.5B
4. Verification of slump flow and VSI as delivered to the site for self-consolidating grout.	X	-	-	-	Art. 1.5B.1.b.3
5. The following shall be verified to ensure compliance:					
a. Proportions of site-prepared mortar, grout and prestressing grout for bonded tendons.	-	X	-	-	Art. 2.6A

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b. Placement of masonry units and construction of mortar joints.	-	X	-	-	Art. 3.3B
c. Placement of reinforcement, connectors and prestressing tendons and anchorages.	-	X	-	Sec. 1.15	Art. 3.4, 3.6A
d. Grout space prior to grout.	X	-	-	-	Art. 3.2D
e. Placement of grout.	X	-	-	-	Art. 3.5
f. Placement of prestressing grout.	X	-	-	-	Art. 3.6C
g. Size and location of structural elements.	-	X	-	-	Art. 3.3F
h. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	X	-	-	Sec.1.2.2(e), 1.16.1	-
i. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages.	-	X	-	Sec. 1.15	Art. 2.4, 3.4
j. Welding of reinforcing bars.	X	-	-	Sec. 2.1.9.7.2, 3.3.3.4 (b)	-
k. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	-	X	Sec. 2104.3, 2104.4	-	Art. 1.8C, 1.8D
l. Application and measurement of prestressing force.	X	-	-	-	Art. 3.6B
6. Preparation of any required grout specimens and/or prisms shall be observed.	X	-	Sec. 2105.2.2, 2105.3	-	Art. 1.4

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For SI: °C = [(°F) - 32]/1.8, 1 square foot = 0.0929 m^2.

a. The specific standards referenced are those listed in Chapter 35.

1704.6 Wood construction. *Special inspections* of the fabrication process of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2. *Special inspections* of site-built assemblies shall be in accordance with this section.

1704.6.1 High-load diaphragms. High-load diaphragms designed in accordance with Table 2306.2.1(2) shall be installed with *special inspections* as indicated in Section 1704.1. The special inspector shall inspect the wood structural panel sheathing to ascertain whether it is of the grade and thickness shown on the *approved* building plans. Additionally, the special inspector must verify the nominal size of framing members at adjoining panel edges, the nail or staple diameter and length, the number of fastener lines and that the spacing between fasteners in each line and at edge margins agrees with the *approved* building plans.

1704.6.2 Metal-plate-connected wood trusses spanning 60 feet or greater. Where a truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

1704.7 Soils. *Special inspections* for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table 1704.7. The *approved* geotechnical report, and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the *approved* geotechnical report.

Exception: Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is not less than 90 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D 1557.

TABLE 1704.7 REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	-	X
2. Verify excavations are extended to proper depth and have reached proper material.	-	X
3. Perform classification and testing of compacted fill materials.	-	X

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4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	-
5. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.	-	X

1704.8 Driven deep foundations. *Special inspections* shall be performed during installation and testing of driven deep foundation elements as required by Table 1704.8. The *approved instruction documents* prepared by the *registered design professionals*, shall be used to determine compliance.

TABLE 1704.8 REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify element materials, sizes and lengths comply with the requirements.	X	-
2. Determine capacities of test elements and conduct additional load tests, as required.	X	-
3. Observe driving operations and maintain complete and accurate records for each element.	X	-
4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	X	-
5. For steel elements, perform additional inspections in accordance with Section 1704.3.	-	-
6. For concrete elements and concrete-filled elements, perform additional inspections in accordance with Section 1704.4.	-	-
7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge.	-	-

1704.9 Cast-in-place deep foundations. *Special inspections* shall be performed during installation and testing of cast-in-place deep foundation elements as required by Table 1704.9. The *approved* geotechnical report, and the *construction documents* prepared by the *registered design professionals*, shall be used to determine compliance.

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TABLE 1704.9 REQUIRED VERIFICATION AND INSPECTION OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Observe drilling operations and maintain complete and accurate records for each element.	X	-
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes.	X	-
3. For concrete elements, perform additional inspections in accordance with Section 1704.4.	-	-

1704.10 Helical pile foundations. *Special inspections* shall be performed continuously during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the *registered design professional in responsible charge*. The *approved* geotechnical report and the *construction documents* prepared by the *registered design professional* shall be used to determine compliance.

1704.11 Vertical masonry foundation elements. *Special inspection* shall be performed in accordance with Section 1704.5 for vertical masonry foundation elements.

1704.12 Sprayed fire-resistant materials. *Special inspections* for sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be in accordance with Sections 1704.12.1 through 1704.12.6. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. *Special inspections* shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable.

1704.12.1 Physical and visual tests. The *special inspections* shall include the following tests and observations to demonstrate compliance with the listing and the fire-resistance rating:

1. Condition of substrates.
2. Thickness of application.
3. Density in pounds per cubic foot (kg/m^3).
4. Bond strength adhesion/cohesion.
5. Condition of finished application.

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1704.12.2 Structural member surface conditions. The surfaces shall be prepared in accordance with the *approved* fire-resistance design and the written instructions of *approved* manufacturers. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

1704.12.3 Application. The substrate shall have a minimum ambient temperature before and after application as specified in the written instructions of *approved* manufacturers. The area for application shall be ventilated during and after application as required by the written instructions of *approved* manufacturers.

1704.12.4 Thickness. No more than 10 percent of the thickness measurements of the sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be less than the thickness required by the *approved* fire-resistance design, but in no case less than the minimum allowable thickness required by Section 1704.12.4.1.

1704.12.4.1 Minimum allowable thickness. For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus $^{1}/_{4}$ inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections 1704.12.4.2 and 1704.12.4.3.

1704.12.4.2 Floor, roof and wall assemblies. The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, making not less than four measurements for each 1,000 square feet (93 m^2) of the sprayed area in each *story* or portion thereof.

1704.12.4.2.1 Cellular decks. Thickness measurements shall be selected from a square area, 12 inches by 12 inches (305 mm by 305 mm) in size. A minimum of four measurements shall be made, located symmetrically within the square area.

1704.12.4.2.2 Fluted decks. Thickness measurements shall be selected from a square area, 12 inches by 12 inches (305 mm by 305 mm) in size. A minimum of four measurements shall be made, located symmetrically within the square area, including one each of the following: valley, crest and sides. The average of the measurements shall be reported.

1704.12.4.3 Structural members. The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

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1704.12.4.3.1 Beams and girders. At beams and girders thickness measurements shall be made at nine locations around the beam or girder at each end of a 12-inch (305 mm) length.

1704.12.4.3.2 Joists and trusses. At joists and trusses, thickness measurements shall be made at seven locations around the joist or truss at each end of a 12-inch (305 mm) length.

1704.12.4.3.3 Wide-flanged columns. At wide- flanged columns, thickness measurements shall be made at 12 locations around the column at each end of a 12-inch (305 mm) length.

1704.12.4.3.4 Hollow structural section and pipe columns. At hollow structural section and pipe columns, thickness measurements shall be made at a minimum of four locations around the column at each end of a 12-inch (305 mm) length.

1704.12.5 Density. The density of the sprayed fire-resistant material shall not be less than the density specified in the *approved* fire-resistance design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605. The test samples for determining the density of the sprayed fire-resistant materials shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m^2) or portion thereof of the sprayed area in each *story*.
2. From beams, girders, trusses and columns at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m^2) of floor area or portion thereof in each *story*.

1704.12.6 Bond strength. The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to floor, roof and wall assemblies and structural members shall not be less than 150 pounds per square foot (psf) (7.18 kN/m^2). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.12.6.1 through 1704.12.6.3.

1704.12.6.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m^2) of the sprayed area in each *story* or portion thereof.

1704.12.6.2 Structural members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, trusses, columns and other structural members at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m^2) of floor area or portion thereof in each *story*.

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1704.12.6.3 Primer, paint and encapsulant bond tests. Bond tests to qualify a primer, paint or encapsulant shall be conducted when the sprayed fire-resistant material is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the fire-resistant material has not been determined. A bonding agent *approved* by the SFRM manufacturer shall be applied to a primed, painted or encapsulated surface where the bond strengths are found to be less than required values.

1704.13 Mastic and intumescent fire-resistant coatings. *Special inspections* for mastic and intumescent fire-resistant coatings applied to structural elements and decks shall be in accordance with AWCI 12-B. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*.

1704.14 Exterior insulation and finish systems (EIFS). *Special inspections* shall be required for all EIFS applications.

Exceptions:

1. *Special inspections* shall not be required for EIFS applications installed over a *water-resistive barrier* with a means of draining moisture to the exterior.
2. *Special inspections* shall not be required for EIFS applications installed over masonry or concrete walls.

1704.14.1 Water-resistive barrier coating. A *water-resistive barrier* coating complying with ASTM E 2570 requires *special inspection* of the *water-resistive barrier* coating when installed over a sheathing substrate.

1704.15 Special cases. *Special inspections* shall be required for proposed work that is, in the opinion of the *building official*, unusual in its nature, such as, but not limited to, the following examples:

1. Construction materials and systems that are alternatives to materials and systems prescribed by this code.
2. Unusual design applications of materials described in this code.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code.

1704.16 Special inspection for smoke control. Smoke control systems shall be tested by a special inspector. [F]

1704.16.1 Testing scope. The test scope shall be as follows: [F]
1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure difference testing, flow measurements and detection and control verification.

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1704.16.2 Qualifications. *Special inspection* agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers. [F]

SECTION 1705 STATEMENT OF SPECIAL INSPECTIONS

1705.1 General. Where *special inspection* or testing is required by Section 1704, 1707 or 1708, the *registered design professional in responsible charge* shall prepare a statement of special inspections in accordance with Section 1705 for submittal by the applicant (see Section 1704.1.1).

1705.2 Content of statement of special inspections. The statement of special inspections shall identify the following:

1. The materials, systems, components and work required to have *special inspection* or testing by the *building official* or by the *registered design professional* responsible for each portion of the work.
2. The type and extent of each *special inspection*.
3. The type and extent of each test.
4. Additional requirements for *special inspection* or testing for seismic or wind resistance as specified in Section 1705.3, 1705.4, 1707 or 1708.
5. For each type of *special inspection*, identification as to whether it will be continuous *special inspection* or periodic *special inspection*.

1705.3 Seismic resistance.

1705.4 Wind resistance. The statement of special inspections shall include wind requirements for structures constructed in the following areas:

1. In wind Exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (mph) (52.8 m/s) or greater.
2. In wind Exposure Category C or D, where the 3-second-gust basic wind speed is 110 mph (49 m/s) or greater.

1705.4.1 Wind requirements in the statement of special inspections. When Section 1705.4 specifies that wind requirements be included, the statement of special inspections shall identify the main wind-force-resisting systems and wind-resisting components subject to *special inspections* as specified in Section 1705.4.2.

1705.4.2 Detailed requirements. The statement of special inspections shall include at least the following systems and components:
1. Roof cladding and roof framing connections.
2. Wall connections to roof and floor diaphragms and framing.
3. Roof and floor diaphragm systems, including collectors, drag struts and boundary elements.
4. Vertical wind-force-resisting systems, including braced frames, moment frames and shear walls.

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5. Wind-force-resisting system connections to the foundation.
6. Fabrication and installation of systems or components required to meet the impact-resistance requirements of Section 1609.1.2.

Exception: Fabrication of manufactured systems or components that have a *label* indicating compliance with the wind-load and impact-resistance requirements of this code.

SECTION 1706 SPECIAL INSPECTIONS FOR WIND REQUIREMENTS

1706.1 Special inspections for wind requirements. *Special inspections* itemized in Sections 1706.2 through 1706.4, unless exempted by the exceptions to Section 1704.1, are required for buildings and structures constructed in the following areas:

1. In wind Exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (52.8 m/sec) or greater.
2. In wind Exposure Categories C or D, where the 3-second-gust basic wind speed is 110 mph (49 m/sec) or greater.

1706.2 Structural wood. Continuous special inspection is required during field gluing operations of elements of the main windforce-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the main windforce-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.

Exception: *Special inspection* is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the main windforce-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.

1706.3 Cold-formed steel light-frame construction. Periodic special inspection is required during welding operations of elements of the main windforce-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

1706.4 Wind-resisting components. Periodic special inspection is required for the following systems and components:

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1. Roof cladding.
2. Wall cladding.

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Comments by Mohammed Shaikh, Modification 4244

IBC Sections 1704 & 1706 are not adopted in FBC 2010 code. See Comments on Mod 4343.

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Date Submitted	4/2/2010	**Section**	2303.5	**Proponent**	Stuart Lewis
Chapter	23	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Subcode	Sec	Mod#	Why?
Building	1716.1	4411	Deleted as section replaced by ASTM D 7147.
Building	35		Add ASTM D 7147-05, update D1761-06 line

Summary of Modification

Replace reference to section 1716.1 with reference to ASTM D7147, which replaces all content of section 1716.1.

Rationale

The 2009 IBC updated the referenced ASTM D 1761 from a prior edition to a 2006 edition which had all information on joist hangers removed. New ASTM D 7147-05 now contains provisions for joist hangers from the old D 1761, updated and revised to include the information in section 1716.1 of the 2009 IBC. The proposed change will reinstate hanger test requirements deleted by this inadvertent change and remove section 1716.1 to avoid confusion due to its redundancy to some, but not all, of D 7147.

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

Minimal (only if past testing not up to current standard)

Requirements

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

Yes, it pertains to structural safety of buildings.

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

Yes, it updates joist hanger testing to current standard.

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

It does not so discriminate.

Does not degrade the effectiveness of the code

It does not degrade the effectiveness of the code.

1st Comment Period History 04/15/2010 - 06/01/2010

S4414-G1

Proponent	Randall Shackelford	**Submitted**	6/1/2010	**Attachments**	No

Comment:

This proposal should be denied. It does not fix the problem. The conflict this is trying to fix is addressed in a Comment to Item S4411 (related item).

1. Test standard for hangers is being modified in the wood chapter instead of Chapter 17. Hangers are used for other materials besides wood. The test standard for hangers needs to stay in Chapter 17.
2. The test standard for hangers is being modified in the non-HVHZ section, but is not modified in the HVHZ section, Section 2314.4.4. This will result in inconsistencies in how manufacturers have to test products for approval in different areas of the State. In order to use Section 2314.4.4, ASTM D 1761-88 (2000) must remain referenced in the FBC-Building.
3. This proposal aims to adopt a completely new standard for hangers and similar devices, while deleting one that has been used safely and effectively for many years and continues to be used. Established connector manufacturers have thousands of Florida product approvals (and evaluation reports from approved entities and certifications) based on testing to ASTM D 1761. Removing that standard will cause a hardship for existing manufacturers. It will be virtually impossible for major manufacturers to re-test all their products to the new test standard and have evaluation reports written by the time the code is adopted. In fact, the ICC-ES currently allows either ASTM D 1761 or D 7147 to be used (see attachment to 4411-Acceptance Criteria 13). The proponent says this proposal does not discriminate. That is not true. This proposal does discriminate against existing manufacturers who have used ASTM D 17 for years. The proponent is a new manufacturer who is trying to shut existing manufacturers out of the market. The proponent also states this proposal has minimal impact to industry. That is only true if you are a new manufacturer. This will have a major impact on existing manufacturers.

Revise to delete reference section 1716.1 and replace with statement requiring conformance to ASTM D 7147, as shown below.

2303.5 ~~Test standard for j~~ Joist hangers and connectors. ~~For the required test standards for j~~ Joist hangers and connectors~~, see Section 1716.1~~ shall conform to requirements of ASTM D 7147.

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Date Submitted	3/2/2010	**Section**	AA	**Proponent**	John Kissell
Chapter	35	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This proposed modification updates the references for aluminum construction from the 2005 Aluminum Design Manual to the 2010 Aluminum Design Manual.

Rationale

This proposal updates the 2005 ADM to 2010. 2005 ADM Parts IA & IB were merged in the 2010 ADM into Part I, Specification for Aluminum Structures, which includes both allowable strength design and load and resistance factor design.

Delete the last 4 references because they are no longer separately published and are part of ADM Part I.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Enforcement costs will be reduced by using the most current version of the aluminum specification rather than an out-of-date version.

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

Owners costs will be reduced by using the most current version of the aluminum specification.

Impact to industry relative to the cost of compliance with code

Industry costs will be reduced by using the most current version of the aluminum specification.

Requirements

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

The most current standard will more readily meet the health, safety, and welfare needs of the public.

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

The most current standard represents the best standard that can be used.

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

The 2010 ADM does not discriminate against any materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The 2010 ADM does not degrade the code's effectiveness.

Standard reference number	Title	Referenced in code section number
ADM 1~~—05~~ 10 2010	Aluminum Design Manual: Part ~~1 A~~ Specification for Aluminum Structures~~, Allowable Stress Design; and Part 1 B Aluminum Structures, Load and Resistance Factor Design of Buildings and Similar Type Structures AA 94~~	1604.3.5, 2002.2, 2003.2
~~Specifications for Aluminum Structures 2003.2~~		
~~The Aluminum Formed Sheet Building Sheathing Design Guide 2003.2~~		
~~The Commentary on Specifications for Aluminum Structures 2003.2~~		
~~Engineering Data for Aluminum Structures 2003.2~~		

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S4310

Date Submitted	4/1/2010	**Section**	AAMA	**Proponent**	Daniel Walker
Chapter	35	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

This code change proposal updates the reference to AAMA/NPEA/NSA 2100 from 2002 to 2010.

Rationale

The referenced document, AAMA/NPEA/NSA 2100-02 has been updated by the three authoring groups and released as a 2010 edition. The definitions of the various sunroom categories have been updated in the revised document and thus should be updated in the 2010 Florida Building Code.

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.

Requirements

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

This proposal has reasonable and substantial connection with the health, safety and welfare of the general public.

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

This proposal strengthens and improves the code.

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

This proposal does not discriminate against any materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

1st Comment Period History 04/15/2010 - 06/01/2010

S4310-G1

Proponent	Joseph Belcher	**Submitted**	4/27/2010	**Attachments**	No

Comment:

Request copy of the updated standard, preferably electronic be provided.

AAMA/NPEA/NSA 2100-~~02~~10 Voluntary Specifications for Sunrooms 2002.6

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4310_TextOfModification_1.png

Sub Code: Existing Building

Date Submitted	4/2/2010	**Section**	506.2	**Proponent**	James Battaglia
Chapter	5	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

None.

Summary of Modification

Adds clarity about non-structural damage repairs.

Rationale

Clarify the Code in relation to damaged buildings being a repair.

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

Property owners would see a decrease in actual costs.

Impact to industry relative to the cost of compliance with code

Insurance carriers would see a decrease in actual costs.

Requirements

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

Non-structural issues are involved, so safety is not a factor.

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

Equivalent products would be a minimum requirement.

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

Existing systems would have to be placed back.

Does not degrade the effectiveness of the code

Not at all.

506.2.5 Non-structural damage. For all non-structural damage, repairs shall be allowed that restore the building to its predamaged state using materials and strengths that existed prior to the damage, regardles of extent of said damage.

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Informal Interpretation
Report Number 5709

Date: Thu May 22 2008

Report: 5709

Code: Existing Building **Code Year:** 2004

Section: 305

Question:
Is it the intent of this section to state that a level 3 is only the area of reconfiguration or work. Comment: Reading the definition of work area it is not claer as to what the limitations are. The question I have is a 1000SF structure is fire damaged required complete replacement of roof system, redrywalling entire structure, repair/replacement of electrical and mechanical systems and installation of hurricane connectors throughout the building. Would this be a level 3 or not according to the existing code?

Answer:
The final authority for the decision, as stated in the Code, is the Building Official. From the statements made, it does not appear this is a level 3 alteration. This appears it could be a repair governed by Chapter 4. If there is work undertaken beyond a repair, such as relocation of walls or expansion or updating of systems, that portion would rise to level 1 or 2 alteration which may ultimately trigger Level 3. Again, a meeting is required with the Building Official.

Commentary:
None

Notice:
The Building Officials Association of Florida, in cooperation with the Florida Building Commission, the Florida Department of Community Affairs, ICC, and industry and professional experts offer this interpretation of the Florida Building Code in the interest of consistency in their application statewide. This interpretation is informal, non-binding and subject to acceptance and approval by the local building official.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4419_Text_5709_1.png

Informal Interpretation
Report Number 6414

Date: Thu Jan 21 2010

Report: 6414

Code: Existing Building **Code Year:** 2007

Section: 405

Question:
Is it the intent of Florida Building Code - Existing Building Section 405 to classify as a Level 3 Alteration, a residential home that due to fire, has incurred fire, smoke and water damage to the interior and requires the entire removal of the home's drywall, ceiling board, cabinets, trim, and flooring?

Comment:
The work area exceeds 50 percent of the aggregate area of the building and was made within a 12-month period; should this be classified as a Level 3 Alteration?

Answer:
No. Repairs, as defined in Chapter 2 of the Florida Building Code - Existing Building, include the patching or restoration or replacement of damaged materials, elements, equipment or fixtures for the purpose of maintaining such components in good or sound condition with respect to existing loads or performance requirements. As described, the intended work would be classified as a repair.

Commentary:
The percentage of area where the repairs occur has no effect; it is a repair, even if 100% of the building is undergoing repairs.

Notice:
The Building Officials Association of Florida, in cooperation with the Florida Building Commission, the Florida Department of Community Affairs, ICC, and industry and professional experts offer this interpretation of the Florida Building Code in the interest of consistency in their application statewide. This interpretation is informal, non-binding and subject to acceptance and approval by the local building official.

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Sub Code: Residential

Date Submitted	4/1/2010	**Section**	R202	**Proponent**	Daniel Walker
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Updates the definition of Habitable Space to include revised information from AAMA/NPEA/NSA 2100-10 for sunrooms. This document now defines a Category IV sunroom as a non-habitable space.

Rationale

The referenced document, AAMA/NPEA/NSA 2100-02 has been updated by the three authoring groups and released as a 2010 edition. The definitions of a Category IV sunroom has been changed in the referenced document to be non-habitable.

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.

Requirements

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

This proposal has reasonable and substantial connection with the health, safety and welfare of the general public.

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

This proposal strengthens and improves the code.

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

This proposal does not discriminate against any materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

HABITABLE SPACE. A space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, screen enclosures, sunroom Categories I, II and III and IV as defined in the AAMA/NPEA/NSA 2100, storage or utility space and similar areas are not considered habitable spaces.

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S4097

Date Submitted	3/30/2010	**Section**	301.3	**Proponent**	J Glenn-BASF
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Retain the base code (IRC) language.

Rationale

Retain the base code (IRC) language as it provides better direction

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against aything.

Does not degrade the effectiveness of the code

Does not degrade the code

R301.3 Story height. Buildings constructed in accordance with these provisions shall be limited to story heights of not more than the following:

1. For conventional light-frame wood construction, the laterally unsupported bearing wall stud height permitted by Table R602.2(5) plus a height of floor framing not to exceed sixteen inches. For purposes of determining uplift, gravity loads, and lateral bracing requirements, an attic shall be considered an additional story when the roof slope is 6 in 12 or greater. (See Figure R301.3).

Exception: For wood framed wall buildings with bracing in accordance with Table R602.~~2~~10.10.1.2(1), the wall stud clear height used to determine the maximum permitted story height may be increased to 12 feet (3658 mm) without requiring an engineered design for the building wind and seismic force resisting systems provided that the length of bracing required by Table R602.~~2~~10.10.1.2(1) is increased by multiplying by a factor of 1.1~~2~~0 and the length of bracing required by Table R602.10.1.2(2) is increased by multiplying by a factor of 1.20. Wall studs are still subject to the requirements of this section.

1. For wood wall framing, the laterally unsupported bearing wall stud height permitted by Table R602.3(5) plus a height of floor framing not to exceed 16 inches (406 mm).

shall not exceed 10 feet (3048 mm) plus a height of floor framing not to exceed 16 inches (406 mm).

Individual walls or walls studs shall be permitted to exceed these limits as permitted by Chapter 6 provisions ~~for buildings where the wind speed is less than 100 mph (160.9 km/h)~~, provided story heights are not exceeded. Floor framing height shall be permitted to exceed these limits provided the story height does not exceed 11 feet 7 inches (3531 mm). An engineered design shall be provided for the wall or wall framing members when they exceed the limits of Chapter 6. Where the story height limits are exceeded, an engineered design shall be provided in accordance with the Florida Building Code, Building for the overall wind and seismic force resisting systems.

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S4192

Date Submitted	3/31/2010	**Section**	308.6.9	**Proponent**	J Glenn-BASF
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language

Rationale

Utilizes base code language as it provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

1st Comment Period History 04/15/2010 - 06/01/2010

S4192-G1

Proponent	Roger LeBrun	**Submitted**	5/21/2010	**Attachments**	No

Comment:

Please do not delete paragraphs 2 and 3, unless the same change is made relative to windows.

Also, "/CSA" must remain in the referenced standard citation, since that is the true designation of the document.

1st Comment Period History 04/15/2010 - 06/01/2010

S4192-G2

Proponent	jeff inks	**Submitted**	6/1/2010	**Attachments**	No

Comment:

Deleting the specific label provisions in the second and third paragraphs as proposed should be given very careful consideration before a final decision is made to do so. The intent to align the provisions of this section with the IRC is understood, however, these additional label requirements are very important to verifying that all of the performance requirements for these products are met.

R308.6.9 Testing and labeling of skylights. ~~Exterior~~ Unitskylights shall be tested by an approved independent testing laboratory, ~~and shall be labeled to indicate compliance with the requirements of one of the following specification:~~ and bear a label identifying manufacturer, performance grade rating and approved inspection agency to indicate compliance with the requirements of ~~ANSI/~~AAMA/WDMA~~/CSA~~ 101/I.S.2/ ~~NAFS or AAMA/WDMA/CSA 101/I.S.2/A440,~~ A440, or TAS 202 (HVHZ shall comply with TAS 202).

~~Exterior skylights shall be labeled with a permanent label, marking, or etching providing traceability to the manufacturer and product. The following shall also be required either on a permanent label or on a temporary supplemental label applied by the manufacturer: information identifying the manufacturer, the product model/series number, positive and negative design pressure rating, product maximum size, type and thickness of glass or glazing material, impact resistance rating if applicable, Florida Product Approval number or Miami-Dade Product Approval number, applicable test standard(s), and approved product certification agency, testing laboratory, evaluation entity or Miami-Dade Product Approval.~~

~~Labels are limited to one design pressure rating per reference standard. The temporary supplemental label shall remain on the skylight until final approval by the building official.~~

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Date Submitted	4/1/2010	**Section**	R301.2.1.1.2	**Proponent**	Daniel Walker
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

This code change proposal updates the sunroom categories to be consistent with the revised edition of AAMA/NPEA/NSA 2100-10.

Rationale

The referenced document, AAMA/NPEA/NSA 2100-02 has been updated by the three authoring groups and released as a 2010 edition. The definitions of the various sunroom categories have been updated in the revised document and thus should be updated in the 2010 Florida Building Code.

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.

Requirements

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

This proposal has a reasonable and substantial connection with the health, safety and welface or the general public.

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

This proposal will strenghen and improve the code, and provide for better products, methods and systems of construction.

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

This proposal does not discriminate against any materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

R301.2.1.1.2 Sunrooms. Sunrooms shall comply with AAMA/NPEA/NSA 2100 with the structural requirements and testing provisions of Chapter 5 modified to incorporate ASCE 7. Sunrooms shall be categorized in one of the following categories by the permit applicant, design professional or the property owner where the sunroom is being constructed.

Category I: A Thermally Isolated Sunroom with walls that are either open, or enclosed with insect screening, or ~~roof or a covering of an outdoor space. The openings shall be permitted to be enclosed with insect screening or~~ 0.5 mm (20 mil) maximum thickness plastic film. Category I shall meet the structural requirements as outlined in Section 5 of AAMA/NPEA/NSA 2100. The space is defined as a non-habitable and ~~un~~non-conditioned sunroom.

Category II: A Thermally Isolated Sunroom ~~A roof or a covering of an outdoor space~~ with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. Category II shall meet the structural requirements as outlined in Sections 4 and 5 of AAMA/NPEA/NSA 2100. The space is defined as a non-habitable, ~~and un~~non-conditioned sunroom.

Category III: A Thermally Isolated Sunroom ~~A roof or a covering of an outdoor space~~ with enclosed walls. The openings are permitted to be enclosed with translucent or transparent plastic or glass. The sunroom fenestration complies with additional requirements for air infiltration resistance and water penetration resistance as outlined in Sections 4 and 5 of AAMA/NPEA/NSA 2100. The sunroom complies with the structural requirements as outlined in Sections 4 and 5 of AAMA/NPEA/NSA 2100.~~forced entry resistance, air leakage resistance and water penetration resistance.~~ The space is defined as a non-habitable, ~~and un~~non-conditioned sunroom.

Category IV: A Thermally Isolated Sunroom ~~A roof or a covering of an outdoor space~~ with enclosed walls. The sunroom is designed to be heated and/or cooled by a separate temperature control or system and is thermally isolated from the primary structure. The sunroom complies with additional requirements for ~~forced entry resistance, water penetration resistance, air leakage resistance, and~~ air infiltration resistance, water penetration resistance, thermal performance, and the structural requirements as outlined in Sections 4, 5 and 6 of AAMA/NPEA/NSA 2100. The space is defined as a non-habitable and conditioned sunroom.

Category V: A ~~roof or a covering of an outdoor space~~ sunroom with enclosed walls. The sunroom is designed to be heated and/or cooled and is open to the main structure. The sunroom complies with additional requirements for ~~forced entry resistance, water penetration resistance, air leakage resistance, and~~ air infiltration resistance, water penetration resistance, thermal performance, and the structural requirements as outlined in Sections 4, 5 and 6 of AAMA/NPEA/NSA 2100. The space is defined as a habitable and conditioned sunroom.

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Date Submitted	3/30/2010	**Section**	401.1	**Proponent**	J Glenn-BASF
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language

Rationale

Utilizes base code language as it provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

R401.1 Application. The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for all buildings. In addition to the provisions of this chapter, the design and construction of foundations in areas prone to flooding as established by Table R301.2(1) shall meet the provisions of Section R322. Wood foundations shall be designed and installed in accordance with AF&PA PWF. ~~(see Section R301.2.1.1).~~

Exceptions:

1. The provisions of this chapter shall be permitted to be used for wood foundations ~~subject to the following~~ only in the following situations:

1.1. Buildings shall have no more than two floors and a roof.

~~1.2. Interior basement and foundation walls shall be provided at intervals not exceeding 50 feet.~~

~~1.3 When the foundation uplift loads determined from Table R401.1 exceed 0 or when such uplift loads cannot be determined from Table R401.1, an engineered design shall be required.~~

2. When interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15 240 mm).

~~2. In addition to the provisions of this chapter, the design and construction of foundations in areas prone to flooding shall meet the provisions of Section R323.~~

3. Buildings and structures located within the High-Velocity Hurricane Zone shall comply with the provisions of Chapter 44.

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Date Submitted	3/30/2010	**Section**	401.2	**Proponent**	J Glenn-BASF
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language

Rationale

Utilizes base code language as it provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything

Does not degrade the effectiveness of the code

Does not degrade the code.

R401.2 Requirements. ~~Foundations shall be capable of resisting all loads from roof uplift and building overturn. Foundation uplift for light frame wood or steel buildings shall be calculated or determined from Table R401.1. Masonry buildings within the dimensional scope of Table R401.1 shall be assumed to be of adequate weight so as not to require uplift resistance greater than that provided by the structure and any normal foundation.~~ Foundation construction shall ~~also~~ be capable of accommodating all ~~gravity~~ loads according to Section R301 and of transmitting the resulting loads to the supporting soil. Fill soils that support footings and foundations shall be designed, installed and tested in accordance with accepted engineering practice. Gravel fill used as footings for wood and precast concrete foundations shall comply with Section R403.

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S4047

Date Submitted	3/29/2010	**Section**	802.1.6.5	**Proponent**	J Glenn-BASF
Chapter	8	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language

Rationale

Utilizes base code (IRC) language as it provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local enforcement is created by this change.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

1st Comment Period History 04/15/2010 - 06/01/2010

S4047-G1

Proponent	Jim Vogt	**Submitted**	6/1/2010	**Attachments**	No

Comment:

Section R802.10.5 has been deleted from the 2012 IRC via an extensive code change (RB154), which provides prescriptive connection requirements between the roof framing and braced wall lines. These provisions are now included in section R802.11 Roof tie-down.

R802.1.6.5 [IRC R802.10.5] Truss to wall connection. Trusses shall be connected to wall plates by the use of approved connectors having a resistance to ~~design~~ uplift~~, lateral and shear forces~~ of not less than 175 pounds (779 N) and shall be installed in accordance with the manufacturer's specifications. ~~Trusses shall be installed in accordance with the manufacturer's design andspecifications.~~ For roof assemblies subject to wind uplift pressures of 20 pounds per square foot (~~0.958 kN/m2~~ 960Pa) or greater, as established in Table R301.2(2), adjusted for height and exposure per Table R301.2(3), see Section R802.2.9.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4047_TextOfModification_1.png

Date Submitted	3/29/2010	**Section**	802.2	**Proponent**	J Glenn-BASF
Chapter	8	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language

Rationale

Utilizes base code (IRC) language as it provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement

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

Nnone

Impact to industry relative to the cost of compliance with code

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

R802.2 Design and construction ~~where wind speed is less than 100 mph.~~ The framing details required in Section R802 apply to roofs having a minimum slope of three units vertical in 12 units horizontal (25-percent slope) or greater. Roof-ceilings ~~of conventional light-frame wood construction~~shall be designed and constructed in accordance with the provisions of this ~~Section~~ chapter and Figures R606.11(1), R606.11(2) and R606.11(3) or in accordance with AFPA/NDS. Components of roof-ceilings shall be fastened in accordance with Table R602.2(1). ~~Alternately, roof ceilings may be designed and constructed inaccordance with AF&PA"s NDS or AF&PA's WFCM. Components of roof ceilings shall be fastened in accordance with Table R602.2(1).~~

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S4165

Date Submitted	3/31/2010	**Section**	802	**Proponent**	Ann Stanton
Chapter	8	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

Revise Sec. 802 to reserve roof/ceiling design and construction criteria for wind loads less than 100 mph and return section numbering to that used in the IRC.

Rationale

Delete material that is not applicable in Florida. Return to IRC formatting for consistency of code development and publishing.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Removing non-applicable criteria will clarify code requirements and improve enforcement.

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

May need to revise how they comply with the code.

Requirements

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

Yes, code clarity.

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

Yes, eliminates potential for error.

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

No.

Does not degrade the effectiveness of the code

No.

Section 802: Delete general requirements and renumber rest to IRC designations as follows:

~~**R802.1 General Requirements.** Roof and ceiling framing of wood construction shall be designed and constructed in accordance with the provisions of this Section.~~

R802.1.~~1~~ Identification. [No change to text]

R802.1.1 ~~R802.1.2~~Blocking. [No change to text]

R802.1.2~~R802.1.3~~ End-jointed lumber. Approved end-jointed lumber identified by a grade mark conforming to Section R802.1.~~1~~ may be used interchangeably with solid-sawn members of the same species and grade.

R802.1.3 ~~R802.1.4~~ Fire-retardant-treated wood. [No change to text]

R802.1.3.1 ~~R802.1.4.1~~ Pressure process. For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gauge (psig) (344.7 kPa).

R802.1.3.2 ~~R802.1.4.2~~ Other means during manufacture. For wood products produced by other means during manufacture the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.

R802.1.3.3 ~~R802.1.4.3~~ Testing. For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section R802.1.43. Testing of only the front and back faces of wood structural panels shall be permitted.

R802.1.3.4 ~~R802.1.4.4~~ Labeling. Fire-retardant-treated lumber and wood structural panels shall be labeled. The label shall contain:

1 – 6 [No change from IRC].

7. Conformance with appropriate standards in accordance with Sections R802.1.34.5 through R802.1.34.8.

8. [No change from IRC.]

R802.1.3.5 ~~R802.1.4.5~~ Strength adjustments. [No other change to IRCtext]

R802.1.3.5.1~~R802.1.4.5.1~~Wood structural panels. [No other change to IRCtext]

R802.1.3.5.2 ~~R802.1.4.5.2~~ Lumber. [No other change to IRCtext]

R802.1.3.6~~R802.1.4.6~~ Exposure to weather. [No other change to IRCtext]

R802.1.3.7~~R802.1.4.7~~ R Interior applications. Interior fire retardant- treated wood … in accordance with Section R802.1.34.5.1 or R802.1.34.5.2...of this section.

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R802.1.3.8 ~~R802.1.4.8~~ Moisture content. Fire-retardant-treated wood shall be dried … in Section R802.1.3~~4~~.5.1 for plywood and R802.1.3~~4~~.5.2 for lumber.

R802.1.4~~802.1.5~~ Structural glued laminated timbers. [No other change from IRC.]

R802.10~~R802.1.6~~ Wood trusses.

R802.10.1~~R802.1.6.1~~Truss design drawings. Truss design drawings, prepared in conformance with Section R802.10.1 ~~1.6.1~~, shall be provided to the building official and approved prior to installation. Truss design drawings shall include, at a minimum, the information specified below. Truss design drawing shall be provided with the shipment of trusses delivered to the jobsite.

