

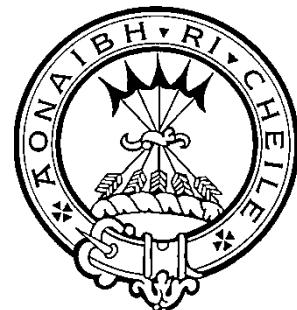


**TOWN OF NORTH HEMPSTEAD
WHITNEY/MANHASSET VALLEY POND
MANHASSET, NY**

HURRICANE SANDY AQUATIC SAND REMOVAL



**PREPARED FOR
TOWN OF NORTH HEMPSTEAD**



**PREPARED BY
CAMERON ENGINEERING & ASSOCIATES, LLP**

APRIL 2014



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& ASSOCIATES, LLP

**TOWN OF NORTH HEMPSTEAD
WHITNEY LAKE/MANHASSET VALLEY POND, MANHASSET, NY
HURRICANE SANDY AQUATIC SAND REMOVAL**

April 2014

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APPENDICES

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- Appendix A – Drainage Area
- Appendix B – Bathymetric Surveys
- Appendix C – Hurricane Sandy Flood Inundation Map (FEMA Flood Zones)
- Appendix D – Map of Protected Natural Areas
- Appendix E – FEMA Flood Zones
- Appendix F – Photographs



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1. Overview

Whitney Lake is located in Manhasset on the eastern side of Community Drive between Northern Boulevard and Community Drive East. It is currently owned by the Town of North Hempstead. North of Whitney Lake is Manhasset Valley Pond. Manhasset Valley Pond is at the very southern tip of Manhasset Bay. Manhasset Valley Pond is bordered by Northern Boulevard to the south, Maple Street to the east and East Shore Road to the west.

Whitney Pond Park, a 24 acre park located on Whitney Lake, offers visitors the following amenities:

- Tennis Courts
- Basketball Courts
- Children's Playgrounds
- Handball Courts
- A swimming complex with multiple pools
- Restrooms
- Benches
- BBQs & Picnic Tables
- A Walking Trail w/Small Bridges
- Jogging Course
- Nature Appreciation

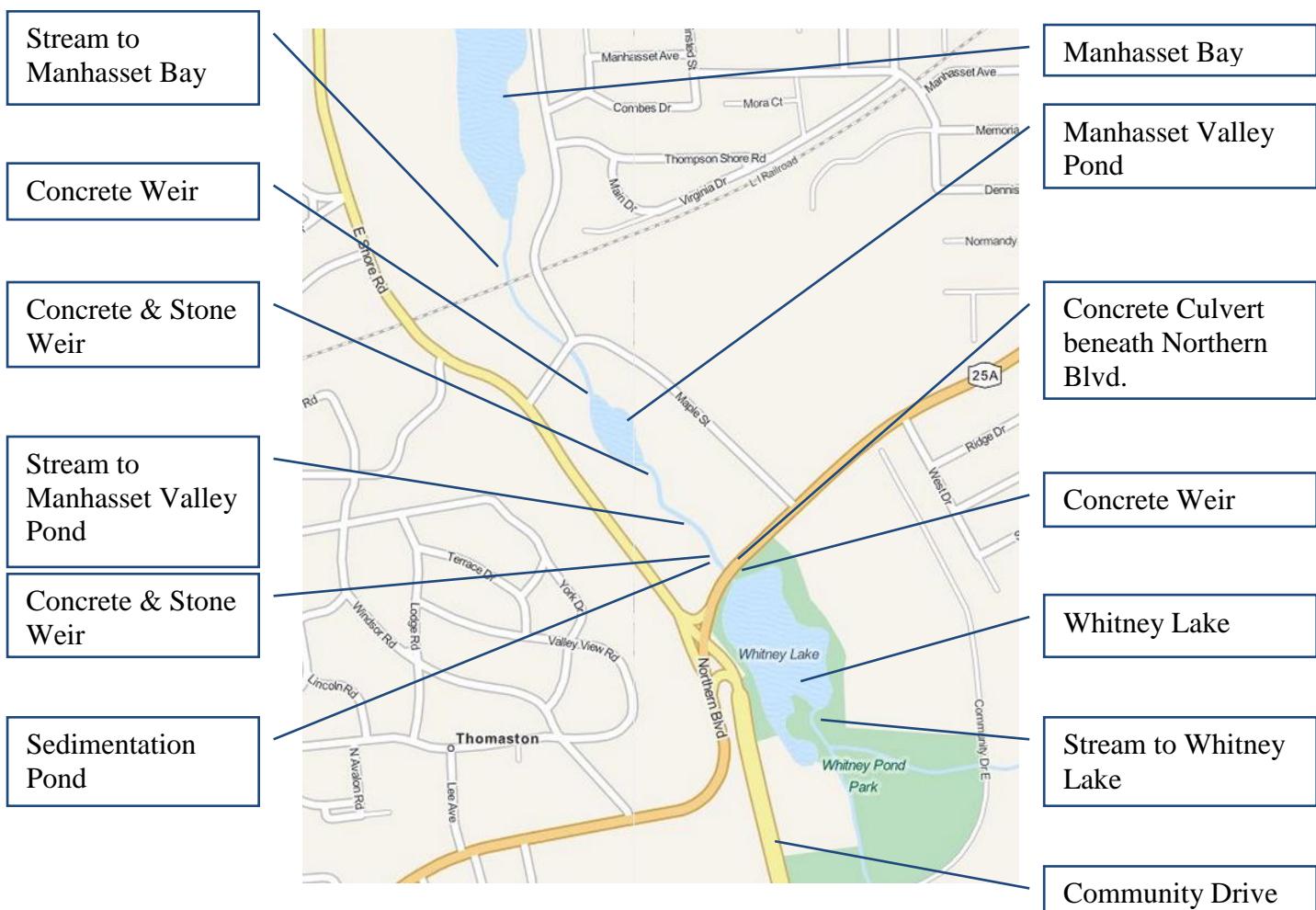
The 6.7-acre Whitney Lake is fed by groundwater seepage and storm water flow from a 1,860-acre suburban watershed as shown in Exhibit A – Drainage Area. Flow from the lake discharges over a concrete weir structure located on the northern side of the lake, through a concrete culvert, and into a 0.2-acre sedimentation pond. At the north end of the sedimentation pond, the water flows north over another concrete and stone weir and travels via stream to another concrete and stone weir prior to entering Manhasset Valley Pond.



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At the north end of Manhasset Valley Pond, the water travels over a final concrete weir before entering a stream that ultimately carries the flow to Manhasset Bay. The numerous weirs in place prevent the Pond from receiving reverse tidal flow from Manhasset Bay during normal conditions. The following figure shows the location of these features:





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2. Storm Water Surge

Hurricane Sandy surcharged Whitney Lake with a significant volume of runoff. Various methods are available to calculate estimated discharge of a watershed into a receiving body. For simplification purposes, the Rational Method is used in this case to estimate runoff volume:

Watershed of Lake: 1,860-acres (Exhibit 1)

Runoff Coefficient: 0.3 Single Family Residential (Lindeburg, 2009)

Rain Volume: 1,860-acres x 1" rainfall = 50,506,972 gallons = 50.5MG

**This was derived by applying a 1-inch rainfall over the 1,860-acre watershed for duration of 1-hour.*

Runoff Reaching Lake: Volume of Rainfall x Runoff Coefficient

50.5MG x 0.3 = 15MG of runoff reaching Whitney Lake

For Comparative Purposes: Whitney Lake is a 6.7-acre water body approximately 2-feet deep. Hence the pond volume is approximately 4,366,409 gallons = 4.4 MG. Based on the above, Hurricane Sandy surcharged Whitney Lake with approximately 3.4 times the Lake's volume. An inspection of the Lake indicated significant sediment accumulation, as shown in the images in Exhibit F. To estimate the volume of sediment introduced into the Lake and Pond system from Hurricane Sandy, a bathymetric analysis was performed.

3. Bathymetry

A bathymetric survey reveals the physical features of a water body and allows depth contours to be drawn. In 1997, Gibbons, Esposito & Boyce, Engineers, P.C. conducted a bathymetric survey of Manhasset Valley Pond and Whitney Lake. An additional Post Sandy bathymetric survey was performed in April, 2014 by Sidney B. Bowne & Son, LLP. Comparing the Pre-Sandy bathymetric survey (1997) with the Post-Sandy bathymetric survey helps to reveal what the effects of the Hurricane were on the water body. Possible effects include deposition of sediment, which would reduce the depth of the water body; or scouring, which would increase the depth of the water body.



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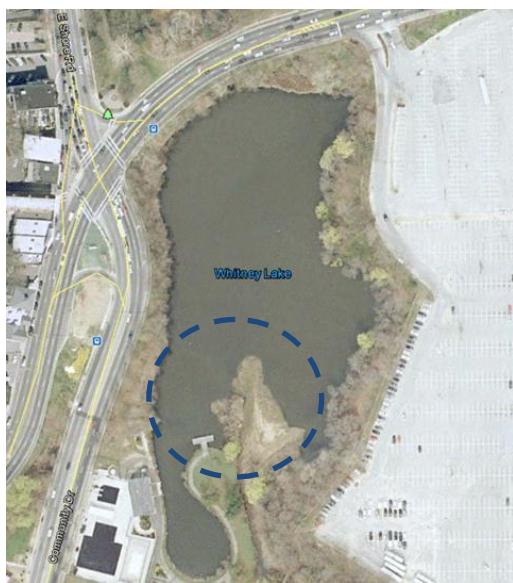
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Using the contours provided in both the Pre and Post Sandy Surveys, cross sections were established every 25' and analyzed for sedimentation or scour using AutoCAD Civil3D. Cross sections showing sedimentation or scour are attached as Exhibit 2. The results are as follows:

3.1. Whitney Lake

A comparison of the 1997 bathymetric survey of Whitney Lake with the post Hurricane Sandy bathymetric survey revealed approximately 4,721 cubic yards of sediment accumulated in the pond. Conversely, the Hurricane event is estimated to have removed 1,261 cubic yards from the Lake through scouring; resulting in a net gain of 3,460 cubic yards of sediment in the Lake.

Note: The most recent Bathymetric survey only compares those points that are covered by water in both surveys. This ensures that sedimentation that has likely occurred prior to the Hurricane event is not accounted for in this study. However, it should be noted that over the years, there has been a significant accumulation of sediment within the Lake as shown that is not accounted for in this study as shown in the image comparison below:



2000 Google Earth Image



2013 Google Earth Image



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3.2. Manhasset Valley Pond

A comparison of the 1997 bathymetric survey of Manhasset Valley Pond with the post Hurricane Sandy bathymetric survey revealed that approximately 926 cubic yards of sediment accumulated in the pond. Conversely, the Hurricane event is estimated to have removed 1,785 cubic yards through scouring; resulting in a net loss of 859 cubic yards of sediment from the Pond.

