



## Mitigation Techniques Save a Bungalow in the Meadow

Ocean County, New Jersey – As Hurricane Sandy moved across the Atlantic Ocean in late October 2012, coastal New Jersey residents prepared for the storm's impact by moving their cars and boarding up windows and doors. Many residents expected to quickly return to their homes and begin preparing to celebrate the upcoming holiday season. Sam Juliano and his neighbors in West Creek, New Jersey did not expect the five foot surge the storm brought that ravaged his community. Since he and his wife rebuilt their home nearly three years ago to the new building standards, they escaped the storm's wrath with minor damage and cleanup unlike the majority of the residents on their street.

"Our neighbors have been here for 30 years and Sandy was the worst they've seen," Juliano said. "They've never had water in their houses before now."

Juliano and his wife always dreamed of having a home on the shore so in 1998, they purchased their home for \$80,000, a mile and a half from Manahawkin Bay. Their one story home was an 850 square foot house built in the 1920s and sat about three feet off the ground. They always had ideas of rebuilding what they considered their "bungalow in the meadow", especially since Cedar Run Creek runs directly behind it. In November 2009, they obtained permits in order to begin construction.

Working directly with the building officials throughout the process, they were able to have a home built that would later have the design codes and standards tested by Sandy. Their home is supported by piles driven into the ground and is elevated to the Base Flood Elevation (BFE) plus an additional foot of freeboard.

Used for parking and access, Juliano's lower level was inundated with waist height flood waters. Since the township required him to build with flood resistant materials below the BFE, he and his wife only had to do minor cleanup after the storm impacted the area. The surge left nearly one eighth of an inch of mud on the floods and marsh grass on the walls.

"Building to code, the only thing we had to do for the lower level was clean up—and cleanup was painless," Juliano said.

"Anything (building materials) below BFE had to be able to be submerged underwater for 72 hours without damage—and that's what we used," builder Mark Hayek said. "The building officials gave us a [Federal Emergency Management Agency] FEMA technical bulletin to see what materials could be used below the BFE."

In March 2010, a nor'easter brought high levels of water and severe winds to the area. The Julianos were in the process of painting at the time and recall how that storm impacted their area.

"When we have a nor'easter, water surrounds the home," Juliano said. "There were 85 mph winds blowing during the March 2010 nor'easter." The home escaped the storm unscathed.

Since areas below the BFE have limited coverage by flood insurance, these areas should only be used for parking, storage, and access. FEMA recommends building with flood damage resistant materials below the BFE to reduce damage caused by flood waters and make cleanup easier. These materials are considered effective if they can withstand direct contact with flood waters for at least 72



hours without being significantly damaged.

The Julianos did lose all the contents they had in their shed and anything they had stored on the ground level was also lost. The surge washed their boat nearly 600 feet into the neighbor's yard. They have since elevated their shed while they have been replacing the things that were lost.

If it weren't for the newer building codes, the Julianos' home may have been one of the many on their street that was severely flooded or washed off their foundations. Although it was a daunting process, they are glad they made the decision to rebuild.

"Based on what I saw down the street, we sustained the least amount of damage out of everybody and there are nearly 50 homes on this street," Juliano said. "We're also the newest construction on the street. I was mad at first but I see now that enforcing higher building standards is extremely worth it!"

To find out more information on building regulations, freeboard and Base Flood Elevations, contact your local officials.

To find more information on building codes visit: <http://www.fema.gov/building-science/building-code-resources>

To find more information wind-resistant building and other coastal construction design information visit: <http://www.fema.gov/residential-coastal-construction> and <http://www.region2coastal.com>.