

SECTION 1525 [Florida Building Code] HIGH VELOCITY HURRICANE ZONES - REQUIRED OWNERS NOTIFICATION FOR ROOFING CONSIDERATIONS

§1525.1 - 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 Chapter 15 of the Florida Building Code, Building govern the minimum requirements and standards of the industry for roofing system installations. Additionally, the following items should be addressed as part of the agreement between the owner and the contractor. The owner's initial in the designated space indicates that the item has been explained.

- 1. Aesthetics-Workmanship: The workmanship provisions of Chapter 15 (High Velocity Hurricane Zone) are for the purpose of providing that the roofing system meets the wind resistance and water intrusion performance standards. Aesthetics (appearance) are not a consideration with respect to workmanship provisions. Aesthetic issues such as color or architectural appearance, that are not part of a zoning code, should be addressed as part of the agreement between the owner and the contractor.
- 2. Renailing Wood Decks: When replacing roofing, the existing wood roof deck may have to be renailed in accordance with the current provisions of Chapter 16 (High Velocity Hurricane Zones) of the [Code]. (The roof deck is usually concealed prior to removing the existing roof system).
- 3. Common Roofs: Common roofs are those which have no visible delineation between neighboring units (i.e., townhouses, condominiums, etc.). In buildings with common roofs, the roofing contractor and/or owner should notify the occupants of adjacent units of roofing work to be performed.
- 4. Exposed cellings: Exposed, open beam ceilings are where the underside of the roof decking can be viewed from below. The owner may wish to maintain the architectural appearance; therefore, roofing nail penetrations of the underside of the decking may not be acceptable. [The Code] provides [an alternate for] maintaining this appearance.
- 5. Ponding Water: The current roof system and/or deck of the building may not drain well and may cause water to pond (accumulate) in low-lying areas of the roof. Ponding can be an indication of structural distress and may require the review of a professional structural engineer. Ponding may shorten the life expectancy and performance of the new roofing system. Ponding conditions may not be evident until the original roofing system is removed. Ponding conditions should be corrected.
- __6. Overflow Scuppers (wall outlets): It is required that rainwater flow off so that the roof is not overloaded from a buildup of water. Perimeter/edge walls or other roof extensions may block this discharge if overflow scuppers (wall outlets) are not provided. It may be necessary to install overflow scuppers in accordance with the requirements of: [Chapter 16].
- _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.

Owner's/Agent's Si	gnature
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Date

Contractor's Signature

%CHPDC1\DEPARTMENT\Building - Zoning\Forms\Form Section 1524.doc

11/17/05



SUPPLEMENTAL ROOF APPLICATION FOR HURRICANE MITIGATION AS PER FLORIDA STATUTE 553.844

SINGLE FAMILY HOUSES

Job address

Year house was built_____ Insured or taxation value \$____

(Building only)

Renailing Requirements

Supplemental fasteners at panel edges and intermediate framing Existing East

g r dotoriers	Existing Spacing	Wind anord
	g - p doning	wind speed greater than 110 mph
		supplemental fasteners shall be me
01		the new concerters shall be no
Staples or 6d	A	greater than
8d clipped head round have	Any	6"
a chipped nead, round nead, or ring	6" or loss	ОО.С. Б
shank	0 01 1655	None necessary
8d olipped by 1		in the house any
ou clipped head, round head, or ring	Greater the or	
shank	Greater than 6" o.c. a	6"
		U U.C.

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

b. Maximum spacing determined based on supplemental fasteners only.

Secondary Water Barrier Requirements

The entire roof deck shall be covered with an approved asphalt impregnated 30# felt underlayment installed with nails and tin caps as required for the HVHZ of the Florida Building Code. No additional underlayment shall be required over the top of this sheet.