1. Design wind speed and exposure category.

2. Slope or depth, span and spacing.

3. Location of all joints.

4. Required bearing widths.

5. Design loads as applicable.

    5.1 Top chord live load (as determined from Section R301.6).

    5.2 Top chord dead load.

    5.3 Bottom chord live load.

    5.4 Bottom chord dead load.

    5.5 Concentrated loads and their points of application.

    5.6 Controlling wind and earthquake loads.

6. Adjustments to lumber and joint connector design values for conditions of use.

7. Each reaction force and direction.

8. Joint connector type and description (e.g., size, thickness or gauge) and the dimensioned location of each joint connector except where symmetrically located relative to the joint interface.

9. Lumber size, species and grade for each member.

10. Connection requirements for:

    10.1 Truss to truss girder.

    10.2 Truss ply to ply.

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10.3 Field splices.

11. Calculated deflection ratio and/or maximum description for live and total load.

12. Maximum axial compression forces in the truss members to enable the building designer to design the size, connections and anchorage of the permanent continuous lateral bracing. Forces shall be shown on the truss design drawing or on supplemental documents.

13. Required permanent truss member bracing location.

R802.10.2 ~~R802.1.6.2~~ Design. Wood trusses shall be designed in accordance with accepted engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional where required by Florida Statutes.

R802.10.2.1 ~~R802.1.6.2.1~~ Applicability limits. The provisions of this section shall control the design of truss roof framing ~~when snow controls~~ for buildings not greater than 60 feet (18 288 mm) in length perpendicular to the joist, rafter or truss span, not greater than 36 feet (10 973 mm) in width parallel to the joist, rafter or truss span, not greater than two stories in height with each story not greater than 10 feet (3048 mm) high, and roof slopes not smaller than 3:12 (25-percent slope) or greater than 12:12 (100-percent slope). Truss roof framing constructed in accordance with the provisions of this section shall be limited to sites subjected to a maximum design wind speed of 110 miles per hour (49 m/s), Exposure A, B or C~~, and a maximum ground snow load of 70 psf (3352 Pa). For consistent loading of all truss types, roof snow load is to be computed as: 0.7 pg~~.

R802.10.3 ~~R802.1.6.3~~ Bracing. Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the construction documents for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with TPI/WTCA BCSI.

R802.10.4 ~~R802.1.6.4~~ Alterations to trusses. [No other change to IRC text]

R802.10.5 ~~R802.1.6.5~~ Truss to wall connection. Trusses shall be connected to wall plates by the use of approved connectors having a resistance to design uplift, lateral and shear forces. Trusses shall be installed in accordance with the manufacturer's design andspecifications. For roof assemblies subject to wind uplift pressures of 20 pounds per square foot (0.958 kN/m2) or greater, as established in Table R301.2(2), adjusted for height and exposure per Table R301.2(3), see Section R802.11 ~~2.9~~.

Change FL R802.2 as shown:

R802.2 Design and construction. Roof-ceilings of light-frame wood construction shall be designed and constructed in accordance with the provisions of Section R301.2.1.1 and Section R802.1.

~~**where wind speed is less than 100 mph.**The framing details required in Section R802 apply to roofs having a minimum slope of three units vertical in 12 units horizontal (25 percent slope) or greater. Roof ceilings of conventional light-frame wood constructionshall be designed and constructed in accordance with the provisions of~~

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~~this Section. Alternately, roof ceilings may be designed and constructed inaccordance with AF&PA"s NDS or AF&PA's WFCM. Components of roof ceilings shall be fastened in accordance with Table R602.2(1).~~

R802.3 ~~R802.2.1~~Framing details. Reserved. [Delete all text]

R802.3.1~~R802.2.1.1~~ Ceiling joist and rafter connections. Reserved. ~~Ceiling joists and rafters shall be nailed to each other in accordance with Tables R802.5.1(9) R602.32(1) and R802.2.3(9) and the rafter assembly shall be nailed to the top wall plate in accordance with Table R602.2(1). Ceiling joists shall be continuous or securely joined where they meet over interior partitions and nailed to adjacent rafters to provide a continuous tie across the building when such joists are parallel to the rafters.~~

~~Where ceiling joists are not connected to the rafters at the top wall plate, joists connected higher in the attic shall be installed as rafter ties, or rafter ties shall be installed to provide a continuous tie. Where ceiling joists are not parallel to rafters, rafter ties shall be installed. Rafter ties shall be a minimum of 2 inch by 4 inch (51 mm by 102 mm) (nominal), installed in accordance with the connection requirements in Table R802.5.1(9), or connections of equivalent capacities shall be provided. Where ceiling joists or rafter ties are not provided, the ridge formed by these rafters shall be supported by a wall or girder designed in accordance with accepted engineering practice.~~

~~-~~

~~Collar ties or ridge straps to resist wind uplift shall be connected in the upper third of the attic space in accordance with Table R602.2(1).~~

~~-~~

~~Collar ties shall be a minimum of 1 inch by 4 inch (25 mm by 102 mm) (nominal), spaced not more than 4 feet (1219 mm) on center.~~

R802.3.2~~R802.2.1.2~~ Ceiling joists lapped. Reserved. ~~Ends of ceiling joists shall be lapped a minimum of 3 inches (76 mm) or butted over bearing partitions or beams and toe nailed to the bearing member. When ceiling joists are used to provide resistance to rafter thrust, lapped joists shall be nailed together in accordance with Table R602.2(1) and butted joists shall be tied together in a manner to resist such thrust.~~

R802.5 ~~R802.2.2~~ Allowable ceiling joist spans. Reserved. ~~Spans for ceiling joists shall be in accordance with Tables R802.2(1) and R802.2(2). For other grades and species and for other loading conditions, refer to the AF&PA Span Tables for Joists and Rafters~~.

Table R802.4(1) ~~Table R802.2(1)~~Ceiling Joist Spans For Common Lumber Species. Reserved.

Table R802.4(2) ~~Table R802.2(2)~~Ceiling Joist Spans For Common Lumber Species. Reserved.

R802.5 ~~R802.2.3~~ Allowable rafter spans. Reserved. ~~Spans for rafters shall be in accordance with Tables R802.2.3(1) through R802.2.3(8). For other grades and species and for other loading conditions, refer to the AF&PA Span Tables for Joists and Rafters. The span of each rafter shall be measured along the horizontal projection of the rafter.~~

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R802.5.1~~R802.2.3.1~~ Purlins. Reserved. ~~Purlins are permitted to be installed to reduce the span of rafters as shown in Figure R802.2.3.1. Purlins shall be sized … braces shall not exceed 8 feet (2438 mm).~~

Table R802.5.1(1)~~Table R802.2.3(1)~~ Rafter Spans For Common Lumber Species. Reserved.

Table R802.5.1(2)~~Table R802.2.3(2)~~ Rafter Spans For Common Lumber Species. Reserved.

Table R802.5.1(3) Rafter Spans for Common Lumber Species (Ground snow load = 30 psf, ceiling not attached to rafters, L/D = 180) Reserved.

Table R802.5.1(4) Rafter Spans for Common Lumber Species (Ground snow load = 50 psf, ceiling not attached to rafters, L/D = 180) Reserved.

Table R802.5.1(5) Rafter Spans for Common Lumber Species (Ground snow load = 30 psf, ceiling not attached to rafters, L/D = 240) Reserved.

Table R802.5.1(6) Rafter Spans for Common Lumber Species (Ground snow load = 50 psf, ceiling not attached to rafters, L/D = 240) Reserved.

Table R802.5.1(7) Rafter Spans for 70 PSF Ground Snow Load (Ceiling not attached to rafters, L/D = 180) Reserved.

Table R802.5.1(8)Rafter Spans for 70 PSF Ground Snow Load (Ceiling not attached to rafters, L/D = 180) Reserved.

Table R802.5.1(9) ~~Table R802.2.3(9)~~Rafter/Ceiling Joist Heel Joint Connections. Reserved.

R802.6~~R802.2.4~~ Bearing. Reserved.

R802.6.1~~R802.2.5~~ Finished ceiling material. Reserved.

R802.7~~R802.2.6~~ Cutting and notching. Reserved.

R802.7.1~~R802.2.6.1~~ Sawn lumber. Reserved.

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R802.7.2~~802.2.6.2~~ Engineered wood products. Reserved. ~~Cuts, notches and holes bored in trusses, structural composite lumber, structural glue laminated members or I joists are prohibited except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a registered design professional.~~

R802.8~~R802.2.7~~ Lateral support. Reserved.

R802.8.1~~R802.2.7.1~~ Bridging. Reserved.

R802.9~~R802.2.8~~ Framing of openings. Reserved.

R802.11~~R802.2.9~~ Roof tie-down.

R802.11.1~~R802.2.9.1~~ Uplift resistance. Roof assemblies which are subject to wind uplift pressures of 20 pounds per square foot (0.958 kN/m2) or greater shall have roof rafters or trusses attached to their supporting wall assemblies by connections capable of providing the resistance required in Table R802.11 ~~R802.2.9.1~~. Wind uplift pressures shall be determined using an effective wind area of 100 square feet (9.3m^2) and Zone 1 in Table R301.2(2), as adjusted for height and exposure per Table R301.2(3).

A continuous load path shall be provided to transmit the uplift forces from the rafter or truss ties to the foundation. For rafter construction, straps and/or clips shall extend such that the top nail is within 1 inch of the top of the rafter, or shall be wrapped around the top of the rafter with one or more nails installed on the opposite side of the rafter.

IRC Table 802.11 is deleted in its entirety and replaced with a Florida-specific Table R802.11 as shown:

TABLE R802.11 ~~R802.2.9.1~~

WIND UPLIFE FORCES[a,b,c,e,f]

ROOF BEARING UPLIFT AT TOP OF WALL IN EXPOSURE B, PLF[1,2,4]

Roof Angle	Wind Speed, mph	Roof Span (feet) 12	20	24	28	32	36	40	Over-hangs[3]
	85	-39.50	-65.83	-79.00	-92.16	-105.33	-118.49	-131.66	-19.3
	90	-48.64	-81.07	-97.28	-113.50	-129.71	-145.92	-162.14	-21.6
End zone	100	-68.50	-114.16	-136.99	-159.82	-182.66	-205.49	-228.32	-26.7
load for	110	-90.44	-150.73	-180.88	-211.03	-241.17	-271.32	-301.47	-32.3
all roof	120	-114.47	-190.79	-228.95	-267.11	-305.26	-343.42	-381.58	-38.4
angles	130	-140.60	-234.33	-281.20	-328.06	-374.93	-421.79	-468.66	-45.1
	140	-168.81	-281.35	-337.62	-393.89	-450.16	-506.44	-562.71	-52.3
	150	-199.12	-331.86	-398.23	-464.60	-530.97	-597.35	-663.72	-60.0
Interior	85	-17.57	-29.28	-35.13	-40.99	-46.84	-52.70	-58.55	-15.1

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zone load for all roof angles	**90**	-24.05	-40.09	-48.11	-56.12	-64.14	-72.16	-80.18	-16.9
	100	-38.14	-63.57	-76.28	-88.99	-101.71	-114.42	-127.13	-20.9
	110	-53.71	-89.52	-107.42	-125.32	-143.22	-161.13	-179.03	-25.3
	120	-70.76	-117.94	-141.52	-165.11	-188.70	-212.28	-235.87	-30.1
	130	-89.30	-148.83	-178.59	-208.36	-238.12	-267.89	-297.65	-35.3
	140	-109.31	-182.19	-218.63	-255.07	-291.50	-327.94	-364.38	-40.9
	150	-130.81	-218.02	-261.63	-305.23	-348.84	-392.44	-436.05	-47.0
Interior zone uplift for 30^0 roof angle	All values deleted								

TABLE<u>R802.11</u> ~~R802.2.9.1~~ (cont.)

ROOF BEARING UPLIFT AT TOP OF WALL IN EXPOSURE C, PLF[1,2,4]

Roof Angle	Wind Speed, mph	Roof Span (feet) 12	20	24	28	32	36	40	Over-hangs[3]
End zone load for all roof angles	**85**	-69.85	-116.42	-139.70	-162.99	-186.27	-209.55	-232.84	-27.0
	90	-82.67	-137.78	-165.34	-192.90	-220.45	-248.01	-275.57	-30.3
	100	-110.51	-184.18	-221.01	-257.85	-294.68	-331.52	-368.36	-37.4
	110	-141.27	-235.45	-282.55	-329.64	-376.73	-423.82	-470.91	-45.3
	120	-174.97	-291.62	-349.94	-408.26	-466.59	-524.91	-583.23	-53.9
	130	-211.60	-352.66	-423.19	-493.72	-564.26	-634.79	-705.32	-63.2
	140	-251.15	-418.59	-502.31	-586.02	-669.74	-753.46	-837.18	-73.3
	150	-293.64	-489.40	-587.28	-685.16	-783.04	-880.92	-978.80	-84.2
Interior zone load for all roof angles	**85**	-39.10	-65.17	-78.20	-91.24	-104.27	-117.30	-130.34	-21.2
	90	-48.20	-80.33	-96.39	-112.46	-128.52	-144.59	-160.66	-23.7
	100	-67.95	-113.24	-135.89	-158.54	-181.19	-203.84	-226.49	-29.3
	110	-89.78	-149.63	-179.55	-209.48	-239.40	-269.33	-299.25	-35.4
	120	-113.68	-189.47	-227.37	-265.26	-303.16	-341.05	-378.94	-42.2
	130	-139.67	-232.78	-279.34	-325.90	-372.45	-419.01	-465.57	-49.5
	140	-167.74	-279.56	-335.47	-391.38	-447.29	-503.21	-559.12	-57.4
	150	-197.88	-329.80	-395.76	-461.72	-527.68	-593.64	-659.60	-65.9
Interior zone uplift for 30^0 roof angle	All values deleted.								

Notes:

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a. The uplift loads are pounds per lineal foot of building length. For roof uplift connections use the tables for 20 degrees and multiply by 1.33 for framing spaced 16 inches on center and multiply by 2 for framing spaced 24 inches on center.

b. The uplift loads include an allowance for 10 pounds of dead load.

c. The uplift loads do not account for the effects of overhangs. The magnitude of the aboveloads shall be increased by adding the overhang loads found in the table. The overhang loads are also based on framing spaced 12 inches on center. The overhang loads given shall be multiplied by the overhang projection and added to the roof uplift value in the table.

d. End zones extend 8 feet from building corners.

e. For buildings with a roof slope of 5:12 or greater, tabulated uplift loads shall be permitted to be multiplied by 0.87.

f. Negative values indicate uplift.

g. Reserved.

-

~~**R802.3Design and construction where wind speed is 100 mph or greater.** Roof ceilings of light-frame wood construction shall be designed and constructed in accordance with the provisions of Section R301.2.1.1 and Section R802.1.~~

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Date Submitted	4/1/2010	**Section**	AAMA	**Proponent**	Daniel Walker
Chapter	43	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Mod #4306

Summary of Modification

Updates reference from AAMA/NPEA/NSA 2100-02 to AAMA/NPEA/NSA 2100-10.

Rationale

The referenced document, AAMA/NPEA/NSA 2100-02 has been updated by the three authoring groups and released as a 2010 edition. The definitions of the various sunroom categories have been updated in the revised document and thus should be updated in the 2010 Florida Building Code.

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.

Requirements

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

This proposal has a reasonable and substantial connection with the health, safety and welfare of the general public.

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

This proposal strengthens the code by bringing it up to date.

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

This proposal does not discriminate against any materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

AAMA/NPEA/NSA 2100-~~02~~ 10 Voluntary Specifications for Sunrooms R301.2.1.1.2

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Date Submitted	4/1/2010	**Section**	AAMA	**Proponent**	Daniel Walker
Chapter	43	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Summary of Modification

Updates reference from AAMA/NPEA/NSA 2100-02 to AAMA/NPEA/NSA 2100-10.

Rationale

The referenced document, AAMA/NPEA/NSA 2100-02 has been updated by the three authoring groups and released as a 2010 edition. The definitions of the various sunroom categories have been updated in the revised document and thus should be updated in the 2010 Florida Building Code.

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.

Requirements

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

This proposal has a reasonable and substantial connection with the health, safety and welfare of the general public.

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

This proposal strengthens the code by bringing it up to date.

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

This proposal does not discriminate against any materials, products, methods or systems of construction.

Does not degrade the effectiveness of the code

This proposal does not degrade the effectiveness of the code.

AAMA/NPEA/NSA 2100-~~02~~ 10 Voluntary Specifications for Sunrooms R301.2.1.1.2

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S3802

Date Submitted	3/24/2010	**Section**	R4403.16.1	**Proponent**	Michael Hemmer
Chapter	44	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

This code modification is meant to standardize a form of testing which is extremely necessesary for soffit vents, soffit systems, and ridge vents in hurricane prone areas. This mod only revise Exception (b), the remaining text "unchanged"

Rationale

This proposed code modification will assist in providing a solution to a problematic area of a building's construction in a hurricane prone area, the soffit and ridge vent systems. These areas have been attacked over and over again by hurricanes of the past which in turn have been major contributers to water, wind, and mold damage in a structure as well as personal property damage.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This proposed code modification will assist in the enforcement of the code by setting standards to follow in this area of a building's construction.

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

Additional cost will be minimal.

Impact to industry relative to the cost of compliance with code

Additional cost will be minimal.

Requirements

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

This proposed modification has a substantial connection with the safety, health, and general welfare of the building's occupants. A storm's impact on a structure through these openings can cause water, mold, structural, and personal property damage.

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

This code modification will strenthen and improve the code in providing better products, methods, and systems to insure a stronger soffit and ridge ventilation system in hurricane prone areas. Also, this will benefit the codes on roofing in providing for a safer and stronger roof structure.

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

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

Does not degrade the effectiveness of the code

This modification will improve the effectiveness of the code by providing the public a Stronger and Safer structure in which they live and work.

1st Comment Period History 04/15/2010 - 06/01/2010

S3802-G1

Proponent	Max Mayfield	**Submitted**	5/31/2010	**Attachments**	No

Comment:

I support soffit vent covers for hurricane protection. During Andrew, I had wind driven water come into my attic through the soffit vents. Soffit vent problems were also mentioned in some of the FEMA post storm reports after the 2004 sedason. I now have aluminum covers to my soffit vents, in addition to accordion shutters for all my winds and french doors, impact resistant entry doors, garage doors and a metal roof. See http://www.justnews.com/mayfieldblog/index.html from June 27, 2009 for additional comments and pictures. Thanks, Max Mayfield

SECTION R4403.16 HIGH-VELOCITY HURRICANE ZONES— IMPACT TESTS FOR WIND-BORNE DEBRIS

R4403.16.1 All parts or systems of a building or structure envelope such as, but not limited, to exterior walls, roof, outside doors, skylights, glazing and glass block shall meet impact test criteria or be protected with an external protection device that meets the impact test criteria. Test procedures to determine resistance to wind-borne debris of wall cladding, outside doors, skylights, glazing, glass block, shutters and any other external protection devices shall be performed in accordance with this section.

Exception: The following structures or portion of structures shall not be required to meet the provisions of this section:

a. Roof assemblies for screen rooms, porches, canopies, etc., attached to a building that do not breach the exterior wall or building envelope and have no enclosed sides other than screen.

b. Soffits, soffit vents and ridge vents, however these systems must have Product Approval and have met the specifications set forth in TAS 202 and TAS 203. Size and location of such vents shall be detailed by the designer and shall not compromise the integrity of the diaphragm boundary.

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HURRICANE IKE & IN TEXAS & LOUISIANA

D Hurricane Ike Recovery Advisories

FEMA has prepared a series of Recovery Advisories that present guidance for design, construction, and restoration of buildings in areas subject to coastal flooding and high winds from Hurricane Ike. To date, eight advisories have been prepared and are included in this appendix:

- Attachment of Brick Veneer in High-Wind Regions ([December, 2005]; revised 2009)
- Design and Construction in Coastal A Zones ([December, 2005]; revised 2009)
- Designing for Flood Levels above the BFE ([July, 2006]; revised 2009)
- Enclosures and Breakaway Walls
- Erosion, Scour, and Foundation Design
- Minimizing Water Intrusion Through Roof Vents in High-Wind Regions
- Metal Roof Systems in High-Wind Regions
- Siding Installation in High-Wind Regions

These Advisories are also available online at http://www.fema.gov/library/viewRecord.do?id=3539 where future Advisories will also be posted.

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Attachment of Brick Veneer in High-Wind Regions

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend practices for installing brick veneer that will enhance wind resistance in high-wind areas (i.e., greater than 90-mph gust design wind speed).

Key Issues

- Brick veneer is frequently blown off walls of residential and non-residential buildings during hurricanes (Figure 1). When brick veneer fails, wind-driven water can enter and damage buildings, and building occupants can be vulnerable to injury from windborne debris (particularly if walls are sheathed with plastic foam insulation or wood fiberboard in lieu of wood panels). Pedestrians in the vicinity of damaged walls can also be vulnerable to injury from falling veneer (Figure 2).
- Common failure modes include tie (anchor) corrosion (Figure 3), tie fastener pull-out (Figure 4), failure of masons to embed ties into the mortar (Figure 5), and poor bonding between ties and mortar and mortar of poor quality (Figure 6).
- Ties are often installed before brick laying begins. When this is done, ties are often improperly placed above or below the mortar joints. When misaligned, the ties must be angled up or down in order for the ties to be embedded into the mortar joints (Figure 7). Misalignment not only reduces embedment depth, but also reduces the effectiveness of the ties because wind forces do not act parallel to the ties themselves.
- Corrugated ties typically used in residential veneer construction provide little resistance to compressive loads. Use of compression struts would likely be beneficial, but off-the-shelf devices do not currently exist. Two-piece adjustable ties (Figure 8) provide significantly greater compressive strength than corrugated ties and are, therefore, recommended. However, if corrugated ties are used, it is recommended that they be installed as shown in Figures 9 and 10 in order to enhance their wind performance.



Figure 1. Failed brick veneer over plywood. Many of the ties are still attached to the substrate, but several of the tie fasteners pulled out of the substrate and the ties are embedded in the collapsed veneer. Estimated wind speed: 107 miles per hour (peak gust, Exposure C, at 33 feet).



Figure 2. The upper portion of the brick veneer at this apartment building collapsed. Pedestrian and vehicular traffic in the vicinity of the damaged wall are vulnerable to injury and damage if remaining portions of the wall were to collapse during subsequent storms.



Figure 3. Significant tie corrosion caused the brick at a fire station to fail, even though the building is not near the coast. Note that metal is missing for half of of width of the tie at two locations (red arrows). The left end of the tie was still embedded into a concrete masonry unit back-up wall. The right end is where the tie failed in tension, thus leaving a portion of the tie embedded in the collapsed brick.

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- Buildings that experience veneer damage typically do not comply with current building codes. Building code requirements for brick veneer have changed over the years. Model codes prior to 1995 permitted brick veneer in any location, with no wind speed restrictions. Also, some older model codes allowed brick veneers to be anchored with fewer ties than what is required by today's standards.

  The American Concrete Institute's (ACI's) 530/American Society of Civil Engineers (ASCE) 5/The Masonry Society (TMS) 402 (ACI 530) *Building Code Requirements for Masonry Structures* is the current masonry standard referenced by model building codes. The 2006 International Building Code® (IBC®) and the 2006 International Residential Code® (IRC®) both reference the 2005 edition of ACI 530. The latest ACI 530 is the 2008 edition.

  ACI 530 addresses brick veneer in two manners: rational design and a prescriptive approach. Nearly all brick veneer in residential and low-rise construction follows the prescriptive approach. The first edition of ACI 530 limited the use of prescriptive design to areas with a basic wind speed of 110 mph or less. The 2005 and the 2008 editions of ACI 530 extend the prescriptive requirements to include a basic wind speed of 130 mph, but limit the amount of brick that can be anchored with veneer ties to 70 percent of that allowed in lower wind speed regions. Both the 2005 and the 2008 editions require rational design approaches in locations where the basic wind speeds exceed 130 mph.

  Some noteworthy distinctions exist in the requirements for anchored brick veneer between the 2005 and the 2008 editions of ACI 530. For lower wind speed regions (110 mph and below), ACI 530-05 limited the vertical spacing of ties to 18"; the 2008 edition allows vertical ties to be spaced up to 25", provided the amount of veneer anchored per tie does not exceed 2.7 square feet. In ACI's high-wind regions (over 110 mph and up to 130 mph), both editions of the code limit vertical spacing to 18". ACI 530-08 also limits the space between veneer anchored with corrugated ties and the wall sheathing to 1". This is to avoid compression failures in the corrugated ties when they are exposed to positive pressures.



Figure 4. This tie remained embedded in the mortar joint while the smooth-shank nail pulled out from the stud.



Figure 5. These four ties were never embedded into the mortar joint.



Figure 6. This tie was embedded in the mortar, but the bond was poor.

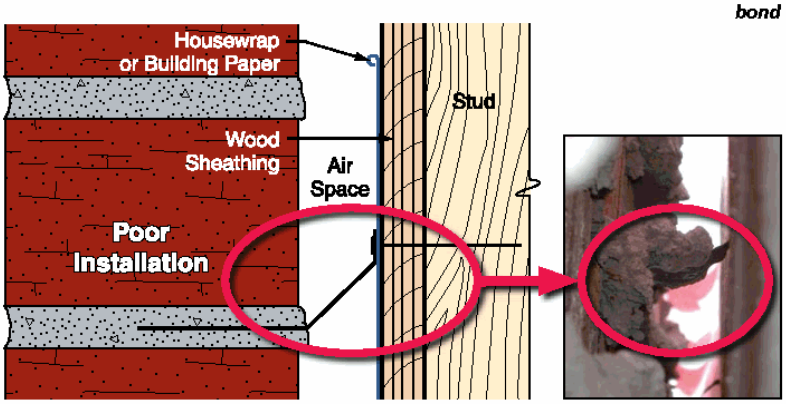


Figure 7. Misalignment of the tie reduces the embedment and promotes veneer failure.

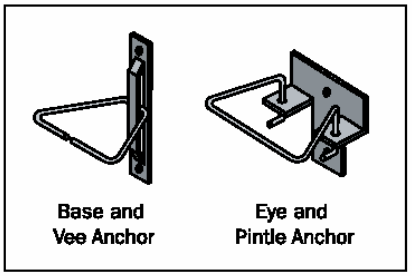


Figure 8. Examples of two-piece adjustable ties.

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- The following Brick Industry Association (BIA) Technical Notes provide guidance on brick veneer: Technical Notes 28 – Anchored Brick Veneer, Wood Frame Construction; Technical Notes 28B – Brick Veneer/Steel Stud Walls; and Technical Notes 44B – Wall Ties (available online at http://www.bia.org). These Technical Notes provide attachment recommendations, but the recommendations are not specific for high-wind regions and are, therefore, inadequate.

Sustainability

Brick veneer can offer a very long service life, provided the ties are not weakened by corrosion. To help ensure that brick veneer achieves its long life potential, in addition to properly designing and installing the ties, stainless steel ties are recommended.

Construction Guidance

The brick veneer wall system is complex in its behavior. There are limited test data on which to draw. The following guidance is based on professional judgment, wind loads specified in ASCE 7-05, *Minimum Design Loads for Buildings and Other Structures*, fastener strengths specified in the American Forest and Paper Association's (AF&PA's) National Design Specification (NDS) for Wood Construction, and brick veneer standards contained in ACI 530-05. In addition to the general guidance given in BIA Technical Notes 28 and 28B, the following are recommended:

Note: In areas that are also susceptible to high seismic loads, brick veneer should be evaluated by an engineer to ensure it can resist seismic and wind design loads.

Stud Spacing: For new construction, space studs 16" on center, so that ties can be anchored at this spacing.

Tie Fasteners: Ring-shank nails are recommended in lieu of smooth-shank nails. A minimum embedment of 2" into framing is suggested.

Ties: For use with wood studs, two-piece adjustable ties are recommended. However, where corrugated steel ties are used, use 22-gauge minimum, 7/8" wide by 6" long, complying with American Society for Testing and Materials (ASTM) A 366 with a zinc coating complying with ASTM A 153 Class B2. For ties for use with steel studs, see BIA Technical Notes 28B – Brick Veneer/Steel Stud Walls. Stainless steel ties should be used in areas within 3,000 feet of the coast.

Tie Installation

- Install ties as the brick is laid so that the ties are properly aligned with the mortar joints.
- Install brick ties spaced per Table 1. Studs should be installed at 16" spacing. Veneer tie locations for 24" stud spacing are included for repairing damaged veneer on existing buildings with the wider stud spacing. In areas where the 2006 Editions of the IBC/IRC are adopted, install brick veneer ties spaced no more than 18" vertically to satisfy the requirements of ACI 530-05.
- Locate ties within 8" of door and window openings and within 12" of the top of veneer sections.
- Bend the ties at a 90-degree angle at the nail head in order to minimize tie flexing when the ties are loaded in tension or compression (Figure 9).
- Embed ties in joints so that mortar completely encapsulates the ties. Embed a minimum of 1 1/2" into the bed joint, with a minimum mortar cover of 5/8" to the outside face of the wall (Figure 10).

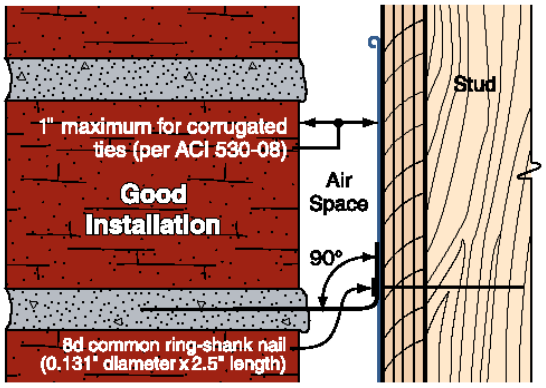


Figure 9. Bend ties at nail heads.

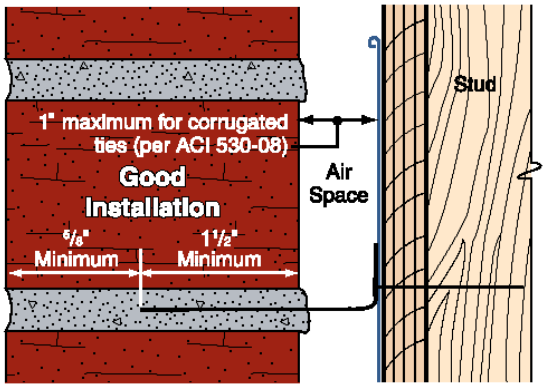


Figure 10. Tie embedment.

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Table 1. Brick Veneer Tie Spacing

Wind Speed (mph) (3–Second Peak Gust)	Wind Pressure (psf)	Maximum Vertical Spacing for Ties (inches)	
		16" stud spacing	24" stud spacing
90	–19.5	24[a,b]	16[a]
100	–24.1	24[a,b]	16[a]
110	–29.1	20½ [b]	13½
120	–34.7	17	NA[c]
130	–40.7	15	NA[c]
140	–47.2	13	NA[c]
150	–54.2	11	NA[c]

Notes:

1. The tie spacing is based on wind loads derived from Method 1 of ASCE 7-05, for the corner area of buildings up to 30' high, located in Exposure B with an importance factor (I) of 1.0 and no topographic influence. For other heights, exposures, or importance factors, engineered designs are recommended.
2. Spacing is for 2½" long 8d common (0.131" diameter) ring-shank fasteners embedded 2" into framing. Fastener strength is for wall framing with a Specific Gravity G=0.55 with moisture contents less than 19 percent and the following adjustment factors, C_t=0.8; and C_D, C_M, C_{eg}, and C_{tn}=1.0. Factored withdrawal strength W'= 65.6#.
3. The brick veneer tie spacing table is based on fastener loads only and does not take into account the adequacy of wall framing, sheathing, and other building elements to resist wind pressures and control deflections from a high-wind event. Prior to repairing damaged brick veneer, the adequacy of wall framing, wall sheathing, and connections should be verified by an engineer.

[a] Maximum spacing allowed by ACI 530-08.

[b] In locales that have adopted the 2006 IBC/IRC, the maximum vertical spacing allowed by ACI 530-05 is 18".

[c] 24" stud spacing exceeds the maximum horizontal tie spacing of ACI 530-08 prescribed for wind speeds over 110 mph.

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Design and Construction in Coastal A Zones

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend design and construction practices in coastal areas where wave and flood conditions during the base flood will be less severe than in V zones, but still cause significant damage to typical light-frame construction.

Key Issues

- Recent post-storm investigations have shown that typical A-zone construction techniques (e.g., wood-frame, light gauge steel, or masonry walls on shallow footings or slabs, etc.) are subject to damage or destruction when exposed to less than 3' waves, which is the current threshold for V-zone conditions.
- Coastal A-zone buildings that employ typical residential and light commercial walls to elevate and support habitable space above the flood level will be susceptible to flood damage (Figure 1). Laboratory tests and recent field investigations confirm that breaking wave heights as small as 1.5' will cause failure of these types of walls (Figure 2).
- Other flood hazards associated with coastal waves (e.g., floating debris, high velocity flow, erosion and scour) also damage A-zone type construction in coastal areas (Figure 3).
- National Flood Insurance Program (NFIP) flood hazard mapping is generally divided into two categories, V and A zones. In coastal areas, the A-zone category could be subdivided into "Coastal A zone" and "A



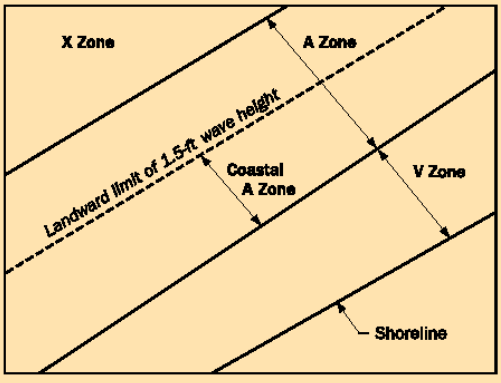
Figure 1. Failure of wood-frame walls used to support a coastal building, which was subjected to shallow flooding, small waves, and floating debris (Fort Walton Beach, FL, Hurricane Opal).

The Hurricane Ike Mitigation Assessment Team (MAT) observed small wave damage consistent with Coastal A-zone conditions throughout the area affected by Ike, including portions of west Galveston Island (Figure 4), communities situated along portions of Galveston Bay (Figure 5), Orange County (Figure 6), and portions of coastal Louisiana (Figure 7).

Coastal A Zone, Defined

Coastal A Zone: area landward of a V zone, or landward of an open coast without mapped V zones. In a Coastal A zone, the principal source of flooding will be astronomical tides, storm surges, seiches or tsunamis, not riverine flooding. During base flood conditions, the potential for wave heights between 1.5 and 3.0' will exist. At least 2 to 4' of stillwater depth is necessary to support these wave heights.

Coastal A-zone design and construction practices described herein are not mandated by the NFIP, but are recommended for communities that wish to adopt higher floodplain management standards. Community Rating System (CRS) credits are available for doing so. Note that some Coastal A-zone practices may be required by the International Building Code®, through its reference to ASCE 24, *Standard for Flood Resistant Design and Construction*.



Plan view showing a Coastal A zone landward of a V zone (source: ASCE 24-05).

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zone." Base flood conditions in the Coastal A zone will be similar to, but less severe than, those in the V zone; base flood conditions in the A zone will be similar to those in riverine or lake floodplains.

- The Coastal A zone is not shown on the Flood Insurance Rate Maps (FIRMs) presently adopted by communities. Communities, designers, and owners will have to determine whether a site lies within a Coastal A zone, either by wave height estimation or by consultation with FEMA regarding the LiMWA (see text box).

> Flood insurance studies produced after Hurricane Katrina may include an advisory line indicating the limit of the 1.5' wave height during the base flood. This line is known as the Limit of Moderate Wave Action (LiMWA), and the area between this line and the VE zone boundary is the Coastal A zone.

- **In general, V-zone design and construction standards are recommended in Coastal A zones subject to erosion, high velocity flow, and/or wave heights greater than 1.5'.**



Figure 2. Failure of wood-frame wall, brick veneer, and windows as a result of 4' of stillwater flooding and small waves (Bay St. Louis, MS, Hurricane Katrina).



Figure 3. Failure of A-zone type foundation in coastal area, not subject to V-zone conditions (Topsail Island, NC, Hurricane Fran).



Figure 4. Coastal A-zone flood conditions are sufficient to cause failure of solid breakaway walls and garage doors (west Galveston Island, TX, Hurricane Ike).

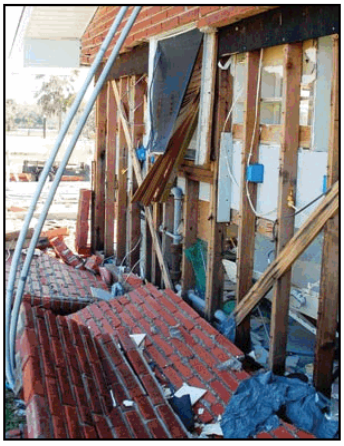
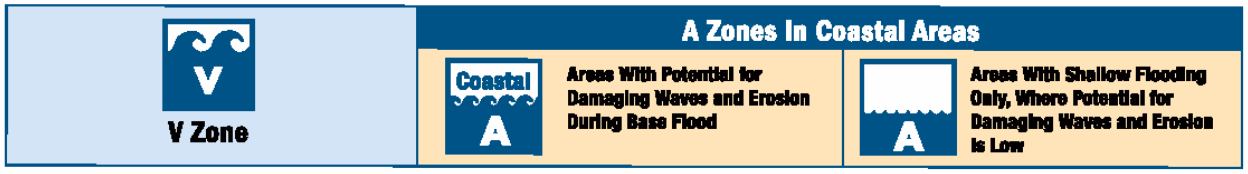


Figure 5. Damage to brick veneer walls due to shallow flooding, floating debris, and small waves. The damaged home was on a sheltered bay shoreline (Baytown, TX, Hurricane Ike).



