

6. Opening Protection

You can protect your home's openings, such as windows and doors, from penetration by windborne debris by installing impact-resistant windows and doors or installing impact resistant coverings, such as shutters over windows and doors.

Impact resistant glass and shutters are specifically designed to meet a combination of impact and continuous pressure from the wind. Always use products that have been tested to one of these standards and have been designated as such through a recognized product approval system or evaluation report: SBCCI SSTD 12
ASTM E 1886 and ASTM E 1996
Miami-Dade Protocols PA 201, PA 202, and PA 203.

Equally important as the strength of the glass or shutter is the strength of the window's frame and attachment hardware. Opening protection devices are tested as a unit that includes the glass, the frame, as well as the attachment hardware and the installation method. Impact resistant windows and shutters should always be installed following the manufacturer's recommendations.

7. Doors

Exterior doors should also be wind and impact resistant or protected with an impact resistant covering.

Garage doors are particularly vulnerable to high winds, because of the long span of opening they cover and the relatively lightweight material they are made of. Two options are available for strengthening garage doors.

Replace the door and track with a system that is designed to withstand high winds and wind-borne debris. The second option is to protect the garage door with a tested and approved impact resistant covering.

For more information...

Construction information, builder/inspector courses and technical support is available to homeowners, homebuilders or inspectors at no charge from the Federal Alliance for Safe Homes – FLASH, Inc., a non-profit, 501(c)3 education organization dedicated to strengthening homes and safeguarding families from natural and manmade disasters.

For more information on disaster-resistant, "code-plus building techniques visit www.flash.org, www.blueprintforsafety.org or call 877.221.SAFE.



Special Edition

BLUEPRINT NEWS[®] FOR SAFETY

Rebuilding After the Storm

"Seven Things You Need to Know Before Rebuilding Your Hurricane-Damaged Home"

...Homeowners can now strengthen homes to "code-plus" standard.

When repairing or rebuilding after a storm there are a number of steps homeowners can take to strengthen their homes against future disasters. Storms as recent as Hurricane Charley underscore the need for disaster-resistant homes that exceed current building standards. The Federal Alliance for Safe Homes offers "code-plus" construction techniques for new and existing homes that provide the maximum level of protection from wind, rain and windborne debris. Inside this Special Edition of Blueprint for Safety News are the tips and techniques homeowners need to strengthen their homes and safeguard their families.



Disaster Safety Through Partnership

Academic Partners

Austin College
Central U.S. Earthquake Consortium
International Code Council
Texas Tech Wind Science and Engineering Research Center

National Partners

American Red Cross
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The Home Depot Foundation
The Salvation Army
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Rocky Mountain Insurance Information Association
Southwest Insurance Information Service
Tampa Bay Regional Planning Council

State Partners

Alabama Department of Insurance
Arkansas Department of Insurance
Building Officials Association of Florida
Citizens Property Insurance Corporation
Disaster Contractors Network
First Floridian
Florida Department of Community Affairs
Florida Department of Financial Services
Florida Division of Forestry
Florida Emergency Preparedness Association
Florida Fire Chiefs Association
Florida Insurance Council
Florida Select
Georgia Department of Insurance
Georgia Emergency Management Agency
Independent Insurance Agents of Texas
Kentucky Division of Emergency Management
Kentucky Office of Insurance
Kentucky Weather Preparedness Committee
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Virginia Bureau of Insurance
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Volunteer Florida
West Virginia Insurance Commission

Community Partners

Brevard Prepares
Duval Prepares
Hernando County Emergency Management
Home Builders Association of Greater Dallas

