Working Draft
Hurricane Mitigation Techniques
2/14/2008

The following is a proposed code change to incorporate the provisions of Rule 9B-3.0475, Hurricane Mitigation Retrofits for Existing Site-Built Single Family Residential Structures into the 2007 Florida Building Code:

FLORIDA BUILDING CODE, EXISTING BUILDING

Revise Chapter 2, Definition, to add a definition for the term "Site Built single – family residential structures" to read as follows:

Site built single- family residential structures. This term shall mean site built single family detached residential structures

Revise Chapter 6, Alteration –Level 1, to add a new section 611.7 to read as follows:

611.7 ~~**101.1**~~ When a roof covering on an existing site-built - single family residential structure is removed and replaced, the following procedures shall be permitted to be performed by the roofing contractor:

(a) Roof-decking attachment and fasteners shall be strengthened and corrected as required by Section 611.7.1 ~~201.1.~~

(b) A secondary water barrier shall be provided as required by section 611.7.2 ~~201.2~~.

Exception: Single family residential structures permitted subject to the Florida Building Code are not required to comply with this ~~Rule~~ section.

611.7.1 ~~**201.1**~~ **Roof decking** ~~**sheathing**~~ **fastening for site-built single family residential structures.** For site-built single family residential structures the ~~fasteners and spacing required in Table 201.1 are deemed to comply with the requirements of Section 507.2.2, of the 2004 Florida Building Code, Existing Building.~~

Fastening shall be in accordance with section 611.7.1.1 ~~201.1.1~~ or 611.7.1.2 ~~201.1.2~~. as appropriate for the existing construction. 8d nails shall be a minimum of 0.141 inch in diameter and shall be a minimum of 2-1/4 inch long to qualify for the provisions of this section for existing nails regardless of head shape or head diameter.

~~Board roof decking secured with at least two 8d nails into roof framing members shall be deemed to be sufficiently connected. Board roof decking secured with smaller fasteners than 8d nails or with fewer than two 8d nails per board shall be deemed sufficiently connected if two 8d clipped head, round head, or ring shank nails are in place on each framing member.~~

611.7.1.1 ~~**201.1.1**~~ Roof decking consisting of sawn lumber or wood planks up to 12" wide and secured with at least two nails (minimum size 8d) to each roof framing member it crosses shall be deemed to be sufficiently connected. Sawn lumber or wood plank decking secured with smaller fasteners than 8d nails or with fewer than two nails (minimum size 8d) to each framing member it crosses shall be deemed sufficiently connected if fasteners are added such that two clipped head, round head, or ring shank nails (minimum size 8d) are in place on each framing member it crosses.

611.7.1.2 ~~**201.1.2**~~ For roof decking consisting of wood structural panels, fasteners and spacing required in columns 3 and 4 of Table 611.7.1.2 ~~201.1.2~~ are deemed to comply with the requirements of Section 606.3 ~~507.2.2~~, *Florida Building Code, Existing Building* for the indicated design wind speed range. Wood structural panel connections retrofitted with a two part urethane based closed cell adhesive sprayed onto the joint between the sheathing and framing members are deemed to comply with the requirements of Section 606.3 ~~507.2.2~~, *Florida Building Code, Existing Building*, provided testing using the manufacturer's recommended application on panels connected with 6d smooth shank nails at no more than a 6-inch edge and 12-inch field spacing demonstrate an uplift resistance of a minimum of 200 psf.

Supplemental fasteners as required by Table 611.7.1.2 ~~201.1~~.2 shall be 8d ring shank nails with round heads and the following minimum dimensions:
1. 0.113-inch nominal shank diameter
2. Ring diameter a minimum of 0.012-inch greater than ~~over~~ shank diameter
3. 16 to 20 rings per inch
4. a minimum 0.280-inch full round head diameter
5. Ring shank to extend a minimum of 1 ½" from the tip of the nail.
6. Minimum 2-1/4 inch nail length

Table 611.7.1.2 ~~201.1~~
Supplement Fasteners at Panel Edges and Intermediate Framing

