

Force of Nature

When Disaster Strikes, Be Ready

by Julie P. Hawkins, for the PATH Partners

As we witnessed in New Orleans in 2005, hurricanes can cause damage in the billions of dollars and disrupt or end hundreds of lives. Nobody wants a home (or a life) to become a statistic.

Thankfully, several building materials and methods are available to increase a home's – and a family's – chance of weathering the storm and provide a reasonable amount of comfort in the aftermath.

This article is a simple primer on hurricane resistance for the everyday homeowner. Hand this article to your builder, and together, you can discuss what works best for your home. (More detail on the measures discussed below is available from the Partnership for Advancing Technology in Housing (PATH) at www.PathNet.org.)

SOLID AS A ROCK

Hurricane wind speeds can reach an astounding 150 mph or more. If windows or doors fail during the storm, the wind rushes inside and pushes upward. Outside, the turbulent air over the roof is like a giant hand, also tugging upward. Together, these forces can blow the roof right off.

But wind isn't even the most damaging force in a hurricane. In fact, the greatest damage in most storms is due to water. You must take both factors into account to create a truly

durable home. Luckily, there are many steps you can take to reduce these risks and keep your home intact.

STRUCTURE. Concrete is a popular method of construction in hurricane-prone areas, and for good reason. It withstands winds better than wood, doesn't retain moisture and lasts practically forever.

A cut above traditional concrete block is precast concrete walls and foundations. These come in many forms, but all are manufactured in a factory, rather than constructed on site. This cuts costs and speeds construction, which means a more durable home built faster, for less.

What if concrete isn't your style? Several other hurricane-resistant measures will help protect your home, whether you choose concrete or not:

ROOF AND WALLS. Imagine the difference between the hurricane trying to lift the entire house – one solid structure – rather than just the roof. Hurricane straps, which tie the roof and walls to the foundation, provide this kind of protection. They are most effective when all of the framing is lined up, top to bottom, and must be installed on all exterior walls, as well as any interior walls that help support the weight of the roof or upper stories (“load-bearing walls”).



- 1 Hurricane Straps
- 2 Load Bearing Walls
- 3 Hipped Roof
- 4 High Wind-Resistant Shingles
- 5 Peel-and-Stick Roof Membrane
- 6 Storm Shutters
- 7 Impact-Resistant Glass
- 8 Reinforced Garage Doors
- 9 Out-Swinging Doors
- 10 Extended Deadbolt
- 11 Water-Resistant Insulation
- 12 Roof Trusses
- 13 Safe Room
- 14 Natural Gas-Powered Generator

drawings courtesy of the PATH Partners

COST COMPARISON:

	SIGNIFICANTLY MORE EXPENSIVE than the traditional alternative	NOT SIGNIFICANTLY MORE EXPENSIVE than the traditional alternative
Hurricane ties		X
Out-swinging doors		X
Reinforced garage doors		X
Hipped roof	X	
Safe room	X	
High wind-resistant shingles	X	
Storm shutters*	X	X
Impact-resistant glazing*	X	

*A regular 3' x 5' window costs about \$250. Storm shutters cost \$8 to \$30 per square foot more than regular windows. Windows with impact-resistant glazing cost \$25 to \$30 per square foot more than regular windows.

Consider a moderately pitched hipped roof rather than a gable roof for added hurricane resistance. A hipped roof might cost a little more, but it'll look a whole lot better than a gable roof destroyed by a storm.

Regardless of the roof type, the roof must be installed properly. For the roof to survive hurricane-force winds, your builder will need to use ring shank nails, which have little rings or spirals along the length of the nail to hold them in. The builder will need to consult the local code to determine how many nails are enough.

High wind-resistant shingles will also go a long way toward keeping your roof in place. These shingles are more expensive than your typical asphalt variety, but they will pay for themselves many times over if they keep the roof on and the water out. Some major insurance companies even offer homeowners premium discounts.

Another alternative is a peel-and-stick roof membrane, which covers the entire roof below the shingles. This will provide excellent protection from rain if the shingles blow off. Again, this membrane is more expensive than standard roofing felt, but way less than the cost of replacing the roof.

SHUTTERS. Shutters that actually close over the windows will help keep windows intact and keep hurricane-force winds and wind-driven rain out. Storm-resistant shutters are either permanent or removable. Removable shutters can be heavy and have sharp edges, so you may need assistance when putting them up or taking them down. The installation of shutters on second-story windows or on vacation homes could also be especially complicated. What if you're out of town or have to install the shutters without help? Keep safety and convenience in mind.

