

CITY OF LAKE HELEN  
Building Department  
**Residential Slope Roof Application**

| <u>Residential Slope Roof Application Information</u> |  |  |
|---|--|--|
| WIND-BORNE DEBRIS AREA RETROFITS                      | WHEN A ROOF ON AN EXISTING BUILDING IS REPLACED THAT HAS A VALUE \$300,000 + SECTION 101.2, 201.1 & 201.2 WILL APPLY   |  |
| ROOF-DECKING ATTACHMENT AND FASTENERS                 | WHEN A ROOF ON AN EXISTING SITE-BUILT, SINGLE FAMILY RESIDENTIAL STRUCTURE IS REPLACED: SECTION 201.1 WILL APPLY   |  |
| SECONDARY WATER BARRIER                               | PELL & STICK MUST COMPLY WITH SECTION 201.2 & ASTM D1970 – <input type="checkbox"/> SHEATHING JOINTS<br><input type="checkbox"/> ENTIRE ROOF DECK  |  |
| SLOPE:  | _____ “ IN 12”   | EXAMPLE: 5” IN 12” (INCHES OF RISE IN 12” OF RUN)  |
| AVERAGE ROOF HEIGHT:                                  | _____ FEET   | EXAMPLE: 15 FEET (SINGLE STORY BUILDING)   |
| DECK TYPE:  | TYPE: _____  | EXAMPLE (S): ½” PLYWOOD, 5/8” OSB  |
| UNDERLAYMENT:   | TYPE: _____ LAYERS: _____<br><input type="checkbox"/> ASTM D 226, Type I or II <input type="checkbox"/> #15 FELT<br><input type="checkbox"/> ASTM 4869, Type I or II <input type="checkbox"/> #30 FELT | EXAMPLE: <input checked="" type="checkbox"/> 15 #FELT, 2 LAYERS<br><input checked="" type="checkbox"/> ASTM D 226 Type 1 |
| ROOF COVERING:  | MANUFACTURER _____<br>PRODUCT _____  | EXAMPLE:<br>ABC ROOFING PRODUCTS, INC.<br>PINEVALLEY 30 AR   |
| APPROVAL METHOD:                                      | FLORIDA APPROVAL #: _____<br>-OR-<br>MIAMI / DADE N.O.A.: _____  | EXAMPLE: 1675.4 (FL#) -OR-<br>NOA No 03-0528.06 (MIAMI / DADE)   |
| FASTENERS:  | TYPE: _____  | EXAMPLE: 11/2” GALVANIZED ROOFING NAIL   |

**HURRICANE MITIGATION RETROFITS FOR EXISTING SITE-BUILT SINGLE FAMILY RESIDENTIAL STRUCTURES**

**101 Retrofits Required.** Pursuant to Section 553.844, Florida Statutes, strengthening of existing site-built, single family residential structures to resist hurricanes shall be provided. Site built single-family residential structures shall mean site built single family detached residential structures.

**101.1** When a roof on an existing site-built, single family residential structure is 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 201.1.
- (b) A secondary water barrier shall be provided as required by section 201.2.

**101.2** When a roof 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 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 201.3 would exceed 15 percent of the cost of the re-roofing project, the priorities outlined in Section 201.3.5 shall be used to limit the scope of work to the 15 percent limit.

**201 Roof System Mitigation Techniques.** Roof sheathing fastening, secondary water barriers, roof to wall connection and gable end bracing shall be permitted pursuant to this section.

**201.1 Roof 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. 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. Supplemental fasteners as required by Table 201.1 shall be 8d ring shank nails with round heads and the following minimum dimensions:

1. 0.113 inch nominal shank diameter
2. Ring diameter of 0.012 over shank diameter
3. 16 to 20 rings per inch
4. 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 201.1  
Supplement Fasteners at Panel Edges and Intermediate Framing**

| Existing fasteners                         | Existing spacing     | Wind speed greater than 110 mph supplemental fastening shall be no greater than |
|--|----------------------|---|
| Staples or 6d                              | Any                  | 6" O.C. b   |
| 8d clipped head, round head, or ring shank | 6" o.c. or less      | None necessary  |
| 8d clipped head, round head, or ring shank | Greater than 6" o.c. | 6" O.C. b a   |

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

**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 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 sheet. No additional underlayment shall be required on top of this sheet for new installations.
- c) The entire roof deck shall be covered with 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).
- d) Outside of the HVHZ, an underlayment complying with section 1507.2.3 of the Florida Building Code, Building 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).

**Exceptions:**

1. Roof slopes < 2:12 having a continuous roof system shall be deemed to comply with section 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 201.2 for Secondary Water Barriers.

Florida Building Code, Building 1507.2.3 Underlayment.

Unless otherwise noted, required underlayment shall conform to ASTM D 226, Type I or Type II, or ASTM D 4869 Type I or Type II.

**201.3 Roof-to-wall connections for site-built single family residential structures.** 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 Sections

201.3.1 through 201.3.64 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.

**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.

**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.

**201.3.3 Prescriptive method for gable roofs on a wood frame 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. 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.

**201.3.4 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 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 1/4-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.

**201.3.5 Prescriptive method for hip roofs on a wood frame wall.** Unless it is possible to verify through nondestructive 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 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.

**201.3.6 Prescriptive method for hip roofs on a masonry wall.** Unless it is possible to verify through nondestructive 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 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, 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.

