MILL POND PARK, PORT WASHINGTON, NY

HURRICANE SANDY

AQUATIC SAND REMOVAL

PREPARED FOR

TOWN OF NORTH HEMPSTEAD

PREPARED BY

CAMERON ENGINEERING & ASSOCIATES, LLP

MARCH 2014

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EXHIBITS

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Exhibit A – FEMA Flood Zones
Exhibit B – Mill Pond Bathymetric Survey
Exhibit C – Mill Pond Bathymetric Survey Cross Sections
Exhibit D – Sediment Volume Calculation

1. Overview

Mill Pond is located in the incorporated Village of Port Washington North on the eastern side of Shore Road between Harbor Road and Mill Pond Road. The manmade pond was constructed in the latter part of the eighteenth century, over 200 years ago. It is currently owned by the Town of North Hempstead and located in the historic district of the Village of Port Washington North.

The six acre pond is fed by groundwater seepage and storm water flow from a 750-acre suburban watershed. Flow from the pond discharges over a concrete weir structure located on the western side of the pond into Manhasset Bay. The pond receives reverse tidal flow from Manhasset Bay during high tide as well as during storm events. Mill Pond Park is used for passive and active community recreation including model boating, walking, and nature appreciation. Ice-skating and ice hockey are permitted by the Town when the pond freezes over.

The park includes:

- A Historic Structure Boat House, cira 1900
- Hardscaped and landscaped public park area
- An underground stormwater treatment structure fitted with a sediment and floatables removal system to capture stormwater borne debris
- Mill Pond overflow weir to maintain the pond at a constant water level (the weir height is adjustable)
- A sluiceway on the south side of the pond servicing a localized stormwater basin on the south side and adjacent to the pond
- Intertidal marine plantings chosen to aid in contaminant removal, soil stabilization, and habitat for marine organisms
- A capped stone retaining wall around the perimeter of the pond; and stone steps at various locations leading down to the pond surface
- Amenities including benches and trash receptacles

The Town of North Hempstead had recently completed a major restoration effort at Mill Pond that was funded partly by grants. The Project included dredging approximately 10,000 cubic yards of sediment from the pond, reshaping the pond floor to provide shorage and improve habitat, repairing the pond wall surrounding the pond and improving the flow of water to and from Manhasset Bay. The Town planted vegetation to filter the stormwater runoff, and improve habitat, and installed devices to prevent further sedimentation into the pond. The Federal, State, and County Governments assisted with the funding for the multi-million dollar Project.

2. Damage

During the incident period, October 27 through November 8, 2012, high winds and heavy rain from Hurricane Sandy damaged the facilities at Mill Pond Park.

- The stormwater treatment device was subjected to heavy loading of debris
- The western end of the pond received a sediment load from the storm tide entering the pond
- The sluiceway was subjected to heavy loading of debris

3. Emergency Interim Repairs

Emergency cleaning of the sluiceway was required to restore functionality.

Emergency cleaning of the stormwater treatment device was required to restore functionality.

4. Long Term Improvements

At this time it is important to review the remaining damage, the extent of the emergency interim repairs and the recommended long term improvements for hardening the, Park property and drainage system against future events on the scale of Hurricane Sandy.

4.1. Dredging and Removal of Storm Accumulated Sediments

Hurricane Sandy surcharged the sedimentation chamber with a flow of approximately 20,367,022 gallons of stormwater. This was derived by applying a 1-inch rainfall over the 750-acre watershed for duration of 1-hour.

For comparative purposes: Mill Pond is a 6-acre pond approximately 4-feet deep. Hence the pond volume is 7,820,937 gallons. Based on the above, Hurricane Sandy surcharged Mill Pond and the accompanying sediment removal system 2.6 times the pond's volume. The stormwater treatment system was designed for 25 cubic feet per second (cfs). Based on the above, Hurricane Sandy provided approximately 756-cfs, or 30 times the design flow of the system.

An inspection of the pond and sediment removal system indicated accumulated floatables in the chamber.

A comparison of the pre Hurricane Sandy bathymetric survey of Mill Pond with the post Hurricane Sandy bathymetric survey revealed approximately 3500 cubic yards of sediment accumulated in the pond. Approximately 3,500 cubic yards of sediment (Exhibit B, C, and D) in the pond would require disposal if all accumulated material were removed from Mill Pond.

Disposal of dredged material in a permitted lined landfill would likely exceed $230/cy including excavation, dewatering, trucking, and disposal.

4.2. Regulatory Oversight and Permit Requirements

The New York State Department of Environmental Conservation (NYSDEC) does not consider Mill Pond a regulated freshwater wetland or a regulated tidal wetland. However, because it is intertidal, any work within the water body will require a NYSDEC permit. The pond is regulated by the NYSDEC according to the Article 15, Protection of Waters.

