

# CONNECTORS FOR FLORIDA HURRICANE MITIGATION RETROFIT WHEN RE-ROOFING



## METHODS FOR ACHIEVING SUFFICIENT UPLIFT CAPACITY FOR ROOF-TO-WALL CONNECTIONS

The 2009 Supplement to the 2007 *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 611.7 and 611.8)

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 611.8.1.

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 611.8.1, or
2. Meet one of four prescriptive methods:
  - a. Gable roofs on a wood frame wall (Sect. 611.8.1.3).
  - b. Gable roofs on a masonry wall (Sect. 611.8.1.4).
  - c. Hip roofs on a wood frame wall (Sect. 611.8.1.5).
  - d. Hip roofs on a masonry wall (Sect. 611.8.1.6).

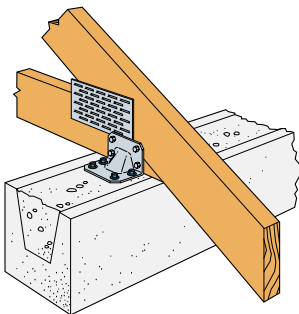
In general, the prescriptive methods require the following:

- Inspect any existing connectors within 6 feet of the corner, and verify that there are at least four nails in each member being connected.
  - If there are less than 4 nails into each member, then nails can be added to the connector so that there are 4 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 lbs.
- For connections to masonry walls, the connector must have at least four approved masonry screws that will provide at least a 2½" 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 lbs. 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 1½" 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 ¼" diameter Titen® masonry screws, with supplementary washer, having sufficient length to provide a 2½" embedment into the concrete or masonry. Install one Simpson Strong-Tie® Titen 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.

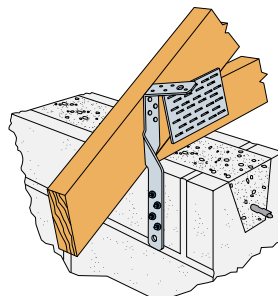
## The Following Illustrations Show Connectors that Achieve at Least 500 lbs. Uplift Capacity:

**Truss to Top of Masonry Wall**

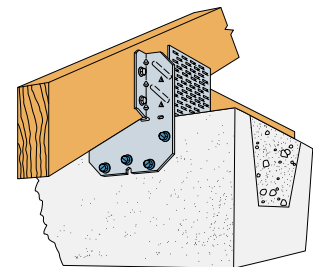


**HGAM10** – 850 lbs. uplift  
Fastens using ¼" Strong-Drive® SDS screws to wood and Titen masonry screws to masonry or concrete.  
1½" long to truss  
2¾" long to masonry  
1¾" long to concrete (*not included*)  
HGAM10KTA kit includes 10 connectors and all required screws for masonry installations.

**Truss to Side of Masonry Wall**

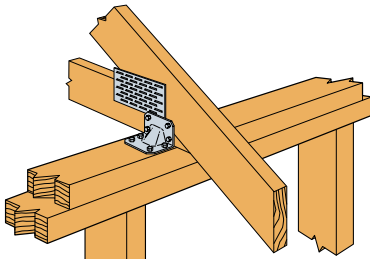


**MTSM16** – 860 lbs. uplift  
Fastens to truss with 7-10d×1½" nails, fastens to wall with ¼" Titen® masonry screws (2¼" long to masonry – 1¾" long to concrete). Connector is not required to wrap over truss to achieve allowable load. Installation with 4 nails satisfies prescriptive requirements.  
**Note:** Simpson Strong-Tie recommends 2¼" masonry screws, but prescriptive method in code requires 2½" screws. Allowable loads are achieved with 2¼" screws.



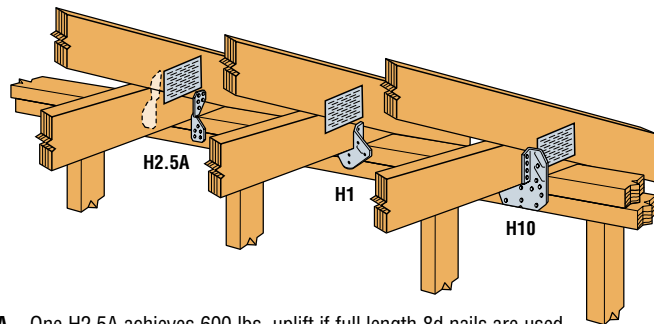
**HM9** – 595 lbs. uplift  
Fastens using ¼" SDS screws to wood and Titen masonry screws for masonry or concrete.  
2¼" long to masonry  
1¾" long to concrete (*not included*)  
HM9KT kit includes 20 connectors and all required screws.  
**Note:** Simpson Strong-Tie recommends 2¼" masonry screws, but prescriptive method in code requires 2½" screws. Kit includes 2¼" screws and allowable loads are achieved with 2¼" screws for masonry installations.

