

Hurricane Retrofit Guide



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Enhancing Roof Sheathing Attachment Strength

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Enhancing Roof Sheathing Attachment with Sub-floor Adhesive: You can improve the uplift resistance of the roof deck from the attic - without removing the roof covering. This is how:

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- Using a caulking gun, apply a 1/4-inch bead of wood sub-floor adhesive (AFG-01 rated) along the intersection of the roof deck and the roof support element (rafter or truss chord) on both sides. Make sure that the adhesive is in contact with both the deck and roof support elements.



Bead of adhesive applied along the intersection between roof sheathing and rafters or truss top chord.

(click image for larger version)



You can also get similar improvements in uplift using blocks of wood with adhesive on two sides

(click image for larger version)

- At places where you have limited access to either side of the roof support, such as the last rafter or truss at the gable end of the house, use 1/2 or 3/4 inch quarter-round pieces of wood and run them as far along the length of the roof support as you can. Pre-drilling holes for finishing nails before you get up in the attic will make it a lot easier to hold the quarter-round, nail, and adhesive because you can eliminate the need for "the third hand" by inserting the nails into the pre-drilled holes. Apply the adhesive along the two adjacent sides of the quarter round. Press the wood pieces onto the intersection making sure the adhesive is in contact with the deck and roof support elements and tack in place with the finishing nails. You can tell when you have applied enough adhesive if it squeezes out. The nails should not be driven into the deck as they may go through the deck and

damage the roof covering. As an alternative, you could clamp the wood pieces in place while the glue sets up.



This will permanently attach the roof deck to the top edges of the rafters or trusses. If at a later time one of these pieces of decking is damaged and has to be replaced, the roofer should not just try to pry the deck off the rafter or truss as this will damage the rafter or truss top chord, necessitating expensive repairs. If the glue approach has been used, the roofer needs to run a circular saw along the edge of the rafter or truss on either side and remove the sheathing in pieces.



Use of quarter round wood strips to significantly increase strength of the connection

(click image for larger version)

- Attics are typically tight, enclosed areas with poor ventilation. When applying the adhesive, be sure to follow the directions for proper application and ventilation. You can check the labels on the available adhesives and select the one that gives off the least amount of fumes. Nevertheless, a fan that circulates fresh air should be used to help ventilate the work area.
- Laboratory tests show that using the wood adhesive can increase the wind uplift resistance of the plywood roof sheathing by as much as three times the old code minimum method of securing the sheathing with 6 penny nails or staples. A variety of AFG-01 rated sub-floor wood adhesives are available at local hardware and building supply stores. You will likely find it more efficient and economical to buy the large caulk gun size tubes of adhesive. It will require fewer changes of tubes and that can be important in attic work and you will probably save more than enough to buy the larger caulk gun. See the document [Adhesive_Retrofit_of_Sheathing_Reinhold_Oct_1998.pdf](#) for additional information.

Enhancing Roof Sheathing Attachment with Spray Foam Adhesive: There are also some foam adhesives (usually polyurethane) that can be applied in the attic along the joints between the roof sheathing and the rafters or trusses. These adhesives are widely used in the manufactured housing industry and are different from insulating products such as Icynene. If also sprayed over the joints between the sheathing, these adhesives can help to keep water out if the roof covering is damaged. These systems use special chemicals that are mixed on site and require professional installation. Costs have typically started at about \$1.50 per square foot of roof and go up depending on the difficulty of attic access.



Foam adhesive sprayed over all joints between sheathing and along intersections between roof sheathing and roof structural members

(click image for larger version)

Enhancing Roof Sheathing Attachment with Closed Cell Spray Foam Insulation: Spraying a layer of closed cell polyurethane based foam insulation (about 3 to 4 inches thick) to the bottom side of the roof sheathing has gained popularity in recent years because of its benefits for reducing energy consumption and creating an un-vented attic space where ductwork and air handlers are operating in "Semi-conditioned" space. These foams bond very well to all the structural members as well as the roof sheathing and have been found to significantly increase the stiffness and rigidity of the roof, including the deck. While the cost of doing this is relatively high, the benefits in lower energy bills can be substantial. In addition, although there has not yet been any formal testing to determine how much the uplift resistance of the sheathing is increased, the expectation is that it will provide a substantial increase, perhaps doubling, the initial uplift resistance of the roof sheathing connection. Our expectation is that if the installation is done correctly and the attic is converted into an un-vented attic it will create multiple positive effects including, lower energy costs, a stronger roof that is better able to resist wind forces, and significant reduction in water penetration.

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