As per the U.S. Fish and Wildlife Service (USF&WS) National Wetlands Inventory (NWI) maps, the pond is denoted as POWZh, defined as a palustrine open water system that is intermittently exposed/permanent and is diked/impounded. As a diked/impounded waterway, work proposed in the pond would require a permit from the United States Army Corps of Engineers (USACE).

Mill Pond Park lies adjacent to Manhasset Bay; a New York State Department of State (NYSDOS) designated Significant Coastal Fish and Wildlife Habitat. It is also located within the coastal zone and part of New York State's Coastal Management Program (CMP). Therefore, any work conducted within the park would require a Federal Coastal Consistency Assessment Form and would be subject to review by NYSDOS for consistency to the CMP.

All of Mill Pond Park is situated in the 100 Year Flood Zone AE as designated by the Federal Emergency Management Agency. The western two-third of the pond is in Base Flood Elevation 12'. The most westerly portion surrounding the overflow weir is in Base Flood Elevation 13'. It is noted however, the entire Mill Pond Park, except for a small southeastern portion was within the Sandy Inundation Limit (Exhibit A).

4.3. Long Term Maintenance

With respect to hardening to resist future storm/flood events, it is considered to secure a 10-year dredging and sediment removal permit from the NYSDEC at this time, with an initial Project to remove that portion of the sediments directly attributed to Hurricane Sandy.

4.4. Cost

The cost for the proposed improvements is estimated to be on the order of $1,032,907. Please see Table 1 for a detailed breakdown of these estimated costs. The cost estimate will be revised during the detailed design phase.

TOWN OF NORTH HEMPSTEAD
MILL POND PARK, PORT WASHINGTON, NY
HURRICANE SANDY AQUATIC SAND REMOVAL

March 2014

Table 1 – Mill Pond Flood Rehabilitation Cost

	ITEM				UNITS		$/UNIT		EXTENSION
GC	Mobilization				1	Ea	$ 3,500		$ 3,500
	Demobilization				1	Ea	$ 3,500		$ 3,500
	Sediment Removal & Disposal				3518	CY	$ 230		$ 809,140
	subtotal								**$ 816,140**
	General Conditions 3%						lump sum		$ 24,484
	Contingency 10%						lump sum		$ 81,614
	Total GC cost								**$ 922,238**
ENG	Design Services				7.50%		lump sum		$ 69,168
	Permitting				1.50%		lump sum		$ 13,834
	Construction Administration				3.00%		lump sum		$ 27,667
	Total Soft Costs *								**$ 110,669**

