

Damage Report for Household Residence in Seaford, NY

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Introduction

As requested by Allstate Insurance Company (Allstate), Strangework Engineering prepared a summary of the cause of damage on a residential household located in Seaford, NY due to Hurricane Sandy (Sandy) on October 2012. As the property is already demolished, three reports were provided for our review by: (1) Forensic Engineering, LLC prepared by the insurance carrier's engineer, (2) John Smith, PE who represents the homeowner, and (3) Allstate, the insurance carrier who denied the homeowner's claim. The objective of our report is to summarize the structural damage on the house and identify or eliminate possible causes of damage.

Background Information

The property is located in Seaford, NY near South Oyster Bay. The house is a two story, wood frame colonial style structure with asphalt shingle roofing and concrete block crawl space foundation. A waterway lies along the rear of the property. According to the homeowner's report, the house was previously flooded by Hurricane Irene in August 2011, causing damage to the first floor interior finishes and electrical components.

Weather data in the vicinity during Sandy were gathered from the National Oceanographic and Atmosphere Administration (NOAA) and the United States Geographical Survey (USGS). According to NOAA, the maximum sustained wind speeds around Seaford, NY are 50 mph to 55 mph (Figure 1)¹. Based on the data provided from USGS, the estimated waterline recorded around the vicinity is 3.3 ft to 3.5 ft above ground (Figure 2)².

¹Full data and photos: <http://ga.water.usgs.gov/flood/hurricane/sandy/sites/SSS-NY-NAS-005WL.html>

²Full data and photos: <http://ga.water.usgs.gov/flood/hurricane/sandy/sites/hwm/HWM-NY-NAS-416.html>

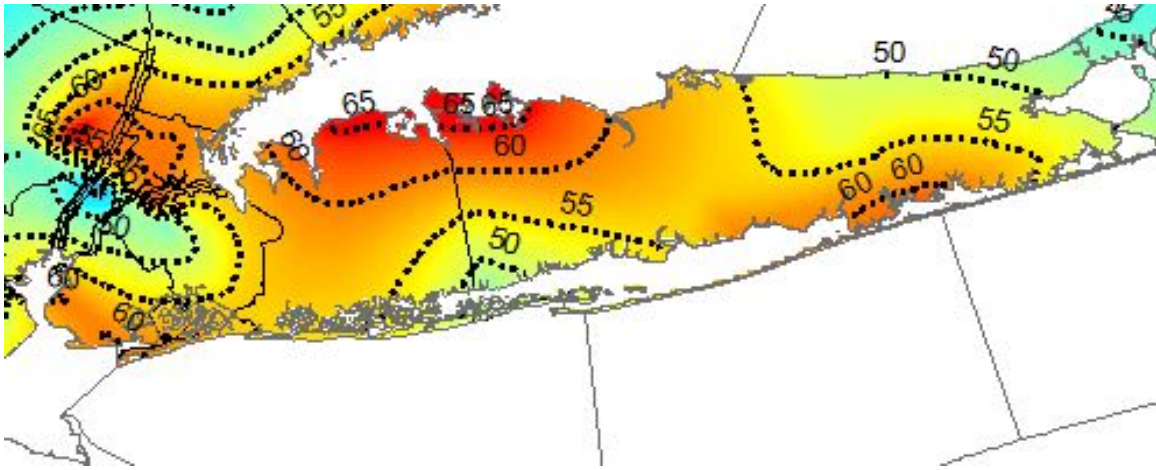
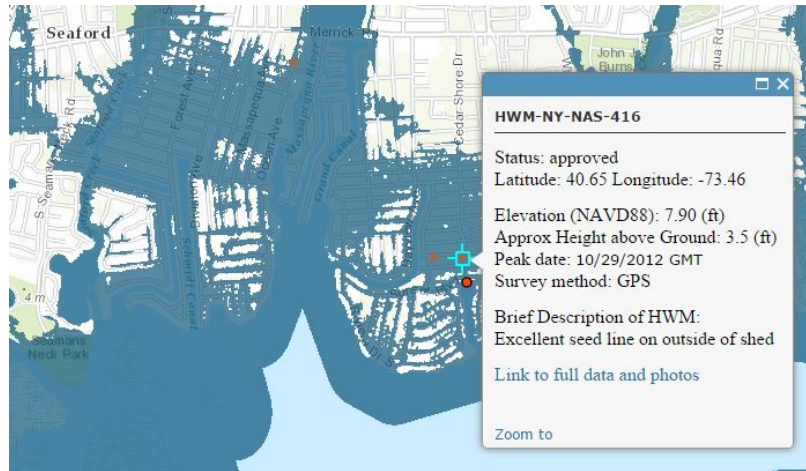