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Figure 6. Damage attributed to small waves and approximately 5' of stillwater depth (Bridge City, TX, Hurricane Ike).



Figure 7. Damage believed to have resulted from Coastal A-zone conditions (Johnson Bayou, LA, Hurricane Ike).

Coastal A-Zone Construction Guidance

Because of the presence of damaging waves, V-zone design, construction, and certification practices are recommended for Coastal A zones.

Coastal A-zone construction should include:

- Use of open foundations (pile or pier) designed to resist all base flood conditions, including small waves, high velocity flow, erosion and scour, and floodborne debris (see Table 1).
- Elevation of the bottom of the lowest horizontal structural member supporting the lowest floor above the base flood wave crest elevation (Figure 8). Since waves and debris will be impacting on the floor joists and other foundation elements during the base flood, do not follow current NFIP minimum requirements that allow the lowest floor's walking surface to be set at the wave crest elevation in Zone A. **The 2009 International Residential Code® (IRC®) will require 1' of freeboard in V zones and Coastal A zones.**

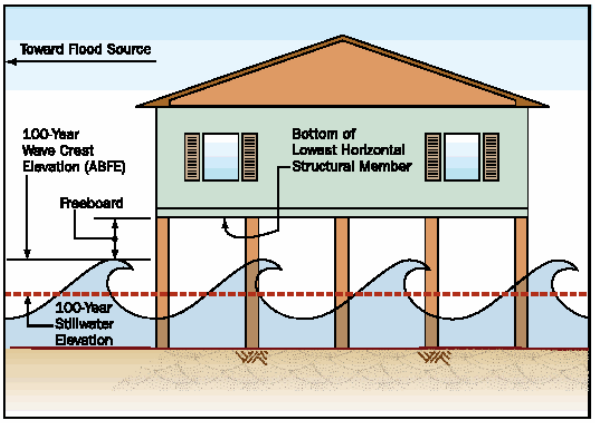


Figure 8. Recommended post-Katrina building standards in Coastal A zones.

- Use of flood-resistant materials above the level of the walking surface of the lowest floor (in the event that future flooding exceeds the lowest floor level and any freeboard incorporated into the building design).
- Specification of connections between the foundation and the elevated building that are capable of withstanding simultaneous wind and flood forces. Post-hurricane investigations typically find many foundation-to-building connections that are deficient.
- Use of space below the lowest horizontal structural member for parking, access, or storage only. Adding sufficient freeboard to allow parking beneath the building will not only reduce future flood damages, but will also lower flood insurance premiums.

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- Use of screen, lattice, louvers, or solid breakaway walls if space below the elevated floor is enclosed (see Hurricane Ike Recovery Advisory, *Enclosures and Breakaway Walls*). Note: unless flood regulations are changed, solid breakaway walls in Coastal A zones must be equipped with flood openings.

Additional guidance for design and construction in Coastal A zones can be found in FEMA 499, *Home Builder's Guide to Coastal Construction* (http://www.fema.gov/library/viewRecord.do?id=1570). The publication is a series of 31 fact sheets that provide recommended design and construction practices for foundations, connections, building envelope, etc. Fact Sheet 2 summarizes recommended practices for Coastal A zones, and references other fact sheets that provide more details.

Table 1. Foundation Recommendations for Coastal A Zones (Users should read across from a foundation type to see under what soil and base flood conditions that foundation is acceptable. A foundation must be capable of resisting all base flood conditions likely to exist at the site, or it should not be used. For example, a properly constructed pier on a shallow footing will generally withstand 1.5 to 3.0' wave heights, but should not be used where soils are erodible, and where high velocity flow is possible.)

Foundation Type	Base Flood Condition Present	
	Wave Heights Between 1.5 and 3.0 Feet*	Velocity Flow, Erodible Soils
Fill	no	no
Slab on grade	no	no
Crawlspace, shallow footing	no	no
Foundation walls, shallow footing	no	no
Stem wall**	no	no
Pier, shallow footing	yes	no
Pier, deep footing***	yes	yes
Post, shallow embedment	no	no
Pile/Column, deep embedment***	yes	yes

* Wave heights greater than 3.0' mapped as V zone: fill, slab, crawlspace, wall foundations not permitted.

** Typical stem wall foundations are vulnerable to damage from small waves or undermining and are, therefore, not recommended for use in Coastal A zones.

*** Deep means sufficiently deep to withstand erosion and scour, including that induced by the presence of the foundation itself.

Identifying Coastal A Zones

Coastal A zones are not shown on present day FIRMs or mentioned in a community's Flood Insurance Study (FIS) Report. Those maps and studies show Zones VE, AE, and X (or older designations V1-30, A1-30, B, and C). Therefore, until Coastal A-zone designations or wave height contours are incorporated into FISs, the community official, designer, or owner will have to determine whether or not a site will be subject to Coastal A-zone conditions during the base flood.

In order for a Coastal A zone to be designated, two conditions are required:

1) a water depth sufficient to support waves between 1.5 and 3.0' high, and

2) the actual presence of wave heights between 1.5 and 3.0'.

Condition 1 requires stillwater depths (vertical distance between the 100-year stillwater elevation and the ground elevation) of at least 2 to 4' at the site.

Condition 2 requires wave heights at the shoreline greater than 1.5 to 3.0' (under the 100-year flood conditions), sufficient water depth between the shoreline and the site and few, if any obstructions (buildings, dense tree stands, etc.) that may block or dampen the waves, between the shoreline and the site.

Figure 9 illustrates the procedure that was used following Hurricane Katrina to estimate Advisory Base Flood Elevations (ABFEs) and corresponding Coastal A zones, knowing only the ground elevation and the 1-percent annual chance stillwater level.

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Communities, designers, and owners can obtain the information necessary to make a post-Ike Coastal A-zone determination by observing the site and its surroundings, knowing site ground elevations, and using 1-percent annual chance stillwater elevations (from the FIS report or as determined by a government agency). Figure 10 shows how site and surrounding conditions would influence a Coastal-A zone determination.

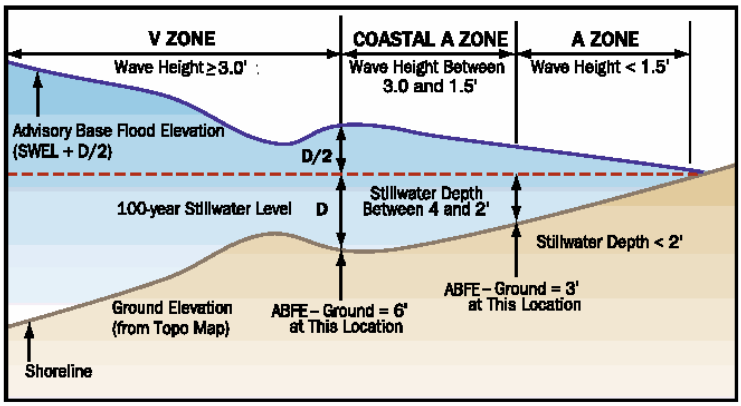


Figure 9. Post-Katrina Coastal A-zone methodology cross-section showing 1 percent annual chance stillwater elevation, stillwater depth and ABFE, and inland limits of an V zone and a Coastal A zone.





Figure 10. The site on the left is mapped Zone AE, and lies directly along the Gulf of Mexico shoreline. Limited obstructions to waves indicate the site could be classified as a Coastal A zone. The site on the right is over ½ mile from the Gulf shoreline, is mapped as Zone AE, and has a base flood stillwater level sufficient to support >1.5' wave heights – but obstructions to waves (e.g., trees and other buildings between the site and the shoreline) and distance from the source of flooding would indicate the area is not a Coastal A zone.

References

ASCE. 2005. *Standard for Flood Resistant Design and Construction*, ASCE 24-05.

FEMA. 2005. *Home Builder's Guide to Coastal Construction*, FEMA 499.

FEMA. 2009. *Hurricane Ike Recovery Advisory, Enclosures and Breakaway Walls*.

ICC 2006. International Building Code. 2006.

ICC 2009. International Residential Code. 2009.

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Designing for Flood Levels Above the BFE

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend design and construction practices that reduce the likelihood of flood damage in the event that flood levels exceed the Base Flood Elevation (BFE).

Key Issues

- BFEs are established at a flood level, including wave effects, that has a 1-percent chance of being equaled or exceeded in any given year, also known as the 100-year flood or base flood. Floods more severe and less frequent than the 1-percent flood can occur in any year.
- Flood levels during some recent storms have exceeded BFEs depicted on the Flood Insurance Rate Maps (FIRMs), sometimes by several feet. In many communities, flooding extended inland, well beyond the 100-year floodplain (Special Flood Hazard Area (SFHA)) shown on the FIRM (see Figure 1).
- Flood damage increases rapidly once the elevation of the flood extends above the lowest floor of a building, especially in areas subject to coastal waves. In a V zone, a coastal flood with a wave crest 3 to 4' above the bottom of the floor beam (approximately 1 to 2 feet above the walking surface of the floor) will be sufficient to substantially damage or destroy most light-framed residential and commercial construction (see Figure 2).
- There are design and construction practices that can eliminate or minimize damage to buildings when flood levels exceed the BFE. The most common approach is to add freeboard to the design (i.e., to elevate the building higher than required by the FIRM).
- There are other benefits of designing for flood levels above the BFE: reduced building damage and maintenance: longer building life; reduced flood insurance premiums; reduced displacement and dislocation of building occupants after floods (and need for temporary shelter and assistance); reduced job loss; and increased retention of tax base.
- The cost of adding freeboard at the time of home construction is modest, and reduced flood insurance premiums will recover the freeboard cost in a few years time.



Figure 1. Bridge City, TX, homes were flooded during Ike, even though they were constructed outside the SFHA and in Zone B. The flood level was approximately 4' above the closest BFE.



Figure 2. Bolivar Peninsula, TX, V-zone house constructed with the lowest floor (bottom of floor beam) at the BFE (dashed line). The estimated wave crest level during Ike (solid line) was 3 to 4' above the BFE at this location.

How High Above the BFE Should a Building be Elevated?

Ultimately, the building elevation will depend on several factors, all of which must be considered before a final determination is made:

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- **The accuracy of the BFE shown on the FIRM:** If the BFE is suspect, it is probably best to elevate several feet above the BFE; if the BFE is deemed accurate, it may only be necessary to elevate a couple of feet above the BFE.
- **Availability of Advisory Base Flood Elevations (ABFEs):** ABFEs have been produced for coastal areas following Hurricanes Ivan, Katrina, and Rita. These elevations are intended to be interim recommendations until new FISs can be completed.
- **Availability of Preliminary Digital Flood Insurance Rate Maps (DFIRMS):** As new Flood Insurance Studies (FISs) are completed for Louisiana and Texas communities, preliminary DFIRMs will be produced and available for use, even before they are officially adopted by those communities.
- **Future conditions:** Since the FIRM reflects conditions at the time of the FIS, some owners or jurisdictions may wish to consider future conditions (such as sea level rise, subsidence, wetland loss, shoreline erosion, increased storm frequency/intensity, and levee settlement/failure) when they decide how high to elevate.
- **State or local requirements:** The State or local jurisdiction may require a minimum freeboard through its floodplain management requirements or building code.
- **Building code requirements:** The International Building Code® (IBC®) requires buildings be designed and constructed in accordance with American Society of Civil Engineers (ASCE) 24 (*Standard for Flood Resistant Design and Construction*). ASCE 24 requires between 0 and 2' of freeboard, depending on the building importance and the edition of ASCE 24 referenced.[1] The 2009 IRC will require 1 foot of freeboard in V and Coastal A zones.
- **Critical and essential facilities:** Given the importance of these facilities, some of which must remain operational during a hurricane, they should be elevated higher than commercial and residential buildings.
- **Building owner tolerance for damage, displacement, and downtime:** Some building owners may wish to avoid building damage and disruption, and may choose to elevate far above the BFE.

The Hurricane Ike MAT report recommends that critical and essential facilities be elevated to the 500-year flood elevation or to the requirements of ASCE 24-05, whichever is higher. This recommendation may also be appropriate for residential and commercial structures, as well.

The 500-year wave crest elevation can be approximated as 1.5 times the 500-year stillwater depth (500-year stillwater elevation minus the ground elevation) added to the ground elevation. This procedure is similar to the procedure used to calculate ABFEs, but with a different stillwater level.

If the 500-year stillwater elevation (feet North American Vertical Datum of 1988 [NAVD] or feet National Geodetic Vertical Datum of 1929 [NGVD]) is not available, a rule of thumb can be used to approximate it as 1.25 times the 100-year stillwater elevation (feet NAVD or feet NGVD).

MAT Elevation Recommendation

The Hurricane Ike MAT recommends new and reconstructed residential and commercial buildings be elevated above the effective BFEs with freeboard equal to that specified in ASCE 24-05, plus 3 feet. Once new DFIRMs are available and adopted, the MAT recommends new and reconstructed residential and commercial buildings be elevated to or above the freeboard elevation specified by ASCE 24-05. Critical and essential facilities should be elevated higher than residential and commercial buildings.

Flood Insurance Rate Maps and Flood Risk

Hurricanes Ivan (2004), Katrina (2005), Rita (2005), and Ike (2008) have demonstrated that constructing a building to the minimum National Flood Insurance Program (NFIP) requirements – or constructing a building outside the SFHA shown on the FIRMs – is no guarantee that the building will not be damaged by flooding. This is due to two factors: 1) flooding more severe than the base flood occurs, and 2) some FIRMs, particularly older FIRMs, may no longer depict the true base flood level and SFHA boundary.

Even if the FIRM predicted flood levels perfectly, buildings constructed to the elevations shown on the FIRM will offer protection only against the 1-percent annual chance flood level (BFE). Some coastal storms will result in flood levels

[1] The 1998 edition of ASCE 24 is referenced by the 2003 edition of the IBC, and requires between 0 and 1' of freeboard. The 2005 edition of ASCE 24 is referenced by the 2006 edition of the IBC, and requires between 0 and 2' of freeboard.

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that exceed the BFE, and buildings constructed to the minimum elevation could sustain flood damage. The black dashed line in Figure 3 shows the probability that the level of the flood will exceed the 100-year flood level during time periods between 1 year and 100 years; there is an 18-percent chance that the 100-year flood level will be exceeded in 20 years, a 39-percent chance it will be exceeded in 50 years, and a 51-percent chance it will be exceeded in 70 years. As the time period increases, the likelihood that the 100-year flood will be exceeded also increases.

Figure 3 also shows the probabilities that floods of other severities will be exceeded. For example, taking a 30-year time period where there is a 26-percent chance that the 100-year flood level will be exceeded, there is an 18-percent chance that the 150-year flood will be exceeded, a 14-percent chance that the 200-year flood will be exceeded, and a 6-percent chance that a flood more severe than the 500-year flood will occur.

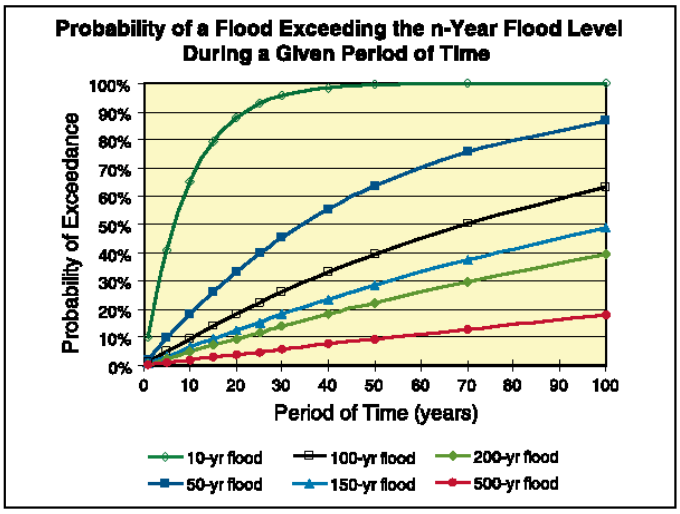


Figure 3. Probability that a flood will exceed the n-year flood level over a given period of time. (Note: this analysis assumes no shoreline erosion, and no increase in sea level or storm frequency/severity over time.)

FIRMs depict the limits of flooding, flood elevations, and flood hazard zones during the base flood. As seen in Figure 3, buildings elevated only to the BFEs shown on the FIRMs have a significant chance of being flooded over a period of decades. Users should also be aware that the flood limits, flood elevations, and flood hazard zones shown on the FIRM reflect ground elevations, development, and flood conditions at the time of the FIS.[2]

Consequences of Flood Levels Exceeding the BFE

Buildings are designed to ***resist*** most environmental hazards (e.g., wind, seismic, snow, etc.), but are generally designed to ***avoid*** flooding by elevating the building above the anticipated flood elevation. The difference in design approach is a result of the sudden onset of damage when a flood exceeds the lowest floor elevation of a building. Unlike wind – where exposure to a wind speed slightly above the design speed does not generally lead to severe building damage – occurrence of a flood level even a few inches above the lowest floor elevation generally leads to significant flood damage, therefore, the recommendation to add freeboard.

This is especially true in cases where waves accompany coastal flooding. Figure 4 illustrates the expected flood damage (expressed as a percent of a building's pre-damage market value) versus flood depth above the bottom of the lowest horizontal structural member supporting the lowest floor (e.g., bottom of the floor beam), for a V-zone building and for a riverine A-zone building.[3]

FIRMs do not account for the following:

- Shoreline erosion, wetland loss, subsidence, and relative sea level rise
- Upland development or topographic changes
- Degradation or settlement of levees and floodwalls
- Changes in storm climatology (frequency and severity)
- The effects of multiple storm events

Thus, what was once an accurate depiction of the 100-year floodplain and flood elevations may no longer be so.

One striking difference between the two curves is that a V-zone flood depth (wave crest elevation) 3 to 4' above the bottom of the floor beam (or approximately 1 to 2' above the top of the floor) is sufficient to cause substantial (>50 percent) damage to a building. In contrast, A zone riverine flooding (without waves and high velocity) can submerge a structure without causing substantial damage. This difference in building damage is a direct result of the energy contained in coastal waves striking buildings – something obvious to those who saw the wave damage that Hurricane Ike caused in Texas and Louisiana (see Figure 5).

[2] Sections 7.8.1.3 and 7.9 of FEMA's *Coastal Construction Manual* (FEMA 55, 2000 edition) provide guidance on evaluating a FIRM to determine whether it still provides an accurate depiction of base flood conditions, or whether it is obsolete.

[3] Since the normal floor reference for A-zone buildings is the top of the lowest floor, the A-zone curve was shifted for comparison with the V-zone curve.

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In cases where buildings are situated behind levees, a levee failure can result in rapid flooding of the area. Buildings near a levee breach may be exposed to high velocity flows, and damages to those buildings will likely be characterized by the V-zone damage curve in Figure 4. Damages to buildings farther away from the breach will be a result of inundation by floodwaters, and will likely resemble the A-zone curve in Figure 4.

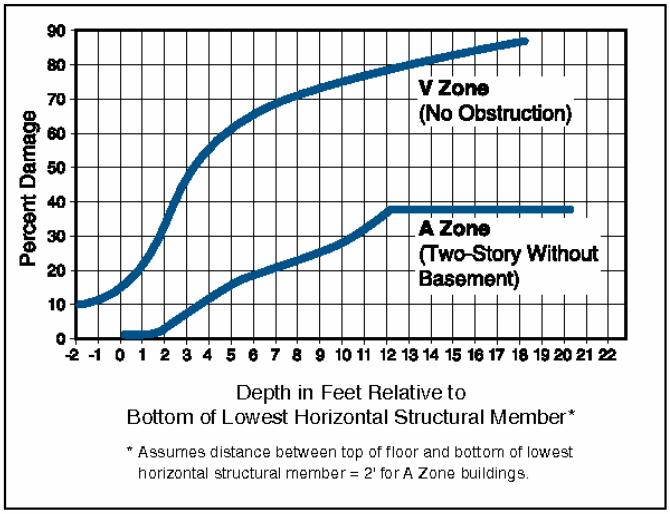


Figure 4. Flood depth versus building damage curves for V zones and riverine A zones (Source: FEMA 55, Coastal Construction Manual).



Figure 5. Hurricane Ike damage to buildings. The upper left and upper right photos are of buildings that were close to the Gulf of Mexico shoreline and subjected to storm surge and large waves above the lowest floor. The lower left photo is of a building close to Galveston Bay shoreline and subjected to storm surge and small waves. The lower right photo is of a Cameron Parish, Louisiana, school that was approximately 1.3 miles from the Gulf shoreline, but subjected to storm surge and small waves.

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General Recommendations

The goal of this Advisory is to provide methods to minimize damage to buildings in the event that coastal flood levels rise above the BFE. Achieving this goal will require adherence to one or more of the following general recommendations:

- **In all areas where flooding is a concern**, inside and outside the SFHA, **elevate the lowest floor so that the bottom of the lowest horizontal structural member is at or above the Design Flood Elevation (DFE)**. Do not place the top of the lowest floor at the DFE, since this guarantees flood damage to wood floor systems, wood floors, floor coverings, and lower walls during the design flood, and may lead to mold/contamination damage (see Figure 6).
- **In flood Zones V and A**, use a DFE that results in **freeboard** (elevate the lowest floor above the BFE) (see Figure 7).
- In flood Zones V and A, **calculate design loads and conditions** (hydrostatic loads, hydrodynamic loads, wave loads, floating debris loads, and erosion and scour) under the assumption that the flood level will exceed the BFE.
- In an A zone subject to moderate waves (1.5 to 2.9 ft high) and/or erosion (i.e., a Coastal A zone), use a pile or column foundation (see Figure 7). See the Hurricane Ike Recovery Advisory at http://www.fema.gov/library/viewRecord.do?id=3539 for details on Coastal A zones.
- Outside the SFHA (in **flood Zones B, C, and X**), **adopt flood-resistant design and construction practices** if historical evidence or a review of the available flood data shows the building could be damaged by a flood more severe than the base flood (see Figure 8).
- **Design and construct buildings using the latest model building code, ASCE 7-05,** *Minimum Design Loads for Buildings and Other Structures* and **ASCE 24-05,** *Standard for Flood Resistant Design and Construction*.
- **Follow the recommendations in FEMA 499,** *Home Builder's Guide to Coastal Construction Technical Fact Sheets* Series (available at: http://www.fema.gov/rebuild/mat/mat_fema499.shtm).
- **Use the pre-engineered foundations shown in FEMA 550,** *Recommended Residential Construction for the Gulf Coast: Building on Strong and Safe Foundations* (available at: http:\\www.fema.gov\library\viewRecord.do?id=1853).
- Use **strong connections between the foundation and the elevated building** to prevent the building from floating or washing off the foundation, in the event that flood levels do rise above the lowest floor.



Figure 6. Other concerns when flood levels rise above the lowest floor are mold and biological/chemical contamination. These may render an otherwise repairable building unrepairable, or will at least make the cleanup, restoration, and repairs much more expensive and time-consuming.

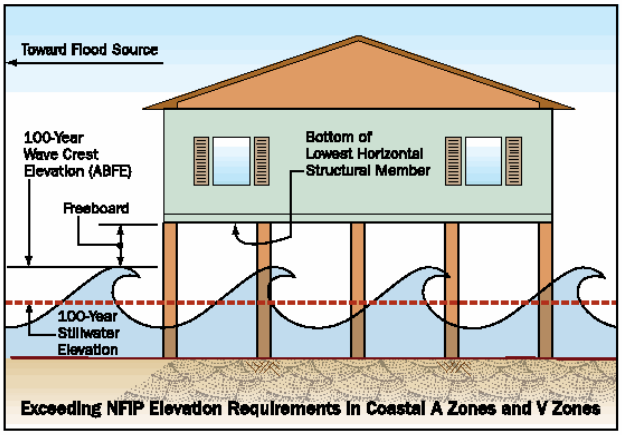


Figure 7. Recommended construction in Coastal A zones and V zones.

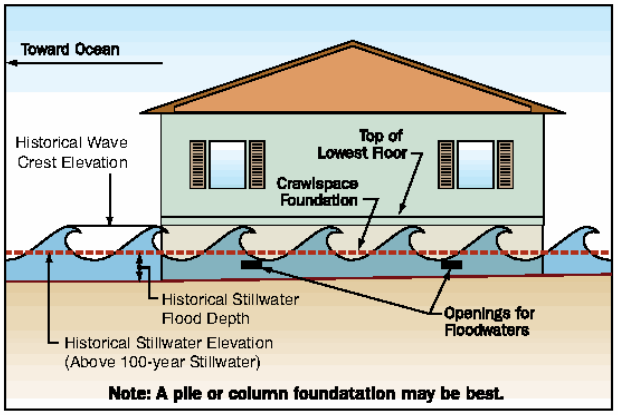


Figure 8. Recommended construction in Zones B, C, and X.

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- Use **flood damage-resistant building materials and methods** above the lowest floor. For example, consider using drainable, dryable interior wall assemblies (see Figure 9). This allows interior walls to be opened up and dried after a flood above the lowest floor, minimizing damage to the structure. For cavity and mass wall assemblies, the methods and materials in Figures 10 and 11 are recommended.

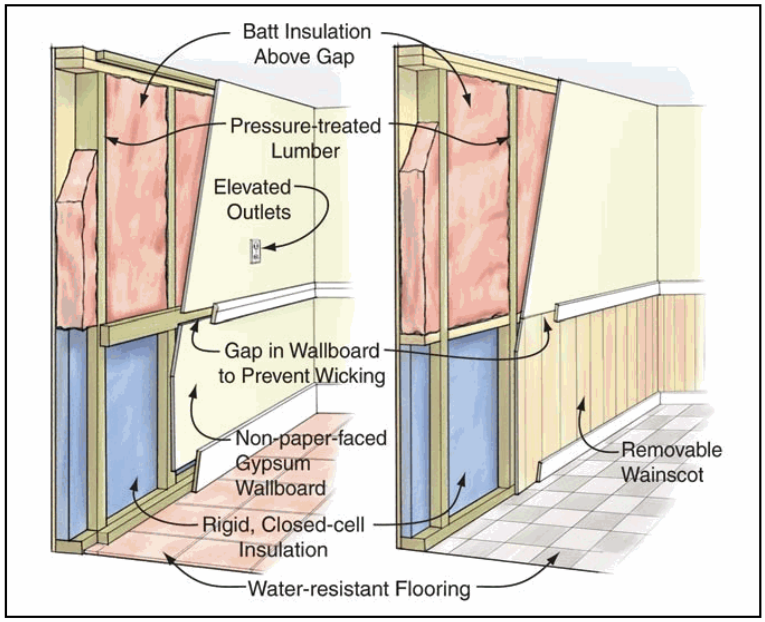


Figure 9. Recommended wet floodproofing techniques for interior wall construction. The following flood damage-resistant materials and methods will prevent wicking and limit flood damage: 1) construct walls with horizontal gaps in wallboard; 2) use non-paper-faced gypsum wallboard below gap, painted with latex paint; 3) use rigid, closed-cell insulation in lower portion of walls; 4) use water-resistant flooring with waterproof adhesive; and 5) use pressure treated wood framing (Source: LSU AgCenter and Coastal Contractor Magazine).

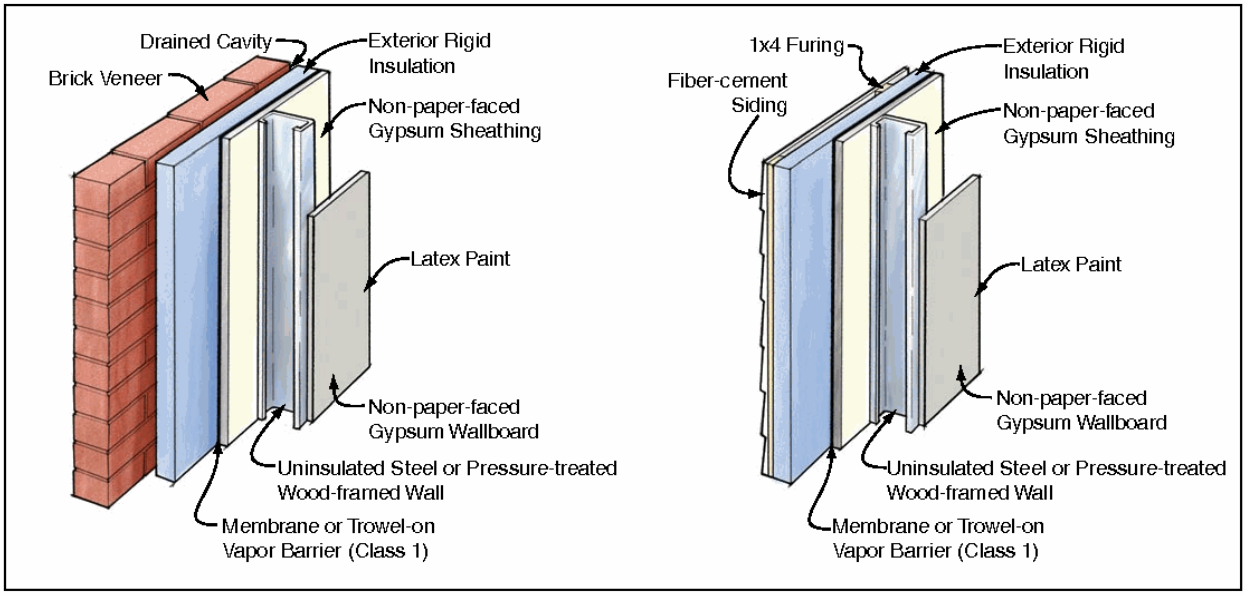


Figure 10. Recommended flood-resistant exterior cavity wall construction. The following materials and methods will limit flood damage to exterior cavity walls: 1) use brick veneer or fiber-cement siding, with non-paper-faced gypsum sheathing (vinyl siding is also flood-resistant but is less resistant to wind damage); 2) provide cavity for drainage; 3) use rigid, closed-cell insulation; 4) use steel or pressure-treated wood studs and framing; and 5) use non-paper-faced gypsum wallboard painted with latex paint (Source: Coastal Contractor Magazine and Building Science Corporation).

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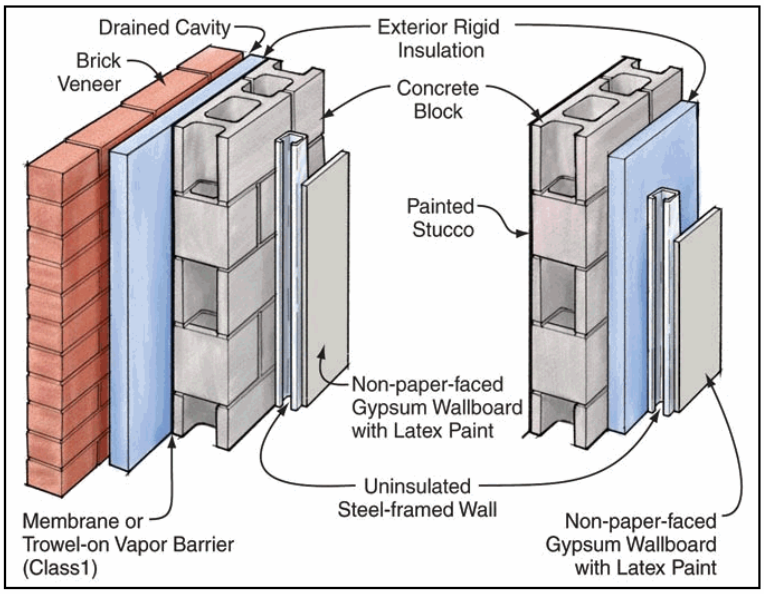


Figure 11. Recommended flood-resistant exterior mass wall construction. The following materials and methods will limit flood damage to exterior mass walls: 1) use concrete masonry with stucco or brick veneer (provide drainage cavity if brick veneer is used); 2) use rigid, closed-cell insulation; 3) use steel framing; and 4) use non-paper-faced gypsum wallboard painted with latex paint (Source: Coastal Contractor Magazine and Building Science Corporation).

- **New and replacement manufactured homes should be installed in accordance with the provisions of the 2009 edition of the National Fire Protection Association (NFPA) 225**, *Model Manufactured Home Installation Standard* (http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=225&cookie_test=1). The standard provides flood, wind, and seismic-resistant installation procedures. It also calls for elevating A-zone manufactured homes with the bottom of the main chassis frame beam at or above the BFE, not with the top of the floor at the BFE.

Other Considerations

As previously stated, in addition to reduced building damage, there are other reasons to design for flood levels above the BFE:

- Reduced building maintenance and longer building life
- Reduced flood insurance premiums
- Reduced displacement and dislocation of building occupants after floods (and need for temporary shelter and assistance)
- Reduced job loss
- Increased retention of tax base

Until flooded, many homeowners and communities don't think about these benefits. However, one of the most persuasive (to homeowners) arguments for elevating homes above the BFE is the reduction in annual flood insurance premiums. In most cases, flood premiums can be cut in half by elevating a home 2 feet above the BFE, saving several hundred dollars per year in A zones, and $2,000 or more per year in V zones. In V zones, savings increase with added freeboard.

A comprehensive study of freeboard (American Institutes for Research, 2006) demonstrated that adding freeboard at the time of house construction is cost-effective. Reduced flood damage yields a benefit/cost ratio greater than 1 over a wide range of scenarios, and flood insurance premium reductions make adding freeboard even more beneficial to the homeowner. **Reduced flood insurance premiums will pay for the cost of incorporating freeboard in a Zone V house in 1 to 3 years; for a Zone A house, the payback period is approximately 6 years.**

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Flood Insurance Premium Reductions Can Be Significant

Example 1: V-zone building, supported on piles or piers, no below-BFE enclosure or obstruction. $250,000 building coverage, $100,000 contents coverage.		**Example 2:** A-zone building, slab or crawlspace foundation (no basement). $200,000 building coverage, $75,000 contents coverage.	
Floor Elevation Above BFE	**Reduction in Annual Flood Premium***	**Floor Elevation Above BFE**	**Reduction in Annual Flood Premium***
1 foot	25%	1 foot	39%
2 feet	50%	2 feet	48%
3 feet	62%	3 feet	48%
4 feet	67%	4 feet	48%

* Compared to flood premium with lowest floor at BFE

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Enclosures and Breakaway Walls

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To discuss requirements and recommendations for enclosures and breakaway walls below the Base Flood Elevation (BFE).

Key Issues

- Spaces below elevated buildings can be used only for building access, parking, and storage.
- Areas enclosed by solid walls below the BFE ("enclosures") are subject to strict regulation under the National Flood Insurance Program (NFIP). Note that some local jurisdictions enforce stricter regulations for enclosures.
- Enclosures in V-zone buildings must be breakaway (non-breakaway enclosures are prohibited). Breakaway enclosures in V zones must be built with flood-resistant materials, meet specific design requirements, and be certified by a registered design professional.
- Enclosures (breakaway and non-breakaway) in A-zone buildings must be built with flood-resistant materials and equipped with flood openings that allow water levels inside and outside to equalize.
- Breakaway enclosure walls should be considered expendable, and the building owner could incur significant costs when the walls are replaced. Breakaway wall replacement is not covered by the flood insurance policy.
- For V zones, breakaway wall enclosures below an elevated building will result in higher flood insurance premiums; however, surrounding below-BFE space with insect screening, open lattice, slats, or shutters (louvers) can result in much lower flood insurance premiums (Figure 1). Use of these materials will allow floodwaters to pass into and out of the enclosed space and minimize damage to the enclosure "walls." Although not required by the NFIP, installation of flood openings in breakaway walls may also reduce damage to the walls.

Space Below the BFE — What Can It Be Used For?

NFIP regulations state that the area below an elevated building can be used only for parking, building access,

WARNING

Designers and owners should realize that: (1) enclosures and items within them are likely to be destroyed even during minor flood events; (2) enclosures, and most items within them, are not covered by flood insurance and can result in significant costs to the building owner; and (3) even the presence of properly constructed breakaway wall enclosures will increase flood insurance premiums for the entire building (the premium rate will increase as the enclosed area increases). Including enclosures in a building design can have significant cost implications.

The Hurricane Ike Mitigation Assessment Team (MAT) observed some breakaway walls in excess of 11' high. While FEMA promotes elevating homes above the BFE (i.e., adding freeboard), one of the unintended consequences appears to be the increasing size of floodborne debris elements due to taller breakaway walls.



Figure 1. Wood louvers installed beneath an elevated house in a V zone are a good alternative to solid breakaway walls.

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and storage. These areas must not be finished or used for recreational or habitable purposes. No mechanical, electrical, or plumbing equipment is to be installed below the BFE.

What is an Enclosure?

An "**enclosure**" is formed when any space below the BFE is enclosed on all sides by walls or partitions. Enclosures can be divided into two types, breakaway and non-breakaway.