Total Project Cost **$ 1,032,907**

*** does not include costs for surveys and daily construction inspection services**

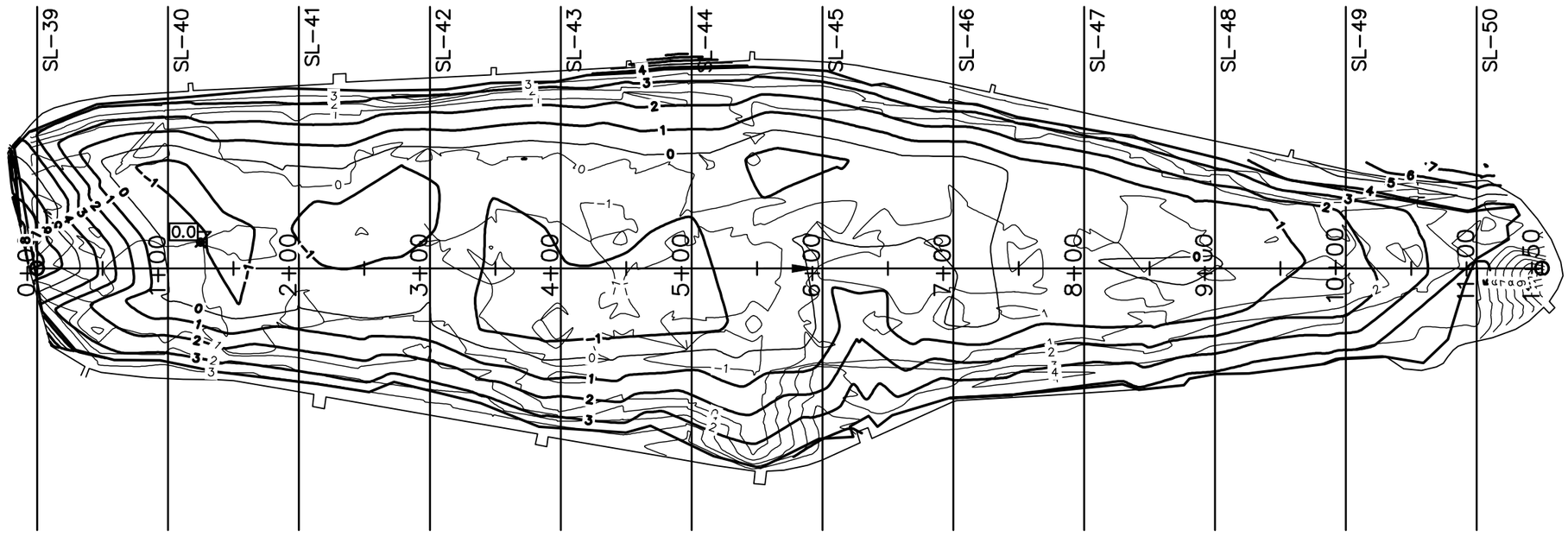
EXHIBIT A

FEMA Flood Zones


George St
Shore Rd
Smull Pl
0.2 PCT Annual
Chance Flood Hazard
Morgan Pl
Pleasant Ave
Port Washington North
Millpond Rd
100-Year "VE"
Flood Zone
Base Flood
Elev = 14 Feet
100-Year "AE" Flood Zone
Base Flood Elev = 12 Feet
100-Year "AE" Flood Zone
Base Flood Elev = 11 Feet
Port
Washington
Harbor Rd
0.2 PCT Annual
Chance Flood Hazard
Bayside Ave
Baxter Estates
100-Year "AE" Flood Zone
Base Flood Elev = 13 Feet
Port
Washington
Sandy Hollow Rd
FEMA Flood Zones
0.2 Percent Annual
Chance Flood Hazard
AE (100-Year)
VE (100-Year)
Sandy Inundation Limit
0
100
200
Feet
Source: FEMA, USGS

EXHIBIT B

Mill Pond Bathymetric Survey



KEY

2009 CONTOUR LINE

2014 CONTOUR LINE

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PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
POST SANDY BATHOMETRIC SURVEY (4)