4. Flooding

During the incident period, October 27 through November 8, 2012, high winds, heavy rain and a storm surge from Hurricane Sandy damaged the facilities at Whitney Pond Park. Flooding attributed to Hurricane Sandy inundated Manhasset Bay all the way back to Whitney Lake as shown in Exhibit C - Sandy Flood Inundation Map. In addition to the sediment attributed to a stormwater surge, Manhasset Valley Pond, and the stream leading from Whitney Lake to the Pond received a significant sediment load from the storm tide from Manhasset Bay.

4.1. Comparison

Stormwater inflow attributed to Hurricane Sandy first entered Whitney Lake before traveling over the weir into Manhasset Valley Pond and beyond. The Lake acted as a sedimentation basin, as designed, resulting in the accumulation of nearly 3,500 cubic yards of sediment. The additional flow through the weir and into the Pond (approximately 15MG) resulted in a slight scouring of the pond.

5. Regulatory Oversight and Permit Requirements

The New York State Department of Environmental Conservation (NYSDEC) considers both Whitney Lake and Manhasset Valley Pond a regulated freshwater wetland. The pond is regulated by the NYSDEC according to the Article 24, Freshwater Wetlands.



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As per the U.S. Fish and Wildlife Service (USF&WS) National Wetlands Inventory (NWI) maps, **Whitney Lake** is denoted as PUBHx:

- P – Palustrine – non-tidal wetlands dominated by trees and other vegetation that occur in tidal areas with ocean derived salts below a certain threshold.
- UB – Unconsolidated Bottom – wetlands with at least 25% cover of particles smaller than stones and a vegetative cover less than 30%.
- H – Permanently Flooded – water covers the land surface throughout the year in all years
- x – Excavated – lies within a basin or channel that has been dug out through artificial means by man.

As per the U.S. Fish and Wildlife Service (USF&WS) National Wetlands Inventory (NWI) maps, **Manhasset Valley Pond** is denoted as PUBHh:

- P – Palustrine – non-tidal wetlands dominated by trees and other vegetation that occur in tidal areas with ocean derived salts below a certain threshold.
- UB – Unconsolidated Bottom – wetlands with at least 25% cover of particles smaller than stones and a vegetative cover less than 30%.
- H – Permanently Flooded – water covers the land surface throughout the year in all years
- h – Diked/ impounded – the water body has been modified by a man-made barrier which obstructs the inflow or outflow of the water.

As a diked/impounded waterway, work proposed in the Manhasset Valley Pond would require a permit from the United States Army Corps of Engineers (USACE).

Whitney Pond Park and Manhasset Valley Pond are designated Protected Natural Areas as shown in Exhibit D. Both parks lie just south of 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



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require a Federal Coastal Consistency Assessment Form and would be subject to review by NYSDOS for consistency to the CMP.

Whitney Lake is situated outside of the FEMA (Federal Emergency Management Agency) 100 Year Flood Zone, as shown in Exhibit E. However, all of Manhasset Valley Pond is located within it. The majority of the pond is located within the 100 year Flood Zone AE (EL. 11) (1% annual chance of flood), while the most southerly portion surrounding the weir near Northern Boulevard is designated Zone X (0.2% chance of annual flood) as designated by FEMA. It is noted however, the entire Manhasset Valley Pond within the Sandy Inundation Limit (Exhibit C).

Whitney Lake is listed in the 2012 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy: Whitney Lake is listed as containing chlordane contaminated sediment.

6. Conclusion

Because the sediment in Whitney Lake is contaminated by chlordane, it is likely that removing and properly disposing of contaminated sediment from Whitney Lake will be cost prohibitive. The proposed method of remediation includes re-grading Whitney Lake and Manhasset Valley Pond; addressing topographic modifications resulting from sedimentation. The Lake and Pond will be graded such that each water body will be deeper in the center in order to facilitate flow. Wetlands will be created near the outskirts of each water body with the sediment that is relocated, improving the aesthetics and creating a stable wetland habitat.

7. Long Term Maintenance

With respect to hardening to resist future storm/flood events, securing a 10-year dredging and sediment removal permit from the NYSDEC should be considered at this time. It is recommended that a sample and testing program be put in place to determine the toxicity of the Lake and Pond Sediment.



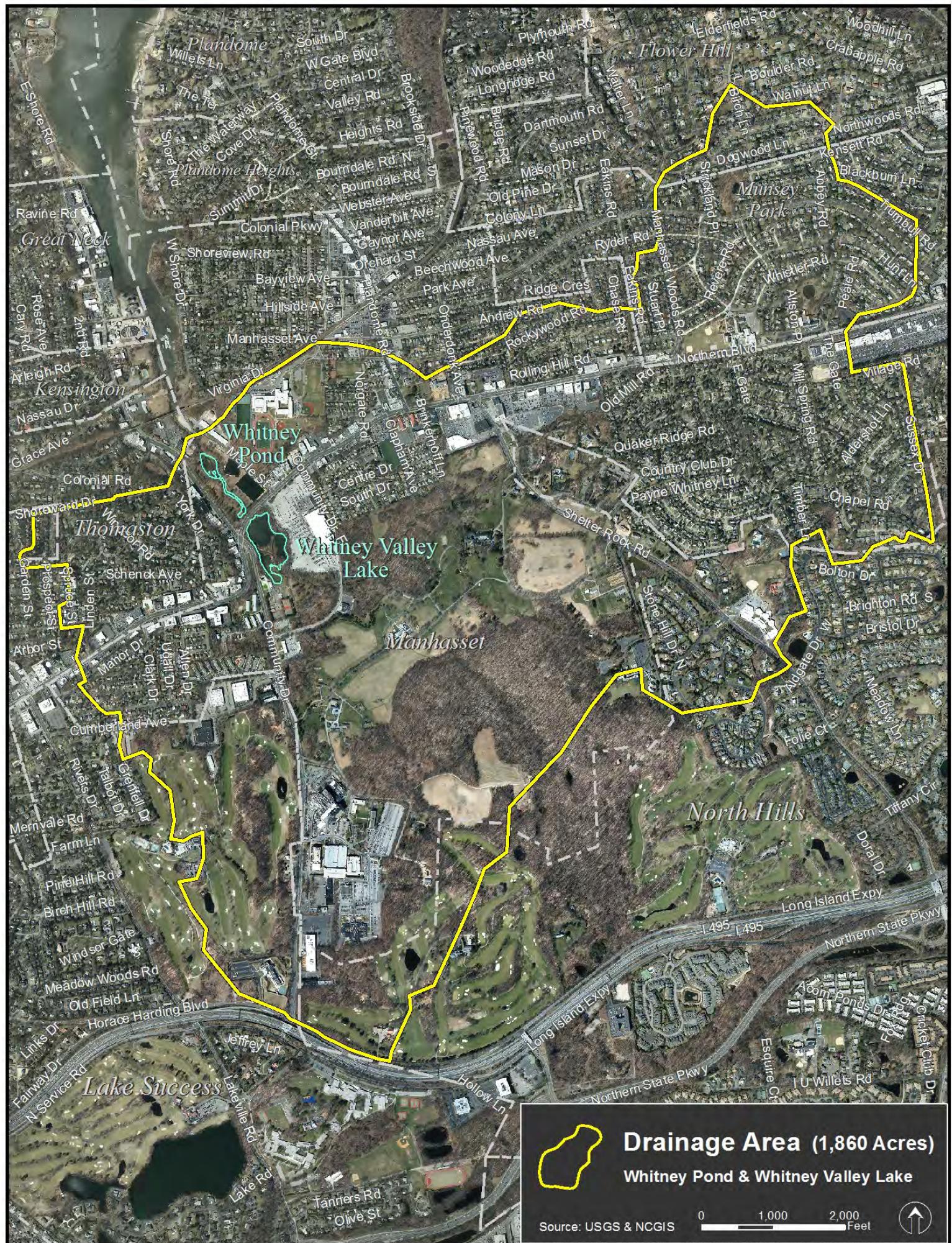
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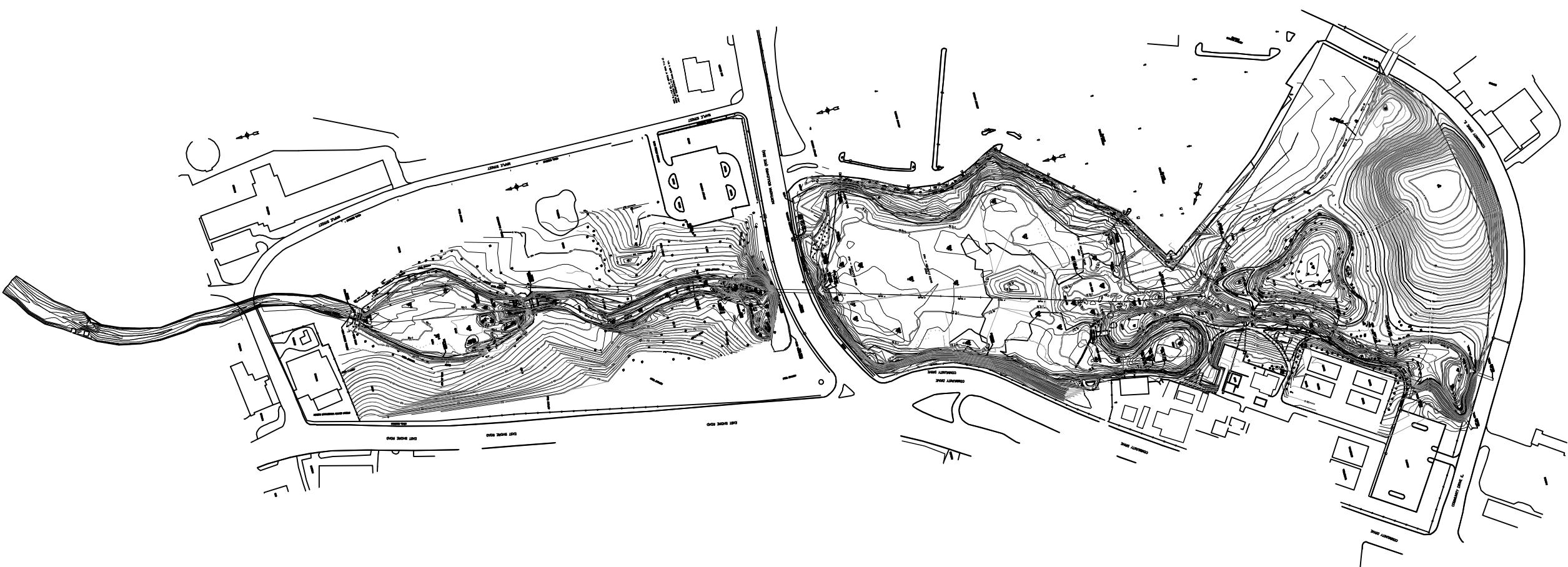
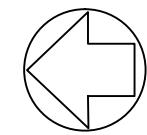
APPENDIX A