### Truss to Top of Wood Wall



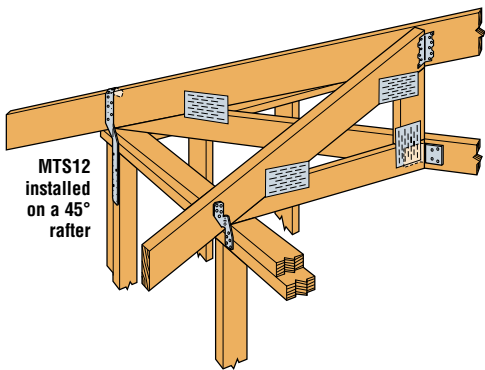
**HGA10** – 695 lbs. uplift. Fastens using ¼" Strong Drive® SDS screws. 1½" long to truss 3" long to top plates  
**HGA10KT** kit includes 10 connectors and all required screws.

### Truss to Side of Wood Wall



**H2.5A** – One H2.5A achieves 600 lbs. uplift if full length 8d nails are used. Use two H2.5A connectors if 8dx1½" nails are used.  
**H1** – 585 lbs. uplift. 6-8dx1½" nails to rafter/truss, 4-8d common to top plates.  
**H10** – 990 lbs. uplift. 8-8dx1½" nails to rafter/truss, 8-8dx1½" nails to top plates.

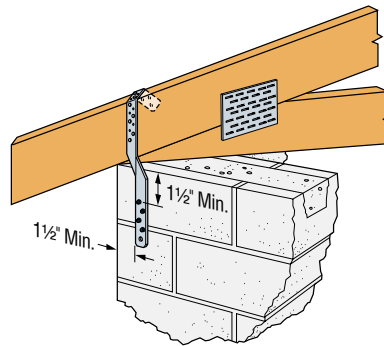
### Hip Truss or Hip Ridge to Wood Wall



**MTS12** installed on a 45° rafter

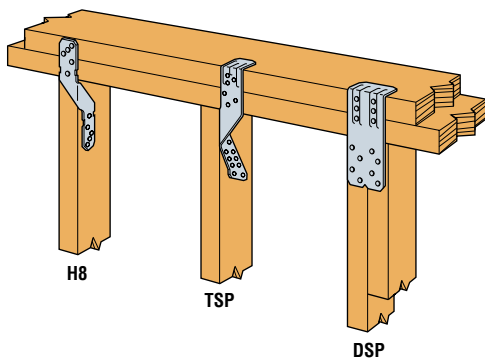
**MTS12** field bent at 45° angle – 840 lbs. uplift. Use 7-10dx1½" nails each end.

### Hip Truss or Hip Ridge to Masonry Wall



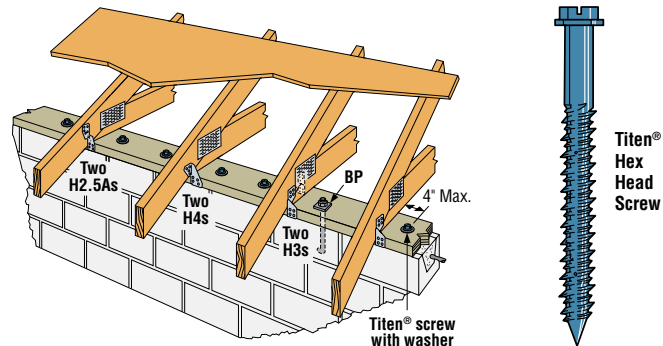
**MTSM16** field bent 45° for hip – 840 lbs. uplift. Use 7-10dx1½" nails to hip. Fastens to wall with ¼" Titen® masonry screws. 2¼" long to masonry – 1¼" long to concrete.  
**HGAM10** – Refer to previous page.

### Top Plates to Stud Below Where Accessible



**DSP** – 775 lbs. uplift (for doubled studs) Use 6-10dx1½" nails to plates, 8-10dx1½" nails to studs.  
**TSP** – 755 lbs. uplift Use 6-10dx1½" nails to plates, 9-10dx1½" nails to stud.  
**H8** – 745 lbs. uplift Use 5-10dx1½" nails to plates, 5-10dx1½" nails to stud.

### Plate or Plates to Masonry Wall Using Titen® Masonry Screws



When the connectors or HGA10 angles are attached to an existing wood plate, the plate must be anchored to the masonry wall below using ¼" diameter Titen masonry screws, with supplementary washers, having sufficient length to develop a 2½" embedment into the concrete or masonry. Install one Titen 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.

Recommended Titen Screws:  
 Single 2x plate: **TTN25400H** (¼x4") – Double 2x plate: **TTN25600H** (¼x6")

#### GENERAL NOTES:

1. Install connectors as recommended in the most recent Simpson Strong-Tie® Wood Construction Connectors catalog.
2. Install Titen 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](http://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 C-2011 or [www.strongtie.com/sd](http://www.strongtie.com/sd).

This technical bulletin is effective until June 30, 2013, and reflects information available as of February 1, 2011. This information is updated periodically and should not be relied upon after June 30, 2013; contact Simpson Strong-Tie for current information and limited warranty or see [www.strongtie.com](http://www.strongtie.com).