



Harbor Engineering, LLC

26 Bosworth Street; Suite F
Barrington, RI 02806

Main: (401) 829-4870
Website: harboreng.com

December 16, 2022

Mr. Peter Cabrera
Seaview House, LLC
70 Seaview Avenue
Stamford, CT 06902

RE: Seaview House Coastal Analysis Peer Review

Dear Mr. Cabrera,

Harbor Engineering, LLC (HARBOR) was engaged by Seaview House, LLC to perform a peer review of the desktop coastal analysis to assess flood risk completed by **RACE Coastal Engineering (RACE)** that was issued April 25, 2022. The site-specific coastal analysis focuses on the facility located at **68-70 Seaview Avenue in Stamford, CT (Site)**. In addition to the aforementioned report, RACE also provided supporting documents including calculations (wave heights/periods & wave runup) and the following references:

1. ASCE 7 Hazards Report – Summary of wind speeds for the Site.
2. Portion of the FEMA **Flood Insurance Study (FIS) 09001CV001C** for Fairfield County Connecticut revised October 16, 2013
3. “Summary of Coastal Engineering Analyses DFIRM Update for Coastal Analysis for Fairfield County, CT” prepared by STARR dated August 22, 2011. **Strategic Alliance for Risk Reduction (STARR)** is a joint venture of engineering firms (including Atkins, Stantec and Dewberry) that support the development of flood insurance rate maps and flood information studies for FEMA.
4. “Guidance for Flood Risk Analysis and Mapping – Coastal Wave Setup” prepared by FEMA dated November 2015
5. “Guidance for Flood Risk Analysis and Mapping – Coastal Wave Runup and Overtopping” dated February 2018

It is HARBOR’s understanding that the City of Stamford has expressed concern regarding its ability to access the subject location during a 100-year event (1% annual recurrence). The following is a summary of HARBOR’s review of the RACE report focusing on the coastal engineering aspects as they relate to the Site’s vulnerabilities to a storm with a 1% annual recurrence:

The Site is located next to a small embayment (Halloween Basin) that is inside Westcott Cove adjacent to Long Island Sound. The FIS for Fairfield County provides Stillwater Elevations determined for various recurrence intervals based on a frequency analysis performed using data obtained from the nearest gage. In addition to Stillwater Elevations, the FIS also provides “Total

Water Levels” associated with a 1% annual recurrence which combines the Stillwater Elevation and the effects of wave setup.

As noted in both the *Flood Insurance Rate Map (FIRM)* and FIS, the Site is located in between Transects 16 & 17 as represented in Figure 1 below. A summary of Stillwater Elevations and Total Water Levels associated with those transects are provided in Table 1 below.



Figure 1: Aerial photo showing the approximate locations of FEMA Transects 16 & 17 as determined from FEMA Flood Insurance Rate Map 09001C0517G

Transect #	Stillwater Elevations (NAVD88)			Total Water Level (NAVD88)	Calculated Wave Setup (feet)
	10% Annual Chance	2% Annual Chance	1% Annual Chance	1% Annual Chance	1% Annual Chance
16	8.4	10.1	10.8	12.5	1.7
17	8.4	10.0	10.7	13.3	2.6