Drainage Area



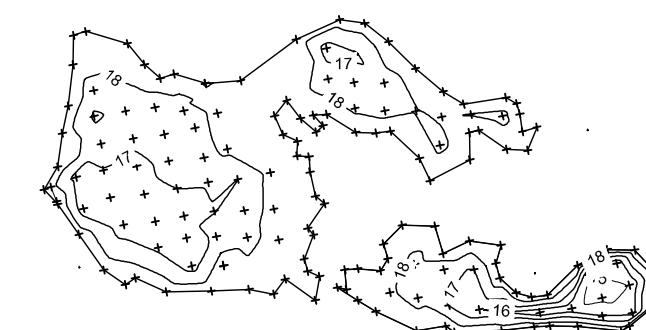
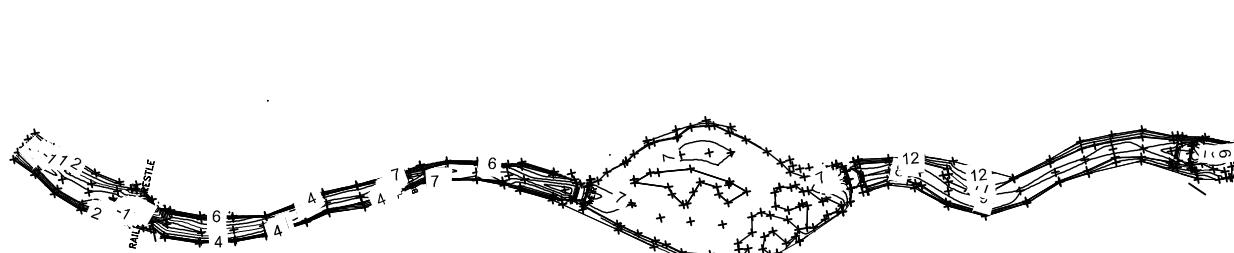
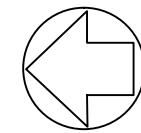
APPENDIX B

Bathymetric Surveys

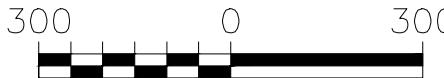


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NO.	REVISION DESCRIPTION	DATE	
COUNTY OF NASSAU DEPARTMENT OF PUBLIC WORKS			
MANHASSET VALLEY POND TOPO & CONTOUR PLAN PLAN - 7			
CONTRACT NO. *****	SCALE 1" = 300'	DATE JANUARY 1997	SHEET NO. * OF *

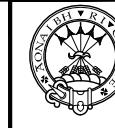


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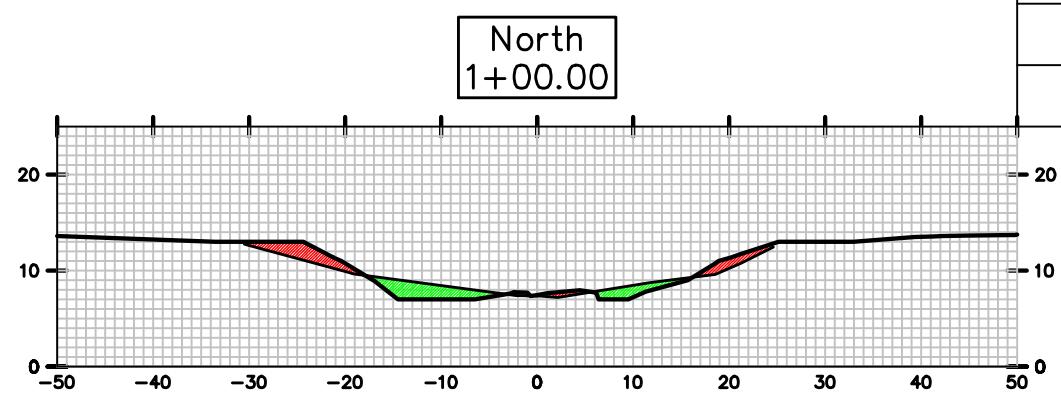
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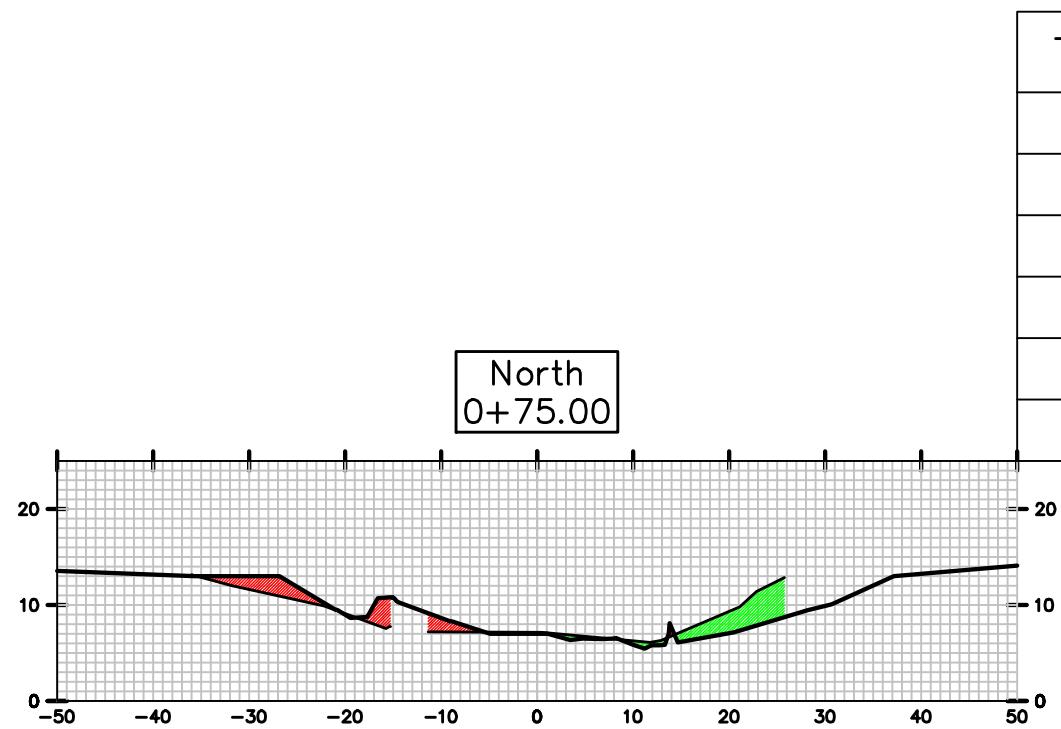
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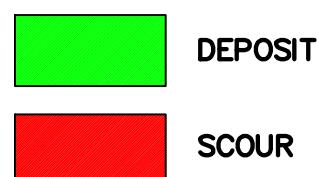
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Whitney Pond Bathymetric Survey - POST SANDY
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



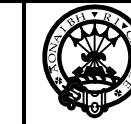
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Sediment Area	25.37
Scour Vol	23.07
Sediment Vol	26.90
Cum Scour Vol	45.17
Cum Sediment Vol	131.24



Total Volume at Station 0+75.00	
Scour Area	27.18
Sediment Area	32.73
Scour Vol	16.20
Sediment Vol	40.78
Cum Scour Vol	22.10
Cum Sediment Vol	104.34