Existing fasteners	Existing spacing	Wind speed 110 mph or less supplemental fastener spacing shall be no greater than	Wind speed greater than 110 mph supplemental fastener spacing shall be no greater than
Staples or 6d	Any	6" o.c. [b]	6" o.c. [b]
8d clipped head, round head, or ring shank	6" o.c. or less	None necessary	None necessary
8d clipped head ~~or~~ round head **, or ring shank**	Greater than 6" o.c.	6" o.c. [a]	6" o.c. ~~[b]~~ [a]
~~8d round head ring shank~~	~~Greater than 6" o.c.~~	~~6" o.c.~~ [a]	~~6" o.c.~~ [a]

a. Maximum spacing determined based on existing fasteners and supplemental fasteners.
b. Maximum spacing determined based on supplemental fasteners only.

611.7.2 ~~201.2~~ Roof secondary water barrier for site-built single family residential structures. A secondary water barrier shall be installed using one of the following methods when roof covering is removed and replaced: ~~roofing replacement when reroofing.~~

a) All joints in structural panel roof sheathing or decking shall be covered with a minimum 4 in. wide strip of self-adhering polymer modified bitumen tape applied directly to the sheathing or decking. The deck and self adhering polymer modified bitumen tape shall be covered with one of the underlayment systems approved for the particular roof covering to be applied to the roof.

b) The entire roof deck shall be covered with an approved self-adhering polymer modified bitumen ~~cap~~ sheet. No additional underlayment shall be required on top of this ~~cap~~ sheet for new installations.

c) The entire roof deck shall be covered with an underlayment in accordance with section 1518.4 of the Florida Building Code, Building or R4402.7.4 of the Florida Building Code, Residential, or an approved asphalt impregnated 30# felt underlayment installed with nails and tin-tabs as required for the HVHZ. (No additional underlayment shall be required over the top of this sheet). This method shall be allowed outside the HVHZ.

d) Outside of the HVHZ, for slopes greater than 4:12, **an** underlayment complying with section 1507.2.3 of the Florida Building Code, Building or Section R905.2.3 of the Florida Building Code, Residential fastened as described below or a layer of asphalt impregnated approved #30 felt shall be installed. The felt is to be fastened with 1" round plastic cap or metal cap nails, attached to a nailable deck in a grid pattern of 12 inches (305 mm) staggered between the overlaps, with 6-inch (152 mm) spacing at the overlaps. For slopes of 2:12 to 4:12 ~~an additional~~ layer of felt shall be installed in a shingle-fashion and lapped 19" and fastened as described above. (No additional underlayment shall be required over the top of this sheet).

e) ~~3.~~ Application of a two-part urethane based closed cell spray-on adhesive to the attic side of the joints between the sheathing and along both sides of the truss top chords or rafters shall be deemed to meet the requirements for the secondary water barrier.

Exceptions:

1. Roof slopes < 2:12 having a continuous roof system shall be deemed to comply with section 611.7.2 ~~201.2~~ requirements for a secondary water barrier.

2. Clay and Concrete tile roof systems installed as required by the Florida Building Code are deemed to comply with the requirements of section 611.7.2 ~~201.2~~ for Secondary Water Barriers.

~~1. An asphalt impregnated 30# felt underlayment installed with nails and tin-tabs as required for the HVHZ and covered with either an approved self-adhering polymer modified bitumen cap sheet or an approved cap sheet applied using an approved hot-mop application shall be deemed to meet the requirements for the secondary water barrier.~~

611.8 ~~**101.2**~~ When a roof covering on an existing site-built-single-family residential structure is replaced on a building that is located in the wind-borne debris region as defined in ~~s. 1609.2 of~~ the Florida Building Code, Building and that has an insured value of $300,000 or more or, if the building is uninsured or for which documentation of insured value is not presented, has a just valuation for the structure for purposes of ad valorem taxation of $300,000 or more:

(a) Roof to wall connections shall be improved as required by Section 611.8.1 ~~201.3~~.

(b) Mandated retrofits of the roof-to-wall connection shall not be required beyond a 15 percent increase in the cost of re-roofing.

(c) Where complete retrofits of all the roof-to-wall connections as prescribed in Section 611.8.1 ~~201.3~~ would exceed 15 percent of the cost of the re-roofing project, the priorities outlined in Section 611.8.1.7 ~~201.3.7~~5 shall be used to limit the scope of work to the 15 percent limit.

