

Keep Wind and Water Out

A Guide to High Wind Protection



INSTITUTE FOR
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A GUIDE TO HIGH WIND PROTECTION

The 2004 hurricane season provided painful lessons in the importance of preparing for such destructive storms. Perhaps the most important of all is the need to properly protect your home sooner than later. This will allow you to focus on other important actions when a hurricane approaches, including gathering supplies and heeding evacuation orders.

The first step is to decide what level of protection you want and can afford – especially for doors and windows. Then you can permanently install any hardware that should be in place before storms start brewing. When a storm threatens, you can quickly install the protection and move on to other tasks and actions.

PROTECTING WINDOWS

The highest level of protection normally available for windows is professionally produced shutters that meet the Dade County standards for opening protection. These standards require that the product be able to resist the impact of a 9 lb 2x4 traveling at 34 m.p.h. without penetration of the shutter, and if installed according to the manufacturer's recommendations, not break the glass behind the shutter.

This level of protection can also be achieved for small to medium sized windows by making the shutter out of a 1/4" polycarbonate sheet. This has the added benefit of providing a transparent shutter that will allow light in if the power goes out. The disadvantage is that the cost of polycarbonate material has continued to climb as oil prices have gone up. (A 4' x 8' sheet currently costs just under \$200.) If you are making and installing your own shutters, you may want to consider this for your windows that allow the most daylight into living areas.

It takes about a 3/4" thick piece of plywood to provide close to the same protection as the Dade County approved products, and that will make for a very heavy shutter. You can of course use thinner plywood (and IBHS recommends plywood over oriented strand board, or OSB, because it takes 30% thicker OSB to equal the impact resistance of plywood.) Recognize



BE WISE ABOUT WINDOW MYTHS

- Do NOT open windows during a storm. This only lets damaging wind and rain into your home.
- Tape does NOT protect your windows from flying debris. It might keep more of the glass together when impacted, but it will not keep it in place.
- Window film does NOT provide much gain in protection from impact of anticipated debris. Some thicker "structural" film has passed the small missile test, which applies to things like gravel or similar sized objects. It does help keep glass shards together when the window breaks.

that the resistance to penetration by windborne debris is reduced in direct proportion to the thickness of the plywood. In other words, a 3/8" inch thick plywood shutter would be only about half as effective in resisting penetration as a 3/4" plywood shutter. IBHS recommends 5/8" thick plywood as a minimum unless you are having problems with handling the weight of the shutter.

Some layer of plywood over your windows will always be better than nothing, as long as it remains in place. And even the thinner sheets will help resist the most common wind borne debris such as small branches and shingles.

If you live in a community with tile roofs, IBHS strongly recommends you seriously consider Dade County approved shutter products for your windows. Our 2004 post-hurricane damage assessments noted considerable damage caused by wind-borne debris from roof tiles set with mortar.

INSTALLING PLYWOOD SHUTTERS

If you are going to make and install your own shutters, take the time to pre-install the anchorage hardware and prepare your shutter materials now, before a storm threatens. Pick out and purchase the material you want to use and cut it to the appropriate size for the type of installation you select. There are a lot of effective ways to install shutters and many more that are not. While you can nail plywood shutters as a last resort just before a storm strikes, repeatedly putting them up and taking them down will damage the area around your windows and doors, and ultimately affect anchorage quality.

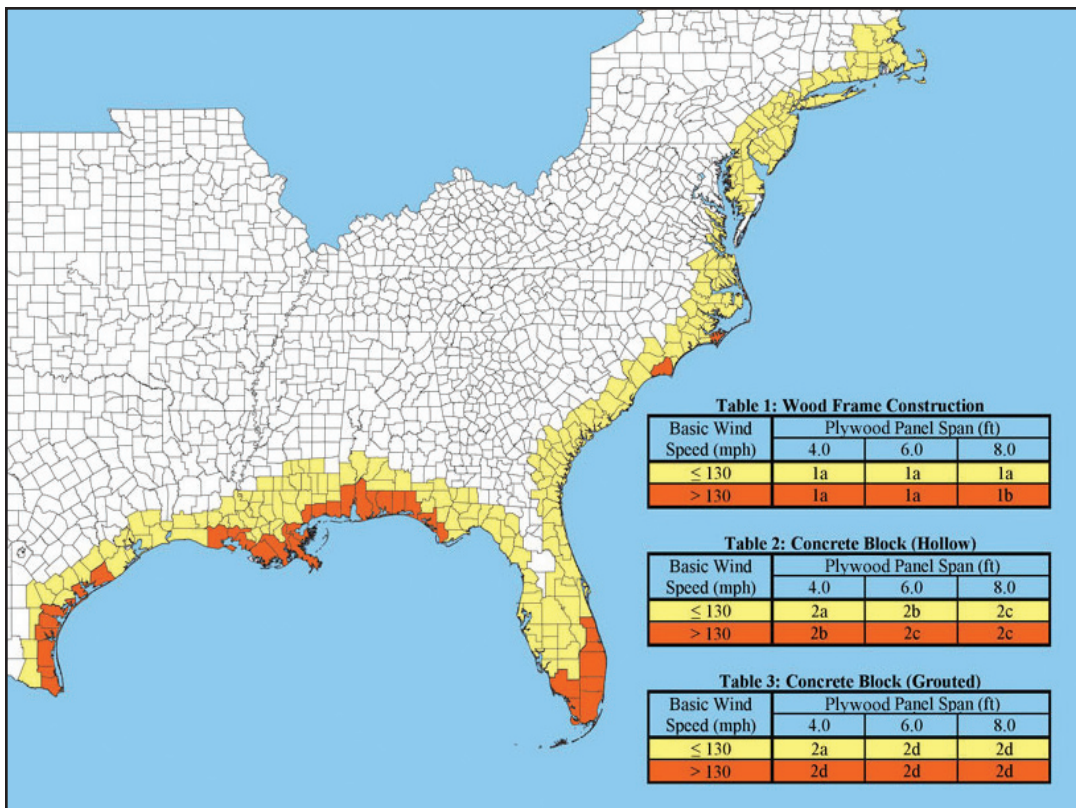
Plywood is stronger in the direction parallel to the grain. So you can take advantage of the panel's inherent strength and place fasteners only on the sides perpendicular to the grain (for example, top and bottom as shown), or along the sides if the grain runs that way.