Miami-Dade Emergency Management
Tulsa Partners

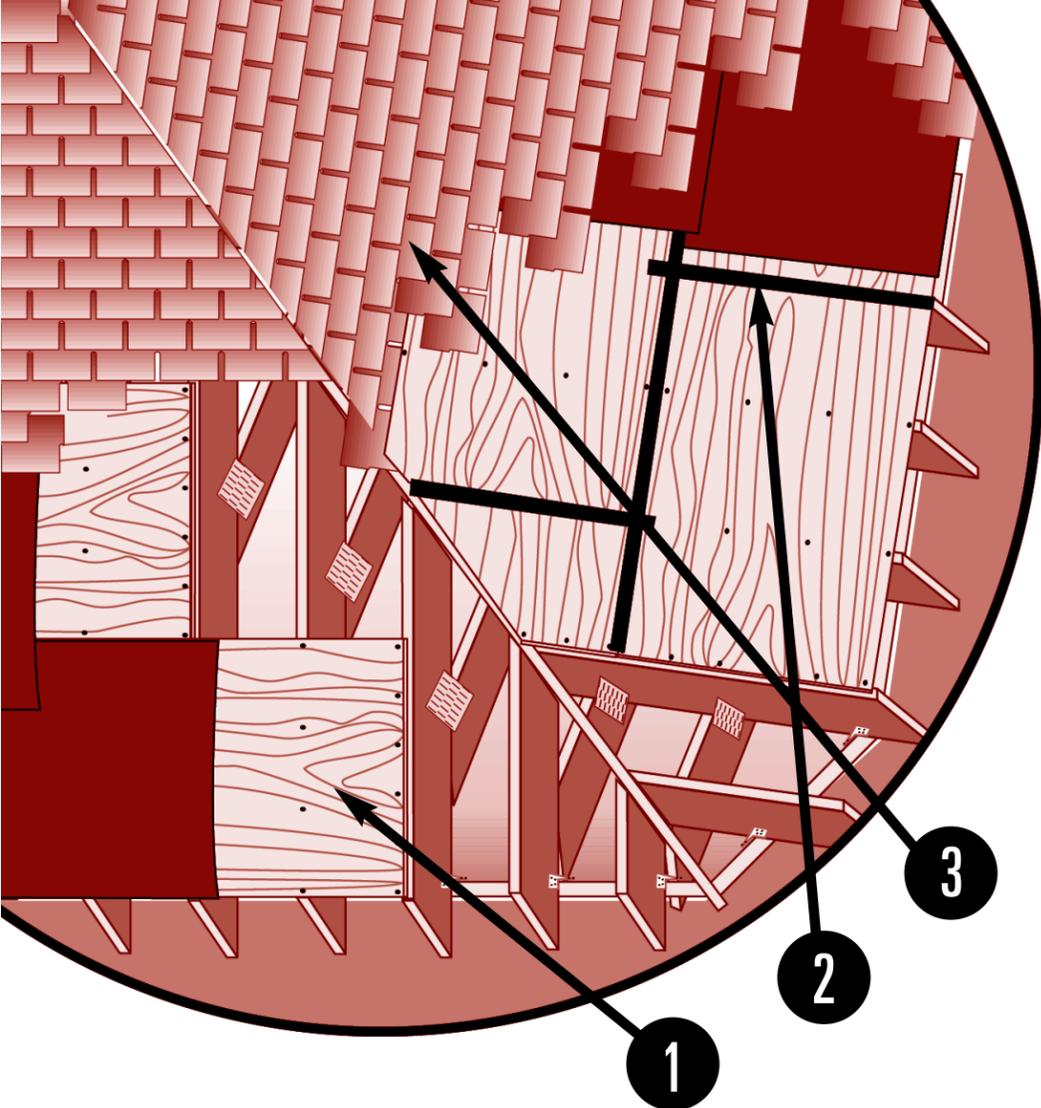
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1. Roof Deck and Attachment

The roof covering, and the deck beneath it, are your home's first line of defense and form a critical shield of protection from high winds and rain. The following techniques should be used during roof installation on both new and existing homes, and are best performed by a licensed, professional roofing contractor.

- Install a roof deck of solid plywood – 5/8" thickness to maximize wind and windborne debris resistance with 10 penny common or 8 penny ring shank nails spaced at 4 inches along the panel edges and every six inches in the field of the plywood panel. Make sure that the nails penetrate the decking directly into the roof framing.
- Be sure to look in the attic to confirm that the roof decking is properly nailed to the roof framing. If you can see nails along the sides of rafters or trusses, where the nail penetrates the decking, your roof deck is probably not securely attached.

2. Secondary Water Barrier

Even though roof coverings are somewhat wind resistant, a secondary water barrier provides protection if the covering is damaged or is blown off.

- Create a secondary water barrier by installing self-adhering flashing tape or modified polymer bitumen strips on top of the joints in your roof deck. This will help keep out the rain in the event the roof covering is damaged or destroyed by severe weather.
- Install one layer of #30 underlayment – sometimes called felt paper – over the roof decking and secondary water barrier. The felt helps with drainage in the event water gets under the roof covering.