**201.3.7 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 connecting the corners of roofs to walls below where the spans of the roofing members are greatest

**Table 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           | -149.65 | -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      |

**Notes:**

- a. The required capacities are pounds per lineal foot of building length. For roof framing spaced at 16 inches on center multiply table values by 1.33. For roof framing spaced at 24 inches on center multiply table values by 2.
- b. The required capacities include an allowance for 10 pounds of dead load.
- c. The required capacities do not account for the effects of overhangs. The overhang loads given shall be multiplied by the overhang projection and added to the required capacities in the table.

**Florida Building Code, Building**

1507.2.5 Asphalt shingles.

Asphalt shingles shall have self-seal strips or be interlocking, and comply with ASTM D 225 or ASTM D 3462.

1507.2.6 Fasteners.

Fasteners for asphalt shingles shall be galvanized, stainless steel, aluminum or copper roofing nails, minimum 12 gage [0.105 inch (2.67 mm)] shank with a minimum 0.375 inch-diameter (9.5 mm) head, of a length to penetrate through the roofing materials and a minimum of 0.75 inch (19.1 mm) into the roof sheathing. Where the roof sheathing is less than 0.75 inch (19.1 mm) thick, the nails shall penetrate through the sheathing. Fasteners shall

comply with ASTM F 1667.

#### 1507.2.6.1

The nail component of plastic cap nails shall meet the corrosion resistance requirements of 1507.2.6.

#### 1507.2.7 Attachment.

Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 21 units vertical in 12 units horizontal (21:12), shingles shall be installed as required by the manufacturer.

#### 1507.2.8 Underlayment application.

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For roof slopes from two units vertical in 12 units horizontal (17-percent slope), up to four units vertical in 12 units horizontal (33-percent slope), underlayment shall be two layers applied in the following manner. Apply a minimum 19-inch-wide (483 mm) strip of underlayment felt parallel with and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment overlapping successive sheets 19 inches (483 mm) and fastened sufficiently to hold in place. For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened only as necessary to hold in place.

##### 1507.2.8.1 High wind attachment.

Underlayment applied in areas subject to high winds (greater than 110 mph in accordance with Figure 1609) shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.

#### 1507.2.9 Flashings.

Flashing for asphalt shingles shall comply with this section. Flashing shall be applied in accordance with this section and the asphalt shingle manufacturer's printed instructions.

##### 1507.2.9.1 Base and counter flashing.

Base and counter flashing shall be installed as follows:

1. In accordance with manufacturer's installation instructions, or
2. A continuous metal "L" flashing shall be set in approved flashing cement and set flush to base of wall and over the underlayment. Both horizontal and vertical metal flanges shall be fastened 6 inches (152 mm) on center with approved fasteners. All laps shall be a minimum of 4 inches (102 mm) fully sealed in approved flashing cement. Flashing shall start at the lower portion of roof to insure water-shedding capabilities of all metal laps. The entire edge of the horizontal flange shall be sealed covering all nail penetrations with approved flashing cement and membrane. Shingles will overlap the horizontal flange and shall be set in approved flashing cement. Base flashing shall be of either corrosion resistant metal with a minimum thickness provided in Table 1503.2 or mineral surface roll roofing weighing a minimum of 77 pounds per 100 square feet (3.76 kg/m<sup>2</sup>). Counter flashing shall be corrosion resistant metal with a minimum thickness provided in Table 1503.2.

##### 1507.2.9.2 Valleys.

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

1. For open valleys lined with metal, the valley lining shall be at least 16 inches (406 mm) wide and of any of the corrosion-resistant metals in Table 1503.2.
2. For open valleys, valley lining of two plies of mineral-surfaced roll roofing complying with ASTM D 6380 Class M or ASTM D 3909 shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys, valley lining of one ply of smooth roll roofing complying with ASTM D 6380 Class S and at least 36 inches (914 mm) wide or types as described in Items 1 or 2 above shall be permitted. Specialty underlayment complying with ASTM D 1970 may be used in lieu of the lining material.

##### 1507.2.9.3 Drip edge.

Provide drip edge at eaves and gables of shingle roofs. Overlap to be a minimum of 2 inches (51 mm). Eave drip edges shall extend ½ inch (13 mm) below sheathing and extend back on the roof a minimum of 2 inches (51 mm). Drip edge at eaves shall be permitted to be installed either over or under the underlayment. If installed over the underlayment, there shall be a minimum 4 inch (102 mm) width of roof cement installed over the drip edge flange. Drip edge shall be mechanically fastened a maximum of 12 inches (305 mm) on center. Where the basic wind speed per Figure 1609 is 110 mph (177 km/h) or greater or the mean roof height exceeds 33 feet (10 058 mm), drip edges shall be mechanically fastened a maximum of 4 inches (102 mm) on center.

## **SECTION 1518**

### **HIGH-VELOCITY HURRICANE ZONES—ROOF COVERINGS WITH SLOPES 2:12 OR GREATER**

#### 1518.1 General.

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

#### 1518.2 Underlayments.

Underlayment shall be as defined in Section 1513. Underlayment shall be installed in compliance with the roofing component Product Approval and shall be in compliance with the following minimum requirements:

##### 1518.2.1

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

##### 1518.2.2

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

##### 1518.2.3

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

##### 1518.2.4

Underlayment nails shall be as defined in Section 1517.5.1.