



# FEMA

## House of Steel Survives Charley

**Punta Gorda, FL** – When Bob and Robin Leonard built their home in 2004 on a canal off Pirate Harbor in Charlotte County they wanted a beautiful, low-maintenance building. They chose a highly engineered, above code steel-panel construction that would endure a major storm.

The structural sandwich panel home was engineered to withstand 150 mph sustained winds, exceeding the current 130 mph required by the Florida Building Codes. When neighbors rebuilt after Hurricane Charley, many asked the Leonards about their house of steel. The Leonards gladly told their story.

“We were in the northeast quadrant of Hurricane Charley. Winds went well beyond 140 mph and this house did what it was supposed to do; it swayed,” Leonard said. “The only damage came after the wind pushed the front door open and we nailed wood braces to the floor to close it.”

The Leonards used a consumer software package to design their home. They brought the drawings to their steel-panel manufacturer for engineered plans, permit prints, and manufacturing specifications. After the city’s building department approved the plans, Leonard said, the eight-month project started.

Three-and-a-half feet of compacted fill material served as the base for the steel-reinforced reinforced concrete footings. Six-inch steel I-beam posts anchored to reinforced concrete footings held up the cupola and main frame. Surrounding the ground floor, a grade beam added stability to the building as it swayed when pushed by winds.

The structural sandwich panel assembly consisted of a lightweight foam core securely laminated between two relatively thin metal facings. The manufacturer bonded a pre-formed expanded polystyrene board to the metal skins with adhesive.

Composing the outer structure, the design specified top and bottom channels that anchored six-inch thick structural sandwich panels to create walls. These channels had plates that connected them and supported the roof system’s I-beam rafters. The floor system layered nine-inch structural panels supported by I-beams, topped with sub-floor and finished with hardwood flooring.

The Leonard's home boasts its height as an additional strength. Floodplain regulations adopted by the city required building the lowest floor of the house on or above the 11-foot base flood elevation (BFE), but the house exceeds that requirement.

Since they lost power as a result of Hurricane Charley, the Leonards added a propane-fueled generator. To keep intense wind from opening the front door, they bought shuttering to cover the outside and bracing for inside the door.



Charlotte County,  
Florida



### Quick Facts

Sector:

**Private**

Cost:

**\$275,000.00 (Estimated)**

Primary Activity/Project:

**Building Codes**

Primary Funding:

**Property Owner, Residential**