Figure 1: Sustained wind speed in NY Area (from NOAA)

Observations

The following observations are based on the photographs attached to the reports submitted by John Smith, PE and Forensic Engineering, LLC:

1. On the southeast side of the house, part of the foundation is fully separated from the whole and has settled. There is a gutter which discharges right next to this. There is also cracking further down this foundation wall on the southern end. (Figures 5 and 6, Forensic Engineering, LLC)
2. There is some cracking on the surface of the front porch. (Figure 7, Forensic Engineering, LLC and Photo 17, John Smith, PE)
3. The brick patio area is settled and contains accumulated soil. (Photo 1, John Smith, PE)
4. Some damage to the wood girders underneath the foundation is evident. Sill plates were not attached to the foundation. Debris is also found underneath the foundation. (Photos 2 through 8, John Smith, PE)



(a) Tide data around Seaford, NY



(b) Photo of marked waterline

Figure 2: Estimated waterline around property vicinity (from USGS)

Discussion

The perimeter foundation contained cracks along the southern end of the east wall while a piece at the southeast end was separated from the whole foundation and the building. Forensic Engineering, LLC states that the cause of damage was due to long term earth movement. The report notes that there was a brick and a wood member placed between the foundation and structure, indicating a temporary fix for previous damage. Cracking near this fix did not appear to be fresh, therefore, not caused by flooding due to Hurricane Sandy. Additionally, the gutter adjacent to the separated foundation piece suggests that discharged water can pool around the foundation, leading to settlement and cracking when the water drains off. John Smith, PE states that the foundation damage is also due to soil washout and emulsification, but the cause is directly due to flooding and not long term settlement. Given the condition of the cracks and the fact the house was affected by Hurricane Irene previously, we believe that damage due to long term earth movement is the more credible cause.

Regarding racking or shifting of the structure itself, both reports state contradictory claims. John Smith, PE claims that racking and shifting of the wood framing were apparent due to tightness of door jambs and doors being out of square. Forensic Engineering, LLC claims that racking or shifting of the structure was not apparent at all. While racking or uplifting of the structure is a typical flood damage signature, it is inconclusive whether shifting or racking is directly caused by flooding or by a combination of long term earth movement and previous flooding from Hurricane Irene.

In addition, John Smith, PE claims that both flooding and high wind speeds contributed to shifting and racking of the house. We do not believe any wind damage is possible since the maximum sustained wind speed in the vicinity was about 55 mph (see Figure 1). Referring to the Saffir-Simpson Hurricane Wind Scale ³, the lowest wind speed in which damage due to hurricane winds will occur is about 75 mph (Category 1). Since the wind speed measured is lower than Category 1 wind speeds, any damage due to high winds is very unlikely.

Since the waterline at the property was about 3.5 ft above ground, the exterior finishes and

³<http://www.nhc.noaa.gov/aboutsshws.php>

interior finishes on the first floor would expect non-structural damage. As stated in both reports, the interior floor and drywall were damaged and removed for either drying or the possibility of mold growth.

Conclusions

Based on the reports provided and weather data gathered, we have concluded the following:

1. The perimeter foundation damage is due to long term earth movement of the structure. Flooding from Hurricane Sandy may have increased the damage, but is not the cause.
2. The cause for racking and shifting of the structure is inconclusive due to the contradictory claims from both reports.
3. Wind damage to the structure is very unlikely due to wind speeds in the vicinity being less than Category 1 wind speeds on the Saffir-Simpson Hurricane Wind Scale.