- **Breakaway** enclosures are designed to fail under base flood conditions without jeopardizing the elevated building (Figure 2) – **any below-BFE enclosure in a V zone must be breakaway.** Breakaway enclosures are permitted in A zones, but must be equipped with flood openings.
- **Non-breakaway** enclosures can be constructed in an A zone. They may be used to provide structural support to the elevated building. All A-zone enclosures must be equipped with flood openings to allow the automatic entry and exit of floodwaters. **This Recovery Advisory recommends their use only in A-zone areas subject to shallow, slow-moving floodwaters without breaking waves.**

Breakaway Walls

Breakaway walls must be designed to break free under the larger of: 1) the design wind load, 2) the design seismic load, or 3) 10 pounds per square foot (psf), acting perpendicular to the plane of the wall (see Figure 3 for an example of a compliant breakaway wall). If the loading at which the breakaway wall is intended to collapse exceeds 20 psf, **the breakaway wall design must be certified.** When certification is required, a registered engineer or architect must certify that the walls will collapse under a water load associated with the base flood and that the elevated portion of the building and its foundation will not be subject to collapse, displacement, or lateral movement under simultaneous wind and water loads. **Breakaway walls must break away cleanly and must not damage the elevated building when they do so** (Figure 4). **Utilities should not be attached to or pass through breakaway walls.** See FEMA (2008a) Technical Bulletin 9, Design and *Construction Guidance for Breakaway Walls* for more information.



Figure 2. Breakaway walls beneath this building failed as intended under the flood forces of Hurricane Ike.

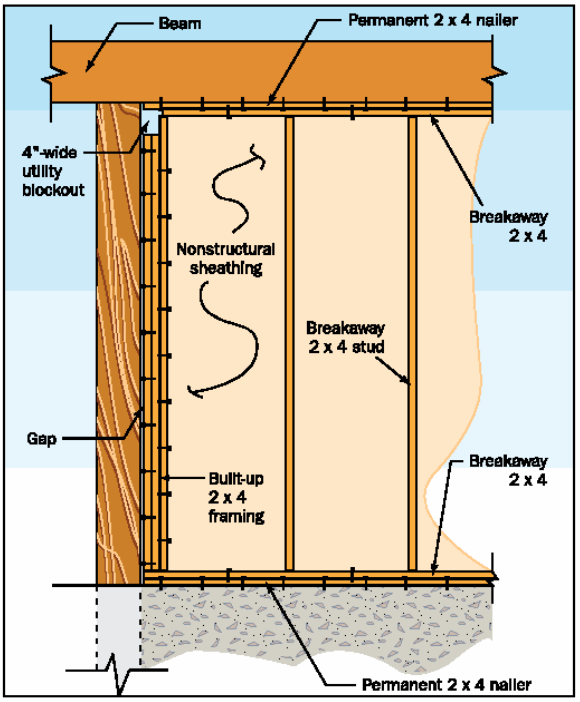


Figure 3. NFIP-compliant breakaway wall construction.



Figure 4. Building siding extended down and over the breakaway wall. Lack of a clean separation allowed damage to spread upward as the breakaway wall failed.

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Obstruction Considerations

A V-zone building, elevated on an open foundation without an enclosure or other obstructions below the BFE, is said to be free of obstructions, and enjoys favorable flood insurance premiums (see FEMA (2008b) Technical Bulletin 5, *Free-of-Obstruction Requirements* for more information).

The following building scenarios are also classified by the NFIP as free of obstructions:

- Below BFE space is surrounded by insect screening and/or by wooden or plastic lattice, slats, or shutters (louvers), if at least 40 percent of the lattice and louver area is open. Lattice can be no thicker than ½"; slats or louvers can be no thicker than 1".
- Below BFE space is surrounded by a combination of one solid breakaway wall (or garage door), and all other sides of the enclosure are insect screening, or wooden or plastic lattice, slats, or louvers.

The following building scenarios are classified by the NFIP as with obstructions:

- Below BFE space is fully enclosed by solid breakaway walls.
- Below BFE space is enclosed by a combination of two or more solid breakaway walls, with the remaining sides of insect screening, or wooden or plastic lattice, slats, or louvers.

Flood Openings

Foundation walls and other enclosure walls of A-zone buildings (including Coastal A-zone buildings) must be equipped with openings that allow the **automatic entry and exit of floodwaters** (Figure 5).



Figure 5. Flood opening in a below-BFE enclosure wall.

A-zone opening requirements are as follows:

- Flood openings must be provided in **at least two of the walls** forming the enclosure.
- **The bottom of each flood opening must be no more than 1' above the higher of the interior or exterior adjacent grade.**
- **Louvers, screens, or covers** may be installed over flood openings as long as they do not interfere with the operation of the openings during a flood.
- Flood openings may be **sized** according to either a prescriptive method (1 square inch of flood opening per square foot of enclosed area) or an engineering method (which must be certified by a registered engineer or architect).

Details concerning flood openings can be found in FEMA (2008c) Technical Bulletin 1, *Openings in Foundation Walls and Walls of Enclosures*.

Other Considerations

Enclosures are strictly regulated because, if not constructed properly, they can transfer flood forces to the main structure (possibly leading to structural collapse). There are other considerations as well:

- Owners may be tempted to convert enclosed areas below the BFE into habitable space, leading to life-safety concerns and uninsured losses. Construction without enclosures should be encouraged. Contractors **should not stub out utilities in enclosures** (utility stub-outs make it easier for owners to finish and occupy the space).
- Siding used on the elevated portions of a building should not extend down over breakaway walls. Instead, a clean separation should be provided so that any siding installed on breakaway walls is structurally independent of siding elsewhere on the building. Without such a separation, the failure of breakaway walls can result in damage to siding elsewhere on the building (see Figure 4).
- Solid breakaway wall enclosures in V zones will result in **significantly higher flood insurance premiums** (especially where the enclosed area is 300 square feet or greater). Insect screening or lattice, slats, or louvers are recommended instead.

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- If enclosures are constructed in **Coastal A zones** (see the Hurricane Ike Recovery Advisory, *Design and Construction in Coastal A Zones*), **open foundations with breakaway enclosures are recommended** in lieu of foundation walls or crawlspaces. If solid breakaway walls are used, they must be equipped with flood openings that allow floodwaters to enter and exit the enclosure. Use of breakaway enclosures in Coastal A zones (or any A zone) will not lead to higher flood insurance premiums.

This Recovery Advisory recommends the use of insect screening, or open wood or plastic lattice, slats, or louvers, instead of solid breakaway walls beneath elevated residential buildings.

- Garage doors installed in below-BFE enclosures of V-zone buildings – even reinforced and high-wind-resistant doors – must meet the performance requirement discussed in the *Breakaway Walls* section of this Recovery Advisory. Specifically, the doors must be designed to break free under the larger of the design wind load, the design seismic load, or 10 psf, acting perpendicular to the plane of the door. If the loading at which the door is intended to collapse is greater than 20 psf, **the door must be designed and certified to collapse under base flood conditions.** See the *Breakaway Walls* section for information about certification requirements.

This Recovery Advisory recommends that flood openings be considered for solid breakaway walls in V zones, even though they are not required by the NFIP. The presence of flood openings may relieve flood forces against the solid breakaway walls and reduce damage to the walls.

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Erosion, Scour, and Foundation Design

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To discuss how any lowering of the ground surface can affect the ability of a building foundation to resist design loads, and to provide additional guidance for coastal foundation design.

Key Issues

- Coastal buildings are often subject to flood loads and conditions that do not affect inland buildings. These include waves, high velocity storm surge flow, floodborne debris, and **erosion** and **scour**. This Recovery Advisory will focus on erosion and scour. See FEMA 499, *Home Builder's Guide to Coastal Construction* (2005), Fact Sheets 11 through 15 at: http://www.fema.gov/library/viewRecord.do?id=1570, and FEMA 55, *Coastal Construction Manual* (2000) at: http://www.fema.gov/library/viewRecord.do?id=1671 for discussion of other foundation issues.

> **Erosion** refers to a general lowering of the ground surface over a wide area.
>
> **Scour** refers to a localized loss of soil, often around a foundation element.

- Foundations must transfer all loads imposed on the building into the ground. If the foundation is not strong enough or deep enough to do this, the building will be destroyed. If the foundation embedment into the ground is not sufficient to account for erosion and scour that may occur over the life of the building, the building is vulnerable to collapse under design flood and wind conditions.
- Predicting the incidence, location, and magnitude of coastal erosion and scour is difficult, and present-day building codes and standards do not prescribe clear-cut solutions for designers. Therefore, designers should be conservative with their foundation designs. This means foundations may need to be stronger, deeper, and higher than what has historically been used. Lessons learned from Hurricane Ike and other recent coastal storm events should be incorporated into foundation designs.

Erosion and Scour Basics

Erosion is defined by the International Building Code® (ICC, 2006) as the "wearing away of the ground surface as a result of the movement of wind, water or ice." Section 7.5 of FEMA's *Coastal Construction Manual* describes erosion as "the wearing or washing away of coastal lands." Since the exact configuration of the soil loss is important for foundation design purposes, a more specific definition is used in this Recovery Advisory (see text box and Figure 1).

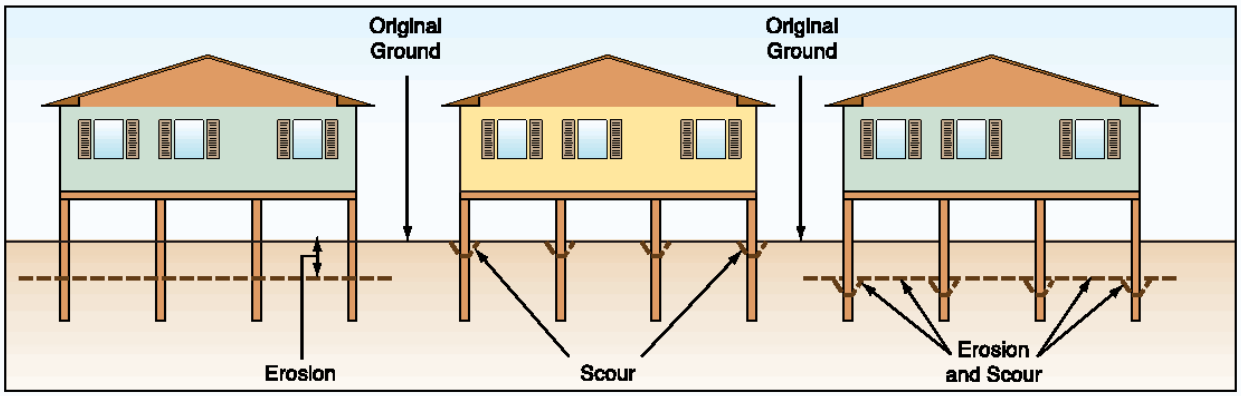


Figure 1. Distinguishing between coastal erosion and scour. A building may be subject to either or both, depending on the building location, soil characteristics, and flood conditions.

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Erosion can occur across a wide range of timeframes – it can be gradual, occurring over a long period of time (many years); more rapid, occurring over a relatively short period of time (weeks or months); or episodic, occurring during a single coastal storm event over a short period of time (hours or days). Figure 2 shows the result of erosion occurring over a long timeframe – buildings that were formerly on upland property, but now stand on the active beach. Figure 3 shows episodic erosion that occurred during Hurricane Ike. In both cases, the recession of the shoreline resulted in a horizontal translation of the beach profile and a lowering of the ground elevation under and near the affected buildings. The closer a building is to the shoreline, the more likely erosion will occur and the greater the erosion depth will be.

Scour occurs when floodwater passes around obstructions in the water column. As the water flows around an object, it must change direction and accelerate. Soil can be loosened and suspended by this process or by waves striking the object, and be carried away. Pilings, pile caps, columns, walls, footings, slabs, and other objects found under a coastal building can lead to localized scour. Scour effects increase with increasing flow velocity and turbulence, and with increasing soil erodibility.

Scour effects are generally **localized**, ranging from small, shallow conical depressions in the sand around individual piles (Figure 4) to larger and deeper depressions around individual piles (Figure 5), to a building-sized shallow depression around a group of piles (Figure 6), to a large and deep depression around a building foundation (Figure 7). Scour depressions like that shown in Figure 7 were observed frequently following Hurricane Ike, and many of these reportedly were 6 to 10' deep and required hundreds of cubic yards of soil to fill. The presence of large, non-frangible concrete slabs and deep grade beams under the buildings may be a contributing factor to the large local scour depressions observed.

In some cases, buildings may settle due to inadequate pile embedment, coupled with some combination of erosion, scour, and soil liquefaction that leads to loss of bearing. This type of failure was observed by the Huricane Ike FEMA Mitigation Assessment Team (MAT) at Surfside Beach, TX (Figure 8) and Holly Beach, LA.



Figure 2. Long-term erosion has caused the shoreline to retreat and has left homes standing on the beach (Surfside Beach, TX). July 2007 Texas General Land Office photo.



Figure 3. Storm-induced erosion beneath an elevated coastal building (Galveston Island, TX, Hurricane Ike).



Figure 4. Local scour around foundation piles (Pensacola Beach, FL, Hurricane Ivan).



Figure 5. Local scour around foundation piles (Holly Beach, LA, Hurricane Ike).

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Figure 6. Local scour around a 3rd row house's pile foundation (Bolivar Peninsula, TX, Hurricane Ike).



Figure 7. Extreme local scour around a Gulf-front pile foundation (Bolivar Peninsula, TX, Hurricane Ike).



Figure 8. Differential settlement of buildings thought to be a result of inadequate foundation embedment coupled with erosion, scour, and/or soil liquefaction (Surfside Beach, TX, Hurricane Ike).



Figure 9. Linear scour and erosion patterns aligning with canals and roads (Bolivar Peninsula, TX, Hurricane Ike).

There is one other erosion and scour scenario to consider in foundation design – the loss of soil around or under a building as a result of storm surge flow being channeled or directed across a building site. This process usually takes place where storm surge flow is constrained between large buildings or gaps in shore protection, or when return flow to the sea follows paths of least resistance, such as along canals and roads (Figure 9).

Erosion and Scour – Impacts on Foundations

Erosion and scour have several adverse impacts on coastal foundations:

- Erosion and scour reduce the embedment of the foundation into the soil, causing shallow foundations to collapse and making buildings on deep foundations more susceptible to settlement, lateral movement, or overturning from lateral loads.
- Erosion and scour increase the unbraced length of pile foundations, increase the bending moment to which they are subjected, and can overstress piles.
- Erosion over a large area between a foundation and a flood source exposes the foundation to increased lateral flood loads (i.e., greater stillwater depths, possible higher wave heights, and higher flow velocities).
- Local scour around individual piles or a building foundation will not generally expose foundations to greater flood loads, but linear scour across a building site may do so.

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Resisting *higher bending moments* brought about by erosion and scour may necessitate a larger pile cross-section or decreased pile spacing (i.e., more piles) or, in some cases, use of a different pile material (e.g., concrete or steel instead of wood). Resisting increased lateral flood loads brought about by erosion (and possibly by linear scour) would necessitate a similar approach. However, designers must remember that increasing the number of piles or increasing the pile diameter will, in turn, also increase lateral flood loads on the foundation.

Resisting *increased unbraced lengths* brought about by erosion and scour will require additional embedment of the foundation into the ground.

To illustrate these points, calculations were made to examine the effects of erosion and scour on foundation design for a simple case – a 32' x 32', two-story house (10' story height), situated away from the shoreline and elevated 8' above grade on 25 square timber piles (spaced 8' apart), on medium dense sand. The house was subjected to a design wind event with a 130-mph (3-second gust) wind speed and a 4' stillwater depth above the uneroded grade, with storm surge and broken waves passing under the elevated building. Lateral wind and flood loads were calculated in accordance with ASCE/SEI 7-05 *Minimum Design Loads for Buildings and Other Structures* (model codes and related prescriptive standards, such as the International Building Code (IBC), the International Residential Code® (IRC®), and ICC-600 *Standard for Residential Construction in High Wind Areas*, are based on ASCE 7 loads). For this illustration, the piles were analyzed under lateral wind and flood loads only; dead, live and wind uplift loads were neglected. If these neglected loads are included in the analysis, deeper pile embedment and possibly larger piles may be needed.

Three different timber pile sizes (8" square, 10" square, and 12" square) were evaluated using pre-storm embedment depths of 10', 15', and 20', and five different erosion and scour conditions (Erosion = 0' or 1'; Scour ranges from 2.0 times the pile diameter to 4.0 times the pile diameter). The results of the analysis are shown in Table 1. A shaded cell indicates the combination of pile size, pre-storm embedment, and erosion/scour does not provide the bending resistance and/or embedment required to resist lateral loads. The reason(s) for a foundation failure is indicated in each shaded cell, using "P" for failure due to bending and overstress within the pile and "E" for an embedment failure from the pile/soil interaction. An unshaded cell with "OK" indicates bending and foundation embedment criteria are both satisfied by the particular pile size/pile embedment/erosion-scour combination.

Table 1. Example foundation adequacy calculations for a two-story house supported on square timber piles and situated away from the shoreline, storm surge and broken waves passing under the building, 130-mph wind zone, soil = medium dense sand. Shaded cells indicate the foundation fails to meet bending (P) and/or embedment (E) requirements.

Pile Embedment Before Erosion and Scour	Erosion and Scour Conditions	Pile Diameter, a		
		8 inch	10 inch	12 inch
10 feet	Erosion = 0, Scour = 0	P, E	E	OK
	Erosion = 1 foot, Scour = 2.0 a	P, E	E	E
	Erosion = 1 foot, Scour = 2.5 a	P, E	E	E
	Erosion = 1 foot, Scour = 3.0 a	P, E	E	E
	Erosion = 1 foot, Scour = 4.0 a	P, E	P, E	E
15 feet	Erosion = 0, Scour = 0	P	OK	OK
	Erosion = 1 foot, Scour = 2.0 a	P	OK	OK
	Erosion = 1 foot, Scour = 2.5 a	P	OK	OK
	Erosion = 1 foot, Scour = 3.0 a	P	OK	OK
	Erosion = 1 foot, Scour = 4.0 a	P, E	P, E	E
20 feet	Erosion = 0, Scour = 0	P	OK	OK
	Erosion = 1 foot, Scour = 2.0 a	P	OK	OK
	Erosion = 1 foot, Scour = 2.5 a	P	OK	OK
	Erosion = 1 foot, Scour = 3.0 a	P	OK	OK
	Erosion = 1 foot, Scour = 4.0 a	P	P	OK

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Review of the table shows several key points:

- Increasing pile embedment will not offset foundation inadequacy (bending failure) resulting from too small a pile cross-section or too weak a pile material.
- Increasing pile cross-section (or material strength) will not compensate for inadequate pile embedment
- Given the building and foundation configuration used in the example, the 8" square pile is not strong enough to resist the lateral loads resulting from the 130-mph design wind speed under any of the erosion and scour conditions evaluated, even if there is no erosion or scour. Homes supported by 8" square timber piles, with embedment depths of 10' or less, will likely fail in large numbers when subjected to design or near-design loads and conditions. Homes supported by deeper 8" piles may still be lost during a design event due to pile (bending) failures



WARNING

The results in Table 1 should not be used in lieu of building- and site-specific engineering analyses and foundation design. The table is for illustrative purposes only and is based upon certain assumptions and simplifications, and for the combinations of building characteristics, soil conditions, and wind and flood conditions described above. Registered design professionals should be consulted for foundations designs.

- The 10" square pile is strong enough to resist bending under all but the most severe erosion and scour conditions analyzed.
- The 12" pile is the only pile size evaluated that satisfies bending requirements under all erosion and scour conditions analyzed. The 12" pile works with 10' of embedment under the no erosion and scour condition. However, introducing as little as 1' of erosion, and scour equal to twice the pile diameter, was enough to render the foundation too shallow.
- 15' of pile embedment is adequate for both 10" and 12" piles subject to 1' of erosion and scour up to three times the pile diameter. However, when the scour is increased to four times the pile diameter (frequently observed following Hurricane Ike), 15' of embedment is inadequate for both piles. In general terms, approximately 11' of embedment is required in this example house to resist the loads and conditions after erosion and scour are imposed.
- The 12" pile with 20' of embedment was the only foundation that worked under all erosion and scour conditions analyzed. This pile design may be justified for the sample house analyzed when expected erosion and scour conditions are unknown or uncertain.

NFIP and Building Code Requirements

One of the requirements of **Section 60.3(a)(3)** of the NFIP regulations that applies to all flood hazard zones (V, VE, V1-30, A, AE, A1-30, AO, AH, etc.) within the Special Flood Hazard Area (SFHA) is:

> "If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy."

A requirement in **Section 60.3(e)(4)** states that all new construction and substantial improvements in V zones must be elevated on pilings and columns so that:

> "(i) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the base flood level; and
>
> (ii) the pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.
>
> Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of paragraphs (e)(4)(i) and (ii) of this section."

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The International Residential Code (2006) has similar requirements:

"**R324.1.1 [Flood Resistant Construction] Structural systems.** All structural systems of all buildings and structures shall be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses from flooding equal to the design flood elevation.

R324.3.3 [Coastal high-hazard areas] Foundations. All buildings and structures erected in coastal high-hazard areas shall be supported on pilings or columns and shall be adequately anchored to such pilings or columns. Pilings shall have adequate soil penetration to resist the combined wave and wind loads (lateral and uplift). Water loading values used shall be those associated with the design flood. Wind loading values used shall be those required by this code. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile systems design and installation shall be certified in accordance with Section R324.3.6. Mat, raft or other foundations that support columns shall not be permitted where soils investigations that are required in accordance with Section R401.4 indicate that soil material under the mat, raft or other foundation is subject to scour or erosion from wave-velocity flow conditions.

Buildings and structures, and all parts thereof, shall be constructed to support safely all loads, including dead loads, live loads, roof loads, flood loads, snow loads, wind loads and seismic loads as prescribed in this code. The construction of buildings and structures shall result in a system that provides a complete load path capable of transferring all loads from their point of origin through the load-resisting elements of the foundation."

Thus, designers are responsible for ensuring that a foundation for a building in any flood hazard area must be adequate to support a building under applicable design loads and load combinations. Designers must consider the effects of erosion and scour when foundations are designed. Designers must certify the foundations.

There may also be other (State or local) foundation design and certification requirements.

Erosion and Scour Design Guidance

Given that the design requirements listed above are performance requirements, designers must translate those into practice. This can be difficult with respect to estimating erosion and scour conditions at a particular site, since definitive guidance for estimating coastal erosion and scour is not present in building codes and standards.

FEMA's *Coastal Construction Manual* (FEMA, 2000) provides some information and guidance, but even this should be considered preliminary and subject to improvement as we learn more from post-storm investigations. The pertinent CCM sections and guidance are summarized below:

CCM Section 7.5: this section summarizes the causes of erosion, its impacts on coastal lands and buildings, and how it is measured. Section 7.5.2.5 discusses local scour. One key point is a procedure outlined in the note on page 7-28 and illustrated in *CCM* Figure 7-66 – three steps that a designer should use to estimate future ground elevations and flood conditions at a site:

Step 1: determine the most landward shoreline location expected during the life of the building

Step 2: define the lowest expected ground elevation during the life of the building

Step 3: define the highest expected BFE during the life of the building

Designers in Texas and Louisiana can obtain erosion data and other related information from various state agencies (see References).

CCM Section 7.8.1.4 discusses FEMA's current procedures for estimating storm-induced erosion.

CCM Section 7.9.2 discusses how designers can update an obsolete flood hazard description for a site by accounting for long-term (Step 1 above) and storm-induced erosion (Step 2 above). *CCM* Figure 7-67 (Figure 10) provides an example, illustrating the use of published long-term erosion information and simple storm erosion calculations to estimate future ground elevations at a building site.

CCM Section 11.6.11 discusses local scour and presents a simple method for calculating erosion around a single pile. The method predicts the depth of a scour depression below the eroded ground elevation

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is equal to 2.0 times the pile diameter, unless non-erodible soil lies beneath the ground surface (Figure 11).

Designers should use the CCM scour depth relationship (Smax = 2.0 a) with caution. Observations after Hurricane Ike showed scour exceeded twice the pile diameter at many locations. This could have been due to deeper scour depths around entire pile foundations (Figures 6 and 7), or to the presence of concrete slabs and deep grade beams that channeled flow between the bottom of the slab and the soil, or to other factors. Given the uncertainty over the exact cause of local scour during Hurricane Ike, foundation designs for reconstruction along the Gulf shoreline should be very conservative, and an assumed scour depth of 6 to 8' would not be unreasonable. Designers should investigate local soils and Hurricane Ike-induced scour at nearby locations before selecting a scour depth. Post-hurricane aerial photographs, such as those obtained after Hurricane Ike by NOAA and USGS (see References) will provide a good source of data for designers.

The *CCM* mentions linear scour channels occurring between large buildings or in-line with roads, canals, and drainage features (see *CCM* Section 8.3.2), but does not provide design guidance for estimating linear scour depths. As was the case with local scour, designers should utilize post-hurricane data when they estimate linear scour likelihood and depth.

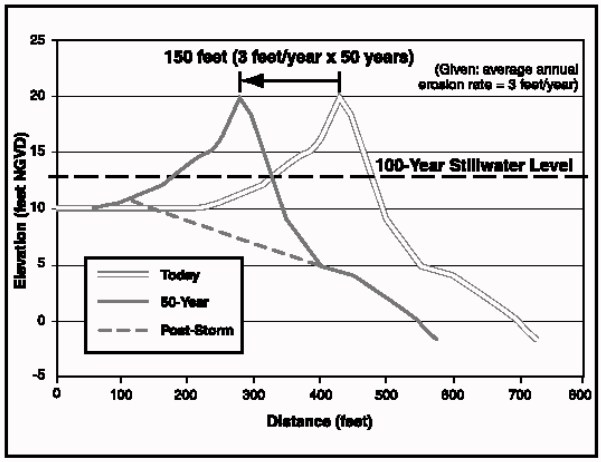


Figure 10. CCM Figure 7-67 illustrating a simple procedure to account for long-term erosion and storm erosion.

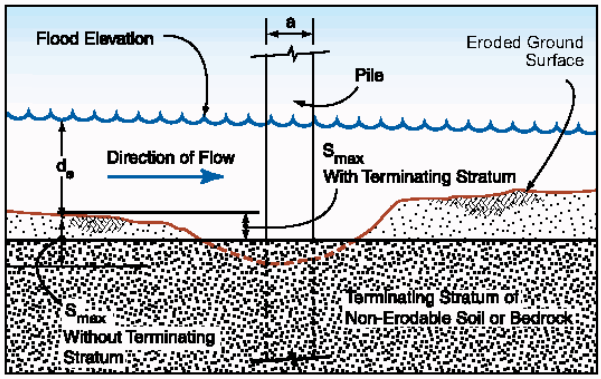


Figure 11. CCM Figure 11-12 illustrating scour estimate around a single pile – Hurricane Ike showed this method may underestimate local scour.

Existing Homes: Are the Pile Foundations Adequate?

The owner of an existing home may wonder whether the pile foundation is adequate to withstand erosion and scour during a design event. The builder or building official may have permit records, building plans, or foundation design information for the house, or may be able to provide information about typical design requirements, construction practices, and probable pile embedment depths for houses of the same age. A licensed engineer can perform an inspection of the foundation, provide information about non-destructive testing methods to determine pile embedment depth, review available foundation data, and analyze the foundation.

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Minimizing Water Intrusion Through Roof Vents in High-Wind Regions

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend practices for minimizing water intrusion through roof vent systems that can lead to interior damage and mold growth in high-wind regions (i.e., greater than 90-miles per hour [mph] gust design wind speed).

Key Issues

- Hurricane winds can drive large amounts of water through attic ventilation openings. The accumulating water soaks insulation, which can lead to mold growth and, in some cases, to the collapse of ceilings.
- Attic ventilation can be provided by a number of devices, most of which have been observed to allow water intrusion under certain conditions and some of which have been observed to blow off. These devices include:
  - Soffit vents
  - Ridge vents
  - Gable end vents
  - Off-ridge vents
  - Gable rake vents
  - Turbines
- Adequate ventilation of attics is generally required to promote the health of wood structural members and sheathing in the attic.
- Attic ventilation can reduce the temperatures of roof coverings, which will typically prolong the life of the roof covering. However, roof color can have more of an impact on roof covering temperature than the amount of ventilation that is or is not provided.
- An unventilated attic can be an effective way to prevent water intrusion and this type of attic is gaining popularity for energy efficiency reasons, provided the air conditioning system is sized appropriately. However, an unventilated attic is best accomplished when it is specifically designed into the house and all of the appropriate details are handled properly. On an existing house, any attempt to change to an unventilated attic configuration needs to be done very carefully with the advice of knowledgeable experts. There are a number of changes that have to be made to produce a successful transition from a ventilated to an unventilated attic. One side effect of going to an unventilated attic may be to void the warranty for the roof covering.
- The following information is intended to help minimize water intrusion through new and existing attic ventilation systems, not to change from a ventilated to an unventilated system. With the exception of the plugging of gable rake vents, all other shuttering of openings or plugging of vents should be done on a temporary basis and removed once the storm threat is over so that the attic is once again properly ventilated.

The Unventilated Attic

The most conservative approach to preventing wind-driven rain from entering the attic is to eliminate attic ventilation, but unventilated attics are controversial. Although allowed by the International Residential Code® (IRC®), provided the Code's criteria are met, unventilated attics may not comply with local building codes.

However, when unventilated attics are allowed by the building code or code compliance is not an issue, and when climatic and interior humidity conditions (e.g., no indoor swimming pools) are conducive to an unventilated design, an unventilated attic is a reliable way to prevent wind-driven rain from entering the attic.

Air barrier: Refer to the *Siding Installation in High-Wind Regions*, Hurricane Ike Recovery Advisory for recommendations regarding attic air barriers.

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Mitigation Guidance

Soffit Vents

Key Issues

- First and foremost, it is important to keep the soffit material in place. While some water can be blown into the attic through almost any type of soffit vent, the amount of water intrusion increases dramatically when the soffit material is missing (Figure 1).
- Plywood or wood soffits are generally adequately anchored to wood framing attached to the roof structure and/or the walls. However, it has been common practice for vinyl and aluminum soffit panels to be installed in tracks that are frequently very poorly connected to the walls and fascia at the edge of the roof overhang. When these poorly anchored soffits are blown off, water intrusion increases significantly. Properly installed vinyl and aluminum soffit panels are fastened to the building structure or to nailing strips placed at intervals specified by the manufacturer.



Figure 1. Missing soffit material.

Proper Installation

The details of proper installation of vinyl and aluminum soffits depend on the type of eave to which they are attached. The key elements are illustrated in Figure 2.

A. Roof truss or rafter framing should extend across the bottom of the eaves, or be added to create a structural support for the soffit. As an alternative, soffits can be attached directly to the undersides of the angled rafters.

B. Nailing strips should be provided, if necessary, to allow attachment of the soffit at the ends. Intermediate nailing strips may be needed, depending on the maximum span permitted for the soffit. If this is not known, the span between attachment points should not exceed 12" in high-wind regions.

C. A J-channel (illustrated), F-channel, or other receiver as specified by the manufacturer should cover the ends of the soffit panels. Fasteners should be those specified by the manufacturer. Fasteners should be used through the nailing strip of each panel and at any other points (such as in the "valleys" of the soffit) if specified.

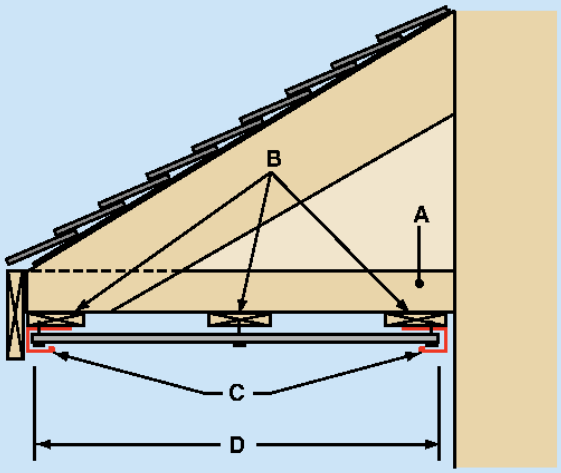


Figure 2. Key soffit installation points.

D. The overall span (eave depth) of the soffit should not exceed any limits specified by the manufacturer, and any required intermediate attachment points should be used.

Checking Soffit Material Installation

As noted above, the most critical soffit installations to check are those where vinyl or aluminum soffit panels are used. Soffits should be fastened to the eave structure; they should not be loose in the channels. Pushing up on the soffit material and the channels used to support the material can be revealing. If it moves

Soffits can receive positive and negative (suction) loads; therefore, soffits need to be designed and installed to resist loads that push up and pull down on the soffit.

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readily or is easy to deform, it probably is not attached very well. Similarly, if the width of the overhang is greater than 12", there should be an intermediate support running along the middle of the soffit and the panels should be attached to this support in addition to the supports at the ends of the panels. If you are concerned about the installation but can't be sure, there are a couple of tools with a viewing screen connected to a small camera lens and light mounted at the end of a flexible tube that can be used to observe the connections. These devices allow inspection through a small hole that is drilled in an inconspicuous location that can be later filled with sealant. In order to ensure that you have a strong connection at the wall, there should be wood blocking running along the wall above the track where the soffit channel is attached and the channel should be fastened to that blocking. If you do not find wood blocking and either see no vertical nailing surface on the channel or see occasional tabs that have been cut and bent up to allow fastening to the wall, strengthening of the anchorage of the soffit material is clearly indicated.

Remedial Measures

If the inspection indicates a poorly attached soffit, the best way to ensure that the soffit material is adequately anchored in place is to remove it and install adequate wood blocking to allow solid anchorage of the soffit material. In some cases, it may be possible to remove the soffit material and reinstall it. However, it is also likely that some or all of the material will need to be replaced, so make sure that it can be matched before it is removed. Short of removing and properly reinstalling the soffit material, testing has shown that the anchorage can be greatly improved by applying a bead of sealant (Figure 3) along the bottom edge of the wall channel to adhere it to the wall surface below followed by applying large dabs of sealant in indentations between the soffit panels and the wall channel at one end (Figure 4) and the fascia flashing at the other end. Surfaces receiving sealant should be cleaned in order to facilitate bonding. Extra resistance can be gained by installing screws that mechanically tie the soffit panels to both the fascia flashing and to the wall channel (Figure 5). Note that use of sealant is a remedial measure only and is not a substitute for proper installation and fastening of soffits in a new installation.

Wind-driven rain penetration: Currently there is no adequate standard test method to evaluate the potential for wind-driven rain to enter attics through soffit vent openings, such as those shown in Figure 6. To avoid water entry at soffit vents, options include eliminating soffit vents and providing an alternate method for air to enter the attic, or design for an unventilated attic. Another approach is to place filter fabric (like that used for heating, ventilation, or cooling



Figure 3. Applying a bead of sealant. (Note: Black sealant was used so that it would be visible in the photograph. Normally a matching sealant color would be used.)



Figure 4. Applying dabs of sealant.



Figure 5. Screws through wall channel.

Rain screen wall venting: In lieu of providing soffit vents, another method to provide attic air intake is through a pressure-equalized rain screen wall system as discussed in *Siding Installation in High-Wind Regions*, Hurricane Ike Recovery Advisory. This alternative approach eliminates soffit vents and their susceptibility to wind-driven rain entry.

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[HVAC] system filters) above the vent openings; however, such an approach needs to be custom designed.

Fascia cover: Field investigations after Hurricane Ike showed many cases where the aluminum fascia cover (fascia cap) from the fascia board was blown off (Figure 7). The fascia cover normally covers the ends of vinyl and aluminum soffits. When the fascia cover is blown off, the ends of the soffit panels are exposed to wind and wind-driven rain.

The IRC currently has no guidelines for the installation of fascia covers. Aluminum fascia covers are typically tucked under the roof drip edge and face-nailed every few feet. More frequent nailing would help secure the fascia cover, but would also inhibit normal thermal movement, which can cause unattractive warping and dimpling of the cover. Vinyl fascia covers are available, which are attached to a continuous strip of utility trim placed underneath the drip edge. This provides a somewhat more secure, continuous attachment and allows for thermal movement. Aluminum fascia covers can also be field-notched and installed with utility trim.



Figure 6. Fiber cement soffit with ventilation slots (red arrow).



Figure 7. Loss of fascia cover exposes ends of vinyl soffit to direct entry of wind-driven rain.



Figure 8. This metal ridge vent was attached with widely spaced roofing nails.

Ridge Vents

Key Issues

- Ridge vents are frequently fastened down using ordinary roofing nails since these are normally handy. It is pretty common to find ridge vents dislodged or blown off during a hurricane (Figure 8). Even a partially dislodged ridge vent can begin to act like a scoop that collects wind-driven rain and directs it into the attic.
- Most roofing manufacturers now make ridge vents that have passed wind-driven water tests. They are identified as having passed Florida Building Code's Product Approvals or Testing Application Standard (TAS) 100(A). Typically, they include a baffle in front of the vent tubes that provide the passageway for hot attic gasses to escape. This baffle is intended to trip any flow of wind and water blowing up the surface of the roof and deflect it over the top of the roof ridge.