PROJECT LOCATION:
TOWN OF CENTERPORT
NASSAU COUNTY, NY 11721

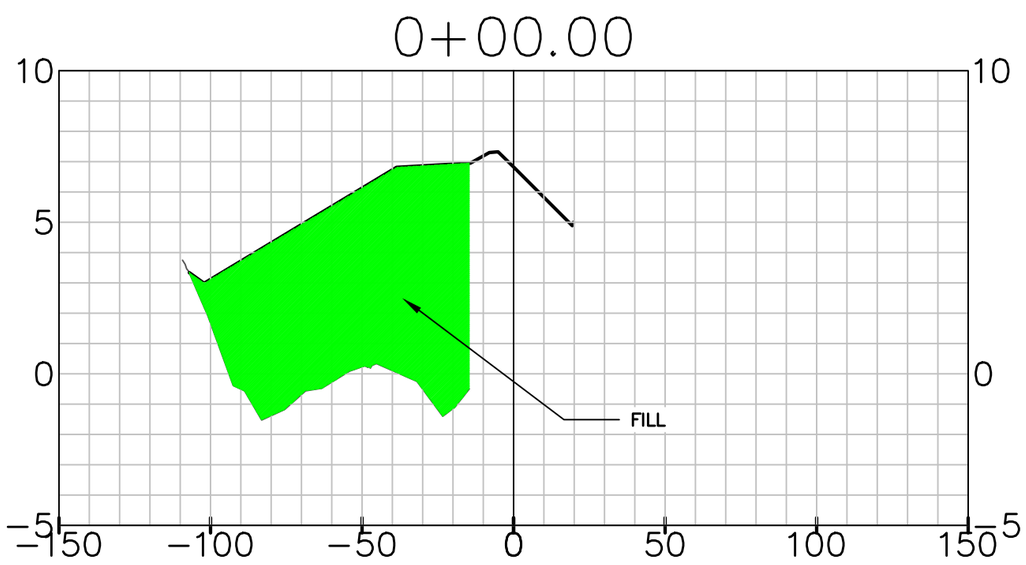
JOB NO.
CE2326A

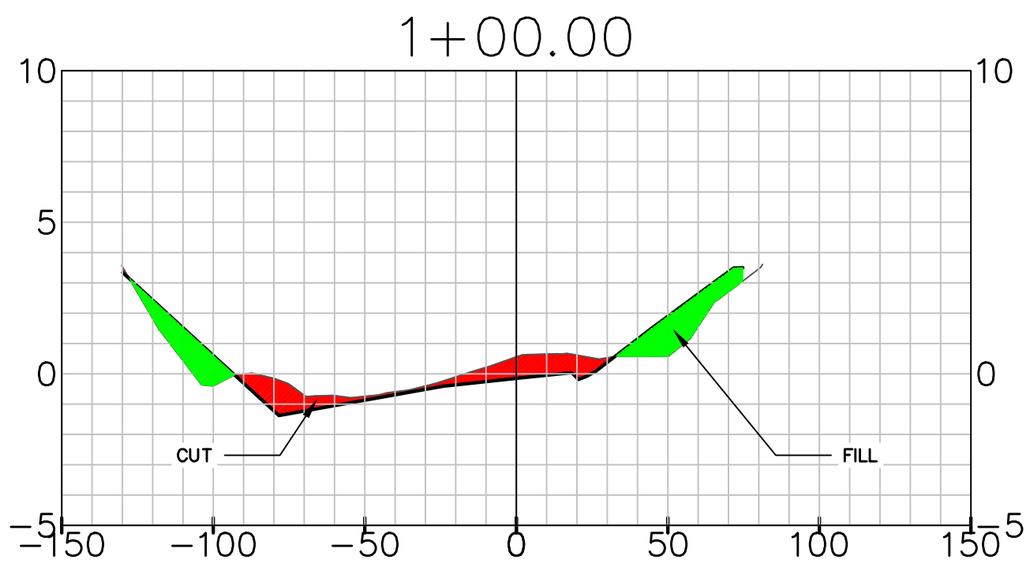
DATE:
MARCH 2014

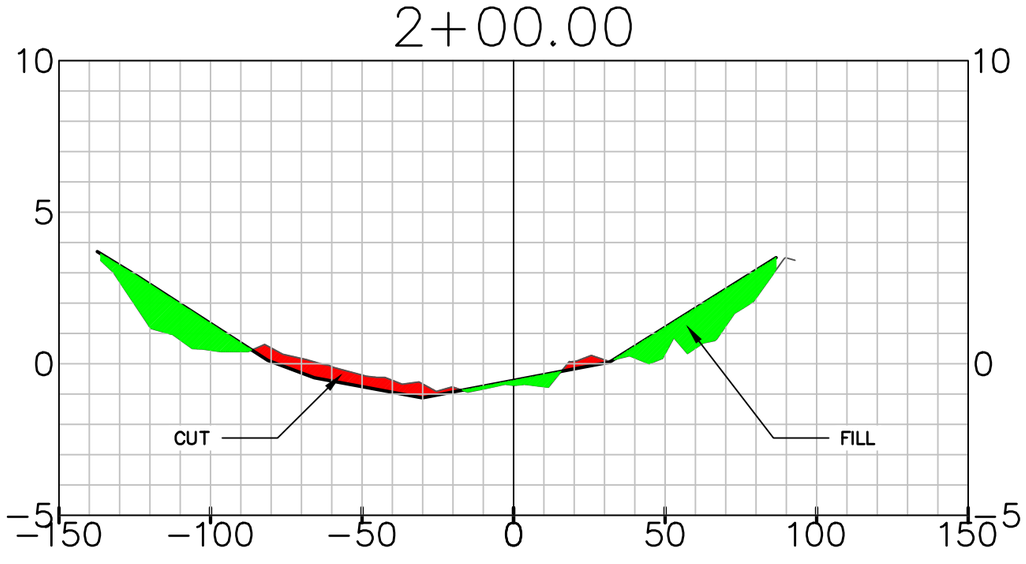
SCALE:
1"=100'