3. Roof Covering

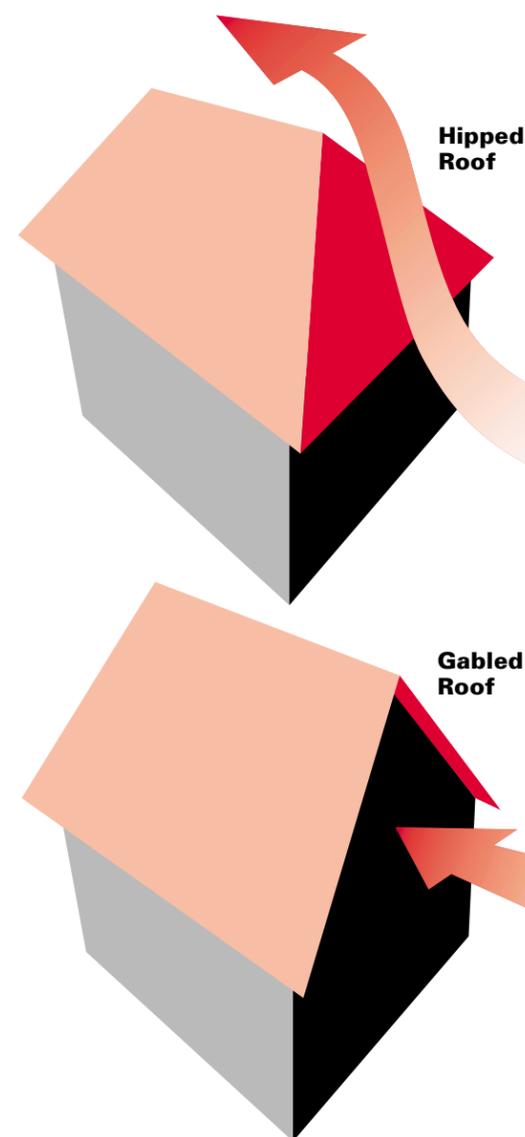
- Install a roof covering that has been tested to the latest standards for wind and hail resistance. These standards are: ASTM D 3161 enhanced or UL 2390 for wind resistance and UL 2218 for impact resistance.
- Be sure to specify these standards and look for labels on the products confirming these standards because ordinary roofing materials may not look any different from the wind resistant versions.

4. Roof Shape and Bracing Gabled Ends

The type and shape of the roof on your home can help determine how well it will perform during a severe windstorm.

A hipped roof typically performs better in windstorms than a gabled roof because of its aerodynamic properties and typical construction techniques.

A hipped roof is one that slopes upward from all sides of the building. A gabled roof has two slopes that come

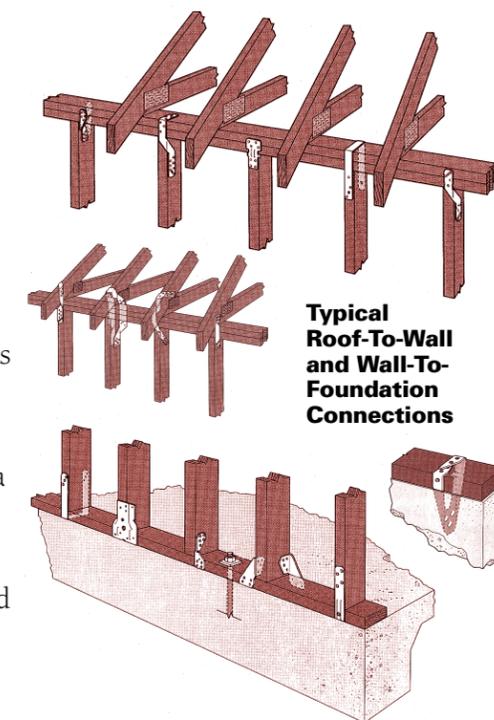


together to form a ridge or a peak at the top – each end looks like the letter A. Homes with gabled roofs are more likely to suffer damage, such as collapse of the end wall from high winds because they are often not braced properly during construction. If your home is built with a gabled end wall, use one of the following construction techniques.

- **Continuous Wall Construction or Balloon Framing** – Use full-height studs, concrete or solid masonry walls from the floor below all the way up to the roof. Balloon-framed gable end walls perform better in windstorms because they do not have the hinge that usually exists where the triangular part of the gable sits on top of the wall below. Homes with high, cathedral-like ceilings, where there is no place to brace a gabled end, should be balloon framed, or will require a special design by a registered or licensed engineer.
- **Platform Framing** – Brace the intersection of the gable and the end wall. This intersection is a particularly weak point and those that are not properly braced can collapse, causing major damage, allowing wind and wind-driven rain into the home. In homes with attics, an attic floor or ceiling diaphragm with the proper bracing techniques can be used to provide the lateral support of the gable end wall if the end wall is NOT framed full height.

5. Roof to Wall Connections

Your home's ability to resist the extreme force of wind is only as strong as its weakest link, so the only sure way to create a wind-resistant home is to secure all connections – roof-to-wall, floor-to-floor and wall-to-foundation.



The roof is your home's first line of defense from a storm. To make sure the roof stays in place when severe winds blow, securely anchor the roof to the wall by installing hurricane straps or clips at every wall-to-rafter (or truss) connection to reinforce the roof.

These connections are critical in holding the roof together and will dramatically increase the home's overall resistance to wind. Be sure to install all connectors following manufacturer's specifications.