Slotting the Deck

When ridge venting is being added to a roof that previously did not have it, it is necessary to cut a slot through the decking. When doing so, it is important to set the depth of the saw blade so that it only slightly projects below the bottom of the decking. At the residence shown in Figure 8, the saw blade cut approximately 1½" into the trusses and cut a portion of the truss plate (red arrow).

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Checking Ridge Vents and Their Installation

When they are used, ridge vents are the last part of the roof to be installed. Consequently, the connection is readily accessible and frequently visible without having to pry up the edge of the vent cover top. Check the type and condition of the fasteners. If the fasteners are nails, replacement of the fasteners is in order. If the vent has clear holes or slots without any baffle or trip next to the edge of the vent channels, the vent is probably not one that is resistant to water intrusion and you should consider replacing the ridge vent with one that has passed the wind-driven water intrusion tests.

Remedial Measures

Replace nails with gasketed stainless steel wood screws that are slightly larger than the existing nails and, if possible, try to add fasteners at locations where they will be embedded in the roof structure below and not just into the roof sheathing. Close spacing of fasteners is recommended (e.g., in the range of 3 to 6" on center, commensurate with the design wind loads). If the ridge vents are damaged or are one of the older types that are not resistant to water intrusion, they should be replaced with vents that have passed the wind-driven water intrusion tests.



Figure 9. Gable end vent.

Gable End Vents

Key Issues

- Virtually all gable end vents (Figure 9) will leak when the wall they are mounted on faces into the wind-driven rain. The pressures developed between the outside surface of the wall and the inside of the attic are sufficient to drive water uphill for a number of inches and, if there is much wind flow through the vent, water carried by the wind will be blown considerable distances into the attic.

Remedial Measures

If it is practical and possible to shutter gable end vents from the outside of the house, this is the preferable way to minimize water intrusion through gable end vents (Figure 10). Install permanent anchors in the wood structure around the gable vent and precut, pre-drill, and label plywood or other suitable shutter materials so that they are ready for installation by a qualified person just before a storm approaches. If installation of shutters from the outside is difficult because of the height or other considerations, but there is access through the attic, the gable vent opening can be shuttered from the inside. However, careful attention needs to be paid to sealing around the shutter and making sure that any water that accumulates in the cavity can drain to the outside of the house and not into the wall below.



Figure 10. Shuttered gable end vent.

Off-ridge Vents

Key Issues

- Poorly anchored off-ridge vents can flip up and become scoops that direct large amounts of wind-driven rain into the attic (Figure 11).



Figure 11. Two off-ridge vents are shown in this photograph. The vent that is covered with roofing felt flipped up and allowed a substantial amount of water to enter the residence. Carpeting, kitchen cabinets, and a large amount of gypsum board had to be replaced because of the water intrusion.

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- Some vents are also prone to leaking when winds blow from certain directions. This will depend on the location of the vent on the roof surface and the geometry of the roof, as well as the geometry of the particular vent.

Checking Off-ridge Vent Installations

Off-ridge vents typically have a flange that lies against the top surface of the roof sheathing and is used to anchor the vent to the roof sheathing. Frequently, roofing nails are used to attach the flange to the roof sheathing. The off-ridge vents should be checked to make sure that they are well anchored to the roof sheathing. If they seem loose, or there are not many fasteners holding them down, it could be a weak link in preventing water intrusion when a storm occurs. Since the flange and fasteners are hidden below the roof covering, it is not possible to simply add nails or screws to improve the anchorage as these will create holes through the roof covering.

Remedial Measures

If the off-ridge vent is attached to the roof sheathing with long, thin nails, it may be possible to improve the anchorage by cinching the nails (bending them over against the underside of the roof sheathing). However, if they are short and/or thick, trying to bend them over may cause more harm than good. Some homeowners have had covers made that can be installed from the inside of the attic over the hole where the off-ridge vent is installed. This will be easiest if the vent is larger than the hole and the cover can be attached to the sheathing in an area where the fasteners can't be driven through the roof covering. Otherwise, it will be important to ensure that the fasteners are short enough that they won't extend through the roof sheathing and damage the roof cover. If the edge of the hole in the roof deck is flush with the inside edge of the vent, it may be possible to install metal straps that are screwed into the walls of the vent and attached with short screws to the bottom surface of the roof sheathing. Again, it is critical to use screws that are short enough that they won't extend through the roof sheathing and damage the roof covering. The strapping should be connected to the walls of the vent with short stainless steel sheet metal screws.

Gable Rake Vents

Key Issues

- Gable rake vents are formed when porous soffit panels or screen vents are installed on the bottom surface of the roof overhang at the gable end and there is a clear path for wind to blow into the attic. This usually happens when the gable overhang is supported by what are called outriggers. Outriggers are typically used when gable overhangs exceed 12". In these cases, the last roof truss or rafter (the gable end truss or rafter) is smaller than the trusses or rafters at the next location inside the attic. Outriggers (2x4s) are installed over top of the last gable truss or rafter, one end is anchored to the second truss or rafter back from the gable end, and the other end sticks out past the gable end wall to support the roof sheathing on the overhang.

Finding Out if You Have Gable Rake Vents and Whether You Still Need Them

The easiest way to tell if your roof has gable rake vents is to look in the attic on a cool sunny day and see if light is visible in gaps just below the sheathing at the gable end. The presence of the outriggers (2x4s running perpendicular to the gable truss and disappearing into the gable overhang) should also be visible. If you also have a gable end vent or a ridge vent, then you probably don't need the gable rake vent in order to provide adequate venting for your attic.



Figure 12. Metal plugs (red arrows) in gable rake vents.

Remedial Measures

The best solution if you don't actually need the venting provided by the gable rake vents is to simply plug them up with metal flashing (Figure 12) or pieces of wood that are cut and anchored so that they are well attached and completely seal as many of the openings as possible and particularly those near the gable peak. Sealant can be used to seal around the edges of the metal or wood plugs.

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Turbines

Key Issues

- The rotating top portion of many turbines is not designed to withstand high-wind conditions and they are frequently installed with just a friction fit to the short standpipe that provides the venting of the attic. It is possible to find high-wind rated turbines on store shelves in hurricane-prone regions but, in hurricane winds, the turbines will be rotating at tremendous speeds and can be easily damaged by windborne debris.
- The flange on the standpipe that provides the connection of the pipe to the roof sheathing may also be poorly anchored to the roof sheathing.

Checking Turbines and Their Installation

Check any turbines to make sure that the stand pipes are not loose and that the turbine head is anchored to the stand pipe by sheet metal screws and not simply by a friction fit (Figure 13).

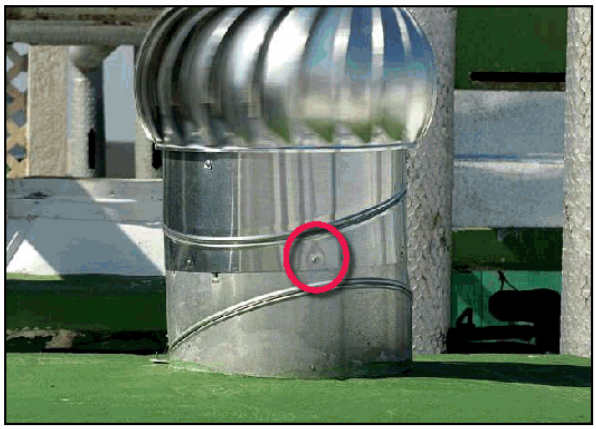


Figure 13. This turbine head is attached to the standpipe with dimple punches. Sheet metal screws should be added to strengthen the connection.

Remedial Measures

Loose standpipes should be securely anchored to the roof sheathing. If the standpipe is attached to the roof sheathing with long, thin nails, it may be possible to improve the anchorage by cinching the nails (bending them over against the underside of the roof sheathing). However, if they are short and/or thick, trying to bend them over may cause more harm than good. Some homeowners have had covers made that can be installed from the inside of the attic over the hole where the standpipe is installed. This will be easiest if the standpipe is larger than the hole and the cover can be attached to the sheathing in an area where the fasteners can't be driven through the roof cover. Otherwise, it will be important to ensure that the fasteners are short enough that they won't extend through the roof sheathing and damage the roof cover. If the edge of the hole in the roof deck is flush with the inside edge of the standpipe, it may be possible to install metal straps that are screwed into the walls of the standpipe and attached with short screws to the bottom surface of the roof sheathing. Again, it is critical to use screws that are short enough that they won't extend through the roof sheathing and damage the roof cover. The strapping should be connected to the walls of the standpipe with short stainless steel sheet metal screws. Beyond any remedial measures taken to anchor the standpipe to the roof sheathing or to plug the hole from the attic side, it is also important to try and seal the standpipe from the outside so that water doesn't build up in the pipe and leak into the roof sheathing around the hole. The best approach is to have a qualified person remove the top active portion of the turbine vent before the storm and plug the hole at the top of the standpipe. A wooden plug can be used that covers the entire hole and has blocks that rest against the walls of the standpipe where screws can be installed to anchor the plug to the standpipe. Some homeowners have had the entire turbine wrapped in plastic to keep water out during a storm (Figure 14). This can work as long as the turbine or wrapping doesn't get dislodged. The smaller area provided by removing the turbine top and plugging the hole is considered preferable.



Figure 14. Plastic wrapped turbine.

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Metal Roof Systems in High-Wind Regions

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To recommend practices for designing and installing metal roof systems that will enhance wind resistance in high-wind regions (i.e., greater than 90-miles per hour [mph] gust design wind speed). This Advisory is applicable to residential and commercial/industrial buildings and critical facilities.

Metal Roofing Options

A variety of metal panel systems (including composite foam panels) are available for low-slope (i.e., 3:12 or less) and steep-slope (i.e., greater than 3:12) roofs. Metal shingles are also available for steep-slope roofs. Common metal roofing options are:

Standing-Seam Hydrostatic (i.e., water-barrier) Systems: These panel systems are designed to resist water infiltration under hydrostatic pressure. They have standing seams, which raise the joint between panels above the water line. The seam is sealed with sealant tape or sealant in case it becomes inundated with water backed up by an ice dam or driven by high wind.

Most hydrostatic systems are structural systems (i.e., the roof panel has sufficient strength to span between purlins or nailers). A hydrostatic architectural panel (which cannot span between supports) may be specified, however, if continuous or closely spaced decking is provided.

An advantage of exposed fastener panels (versus panels with concealed clips) is that, after installation, it is easy to verify that the correct number of fasteners was installed. If fastening was not sufficient, adding exposed fasteners is easy and economical.

For attachment of corrugated metal panels, see FEMA 55, *Coastal Construction Manual*, Appendix K, available online at: http://www.fema.gov/library/viewRecord.do?id=1671.

Hydrokinetic (i.e., water-shedding) panels: These panel systems are not designed to resist water infiltration under hydrostatic pressure and therefore require a relatively steep slope (typically greater than 3:12) and the use of an underlayment to provide secondary protection against water that infiltrates past the panels. Most hydrokinetic panels are architectural systems, thus requiring continuous or closely spaced decking to provide support for gravity loads.

This Recovery Advisory addresses wind and wind-driven rain issues. For general information on other aspects of metal roof system design and construction (including seam types, metal types, and finishes), see:

Architectural Sheet Metal Manual (Sheet Metal and Air Conditioning Contractors National Association, 2003: http://www.smacna.org/bookstore

Copper and Common Sense: http://www.reverecopper.com/candcs.html

Copper Development Association: http://www.copper.org/publications/pub_list/architecture.html

Metal Construction Association: http://www.metalconstruction.org/pubs

Metal Roofing Systems Design Manual (Metal Building Manufacturers Association, 2000, http://www.mbma.com/display.cfm?p=44&pp6&i=47

National Institute of Building Sciences, Whole Building Design Guide: http://www.wbdg.org/design/env_roofing.php

The NRCA Roofing Manual: Metal Panel and SPF Roof Systems (National Roofing Contractors Association, 2008, http://www.nrca.net/rp/technical/manual/default.aspx

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Some hydrokinetic panels have standing ribs and concealed clips (Figure 1), while others (such as 5V-crimp panels, R-panels [box-rib] and corrugated panels) are through-fastened (i.e., attached with exposed fasteners). Panels are available that simulate the appearance of tile.

Metal Shingles: Metal shingles are hydrokinetic products and therefore also require a relatively steep-slope and the use of an underlayment. Metal shingles are available that simulate the appearance of wood shakes and tiles.

Key Issues

Damage investigations have revealed that some metal roofing systems have sufficient strength to resist extremely high winds (Figure 2), while other systems have blown off during winds that were well below design wind speeds given in ASCE 7. When metal roofing (or hip, ridge, or rake flashings) blow off during hurricanes, water may enter the building at displaced roofing; blown-off roofing can damage buildings and injure people. Guidance for achieving successful wind performance is presented below:

1. Always follow manufacturer's installation instructions and local building code requirements.

2. Calculate loads on the roof assembly in accordance with ASCE 7 or the local building code, whichever procedure results in the highest loads.

3. Specify/purchase a metal roof system that has sufficient uplift resist resistance to meet the design uplift loads.

- For standing seam and through-fastened metal panel systems, the International Building Code® (IBC®) requires test methods UL 580 or ASTM E 1592. For standing seam systems, it is recommended that design professionals specify E 1592 testing, because it gives a better representation of the system's uplift performance capability.

  For safety factor determination, refer to Chapter F in standard NAS-01, published by the American Iron and Steel Institute (available online at: http://www.professionalroofing.net/article.aspx?id=266).

- For through-fastened steel panel systems, the IBC allows uplift resistance to be evaluated by testing or by calculations in accordance with standard NAS-01.

- For architectural panels with concealed clips, test method UL 580 is commonly used. However, it is recommended that design professionals specify E 1592 because it gives a better representation of the system's uplift performance capability. When testing architectural panel systems via E 1592, the deck joints need to be unsealed in order to allow air flow to the underside of the metal panels. Therefore, underlayment should be eliminated from the test specimen, and a



Figure 1. This architectural panel system has concealed clips. The panels unlatched from the clips. The first row of clips (just above the red line) was several inches from the end of the panels. The first row of clips should have been closer to the eave.



Figure 2. This structural standing seam roof system survived Hurricane Andrew (Florida, 1992), but some hip flashings were blown off. The estimated wind speed was 170 mph (peak gust, Exposure C at 33 feet).

For observations of metal roofing performance during Hurricanes Charley (2004, Florida), Ivan (2004, Alabama and Florida), and Katrina (Alabama, Louisiana, and Mississippi, 2005), respectively; see Chapter 5 in FEMA MAT reports 488, 489, and 549, available on-line at:

FEMA 488: http://www.fema.gov/library/viewRecord.do?id=1444

FEMA 489: http://www.fema.gov/library/viewRecord.do?id=1569

FEMA 549: http://www.fema.gov/library/viewRecord.do?id=1857

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1/8" minimum gap between deck panel side and end joints should be specified.

For safety factor determination, refer to Chapter F in standard NAS-01.

- For copper roofing testing, see "NRCA analyzes and tests metal," Professional Roofing, May 2003 (available online at: http://www.professionalroofing.net/article.aspx?id=266).
- For metal shingles, it is recommended that uplift resistance be based on test method UL 580 or 1897.
- Specify the design uplift loads for field, perimeter, and corners of the roof. Also specify the dimension of the width of the perimeter. (Note: For small roof areas, the corner load can be used throughout the entire roof area.)

4. Suitably design the roof system components (see the construction guidance below).

5. Obtain the services of a professional roofing contractor to install the roof system.

Construction Guidance

- Consult the local building code and manufacturer's literature for specific installation requirements. Requirements may vary locally.
- Underlayment: If a robust underlayment system is installed, it can serve as a secondary water barrier if the metal roof panels or shingles are blown off (Figures 1 and 3). For enhanced underlayment recommendations, see Technical Fact Sheet No. 19 in FEMA 499, *Home Builder's Guide to Coastal Construction Technical Fact Sheet Series* (available online at: http://www.fema.gov/library/viewRecord.do?id=1570). Fact Sheet 19 pertains to underlayment options for asphalt shingle roofs. For metal panels and tiles, where Fact Sheet 19 recommends a Type I (#15) felt, use a Type II (#30) felt because the heavier felt provides greater resistance to puncture by the panels during application. Also, if a self-adhering modified bitumen underlayment is used, specify/purchase a product that is intended for use underneath metal (such products are more resistant to bitumen flow under high temperature).
- Where the basic (design) wind speed is 110 mph or greater, it is recommended that two clips be used along the eaves, ridges, and hips. Place the first eave clip within 2 to 3" of the eave, and place the second clip approximately 3 to 4" from the first clip. Figures 1 and 4 illustrate ramifications of clips being too far from the eave.
- For copper panel roofs in areas with a basic wind speed greater than 90 mph, it is recommended that Type 316 stainless steel clips and stainless steel screws be used in lieu of the much more malleable copper clips.



Figure 3. These architectural panel system have snap-lock seams. One side of the seam is attached with a concealed fastener. Although a large number of panels blew away, the underlayment did not.



Figure 4. These eave clips were too far from the panel ends. The clip at the left was 13" from the edge of the deck. The other clip was 17" from the edge. It would have been prudent to install double clips along the eave.



Figure 5. The panels blew off the upper roof and landed on the lower roof of this house. The upper asphalt shingle roof shown had been re-covered with 5V-Crimp panels that were screwed to nailers. The failure was caused by inadequate attachment of the nailers (which had widely-spaced nails) to the sheathing. Note that the hip flashing on the lower roof blew off.

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Figure 6. Blow-off of nailers caused these panels to progressively fail. The nailers were installed directly over the trusses. In an assembly such as this where there is no decking, there is no opportunity to incorporate an underlayment. With loss of the panels, rainwater was free to enter the building.



Figure 7. This residence had metal shingles that simulated the appearance of tile. The shingles typically blew off the battens, but some of the battens were also blown away.

- When clip or panel fasteners are attached to nailers (Figures 5, 6, and 7), detail the connection of the nailer to the nailer support (including the detail of where nailers are spliced over a support).
- When clip or panel fasteners are loaded in withdrawal (tension), screws are recommended in lieu of nails.
- For roofs located within 3,000' of the ocean line, stainless steel clips and fasteners are recommended.
- For concealed clips over a solid substrate, it is recommended that chalk lines be specified so that the clips are correctly spaced.
- Hip, ridge, and rake flashings: Because exposed fasteners are more reliable than cleat attachment, it is recommended that hip, ridge, and rake flashings be attached with exposed fasteners. Two rows of fasteners are recommended on either side of the hip/ridge line. Close spacing of fasteners is recommended (e.g., spacing in the range of 3 to 6" on center, commensurate with the design wind loads), as shown in Figure 8 in order to avoid flashing blow-off as shown in Figure 9.

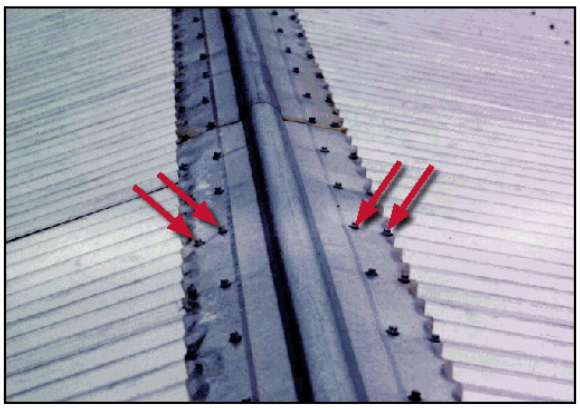


Figure 8. The ridge flashing on these corrugated metal panels had two rows of fasteners on each side of the ridge line.



Figure 9. The ridge flashing fasteners were placed too far apart. A significant amount of water leakage can occur when ridge flashings are blown away.

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Critical Facilities

For metal roofs on critical facilities in hurricane-prone regions (as defined in ASCE 7), see the recommendations in FEMA 543, Section 3.4.3.4 (available online at http://www.fema.gov/library/viewRecord.do?id=2441). (For facilities located outside of hurricane-prone regions, see Section 3.3.3.4.) For load calculation recommendations, see Section 3.3.1.2.

For metal roofs on hospitals in hurricane-prone regions, see the recommendations in FEMA 577, Section 4.3.3.8 (available online at http://www.fema.gov/library/viewRecord.do?id=2739). (For hospitals located outside of hurricane-prone regions, see Section 4.3.3.7.) For load calculation recommendations, see Section 4.3.1.2.

Sustainable Design

Cool Roofs: Use metal roofs with a solar reflectance Index (SRI) equal to or greater than 78 for low-slope and 29 for steep-sloped roofs. The higher solar reflectance will reduce the heat-island effect (thermal gradient differences between developed and undeveloped areas), minimizing the impact buildings have on microclimate and human and wildlife habitat. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, greenhouse gas emissions and air pollution, heat-related illness and mortality, and water quality (http://www.EPA.gov/heatisland).

Recycled Content: Use metal roof systems with recycled content. Many roofing products have recycled scrap content generated both from consumer and industrial users. Recycled content is defined in the International Organization of Standards (ISO) document, ISO 14021 (http://www.iso.org/iso/catalogue_detail?csnumber=23146). Using recycled products reduces impacts from extraction and processing of new materials.

For further information pertaining to sustainable design aspects of metal roofing, see: http://www.metalconstruction.org/design.

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Siding Installation in High-Wind Regions

FEMA
http://www.fema.gov

HURRICANE IKE RECOVERY ADVISORY

Purpose: To provide basic design and installation tips for various types of siding that will enhance wind resistance in high-wind regions (i.e., greater than 90-mph gust design wind speed).

Key Issues

- Siding is frequently blown off walls of residential and non-residential buildings during hurricanes. Also, wind-driven rain is frequently blown into wall cavities (even when the siding itself is not blown off). Guidance for achieving successful wind performance is presented below.
- To avoid wind-driven rain penetration into wall cavities, an effective moisture barrier (housewrap or building paper) is needed. For further information on moisture barriers, see Technical Fact Sheet No. 9 in FEMA 499, *Home Builder's Guide to Coastal Construction*, Technical Fact Sheet Series (available online at: http://www.fema.gov/library/viewRecord.do?id=1570). For further information on housewrap, see Technical Fact Sheet No. 23.
- Always follow manufacturer's installation instructions and local building code requirements.
- Use products that are suitable for a coastal environment. Many manufacturers do not rate their products in a way that makes it easy to determine whether the product will be adequate for the coastal environment. Use only siding products where the supplier can provide specific information on product performance in coastal or high-wind environments.
- For buildings located within 3,000' of the ocean line, stainless steel fasteners are recommended.
- Avoid using dissimilar metals together.
- The installation details for starting the first (lowest) course of lap siding can be critical. Loss of siding often begins at the lowest course and proceeds up the wall (Figures 4 and 12). This is particularly important for elevated buildings, where the wind blows under the building as well as against the sides.
- When applying new siding over existing siding, use shims or install a solid backing to create a uniform, flat surface on which to apply the siding, and avoid creating gaps or projections that could catch the wind.
- Coastal buildings require more maintenance than inland buildings. This maintenance requirement needs to be considered in both the selection and installation of siding.

Moisture barrier (also known as a water-resistive barrier): In the context of residential walls, the moisture barrier is either housewrap or building paper (felt). The moisture barrier occurs between the wall sheathing and the siding. It is a dual-purpose layer that sheds water that gets through the siding and limits air flow through the wall. When properly sealed, housewrap is considered an air barrier. Although building paper provides some resistance to air flow, it is not considered an air barrier. Moisture barriers shed water, but they allow water vapor to pass through them.

For further guidance on principles, materials, and procedures for the design and construction of walls to make them resistant to water intrusion, see American Society for Testing and Materials (ASTM) E 2266, *Standard Guide for Design and Construction of Low-Rise Frame Building Wall Systems to Resist Water Intrusion*.

Vinyl Siding

Vinyl siding can be used successfully in a coastal environment if properly designed and installed.

- Windload resistance:

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- Vinyl siding is required by the International Building Code® (IBC®) and the International Residential Code® (IRC®) to comply with ASTM D 3679, *Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding*, which requires the siding to withstand wind pressures equivalent to 110 mph on a building up to 30' in height in Exposure B. Most vinyl siding has also been tested for higher wind pressures, and can be used in locations with a higher basic wind speed, greater building height, more open exposure, or some combination of those. The design wind pressure or wind speed for which these products are rated is available from product literature, installation instructions, or listings of agencies such as the International Code Council® (ICC®) Evaluation Service.

Definition of Wind Exposure Zones

Exposure B: Urban, suburban, wooded areas.

Exposure C: Open terrain, flat open country, grasslands, all water surfaces in hurricane-prone regions.

- For design wind speeds greater than 110 mph, or building heights greater than 30', or Exposure C, choose a model of siding rated for those conditions or higher. The manufacturer's product literature or installation instructions should specify the fastener type, size and spacing, and any other installation details needed to achieve this rating.

- Products that have been rated for high winds typically have an enhanced nailing hem and are sometimes made from thicker vinyl (Figure 1). Thick, rigid panels provide greater wind resistance, withstand dents, and lie flatter and straighter against the wall. Optimum panel thickness should be 0.040 to 0.048", depending on style and design. Thinner gauge vinyl works well for stable climates; thicker gauge vinyl is recommended for areas with high winds and high temperature changes.

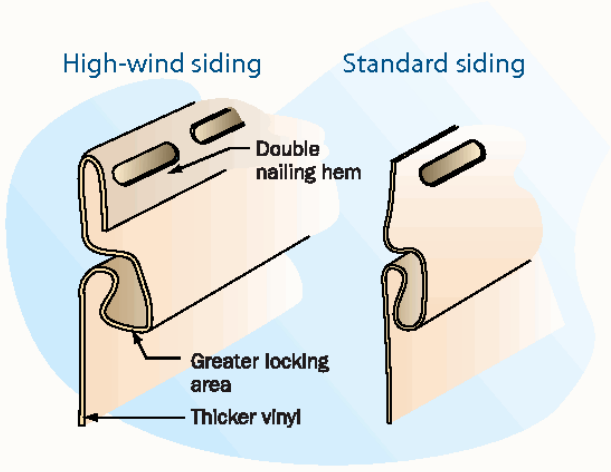


Figure 1. Features of typical high-wind siding and standard siding.

- Position nails in the center of the nailing slot (Figure 2).
- To allow for thermal movement of the siding, do not drive the head of the nail tight against the nail hem (unless the hem has been specifically designed for this). Allow approximately 1/32" (which is about the thickness of a dime) clearance between the fastener head and the siding panel (Figure 3).

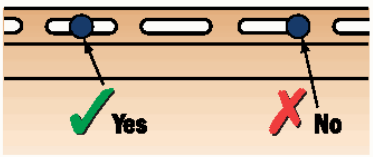


Figure 2. Proper and improper fastener locations.

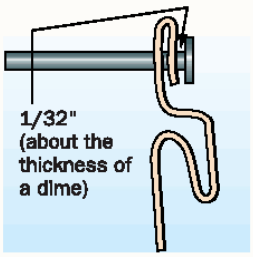


Figure 3. Allow 1/32" clearance between the fastener head and the siding panel.

- Drive nails straight and level to prevent distortion and buckling in the panel.
- Do not caulk the panels where they meet the receiver of inside corners, outside corners, or J-trim. Do not caulk the overlap joints.
- Do not face-nail or staple through the siding.
- Use aluminum, galvanized steel, or other corrosion-resistant nails when installing vinyl siding. Aluminum trim pieces require aluminum or stainless steel fasteners.
- Nail heads should be 5/16" minimum in diameter. Shank should be 1/8" in diameter.
- Use the manufacturer-specified starter strip to lock in the first course; do not substitute other accessories such as a J-channel or utility trim (Figure 4) unless specified by the manufacturer. If the manufacturer specifies a particular strip for high-wind applications, use it. Make sure that the starter strip is designed to positively lock the panel, rather than just hooking over a bulge in the strip; field test the interlock before proceeding with the installation.

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- Make sure that every course of siding is positively locked into the previous course (Figure 5). Push the panel up into the lock from the bottom before nailing rather than pulling from the top. Do not attempt to align siding courses with adjacent walls by installing some courses loosely.
- Make sure that adjacent panels overlap properly, about half the length of the notch at the end of the panel, or approximately 1". Make sure the overlap is not cupped or gapped, which is caused by pulling up or pushing down on the siding while nailing. Reinstall any panels that have this problem.
- Use utility trim under windows or anywhere the top nail hem needs to be cut from siding to fit around an obstacle. Be sure to punch snap-locks into the siding to lock into the utility trim. Do not overlap siding panels directly beneath a window (Figure 6).



Figure 4. Utility trim was substituted for the starter strip and the bottom lock was cut off the siding. Siding was able to pull loose under wind pressure.

- At gable end walls, it is recommended that vinyl siding be installed over wood sheathing rather than over plastic foam sheathing, as was done at the house shown in Figure 7.
- Install vinyl siding in accordance with manufacturer's installation instructions and local building code requirements.
- It is recommended that vinyl siding installers be certified under the VSI Certified Installer Program sponsored by the Vinyl Siding Institute. For more information, go to http://www.vinylsiding.org/aboutsiding/installation/certinstaller.



Figure 5. The siding panel was not properly locked into the panel below.



Figure 6. Proper detailing around windows and other obstacles is important. Use utility trim, punch snap-locks into siding, and don't overlap directly beneath a window.



Figure 7. The vinyl siding at this gable was installed over plastic foam insulation. Without wood sheathing, the wind pressures on the vinyl are increased. Also, if the siding blows away, the foam insulation is very vulnerable to blow-off. With loss of the foam insulation, wind-driven rain can freely enter the attic, saturate the ceiling insulation, and cause collapse of the ceiling.

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Wood Siding

- Use decay-resistant wood such as redwood, cedar, or cypress. See the Sustainable Design section regarding certified wood.
- To improve longevity of paint, back-prime wood siding before installation.
- Carefully follow manufacturer's detailing instructions to prevent excessive water intrusion behind the siding.
- For attachment recommendations, see *Natural Wood Siding: Selection, Installation and Finishing*, published by the Western Wood Products Association (http://www.wwpa.org).

  This publication recommends an air gap between the moisture barrier and the backside of the siding to promote drainage and ventilation. Such a wall configuration is referred to as a rain screen wall. See the text box on page 5.
- Follow the installation details shown in Figure 8. (Note: Although these details do not show a rain screen, inclusion of vertical furring strips to create a rain screen is recommended.)

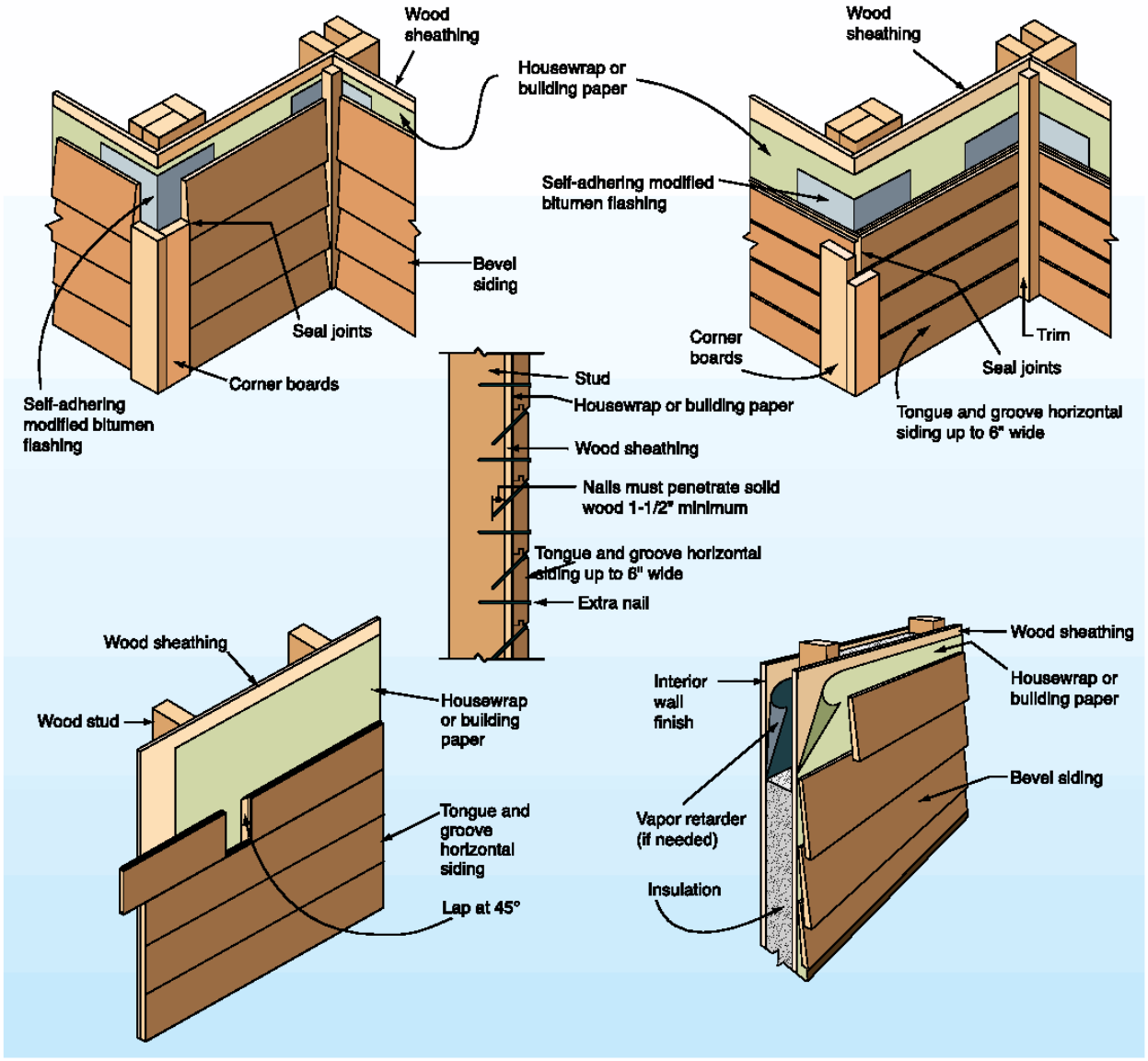


Figure 8. Wood siding installation details.

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Pressure-equalized rain screen wall system

In areas that experience frequent wind-driven rain and areas susceptible to high winds, it is recommended that a rain screen design be considered when specifying wood or fiber cement siding. (Typical vinyl siding products inherently provide air cavities behind the siding that facilitate drainage. Therefore, incorporation of vertical furring strips is normally not applicable to this type of wall covering.) A rain screen design is accomplished by installing suitable vertical furring strips between the moisture barrier and siding material (see Figure 9). The cavity facilitates drainage of water from the space between the moisture barrier and backside of the siding and it facilitates drying of the siding and moisture barrier.

Furring strip attachment: For 1" x 2" furring strips, tack strips in place and use siding nails that are ¾" longer than would be required if there were no strips (thereby maintaining the minimally required siding nail penetration into the studs). For thicker furring strips, an engineered attachment is recommended.

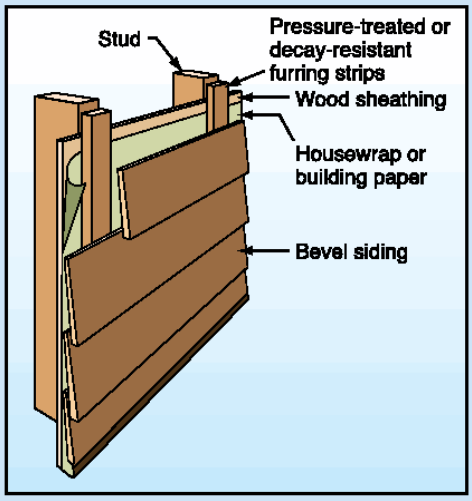


Figure 9. Pressure-equalized rain screen system.

At the bottom of the wall, the cavity should be open to allow water drainage. However, the opening should be screened to avoid insect entry.

At the wall/soffit juncture, the top of the cavity can open into the attic space to provide inlet air ventilation, thereby eliminating soffit vents and their susceptibility to wind-driven rain entry. If the rain screen cavity vent path is used in lieu of soffit vents, the depth of the cavity needs to be engineered to ensure that it provides sufficient air flow to ventilate the attic.

Fiber Cement Siding

Installation procedures are similar to those for wood siding, but require specialized cutting blades and safety precautions because of the dust produced during cutting with power tools. Manufacturer's installation recommendations should be strictly adhered to, and particular attention paid to the painting and finishing recommendations for a high-quality installation.

- Always seal field-cut ends according to the manufacturer's instructions. Properly gap the intersection between siding edges and other building components and fill the gap with sealant.
- Always consult and follow the manufacturer's installation requirements for the needed wind speed rating or design pressure (refer to the manufacturer's building code compliance evaluation report). Observe the manufacturer's fastener specifications, including fastener type and size, spacing, and penetration requirements. Do not over drive or under drive.
- At gable end walls, it is recommended that fiber cement siding be installed over wood sheathing rather than over plastic foam sheathing.
- Keep blind nails between ¾ and 1" from the top edge of the panel (Figure 10). Be sure to drive nails at least 3/8" from butt ends, or use manufacturer-specified joiners.
- Face nailing (Figure 11) instead of blind nailing is recommended where the basic (design) wind speed is 100 miles per hour or greater. If the local building code or manufacturer specifies face nailing at a lower wind speed, install accordingly.
- Do not leave the underside of the first course exposed or extending beyond the underlying material (Figure 12). Consider the use of a trim board to close off the underside of the first course.