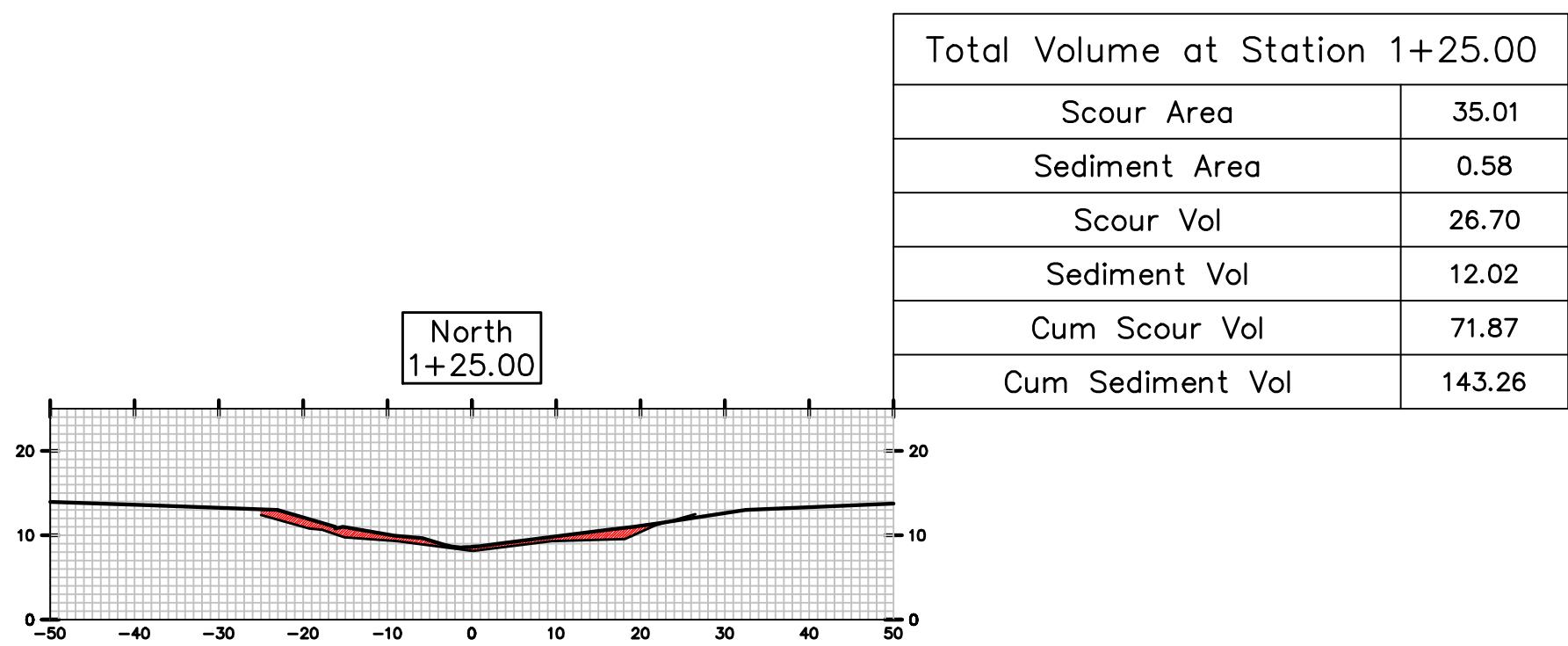
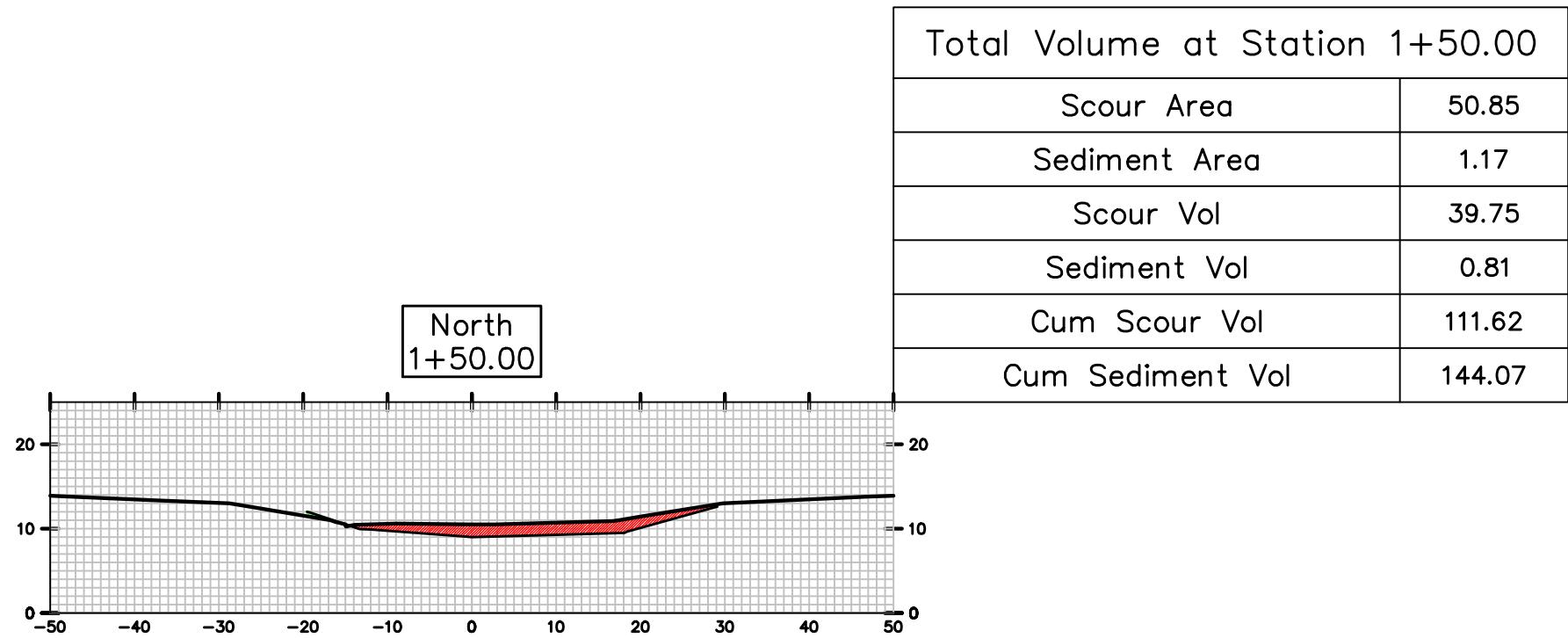
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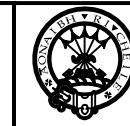
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DEPOSIT
 SCOUR



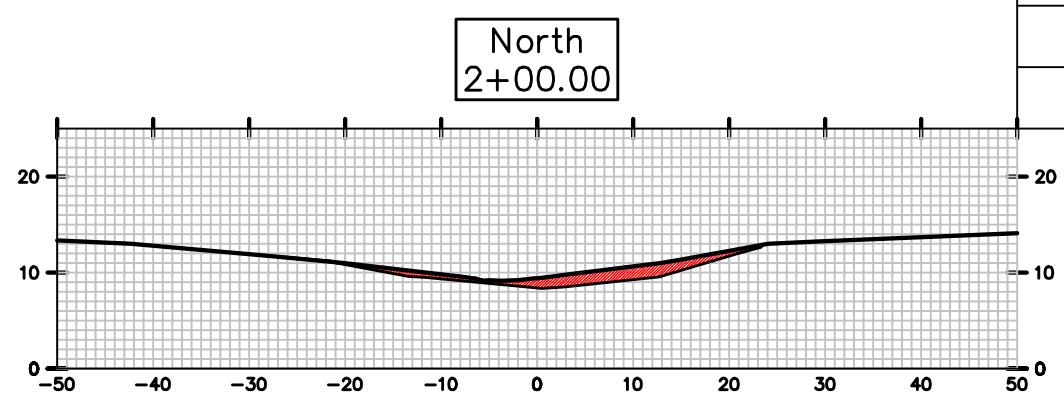
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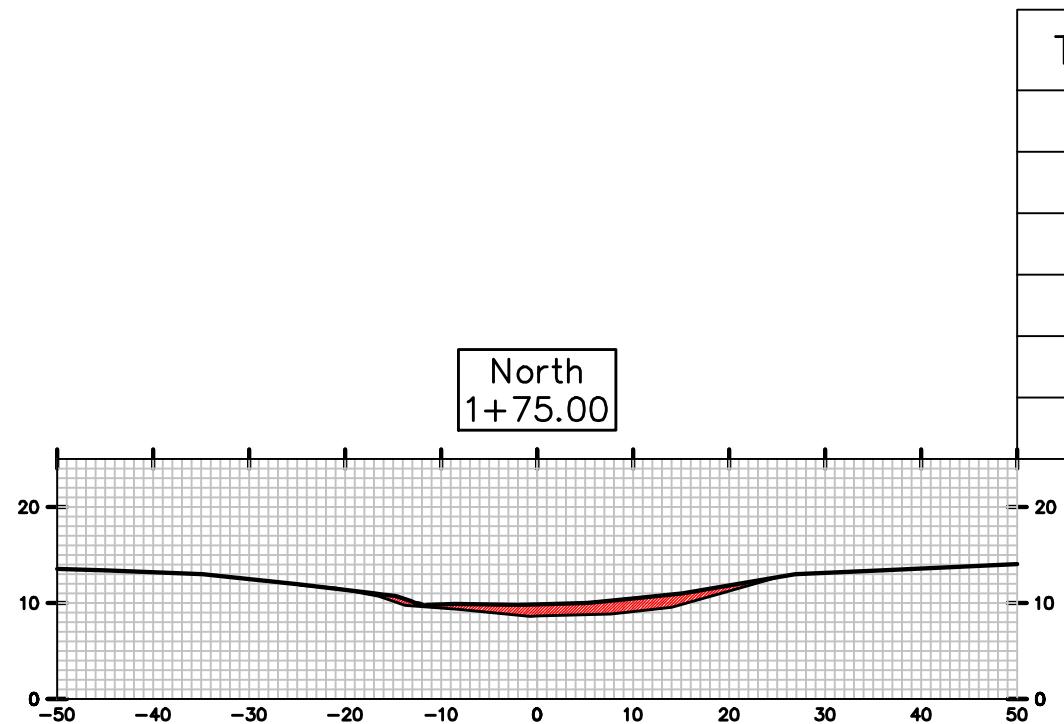
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Total Volume at Station 2+00.00	
Scour Area	33.87
Sediment Area	0.40
Scour Vol	33.47
Sediment Vol	0.19
Cum Scour Vol	186.92
Cum Sediment Vol	144.79



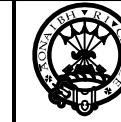
Total Volume at Station 1+75.00	
Scour Area	36.67
Sediment Area	0.08
Scour Vol	41.83
Sediment Vol	0.53
Cum Scour Vol	153.45
Cum Sediment Vol	144.60

DEPOSIT

SCOUR



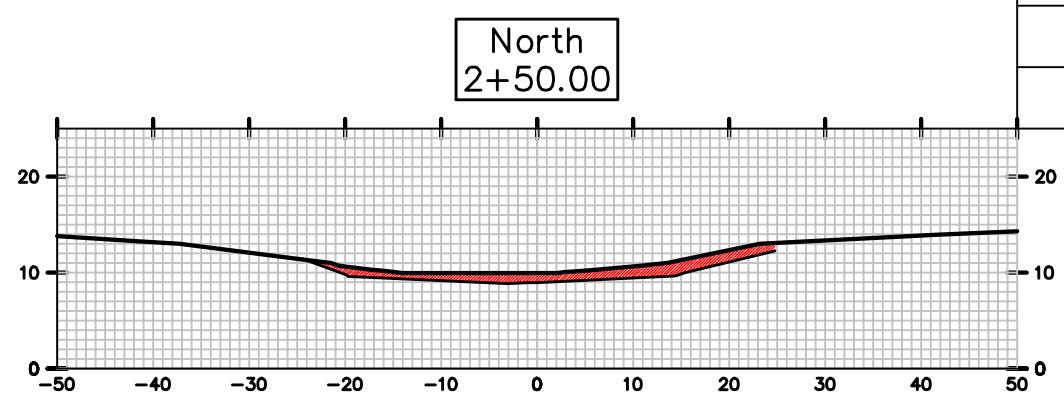
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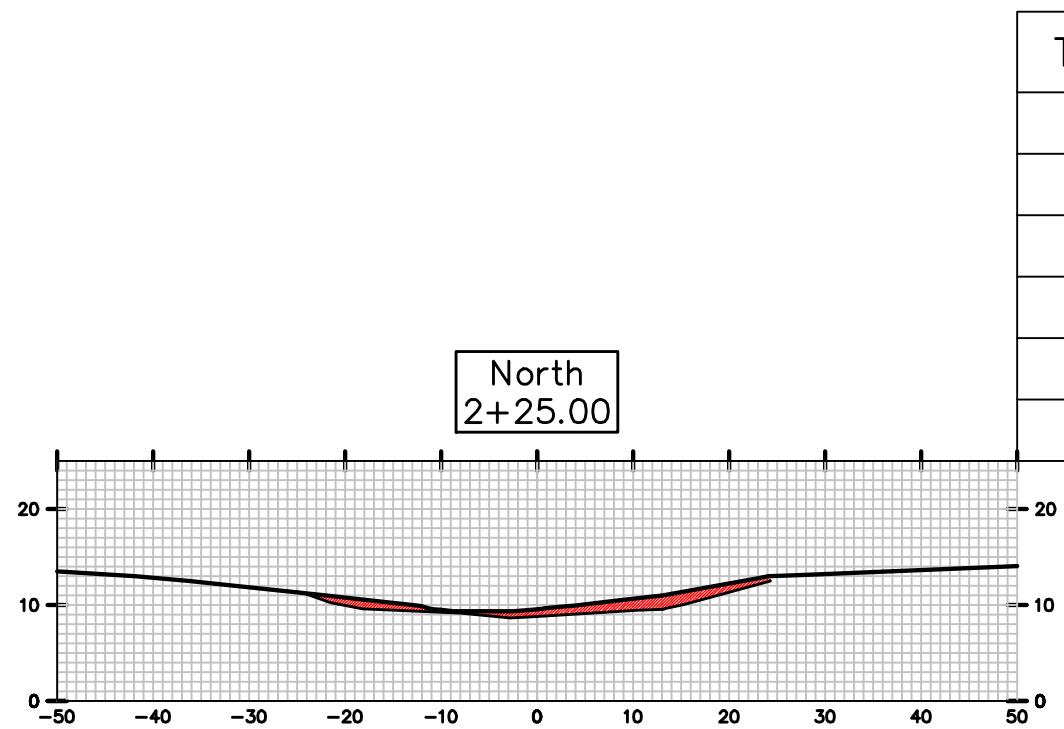
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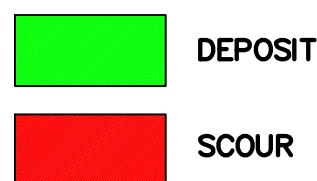
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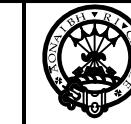
Total Volume at Station 2+50.00	
Scour Area	48.49
Sediment Area	0.01
Scour Vol	41.40
Sediment Vol	0.06
Cum Scour Vol	262.96
Cum Sediment Vol	145.07