Exception: Single family residential structures permitted subject to the Florida Building Code are not required to comply with this ~~Rule~~ section.

~~**201.3**~~ **611.8.1 Roof-to-wall connections for site-built single family residential structures.** Where required by Section 611.8 ~~101.2~~, the intersection of roof framing with the wall below shall ~~be strengthened by adding metal connectors, clips, straps, and fasteners such that the performance level equals or exceeds the uplift capacities as~~ provide sufficient resistance to meet the uplift loads specified in Table 611.8.1 ~~201.3~~ either because of existing conditions or through retrofit measures. As an alternative to an engineered design, the prescriptive retrofit solutions provided in Sections 611.8.1.1 ~~201.3.12~~ through 611.8.1.6 ~~201.3.45~~ shall be accepted as meeting the mandated roof-to-wall retrofit requirements.

Exceptions:
1. Where it can be demonstrated (by code adoption date documentation and permit issuance date) that roof-to-wall connections and/or roof-to-foundation continuous load path requirements were required at the time of original construction.

2. Roof- to- wall connections shall not be required unless evaluation and installation of connections at gable ends or all corners can be completed for 15% of the cost of roof replacement.

611.8.1.1 ~~201.3.1~~ Access for Retrofitting Roof to Wall Connections. These provisions are not intended to limit the means for gaining access to the structural elements of the roof and wall for the purposes of retrofitting the connection. The retrofit of roof to wall connections can be made by access through the area under the eave, from above through the roof, or from the interior of the house. Methods for above access include removal of roof panels or sections thereof or removal of portions of roof paneling at selected locations large enough for access, viewing, and installing the retrofit connectors and fasteners.

Where panels or sections are removed, the removed portions shall not be reused. New paneling shall be used and fastened as in new construction.

Holes shall be deemed adequately repaired if a patch of paneling is installed with no gap greater than ½ inch between the patch and the existing sheathing and if the patch is supported using one of the following methods.

a) Solid 1-1/2 inch lumber shall fully support the patch and shall be secured to the existing sheathing with #8 by 1-1/4 inch screws spaced a minimum of 3" around the perimeter with screws a minimum of ¾ inch from the near edge of the hole. The patch shall be secured to the lumber with #8 x 1-1/4 inch screws spaced on a grid no greater than 6 inches by 6 inches with no fewer than 2 screws.

b) Holes that extend horizontally from roof framing member to adjacent roofing framing member that are less than or equal to 7" wide along the slope of the roof shall be supported by minimum of 2x4 lumber whose face is attached to each roofing framing members using a minimum of 2 each 3-inch long fasteners (#8 screws or 10d common nails) connecting the two. The patch shall have attached to its bottom running horizontally a minimum 2x4 either flat wise or on edge secured with #8 x 1-1/4 inch screws a maximum of 4 inches on center and no more distant from the end of the added lumber than 3 inches. The patch shall be secured with two #8 x 1-1/4 inch screws to each support member.

611.8.1.2 **~~201.3.2~~ Partially inaccessible straps:** Where part of a strap is inaccessible, if the portion of the strap that is observed is fastened in compliance with these requirements, the inaccessible portion of the strap shall be presumed to comply with these requirements.

611.8.1.3 **~~201.3.3~~1 Prescriptive method for gable roofs on a wood frame wall.** ~~Sufficient eave sheathing shall be removed to expose a minimum of 6-feet of framing members, measured from the corner, along the exterior wall on each side of each gable end~~. The anchorage of each of the exposed rafters or truss within 6 ft of ~~the framing members as measured from~~ 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. 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. Wherever access makes it possible (without damage of the wall or soffit finishes), both top plate members shall be connected to the stud below using a stud to plate connector with a minimum uplift capacity of 500 lbs. Use of straps that connect directly from the rafter or truss to the wall stud below shall be allowed as an alternate provided the two members align with no more than 1-1/2" offset.

611.8.1.4 **~~201.3.~~42 ~~Prescriptive method for gable roofs on a masonry wall.~~** ~~Sufficient eave sheathing shall be removed to expose a minimum of 6-feet of framing members, measured from the corner, along the exterior wall on each side of each gable end~~. The anchorage of each of the exposed rafters or truss within 6 ft of ~~the framing members as measured from~~ 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 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.