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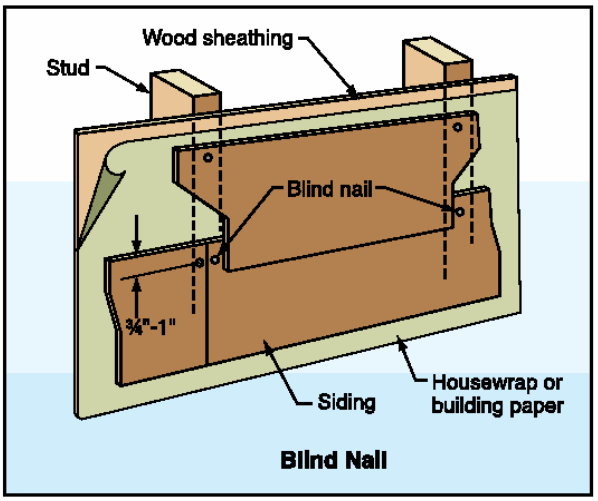


Figure 10. Blind nailing.

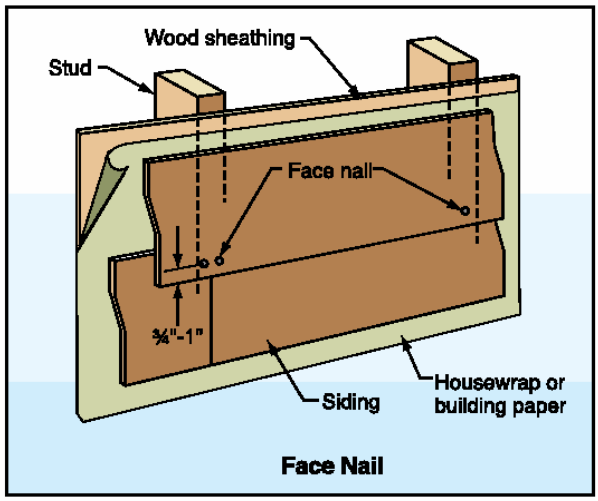


Figure 11. Face nailing.

Sustainable Design

Material selection for sustainable sources and durability

For wood products, select a Forest Stewardship Council (FSC) certified product. The FSC seeks to ensure that wood is harvested in a more responsible fashion, including protecting forest ecosystems, and avoids the use of chemicals and genetic engineering. While redwood, cedar, and cypress are decay-resistant and recommended for durability, they are generally cut from old growth timber. You can determine if the manufacturer is FSC certified by going to http://www.fsc-info.org.

For other siding products, consider long-term life spans for coastal environments, recycled content, and post-consumer use.



Figure 12. Blind nailed siding installed with exposed gap at bottom (red circle) is vulnerable to failure.

The following publications discuss sustainable aspects of vinyl siding:

A Dozen Things You Might Not Know That Make Vinyl Siding Green (available online at http://www.vinylsiding.org/aboutsiding/greenpaper/080919_VSI_Green_Paper_for_web.pdf).

Siding with the Environment (available online at http://www.vinylsiding.org/publications/final_Enviro_single_pg.pdf).

Energy Conservation and Air Barriers: Uncontrolled air leakage through the building envelope is often overlooked. The U.S. Department of Energy estimates that 40 percent of the cost of heating or cooling the average American home is lost to uncontrolled air leakage. In warmer climates, it is a lower percentage of loss. An air barrier system can reduce the heating, ventilation, and cooling (HVAC) system size, resulting in reduced energy use and demand.

Uncontrolled air leakage can also contribute to premature deterioration of building materials, mold and moisture problems, poor indoor air quality, and compromised occupant comfort. When uncontrolled air flows through the building envelope, water vapor moves with it. Controlling the movement of moisture by air infiltration requires controlling the air pathways and/or the driving force.

To effectively control air leakage through the building envelope, an effective air barrier is required. To be effective, it needs to be continuous; therefore, air barrier joints need to be sealed and the barrier needs to be sealed at penetrations through it. The Air Barrier Association of America recommends that materials used

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as a component of a building envelope air barrier be tested to have an air infiltration rate of less than 0.004 cfm/square foot, assemblies of materials that form the air barrier be tested to have an air infiltration rate of less than 0.04 cubic feet per minute (cfm)/square foot, and the whole building exterior enclosure have an air infiltration rate of less than 0.4 cfm/square foot.

Air barrier systems installed behind siding:

Housewrap is the most common air barrier material for residential walls. To be effective, it is critical that the joints between sheets of housewrap be sealed as recommended by the manufacturer, and penetrations (other than fasteners) should also be sealed. At transitions between the housewrap and door and window frame, use of self-adhering modified bitumen flashing tape is recommended.

An air barrier should be installed over a rigid material, or it will not function properly. It also needs to be restrained from pulling off of the wall under negative wind pressures. For walls, wood sheathing serves as a suitable substrate, and the siding (or furring strips in a rain screen wall system) provide sufficient restraint for the air barrier.

At the base of the wall, the wall air barrier should be sealed to the foundation wall. If the house is elevated on piles, the wall barrier should be sealed to an air barrier installed at the plane of the floor.

If the building has a ventilated attic, at the top of the wall, the wall air barrier should be sealed to an air barrier that is installed at the plane of the ceiling.

If the building has an unventilated attic or no attic, at the top of the wall, the wall air barrier should be sealed to an air barrier that is installed at the plane of the roof (the roof air barrier may be the roof membrane itself, or a separate air barrier element).

Siding maintenance:

For all siding products, it is very important to periodically inspect and maintain the product especially in a coastal environment. This includes recoating on a scheduled maintenance plan that is necessary according to the manufacturer's instructions and a periodic check of the sealant to ensure its durability. Check the sealant for its proper resiliency and that it is still in place. Sealant should be replaced before it reaches the end of its service life.

Air barrier: A component installed to provide a continuous barrier to the movement of air through the building envelope. Housewrap is a common air barrier material for residential walls. Although very resistant to airflow, housewrap is very vapor permeable and therefore is not suitable for use as a vapor retarder.

Vapor retarder: A component installed to resist diffusion of water vapor and provide a continuous barrier to movement of air through the building envelope. Polyethylene is a common vapor retarder material for residential walls. To determine whether or not a vapor retarder is needed, refer to the Moisture Control section of the *NRCA Roofing and Waterproofing Manual*, published by the National Roofing Contractors Association (NRCA) (http://www.nrca.net).

ASTM E 1677, *Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls*: This specification covers the minimum performance and acceptance criteria for an air barrier material or system for framed walls of low-rise buildings with the service life of the building wall in mind. The provisions contained in this specification are intended to allow the user to design the wall performance criteria and increase air barrier specifications to accommodate a particular climate location, function, or design of the intended building.

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Update on Soffit Mitigation Research: Soffit Vent Covers as a Mitigation Option

Prepared by: Forrest Masters, Ph.D., and David O. Prevatt, Ph.D.
Department of Civil and Coastal Engineering
University of Florida

BACKGROUND

The University of Florida is currently engaged in research to evaluate and improve the performance of soffit during extreme wind and wind-driven rain events. Assessments conducted after Hurricane Charley revealed that more than 80% of newer homes exposed to the highest winds experienced soffit failures. Both suction and pressure failures were observed. While most of these homes suffered very little structural damage, many experienced enough rain penetration from soffits, roof covering failures and leakage around windows and doors to require interior restoration and occupant displacement until the completion of repairs. While there are some indications that much of the damage to soffits was due to lack of attention to this area of building construction, a sound technical basis—in the form of design requirements—is needed to guide the development of solutions for both existing and new homes.

SOFFIT VENT COVERS

The Soffit Vent Cover is manufactured and sold by Vent Covers Inc. of Sunrise, Florida. It was designed by Michael Hemmer, Vent Covers Inc. President, for the purpose of providing protection of attics in residential buildings from wind-driven rain during hurricanes. The cover is formed out .080 aluminum sheet bent to fit over several standard sized soffit and gable vents. The vent covers are designed to be installed by the homeowner in advance of an approaching hurricane and its intent is to eliminate of reduce water intrusion due to wind-driven rain. Installation is done by two screws into the soffit material, (plywood). A video record of this test provides additional details.

Testing was conducted on 20 March 2008 at the East Campus Laboratories of the University of Florida. Using the Hurricane Simulator to produce typical design level winds the comparative test will evaluate the quantity of water entering the attic areas through a) an open and b) soffit vent during simulated extreme wind events. Static and dynamic pressure measurements were made use Pitot tubes attached to Dwyer MS-131 differential pressure sensor (10 in. w.c. FSO).

TESTING PROCEDURE

1. One 7.5 in. by 24.5 in. soffit vent was installed under the 12" overhang of a 6:12 roof. The centerline of the narrow dimension of the vent was concurrently located with the rafter (seen through the vent in Figure 1a)
2. Foam board catch basins were installed in the attic space (see Figure 1b). The perimeter of the basin extended to the sheathing to create an enclosed space
3. A second vent was installed on the rear-facing wall of the catch basin to allow for airflow through the basin. Thus the free net area of the windward opening matched the free net area of the basin

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4. The test subject then received a steady wind load (up to 120 mph ~35 psf) for a period of three minutes. The unobstructed wind-driven rain intensity was set to 35 in/hr. Based on a local effect factor of 0.3, the test subject received on the order of 35 x 0.3 = 10.5 in/hr of wetting.
5. Next, the vent cover was installed (see Figure 2) and the test was repeated



(a) Exterior of House Mockup



(b) Interior of House Mockup

Figure 1. First Test Configuration





Figure 2. Vent Cover Installation

OBSERVATIONS

Figure 3 shows a sketch of the experimental setup and location of the Pitot tubes and soffit vent

Table 1: Summary Results

Test/ Location	Differential Pressure		Mean Wind Speed (mph)
	Inches w.c.	psf	
Both tests/Pitot Tube #1 – exterior surface	6.2 in.	32.2	113
Test 1 (open soffit vent) Pitot Tube #2 – 2 in. above vent opening	3.3 in.	17.2	82.7
Test 2 (vent cover installed) Pitot Tube #2 – 2 in. above opening	0.02 in.	N/A	0

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No Vent Cover - During the tests with no vent cover the peak wind speed measured within the attic was 50 mph. –In this condition, water was blown into the attic space, wetting the underside of the roof sheathing. We recorded a wind speed of 82 mph just inboard of the vent opening and a static pressure of 18 psf. A discontinuous stream of water was blown by this wind.

With Vent Cover Installed – The vent cover remained firmly in place during the test and there was a significant reduction in wind-driven rain entering the attic as the wind speed was reduced to 0 mph. Water collected within the pan of the vent cover, pooling to about 1/8 in. to ¼ in. but the vent cover practically eliminated the blown water from wetting the underside of the roof or blowing into the attic.

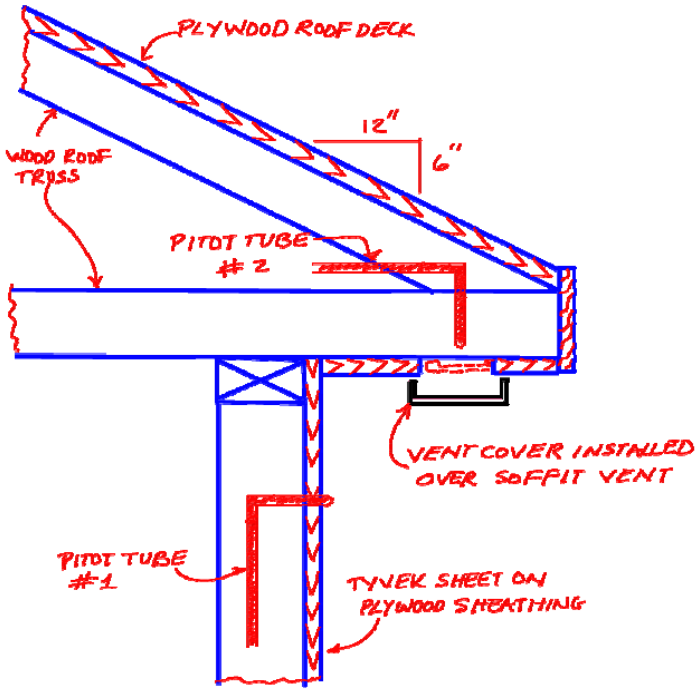


Figure 3. Section through Experimental Section showing instrumentation

SUMMARY

This easy to install soffit vent cover provides protection to the interior attic space from wind-driven rain during extreme wind events. The tested sample remained secured to the soffit during our 3 minute test at hurricane strength wind speeds, while substantially reducing the quantity of wind-driven water entering the attic. Although we observed water ponding within the vent cover, the reduction of wind speed pressure within the attic significantly reduced the wetting potential to adjacent attic materials. Installing one or two weepholes in the vent cover would provide a path for this collected water to drain to the exterior of the building, thereby improving overall performance of the vent cover in retrofit applications.

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Sub Code: Test Protocols

Date Submitted	3/10/2010	**Section**	1.3, 8.5, 12.1.2	**Proponent**	chris schulte
Chapter	1	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

Mod 3542

Summary of Modification

Clarifications of terms

Rationale

Registered roof consultant is not required by the F.B.C.

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

Requirements

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

Clarification

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

Clarification

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 degrade

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G1

Proponent Anthony Ruggiero **Submitted** 5/4/2010 **Attachments** No

Comment:

No references exist to studies confirming financial impact relative to enforcement of code by the local entity.
Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential people to perform/certify compliance with this TAS. The reduction of supply will increase costs to building and property owners.
Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. There is an impact to the contractors who also employ RRC's in that new business relationships will have to be developed with an uncertain cost structure.
Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.
Modification does nothing to strengthen the existing code.
Modification discriminates against methods of demonstrated capabilities. No documented cases exist where the efforts of RRC's have been defective in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.
Modification degrades the effectiveness of the code, the cumulative removal of literally thousands of years of roofing related experience would no longer exist. The experience required to properly perform testing under numerous and varied conditions is essential for the effective certification of code compliance.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G2

Proponent Michael Schuman **Submitted** 5/10/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification does nothing to strengthen the existing code.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G3

Proponent Rick Stow **Submitted** 5/10/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification does nothing to strengthen the existing code.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G4

Proponent Matt Lowther **Submitted** 5/10/2010 **Attachments** No

Comment:

Please do not take the roof consultant out of the documentation. this will be several steps in the wrong direction...

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G5

Proponent Jeremy Bernauer **Submitted** 5/11/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification does nothing to strengthen the existing code.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G6

Proponent Jerry Teitsma **Submitted** 5/11/2010 **Attachments** No

Comment:

I believe the elimination of the current provisions in the code that specify the recognition of RRCs (Registered Roof Consultants) to perform certain roof design tasks is a significant mistake in the proposed code modifications. I urge you to change the proposed 2010 Florida Building Code Modifications to again recognize RRCs for these design tasks.

The removal of Registered roof consultants (RRCs) from the code language would have a significant impact on jobs in Florida. Not only that, it would significantly reduce the supply of potential persons to perform/certify compliance with this TAS. RRCs provide focused design expertise for new and replacement roofs to comply with the Florida Building Code. As part of their efforts, they also provide or oversee installation observation to assure compliance with the code during the critical installation phase. Removal of RRCs could also result in the removal of Registered Roof Observers (RROs) for this critical work. The effectiveness of the Florida Building Code and these proposed modifications would be significantly impaired with the elimination of RRCs.

The removal of thousands of years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS within the HVHZ designated counties.

I urge you to reinstate the RRC approval language in the proposed Florida Building Code modifications.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G7

Proponent Robert Hinojosa **Submitted** 5/11/2010 **Attachments** No

Comment:

As a Florida licensed Professional Engineer, I say this modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's which, in my opinion, have significantly more roofing knowledge than the majority of Florida licensed Professional Engineers.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G8

Proponent Robert Elsdon Preside **Submitted** 5/11/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification does nothing to strengthen the existing code.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G9

Proponent Josh Tatum **Submitted** 5/11/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

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1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G10

Proponent Thomas Gernetzke **Submitted** 5/11/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

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1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G11

Proponent James Hoff **Submitted** 5/12/2010 **Attachments** No

Comment:

The current inclusion of Registered Roof Consultants (RRC) in the FBC to certify roof-related test reports and calculations provides significant benefit to the citizens of the state. No other professional construction registration can claim to validate the consistently high level of training and experience in roof-related technology as the RRC designation. Although many Professional Engineers may have similar roof-related training and experience, the Professional Engineer certification, because of the broad scope covered by the designation, cannot on its face provide assurance that any particular Professional Engineer has demonstrated adequate professional expertise in roofing technology to serve the roof-related role intended by the FBC. In fact, a credible case could be made to limit the authority of this section exclusively to RRCs.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G12

Proponent milsaps aaron **Submitted** 5/13/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G13

Proponent Ken Leggett **Submitted** 5/17/2010 **Attachments** No

Comment:

For years Florida has been looked at as the "Standard of Roof Design". This proposed modification would detrimentally effect the quality and high standard in this building code. It would erase thousands of years of cumulative experience being used by professionals to strengthen this code. The economic impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ would only fuel the currently rising unemployment rate in Florida which currently stands at 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have an enormously negative impact on our "Right to Work" as citizens and tax payers of Florida. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS and thus increase the cost imposed on building and property owners statewide. I also feel this modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code. I strongly feel the general public will suffer greatly at the removal of the Registered Roof Consultants (RRC) from and their participation in this building code.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G14

Proponent Melanie Anderson **Submitted** 5/17/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification does nothing to strengthen the existing code.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G15

Proponent Kellie Dunn **Submitted** 5/17/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification does nothing to strengthen the existing code.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G16

Proponent Michael Fell **Submitted** 5/19/2010 **Attachments** No

Comment:

The above proposed modification, in my professional opinion, does not strengthen the existing code but discriminates against many other professionals (RRCs) that are as qualified as engineers to provide the services identified within this section of the code.

The removal of Registered Roof Consultants (RRC) would reduce the supply of qualified professionals to perform/certify compliance with this TAS. Based on the simple economic principles of supply and demand, the proposed change will have a definite financial impact on the building construction industry with regards to product code compliance. The proposed modification could potentially contribute to the already alarming unemployment rate. Not just for the unemployed RRCs but their support staff as well.

The public will be negatively impacted by the loss of valuable experienced RRC's. The removal of this roofing experience would degrade the effectiveness of the code. Although I received an exceptional education and foundation for my career in engineering from the University of Florida, it was RCI that provided the necessary continued education and training to expound the practical application of roofing technology, waterproofing methods and sound building envelope theory.

RCI is an international association of professional architects, consultants and engineers who specialize in the specification and design of roofing, waterproofing and exterior wall systems. RCI's professional members adhere to a strict ethics code that offers unprejudiced service without affiliation with any product or manufacturer.

RCI's Professional Registrations of Registered Roof Consultant (RRC), Registered Waterproofing Consultant (RWC) and Registered Roof Observer (RRO) distinguish professionals with the proven standards of education, experience and ethics.

This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G17

Proponent Robert Martin **Submitted** 5/24/2010 **Attachments** No

Comment:

May 18, 2010

RCI Florida Chapter

Gentlemen:

I am a Registered Roof Consultant since 1986. Also, I am on the RICOWI Wind/Hail Disaster Team as trained and approved by Oak Ridge National Laboratories. There are numerous others from Florida.

I have never done work in Florida and have no particular business “ax” to grind, but when some action like the one you contemplate goes forward - - - too many times it’s due to the misguided efforts of a local special interest group. Enough said!

To the best of my knowledge, there has never been a problem/law suit related to an RRC and negligence with regard to Florida Building codes. Does it really make sense to eliminate 15 years of success in an existing program/requirement? “If it ain’t broke - - - don’t fix it.”

Sincerely,

Robert F. Martin, RRC (#35), FRCI

1st Comment Period History 04/15/2010 - 06/01/2010

S3535-G18

Proponent Joe Malpezzi **Submitted** 5/25/2010 **Attachments** No

Comment:

The proposed modification to not allow Roofing Consultants to certify roof-related test reports and calculations will, I believe, severely weaken the Building Code and the construction industry in Florida. Roofing Consultants are specifically and exclusively trained in all aspects of roofing including design, installation, inspection, trouble-shooting and remediation. Registered Professional Engineers may have roofing experience, but the mere fact that they have a PE stamp does not alone qualify them as roofing experts. Roofing Consultants are roofing experts. Why would anyone want to impose this restriction on an expert? In fact, one could argue that the code should perhaps be changed to require that Registered Professional Engineers be formally trained in roofing to become qualified to certify roofing test reports and calculations.

Chapter No. 100(a)-95 - Test Procedure for Wind and Wind Driven Rain Resistance and/or Increased Windspeed Resistance of Soffit Ventilation Strip and Continuous or Intermittent Ventilation System Installed At the Ridge Area

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 Professional Engineer ~~or Registered Roof Consultant~~.

8.5 The test specimen shall be inspected by a Professional Engineer ~~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.

12.1.2 A detailed report of the method of construction, including a sketch of the test specimen; certification by a Professional Engineer ~~or Registered Roof Consultant~~ that the test specimen was constructed in compliance with the specifications of this Protocol and the manufacturers published application instructions, and, a copy of the published application instructions provided by the ridge area ventilation system or ventilation unit manufacturer.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3535_TextOfModification_1.png

Date Submitted	3/11/2010	**Section**	1.2	**Proponent**	chris schulte
Chapter	1	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarification

Rationale

Registered roof consultant is not required by the F.B.C.

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

Requirements

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

Clarification

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

Clarification

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 degrade

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G1

Proponent Anthony Ruggiero **Submitted** 5/4/2010 **Attachments** No

Comment:

No references exist to studies confirming financial impact relative to enforcement of code by the local entity.
Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential people to perform/certify compliance with this TAS. The reduction of supply will increase costs to building and property owners.
Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. There is an impact to the contractors who also employ RRC's in that new business relationships will have to be developed with an uncertain cost structure.
Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.
Modification does nothing to strengthen the existing code.
Modification discriminates against methods of demonstrated capabilities. No documented cases exist where the efforts of RRC's have been defective in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.
Modification degrades the effectiveness of the code, the cumulative removal of literally thousands of years of roofing related experience would no longer exist. The experience required to properly perform testing under numerous and varied conditions is essential for the effective certification of code compliance.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G2

Proponent Michael Schuman **Submitted** 5/10/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

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If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G3

Proponent Rick Stow **Submitted** 5/10/2010 **Attachments** No

Comment:

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1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G4

Proponent Matt Lowther **Submitted** 5/10/2010 **Attachments** No

Comment:

Please do not take the roof consultant out of the documentation. this will be several steps in the wrong direction...

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G5

Proponent Jeremy Bernauer **Submitted** 5/11/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

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1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G6

Proponent Jerry Teitsma **Submitted** 5/11/2010 **Attachments** No

Comment:

I believe the elimination of the current provisions in the code that specify the recognition of RRCs (Registered Roof Consultants) to perform certain roof design tasks is a significant mistake in the proposed code modifications. I urge you to change the proposed 2010 Florida Building Code Modifications to again recognize RRCs for these design tasks.

The removal of Registered roof consultants (RRCs) from the code language would have a significant impact on jobs in Florida. Not only that, it would significantly reduce the supply of potential persons to perform/certify compliance with this TAS. RRCs provide focused design expertise for new and replacement roofs to comply with the Florida Building Code. As part of their efforts, they also provide or oversee installation observation to assure compliance with the code during the critical installation phase. Removal of RRCs could also result in the removal of Registered Roof Observers (RROs) for this critical work. The effectiveness of the Florida Building Code and these proposed modifications would be significantly impaired with the elimination of RRCs.

The removal of thousands of years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS within the HVHZ designated counties.

I urge you to reinstate the RRC approval language in the proposed Florida Building Code modifications.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G7

Proponent Robert Hinojosa **Submitted** 5/11/2010 **Attachments** No

Comment:

As a Florida licensed Professional Engineer, I say this modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's which, in my opinion, have significantly more roofing knowledge than the majority of Florida licensed Professional Engineers.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G8

Proponent Robert Elsdon Preside **Submitted** 5/11/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

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1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Josh Tatum **Submitted** 5/11/2010 **Attachments** No

S3542-G9

Comment:

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The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

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1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Thomas Gernetzke **Submitted** 5/11/2010 **Attachments** No

S3542-G10

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

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Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G11

Proponent James Hoff **Submitted** 5/12/2010 **Attachments** No

Comment:

The current inclusion of Registered Roof Consultants (RRC) in the FBC to certify roof-related test reports and calculations provides significant benefit to the citizens of the state. No other professional construction registration can claim to validate the consistently high level of training and experience in roof-related technology as the RRC designation. Although many Professional Engineers may have similar roof-related training and experience, the Professional Engineer certification, because of the broad scope covered by the designation, cannot on its face provide assurance that any particular Professional Engineer has demonstrated adequate professional expertise in roofing technology to serve the roof-related role intended by the FBC. In fact, a credible case could be made to limit the authority of this section exclusively to RRCs.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G12

Proponent milsaps aaron **Submitted** 5/13/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G13

Proponent Ken Leggett **Submitted** 5/17/2010 **Attachments** No

Comment:

For years Florida has been looked at as the "Standard of Roof Design". This proposed modification would detrimentally effect the quality and high standard in this building code. It would erase thousands of years of cumulative experience being used by professionals to strengthen this code. The economic impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ would only fuel the currently rising unemployment rate in Florida which currently stands at 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have an enormously negative impact on our "Right to Work" as citizens and tax payers of Florida. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS and thus increase the cost imposed on building and property owners statewide. I also feel this modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code. I strongly feel the general public will suffer greatly at the removal of the Registered Roof Consultants (RRC) from and their participation in this building code.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G14

Proponent Melanie Anderson **Submitted** 5/17/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification does nothing to strengthen the existing code.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G15

Proponent Kellie Dunn **Submitted** 5/17/2010 **Attachments** No

Comment:

Definite financial impact to building and property owners relative to cost of compliance with code. The removal of Registered Roof Consultants (RRC) would reduce the supply of potential persons to perform/certify compliance with this TAS.

Definite impact to the industry due to the loss of jobs not only for RRC's but also for the techs that assist them and the admin personnel they employ. Florida's current Unemployment Rate is 12.3%. This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

Modification has a reasonable and substantial connection to health, safety and welfare of the general public. The public will be negatively impacted by the loss of the specific experience of RRC's.

Modification does nothing to strengthen the existing code.

Modification discriminates against methods of demonstrated capabilities. To my knowledge, no documented cases exist where the efforts of RRC's have been negligent in their efforts to provide construction in full compliance with existing building codes in the 15 years RRC's have been included in the code.

The removal of literally thousands of cumulative years of roofing experience would degrade the effectiveness of the code. The experience required to properly perform testing under numerous and varied conditions, is essential for the effective certification of code compliance.

If this modification is due in part to a question of oversight, it is a requirement of the Florida Building Commission, pursuant to subsection 9B-72.100 (5), Florida Administrative Code (FAC), that the Miami-Dade County Building Code Compliance Office, Product Control Division, provide oversight of testing laboratories. In following the code, the RRC must be attached to said testing laboratory in order to perform work associated with this TAS, within the HVHZ designated counties.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G16

Proponent Michael Fell **Submitted** 5/19/2010 **Attachments** No

Comment:

The above proposed modification, in my professional opinion, does not strengthen the existing code but discriminates against many other professionals (RRCs) that are as qualified as engineers to provide the services identified within this section of the code.

The removal of Registered Roof Consultants (RRC) would reduce the supply of qualified professionals to perform/certify compliance with this TAS. Based on the simple economic principles of supply and demand, the proposed change will have a definite financial impact on the building construction industry with regards to product code compliance. The proposed modification could potentially contribute to the already alarming unemployment rate. Not just for the unemployed RRCs but their support staff as well.

The public will be negatively impacted by the loss of valuable experienced RRC's. The removal of this roofing experience would degrade the effectiveness of the code. Although I received an exceptional education and foundation for my career in engineering from the University of Florida, it was RCI that provided the necessary continued education and training to expound the practical application of roofing technology, waterproofing methods and sound building envelope theory.

RCI is an international association of professional architects, consultants and engineers who specialize in the specification and design of roofing, waterproofing and exterior wall systems. RCI's professional members adhere to a strict ethics code that offers unprejudiced service without affiliation with any product or manufacturer.

RCI's Professional Registrations of Registered Roof Consultant (RRC), Registered Waterproofing Consultant (RWC) and Registered Roof Observer (RRO) distinguish professionals with the proven standards of education, experience and ethics.

This and the other 17 modifications to remove RRC's from the HVHZ will have a detrimental impact on our "Right to Work" as citizens and tax payers of Florida.

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G17

Proponent Robert Martin **Submitted** 5/24/2010 **Attachments** No

Comment:

May 18, 2010

RCI Florida Chapter

Gentlemen:

I am a Registered Roof Consultant since 1986. Also, I am on the RICOWI Wind/Hail Disaster Team as trained and approved by Oak Ridge National Laboratories. There are numerous others from Florida.

I have never done work in Florida and have no particular business “ax” to grind, but when some action like the one you contemplate goes forward - - - too many times it’s due to the misguided efforts of a local special interest group. Enough said!

To the best of my knowledge, there has never been a problem/law suit related to an RRC and negligence with regard to Florida Building codes. Does it really make sense to eliminate 15 years of success in an existing program/requirement? “If it ain’t broke - - - don’t fix it.”

Sincerely,

Robert F. Martin, RRC (#35), FRCI

1st Comment Period History 04/15/2010 - 06/01/2010

S3542-G18

Proponent Joe Malpezzi **Submitted** 5/25/2010 **Attachments** No

Comment:

The proposed modification to not allow Roofing Consultants to certify roof-related test reports and calculations will, I believe, severely weaken the Building Code and the construction industry in Florida. Roofing Consultants are specifically and exclusively trained in all aspects of roofing including design, installation, inspection, trouble-shooting and remediation. Registered Professional Engineers may have roofing experience, but the mere fact that they have a PE stamp does not alone qualify them as roofing experts. Roofing Consultants are roofing experts. Why would anyone want to impose this restriction on an expert? In fact, one could argue that the code should perhaps be changed to require that Registered Professional Engineers be formally trained in roofing to become qualified to certify roofing test reports and calculations.

Testing Application Standards (TAS)

Chapter No. 105-98 - Test Procedure for Field Withdrawal Resistance Testing

1.2 All testing shall be conducted by an approved testing agency, and all test reports shall be signed by a Professional Engineer ~~or Registered Roof Consultant~~.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3542_TextOfModification_1.png

Date Submitted	3/16/2010	**Section**	12	**Proponent**	Jaime Gascon
Chapter	1	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second

Commission Action Pending Review

Related Modifications

MOD 3461 - TAS202

MOD 3462 - TAS203

Summary of Modification

Adds requirement for additional testing when original test is older than 10 years.

Rationale

System performance is directly related to the quality and tolerances aforded to its components. Technology in manufacturing is rarely constant for more than 10 years, and this variable contributes to unintentional variation in system performance. This code modification attempts to limit the additional testing required for confirmation, and serves to close the loop on potential manufacturing assumptions and variations made since since the original testing took place.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The local entities would only be impacted when processing local product approvals, requiring them to check the recency of the testing.

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

The impact to this group would be minimal; the cost of an additional mockup test spread throughout a ten-year period and among all the potential customers of the given product during the same period.

Impact to industry relative to the cost of compliance with code

The impact to this group would be the cost of an additional product mockup test every 10 years.

Requirements

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

The modification helps to confirm that unintentional or unknown system and/or component changes made during a 10-year period do not have a negative impact on the product's originally qualified performance.

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

This modification improves the code by establishing a defined follow-up for system retesting, which the test protocol currently lacks. This will result in better systems of construction by actually having implemented assumptions tested.

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

The modification does not discriminate as it would be applicable to all systems subject to testing by this protocol under the current FBC.

Does not degrade the effectiveness of the code

This modification will not degrade the effectiveness of the code. It will improve it by providing defined limits on age of testing, and allow manufacturers a qualified means of showing continued proof of compliance after the first 10 years.

12. Additional Testing:

12.1 Following successful completion of this test, all specimen must then be successfully tested as per TAS 203-94.

12.2 Any product, when installed that is subjected to weathering, where such weathering can affect the integrity of the product, the manufacturer shall contact the Authority Having Jurisdiction for additional testing requirements such as but not limited to moisture, U.V., accelerated aging, and other similar tests.

12.3 The Authority Having Jurisdiction reserves the right to require any additional testing necessary to assure full compliance with the intent of the Florida Building Code, Building.

12.4 Some products, such as, but not limited to exterior doors, exterior windows, skylights, and wall cladding shall be required to be successfully tested under TAS 202-94 prior to conducting tests under this protocol.

12.5 Testing that is older than 10 years shall be retested on at least one (1) specimen to confirm continued performance of original level.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3446_TextOfModification_1.png

Date Submitted	3/11/2010	**Section**	6.3.1.1	**Proponent**	chris schulte
Chapter	1	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

Summary of Modification

Clarification

Rationale

6.3.1.1 - Chief code complaince officer is not recognized by the F.B.C.

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

Requirements

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

Clarification

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

Clarification

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 degrade

1st Comment Period History 04/15/2010 - 06/01/2010

S3571-G1

Proponent Alex Tigera **Submitted** 5/20/2010 **Attachments** No

Comment:

The term “Chief Code Compliance Officer” in the High Velocity Hurricane Zone (HVHZ) is understood to be the Director of the Miami-Dade County Building Code Compliance Office. Deletion of this term and substituting it for “Building Official” will create a great deal of confusion by introducing more than 50 different interpretations in the High Velocity Hurricane Zone (HVHZ) alone. This change will destroy the currently established uniformity that presently exists in the High Velocity Hurricane Zone (HVHZ) as it relates to this protocol. Approval of this modification sets the stage for the specter of individual “local” building officials directing the issuance of product approvals which will be unacceptable to one or all of the other local jurisdictions within the HVHZ. As a consequence, this modification will create chaos where order, stability and clarity have prevailed and ensure an unacceptable weakening of the current code provisions.

Testing Application Standards (TAS)

Chapter 201-94 - Impact Test Procedures

6.3.1.1 Calibration of Timing Equipment - The timing system shall be calibrated and certified by an independent qualified agency approved by the ~~Chief Code Compliance Officer~~ local building official, at six-month intervals using one of the following methods:

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3571_TextOfModification_1.png

S3461

Date Submitted	3/16/2010	**Section**	12	**Proponent**	Jaime Gascon
Chapter	1	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

MOD 3446 - TAS201
MOD 3462 - TAS203

Summary of Modification

Adds requirement for additional testing when original test is older than 10 years.

Rationale

System performance is directly related to the quality and tolerances afforded to its components and how these interact. Technology in manufacturing is rarely constant for more than 10 years, and this variable contributes to unintentional variation in system performance. This code modification attempts to limit the additional testing required for confirmation, and serves to close the loop on potential manufacturing assumptions and variations made since the original testing took place.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The local entities would only be impacted when processing local product approvals, requiring them to check the recency of the testing.

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

The impact to this group would be minimal; the cost of an additional mockup test spread throughout a ten-year period and among all the potential customers of the given product during the same period.

Impact to industry relative to the cost of compliance with code

The impact to this group would be the cost of an additional product mockup test every 10 years.

Requirements

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

The modification helps to confirm that unintentional or unknown system and/or component changes made during a 10-year period do not have a negative impact on the product's originally qualified performance.

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

This modification improves the code by establishing a defined follow-up for system retesting, which the test protocol currently lacks. This will result in better systems of construction by actually having implemented assumptions tested.

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

The modification does not discriminate as it would be applicable to all systems subject to testing by this protocol under the current FBC.

Does not degrade the effectiveness of the code

This modification will not degrade the effectiveness of the code. It will improve it by providing defined limits on age of testing, and allow manufacturers a qualified means of showing continued proof of compliance after the first 10 years.

12. Additional Testing:

12.1 After successfully completing all parts of the test described in this protocol, the specimen shall be subjected to the forced entry test per ASTM F 588, ASTM F 842, or AAMA 1304 as applicable.

12.2 Any product when installed that is subjected to weathering, where such weathering can affect the integrity of the product, the manufacturer shall contact the Authority Having Jurisdiction for additional testing requirements such as but not limited to moisture, U.V., accelerated aging, and other similar tests.

12.3 The Authority Having Jurisdiction reserves the right to require any additional testing necessary to assure full compliance with the intent of the Florida Building Code, Building.

12.4 Testing that is older than 10 years shall be retested on at least one (1) specimen to confirm continued performance of original level.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3461_TextOfModification_1.png

System performance is directly related to the quality and tolerances afforded to its components and how these interact. Technology in manufacturing is rarely constant for more than 10 years, and this variable contributes to unintentional variation in system performance. This code modification attempts to limit the additional testing required for confirmation, and serves to close the loop on potential manufacturing assumptions and variations made since the original testing took place. Users can then make decisions on continued acceptance of the system, or require additional testing.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3461_Rationale_Rational 10-year tests_1.png

S3462

Date Submitted	3/16/2010	**Section**	13	**Proponent**	Jaime Gascon
Chapter	1	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation No Affirmative Recommendation with a Second
Commission Action Pending Review

Related Modifications

MOD 3446 - TAS201
MOD 3461 - TAS202

Summary of Modification

Adds requirement for additional testing when original test is older than 10 years.