Roof -to-wall connections

If required*, Method of roof -to- wall remediation:

*If house or addition was built under the Code prior to March 1, 2002 and the value of the building is

Note: Any work done to wall-to-roof connection shall be under a separate application by a licensed General Contractor, Building Contractor, or Residential Contractor, or persons certified under FS 468

REQUIREMENTS FOR SUPPLEMENTAL FASTENERS AND SECONDARY WATER BARRIER

Florida Existing Building Code

	Supplemental Fa	able 201.1 - (HVHZ) Asteners at Panel Edges and) I Intermediato Emania -
	Existing Fasteners	Existing Spacing	Wind speed greater than 110 mph supplemental fastones
	Staples or 6d	Amu	shall be no greater than
	8d clipped head, round head, or ring shank	6" or less	6" о.с. ь None necessary
	8d clipped head or round head	Greater than 6" o.c.	6" О.С. ь
	Per EBC 2220 0 0	Greater than 6" o.c.	6"
	1 - 61 - 60 - 2322.2.8, minimu	Im nail spacing shall be	0 0.C.a
	CTURES: A secondary water barrier shall	BARRIER FOR SITE-BI	UILT SINGLE FAMILY RESIDENTIA
o i RU roofinį	CTURES: A secondary water barrier shal g:	BARRIER FOR SITE-BI	UILT SINGLE FAMILY RESIDENTIA of the following methods when re-
oofing) All j) nimu eckin nderla An a VHZ a	CTURES: A secondary water barrier shal points in roof sheathing or decking um 40 mil. self-adhering polymer g. The deck and adhering polymer ayment systems approved for the sphalt impregnated 30# felt under and covered with either an appro-	SARRIER FOR SITE-BI I be installed using one g shall be covered with a modified bitumen tape er bitumen tape shall be particular roof covering erlayment installed with by ed self-adhering polym	UILT SINGLE FAMILY RESIDENTIA of the following methods when re- a minimum 4 inch wide strip of applied directly to the sheathing or a covered with one of the g to be applied to the roof. nails and tin tabs as required for the ner modified bitumen can sheat an



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City of Pembroke Pines

ROOF TO WALL CONNECTION AFFIDAVIT*

Pe	ermit Number;		
	Above sumbar	Job Number:	
	Lot	Block	& Subdivision
N	ame of Company:		& Subdivision
Ac	ddress:		
Cit	ty/State/Zip:		
- Co	ontact Number:		
Na	me of Qualifier (Print)		
Lice	ense Number:		
١,			
		, do hereby affirm:	
That I the ro metho	I have personally inspected the roof to wall connections as ofing permit referenced above and further state that the cor ods. Initial one or all that apply:	required by the Florida Existing mections comply with one or m	Building Code section101.2 for
	Roof complies, no alterations needed		interiority prescriptive
	Connections by engineered design, sealed copy attach	ed.	
	201.3.1 Prescriptive method for gable roofs on a wood	frame wall	
	201.3.2 Prescriptive method for gable roofs on a masor	ry wall	
	201.3.4 Prescriptive method for hip roofs on a wood fran	ne wali	
	101.0.4 Plescriptive method for hip roofs on a masonry	wall	
101.2 V Florida documa \$300,00 a) Roof i b) Mandi c) Where the re-rou *Inspection a register	When a roof covering is replaced on a building that is local Building code, and that has an insured value of \$300,0 intation of insured value is not present, has a just valuati to or more: to wall connections shall be improved as required by 201.3 lated retrofits of roof-to-wall connection shall not be required e complete retrofits of all the roof-to-wall connections as pri- ofing project, the priorities outlined in Section 201.3.5 shall b on for this purpose shall only to be done by a licensed Gene red Architect or Engineer, or persons certified under FS 468.	ted in the wind borne region 100 or more or, if the buildin on for the structure for purpo beyond 15% of the cost of the escribed in Section 201.3 woul e used to limit the scope of wo rral, Residential, or Building Co	as defined in s.1609.2 of the 19 is uninsured or for which se of ad valorem taxation of roofing. d exceed 15% of the cost of tk to the 15% limit.
Qualifie	r/Contractor - Signature		
State		Date:	
County)	of Broward		
SWORN to a	and subscribed before me this day of		
	, who is known to me or who p	resented as ID	by
	Notary Pub	lic, State of Florida	



