

# Wind Retrofits

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## Information on Retrofits to Achieve Discounts on Residential Property Wind Insurance in Florida

There are many ways to protect your home from hurricane and wind damage. Information on various ways is presented below in three sections: Reinforcing Your Roof, Protecting Your Openings, and Upgrading Framing Connections.

### Reinforcing Your Roof

Recommendations for reinforcing your roof focus on two areas. One is using a roof covering (shingles, tiles, etc) that can withstand high winds and prevent water from entering the building. The other is ensuring that the roof deck (sheathing) does not fail during a storm.

One way to reduce the chances of roof covering loss is to replace older inferior products with new superior ones. The Dade County Building Code Compliance Office maintains a list of approved products that have been tested for higher wind speeds and should perform better in hurricanes. The list of approved products is available from the Dade County Code Compliance Office, (305) 375-2901, or on the Internet at: [www.buildingcodeonline.com](http://www.buildingcodeonline.com).

When replacing your roof covering, you have an excellent opportunity to install "secondary water resistance" (SWR) protection on your roof. SWR material is a 6-inch wide strip of self-adhesive waterproofing applied to the roof deck joints under the normal roofing underlayment (tar paper). This material prevents water from seeping into the house when the roof covering is lost during a storm. It must be installed after removing the existing roof covering and the wood deck is exposed. Alternatively, you may be able to achieve similar results by having a sprayed polyurethane foam adhesive applied to the deck from inside the attic.

Reinforcing the roof deck connections involves either re-nailing the deck to the trusses/rafters with more nails or screws, or having a sprayed polyurethane foam adhesive applied to the deck-framing joints from inside the attic. The choice of which technique to use depends on the type, attic access, age, and condition of the roof deck and the cost of replacing your existing roof covering.

### Protecting Your Openings

To receive the HURRICANE shutter discounts, all windows, doors, sliding glass doors, garage doors and skylights in your home must be protected from wind borne debris and wind pressure! That means all openings must be protected with a product that has been tested according to one of the wind pressure and impact testing standards listed in Guideline B on page 4. Use of products tested as required by one of these standards reduces the chance that windows and doors will be broken by wind borne debris.

Usually protection of existing windows and doors is most economically accomplished by covering the opening with commercially available (tested and approved) storm panels made of corrugated steel or aluminum. At least one entry door should be replaced with an impact resistant product to allow for ingress and egress from the home when all other doors are covered (with shutters). Typically, the most economical method of protecting garage doors and skylights is by replacing them with new products that meet wind pressure and impact standards.

### Upgrading Framing Connections

The term "framing connections" in this analysis refers to the roof to wall connections and gable-end bracing methods. The roof to wall connections may need to be improved by installing hurricane straps or clips that anchor the truss or rafter to the exterior wall. This process may involve removal and replacement of exterior soffits or interior drywall to expose the joint where roof meets the wall. This process can be expensive and may best be completed during remodeling or re-roofing. Homes with gable shaped roofs may require gable-end bracing to resist wind loads.

## Suggestions on Obtaining a Contractor To Retrofit Your House

The following pages contain suggestions that are intended to help you meet typical criteria for wind insurance credits. After selecting retrofits you wish to consider completing (shown on Page 4 of the report), mark the “**Bid Requested**” column next to the desired work shown in the table below.

For example, if you decide to replace your roof covering and install Secondary Water Resistance, you would check the box beside the letters 'A1' in the “**Bid Requested**” column below. Leave the Cost column blank for the contractor to complete.

Next, locate at least three contractors in your area and ask each of them to prepare a cost estimate for the work. (Provide each contractor with a copy of this document.) Once you have all the bids from the contractors, select the contractor you want to use based on price and quality. Make sure that the contractor knows the work he does must be certified (using an appropriate form from the insurance company) in order for you to receive the insurance credit. ***It is highly recommended that your agreement with the contractor calls for final payment only after you received appropriately completed certification forms.***

### To Potential Contractors:

These guidelines should not be used for engineering design or analysis purposes. For any retrofits performed, the homeowner and construction contractor must comply with local building codes and permit requirements. The contractor must confirm all sizes, areas, and scope of works listed within, and perform his own cost estimate of the selected retrofits. It is the contractor's responsibility to obtain engineering designs for retrofit if this is required by the local building code.

The following abbreviations are used throughout the following section.

