Journey to a Storm-Resistant Home

When Florida resident Dean Norbeck began construction of his home in 1998, he knew he wanted to use impact-resistant windows in his own home despite the extra expense. Norbeck said he was more concerned about the impact-resistant exterior doors as well. Kim came through again with another company that made Andersen windows and doors when Norbeck's builder could not find what he was looking for.

Again, Norbeck turned to FLASH for help. Kim got Norbeck in touch with an impact-resistant window manufacturer who was able to provide the windows he wanted, even a difficult-to-find 12-foot slider. The same company sold impact-resistant exterior doors as well. Norbeck knew he wanted to use impact-resistant windows and doors in his own home despite the extra expense.

When they bought property on Marco Island in 1998, the windows in a nearby model home provided inspiration for their own storm-resistant home. The house had impact-resistant windows that the salesmen told them could not be broken with a baseball bat. After hearing that, Norbeck knew he wanted to use impact-resistant windows and doors in his own home despite the extra expense.

He also recommended that Norbeck pay the extra expense for SiVik equipped glass deicing instead of 0SH, because glass provides better impact resistance. With these changes made, Norbeck believed he had done the best he could to strengthen his home.

"If I had pushed my builder as far as I could go, Norbeck said, "I didn’t feel like he could do more."

Norbeck is having his roofing contractor strip the roof down to the roof deck and replace the roof deck to FLASH specifications. In addition, they will make secondary recommendations of installing a secondary water barrier, also not required by the current building codes. Norbeck advocates the motto about this process, which resulted in reducing the cost by several hundred dollars.

Norbeck is exploring his options regarding his roof covering and says, whatever he chooses to do, he will definitely go beyond the standard building code. The roof replacement project should be completed by June, "just in time for the next batch of storms," he said.

Norbeck said he wants more people to know about FLASH and take advantage of the organization’s expertise. "FLASH is a fantastic group," he said. "The whole mission of educating consumers and also builders about strengthening homes is dead-on right. It’s the only way to solve the property damage here or anywhere for that matter."

With this issue of Blueprint for Safety News, FLASH is kicking off "Retrofitness," a new public awareness campaign designed to help you get your home in better shape to face disaster.

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The word "retrofit" means to install a device or system for use in or on an existing structure, especially an older dwelling. What does FLASH mean when it uses this word interchangeably with "strengthening"? Over the next several months, the Retrofitness campaign will provide you important information on what you can do to strengthen your home against threats such as wind storm, wildfire, flood, and hail.

This newsletter issue focuses on strengthening your existing home against high winds inherent with hurricanes and similar storms. We have witnessed too many times over the past two years what can happen to homes, especially older ones, during a hurricane. While a home's windows, exterior doors, and roof are particularly vulnerable in this situation, they also offer the best opportunities to strengthen your home through retrofitting. For more details on the retrofitting techniques discussed in this newsletter, please visit www.Flash.org and www.Blueprintforsafety.org.

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Your roof’s covering and the deck beneath it work together to shield your home and belongings from wind and rain. Unfortunately, this shield is often damaged during a hurricane. Once it’s damaged, wind and rain can enter your home, causing further destruction and perhaps a complete collapse of your roof. The good news is that you can take steps to strengthen your roof against hurricanes.

Retrofit During Re-Roofing
Did you know that the shape of your roof can have a lot to do with how it performs during a hurricane? Homes with gables are more likely to fail in high winds.

- Brace gable end connections. These connections will dramatically reduce the opportunity for gable end connections to fail during hurricanes. Most often, the gable end framing and endwall is a common failure during hurricanes.
- Install hurricane straps or wind clips at the exterior wall to monitor safety of gable end connections, which may be more likely to fail in high wind.

Other Considerations
- Add hurricane straps to gable end connections. Many homes located in extreme weather climates will need to be rebraced in order to perform well during hurricane winds.

Metal panels – Clips or create a pressure equalization barrier between the roof covering and the interior of the building. These are commonly referred to as wind clips or storm straps. A common practice in high wind areas is to use a dab of roof cement or penetrate 3/4-inch into wood or structural timber. Avoid using nails as a means to fasten the roof covering to the sheathing. (usually means raised or cathedral ceilings), attention should be brought to the homeowner of likely damage during the next severe storm.

- **If not, the chances are the house has gables. Evaluate whether or not the house has any significant gable end walls (larger than 15’ wide) with access from the attic to reach all exterior walls?**
- **2. Is it feasible to install hurricane wall anchors?** The answer will be yes for homes with attic access, and no for homes without attic access.
- **3. Seal all roof-wall connections.** This will help keep out the wind blowing over your home.
- **4. Seal all roof sheathing joints.**

Care should be taken during re-roofing to maintain the integrity of your roof. The most common mistake that homeowners make when re-roofing is the failure to install a roof cover as specified by the building code. To maintain the integrity of your re-roof, make sure to:

- **Install a roof covering that has been tested and approved.** A roof covering with a test label is held to higher standards and is considered more durable. Look for the letters “A” on the label. Homes with gabled roofs are often not braced properly during construction. To learn more about roof covering performance and the tests 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 greater damage, such as collapse of the end wall from high winds because they are not braced properly during construction.