RE-NAILING AFFIDAVIT

A secondary water barrier is deemed to		
in field and in accordance with the High Velocity Wind	an approved 30# fel Zone of the Florida I	t nailed 6" at laps and 2 rows at 12 Building Code
Permit Number		Schiding Code.
	Job Number:	
(Above numbers can be found on permit card) Lot	Block	
Name of Company:	Diock	& Subdivision
Address:		
City/State/Zip:		
Contact Number:		
Name of Qualifier (Print)		
License Number:		
1		
.,	. do hereby office	
101.1 Mandatory in-process inspection for the re-nailin required. However, if the Building Department cannot make said i Professional Engineer, Registered Architect, Licensed General Cor Contractor, or persons certified under FS 468, in the form of a nota the Building Official, attesting to the fact that the nailing of the sheat he standards of this Code. When existing roofs are re-roofed to the point that the exist pof sheathing shall be re-nailed and a secondary water barrier instal upplemental document for nailing requirements and secondary water	Solution for Hurricane M g of roof sheathing ar nspection a letter subm ntractor, Building Contra rized affidavit including hing and the secondary sting roofing is removed led in compliance with (r barrier options.	down to the secondary water barrie titgation. and secondary water barrier shall be hitted by one of the following; Florida actor, Residential Contractor, Roofing license number, shall be submitted to water barrier has been brought up to down to the sheathing, the existing Code Sections 201.1 and 201.2. See
Qualifier/Contractor - Signature	Date:	
ite)of Florida unty)of Broward		
ORN to and subscribed before me thisdav of		
, who is known to me or who p	resented as ID	by
Notary Put	olic, State of Florida	



ROOF TO WALL CONNECTIONS FOR SITE-BUILT SINGLE FAMILY REDSIDENTIAL STRUCTURES GUIDELINES

201.3 Where required by section 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 specified in table 201.3. As an alternative to an engineered design, the prescriptive retrofit solutions provided in Section 201.3.1 through 201.3.4 below shall be accepted as meeting the mandated roof-to-wall retrofit

201.3.1 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 shall be inspected. Wherever a strap is missing or an existing strap has less than 4 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 providing the strap is manufactured to accommodate at least 4 fasteners. Wherever access makes it possible (without damage to 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

201.3.2 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 shall be inspected. Wherever a strap is missing or an existing strap has less than 4 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 approve masonry screws that will provide at least a 2- 1/2 inch 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 ½ inch embedment into the concrete or 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

201.3.3 Prescriptive method for hip roofs on a wood frame wall. 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 4 fasteners on each end, shall be connected to the top plate below using a strap or 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 providing the strap is manufactured to accommodate at least 4 fasteners. Wherever access makes it possible (without damage to 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

201.3.4 Prescriptive method for hip roofs on a masonry wall. 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 4 fasteners on each end, shall be connected to the concrete wall below using a strap or 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 providing the strap is manufactured to accommodate at least 4 fasteners at each end. The straps or right angle gusset bracket shall be installed such that they connect each rafter or truss to the top plate below or directly to the masonry wall using approve masonry screws that will provide at least a 2- 1/2 inch 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 % inch diameter masonry screws, each with supplementary 1/2 -inch washer, having sufficient length to develop a 2 ½ inch embedment into the concrete or 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

201.3.5 Priorities for mandated roof to wall retrofit expenditures. 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 connection the corners of roofs to walls below where the spans of the