- SBC97            ● Standard Building Code 1997
- SFBC            ● South Florida Building Code, Dade County Edition Release 5.0
- SSTD 10-97    ● SBCCI Standard for Hurricane Resistant Construction 1997
- SSTD 12-97    ● SBCCI Test Standard for Determining Impact Resistance from Windborne Debris 1997

Owner to Check each  
type of work desired

Costs provided by Contractor

### BID TABLE

Bid Requested	Retrofit	Cost
<input type="checkbox"/>	A1 Replace Roof Covering and Add Secondary Water Resistance	
<input type="checkbox"/>	A2 Re-Nail Sheathing	
<input type="checkbox"/>	A4 Apply Adhesive to Roof Deck and Rafters	
<input type="checkbox"/>	B Install Window Protection	
<input type="checkbox"/>	C Install Sliding Glass Door Protection	
<input type="checkbox"/>	D Upgrade Garage Door(s)	
<input type="checkbox"/>	E Upgrade Entry Doors	
<input type="checkbox"/>	F Install Skylight Protection	
<input type="checkbox"/>	G Tie Roof to Walls	
<input type="checkbox"/>	H Brace Gable End of Roof	

# Wind Retrofits

## Roof Retrofit Options

### A1. Replace Roof Covering and Add Secondary Water Resistance

REMOVE  
EXISTING ROOF  
COVER:

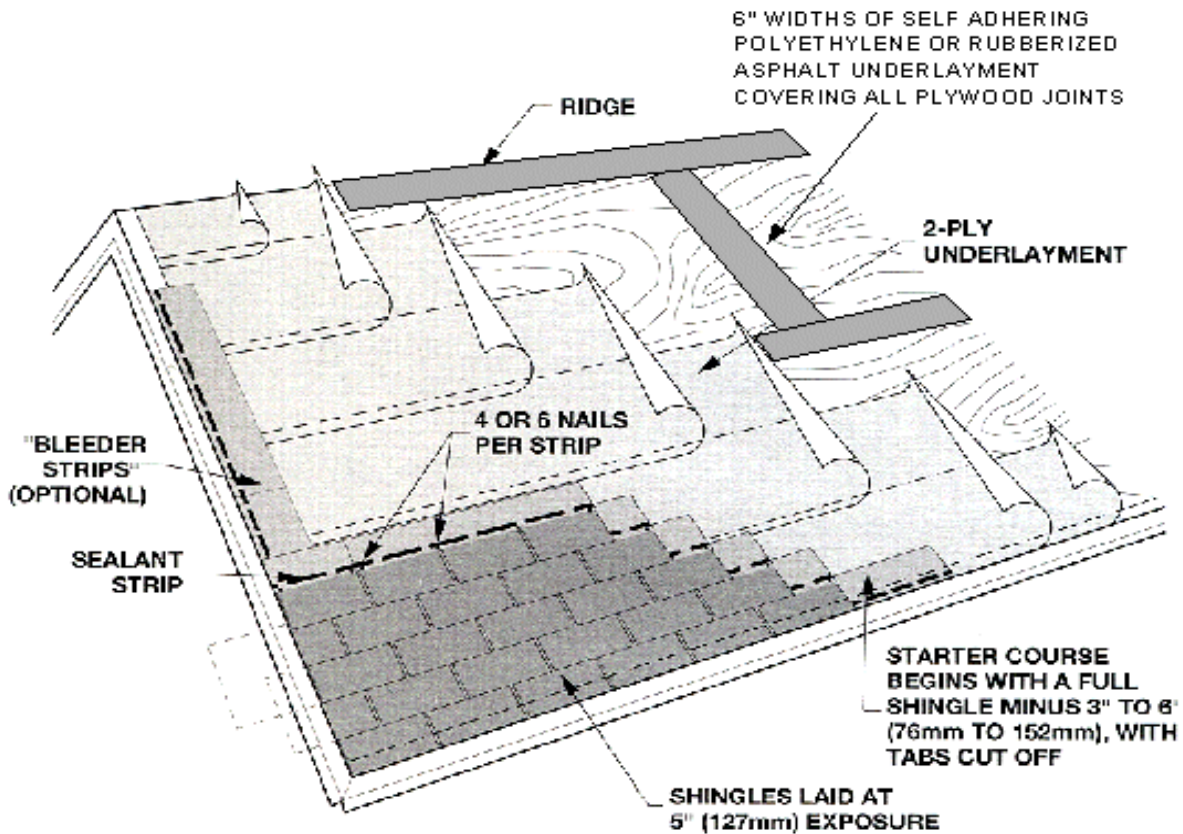
Remove entire roof covering to the decking level. Replace damaged sheathing, replace/repair damaged rafters and related roof components. If requested, fulfill the requirements of A2 before completing the next step.

