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 SSTD12, ASTM E 1886 and ASTM E 1996; or 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. Impact-resistant units 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, or 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.

Frequently Asked Questions

What Do Product Testing Standards Mean to Me?

ASTM D 3161 – This is the testing standard for wind resistance in residential roofing products. The combination of letters and numbers translates to the American Society for Testing and Materials Standard D 3161. The test involves using fans to blow air across product test panels at a speed of 60 mph for two-hours.

UL 2218 – This is the testing standard for impact resistance in residential roofing products. The “UL” stands for Underwriters Laboratories, which developed the testing criteria. The 2218 identifies the test protocol, which consists of dropping steel balls from designated heights onto roofing materials at specified locations.

SBCCI SSTD12 – This is a testing standard for impact-resistant glass and shutters. The combination of letters and words translates into Southern Building Code Congress International Standard 12.

ASTM E 1886 and ASTM E 1996 – Another testing standard for impact-resistant glass and shutters, the letters and numbers stand for American Society for Testing and Materials. The “E” in the testing method while the E 1996 is the specification for determining the performance of impact resistant products.

Miami-Dade Protocols PA 201, PA 202, and PA 203 – The most stringent testing standards in the nation for impact-resistant glass and shutters. The “PA” stands for Product Approval. PA 201 is the large missile impact test; PA 202 is the test for structural pressure; air, water and forced entry; and PA 203 is the test for cyclic pressure.

As a Homeowner, How Can I Find a Reputable Contractor to Work on My Home?

It is essential that your contractor be licensed and insured before any work is undertaken. Check with the state agency that handles the licensing of professionals and your local Better Business Bureau for any complaints on file. Be cautious about hiring contractors to repair or rebuild your damaged property. Remember the old adage: “If it looks too good to be true, it probably is” – FLASH urges consumers to follow these common-sense guidelines:

• Get estimates from at least three licensed, insured contractors. Because of contractors soliciting work door-to-door

• Ask for and check references of other work the contractor has done.

• Ask for proof of insurance. If the contractor does not have liability and workers’ compensation insurance, you may be liable for accidents on your property.

• Ask for a written estimate. Read the fine print. Make sure it includes everything you expect the contractor to do.

• Get a contract in writing. It should cover exactly what work is to be done, when work will start, how long it will take, payment schedules, and the quality of materials to be used. Once signed, the contract is legally binding on both you and the contractor.

• Never make full payment up front. Don’t sign over an insurance settlement check to the contractor. Reputable contractors will accept payment based upon the percentage of work completed.

• Don’t make final payment until the work is finished. Obtain lien waivers to ensure that no one who supplied materials can put a lien on your home because the contractor did not pay them.

• Make sure all work that requires site or county permits and inspections is officially approved in writing before the final payment is made.

When you’re building a new home—or when you’re repairing or rebuilding after a storm—there are a number of steps you can take to strengthen your home against future disasters.

The Federal Alliance for Safe Homes offers construction techniques for new and existing homes that provide a greater level of protection from wind, rain, and wind-borne debris. Inside this brochure are the tips and techniques homeowners need to strengthen their homes and safeguard their families. Homeowners who take these steps can gain greater peace of mind by better protecting their homes and families, and could potentially save money on future repairs.
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 6 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.

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 (modified to 110mph) 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. For gable end wall construction, 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 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.

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.
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- 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 may not be securely attached.

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