ADDETOP EQUIPMENT AFFIDACION Dof #	All roofing applications requi with the High Velocity Hurrica	ard, Pembroke Pines, Florida 33 435-6502 Fax: (954) 435-674 re this Rooftop Equipment ne Zone Uniform Permit Ap	026 9 Affidavit along
Iob #:			plication Form.
Lot: Block: Company Name:	Job #: Subdivision:	Application #:	
Address:	Company Name	Block	· · · · · · · · · · · · · · · · · · ·
ame of Qualifier: License #: there any equipment on the rooftop? No Yes If Yes: Is there an existing code-approved curb or stand? Yes If Yes: Is there an existing code-approved curb or stand? In the provide the equipment are required. These plans must be attachment of stand/curb to roof and to the equipment are required. These plans must be attachment of stand/curb to roof and to the equipment are required. These plans must be or addition of a curb or stand, the Planning Division may determine that alteration of an alteration or addition of a curb or addition of a screening device may be required. exere any electrical work to be completed? Date if er/Contractor Signature Date Wame of person signing document / / / to (or affirmed) and subscribed before me this / / / / iersonally known OR Produced ID	Address:		
License #: there any equipment on the rooftop? No Yes If Yes: Is there an existing code-approved curb or stand? Yes If Curb or stand is proposed, two (2) copies of plans sealed by an engineer showing the according to Florida Building Code Section 1525 in its entirety. Upon submittal of an alteration or a active or stand, the Planning Division may determine that alteration of an alteration of a screening device may be required. existing screening device or addition of a screening device may be required. erer any electrical work to be completed? Io Yes Iffer/Contractor Signature Date Wame of person signing document to (or affirmed) and subscribed before me this ////////////////////////////////////	ame of Qualifier:		
there any equipment on the rooftop? No Yes If Yes: Is there an existing code-approved curb or stand? Yes No If Curb or stand is proposed, two (2) copies of plans sealed by an engineer showing the attachment of stand/curb to roof and to the equipment are required. These plans must be or addition of a curb or stand, the Planning Division may determine that alteration of an alteration or addition of a curb or stand, the Planning Division may determine that alteration of an existing screening device or addition of a screening device may be required. ere any electrical work to be completed?		License #:	
Name of person signing document to (or affirmed) and subscribed before me this / bersonally knownOR Produced ID lic Signature	If Yes: Is there an existing code-approvide the stand is proposed, two (2) copies attachment of stand/curb to prof and to the	yed curb or stand? Yes	
Name of person signing document	If Yes: Is there an existing code-appro- if curb or stand is proposed, two (2) copies attachment of stand/curb to roof and to the according to Florida Building Code Sectior or addition of a curb or stand, the Planning existing screening device or addition of a s here any electrical work to be completed? No Yes If Yes: An electrical permit a	yed curb or stand? Yes s of plans sealed by an engineer s equipment are required. These p 1525 in its entirety. Upon submit Division may determine that alters creening device may be required.	No nowing the lans must be al of an alteration ition of an
tic Signature Notary Seal:	If Yes: Is there an existing code-appro- if curb or stand is proposed, two (2) copies attachment of stand/curb to roof and to the according to Florida Building Code Sectior or addition of a curb or stand, the Planning existing screening device or addition of a s here any electrical work to be completed? No Yes If Yes: An electrical permit a lifier/Contractor Signature	ved curb or stand? Yes of plans sealed by an engineer si equipment are required. These p 1525 in its entirety. Upon submit Division may determine that altera creening device may be required. Application is needed.	No nowing the lans must be al of an alteration tion of an
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Florida Building Code Edition 2004 High Velocity Hurricane Zone Uniform Permit Application Form

INSTRUCTION PAGE

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

Roof System	Required Sections of the Permit Application Form	Attachments Required
Low Slope Application	ABC	(See List Below)
Prescriptive BUR-RAS 150		1,2,3,4,5,6,7
	A,B,C	4587
Asphaltic Shingles	A.B.D	4,0,0,1
Concrete or Clay Tile		1,2,4,5,6,7
	A,B,D,E	1.2.34567
Metal Roofs	ABD	-,=,0,4,0,0,7
Wood Shingles and Shakes		1,2,3,4,5,6,7
	A,B,D	1.2.4.5.6.7
Jther	As Applicable	· ,=, +, 0, 0, /
	encaple	1,2,3,4,5,6,7

1.	Fire Directory Listing Page
2.	From Notice of Acceptance: Front Page Specific System Description Specific System Limitations General Limitations Applicable Detail Drawings
3.	Design Calculations per Chapter 40
4.	Other Component Notice of Assess
5.	Municipal Permit Application
6.	Owners Notification for Booting
7.	Any Required Roof Testing/Calculation Documentations (Re-Roofing Only)