Total Volume at Station 2+25.00	
Scour Area	39.43
Sediment Area	0.14
Scour Vol	34.64
Sediment Vol	0.22
Cum Scour Vol	221.56
Cum Sediment Vol	145.01



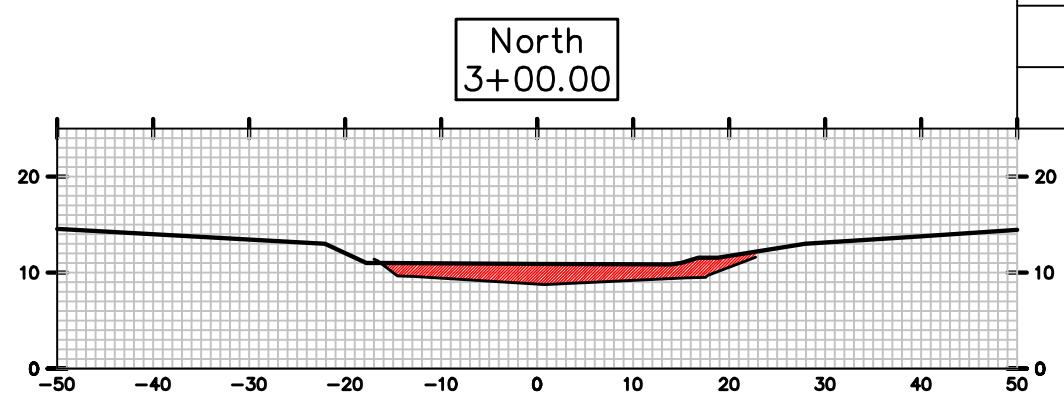
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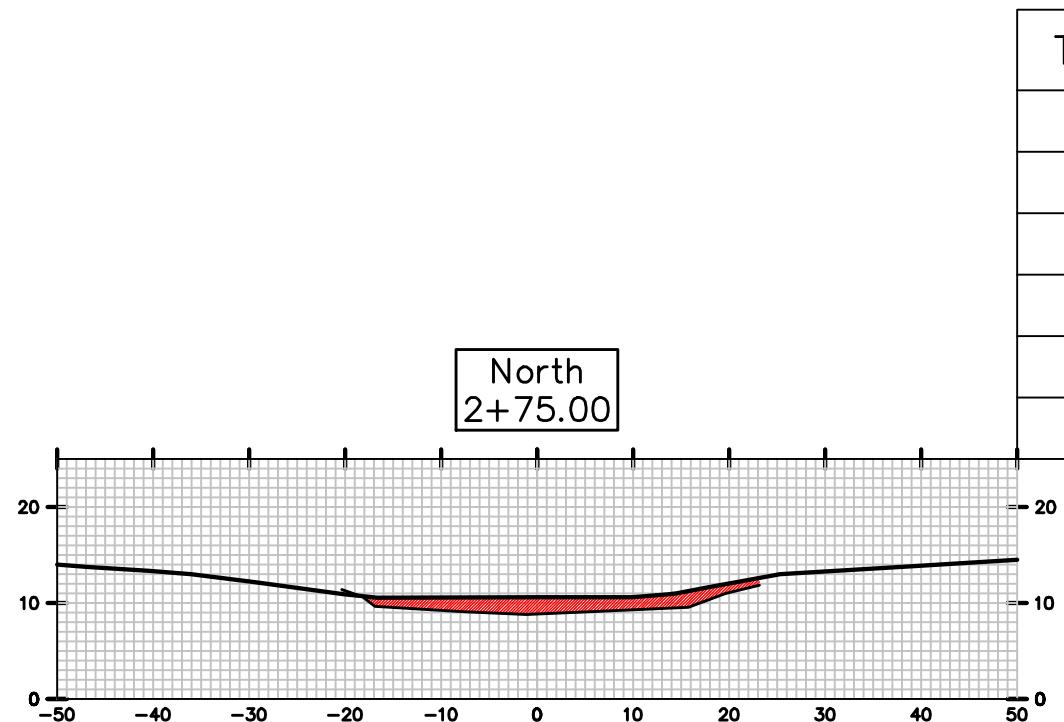
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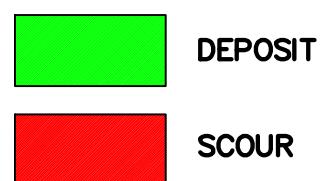
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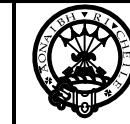
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Sediment Area	0.15
Scour Vol	55.73
Sediment Vol	0.26
Cum Scour Vol	367.53
Cum Sediment Vol	145.51



Total Volume at Station 2+75.00	
Scour Area	56.19
Sediment Area	0.42
Scour Vol	48.84
Sediment Vol	0.19
Cum Scour Vol	311.80
Cum Sediment Vol	145.25



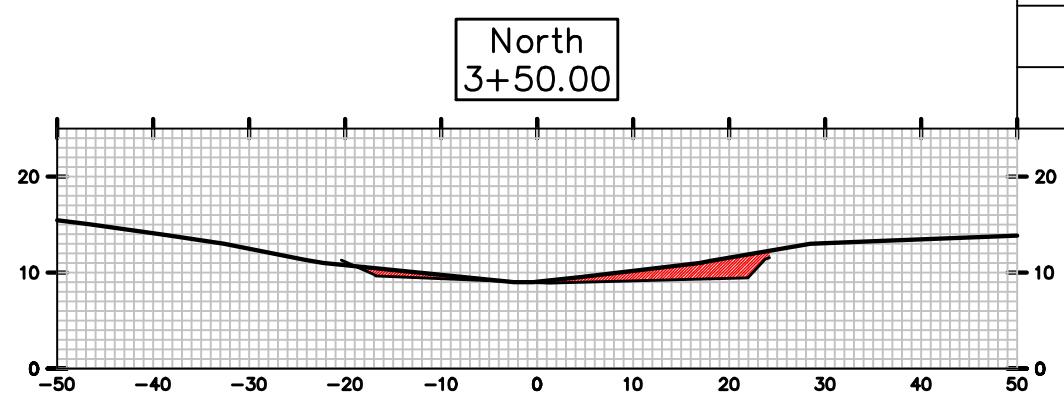
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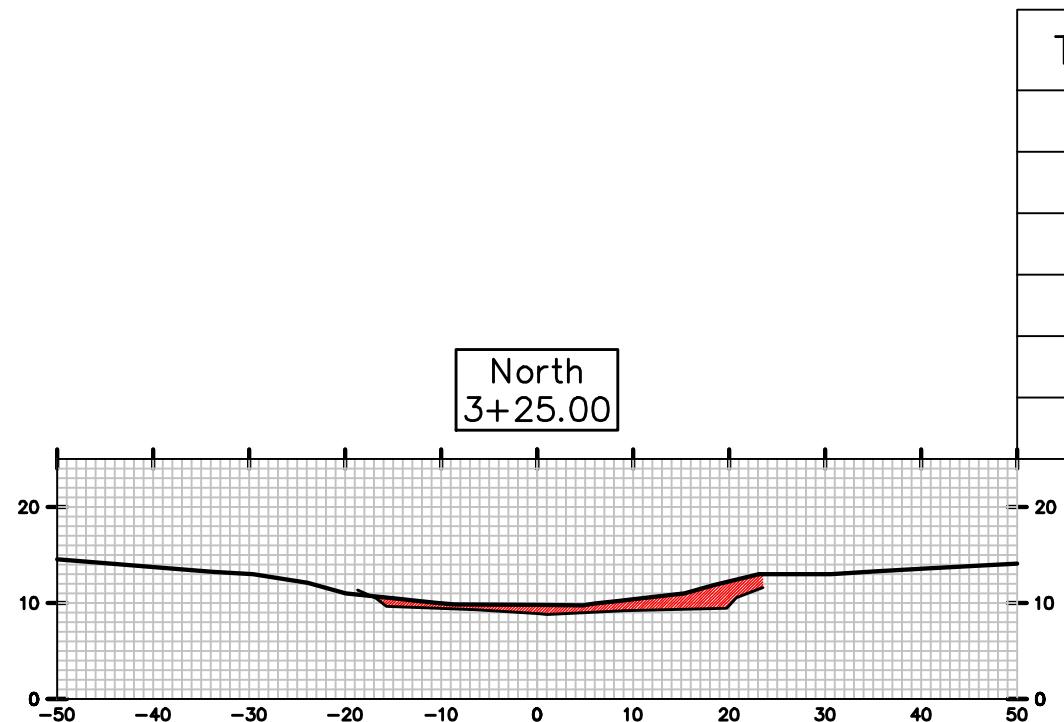
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SCALE:
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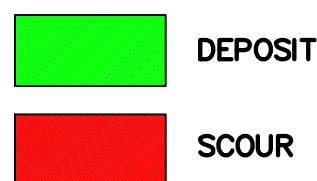
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (6)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