For installations on wood frame walls, you can order stainless steel studs that have wood threads on one end and machine threads on the other. Search under hanger bolts for the types of hardware you need. Select stainless steel anchor bolts for permanent masonry installations.



ASSESS YOUR RISK

Use the map below to find the wind speed that applies to your home. Refer to the box to the right for fastener and spacing recommendations.



Wood Frame Construction:

1a) Use 1/4" diameter stainless steel hanger bolts at 16" O.C. (16" apart) with a minimum embedment depth of 2.0" into the wood framing within the wall.

1b) Use 1/4" diameter stainless steel hanger bolts at 12" O.C. (12" apart) with a minimum embedment depth of 2.0" into the wood framing within the wall.

Concrete Block Construction:

2a) Use 3/8" diameter stainless steel sleeve anchors at 16" O.C. (16" apart).

2b) Use 3/8" acrylic or epoxy-set stainless steel threaded rods with stainless steel screen inserts at 16" O.C. (16" apart).

2c) Use 3/8" acrylic or epoxy-set stainless steel umbrella inserts at 16" O.C. (16" apart).

2d) Use 3/8" acrylic or epoxy-set stainless steel threaded rod with a minimum embedment of 3.5" into the block (solid or grouted block).

APA – the Engineered Wood Association, offers a series of shutter construction and installation guides that can help you determine good installation alternatives for various types of wall systems. You can download free copies of the guides from the APA web site after you register. Go to www.apawood.org, select *publications* and search for *hurricane shutters*.

RESOURCES

Contractors Depot
www.stainless-fasteners.com
Grainger
www.grainger.com

Jamestown Distributors
www.jamestowndistributors.com
MSC
www.mscdirect.com
Wej-it
www.ankr-tite.com

ROOFING TIPS

A stronger roof can also increase your home's resistance to high winds. If you are replacing your roof, the contractor should:

- Remove old coverings down to the bare wood sheathing.
- Remove enough sheathing to confirm rafters and trusses are securely connected to the walls.
- Replace damaged sheathing.
- Refasten existing sheathing with 8d ring shank nails at 6" spacing on all support members.
- Seal all roof sheathing joints with self-stick rubberized asphalt tape (or equivalent system) to provide a secondary moisture barrier.

Choose a roof covering designed to resist high winds and make sure it is installed according to manufacturer recommendations.

PROTECTING DOORS

All doors should have three hinges and a dead-bolt lock with a minimum 1" bolt throw length. Metal or solid wood doors may withstand hurricane pressures and wind-blown debris, but if you have double entry doors (French doors), doors with glass or hollow-core doors, you may want to shutter them.

For double entry doors, add barrel bolt restraints to the inactive door to help keep them from bursting open during a storm. Make sure the bolts connect through the door header and through the threshold into the subfloor.

GARAGE DOORS

Because of their width, double-wide garage doors are more susceptible to wind damage than single doors. The wind may buckle the door, force it out of the roller track, or the track could be vulnerable to the pressure, especially if it is light weight or the fasteners don't penetrate the wall deep enough. Wind coming into your home through an opening this large poses grave problems for the rest of your home – especially your roof.

Consider installing a garage door that is hurricane resistant (tested and approved for your area), or shutter the garage door opening with a wind pressure and impact rated system appropriate for your area. Be sure to check if there are any other code requirements for garage doors where you live.

Garage door retailers may have a wind retrofit kit specifically made for your door. If the manufacturer does not

make a system for your door, you can purchase a generic garage door retrofit kit. There is at least one manufacturer of a vertical bracing kit that has Florida Building Code approval. However, keep in mind that these retrofit kits do not provide any additional protection from flying debris. Most doors that are not hurricane rated will not.

ADDITIONAL STEPS TO CONSIDER

- Shutter and seal gable end vents to prevent wind driven rain from entering attic space.
- Use a high quality silicone caulk around outside wall openings such as clothes dryer, kitchen or bathroom vents, outdoor electrical outlets and where cables or pipes go through the wall. Just before a storm, close dryer and bathroom vents with duct tape (but remove it after a storm, before using the vents.)
- Consider cutting wall screens in pool enclosures just before the storm hits, if you are still there and your property is located near the landfall position. This may save the aluminum enclosure.

If you decide to reinforce your double-wide garage door, do so at its weakest points. Install horizontal and/or vertical bracing onto each panel, using wood or light gauge metal girds bolted to the door mullions (vertical member that forms a division between units of a window, door, or screen.) Heavier hinges and stronger end and vertical center supports may be required.

If you do anything that adds weight to your garage door, call a professional to make sure the door is balanced. The springs will probably need adjusting. Since the springs are dangerous, only a professional should adjust them.



Garage door damage documented during the 2004 hurricane season.

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The Institute for Business & Home Safety's mission is to reduce the social and economic effects of natural disasters and other property losses by conducting research and advocating improved construction, maintenance and preparation practices.

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