- **5. Brace gable end connections. These connections will dramatically reduce the opportunity for gable end connections to fail during hurricanes.**

Many homes located in extreme weather climates will need to be rebraced in order to perform well during hurricane winds. The most common mistake that homeowners make when re-roofing is the failure to install a roof cover as specified by the building code. To maintain the integrity of your re-roof, make sure to:

- **Install a roof covering that has been tested and approved.** A roof covering with a test label is held to higher standards and is considered more durable. Look for the letters “A” on the label.

- **Install hurricane straps to gable end connections.** The combination of letters and numbers translates to the American Society for Testing and Materials Standard D 3161. The test rating indicates the hurricane wind pressure the product can resist. This is a testing standard for impact resistance in residential roofing products. The letters and numbers translate to: ASMD 3161 –

**Wind Protection Options**

- Impact-resistant windows usually consist of a clear plastic-like film sandwiched between two specially-coated pieces of glass, giving the window greater strength than glass alone.
- Impact resistance glass and stainless steel are specifically designed to meet a combination of impact and pressure from the wind. Always use products that have been tested and approved to meet one of three standards and have been designated as such through a recognized product approval system or evaluation report. (SRCS C12, ASTM E 1868, and ASTM E 1696; or Miami-Dade Protocol 201 PA 202, and PA 203)

- **Door Protection Options**

  - Exterior doors should also be impact resistant with the door frame securely mounted to the building or protected with an approved impact-resistant exterior. Exterior doors that open out rather than in are easier to protect. Don’t forget to protect your garage door, which is particularly vulnerable to high winds because of the long space of opening they cover and relatively lightweight material they are made of. The rain option available for garage doors is to replace the door with a door that has a track system that is designed to with high wind loads and operate from the inside. Roll-down shutters are often the easiest to operate in these conditions.
  - Never options for window protection include fabric screeners and are through plastic products. Again, whatever you choose, 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. (SRCS C12, ASTM E 1868, and ASTM E 1696; or Miami-Dade Protocol 201 PA 202, and PA 203)

- **Proper Installation is Key to Effective Protection**

  - Impact-resistant windows, doors, and impact-resistant coverings must be installed according to the manufacturer’s instructions to ensure effective protection of your home’s openings. Read the installation instructions that accompany the product you have chosen for installation. You may choose to hire an inspector to confirm the proper installation of your roof covering products prior to making full payment to the installer.

- **Which Opening Protection Method is Right for You?**

  - **Windows and Doors Of Opportunity**

**What Do Product Testing Standards Mean to You?**

ASTM D 3161 – This is the testing standard for wind resistance in residential metal roof products. The combination of letters and numbers translates to the American Society for Testing and Materials Standard D 3161. The test rating indicates the hurricane wind pressure the product can resist. This is a testing standard for impact resistance in residential roofing products. The US Standards for Underwriters Laboratories, which developed the testing criteria. The test involves using fans to create high wind conditions.

ASTM E 1868 – This is the testing standard for impact resistance glass and shutters, the letters and numbers translate to the American Society for Testing and Materials. The E 1868 is the testing method while the letter “E” denotes the product approval of the unit that includes the glass, the frame, as well as the attachment hardware and the installation method. Impact-resistant windows should always be installed following the manufacturer’s recommendations.

**Keep your Home in Shape**
Each year, tornadoes, hurricanes, and other severe windstorms rip through communities across the U.S., killing and injuring people and causing millions of dollars in property damage.

You can better protect your family from injury caused by the extreme winds and flying debris of a windstorm by constructing or installing a safe room in your home.

In most cases safe rooms consist of a small room in a house, such as a closet or bathroom that has been reinforced to provide protection. But they can also be built in a garage or outside area away from the home. The value of safe rooms has been proven. After a May 1999 tornado outbreak in Oklahoma killed 40 people and injured hundreds, a Federal Emergency Management Agency rebate program resulted in the construction of more than 6,000 safe rooms. When a tornado hit Oklahoma City three years later, residents took shelter in these safe rooms and no lives were lost.

Visit www.flash.org and look for the Tornadoes tab to view an animated how-to on safe rooms. Also, FEMA has ready-to-use plans for homeowners to build a safe room in an existing house or in a new house.

For more information, visit: www.fema.gov/hazard/tornado/to_saferoom.shtm.