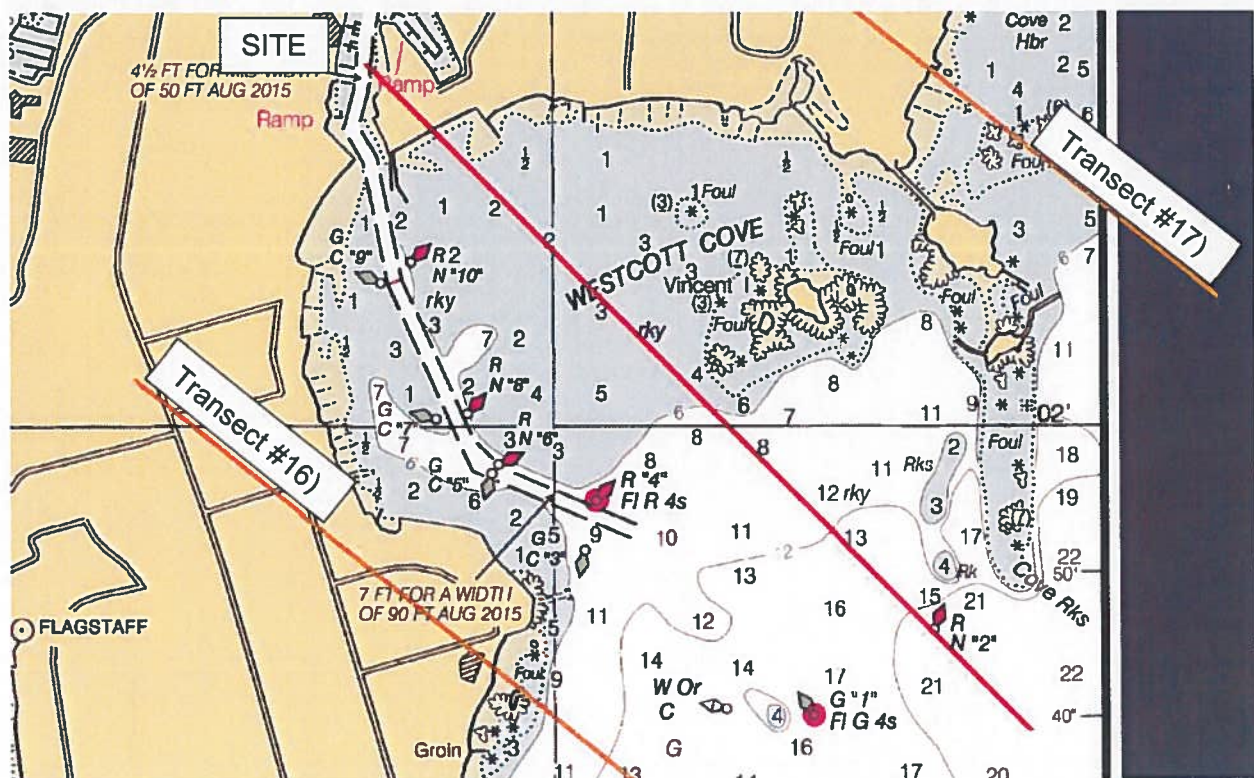
Table 1: Transect data obtained from FEMA FIS 09001CV001C

HARBOR agrees with RACE’s selection of Transect #16 with consideration of its proximity to the Site and the nearshore conditions (i.e. beach). In their report RACE reiterates the Stillwater

Elevations for Transect #16 and then provides an alternative calculated wave setup of 1.2 feet which leads to a Total Water Level of EL+12.0.

Recognizing the differences in wave setup and Total Water Levels provided by STARR in the FIS and by RACE, HARBOR reviewed the calculation summaries prepared by both. As part of RACE's calculation package submittal, the incident wave associated with the 1% recurrence was determined using *Automated Coastal Engineering Software (ACES)*. The resulting incident wave has a wave height (H) of 10.93 feet and wave period (T) of 6.3 seconds. Using the DIM methodology outlined in Reference #4, HARBOR was able to substantiate a similar wave setup compared with what RACE determined with consideration of the same incident wave and the mild (1V:200H) slope consistent with the nearshore bathymetry associated with Westcott Cove.

HARBOR also reviewed the calculation summary provided by STARR (Reference #3). STARR's incident wave had similar properties however the nearshore slopes used to calculate wave setup for Transect #16 was notably steeper (1V:15H). In addition, the calculations provided by STARR also show the calculated wave setup for Transect #17 was based on the presence of a revetment which influenced an amplified result. Although STARR's wave setup was calculated properly for both transects, those transects do not accurately represent the conditions associated with the Site which should include the mild nearshore slope associated with Westcott Cove as can be seen in Figure 2 below.



While reviewing Figure 2, take note of the blue area surrounding Westcott Cove that is a large shallow shoal. Given the size, limited depth and mild slope along the bottom of Westcott Cove, wave setup will be noticeably less since there is a greater area for wave energy to dissipate which results in a lessor superelevation of flooding beyond the surf zone.

At the point of interest along Seaview Avenue, "Point A", the wave action is anticipated to be limited due to the lack of water in the immediate vicinity. The inundation maps developed by RACE show waves, regardless of their size, cannot propagate directly to the location from the southeast. Although waves that originate from the southeast can eventually work their way to Point A via diffraction, the reduction in wave height due to shoaling and diffraction will be significantly reduced. Wave heights around Point A are anticipated to be less than a foot, less than the size of the wave a fire truck will likely generate while moving down the street with 12-15 inches of stormwater above.

Last, HARBOR reviewed RACE's time series of a 100-year event. The resulting plot, presented as Figure 3 in their report, shows the peak of the storm surge lasting 2-3 hours. For comparison, HARBOR also reviewed the water surface levels that were recorded by NOAA at the nearest gage in Bridgeport Harbor during Hurricanes Irene and Sandy. Both plots show the peak of both significant storms lasting 2-3 hours.

In conclusion, I am in agreement with the results provided in RACE's desktop coastal analysis of 68-70 Seaview Avenue in Stamford.

Please feel free to contact the undersigned if you have any questions or need further assistance.

Very Truly Yours,
Harbor Engineering, LLC

A handwritten signature in blue ink, appearing to read 'Gus Kreuzkamp', with a stylized flourish at the end.

Gus Kreuzkamp, PE
Principal