Contractor's Name Job Address Job Address Low Slope	
Job Address	
ROOF CATEGORY Low Slope Mechanically Fastened Tile Mortar/Adhesive Set Tile Asphaltic Metal Panel/Shingles Wood Shingles/Shakes Shingles Prescriptive BUR-RAS 150 Wood Shingles/Shakes New Roof Re-Roofing Recovering Repair	
□ Low Slope □ Mechanically Fastened Tile □ Mortar/Adhesive Set Tile □ Asphaitic □ Metal Panel/Shingles □ Wood Shingles/Shakes Shingles □ Prescriptive BUR-RAS 150 □ Wood Shingles/Shakes □ New Roof □ Re-Roofing □ Recovering □ Repair	
New Roof Re-Roofing Recovering Repair Repair Repair Repair Repair	
	nance
ROOF SYSTEM INFORMATION	
ow Slope Roof Area (SF) Steep Sloped Roof Area (SF)	
Sketch Roof Plan: Illustrate all levels and southers	
scuppers and overflow drains. Include dimensions of sections, scuppers, over identify dimensions of elevated pressure and the sections and levels; cla	low
proceeds and location of parapets.	
オリション しょうぶんし ションション あいにほぼし だいかい とうしかぶ ほしかり 増らけららい みとに はい音が行わせる	
	2 - 4.4
	9 - 44

<u>Section C (Low SI</u>	oped Roof System)
Fill in Specific Roof Assembly Components and Identify Manufacturer (if a component is not used, identify as "NA") System Manufacturer: NOA No.: Design Wind Pressures, From RAS 128 or Calculations: Pmax1: Pmax2: Max. Design Pressure, from the specific NOA System: Max. Design Pressure, from the specific NOA System: Deck: Type: Type: Gauge/Thickness: Slope: Anchor/Base Sheet & No. of Phy(s): Anchor/Base Sheet Fastener/Bonding Material: Insulation Base Layer: Insulation Base Layer: Base Insulation Size and Thickness: Top Insulation Layer: Top Insulation Fastener/Bonding Material: Top Insulation Size and Thickness: Top Insulation Size and Thickness: Base Sheet Fastener/Bonding Material: Phy Sheet(s) & No. of Phy(s): Phy Sheet(s) & No. of Phy(s): Phy Sheet(s) & No. of Phy(s): Phy Sheet Fastener/Bonding Material: Phy Sheet Fastener/Bonding Material: Op Phy: Op Phy Fastener/Bonding Material:	Fastener Spacing for Anchor/Base Sheet Attachment Field: " oc @ Lap, # Rows @ oc O oc @ Lap, # Rows @ oc O oc O oc @ Lap, # Rows @ oc O oc O oc @ Lap, # Rows @ oc O oc Number of Fasteners Per Insulation Board Mumber of Fasteners Per Insulation Board Field Perimeter Corner oc @ Lap, # Rows @ oc Mumber of Fasteners Per Insulation Board Mean Field Perimeter Corner Nothing, Conter, Edge Termination, Stripping, Fashing, Continuous Cleat, Cant Strip, Base Fisshing, Conten, Base Fisshing, Component Material, Material Thickness, Fastener Type, Fastener Spacing or Submit Manufacturers Details that Comply with RAS 111 and Chapter 18. Image frage fra

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	Florida Building Code Edition 2004 High Velocity Hurricane Zone Uniform Permit Application Form
<u>S</u>	ection D (Steep Sloped Roof System)
Roof System Manufa	Icturer:
Notice of Acceptance	a Number:
Minimum Design Win	d Pressures, if Applicable (From RAS 127 or Coloutet
P1:	P2: P3:
Maximum Design Prea (From the NOA Specif	ssure
Method of Tile Attachn	nent:
L	
Stee	ep Sloped Roof System Description
	Deck Type:
Roof Slope:	Chanayment Type:
	Insulation:
	Fire Barrier:
Did	Fastener Type
Ridge Ventilation?	& Spacing:
	Adhesive Type:
	Cap Sheet Type:
	Roof Covering:
Mean Roof Height:	
	Type & Size:

Florida Building Code Edition 2004 High Velocity Hurricane Zone Uniform Permit Application Form

Section E (Tile Calculations)

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

Method 1: Moment Based Tile Calculations Per RAS (P ₁ : $x \lambda = \lambda$	5 127
$\begin{array}{c} (P_2: \underline{\qquad} x \lambda \underline{\qquad} = \underline{\qquad}) - M_6: \underline{\qquad} = M_{r_1} \underline{\qquad} \\ (P_3: \underline{\qquad} x \lambda \underline{\qquad} = \underline{\qquad}) - M_6: \underline{\qquad} = M_{r_2} \underline{\qquad} \end{array}$	NOA M _r NOA M _r
$= M_{t_3}$	NOA Mr