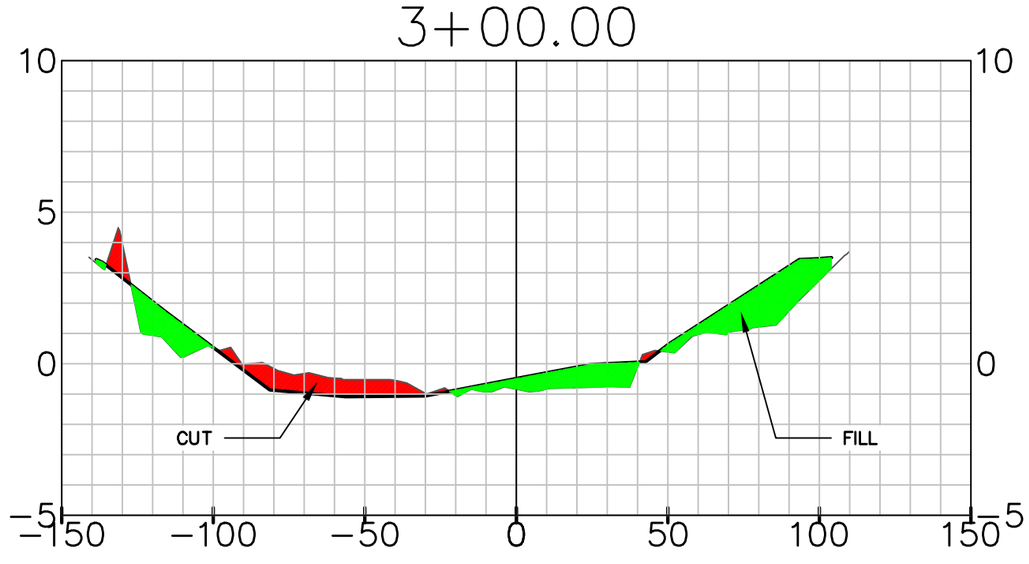
EXHIBIT C

Mill Pond Bathymetric Survey Cross Sections









SCALE: 50H, 5V

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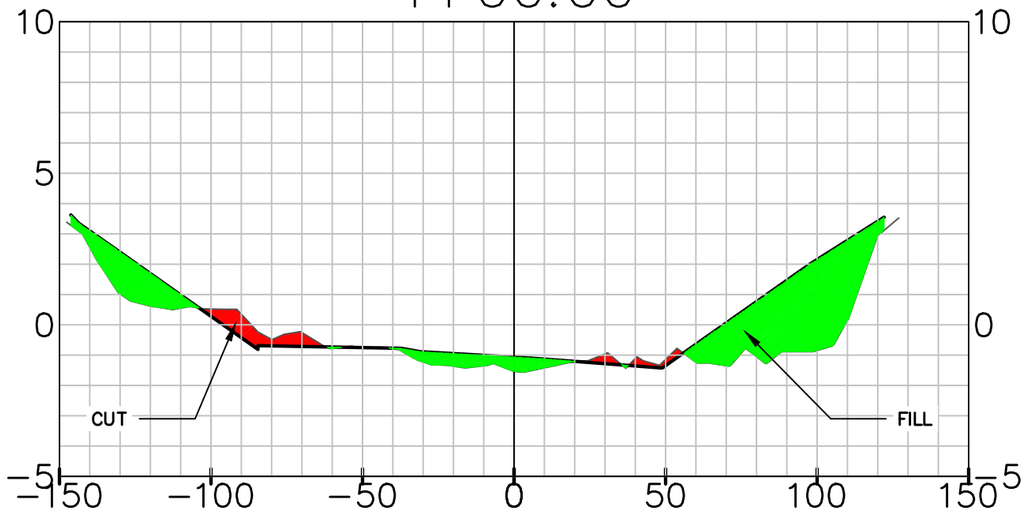
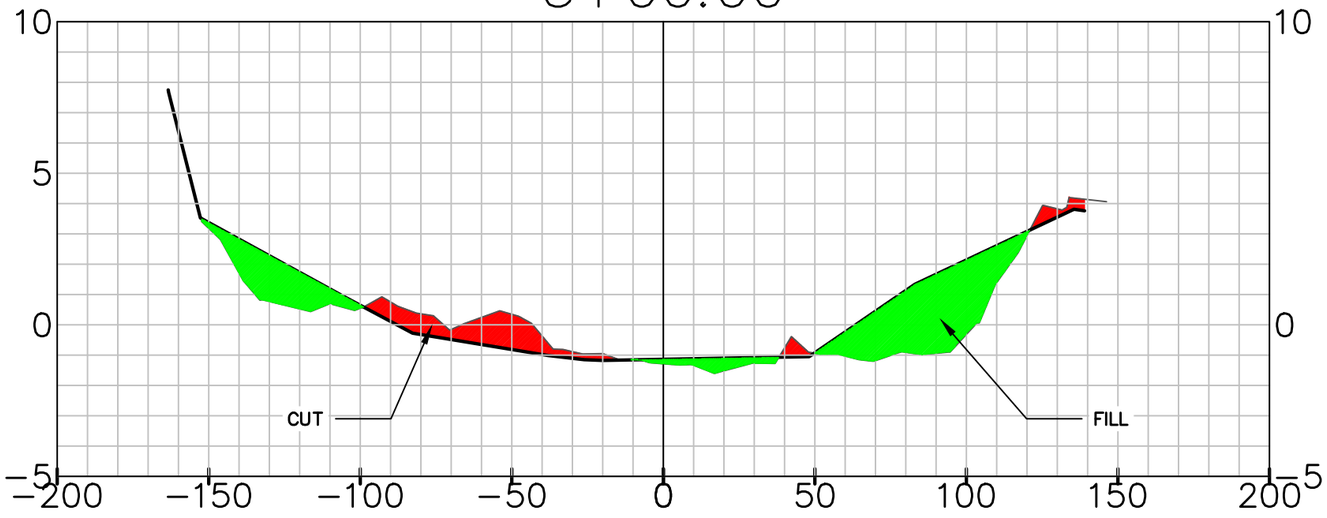
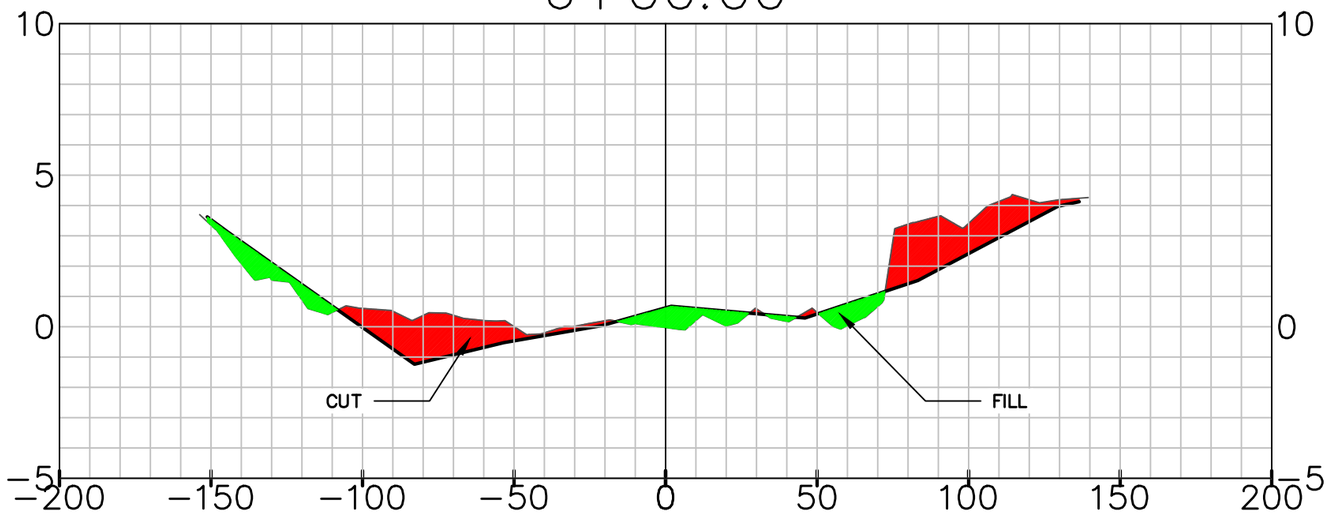
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
POST SANDY BATHOMETRIC SURVEY (1)

