Connectors for Florida Hurricane Mitigation Retrofit When Re-Roofing

Methods for Achieving Sufficient Uplift Capacity for Roof-To-Wall Connections

The 6th Edition (2017) Florida Building Code: Existing Building requires that certain measures be taken when replacing a roof (re-roofing) on a single-family residential structure. (See Sections 706.7 and 706.8.)

In all areas, when re-roofing, the contractor must:
- Verify that roof deck fastening is adequate, and if necessary, add more fasteners.
- Add a secondary water barrier at the roof sheathing joints or over the entire roof deck.

For a single-family residence located in a wind-borne debris region, if the value of the house is $300,000 or more, the roof-to-wall connections must be improved per Section 706.8.1.

Priorities are specified as follows:
- Priority shall be given to connecting the corners of roofs to walls below 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.

There are two basic methods for choosing a connector for the roof-to-wall connection. The connector must either:
1. Have an allowable uplift capacity as listed in Table 706.8.1, or
2. Meet one of four prescriptive methods:
   a. Gable roofs on a wood frame wall (Sect. 706.8.1.3).
   b. Gable roofs on a masonry wall (Sect. 706.8.1.4).
   c. Hip roofs on a wood frame wall (Sect. 706.8.1.5).
   d. Hip roofs on a masonry wall (Sect. 706.8.1.6).

In general, the prescriptive methods require the following:
- Inspect any existing connectors within 6” of the corner, and verify that there are at least four nails in each member being connected.
  - If there are less than four nails into each member, then nails can be added to the connector so that there are four nails into each member. (Use existing holes.)
  - If a connector is not present, or nails cannot be added to the existing connector, an additional connector must be added that has an allowable uplift capacity of at least 500 lb.
- For connections to masonry walls, unless the manufacturer recommends otherwise, the connector must have at least four approved masonry screws that will provide at least a 2 1/2” embedment into the concrete or masonry.
- For hip roofs, the hip rafter (king jack), hip girder, and rafters or trusses adjacent to the hip girder are required to be anchored to the wall.
- Where the connection is accessible, top plates are required to be connected to studs with a connector having a minimum 500 lb. uplift capacity, or the roof framing can be connected directly to the studs with a single connector provided the two members align with no more than a 1 1/2” offset.
- When the connectors or HGA10 angle are attached to an existing wood plate on a masonry wall, the plate must be anchored to the wall below using 1/4”-diameter Titen® 2 masonry screws, with supplementary washer, having sufficient length to provide a 2 1/2” embedment into the concrete or masonry. Install one Simpson Strong-Tie® Titen 2 screw within 4” 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.

A roof-to-wall retrofit is not required if the structure was permitted after adoption of the Florida Building Code (March 1, 2002). Also, retrofits are not required beyond a 15% increase in the cost of re-roofing.

The Following Illustrations Show Connectors That Achieve at Least 500 lb. Uplift Capacity:

**Truss to Top of Masonry Wall**

- **HGAM10** — 850 lb. uplift.
  Fastens using 1/4” Strong-Drive® SDS screws to wood and Titen 2 masonry screws to masonry or concrete.
  1 1/2” long to truss
  2 1/4” long to masonry
  1 3/4” long to concrete (not included)
  HGAM10KTA kit includes 10 connectors and all required screws for masonry installations.

**Truss to Side of Masonry Wall**

- **MTSM16** — 875 lb. uplift.
  Fastens to truss with (7) 10d × 1 1/2” nails, fastens to wall with 1/4” Titen2 masonry screws (2 1/4” long to masonry — 1 3/4” long to concrete). Connector is not required to wrap over truss to achieve allowable load. Installation with four nails satisfies prescriptive requirements.

- **HM9** — 805 lb. uplift.
  Fastens using 1/4” SDS screws to wood and Titen 2 masonry screws for masonry or concrete.
  2 1/4” long to masonry
  1 3/4” long to concrete (not included).
  HM9KCT kit includes 20 connectors and all required screws.
Truss to Top of Wood Wall

HGA10 — 695 lb. uplift. Fastens using 1/4" Strong-Drive® SDS screws.
3" long to top plate
HGA10K kit includes 10 connectors and all required screws. HGA10 to single top plate with 11/2" screws achieves 605 lb. uplift.

MTS12 installed on a 45° rafter

H2.5A — 575 lb. uplift. (5) 8d x 11/2" nails to rafter/truss, (5) 8d x 11/2" nails to top plates.
H1 — 585 lb. uplift. (6) 8d x 1 1/2" nails to rafter/truss, (4) 8d common to top plates.
H10A — 1,140 lb. uplift. (9) 10d x 11/2" nails to rafter/truss, (9) 10d x 11/2" nails to top plates.

Hip Truss or Hip Ridge to Wood Wall

MTS12 field bent at 45° angle — 840 lb. uplift.
Use (7) 10d x 1 1/2" nails each end.

Top Plates to Stud Below Where Accessible

DSP — 775 lb. uplift (for doubled studs).
Use (6) 10d x 11/2" nails to plates, (8) 10d x 1 1/2" nails to studs.
TSP — 755 lb. uplift.
Use (6) 10d x 1 1/2" nails to plates, (9) 10d x 1 1/2" nails to stud.
H8 — 745 lb. uplift.
Use (5) 10d x 1 1/2" nails to plates, (5) 10d x 1 1/2" nails to stud.

General Notes:
1. Install connectors as recommended in the most recent Simpson Strong-Tie® Wood Construction Connectors catalog.
2. Install Titen 2 masonry screws as recommended in the most recent Simpson Strong-Tie® Anchoring and Fastening Systems for Concrete and Masonry catalog.
3. All allowable loads shown assume fastening to Southern Pine Lumber. Refer to the Wood Construction Connectors catalog for other wood species.
4. The Florida Building Code: Existing Building, can be viewed at www.floridabuilding.org.
5. Many Simpson Strong-Tie connectors can now be installed with the Simpson Strong-Tie Strong-Drive SD screw with no reduction or possibly an increase in allowable loads. Refer to the Wood Construction Connectors catalogue or strongtie.com/sd.

This technical bulletin is effective until December 31, 2020, and reflects information available as of July 1, 2018.
This information is updated periodically and should not be relied upon after December 31, 2020.
Contact Simpson Strong-Tie for current information and limited warranty or see strongtie.com.