Method 2: Simplified Tile Calculation Per Table Below

Required Moment of Resistance (Mr) From Table Below _____ NOA Mr____

Man Roof Height	M _r	Required Mon	ent Resistance	,	
Roof Slope	15'	20'	25'	30'	402
2:12	34.4	36.5	29.7		40
3:12	32.2	34.4	36.0	39.7	42.2
4:12	30.4	32.2	30.0	37.4	39.8
5:12	28.4	30.1	33.0	35.1	37.3
6:12	26.4	28.0	20.4	32.8	34.9
7:12	24.4	25.9	29.4	30.5	32.4
			41.1	28.2	30.0

*Must be used in conjunction with a list of moment based tile systems endorsed by the Broward County

/n

_ _

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

> NOA F' NOA F'

Method 3: Uplift Based Tile Calculations Per RAS 127

(r):X): _ =	X W'==) 117.	AS 12/
(P.:	~ ~ ·) - w:	$x\cos\theta$: = F
(4 2· X I: =	$\mathbf{X} \mathbf{W} := \mathbf{U} \mathbf{W}$	
(P	·····)= ₩	$X \cos \theta$: = F ₂ .
· · · · · · · · · · · · · · · · · · ·	$\mathbf{x} \mathbf{w} := \mathbf{u} \mathbf{w}$	
	······································	$x \cos\theta$: = F ₂ :

Where to Obtain Information					
Description	Symbol				
Design Pressure	PI or P2 or P3	RAS 127 Table 1 Where to Find			
Mean Roof Height	Н	Job Size Table I or by an engineering analysis prepared by PE based on ASCE 2			
Roof Slope	A	Lab Cit			
Aerodynamic Multiplier	1	Job Site			
lestoring Moment due to Gravity	<u>.</u>	NOA			
Attachment Resistance	M,	NOA			
Required Moment Resistance	Mr	NOA			
linimum Attachment Resistance	<u>M</u> ,	Calculated			
Required Links Desistance	F'	NOA			
Autoquites Opinit Resistance	F,	Calculated			
Average Tile Weight	W	NOA			
Tile Dimensions	I = length				
	w = width	NOA			

ROOFING APPLICATION STANDARD (RAS) No. 127

1. Scope

This standard covers the procedure for determining the Moment of Resistance (Mr,) and Minimum Characteristic Force (F) to install a tile system on buildings of a specified roof slope and height. Compliance with the requirements and procedures herein specified where the pressures (P) have been determined based on Table 1 of this standard, do not require additional signed and sealed engineering design calculation. All other calculations must be prepared signed and sealed by a professional engineer or registered architect.

2. How to determine the Moment Resistance (Mr) (Moment Based Systems)

- 2.1 Determine the minimum design wind pressures for the field, perimeter and corner areas (P1, P2 and P3, respectively) using the values given in Table 1 or those obtained based by engineering analysis prepared, signed and scaled by a professional engineer or registered architect based on ASCE 7-98.
- 2.2 Locate the aerodynamic multiplier (λ) in tile PCA.
- 2.3 Determine the restoring moment due to gravity (Mg) per PCA.
- Determine the attachment resistance (M_t) per 2.4 PCA
- 2.5 Determine the Moment of Resistance (M,) per following formula: $M_r = (P \times \lambda) - M_g$
- 2.6 Compare the values for M_r , with the values for M_{f_0} noted in the PCA. If the M_f values are greater than or equal to the Mr values, for each area of the roof (i.e., field (P1), perimeter (P2) and corner (P3) areas), then the tile attachment method is acceptable.
- 3. How to determine the Minimum Characteristic Force (F') (Uplift Based System)

3.1 Determine the minimum design pressures for the field, perimeter and corner areas (P1, P2 and P3 respectively) using the values given in Table 1 or those obtained based by engineering analysis prepared, signed and scaled by a professional engineer or registered architect based on the criteria set forth on

ASCE 7-98.