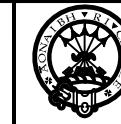
Total Volume at Station 3+50.00	
Scour Area	34.74
Sediment Area	0.48
Scour Vol	36.80
Sediment Vol	0.37
Cum Scour Vol	454.76
Cum Sediment Vol	146.10



Total Volume at Station 3+25.00	
Scour Area	44.74
Sediment Area	0.33
Scour Vol	50.43
Sediment Vol	0.22
Cum Scour Vol	417.96
Cum Sediment Vol	145.73



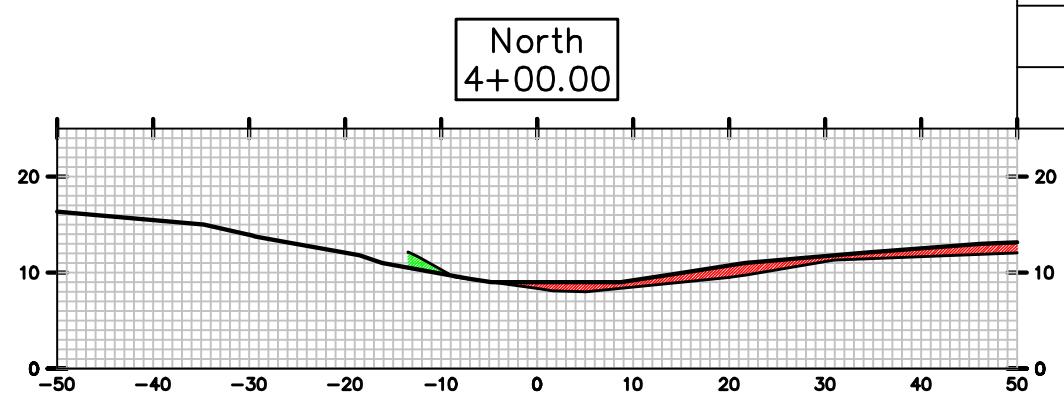
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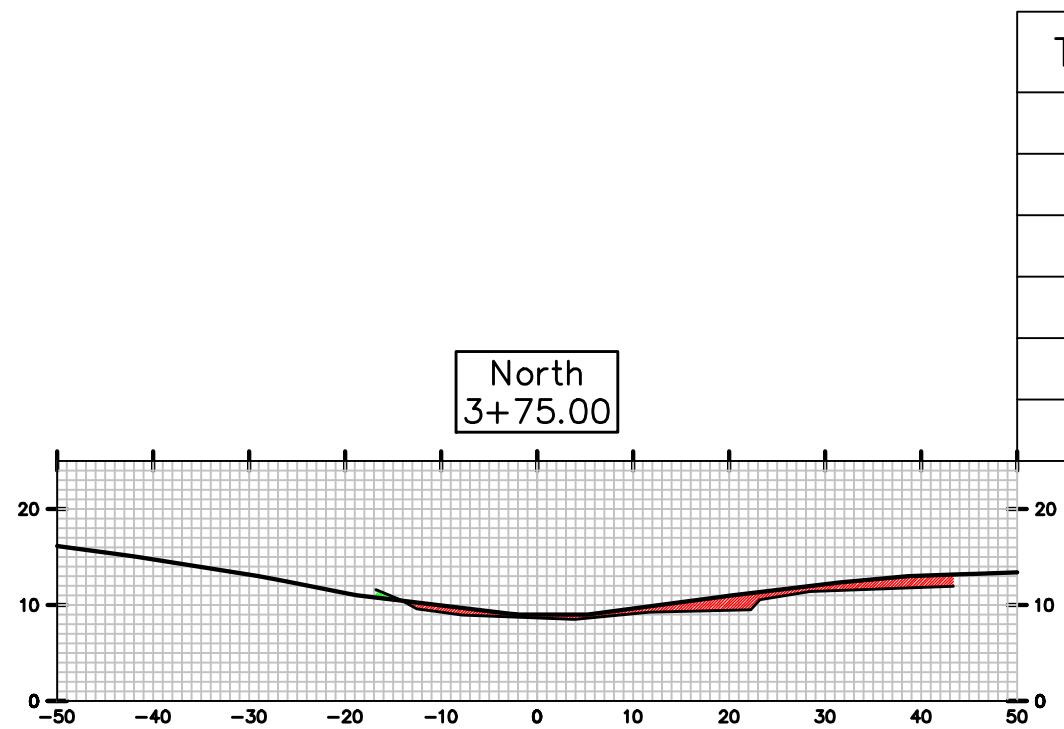
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SCALE:
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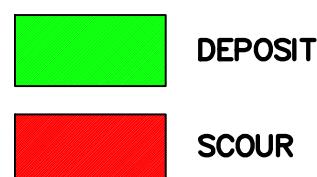
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (7)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



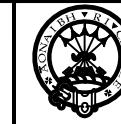
Total Volume at Station 4+00.00	
Scour Area	46.89
Sediment Area	4.00
Scour Vol	33.62
Sediment Vol	2.70
Cum Scour Vol	525.16
Cum Sediment Vol	149.58



Total Volume at Station 3+75.00	
Scour Area	44.71
Sediment Area	1.21
Scour Vol	36.78
Sediment Vol	0.78
Cum Scour Vol	491.54
Cum Sediment Vol	146.88



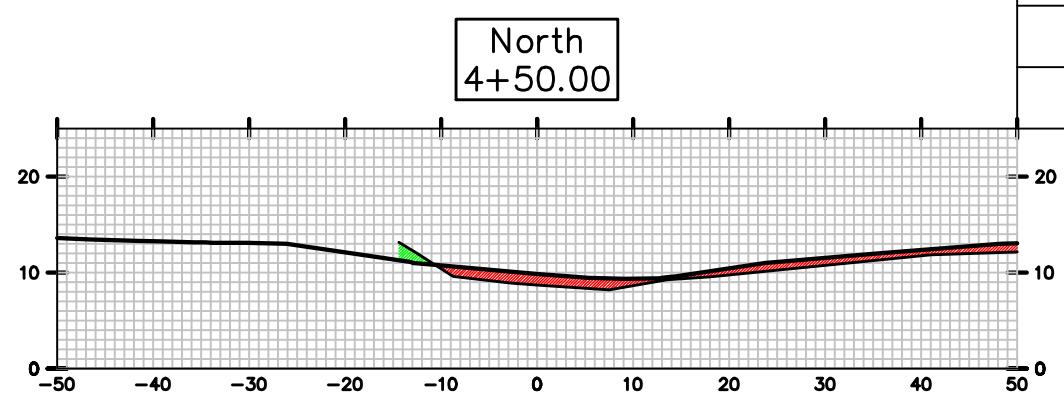
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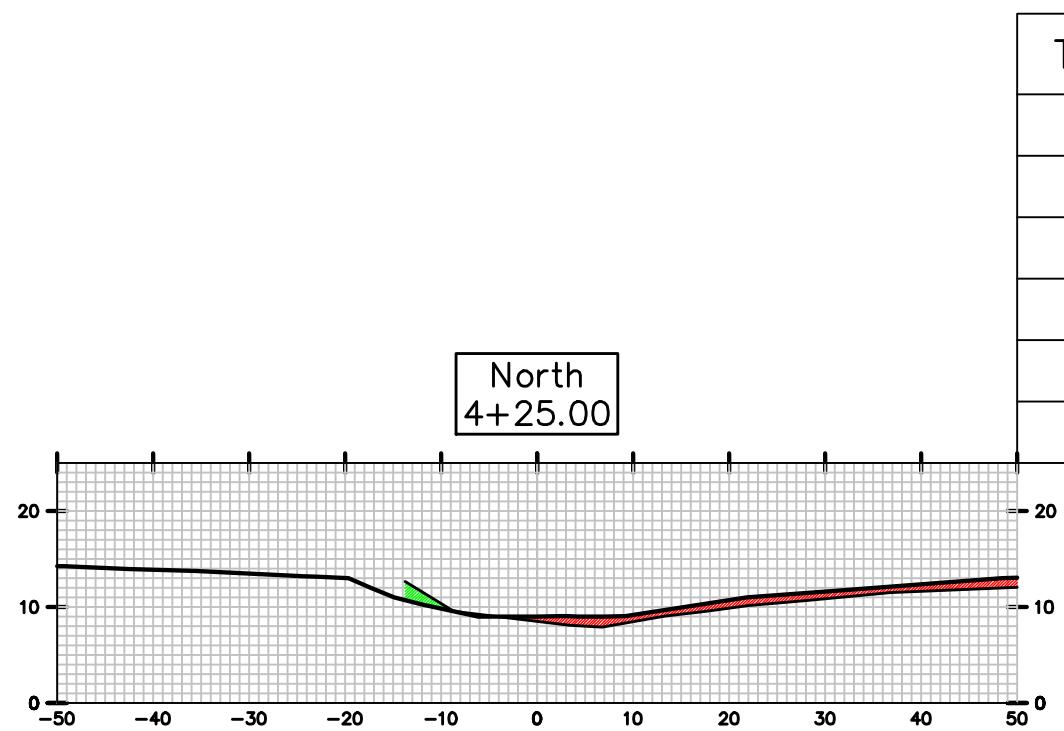
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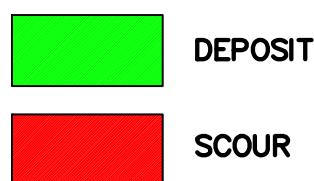
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (8)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



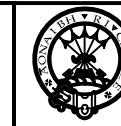
Total Volume at Station 4+50.00	
Scour Area	48.96
Sediment Area	3.68
Scour Vol	29.01
Sediment Vol	5.12
Cum Scour Vol	580.32
Cum Sediment Vol	159.97



Total Volume at Station 4+25.00	
Scour Area	39.93
Sediment Area	5.76
Scour Vol	26.15
Sediment Vol	5.27
Cum Scour Vol	551.31
Cum Sediment Vol	154.85



