**Super Storm Sandy: From South Bethany Maintenance Perspective**

Don Chrobot, Maintenance Supervisor for South Bethany was asked to write about the activities of the Maintenance staff before, during and after Super Storm Sandy. Don very cleverly complied with the request by using information from internet sources to give a broad perspective of Sandy’s travels up the east coast. After setting the stage, Don provides detailed information about activities in South Bethany. South Bethany’s activities are shown in red, in Don’s story that follows.

**October 22**
A tropical depression forms in the southern Caribbean Sea off the coast of Nicaragua. The depression strengthens and becomes Tropical Storm Sandy, with maximum winds of about 40 mph.

**October 24**
Sandy has become a Category 1 hurricane as it moves northward across the Caribbean and crosses Jamaica with winds of 80 mph. Although Sandy’s eye does not cross the Dominican Republic and Haiti to its east, the storm dumps more than 20 inches of rain on Hispaniola. More than 50 people die in flooding and mudslides in Haiti. Weather forecasters already predicting storm to move up the east coast.

South Bethany Maintenance started our normal storm prep which includes cleaning all storm drains, removing everything from beach crossovers, installing plows on truck and 4x4 utility vehicle and monitoring changing storm track and preparation from Delaware Emergency Operation Center. Updated Town Manager on conditions.

**October 25**

* **Had Carl King Energy fill our fuel tank**
* **Had Deer Park water restock our bottled water supply**
* **Monitored Delaware EOC Bridge Calls**
* **Restocked our supplies of batteries, flash lights, chainsaw chains, duct tape, caution tape, tire fix-a-flat and tire plugs (which we ended up using a lot of).**

**October 26, Friday**
Sandy strengthens as it moves from Jamaica to Cuba and strikes the historic city of Santiago de Cuba with winds of about 110 mph, only one mph below the status of a major Category 3 hurricane.

Sandy causes more devastation as it crosses the Bahamas and makes a slight turn to the north-northwest.

With weather forecasting a possible strike on the east coast decisions were made about when our families would evaluate. Monitored Delaware EOC for updates, called in to bridge calls and updated Town Manager and Mayor.

**October 27, Saturday**
Sandy moves away from the Bahamas and makes a turn to the northeast off the coast of Florida. News services estimate the death toll in the Caribbean at 70 or more. The storm briefly weakens to a tropical depression, but quickly re-intensifies into a Category 1 hurricane.

Rain bands started in South Bethany with some winds. Weather forecasts now said Sandy would strike somewhere along the Delaware- New Jersey coast. Early in the morning, our families evacuated the area. South Bethany Maintenance purchased plywood and rolls of plastic, roofing nails and two more rain suits with time running out to prepare. We stocked our personal food supplies in the maintenance building knowing we would be spending a lot of time here through the week end. Little did we know how bad it was really going to be but we were as prepared as we thought we could be. Monitored Delaware EOC for updates, called in to bridge calls and up dated Town Manager and Mayor. Ron and I worked 8 hours that day.

**October 28 Sunday**
Sandy continues moving northeast on a track that takes it parallel to the coasts of Georgia, South Carolina and North Carolina. But the storm’s center stays well offshore as it approaches latitude 35 degrees north off the coast of North Carolina. Still, the storm sends powerful waves onto North Carolina’s Outer Banks, washing out NC Highway 12 in places.

The storm is still a Category 1 hurricane with peak winds of about 80 mph. But an unusual configuration of weather factors is converging, and meteorologists warn that the storm likely will morph into a powerful, hybrid super-storm as it churns northward.

A high-pressure cold front to Sandy’s north will force the storm to start turning to the northwest toward major cities such as Baltimore, Washington, Philadelphia and New York. The full moon will make Sandy’s storm surge – expected to be 11 to 12 feet in some places – a little higher as it makes landfall. Sandy has expanded into a huge storm with winds covering about 1,000 miles.

“You just don’t see this kind of stuff,” Keith Blackwell, a meteorologist at the University of South Alabama’s Coastal Weather Research Center in Mobile, tells National Geographic News. “It’s so strong and so large. Normally protected areas like New York Harbor and Long Island are seeing the worst case scenario.”

South Bethany had heavy rain with 70 mph wind gusts. The south end of the dune breached with very heavy surf. Had some trees down in the roads. All day roads were flooded by heavy rain not able to drain because of high canal levels. By that night water was over the bulk heads. Had major flooding and power outage in surrounding areas. Continued to clean storm drains. Monitored Delaware EOC for updates, called in to bridge calls and updated Town Manager and Mayor. We worked about 10 hours that day.

**October 29 Monday**
**12:30 PM.:**  Sandy has made its expected sharp turn toward the northwest on a path for the coast of New Jersey. The storm also has started interacting with other weather systems, gaining energy in the process. The storm will dump heavy snow in the Appalachian Mountains of Virginia, West Virginia and North Carolina.

Sandy will have a run of about 300 miles over open water as it heads for landfall, giving it time to build up a huge storm surge that will be a little bigger because of the influence of the full moon.

Meanwhile, a replica of the tall ship HMS Bounty, en route from New London, Connecticut to Saint Petersburg, Florida with 16 people on board, is caught in Sandy’s raging seas in the infamous “Graveyard of the Atlantic” off the Outer Banks. CNN reports that the ship’s captain, Robin Walbridge, tries to steer his ship away from the worst of Sandy’s wrath, but the ship’s pumps fail and it begins rapidly flooding and starts to sink.