Rationale

System performance is directly related to the quality and tolerances afforded to its components and how these interact. Technology in manufacturing is rarely constant for more than 10 years, and this variable contributes to unintentional variation in system performance. This code modification attempts to limit the additional testing required for confirmation, and serves to close the loop on potential manufacturing assumptions and variations made since the original testing took place.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The local entities would only be impacted when processing local product approvals, requiring them to check the recency of the testing.

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

The impact to this group would be minimal; the cost of an additional mockup test spread throughout a ten-year period and among all the potential customers of the given product during the same period.

Impact to industry relative to the cost of compliance with code

The impact to this group would be the cost of an additional product mockup test every 10 years.

Requirements

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

The modification helps to confirm that unintentional or unknown system and/or component changes made during a 10-year period do not have a negative impact on the product's originally qualified performance.

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

This modification improves the code by establishing a defined follow-up for system retesting, which the test protocol currently lacks. This will result in better systems of construction by actually having implemented assumptions tested.

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

The modification does not discriminate as it would be applicable to all systems subject to testing by this protocol under the current FBC.

Does not degrade the effectiveness of the code

This modification will not degrade the effectiveness of the code. It will improve it by providing defined limits on age of testing, and allow manufacturers a qualified means of showing continued proof of compliance after the first 10 years.

13. Additional Testing:

13.1 Prior to conducting the test described in this protocol, all specimen must have successfully completed the test specified in protocol TAS 201-94.

13.2 Any product when installed that is subjected to weathering, where such weathering can affect the integrity of the product, the manufacturer shall contact the Authority Having Jurisdiction for additional testing requirements such as but not limited to moisture, U.V., accelerated aging, and other similar tests.

13.3 The Authority Having Jurisdiction reserves the right to require any additional testing necessary to assure full compliance with the intent of the Florida Building Code, Building.

13.4 Some products, such as exterior doors, exterior windows, skylights, and wall cladding shall be required to be successfully tested under TAS 202-94 prior to conducting tests under this protocol.

13.5 Testing that is older than 10 years shall be retested on at least one (1) specimen to confirm continued performance of original level.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3462_TextOfModification_1.png

System performance is directly related to the quality and tolerances afforded to its components and how these interact. Technology in manufacturing is rarely constant for more than 10 years, and this variable contributes to unintentional variation in system performance. This code modification attempts to limit the additional testing required for confirmation, and serves to close the loop on potential manufacturing assumptions and variations made since the original testing took place. Users can then make decisions on continued acceptance of the system, or require additional testing.

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_3462_Rationale_Rational 10-year tests_1.png

Sub Code: Building

Date Submitted	4/1/2010	**Section**	1622	**Proponent**	Joseph Belcher
Chapter	16	**Affects HVHZ**	Yes	**Attachments**	Yes

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Summary of Modification

The modification adds design wind pressures for aluminum screened enclosures developed from wind tunnel testing sponsored by the Aluminum Association of Florida.

Rationale

The tabular values are the result of testing conducted at Virginia Tech and Clemson. Dr. Dr, Timothy Reinhold, PE, developed the values from the raw data generated by the wind tunnel testing. The table has been “tweaked” through a number of code change cycles and a series of rigorous meetings of a large group of engineers practicing in the field of aluminum design over several years. There is no good reason practitioners in the HVHZ should not enjoy the benefits of the work sponsored by AAF.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The changes will have no impact on the cost of compliance relative to the enforcement of the code.

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

The changes will have no impact on the cost to building and property owners relative to compliance with the code.

Impact to industry relative to the cost of compliance with code

The changes will have no impact on the cost to industry relative to compliance with the code.

Requirements

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

The proposal has a connection with the welfare of the general public by permitting designers in the HVHZ the flexibility to use wind pressure data developed from wind tunnel testing and consensus meetings for the design of screen enclosures with the end result an economical and stronger structure.

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

The proposal strengthens and improves the code by permitting designers in the HVHZ the flexibility to use wind pressure data developed from wind tunnel testing and numerous consensus meetings for the design of screen enclosures with the end result of a more economical and stronger structure.

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

The proposal does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities.

Does not degrade the effectiveness of the code

The proposal increases the effectiveness of the code by permitting designers in the HVHZ the flexibility to use wind pressure data developed from wind tunnel testing and numerous consensus meetings for the design of screen enclosures with the end result of a more economical and stronger structure.

SECTION 1622

HIGH-VELOCITY HURRICANE ZONES—

SCREEN ENCLOSURES

1622.1 Screen enclosures.

1622.1.1 The wind loads on screen surfaces shall be per ASCE 7 based on the ratio of solid to gross area or in accordance with Table 1622.1.2.

1622.1.2 Designs utilizing ASCE 7 shall be based on such loads applied horizontally inward and outward to the walls with a shape factor of 1.3 and applied vertically upward and downward on the roof with a shape factor of 0.7.

1622.1.3 Structural members supporting screened enclosures designed utilizing the pressures of Table 1622.1.1 shall be designed for wind in both of two orthogonal directions using the pressures given in Table 1622.1.1. Each primary member shall also be designed for a 300 pound (1.33 kN) load applied vertically downward along any 1 foot (305 mm) of any member, not occurring simultaneously with wind load.

1622.2 Windbreakers.

1622.2.1 Vinyl and acrylic glazed panels shall be removable. Removable panels shall be identified as removable by a decal. The identification decal shall essentially state "Removable panel SHALL be removed when wind speeds exceed 75 mph (34 m/s)." Decals shall be placed such that the decal is visible when the panel is installed.

1622.2.2 Permanent frame shall be designed per section 1620 and 1622.1.2, or 1622.1.3..

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4331_TextOfModification_1.png

TABLE 1622.1.1

DESIGN WIND PRESSURES FOR ALUMINUM SCREENED ENCLOSURES[a,b,c]

SURFACE	BASIC WIND SPEED (mph)											
	100		110		120		130		140		150	
	Exposure Category (B or C) Design Pressure (psf)											
	B	C	B	C	B	C	B	C	B	C	B	C
Horizontal Pressure on Windward Surfaces	12	17	13	18	15	21	18	25	21	29	24	33
Horizontal Pressure on Leeward Surfaces	10	13	10	14	13	17	14	19	15	23	18	27
Vertical Pressure - Screen Surfaces	3	5	4	5	4	6	5	7	6	8	7	9
Vertical Pressure - Solid Surfaces	10	14	11	15	13	18	15	21	17	24	20	28

For SI: 1 pound per square foot = 9.479 kN/m^2.

NOTES:

a. Pressures include importance factors determined in accordance with ASCE 7 Table 1-1 and FBC Table 1604.5.

b. Pressures apply to enclosures with a mean enclosure roof height of 30 feet (10 m). For other heights, multiply the pressures in this table by the factors in Table 1622.1.2

c. Apply horizontal pressures to the area of the enclosure projected on a vertical plane normal to the assumed wind direction, simultaneously inward on the windward side and outward on the leeward side.

d. Apply vertical pressures upward and downward to the area of the enclosure projected on a horizontal plane.

e. Apply horizontal pressures simultaneously with vertical pressures.

f. Table pressures are MWFRS Loads. The design of solid roof panels and their attachments shall be based on component and cladding loads for enclosed or partially enclosed structures as appropriate.

g. Table pressures apply to 20×20×0.013" mesh screen. For 18 ×14 × 0.013" mesh screen, pressures on screen surfaces may be multiplied by 0.88. For screen densities greater than 20×20×0.013", use pressures for enclosed buildings.

h. Table pressures may be interpolated using ASCE 7 methodology.

TABLE 1622.1.2
HEIGHT ADJUSTMENT FACTORS

MEAN ROOF HEIGHT	EXPOSURE	
	B	C
15	1	0.86
20	1	0.92
25	1	0.96
30	1	1.00
35	1.05	1.03
40	1.09	1.06
45	1.12	1.09
50	1.16	1.11
55	1.19	1.14
60	1.22	1.16

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S4282

Date Submitted	4/1/2010	**Section**	2223.8.2	**Proponent**	William Shoemaker
Chapter	22	**Affects HVHZ**	Yes	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Summary of Modification

This proposal deletes an unnecessary requirement that is covered by other required design standards.

Rationale

The fusion welding of structural members and structural sheets is rarely used in metal building systems. Furthermore, AISI S100 Section E2.2 and AWS D1.8 Section 2.3.5.3 contain similar requirements for arc spot welds and weld washers that would apply.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Proposed modification improves enforcement of the code and simplifies the code by referencing design standards that addresses Section 2223.8.2 intent.

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.

Requirements

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

Clarifies the intent of the code.

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

Improves the code by referencing a specific design standard.

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 degrade the effectiveness of the code.

1st Comment Period History 04/15/2010 - 06/01/2010

Proponent Mohammed Shaikh **Submitted** 5/30/2010 **Attachments** Yes

S4282-G1

Comment:

This proposal weakens HVHZ section of the FBC

~~**2223.8.2** The fusion welding of structural members and structural sheets defined in Section 2222.4 and less than 22 gauge (0.0299 inch nominal) in thickness shall have minimum of $^{5}/_{8}$ inch (17 mm) diameter welds through weld washers not less than 14 gauge in thickness and 1 inch (25 mm) in diameter, contoured if necessary to provide continuous contact, or an equivalent device.~~

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Comments on Modification 4282 by Mohammed Shaikh

Section 2223.8.2
This section is applicable only when fusion welding is used.14 gage weld washers are required when structural sheet thickness is less than 22gage to prevent inadequate welds. By deleting this section HVHZ section of the code is weakened.

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Date Submitted	3/27/2010	**Section**	2603.8	**Proponent**	J Glenn-BASF
Chapter	26	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Summary of Modification

Using base code language for termite protection for foam plastic.

Rationale

Covered by existing language in the base code.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**2603.8 Protection from termite damage.**~~

~~**2603.8.1** Foam plastic insulation including, but not limited to, extruded or expanded polystyrene or polyisocyanurate shall not be installed below grade on foundation walls or below grade on the exterior of slab foundations.~~

~~**Exceptions:**~~

~~1. When in addition to the requirements of Section 2304.11.6, an approved method of protecting the foam plastic and structure from subterranean termite damage is provided.~~

~~2. Within Types I and II B construction.~~

~~3. On the interior side of basement walls.~~

~~**2603.8.2 Clearance between earth and foam plastics applied to the exterior wall shall be not less than 6 inches (152 mm).**~~

2603.8 Protection against termites. In Florida ~~areas where the probability of termite infestation is very heavy in accordance with Figure 2603.8~~, extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or preservative-treated wood.

2. An approved method of protecting the foam plastic and structure from subterranean termite damage is provided.

3. On the interior side of basement walls.

~~**FIGURE 2603.8**~~

~~**TERMITE INFESTATION PROBABILITY MAP**~~

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Date Submitted	3/8/2010	**Section**	3113.1 and R325.1	**Proponent**	Kevin Gartland
Chapter	31	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn

Commission Action Pending Review

Related Modifications

PER MO MADANI ADVICE ON 3/16/10 REQUEST FBC ARCHIVE THIS MODIFICATION SINCE WE DIVIDED IT INTO #3574 BUILDING AND #3575 RESIDENCES. This mod is same as mod 3574 and mod 3575.

Summary of Modification

When required by local government to reduce noise attenuation in new structure or addition to existing structure near an airport, applicant must provide documentation that structure meets the reduction requirement.

Rationale

Provides prescriptive guidelines for an applicant when required to meet sound attenuation reductions by a local government when constructing a new structure or addition to an existing structure near an airport. Modification is based on City of Jacksonville Zoning Ordinance prescriptive noise attenuation guidelines with NE Florida Builders Association endorsement in March 2007.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Positive impact to local government because code will provide prescriptive guidelines for the local government to use if it requires an applicant for new structures or additions to existing structures near an airport to reduce noise attenuation in the structures.

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

No additional impact to building and property owners since code will provide prescriptive guidelines to be used when required to comply with noise attenuation reductions in new structures or additions to existing structures near an airport by a local government.

Impact to industry relative to the cost of compliance with code

Positive impact to industry because provides practical prescriptive guidelines when required to comply with local government noise attenuation reductions and results in more energy efficient structures and additions which saves energy costs.

Requirements

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

When required by a local government to reduce noise attenuation in a new structure or addition to an existing structure the proposed modification significantly improves the quality of life of the persons living and working in the structure or addition and reduces their energy costs.

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

Improves code by providing prescriptive measures when required to meet noise attuation reductions. NE Florida Building Association believes guidelines validate use of better windows, doors and insulation to improve energy efficiency and reduce sound attenuation in construction near airports.

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

Guidelines define material, product, methods and systems currently in Code. NE Florida Building Association believes guidelines do not discriminate against materials, products, methods or systems that improve energy efficiency and reduce sound attenuation in construction near airports.

Does not degrade the effectiveness of the code

Improves effectiveness of code by providing prescriptive guidelines not currently in code to use when required to reduce noise attenuation in a new structure or addition to existing structure near airport in area of local government.

3113.1 and R325.1 The Aviation Safety and Noise Abatement Act of 1979 14 CFR Part 150 (US Department of Transportation) including revisions through January 2005 and hereby adopted as a guideline for establishing airport noise control. When required by a local government to reduce noise attenuation in a new structure or addition to an existing structure near an airport in the area of the local government, the applicant must provide either:

* a testing certificate from an accredited noise testing lab that a new structure or addition to existing structure built to the submitted engineering plans will achieve an average minimum dBA reduction equal to or greater than the reduction required,

* an engineering judgement signed and sealed by an engineer licensed in the State of Florida that the structure or addition built to the submitted engineering plans will achieve an average minimum dBA reduction equal to or greater than the reduction required, or

* plans using the standards contained in "Guidelines for Sound Insulation of Residences Exposed to Aircraft Operations" prepared for the Department of the Navy by Wyle Research and Consulting, Arlington, Virginia, April 2005 on file with the Florida Building Commission.

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Date Submitted	4/2/2010	**Section**	SDI ANSI A250.13	**Proponent**	Kurt Roeper
Chapter	35	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Section 1609.1.3, mod 4447
Section 1714.5.3.3.2, mod 4448

Summary of Modification

Delete ANSI A250.13 as a referenced standard

Rationale

Correlation with 2009 International Building Code

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

None

Requirements

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

Deletion of the optional Standard provides consistency of use of assembly test methods SSTD 12, ASTM E1886 / E1996, Protocols TAS 201, 202 and 203, and AAMA 506

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

Strengthens the code via consistency of test methods based on complete product assemblies. Provides correlation with the 2009 IBC.

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

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

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code

1st Comment Period History 04/15/2010 - 06/01/2010

S4449-G1

Proponent	Kurt Roeper	**Submitted**	6/1/2010	**Attachments**	Yes

Comment:

Public comment file attached

~~Steel Door Institute~~
~~c/o Wherry Associates~~
~~30200 Detroit Road,~~
~~Cleveland, Ohio 44145-1967~~
~~Standard~~
~~reference~~
~~number~~
~~ANSI A250.13-03~~

~~Title~~
~~Testing and Rating of Severe Windstorm Resistant Com~~
~~For Swinging Door Assemblies~~

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Public Comment - FBC Proposed Change S4449

1) ANSI A250.13 was proposed for the 2012 edition of the IBC and rejected by a vote of the ICC Governmental members on May 22, 2010. It was proposed in two changes, S90 and S143, both of which were disapproved.

2) ANSI A250.13 was proposed for the 2009 edition of the IBC and rejected by a vote of the ICC Governmental members on September 20, 2008. It was proposed in two changes, S83 and S143, both of which were disapproved.

3) The current edition of ANSI A250.13 - 2008, contains significant reductions in impact energies, compared to the 2003 version, and is no longer equivalent with test protocol TAS201. ANSI A250.13 Section 6.1.1.2 – Hinges, and Section 7.1.1.3 – Latching Hardware, have impact energy requirements reduced to 125 foot-pounds. This represents a 64% reduction from the 350 foot-pounds large-missile impact energy requirements of the Florida Building Code.

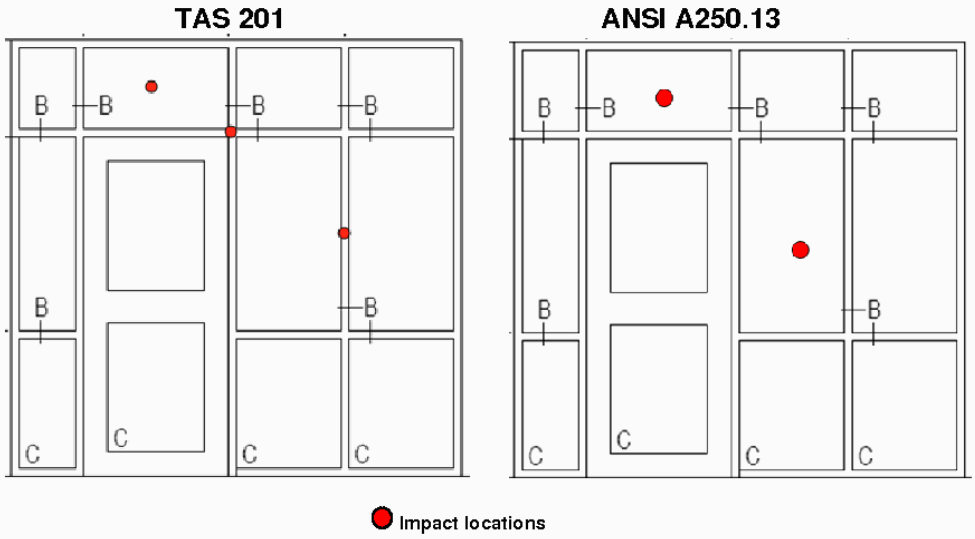
4) ANSI A250.13 - 2008 section 10.1 prohibits missile impacts to framing members of glazed transom / sidelite openings, as is applied under ASTM 1996 or Florida Building Code protocol TAS 201, section 6.3.2.2.

TAS 201 - section 6.3.2.2.
"6.3.2.2 When testing any specimen with more than one component, in addition to complying with the impacts required by Section 1626.2 of the Florida Building Code, the framing member connecting these components shall be impacted at one half the span of such member with the large missile at a speed indicated in Section 1626.2.4 of the Florida Building Code."

ANSI A250.13 - section 10.1
“10.1 Sidelights and/or transoms shall be tested with doors, to the largest total size (maximum area, height and width) to be rated. Testing shall be performed per ASTM E1886 and ASTM E1996 with the impacts applied only to the glazed portion of the assembly.”

A graphic comparison of impact test methods follows;

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In summary, ANSI A250.13 is not equivalent to TAS 201 or ASTM E1886 / E1996, and has been disapproved by four votes of the ICC membership. As such, it should no longer be recognized by the Florida Building Code as a means of compliance for debris impact ratings.

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Sub Code: Residential

Date Submitted	3/28/2010	**Section**	202 Live load.	**Proponent**	J Glenn-BASF
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language as it provides better direction.

Rationale

Retain the wording from the base code (IRC).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local enforcement is created by this change

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**LIVE LOADS.** Those loads produced by the use and occupancy of the building or other structure and do not include construction or environmental loads such as wind load, snow load rain load, earthquake load, flood load or dead load.~~

LIVE LOADS. Those loads produced by the use and occupancy of the building or other structure and do not include construction or environmental loads such as wind load, snow load, rain load, earthquake load, flood load or dead load.

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Date Submitted	3/28/2010	**Section**	202 Shear Wall	**Proponent**	J Glenn-BASF
Chapter	2	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language.

Rationale

The base code (IRC) language provides better direction.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to local enforcement is created by this change.

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

None

Requirements

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

No change

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

Brings Florida in-line with nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

SHEAR WALL. A general term for walls that are designed and constructed to resist racking from seismic and wind by use of masonry, concrete, cold-formed steel or wood framing in accordance with Chapter 6 of this code and the associated limitations in Section R301.2 of this code.

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Date Submitted	3/30/2010	**Section**	318.4	**Proponent**	J Glenn-BASF
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Summary of Modification

Retain base code (IRC) language.

Rationale

The base code change provides more specific direction and restores the Florida Code to the nationally accepted practice.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact on local enforcement.

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

none

Requirements

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

No change

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

The base code change provides more specific direction and restores the Florida Code to the nationally accepted practice.

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

Does not discriminate against anything.

Does not degrade the effectiveness of the code

Does not degrade the code.

~~**R318.5.4 Foam plastic protection.** Extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).~~

~~Exceptions:~~

~~1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or pressure-preservative-treated wood.~~

~~2. When in addition to the requirements of Section R320.1, an approved method of protecting the foam plastic and structure from subterranean termite damage is used.~~

~~3. On the interior side of basement walls.~~

-

R318.4 Foam plastic protection. In areas where the probability of termite infestation is "very heavy" as indicated in Figure R301.2(6), extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or pressure-preservative-treated wood.

2. When in addition to the requirements of Section R318.1, an approved method of protecting the foam plastic and structure from subterranean termite damage is used.

3. On the interior side of basement walls.

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Date Submitted	4/2/2010	**Section**	R301.2.4.1, R322.1.1	**Proponent**	Christopher Jones
Chapter	3	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

4404

related proposal submitted just for A Zone.

Summary of Modification

Allow use of ASCE 24 as an alternative in Coastal A zones (where such areas are delineated, see R322.2).

Rationale

Coastal A Zone has wave heights between 1.5 ft and 3 ft (see R322.2), lead to wave damage to conventional construction. Inland extent of 1.5-ft wave may be delineated on revised FIRMs as Limit of Moderate Wave Action. ASCE 24 uses Coastal A Zones. Approved by ICC in Baltimore for 2012 IRC (RB17).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact because the provision allows – does not require – use of ASCE 24 as alternative to the prescriptive provisions of R322.2.

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

None, or positive, impact. Provision is an alternative, not a requirement. Where alternate is employed, 2006 and 2008 studies for FEMA have shown benefits (to owners) of freeboard required by ASCE 24 exceed costs of providing that freeboard.

Impact to industry relative to the cost of compliance with code

No impact. Provision is an alternate, not a requirement.

Requirements

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

Achieves protection of health, safety, and welfare of the general public, especially in areas where small waves contribute to damage, but minimally compliant foundations do not account for wave effects.

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

Electing to construct according to ASCE 24 provides improved methods and systems of construction in areas subject to small waves.

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

Materials, products, methods, and systems that comply with local floodplain management ordinances are not affected by this proposed modification.

Does not degrade the effectiveness of the code

Improves effectiveness of the code by allowing an alternative that addresses wave effects in Coastal A Zones.

1st Comment Period History 04/15/2010 - 06/01/2010

S4406-G1

Proponent	Joy Duperault	**Submitted**	5/27/2010	**Attachments**	No

Comment:

The FL Division of Emergency Management, Floodplain Management Office, recommends support for this proposal. This change only offers an alternative, which both designers and code officials made deem appropriate in some areas, for example where the flood depths or velocities are expected to be relatively high in which case prescriptive solutions may not be as applicable.

R301.2.4.1 Alternative provisions. As an alternative to the requirements in Section R322.3 for buildings and structures located in whole or in part in coastal high-hazard areas (V Zones) and Coastal A Zones, if delineated, ASCE 24 is permitted subject to the limitations of this code and the limitations therein.

R322.1.1 Alternative provisions. As an alternative to the requirements in Section R322.3 for buildings and structures located in whole or in part in coastal high-hazard areas (V Zones) and Coastal A Zones, if delineated, ASCE 24 is permitted subject to the limitations of this code and the limitations therein.

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Date Submitted	4/2/2010	**Section**	4301	**Proponent**	Christopher Jones
Chapter	43	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Summary of Modification

Correct and update references to FEMA technical bulletins.

Rationale

The FBC approved a recommendation to retain the flood provisions in the next edition of the Florida Building Code. The code should refer to the most recent reference standards. Approved by ICC in Baltimore for 2012 IRC (ADM39).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to Florida's communities that participate in the NFIP and administer floodplain management ordinances consistent with the NFIP regulations (44 CFR 60.3).

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

No impact. Owners must comply with local floodplain management ordinances adopted by Florida communities.

Impact to industry relative to the cost of compliance with code

No impact. Compliance with local floodplain management ordinances adopted by Florida communities is not affected.

Requirements

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

Achieves protection of health, safety, and welfare of the general public, the same bases for adoption and enforcement of local floodplain management ordinances.

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

These FEMA technical bulletins are the latest editions and the best available guidance on these topics.

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

Materials, products, methods, and systems that comply with local floodplain management ordinances are not affected by this proposed modification.

Does not degrade the effectiveness of the code

Improves effectiveness of the code by including the correct titles and the latest reference standards.

1st Comment Period History 04/15/2010 - 06/01/2010

S4392-G1

Proponent	Joy Duperault	**Submitted**	5/27/2010	**Attachments**	No

Comment:

The FL Division of Emergency Management, Floodplain Management Office, recommends support for this proposal. The updated technical bulletin includes an expanded list of materials that can be used as flood damage-resistant materials. This is not a technical change to the code.

FEMA-TB-2 ~~93~~ 08 Flood Damage-Resistant Materials Requirements

FEMA ~~FIA~~-TB-11-01 Crawlspace Construction for Buildings Located in Special Flood Hazard Areas

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4392_TextOfModification_1.png

Date Submitted	4/2/2010	**Section**	4301	**Proponent**	Christopher Jones
Chapter	43	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Summary of Modification

Correct and update references to FEMA technical bulletins.

Rationale

The FBC approved a recommendation to retain the flood provisions in the next edition of the Florida Building Code. The code should refer to the most recent reference standards. Approved by ICC in Baltimore for 2012 IRC (ADM39).

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact to Florida's communities that participate in the NFIP and administer floodplain management ordinances consistent with the NFIP regulations (44 CFR 60.3).

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

No impact. Owners must comply with local floodplain management ordinances adopted by Florida communities.

Impact to industry relative to the cost of compliance with code

No impact. Compliance with local floodplain management ordinances adopted by Florida communities is not affected.

Requirements

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

Achieves protection of health, safety, and welfare of the general public, the same bases for adoption and enforcement of local floodplain management ordinances.

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

These FEMA technical bulletins are the latest editions and the best available guidance on these topics.

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

Materials, products, methods, and systems that comply with local floodplain management ordinances are not affected by this proposed modification.

Does not degrade the effectiveness of the code

Improves effectiveness of the code by including the correct titles and the latest reference standards.

1st Comment Period History 04/15/2010 - 06/01/2010

S4393-G1

Proponent	Joy Duperault	**Submitted**	5/27/2010	**Attachments**	Yes

Comment:

The FL Division of Emergency Management, Floodplain Management Office, recommends support for this proposal. The updated FEMA technical bulletin #2 (uploaded) includes an expanded list of materials that can be used as flood damage-resistant materials. This is not a technical change to the code.

FEMA-TB-2 ~~93~~ 08 Flood Damage-Resistant Materials Requirements

FEMA ~~FIA~~-TB-11-01 Crawlspace Construction for Buildings Located in Special Flood Hazard Areas

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4393_TextOfModification_1.png



Flood Damage-Resistant Materials Requirements

for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program

Technical Bulletin 2 / August 2008

FEMA

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4393_G1_General_TB02_Materials_08_1.png

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Comments on the Technical Bulletins should be directed to:

Department of Homeland Security
FEMA Mitigation Directorate
500 C Street, SW.
Washington, D.C. 20472

Technical Bulletin 2-08 replaces Technical Bulletin 2-93, *Flood-Resistant Materials Requirements for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program.*

http://www.floridabuilding.org/Upload/Modifications/Rendered/Mod_4393_G1_General_TB02_Materials_08_2.png

Introduction

Protecting buildings that are constructed in special flood hazard areas (SFHAs) from damage caused by flood forces is an important objective of the National Flood Insurance Program (NFIP). In support of this objective, the NFIP regulations include minimum building design criteria that apply to new construction, repair of substantially damaged buildings, and substantial improvement of existing buildings in SFHAs. The base flood is used to delineate SFHAs on Flood Insurance Rate Maps (FIRMs) prepared by the NFIP. The base flood is the flood that has a 1-percent chance of being equaled or exceeded in any given year (commonly called the "100-year" flood). Certain terms used in this Technical Bulletin are defined in the Glossary.

Under the NFIP, the "lowest floor" is the floor of the lowest enclosed area of a building. An unfinished or flood-resistant enclosure that is used solely for parking of vehicles, building access, or storage is not the lowest floor, provided the enclosure is built in compliance with applicable requirements.

As used by the NFIP, an "enclosure" is an area that is enclosed on all sides by walls.

The NFIP defines a "basement" as any area that is below-grade on all sides. The regulations do not allow basements to extend below the BFE.

The NFIP regulations require the use of construction materials that are resistant to flood damage. The lowest floor of a residential building must be elevated to or above the base flood elevation (BFE), while the lowest floor of a non-residential building must be elevated to or above the BFE or dry floodproofed to the BFE.

All construction below the BFE is susceptible to flooding and must consist of flood damage-resistant building materials. The purpose of this Technical Bulletin is to provide current guidance on what constitute "materials resistant to flood damage" and how and when these materials must be used to improve a building's ability to withstand flooding.

Table 1 describes five classes of materials ranging from those that are highly resistant to floodwater damage, to those that have no resistance to flooding. Materials are broadly described as structural materials and finish materials based on how they are used in normal construction practices. Table 2 lists materials by generic names, and notes whether the materials are acceptable or unacceptable for use below the BFE. All building materials are in some way fastened or connected to the structure. Fasteners and connectors, as described in this Technical Bulletin, also must be resistant to flood damage.

A brief description of the process used to identify or determine whether the materials listed are flood damage-resistant is provided, followed by some simplified examples with diagrams to illustrate the use of these materials below the BFE. Three additional circumstances where flood damage-resistant materials are used or recommended are described: accessory structures, limited use of wet floodproofing, and buildings outside of SFHAs.

Questions about use of flood damage-resistant materials should be directed to the appropriate local official, NFIP State Coordinating Office, or one of the Federal Emergency Management Agency's (FEMA's) Regional Offices.

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NFIP Regulations

The NFIP regulations for flood damage-resistant materials are codified in Title 44 of the Code of Federal Regulations, in Section 60.3(a)(3), which states that a community shall:

> *"Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a floodprone area, all new construction and substantial improvements shall...(ii) be constructed with materials resistant to flood damage..."*

Proposals for substantial improvement of existing buildings in SFHAs, and proposals to repair those that have sustained substantial damage, must comply with the requirements for new construction. As part of issuing permits, community officials must review such proposals to determine whether they comply with the requirements, including the use of flood damage-resistant materials. Refer to the "Classification of Flood Damage-Resistant Materials" section of this Technical Bulletin for additional details. Further information on substantial improvement and substantial damage is found in *Answers to Questions About Substantially Damaged Buildings* (FEMA 213).

The NFIP Technical Bulletins provide guidance on the minimum requirements of the NFIP regulations. Community or State requirements that exceed those of the NFIP take precedence. Design professionals should contact the community to determine whether more restrictive provisions apply to the building or site in question. All other applicable requirements of the State or local building codes must also be met for buildings in all flood hazard areas.

Required Use of Flood Damage-Resistant Materials

Flood Damage-Resistant Material

"Flood [damage]-resistant material" is defined by the NFIP as "any building product [material, component or system] capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage." The term "prolonged contact" means at least 72 hours, and the term "significant damage" means any damage requiring more than cosmetic repair. "Cosmetic repair" includes cleaning, sanitizing, and resurfacing (e.g., sanding, repair of joints, repainting) of the material. The cost of cosmetic repair should also be less than the cost of replacement of affected materials and systems. In addition to these requirements, individual materials that are considered flood damage-resistant must not cause degradation of adjacent materials or the systems of which the material is a part.

The *International Building Code®* (IBC®), by reference to ASCE 24 *Flood Resistant Design and Construction*, and the *International Residential Code®* (IRC®), require the use of flood damage-resistant materials.

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All building materials below the BFE must be flood damage-resistant, regardless of the expected or historic flood duration. For example, buildings in coastal areas that experience relatively short-duration flooding (generally, flooding with a duration of less than 24 hours) must be constructed with flood damage-resistant materials below the BFE. As noted in Table 2, **only Class 4 and Class 5 materials are acceptable for areas below the BFE in buildings in SFHAs**.

In some instances, materials that are not flood damage-resistant materials, such as wiring for fire alarms and emergency lighting, are allowed below the BFE if specifically required to address life safety and electric code requirements for building access and storage areas.

How Flood Damage-Resistant Materials Affect Flood Insurance Rates

Careful attention to compliance with the NFIP regulations for flood damage-resistant materials is important during design, plan review, construction, and inspection. Compliance influences both the building's vulnerability to flood damage and the cost of NFIP flood insurance. Flood insurance will not pay a claim for finish materials located in basements or in enclosed areas below the lowest floor of elevated buildings, even if such materials are considered to be flood damage-resistant. NFIP claims for damage below the BFE are limited to utilities and equipment, such as furnaces and water heaters.

Classification of Flood Damage-Resistant Materials

The information in this Technical Bulletin was initially developed based on information in the U.S. Army Corps of Engineers' *Flood Proofing Regulations* (1995), and has been updated based on additional information from FEMA-funded studies and reports, technical experts, and industry and trade groups. Table 1 classifies building materials according to their ability to resist flood damage.

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Table 1. Class Descriptions of Materials

NFIP	Class	Class Description
ACCEPTABLE	5	Highly resistant to floodwater[1] damage, including damage caused by moving water.[2] These materials can survive wetting and drying and may be successfully cleaned after a flood to render them free of most harmful pollutants.[3] Materials in this class are permitted for partially enclosed or outside uses with essentially unmitigated flood exposure.
	4	Resistant to floodwater[1] damage from wetting and drying, but less durable when exposed to moving water.[2] These materials can survive wetting and drying and may be successfully cleaned after a flood to render them free of most harmful pollutants.[3] Materials in this class may be exposed to and/or submerged in floodwaters in interior spaces and do not require special waterproofing protection.
UNACCEPTABLE	3	Resistant to clean water[4] damage, but not floodwater damage. Materials in this class may be submerged in clean water during periods of flooding. These materials can survive wetting and drying, but may not be able to be successfully cleaned after floods to render them free of most[3] harmful pollutants.
	2	Not resistant to clean water[4] damage. Materials in this class are used in predominantly dry spaces that may be subject to occasional water vapor and/or slight seepage. These materials cannot survive the wetting and drying associated with floods.
	1	Not resistant to clean water[4] damage or moisture damage. Materials in this class are used in spaces with conditions of complete dryness. These materials cannot survive the wetting and drying associated with floods.

Notes:

1. Floodwater is assumed to be considered "black" water; black water contains pollutants such as sewage, chemicals, heavy metals, or other toxic substances that are potentially hazardous to humans.

2. Moving water is defined as water moving at low velocities of 5 feet per second (fps) or less. Water moving at velocities greater than 5 fps may cause structural damage to building materials.

3. Some materials can be successfully cleaned of most of the pollutants typically found in floodwater. However, some individual pollutants such as heating oil can be extremely difficult to remove from uncoated concrete. These materials are flood damage-resistant except when exposed to individual pollutants that cannot be successfully cleaned.

4. Clean water includes potable water as well as "gray" water; gray water is wastewater collected from normal uses (laundry, bathing, food preparation, etc.).

MODIFIED FROM: USACE 1995 *Flood Proofing Regulations*

Table 2 lists structural materials and finish materials commonly used in construction of floors, walls, and ceilings. For the purpose of this Technical Bulletin, structural materials and finish materials are defined as follows:

- **Structural materials** include all elements necessary to provide structural support, rigidity, and integrity to a building or building component. Structural materials include floor slabs, beams, subfloors, framing, and structural building components such as trusses, wall panels, I-joists and headers, and interior/exterior sheathing.

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- **Finish materials** include all coverings, finishes, and elements that do not provide structural support or rigidity to a building or building component. Finish materials include floor coverings, wall and ceiling surface treatments, insulation, cabinets, doors, partitions, and windows.

Notes Regarding Classification of Materials

The classifications in Table 2 are based on the best information available at the time of publication. However, flood damage-resistance is determined by factors that may be a function of the specific application and by the characteristics of the floodwaters. Each situation requires sound judgment and knowledge of probable contaminants in local floodwaters to select materials that are required to resist flood damage. For materials and products that are listed in Table 2, manufacturers' use and installation instructions must be followed to ensure maximum performance. Masonry and wood products used below the BFE must comply with the applicable standards published by the American Society for Testing and Materials (ASTM), the American Concrete Institute (ACI), the Truss Plate Institute (TPI), the American Forest & Paper Association (AF&PA), and other appropriate organizations.

1. **Materials Not Listed:** Table 2 does not list all available structural materials and finish materials. For materials and products not listed, manufacturers' literature (i.e., specifications, materials safety data sheets, test reports) should be evaluated to determine if the product meets flood damage-resistance requirements. Materials and products that are not listed in Table 2 may be used if accepted by the local official. Acceptance should be based on sufficient evidence, provided by the applicant, that the materials proposed to be used below the BFE will resist flood damage without requiring more than cosmetic repair and cleaning.