SECONDARY  
WATER  
RESISTANCE:

Prior to application of underlayment (15 or 30 pound), all joints between plywood sheets shall be taped with a self-adhering polyethylene or rubberized asphalt underlayment that has a minimum width of 6 inches as shown in Figure A1 below. This self-adhering product shall be applied in accordance with the manufacturers instructions for wood application. This product shall have adherence strength suitable so that it remains attached to the roof deck and provides secondary water resistance if the roof covering and underlayment tears or fails in a hurricane.

REPLACE ROOF  
COVERING:

Install new fungus-resistant roof covering and underlayment as prescribed in Chapter 5 of the SSTD 10-97. A list of approved roof coverings can be found at the Dade County Code Compliance Office or its web site: [www.buildingcodeonline.com](http://www.buildingcodeonline.com). Installation of shingles, tile, or other roof coverings must be done in accordance with the manufacturer's recommendations. The entire new roof system should conform to the building code in use in your area.



NOTE - ALL WEIGHTS AND DIMENSIONS ARE APPROXIMATE

Figure A1: Application of Secondary Water Resistance layer in typical shingle roof construction.

## Roof Retrofit Options

### A2. Re-nail Sheathing

All roof sheathing/decking shall be brought up to the specifications given in Section 207.3.3 (for masonry walls) or Section 307.4.3 (for wood walls) of the SSTD 10-97, with one exception. To receive this credit, all roof sheathing thicknesses MUST be at least 1/2" thick and fastened with 8d nails. It is recommended that nail fastener spacing should not exceed 6 inches on center for all roof zones as shown in Figure A2. Existing fasteners and new fasteners may be used to satisfy this requirement. New fasteners will be 8d ring shank nails for additional nailing. Within 4 feet of any gable end, we recommend that the nail spacing be reduced to 4 inches on center. The contractor will verify that the new fasteners have properly penetrated the rafter/truss by visual examination inside the attic. Fasteners that miss the framing in whole or in part will be removed and re-nailed.

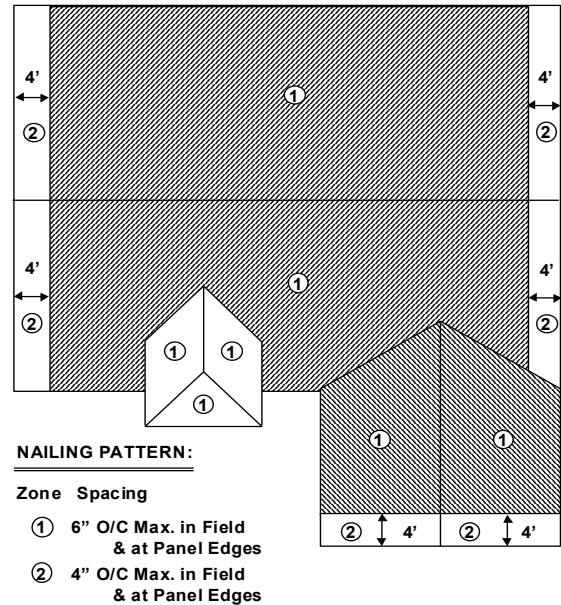


Figure A2: Recommended Nailing Pattern on Typical Roof

### A4. Apply Adhesive to Roof Decking and Rafters

A spray-on adhesive shall be applied to the underside of the roof sheathing from the attic such that a positive bond between the joists and the sheathing is formed. The applied adhesive shall have a minimum uplift capacity of 260 psf for a 4x8 ft panel as determined by laboratory testing. The 260 psf value refers to the mean value of the test results. Joints between sheathing pieces will also be sprayed with adhesive to provide secondary water resistance protection (prevent water infiltration in the event of roof covering losses). The adhesive should be applied continuously to within at least one foot of the eaves.

## Protection of Openings

### B. Install Window Protection:

Shutters must satisfy the SSTD 12-97 or SFBC standards for impact resistance and pressure requirements. Shutters must be installed as per the manufacturer's specifications. In the cost analysis, removable storm panels have been assumed for first floor windows, and accordion shutters assumed for second floor windows, but other similarly approved protective devices can be used. The protective device installed on windows to bedrooms must be operable from the inside of the building to allow for egress requirements of SBC97.

**OTHER REQUIREMENTS:** If the structure is equipped with shutter protection or the equivalent thereof, non-compliance with the current SSTD 12-97, or SFBC standards should be verified before replacement with new products. The contractor will ensure that all local standards and requirements are met. Products that meet the above referenced requirements must be used in order for the homeowner to receive insurance credits from their insurance company. Note that for some insurance companies, ALL openings, including garage doors and skylights, must be protected to the same standards as the windows in order to receive the shutter discount.