Passengers and crew abandon the ship, but only 14 of the 16 people on board make it to the relative safety of the lifeboats. A rescue crew from the U.S. Coast Guard station at Elizabeth City, North Carolina pulls the survivors to safety aboard helicopters. They recover the body of one missing crewman, but Walbridge, the captain, was never found.

By midday, canal water was a foot over the bulk heads flooding most of the streets to the south end. Continued to clean storm drains and check streets for problems. Responded to calls from residents about loose boats. Heavy rain and wind all day with gust in the 60 mph range. Monitored Delaware EOC for updates, called in to bridge calls and updated Town Manager and Mayor.

**During the afternoon:** Sandy brings high winds and drenching rains from Washington, DC northward, toppling trees and power lines and cutting off electrical power for millions of people. The storm eventually will affect more than 50 million people on the Eastern Seaboard. By afternoon canals breached the bulkheads by a foot.

**8:00 PM:**  Sandy’s center comes ashore near Atlantic City, New Jersey. The storm is no longer considered a hurricane but is now classified as a post-tropical nor’easter. But the storm’s unusual path from the southeast makes its storm surge much worse for New Jersey and New York. A cyclone’s strongest winds and highest storm surge are to the front and right of its circulation because the power of the storm’s strongest winds is combined with its forward motion. New York Harbor receives this part of Sandy’s impact.

The surge is worsened because the full moon has added about a foot to the surge and because Sandy arrives at high tide. Meteorologist Tim Morrin of the National Weather Service’s office in New York tells National Geographic News that the surge - nearly 14 feet - is a new record for a storm surge in the harbor. The previous record of just over 10 feet was set in 1960 when Hurricane Donna passed just offshore.

The surge tops the seawall at The Battery in Lower Manhattan and floods parts of the city’s subway system. The surge also floods the Hugh Carey Tunnel, which links Lower Manhattan and Brooklyn.

The storm’s huge size means that its winds, rains and flooding will pound New Jersey and New York throughout the night and through three cycles of high tides and low tides.

Staten Island also is hit very hard by the storm. The Seattle Times later reports that towns such as Oakwood Beach, Midland Beach, South Beach and Tottenville - which lost many residents who were police and firefighters during the terrorist attacks of September 11, 2001 - were among the hardest hit communities.

Worked until 10pm that night. There was a small amount of water in our lower parking lot and with the storm ashore in New Jersey we thought the worst was over.

**October 30**
Although Sandy has started to move away from New York, the backside of the huge storm is still inflicting punishment on the Northeast. As the day progresses, Sandy weakens as it moves inland over Pennsylvania.

Overnight the bays had risen to about 2.5 feet above the bulk heads. We found our shop had been under 12 inches of water with damage to my computer, shop heaters and garage door controls. Water level had made it all the way to the middle lane of Route 1. Most of the roads were under two feet of water. There were boats floating in the middle of roads. We had to climb into the back of our truck and pull the boats over to someone’s yard and tie up to a tree or whatever was available. If not for our big trucks, we would not have been able to make it around town. The water was up to our door sills. The town looked like a bomb had gone off scattering what was around the houses everywhere. We cleared Route 1 first and spent the whole day clearing the towns water covered roads of heavy debris with the plow of our truck. Power transformers that had went under water started to blow around the area cutting off our power. Our emergency generator took over and supplies town hall, police station and maintenance building. Updated Town Manager and Mayor.

**October 31**The storm that began as Hurricane Sandy dissipates over western Pennsylvania, and the National Oceanic and Atmospheric Administration issues its final advisory on the storm. NOAA’s advisory says “multiple centers of circulation in association with the remnants of Sandy can be found across the lower Great Lakes.”

NOAA reports that Sandy killed more than 70 people in the Caribbean and at least 50 in the United States. NOAA estimates that Sandy caused at least $20 billion in damages.

Today the debris cleanup started. Phase One of our cleanup was to push debris from the roads to the sides. We had four outside labors come in to help us start cleaning up sides of the road right of way. As we would clean the road sides, residents were starting to clean up the damage in their homes and moving that debris to the side of our roads. With major piles of trash beginning to pile up we quickly found out our trash company was not equipped with man power or equipment to pick up piles of drywall, lumber, insulation, furniture, appliances, and carpeting. We talked to the Town Manager and Mayor about bring in heavy equipment and more man power and dumpsters to deal with this disaster. Many roads were still covered with water. On November 1st, Town Council had an emergency meeting and they gave us the go ahead for heavy equipment, more manpower and as many dumpsters as needed. We placed dumpsters on streets and had a steady flow of 30 yard dumpsters being filled and removed. We had two dumpsters at town hall for four weeks being filled, dumped and returned so residents could bring their own debris there. We had heavy equipment from November 5th until November 28th. We had contract labor from October 31 until November 19. We removed 26 - 30 yard dumpsters with 113 tons. The trash company had nine curb side pickups with 76 tons and yard waste removal was $4,300. We allowed private scrapers to come through town and pick up appliances and metal. Delaware environmental response unit came to town and asked if we could setup a contaminated gas drop off area. We got two 55-gallon barrels set up for the disposal. We collected over 100 gallons of contaminated gas. Residents also brought over 40 gallons of paints and stain to the drop off. This turned out to be very hard to get rid of and we are still drying out latex paint for disposal. Total cleanup of the town was not complete until December. Ron and I worked a total of 448 regular hours and 71 overtime hours on Hurricane Sandy.

**Update, November 3**
NBC News reports that the death toll in the U.S. is now 109, including at least 40 in New York City. Half of New York’s deaths are on Staten Island. NBC also reports that damages from Hurricane Sandy likely will exceed $50 billion.