2. **Unacceptable Materials:** Class 1, 2, and 3 materials are unacceptable for below-BFE applications for one or more of the following reasons:

   - Normal adhesives specified for above-grade use are water soluble or are not resistant to alkali or acid in water, including groundwater seepage and vapor.
   - The materials contain wood or paper products, or other materials that dissolve or deteriorate, lose structural integrity, or are adversely affected by water.
   - Sheet-type floor coverings (linoleum, rubber tile) or wall coverings (wallpaper) restrict drying of the materials they cover.
   - Materials are dimensionally unstable.
   - Materials absorb or retain excessive water after submergence.

3. **Impact of Material Combinations:** In some cases, the combination of acceptable structural and finish materials can negatively impact the classification of individual materials. This is illustrated by the following examples:

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- Vinyl tile with chemical-set adhesives is an acceptable finish flooring material when placed on a concrete structural floor. However, when the same vinyl tile is applied over a plywood structural floor, it is no longer considered acceptable because the vinyl tile must be removed to allow the plywood to dry.

- Polyester-epoxy or oil-based paints are acceptable wall finishes when applied to a concrete structural wall. However, when the same paint is applied to a wood wall, it is no longer considered acceptable. Recent FEMA-supported studies by Oak Ridge National Laboratory have found that low-permeability paint can inhibit drying of the wood wall.

4. **Impact of Long-Duration Exposure and/or Contaminants:** The classifications of materials listed in Table 2 do not take into account the effects of long-duration exposure to floodwaters or contaminants carried by floodwaters. This is illustrated by the following examples:

   - Following Hurricane Katrina, FEMA deployed a Mitigation Assessment Team (MAT) to examine how building materials performed after long-duration exposure (2 to 3 weeks) to floodwaters (FEMA 549). The field survey revealed that some materials absorbed floodborne biological and chemical contaminants. However, it is not known at this time if a shorter duration flood event would have significantly altered the absorption rates of those contaminants.

   - Building owners, design professionals, and local officials should consider potential exposure to floodborne contaminants when selecting flood damage-resistant materials. For example, Table 2 lists cast-in-place concrete, concrete block, and solid structural wood (2x4s, etc.), as acceptable flood damage-resistant materials. However, experience has shown that buildings with those materials can be rendered unacceptable for habitation after being subjected to floodwaters with significant quantities of petroleum-based products such as home heating oil. Commonly used cleaning and remediation practices do not reduce the "off-gassing" of volatile hydrocarbons from embedded oil residues to acceptable levels that are established by the U.S. Environmental Protection Agency. Other materials, when exposed to these types of contaminants, may also not perform acceptably as flood damage-resistant materials.

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Table 2. Types, Uses, and Classifications of Materials

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Structural Materials (floor slabs, beams, subfloors, framing, and interior/exterior sheathing)							
Asbestos-cement board		■	■				
Brick							
Face or glazed		■	■				
Common (clay)		■		■			
Cast stone (in waterproof mortar)		■	■				
Cement board/fiber-cement board		■	■				
Cement/latex, formed-in-place	■			■			
Clay tile, structural glazed		■	■				
Concrete, precast or cast-in-place	■	■	■				
Concrete block[1]		■	■				
Gypsum products							
Paper-faced gypsum board		■			■		
Non-paper-faced gypsum board		■		■			
Greenboard		■				■	
Keene's cement or plaster		■			■		
Plaster, otherwise, including acoustical		■				■	
Sheathing panels, exterior grade		■			■		
Water-resistant, fiber-reinforced gypsum exterior sheathing		■		■			
Hardboard (high-density fiberboard)							
Tempered, enamel or plastic coated		■				■	
All other types		■					■
Mineral fiberboard		■					■
Oriented-strand board (OSB)							
Exterior grade	■	■				■	
Edge swell-resistant OSB	■	■				■	
All other types	■	■					■
Particle board	■						■
Plywood							
Marine grade	■	■	■				
Preservative-treated, alkaline copper quaternary (ACQ) or copper azole (C-A)	■	■		■			

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Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Structural Materials (floor slabs, beams, subfloors, framing, and interior/exterior sheathing)							
Preservative-treated, Borate[2]	■	■	■				
Exterior grade/Exposure1 (WBP – weather and boil proof)	■	■		■			
All other types	■	■					■
Recycled plastic lumber (RPL)							
Commingled, with 80-90% polyethylene (PE)	■		■				
Fiber-reinforced, with glass fiber strands	■		■				
High-density polyethylene (HDPE), up to 95%	■		■				
Wood-filled, with 50% sawdust or wood fiber	■				■		
Stone							
Natural or artificial non-absorbent solid or veneer, waterproof grout	■	■	■				
All other applications		■				■	
Structural Building Components							
Floor trusses, wood, solid (2x4s), decay-resistant or preservative-treated	■	■		■			
Floor trusses, steel[3]	■		■				
Headers and beams, solid (2x4s) or plywood, exterior grade or preservative-treated		■		■			
Headers and beams, OSB, exterior grade or edge-swell resistant		■				■	
Headers and beams, steel[3]		■	■				
I-joists	■					■	
Wall panels, plywood, exterior grade or preservative-treated		■		■			
Wall panels, OSB, exterior grade or edge-swell resistant		■				■	
Wall panels, steel[3]		■		■			

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Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Structural Materials (floor slabs, beams, subfloors, framing, and interior/exterior sheathing)							
Wood							
Solid, standard, structural (2x4s)		■		■			
Solid, standard, finish/trim		■			■		
Solid, decay-resistant[4]	■	■	■				
Solid, preservative-treated, ACQ or C-A		■		■			
Solid, preservative-treated, Borate[2]		■		■			
Finish Materials (floor coverings, wall and ceiling finishes, insulation, cabinets, doors, partitions, and windows)							
Asphalt tile[5]							
With asphaltic adhesives	■				■		
All other types	■						■
Cabinets, built-in							
Wood		■				■	
Particle board		■					■
Metal[3]		■		■			
Carpeting	■						■
Ceramic and porcelain tile							
With mortar set	■	■		■			
With organic adhesives	■	■				■	
Concrete tile, with mortar set	■		■				
Corkboard		■				■	
Doors							
Wood, hollow		■				■	
Wood, lightweight panel construction		■				■	
Wood, solid		■				■	
Metal, hollow[3]		■		■			
Metal, wood core[3]		■		■			
Metal, foam-filled core[3]		■		■			
Fiberglass, wood core		■		■			
Epoxy, formed-in-place	■		■				

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Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Finish Materials (floor coverings, wall and ceiling finishes, insulation, cabinets, doors, partitions, and windows)							
Glass (sheets, colored tiles, panels)		■		■			
Glass blocks		■	■				
Insulation							
Sprayed polyurethane foam (SPUF) or closed-cell plastic foams	■	■	■				
Inorganic – fiberglass, mineral wool: batts, blankets, or blown	■	■			■		
All other types (cellulose, cotton, open-cell plastic foams, etc.)	■	■				■	
Linoleum	■						■
Magnesite (magnesium oxychloride)	■						■
Mastic felt-base floor covering	■						■
Mastic flooring, formed-in-place	■		■				
Metals, non-ferrous (aluminum, copper, or zinc tiles)		■			■		
Metals							
Non-ferrous (aluminum, copper, or zinc tiles)		■			■		
Metals, ferrous[3]		■		■			
Paint							
Polyester-epoxy and other oil-based waterproof types		■		■			
Latex		■		■			
Partitions, folding							
Wood		■				■	
Metal[3]		■		■			
Fabric-covered		■					■
Partitions, stationary (free-standing)							
Wood frame		■		■			
Metal[3]		■		■			
Glass, unreinforced		■		■			
Glass, reinforced		■		■			
Gypsum, solid or block		■					■

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Table 2. Types, Uses, and Classifications of Materials (continued)

Types of Building Materials	Uses of Building Materials		Classes of Building Materials				
			Acceptable		Unacceptable		
	Floors	Walls/ Ceilings	5	4	3	2	1
Finish Materials (floor coverings, wall and ceiling finishes, insulation, cabinets, doors, partitions, and windows)							
Polyurethane, formed-in-place	■		■				
Polyvinyl acetate (PVA) emulsion cement	■						■
Rubber							
Moldings and trim with epoxy polyamide adhesive or latex-hydraulic cement		■		■			
All other applications		■					■
Rubber sheets or tiles[5]							
With chemical-set adhesives[6]	■		■				
All other applications	■						■
Silicone floor, formed-in-place	■		■				
Steel (panels, trim, tile)							
With waterproof adhesives[3]		■	■				
With non-waterproof adhesives		■				■	
Terrazo	■			■			
Vinyl asbestos tile (semi-flexible vinyl)[5]							
With asphaltic adhesives	■		■				
All other applications	■						■
Vinyl sheets or tiles (coated on cork or wood product backings)	■						■
Vinyl sheets or tiles (homogeneous)[5]							
With chemical-set adhesives[6]	■			■			
All other applications	■						■
Wall coverings							
Paper, burlap, cloth types		■					■
Vinyl, plastic, wall paper		■					■
Wood floor coverings							
Wood (solid)	■						■
Engineered wood flooring	■					■	
Plastic laminate flooring	■					■	
Wood composition blocks, laid in cement mortar	■					■	
Wood composition blocks, dipped and laid in hot pitch or bitumen	■					■	

Notes:

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1 Unfilled concrete block cells can create a reservoir that can hold water following a flood, which can make the blocks difficult or impossible to clean if the floodwaters are contaminated.

2 Borate preservative-treated wood meets the NFIP requirements for flood damge-resistantce; however, the borate can leach out of the wood if the material is continuously exposed to standing or moving water.

3 Not recommended in areas subject to salt-water flooding.

4 Examples of decay-resistant lumber include redwood, cedar, and black locust. Refer to Section 2303 of the International Building Code (IBC) and Section R324 of the International Residential Code (IRC) for guidance.

5 Using normally specified suspended flooring (i.e., above-grade) adhesives, including sulfite liquor (lignin or "linoleum paste"), rubber/asphaltic dispersions, or "alcohol" type resinous adhesives (culmar, oleoresin).

6 Examples include epoxy-polyamide adhesives or latex-hydraulic cement.

Fasteners and Connectors

The term "fasteners" typically refers to nails, screws, bolts, and anchors. The term "connectors" typically refers to manufactured devices used to connect two or more building components. Joist hangers, post bases, hurricane ties and clips, and mud-sill anchors are examples of connectors. Fasteners and connectors are materials and thus must be made of flood damage-resistant materials in order to comply with the NFIP requirements.

Specifications for fasteners and connectors used in buildings in SFHAs are in ASCE 24, a standard referenced by the IBC. Chapter 23 of the IBC has specific requirements for connections and fasteners used with wood, including preservative-treated wood. Similar specifications are in Chapter 3 of the IRC.

Table 2 does not specifically address fasteners and connectors. However, it is clear that the performance of buildings that are exposed to flooding is, at least in part, a function of the fasteners and connectors used to put the components together. When preservative-treated woods are used, particular attention is required for fasteners and connectors because some treatments are more corrosive than others, which could shorten the service life of the fasteners and connectors. For example, alkaline copper quaternary (ACQ) treatments are more corrosive than traditional acid copper chromate (ACC) treatments. If corrosion occurs, buildings are less likely to withstand flood loads and other loads. Fasteners and connectors made of stainless steel, hot-dipped zinc-coated galvanized steel, silicon bronze, or copper are recommended for use with preservative-treated wood.

This Technical Bulletin, consistent with ASCE 24 and the International Code Series, recommends that stainless steel or hot-dip galvanized fasteners and connectors be used below the BFE in both inland (noncorrosive) and coastal (corrosive) areas. In coastal environments where airborne salts contribute to corrosion, it is recommended that corrosion-resistant fasteners and connectors be used throughout the building where they may be exposed. For additional guidance, see Technical Bulletin 8, *Corrosion Protection for Metal Connectors in Coastal Areas*. Also see TPI/WTCA *Guidelines for Use of Alternative Preservative Treatments with Metal Connector Plates* for further guidance on metal plate connected wood trusses manufactured with preservative treated lumber (http://www.sbcindustry.com/images/PTWGuidelines.pdf).

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Construction Examples

Buildings in Zones A, AE, A1-A30, AR, AO, and AH

Figure 1 illustrates a solid foundation wall (crawlspace) elevated to meet the minimum requirement that the lowest floor be at the BFE. Figure 2 illustrates framed walls that may be used for enclosures below the BFE that are used for parking of vehicles, building access, and storage.

To maximize allowable use of enclosures below the BFE, it is a common practice to extend the foundation a full story, even though that puts the lowest floor well above the BFE. In such cases, while the NFIP requirement is that flood damage-resistant materials be used only below the BFE, it is strongly recommended that such materials be used for all construction below the lowest floor. This will reduce flood damage to the enclosed area in the event flooding exceeds the BFE. For additional guidance on enclosures in A zones, see Technical Bulletin 1, *Openings in Foundation Walls and Walls of Enclosures Below Elevated Buildings in Special Flood Hazard Areas*.

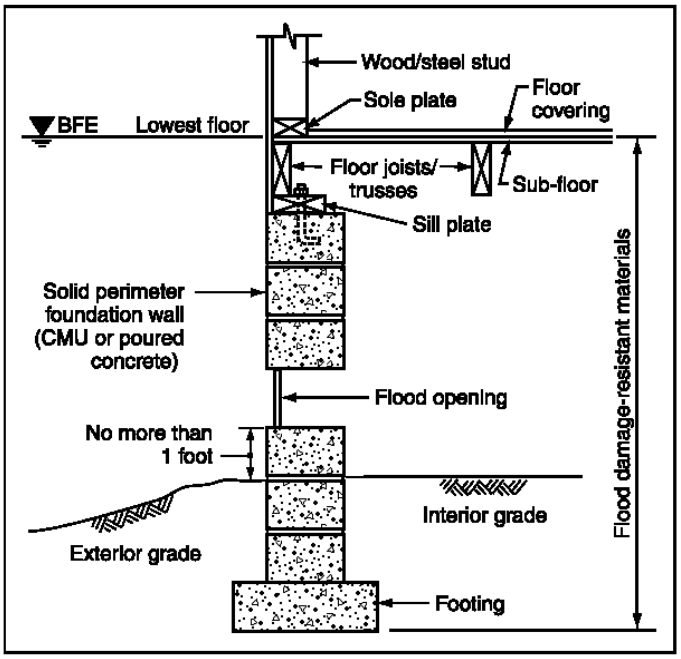


Figure 1. Building elevated on solid foundation walls meeting the minimum NFIP requirements for Zones A, AE, A1-A30, AR, AO, and AH

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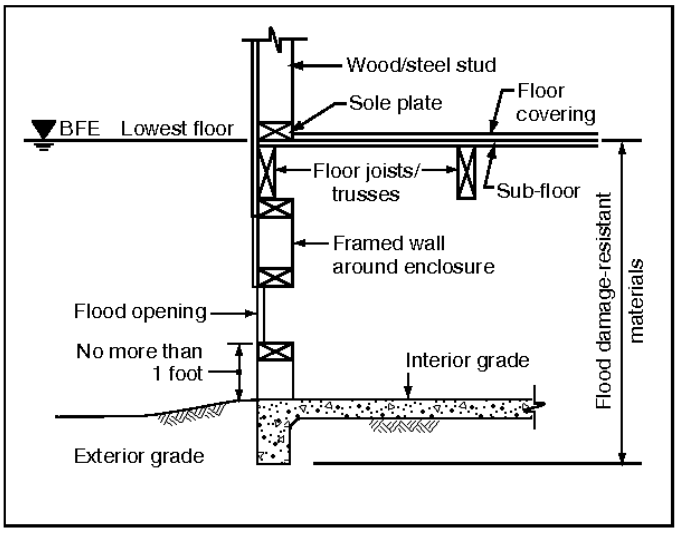


Figure 2. Framed enclosure under building elevated in accordance with NFIP requirements for Zones A, AE, A1-A30, A0, and AH

Buildings in Zones V, VE, and V1-V30

The NFIP regulations require that the bottom of the lowest horizontal structural member of the lowest floor (usually the floor beam or girder) of buildings in Zones V, VE, and Vl-V30 be at or above the BFE. Therefore, all materials below the bottom of those members must be flood damage-resistant materials. This requirement applies to lattice work and screening, and also to materials used to construct breakaway walls that enclose areas below the lowest floor. Depending on the design parameters selected, breakaway walls may remain in place during low-level floods and must be flood damage-resistant so that they can be readily cleaned and not deteriorate over time due to wetting. Figure 3 illustrates the requirement. For additional guidance on breakaway walls used to enclose areas under buildings in V zones, see Technical Bulletin 9, *Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings*.

Additional Uses of Flood Damage-Resistant Materials

Accessory Structures

Accessory structures may be allowed in SFHAs provided they are located, installed, and constructed in ways that comply with NFIP requirements. Some communities allow accessory structures that are limited to the uses specified for enclosures below the BFE: parking of vehicles and storage. As with other buildings, accessory structures below the BFE are required to be constructed with flood damage-resistant materials. In addition, accessory structures must be anchored to resist flotation, collapse, and lateral movement and comply with other requirements based on the flood zone. For additional information and requirements, contact the appropriate community permitting office.

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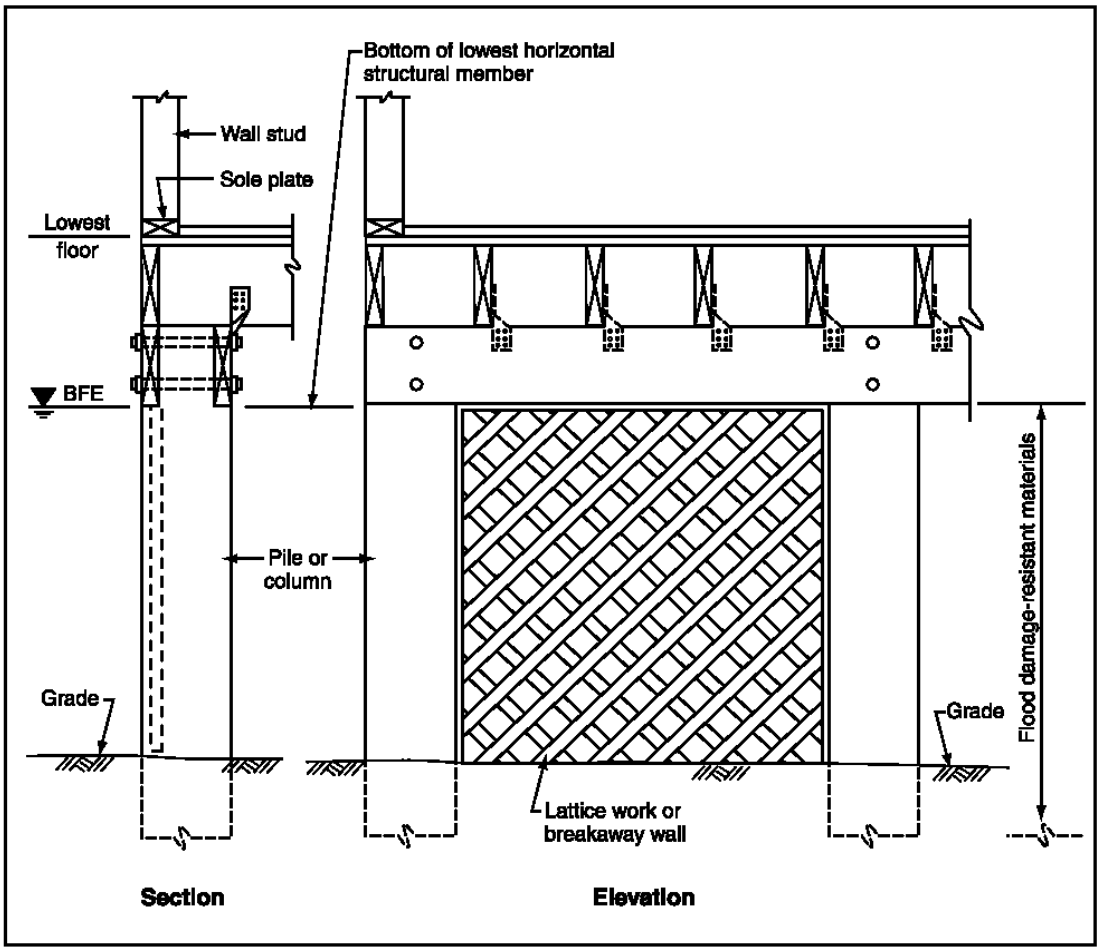


Figure 3. Flood damage-resistant building material requirements for buildings elevated in accordance with NFIP requirements for Zones V, VE, and V1-V30

Wet Floodproofing

Wet floodproofing is a method to reduce damage that typically involves three elements: allowing floodwaters to enter and exit to minimize structural damage, using flood damage-resistant materials, and elevating utility service and equipment. When a building is retrofitted to be wet floodproofed, non-flood damage-resistant materials that are below the BFE should be removed and replaced with flood damage-resistant materials. This will reduce the costs of repair and facilitate faster recovery.

Wet floodproofing is not allowed in lieu of complying with the lowest floor elevation requirements for new residential buildings (or dry floodproofing of nonresidential buildings in A zones). The exception is accessory structures, as noted on the previous page. Wet floodproofing may also be used to voluntarily retrofit buildings that are older than the date of the community's first FIRM (commonly referred to as "pre-FIRM"), provided the requirement to

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bring such buildings into compliance is not triggered (called "substantial improvement"). Figure 4 illustrates some suggested retrofitting of interior walls in a pre-FIRM building. However, please note that the techniques illustrated in Figure 4 cannot be used to bring a substantially damaged or substantially improved building into compliance with the NFIP. For additional information on wet floodproofing, see Technical Bulletin 7, *Wet Floodproofing Requirements*.

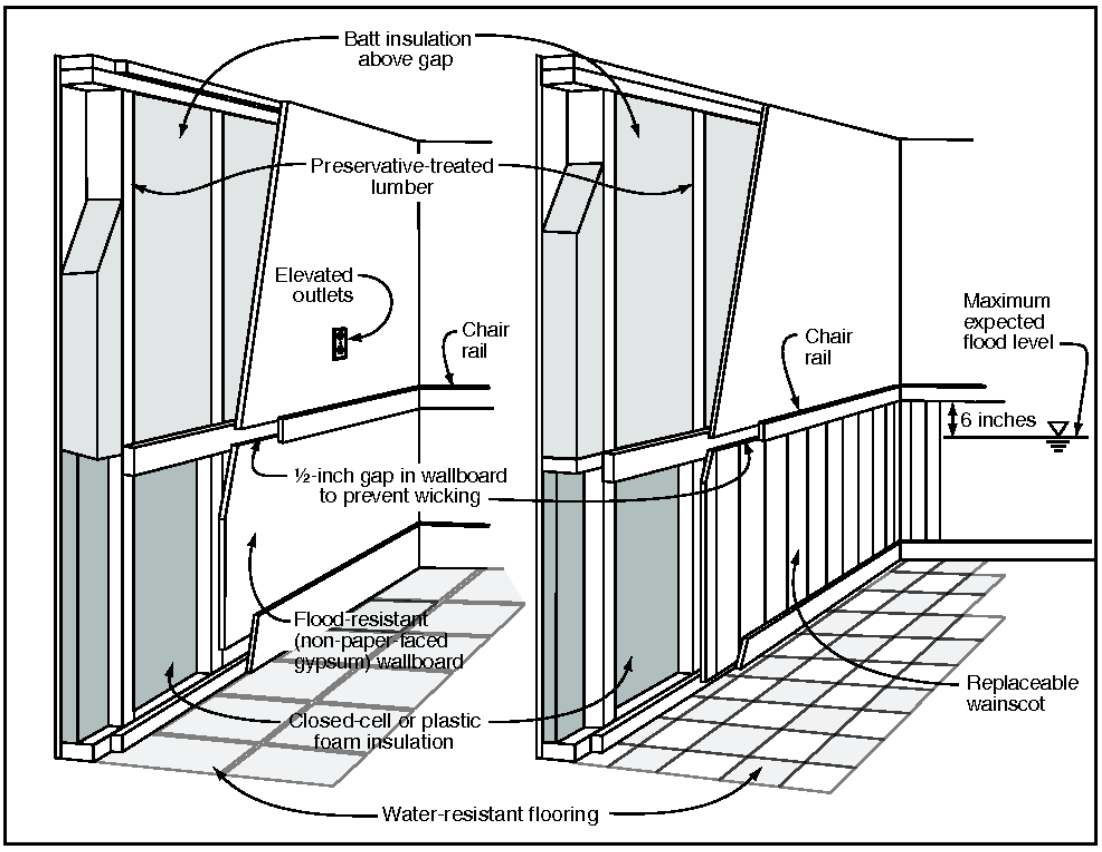


Figure 4. Partial wet floodproofing technique using flood damage-resistant materials for finished wall construction.

Buildings Outside of SFHAs

FEMA reports that up to 25 percent of NFIP flood insurance claims are paid on buildings that are outside of the mapped SFHA. This occurs for many reasons, including out-of-date maps and local drainage problems. In areas known to be prone to flooding that are not subject to the NFIP requirements, it is recommended that flood damage-resistant materials be used for construction of new buildings and for repair or renovation of existing buildings. Figure 4 illustrates some options.

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The NFIP

The U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968. The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as protection against flood losses, in exchange for State and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the Federal Government. If a community adopts and enforces adequate floodplain management regulations, FEMA will make flood insurance available within the community.

Title 44 of the U.S. Code of Federal Regulations contains the NFIP criteria for floodplain management, including design and construction standards for new and substantially improved buildings located in SFHAs identified on the NFIP's FIRMs. FEMA encourages communities to adopt floodplain management regulations that exceed the NFIP criteria. As an insurance alternative to disaster assistance, the NFIP reduces the escalating costs of repairing damage to buildings and their contents caused by floods.

NFIP Technical Bulletins

This is one of a series of Technical Bulletins that FEMA has produced to provide guidance concerning the building performance requirements of the NFIP. These requirements are contained in Title 44 of the U.S. Code of Federal Regulations at Section 60.3. The bulletins are intended for use by State and local officials responsible for interpreting and enforcing the requirements in their floodplain management regulations and building codes, and by members of the development community, such as design professionals and builders. New bulletins, as well as updates of existing bulletins, are issued periodically, as necessary. The bulletins do not create regulations; rather, they provide specific guidance for complying with the requirements of existing NFIP regulations. Users of the Technical Bulletins who need additional guidance should contact their NFIP State Coordinator or the appropriate FEMA regional office. *The User's Guide to Technical Bulletins* (http://www.fema.gov/pdf/fima/guide01.pdf) lists the bulletins issued to date.

Ordering Technical Bulletins

The quickest and easiest way to acquire copies of FEMA's Technical Bulletins is to download them from the FEMA website (http://www.fema.gov/plan/prevent/floodplain/techbul.shtm).

Technical Bulletins also may be ordered free of charge from the FEMA Publications Warehouse by calling 1-800-480-2520, or by faxing a request to 301-362-5355, Monday through Friday between 8 a.m. and 5 p.m. EST. Please provide the FEMA publication number, title, and quantity of each publication requested, along with your name, address, zip code, and daytime telephone number. Written requests may be also be submitted by mail to the following address:

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FEMA Publications
P.O. Box 2012
Jessup, MD 20794

Further Information

The following publications provide further information concerning the use of flood damage-resistant materials.

Algan, H. and Wendt, R. 2005. *Pre-Standard Development for the Testing of Flood-Damage-Resistant Residential Envelope Systems, Comparison of Field and Laboratory Results - Summary Report*, Oak Ridge National Laboratory, June 2005.

American Red Cross, FEMA. 1992. *Repairing Your Flooded Home*, FEMA 232, ARC 4477.

American Society of Civil Engineers, Structural Engineering Institute. 2005. *Flood Resistant Design and Construction*, ASCE/SEI 24-05.

American Society of Civil Engineers, Structural Engineering Institute. 2005. *Minimum Design Loads for Buildings and Other Structures*, ASCE/SEI 7-05.

Brick Institute of America, n.d. *Technical Notes for Brick Construction*, Brick Institute of America, McLean, Virginia.

California Integrated Waste Management Board. 2004. "Recycled Plastic Lumber," California Integrated Waste Management Board, web page, last updated June 22, 2004 (http://www.ciwmb.ca.gov/Plastic/Recycled/Lumber).

Department of Energy. 2005. *Energy-Efficient Flood-Damage-Resistant Home Reconstruction*, (http://www.ornl.gov/sci/res_buildings/FEMA-attachments/Flood_damage-reconstruction.pdf).

FEMA. 1991. *Answers to Questions About Substantially Damaged Buildings*, FEMA 213.

FEMA. 1993. *Wet Floodproofing Requirements*, Technical Bulletin 7-93, FIA-TB-7.

FEMA. 1996. *Corrosion Protection for Metal Connectors in Coastal Areas*, Technical Bulletin 8-96, FIA-TB-8.

FEMA. 2000. *Coastal Construction Manual*, FEMA 55CD (3rd edition).

FEMA. 2005. *Home Builder's Guide to Coastal Construction: Technical Fact Sheet Series*, FEMA 499.

FEMA. 2006. *Mitigation Assessment Team Report: Hurricane Katrina in the Gulf Coast*, FEMA 549.

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FEMA. 2007. *National Flood Insurance Program: Flood Insurance Manual*, Revised October 2007.

International Code Council, Inc. 2006. International Building Code®, IBC® 2006.

International Code Council, Inc. 2006. International Residential Code®, IRC® 2006.

Simpson Strong-Tie. 2008. *Technical Bulletin: Preservative-Treated Wood*, Simpson Strong-Tie T-PTWOOD08-R, July 2008 (http://www.strongtie.com/ftp/bulletins/T-PTWOOD08-R.pdf).

TPI/WTCA. 2004. TPI/WTCA *Guidelines for Use of Alternative Preservative Treatments with Metal Connector Plates*, updated June 4, 2007, (http://www.sbcindustry.com/images/PTWGuidelines.pdf).

U.S. Army Corps of Engineers. 1984. *Flood Proofing Systems and Techniques*, U.S. Army Corps of Engineers, December 1984.

U.S. Army Corps of Engineers. 1995. *Flood Proofing Regulations*, Chapters 9 and 10, U.S. Army Corps of Engineers, EP 1165-2-314.

Wood Truss Council of America (WTCA). 2005. *The Load Guide: Guide to Good Practice for Specifying and Applying Loads to Structural Building Components*, (http://www.sbcindustry.com/loads.php).

World Floor Covering Association (WFCA). n.d., Anaheim, California (http://www.wfca.org/index.html).

Glossary

Accessory structure — A structure that is on the same parcel of property as a principal structure, the use of which is incidental to the use of the principal structure.

Base flood — The flood having a 1-percent chance of being equaled or exceeded in any given year, commonly referred to as the "100-year flood." The base flood is the national standard used by the NFIP and all Federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development.

Base flood elevation (BFE) — The height of the base (1-percent annual chance or 100-year) flood in relation to a specified datum, usually the National Geodetic Vertical Datum of 1929, or the North American Vertical Datum of 1988.

Basement — Any area of a building having its floor subgrade (below ground level) on all sides.

Enclosure or enclosed area — Areas created by a crawlspace or solid walls that fully enclose areas below the BFE.

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Federal Emergency Management Agency (FEMA) — The Federal agency that, in addition to carrying out other activities, administers the National Flood Insurance Program.

Flood Insurance Rate Map (FIRM) — The official map of a community on which FEMA has delineated both the special flood hazard areas (SFHAs) and the risk premium zones applicable to the community.

Floodprone area — Any land area susceptible to being inundated by floodwater from any source.

Lowest floor — The lowest floor of the lowest enclosed area of a building, including a basement. Any NFIP-compliant unfinished or flood-resistant enclosure usable solely for parking of vehicles, building access, or storage (in an area other than a basement) is not considered a building's lowest floor, provided the enclosure does not render the structure in violation of the applicable design requirements of the NFIP.

Mitigation Directorate — The component of FEMA directly responsible for administering the flood hazard identification and floodplain management aspects of the NFIP.

Registered Design Professional — An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the State or jurisdiction in which the project is to be constructed.

Special Flood Hazard Area (SFHA) — An area delineated on a FIRM as being subject to inundation by the base flood and designated as Zone A, AE, A1-A30, AR, AO, AH, A99, V, VE, or V1-V30.

Substantial damage — Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. Structures that are determined to be substantially damaged are considered to be substantial improvements, regardless of the actual repair work performed.

Substantial improvement — Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure (or smaller percentage if established by the community) before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage," regardless of the actual repair work performed.

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Date Submitted	4/2/2010	**Section**	New Appendix	**Proponent**	Doug Harvey
Chapter	3316	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Withdrawn
Commission Action Pending Review

Related Modifications

Add code reference to chapter 35 including the edition date.

Summary of Modification

Add a new Appendix “XX” (Designation to be assigned)

Rationale

This standard provides an adoptable, contemporary set of prescriptive requirements that supplement the International Residential Code provisions. The prescriptive requirements are based on the latest engineering knowledge and are intended to provide minimum requirements to improve structural integrity and improve building envelope performance within the limitations in building geometry, materials, and wind climate specified.
See also the supporting file.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

This proposed change does not impact local enforcement, it merely provides an alternate path for design that adheres to the Florida Building Code and compliments the code in high wind regions

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

No fiscal impact to the building owner is anticipated

Impact to industry relative to the cost of compliance with code

No fiscal impact to the industry is anticipated

Requirements

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

This proposed change protects the health, safety and welfare by providing prescriptive paths for high wind regions

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

This proposed change improves the code for design consistency

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

This proposed change does not discriminate

Does not degrade the effectiveness of the code

This change does not degrade the effectiveness of the code

APPENDIX 'XX' (Designation to be assigned)

ICC 600-2008: Standard for Residential Construction in High-Wind Regions

The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance

SECTION (XX) 101

GENERAL

(XX) 101.1 Scope. The provisions of this appendix are applicable to all occupancies covered by the ICC 600-2008: Standard for Residential Construction in High-Wind Regions

(XX) 101.2 Intent. The intent of this appendix is to provide direction for communities located in high wind areas to have standards for design that will withstand an anticipated wind load. Prescriptive methods to provide wind-resistant designs and construction details for residential buildings of masonry, concrete, wood-framed or cold-formed steel framed construction sited in high-wind regions is provided.

(XX) 101.3 Requirements. The design of buildings shall be in accordance with the ICC 600-2008: Standard for Residential Construction in High-Wind Regions

Add the Following to Chapter 35 – references:

ICC

International Code Council, Inc.

500 New Jersey Avenue, NW

6th Floor

Washington, DC 20001

Standard Referenced: IGCC

Title: **ICC-600; Standard for Residential Construction in High-Wind Regions**

Reference in code section number: Appendix "XX" (To be assigned)

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Date Submitted	April 2, 2010
Mod Number	
Code Version	2010
Code Change Cycle	2010 Triennial Original Modifications 03/01/2010/-/04/02/2010
Sub-code	Residential
Chapter Topic	Appendix
Section	New Appendix, ICC 600-2008: Standard for Residential Construction in High-Wind Regions
Related Modification	Add code reference to chapter 35 including the edition date.
Affects HVHZ	No
Summary of modification	Add a new Appendix "XX" (Designation to be assigned)
Text of Modification	APPENDIX 'XX' (Designation to be assigned) ICC 600-2008: Standard for Residential Construction in High-Wind Regions The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance SECTION (XX) 101 GENERAL (XX) 101.1 Scope. The provisions of this appendix are applicable to all occupancies covered by the ICC 600-2008: Standard for Residential Construction in High-Wind Regions (XX) 101.2 Intent. The intent of this appendix is to provide direction for communities located in high wind areas to have standards for design that will withstand an anticipated wind load. Prescriptive methods to provide wind-resistant designs and construction details for residential buildings of masonry, concrete, wood-framed or cold-formed steel framed construction sited in high-wind regions is provided. (XX) 101.3 Requirements. The design of buildings shall be in accordance with the ICC 600-2008: Standard for Residential Construction in High-Wind Regions Add the Following to Chapter 35 – references: ICC International Code Council, Inc.

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	500 New Jersey Avenue, NW 6th Floor Washington, DC 20001 Standard Referenced: IGCC Title: ICC-600; Standard for Residential Construction in High-Wind Regions Reference in code section number: Appendix "XX" (To be assigned)
Rational	This standard provides an adoptable, contemporary set of prescriptive requirements that supplement the International Residential Code provisions. The prescriptive requirements are based on the latest engineering knowledge and are intended to provide minimum requirements to improve structural integrity and improve building envelope performance within the limitations in building geometry, materials, and wind climate specified. Prescriptive requirements and other details of construction for buildings sited in wind climates of 100 to 150 mph in 10 mph increments are provided by the adoption of this appendix.
Fiscal Impact statement	
Impact to Local Enforcement	This proposed change does not impact local enforcement, it merely provides an alternate path for design that adheres to the Florida Building Code and compliments the code in high wind regions
Impact to Building owner	No fiscal impact to the building owner is anticipated
Impact to Industry	No fiscal impact to the industry is anticipated
Requirements	
Has connection to health safety and Welfare	This proposed change protects the health, safety and welfare by providing prescriptive paths for high wind regions
Strengths or improves Code	This proposed change improves the code for design consistency
Does not discriminate	This proposed change does not discriminate
Does not degrade effectiveness of code	This proposed change does not degrade the effectiveness of the code.

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