WINDOWS. Impact-resistant windows may prove a better alternative to shutters but each homeowner should weigh the pros and cons of each. Impact-resistant glass is best for windows that are hard to reach or not easily fitted with hurricane shutters. When struck, the laminated glass may crack or shatter, but the glass fragments tend to adhere to a plastic layer and stay in place. Strong enough to resist bullets, impact-resistant windows significantly reduce the risk of window failure, personal injury or property loss during a hurricane.

DOORS. If your local building code allows it, install your front door so it swings out instead of into the house.

Out-swinging doors are more resistant to high winds and do a better job of keeping water out of the house.

The deadbolt should be at least one inch long and should penetrate into the stud framing, not just the doorjamb. To strengthen the hinge side, ask the builder to install at least three hinges with the hinge screws penetrating through the doorjamb into the studs. Installing slide locks (also called head and foot bolts) at the top and bottom of the door will further strengthen the door. These are absolutely necessary for double doors. Locks must be mounted securely to the subfloor and door header, not just into the trim.

When we think of doors, garage doors don't always come to mind, but they are often the weakest point of a home. If the garage door fails, this becomes a huge entry point for wind and rain, and could help blow your roof off. Double garage doors are also much more likely to collapse from strong winds than single doors. A simple solution is to install (you guessed it) hurricane-resistant garage doors.

INSULATION. If your insulation gets wet, not only will it be far less effective at insulating your home, it may be a host for mold. Conventional fiber-

glass insulation is very difficult to dry, so it usually must be replaced if it gets wet. Non-moisture absorbent insulation, such as sprayed-foam insulation, dries more readily but costs more.

ASK THE BUILDER:

- ✓ Did you align the framing so that there is a continuous line from the roof trusses down through the wall's studs and to the foundation? (This will improve the strength of the home and help keep the roof on.)
- ✓ Can you design my roof to be hipped rather than gabled?
- ✓ Will local code allow me to have out-swinging exterior doors?
- ✓ How much extra will impact-resistant windows cost? Hurricane shutters?
- ✓ Will you use a construction adhesive (certified by AFG-01) to glue the underside of the roof to the rafter or trusses?
- ✓ Can you use baffled ridge vents and off-ridge vents instead of unbaffled vents? (Unbaffled vents tend to allow wind-driven moisture to enter attic spaces or the cavities of cathedral ceilings, causing moisture damage and mold growth.)
- ✓ Will you design the fascia board to extend and terminate below the underside of the soffit? (This helps keep water out of the eaves.)
- ✓ Will you use water-resistant materials that can dry out easily?

SAFE AND SOUND

An approaching hurricane usually means one thing: it's time to evacuate. A safe room can serve as shelter in the event that evacuation is impossible. The safe room is commonly made from 8-inch concrete block reinforced with steel rebar, which will stand strong in high winds, if a tree falls on the house or if debris blows in through windows, doors or the roof. But remember: staying in the home is your last resort.

In the aftermath of a hurricane, getting back to everyday life can take time if your home has been severely damaged. A safe room can serve as a back-up shelter as you undertake repairs. These interior rooms can also double as a master bedroom closet, a bathroom or laundry area, providing useable space all year round.

While you'll have shelter in a safe room, you may not have power unless you



plan ahead. Ask your builder to provide a natural gas-powered generator in case the lights go out and the fridge turns off. The generator will also allow you to use fans and dehumidifiers if the house floods, which will help prevent mold and rot. Because of the danger of carbon monoxide poisoning, never use a generator inside a home or garage.

ASK THE BUILDER:

- ✓ Will you include a backup generator in the plans for my home connected to the refrigerator, select lighting and outlets in the safe room?
- ✓ Is it feasible to locate all electric outlets and switches 12 inches above the projected flood elevation of my home?
- ✓ Have you located my gas-powered generator in a well-ventilated space outdoors and away from HVAC equipment?

AFTER THE STORM

No matter how many hurricane-resistant features you invest in, it's wise to ask licensed contractors or a home inspector to assess the damage if you are hit by a major storm. They should look for electrical damage, inspect gas lines, remove uprooted trees and check the plumbing.

That's the ideal world. The reality may be different, since building pros are usually in great demand after a damaging storm, busily repairing everyone else's home. But if you work with your builder to prepare for that storm now, it's likely you'll be able to wait. ■

HURRICANE SAFETY TIPS

- ❑ Keep flashlights, batteries, a portable radio, non-perishable food and drinking water on hand.
- ❑ Never use candles or matches inside the home, as gas lines may have ruptured.
- ❑ Turn off electrical equipment you were using when the power went out.
- ❑ Remember that downed or damaged trees can conceal live power lines.
- ❑ Keep listening to NOAA Weather Radio or local radio or TV stations for instructions.

Julie Hawkins writes about better building practices on behalf of the Partnership for Advancing Technology in Housing (PATH).

PATH is administered by the U.S. Department of Housing and Urban Development. Learn more at www.PathNet.org.