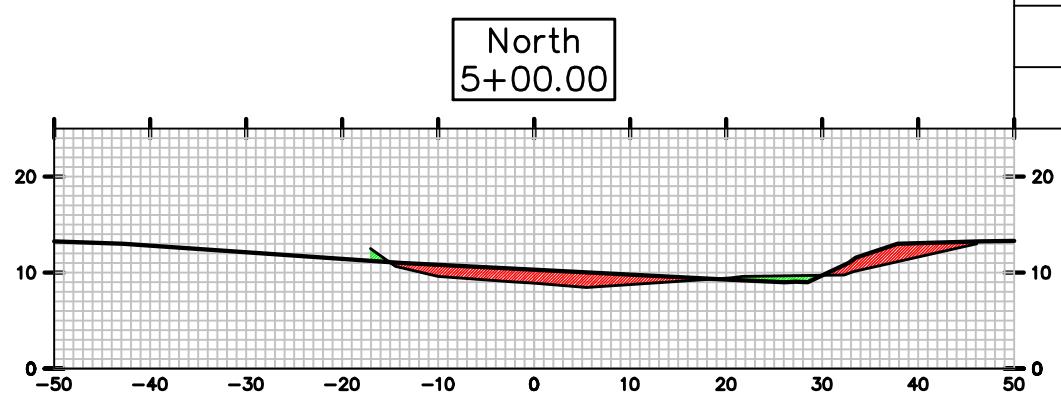
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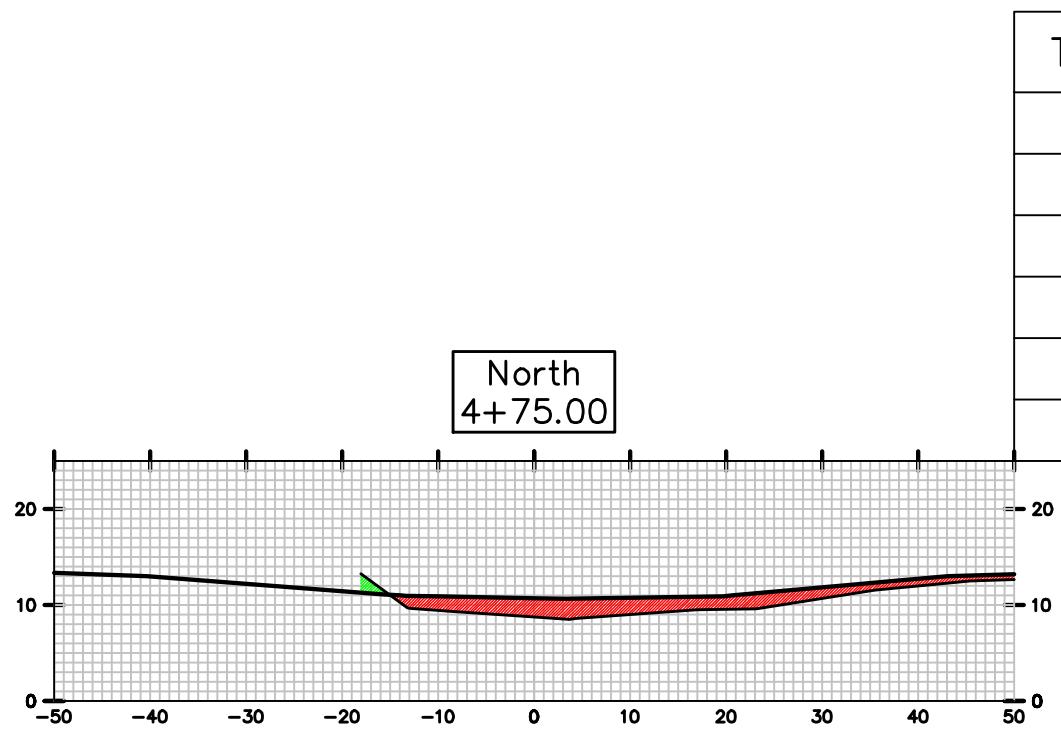
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PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (9)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 5+00.00	
Scour Area	53.45
Sediment Area	6.24
Scour Vol	64.70
Sediment Vol	4.22
Cum Scour Vol	707.64
Cum Sediment Vol	167.23



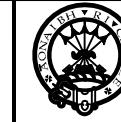
Total Volume at Station 4+75.00	
Scour Area	86.30
Sediment Area	2.88
Scour Vol	62.62
Sediment Vol	3.04
Cum Scour Vol	642.94
Cum Sediment Vol	163.01

DEPOSIT

SCOUR



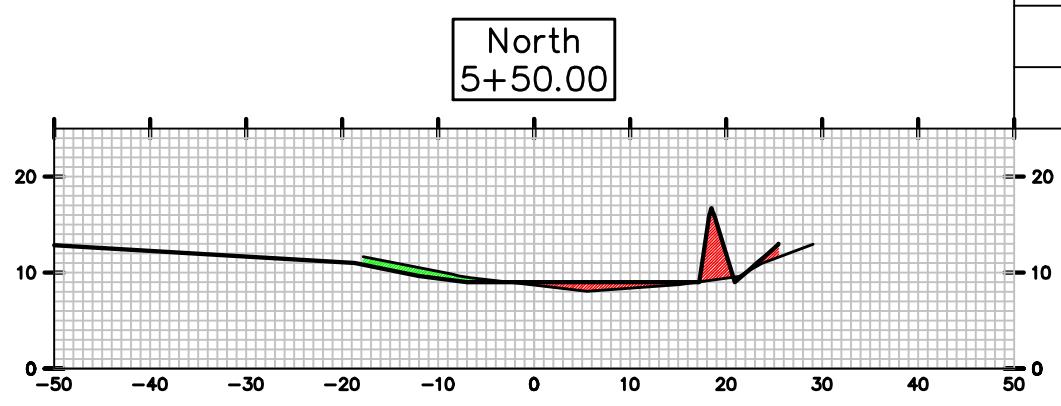
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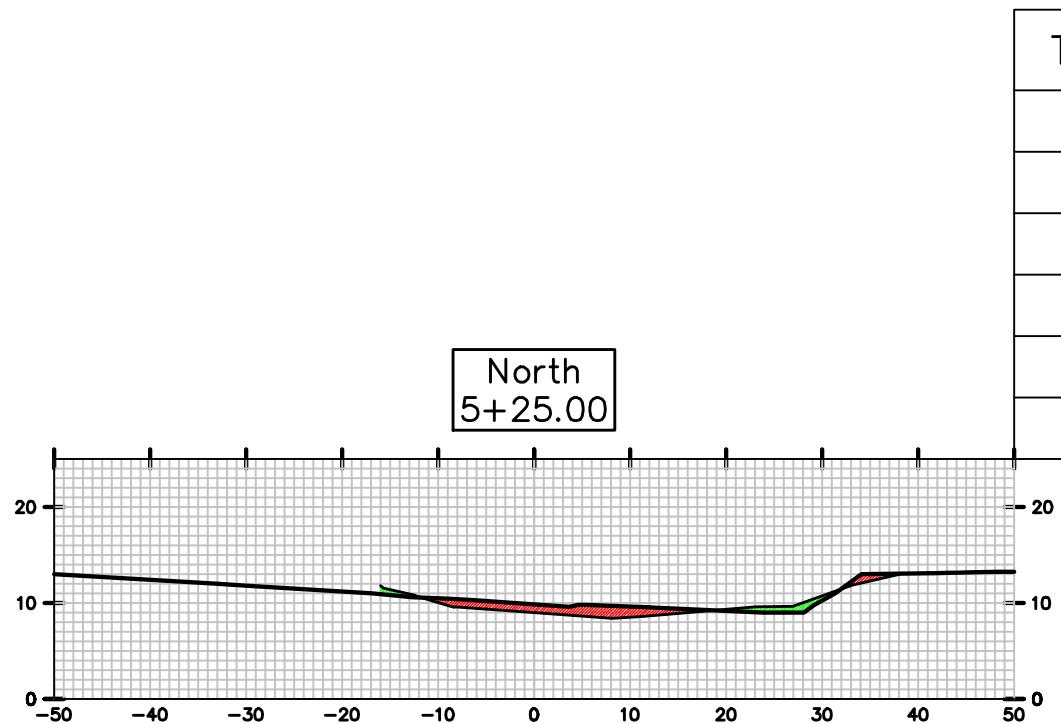
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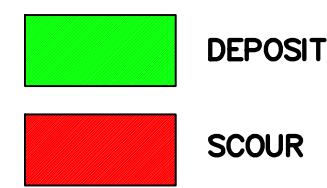
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (10)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 5+50.00	
Scour Area	25.64
Sediment Area	9.82
Scour Vol	28.17
Sediment Vol	8.69
Cum Scour Vol	773.19
Cum Sediment Vol	182.68



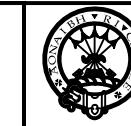
Total Volume at Station 5+25.00	
Scour Area	27.29
Sediment Area	8.35
Scour Vol	37.38
Sediment Vol	6.75
Cum Scour Vol	745.02
Cum Sediment Vol	173.98



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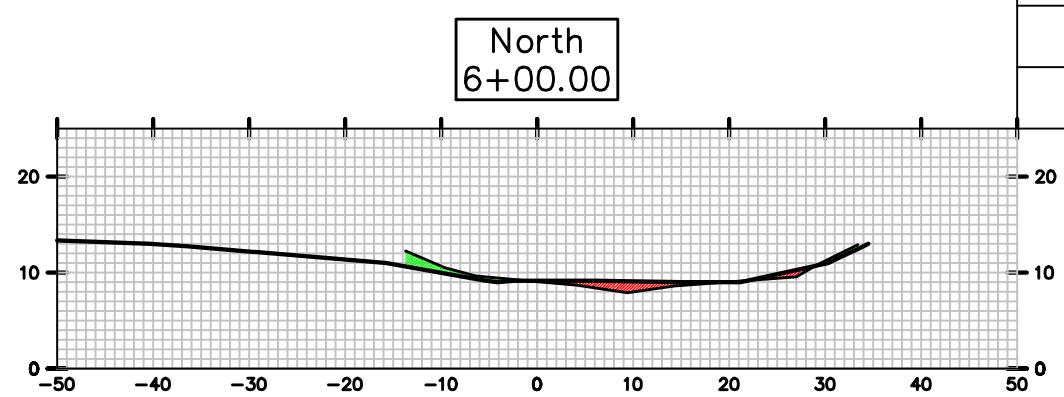


