

RETROFIT Improvements

Hurricane Shutters

Making
Homes
Safer in
Disasters

Retrofit Opportunity

- When the windows are upgraded
- When the exterior cladding is updated

Purpose

- To protect window and door openings from penetration by flying debris during a storm event

Benefits

- Protect the home and its contents from damage
- Prevent injuries to the home's occupants
- Reduce the potential of windborne debris breaching a window opening
- Reduce the potential of wind-driven rain entering into the home and soaking its interior
- Keep wind pressure from building up inside the home and lifting the roof off

Hazards

Wind



Rain



Flood



Seismic



Fire



Snow



Summary

During a storm, unprotected window glass can be broken by high winds and windblown debris. Once penetrated, window and door openings allow rain, debris, and wind into the home causing damage. Wind can raise interior pressure significantly and major structural damage may occur. The roof may detach from the structure and leave the home open to weather conditions and further damage. One method of protecting window openings is to install permanent impact resistant shutters. The installation of permanent impact resistant shutters is the most reliable means of protection; however, there are other methods which include using temporary wood or impact resistant polycarbonate covers or replacing existing windows with impact-resistant windows.

Permanent hurricane shutters may be installed at anytime because windows are easily accessible from the exterior of a house. Precut shutters of metal or impact resistant polycarbonate can be purchase with the tracks for installation permanently mounted on the home. When needed, the shutters can be quickly installed using a few simple tools. Cost will vary by design and feature, but expect to pay more than the cost of replacement windows — up to \$50 per square foot for operable permanent shutters that are impact rated. Shutters should have the capability of being opened and closed from within the house, without electrical power, in order to provide maximum benefit. Consult with your contractor about this and other safety features that can be incorporated in your next remodeling project.

Illustrations

After Retrofit

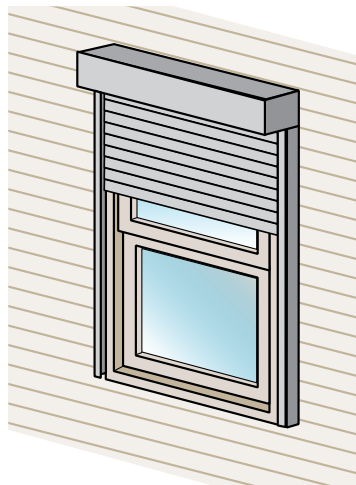
Option 1:

Permanent storm shutters (Bermuda shutters)



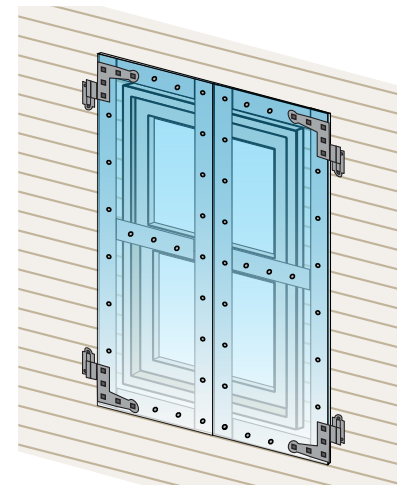
Option 2:

Permanent rollout shutters



Option 3:

Wingnut attachment



Potential Damage



Photo: www.fema.gov

Key Steps

- Permanent impact resistant shutters will bear a test standard certification, such as ASTM E-1886, ASTM E-1996, TAS202 (Miami/Dade County).
- Temporary shutters should have permanently-mounted hardware for quick installation.
- Consider installing a translucent material, such as impact resistant polycarbonate, on at least one window to allow daylight to pass through and to provide a view to the home's exterior.
- Windows which are less accessible are candidates for impact resistant window glazing or remotely operated shutters.
- Motor-driven shutters should include a manual override which should be accessible from the home's interior.
- Your contractor may have additional ideas on how to improve the safety of your home.
- For more details about this retrofit improvement, please refer to the list of Resources in the section below.

Resources

FEMA, *Protect Your Property from High Winds: Protect Windows and Doors with Covers*
<http://www.fema.gov/library/viewRecord.do?id=3263>

Florida Division of Emergency Management, *Openings (Windows and Doors)*
http://www.floridadisaster.org/hrg/content/openings/openings_index.asp

Florida Division of Emergency Management, *Shutter Selection Matrix*
http://www.floridadisaster.org/hrg/downloads/HRG_Shutter_Matrix.pdf

Florida Division of Emergency Management, *Priorities & Incentives*
http://www.floridadisaster.org/hrg/content/priorities/priorities_index.asp#completing

Insurance Institute for Business & Home Safety, *Guide to Shutter Installation*
http://www.disastersafety.org/content/data/file/shutter_matrix.pdf

