



Precautionary Measures Save Home from Hurricane Damage

Full Mitigation Best Practice Story

Santa Rosa County, Florida



Pensacola, FL - Tom and Jennie Smith of Gulf Breeze, Florida, do not park their cars in an ordinary garage. The couple has to weave their cars between pilings that support the house above. The tops of the 7-foot-1-inch tall concrete pilings are 5 feet 1 inch above Florida coastal building code requirements. The extra height planned into the pilings saved the home from thousands of dollars worth of damage when Hurricane Ivan struck the Gulf Coast in September 2004.

The Smiths built their house overlooking Pensacola Bay. Because of its proximity to the coast, the house must adhere to building codes enacted to make coastal construction more resistant to the winds and storm surge of hurricanes.

The house is located in a VE-zone, as designated by the National Flood Insurance Program. A VE-zone is one of the Special Flood Hazard Areas with a determined base flood elevation in a V-zone, which are coastal areas that include the additional hazard associated with storm-induced velocity wave action.

According to Florida building code for construction in flood hazard areas subject to high-velocity wave action, the elevation of the lowest horizontal structural member must be at or above the Base Flood Elevation (BFE). The BFE is the average floodwater depth for a 100-year flood event. The Smiths chose to elevate their home more than five feet higher than the BFE. This mitigation activity resulted in less structural damage to the house and prevented the loss of its contents

Hurricane Ivan's 12-foot storm surge flowed just below the floor joists, damaging the elevator shaft and stairway, but it did not flood the main floor of the Smiths' home. The surge tore away the Smiths' front steps and breakaway walls surrounding the parking area under the house. Both of these elements were designed to break away from the house in order to lessen the damage to the main structure. Ivan also caused minor damage to the windward roof fascia. The high waters lasted 36 to 48 hours and caused flood damage to many other homes in the area.

Additional measures helped the Smiths' house withstand the destructive winds and waters of Ivan. Hurricane anchors add extra strength to structural connections from the roof to the wall to the concrete pilings or foundation. Every window on the Gulf-side of the house has roll-down metal shutters. In the event of a hurricane warning, the windows on the front of the house can be covered with aluminum panels and bolted in place. The windows and shutters are rated to meet coastal construction requirements. Plywood backs the vinyl finishing on the ceilings of the two levels of decks that face the Gulf. The only damage to the Smiths' house from Hurricane Dennis in July 2005 was the separation of the vinyl facing from the plywood backing.

Designing, building, and furnishing their house was a labor of love for the Smiths. They travel extensively and have collected souvenirs from their travels to decorate their home. They spent two years in the building stage, and completed some of the work themselves. The Smiths' foresight in paying as much attention to structural integrity as interior design protected their house from costly damages. Elevating their house to more than five feet above the BFE cost the Smiths \$10,000, but they estimate the precautionary measures incorporated into the structure prevented a loss of \$350,000 from Ivan. The retrofitted house is less than five years old and has already withstood two destructive hurricanes.

Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region IV**

State: **Florida**

County: **Santa Rosa County**

City/Community: **Gulf Breeze**

Key Activity/Project Information

Sector: **Private**

Hazard Type: **Hurricane/Tropical Storm**

Activity/Project Type: **Building Codes**

Activity/Project Start Date: **12/2004**

Activity/Project End Date: **Ongoing**

Funding Source: **Private funds**

Activity/Project Economic Analysis

Cost: **\$10,000.00 (Actual)**

Activity/Project Disaster Information

Mitigation Resulted From Federal
Disaster? **Yes**

Federal Disaster #: **1561 , 09/26/2004**

Federal Disaster Year: **2004**

Value Tested By Disaster? **Yes**

Tested By Federal Disaster #: **No Federal Disaster specified**

Year First Tested: **2005**

Repetitive Loss Property? **Unknown**

Reference URLs

Reference URL 1: **<http://www.floodsmart.gov>**

Reference URL 2: **<http://www.floridadisaster.org>**

Main Points

- The extra height planned into the pilings that support the Smiths' home saved it from costly damages when Hurricane Ivan struck the Gulf Coast in September 2004.
- The Smiths elevated their home more than five feet higher than the Base Flood Elevation.
- Other mitigation measures incorporated into the home include hurricane anchors and windows and shutters rated to meet coastal construction requirements.
- Other homes in the area received flood damage, but the storm surge did not flood the main floor of the Smiths' home.



The Smiths stand in front of new steps constructed after Ivan's storm surge tore away the original steps.



The Smiths elevated their home on pilings to more than five feet above the Base Flood Elevation.