### C. Install Sliding Glass Door Protection:

Protection devices must meet the SSTD 12-97 or SFBC requirements for impact and pressure resistance. All devices must be installed according to the manufacturer's specifications. Accordion shutters have been assumed in the cost analysis, but other similarly approved devices can be used. See OTHER REQUIREMENTS in Install Window Protection section above.

# Wind Retrofits

## Protection of Openings

### D. Upgrade Garage Doors:

Some Garage Door Manufacturers (or Dealers) can provide documentation to show that an upgraded door meets the test requirements of the SFBC or SSTD 12-97; check with your local dealer to see if the required documentation can be provided. If not, you may have to remove existing garage door and replace it with new door (complete with all structural modifications and hardware required). New products must meet the SSTD 12-97 or SFBC requirements for impact and pressure resistance and must be installed according to the manufacturer's specifications. See OTHER REQUIREMENTS in Install Window Protection section above.

### E. Upgrade Entry Doors:

Building codes require that at least one door be useable at all times to provide entry and exit when storm shutters are in place. Accordion shutters may be used to cover a door that opens into the house, so long as the shutter can be opened and closed from the inside and outside. If no such shutter or a rated door exists or can be installed, at least one door must be replaced with a product meeting either SSTD 12-97 or SFBC requirements for impact and wind pressure resistance. If a door meeting either of these standards already exists, then no doors need to be replaced. All remaining entry doors must be rated or equipped with shutter devices meeting SSTD 12-97 or SFBC requirements. All devices must be installed according to the manufacturer's specifications. See OTHER REQUIREMENTS in Install Window Protection section on previous page.

### F. Install Skylight Protection:

All skylights must meet SSTD 12-97 or SFBC requirements for impact and pressure resistance (we know of no retrofits for existing skylights that meet these requirements). All devices must be installed according to the manufacturer's specifications. See OTHER REQUIREMENTS in Install Window Protection section on previous page.

## Upgrade Connections

### G. Tie Roof to Walls:

Provide positive connections via 'hurricane clips' for uplift between rafters, roof trusses and structural walls according to the requirements of the SSTD 10-97 and the manufacturer's specifications. An engineer's inspection, evaluation and recommendations with signed and sealed acceptance of the roof system and its connections to structural walls is required and shall be the responsibility of the contractor. Note that if straps exist, they do not need to be replaced unless improperly installed or compromised by corrosion.

Patch affected walls and ceilings with materials to match the existing materials and paint 'corner-to-corner' in order to match, as close as possible, the paint color and finishes