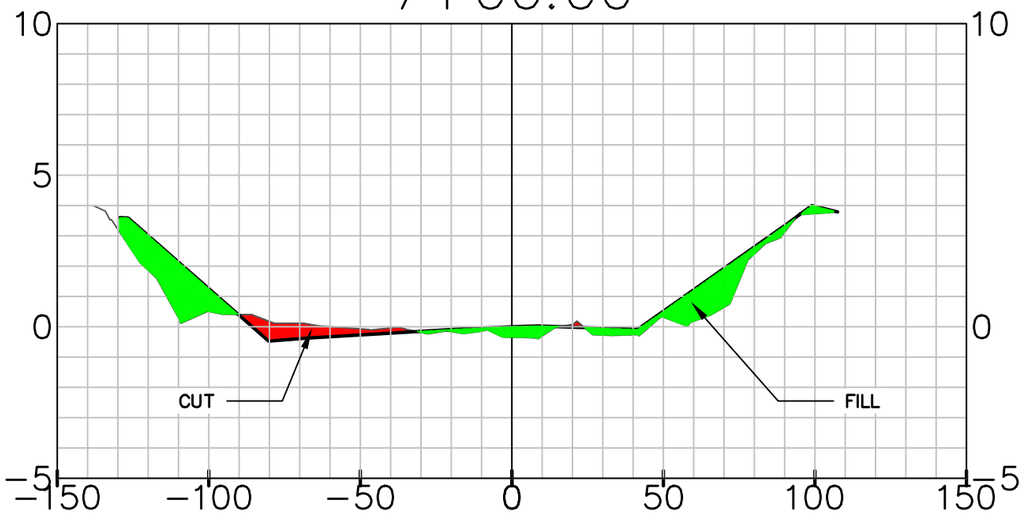
PROJECT LOCATION:
TOWN OF CENTERPORT
NASSAU COUNTY, NY 11721

JOB NO.: CE2326A
DATE: MARCH 2014
SCALE: 1"=50'