611.8.1.5 **201.3.~~5~~53 Prescriptive method for hip roofs on a wood frame 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 ~~Sufficient corner eave sheathing shall be removed from the side of the hip ridge parallel to the roof ridge to provide access to a minimum 6-foot length of the exterior wall. The hip ridge board and any exposed rafters~~ that are not anchored with a strap having at least four fasteners on each end, shall be connected to the top plate below using a strap or a right angle gusset bracket having 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. Wherever access makes it possible (without damage of the wall or soffit finishes), both top plate members shall be connected to the stud below using a stud to plate connector with a minimum uplift capacity of 500 lbs. Use of straps that connect directly from the hip rafter, hip girder or adjacent rafters/trusses to the wall stud below shall be allowed as an alternate provided the two members align with no more than 1-1/2" offset.

611.8.1.6 **~~201.3.~~64 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 ~~Sufficient corner eave sheathing shall be removed from the side of the hip ridge parallel to the roof ridge to provide access to a minimum 6-foot length of the exterior wall. The hip ridge board and any exposed rafters~~ 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 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, 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.

611.8.1.7 ~~**201.3.65**~~ **Priorities for mandated roof-to-wall retrofit expenditures.** Priority shall be given to connecting the exterior corners of roofs to walls where the spans of the roofing members are greatest. For houses with both hip and gable roof ends, the priority shall be to retrofit the gable end roof-to-wall connections unless the width of the hip end is more than 1.5 times greater than the width of the gable end. ~~Priority shall be given to connecting the corners of roofs to walls below where the spans of the roofing members are greatest.~~

Table 611.8.1 ~~201.3~~
REQUIRED UPLIFT CAPACITIES FOR ROOF-TO-WALL CONNECTIONS
(POUNDS PER LINEAR FOOT)

	BASIC WIND SPEED	ROOF SPAN (FEET)							OVERHANGS
		12	20	24	28	32	36	40	
Within 6 feet of building corner	85	-69.85	-116.42	-139.70	-162.99	-186.27	-209.55	-232.84	-27
	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
	170	-387.40	-645.67	-774.81	-903.94	-1033.08	-1162.21	-1291.35	-108
Greater than 6 ft from building corner	85	-39.10	-65.17	-78.20	-91.24	-104.27	-117.30	-130.34	-27
	90	-48.20	-80.33	-96.39	-112.46	-128.52	-144.59	-160.66	-30.3
	100	-67.95	-113.24	-135.89	-158.54	-181.19	-203.84	-226.49	-37.4
	110	-89.78	-149.63	-179.55	-209.48	-239.40	-269.33	-299.25	-45.3
	120	-113.68	-189.47	-227.37	-265.26	-303.16	-341.05	-378.94	-53.9
	130	-139.67	-232.78	-279.34	-325.90	-372.45	-419.01	-465.57	-63.2
	140	-167.74	-279.56	-335.47	-391.38	-447.29	-503.21	-559.12	-73.3
	150	-197.88	-329.80	-395.76	-461.72	-527.68	-593.64	-659.60	-84.2
	170	-264.41	-440.68	-528.81	-616.95	-705.08	-793.22	-881.35	-108

Florida Building Code, Building

Chapter 1, Administration

~~**101.3**~~ 105.15 When any activity requiring a building permit that is applied for on or after July 1, 2008, and for which the estimated cost is $50,000 or more for a building that is located in the wind borne debris region as defined in ~~s. 1609.2 of~~ the Florida Building Code~~, Building~~ and that has an insured value of $750,000 or more, or, if the building is uninsured or for which documentation of insured value is not presented, has a just valuation for the structure for purposes of ad valorem taxation of $750,000 or more.

Opening protections as required within the Florida Building Code, Building or Florida Building Code, Residential for new construction shall be provided.

[Appendix A Gable and Wall Bracing Retrofit has been omitted and will be provided later
The Committee at the last meeting deferred action for Richard Reynolds to provide language necessary to incorporate the appendix as a Chapter in the Existing Building Volume**.]**