- 3.2 Determine the angle (θ) of roof slope, from Table 1.
- 3.3 Determine the length (l), width (w) and average tile weight (W) of tile, per PCA.
- 3.4 Determine the required uplift resistance (F_t) per following formula: $F_r = [(P \times 1 \times w) - W] \times \cos \theta$
- 3.5 Compare the values for F_r with the values for F', noted in the PCA. If the F' values are greater than or equal to the F, values, for each area of roof (i.e., field (P1) perimeter (P2) and corner (P3 areas), then the tile attachment method is acceptable.

MINIMUM DE CORNER	ESIGN WINI (PØ) AREA	D UPLIFT PR S OF ROOFS	TABLI ESSURES, IN FOR EXPOS IEIGHT AS SI	E 1 PSF FOR F SURE "C" BU PECIFIED ¹	IELD (PΦ), PE JILDINGS WIT	RIMETER (H A ROOF	PØ) AND MEAN
		≤ 2:12		≥ 2:12	< 7: 12		. 12
ROOF MEAN	PO	PØ	PO	DO			· 12
20	.52	07.0		PO	PØ & PO	PO	PO&PO
25	-54 2	-67.3	-131.4	-47.6	-100.6	-52	0.03-
30	-54.5	-91.1	-137	-49.7	-104.9	-54.3	63.5
35	-30.0	-95	-143	-51.8	-109.4	-56.6	-00.0
40	-58.4	-98	-147.5	-53.5	-112.9	-58 4	-00.2
Coloritate d	-59.7	-100.8	-151.2	-54.9	-116 1	-60.4	-08.3
Carculated In	accordance	9 with ASCE 7					-/0.2

TABLE 2 WHERE TO OBTAIN INFORMATION						
Description	Symbol	Million A. Mil				
Design Pressure	P1 or P2 or P3	RAS 127 Table 1 or human anticode				
Mean Roof Height	н	Job Site				
Roof Slope	θ	Job Site				
Aerodynamic Multiplier	λ	PCA				
Restoring Moment due to Gravity	Ma	PCA				
Attachment Resistance	M	PCA				
Required Moment Resistance	Mr	Calculated				
Multi Characteristic Resistance	F'	PCA				
Minimum Characteristic Force	F,	Calculated				
Average Tile Weight	W	PCA				
Tile Dimensions	I = length w = width	PCA				
a calculations must be submitted to the Building Official at the time of permit application						

the Building Official at the time of permit application.

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ROOF TO WALL CONNECTIONS FOR SITE-BUILT SINGLE FAMILY REDSIDENTIAL STRUCTURES GUIDELINES

201.3 Where required by section 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 specified in table 201.3. As an alternative to an engineered design, the prescriptive retrofit solutions provided in Section 201.3.1 through 201.3.4 below shall be accepted as meeting the mandated roof-to-wall retrofit

201.3.1 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 shall be inspected. Wherever a strap is missing or an existing strap has less than 4 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 makes it possible (without damage to 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.

201.3.2 **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 comer, along the exterior wall on each side of each gable end. The anchorage of each of the exposed rafters or truss shall be inspected. Wherever a strap is missing or an existing strap has less than 4 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 approve masonry screws that will provide at least a 2- ½ inch 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 the concrete or masonry. These screws shall be installed within 4 inches of the truss or rafter on rafter.

201.3.3 **Prescriptive method for hip roofs on a wood frame wall**. 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 4 fasteners on each end, shall be connected to the top plate below using a strap or 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 access makes it possible (without damage to 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

201.3.4 Prescriptive method for hip roofs on a masonry wall. 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 4 fasteners on each end, shall be connected to the concrete wall below using a strap or 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 providing the strap is manufactured to accommodate at least 4 fasteners at each end. The straps or right angle gusset bracket shall be installed such that they connect each rafter or truss to the top plate below or directly to the masonry wall using approve masonry screws that will provide at least a 2- 1/2 inch 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 1/4 inch diameter masonry screws, each with supplementary ¼-inch washer, having sufficient length to develop a 2 1/2 inch embedment into the concrete or 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 truss or rafter.

201.3.5 Priorities for mandated roof to wall retrofit expenditures. 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 connection the corners of roofs to walls below where the spans of the roofing members are greatest.