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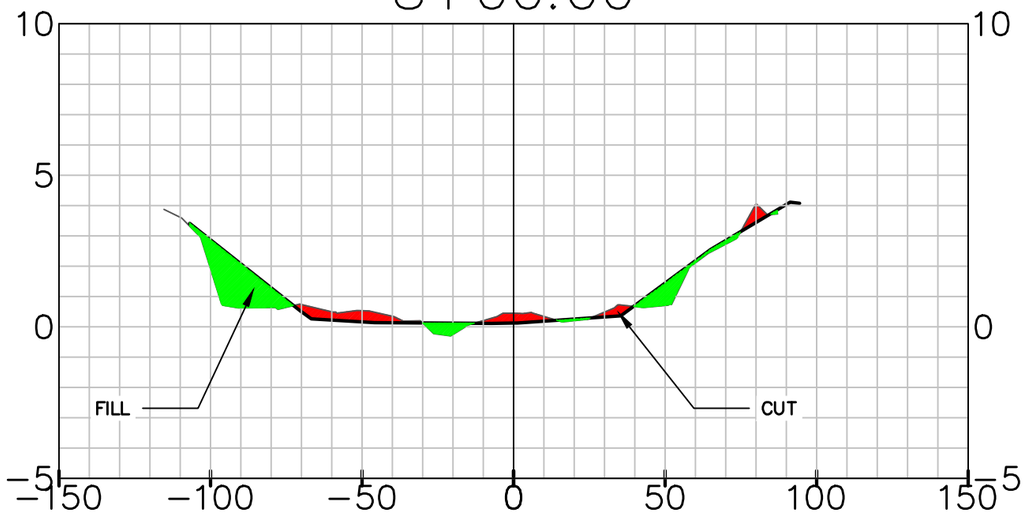
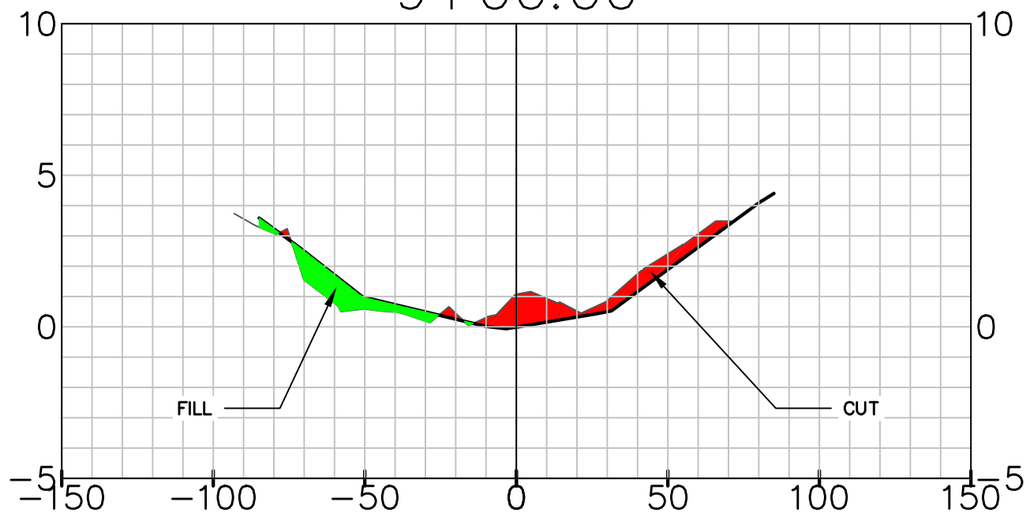
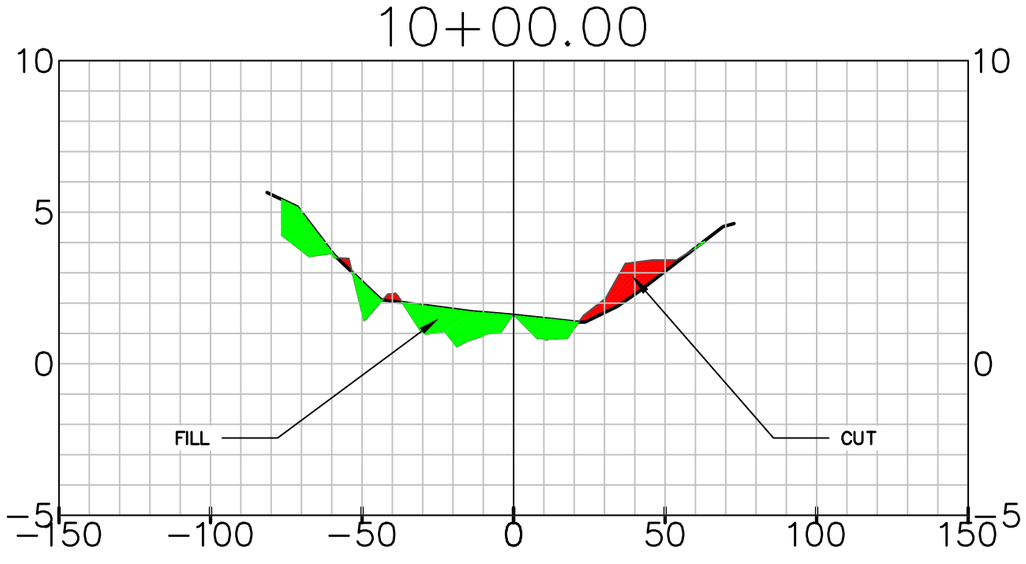
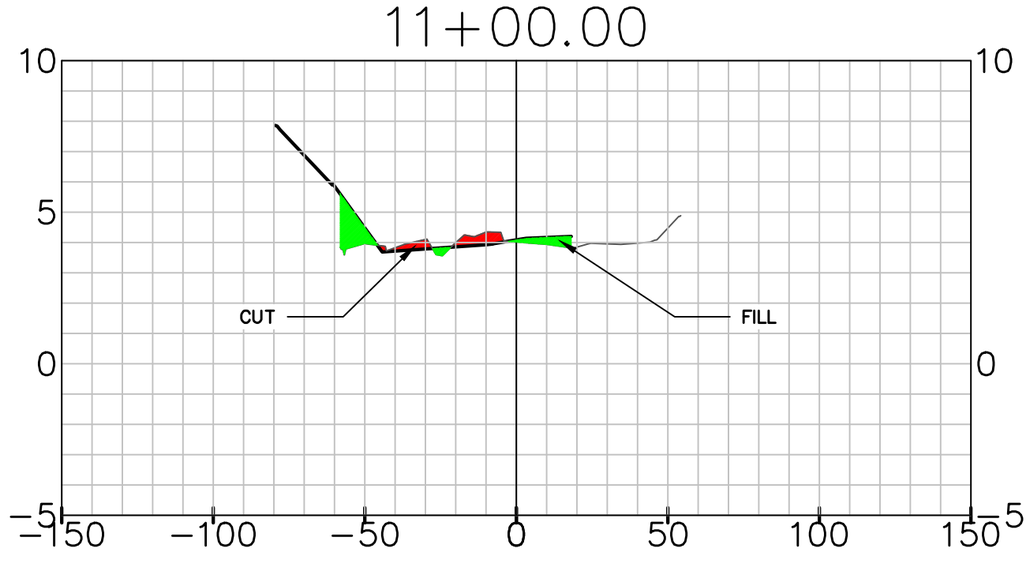
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
POST SANDY BATHOMETRIC SURVEY (2)
PROJECT LOCATION:
TOWN OF CENTERPORT
NASSAU COUNTY, NY 11721