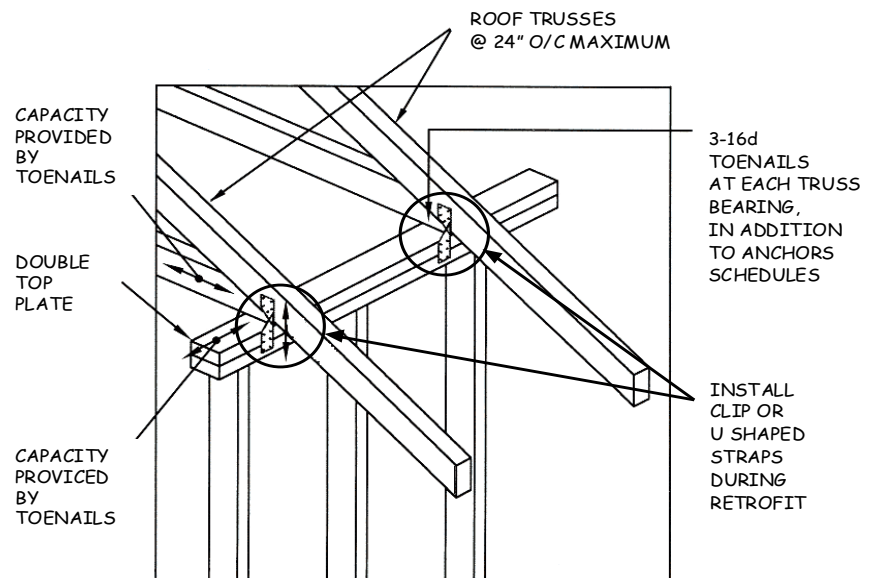


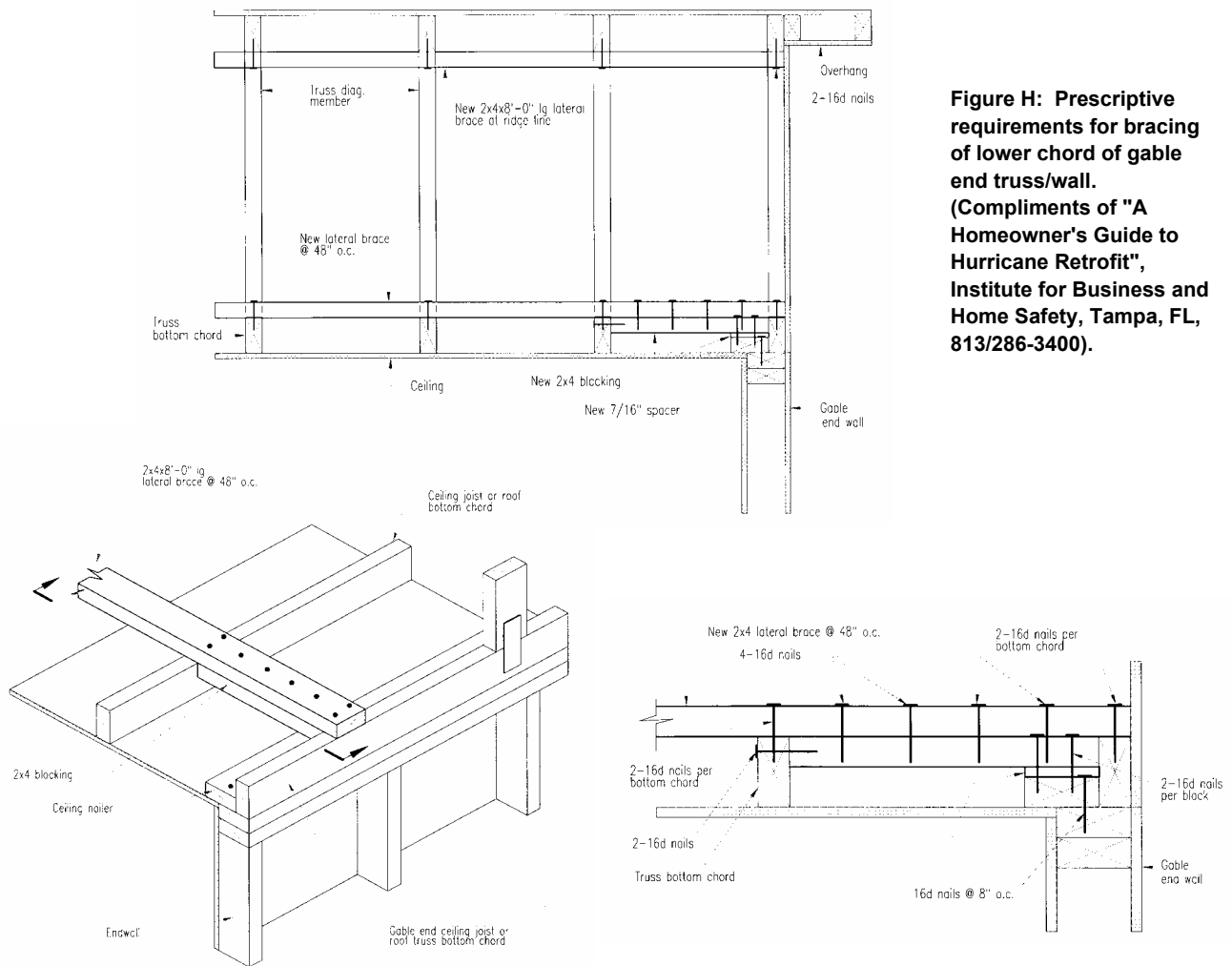
Figure G: Typical detail of truss to wall connection.

# Wind Retrofits

## Upgrade Connections

### H. Brace Gable End of Roof:

This retrofit is required to brace the bottom chord of the gable end truss or gable endwall. (Top chord bracing is accomplished through the use of properly connected roof sheathing, and is not the objective of this retrofit.) For homes with flat ceilings, bracing of the bottom chord may be accomplished by following the prescriptive requirements described below. Otherwise, for cathedral, vaulted, or other unusual situations, a Professional Engineer should conduct an evaluation the existing wall and bracing.



**Figure H: Prescriptive requirements for bracing of lower chord of gable end truss/wall. (Compliments of "A Homeowner's Guide to Hurricane Retrofit", Institute for Business and Home Safety, Tampa, FL, 813/286-3400).**