JOB NO.: CE2326A
DATE: MARCH 2014
SCALE: 1"=50'









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POST SANDY BATHOMETRIC SURVEY (3)
PROJECT LOCATION:
TOWN OF CENTERPORT
NASSAU COUNTY, NY 11721

JOB NO.: CE2326A
DATE: MARCH 2014
SCALE: 1"=50'

EXHIBIT D

Sediment Volume Calculation

Town of North Hempstead Disaster Relief
CE2326A

Volume Calculations

General

Revision number	0
Number of points	3761
Minimum X coordinate	1067060.922'
Minimum Y coordinate	243830.765'
Maximum X coordinate	1067898.613'
Maximum Y coordinate	244723.622'
Minimum elevation	-2.365'
Maximum elevation	8.498'
Mean elevation	0.397'

TIN

Number of triangles	7304
Maximum triangle area	521.04 Sq. Ft.
Minimum triangle area	0.00 Sq. Ft.
Minimum triangle length	0.001'
Maximum triangle length	71.779'

Volume

Base Surface	Mill Pond-2009 (1)
Comparison Surface	Mill Pond - 2014 (1)
Cut Factor	1.000
Fill Factor	1.000
Cut volume (adjusted)	1386.70 Cu. Yd.
Fill volume (adjusted)	4905.01 Cu. Yd.
Net volume (adjusted)	3518.31 Cu. Yd.<Fill>
Cut volume (unadjusted)	1386.70 Cu. Yd.
Fill volume (unadjusted)	4905.01 Cu. Yd.
Net volume (unadjusted)	3518.31 Cu. Yd.<Fill>