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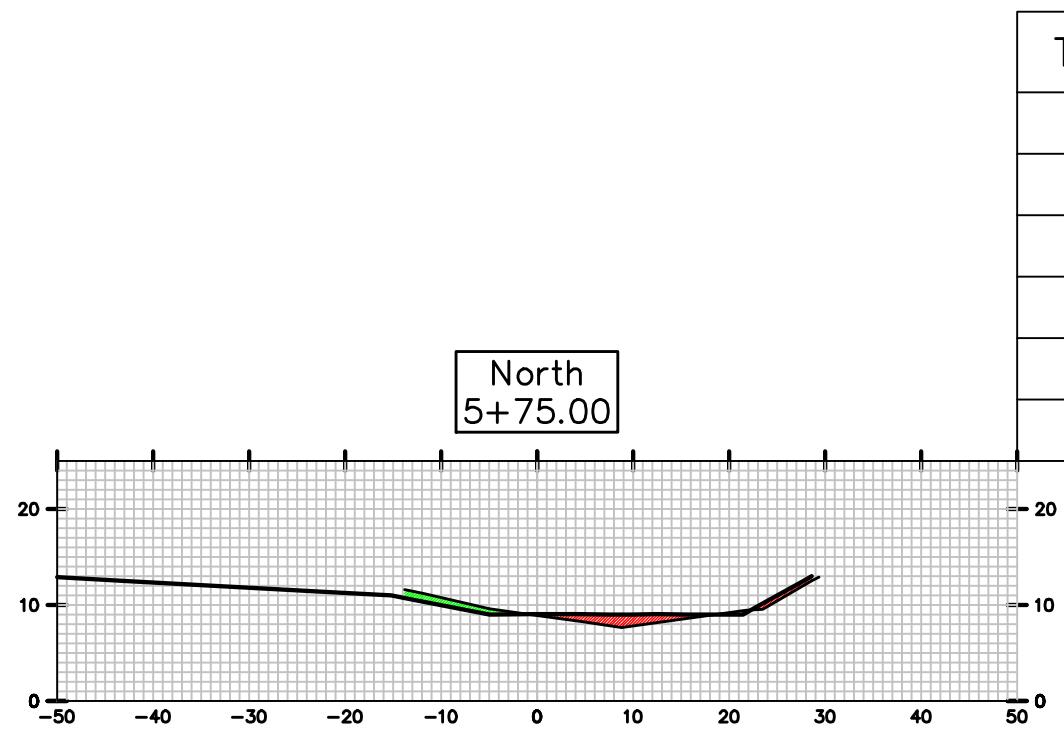
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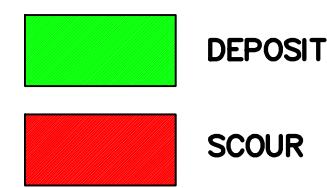
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (11)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 6+00.00	
Scour Area	13.12
Sediment Area	9.23
Scour Vol	13.60
Sediment Vol	8.27
Cum Scour Vol	809.35
Cum Sediment Vol	198.60



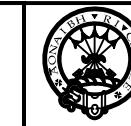
Total Volume at Station 5+75.00	
Scour Area	16.26
Sediment Area	8.64
Scour Vol	22.55
Sediment Vol	7.65
Cum Scour Vol	795.75
Cum Sediment Vol	190.32



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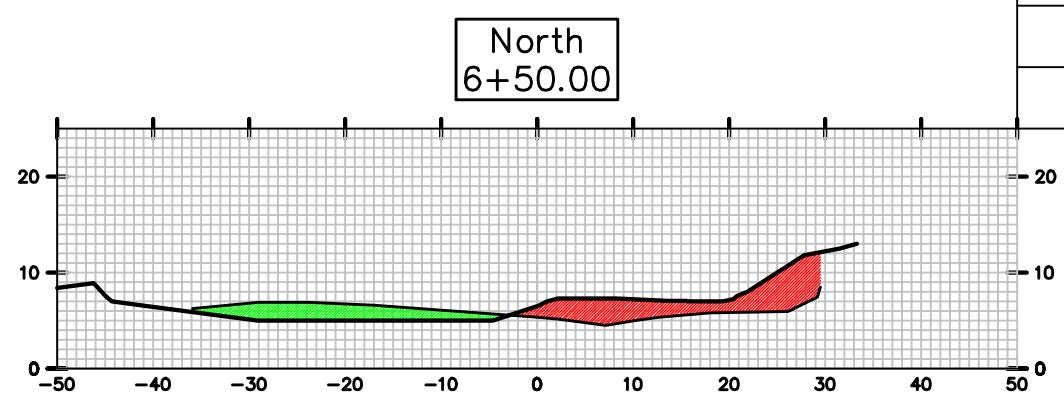


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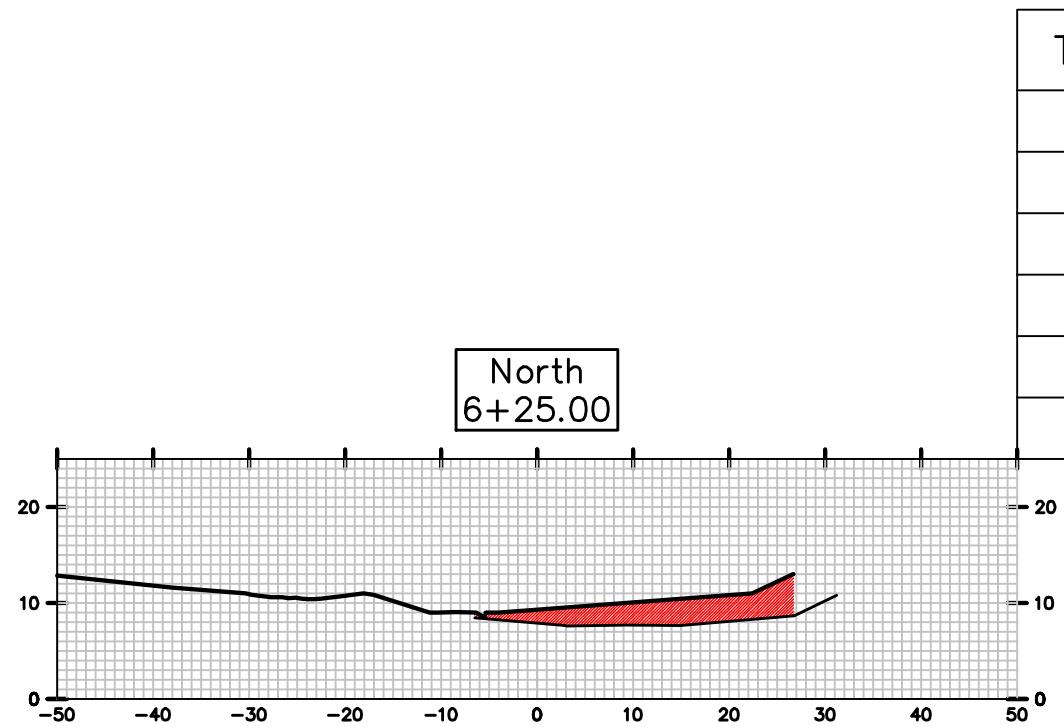
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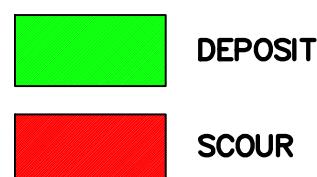
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TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (12)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



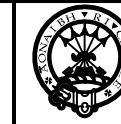
Total Volume at Station 6+50.00	
Scour Area	74.63
Sediment Area	44.37
Scour Vol	64.77
Sediment Vol	22.20
Cum Scour Vol	914.43
Cum Sediment Vol	225.07



Total Volume at Station 6+25.00	
Scour Area	73.97
Sediment Area	0.00
Scour Vol	40.32
Sediment Vol	4.27
Cum Scour Vol	849.67
Cum Sediment Vol	202.87



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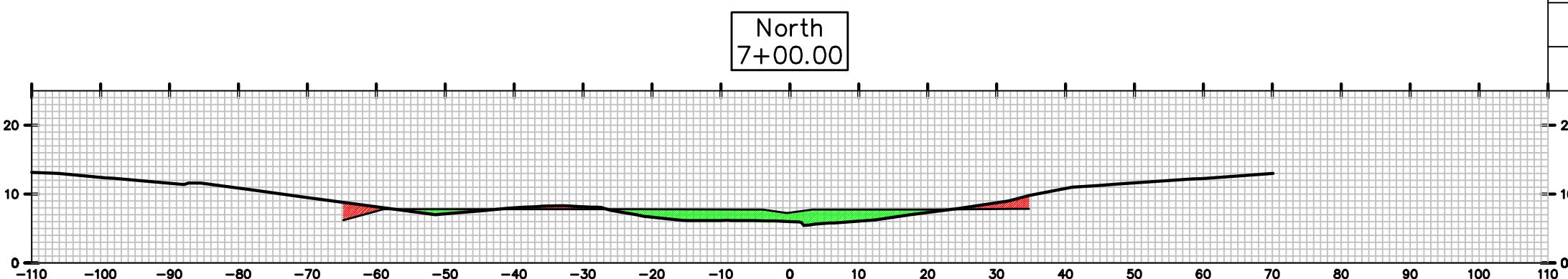


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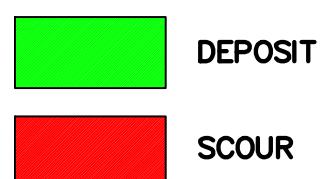
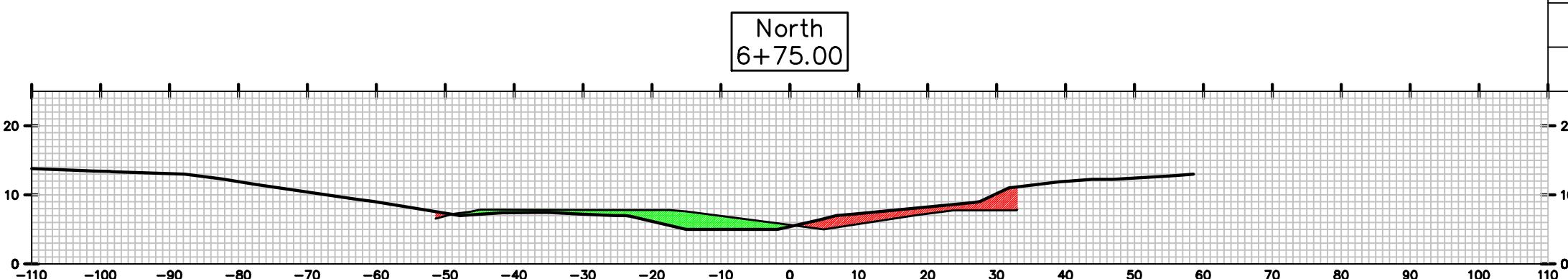
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DATE:
MARCH 2014
SCALE:
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PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (13)
PROJECT LOCATION:
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NASSAU COUNTY, NY

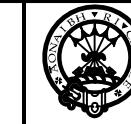
Total Volume at Station 7+00.00	
Scour Area	22.40
Sediment Area	70.98
Scour Vol	31.51
Sediment Vol	57.16
Cum Scour Vol	1001.63
Cum Sediment Vol	327.07



Total Volume at Station 6+75.00	
Scour Area	45.65
Sediment Area	52.49
Scour Vol	55.69
Sediment Vol	44.84
Cum Scour Vol	970.12
Cum Sediment Vol	269.91



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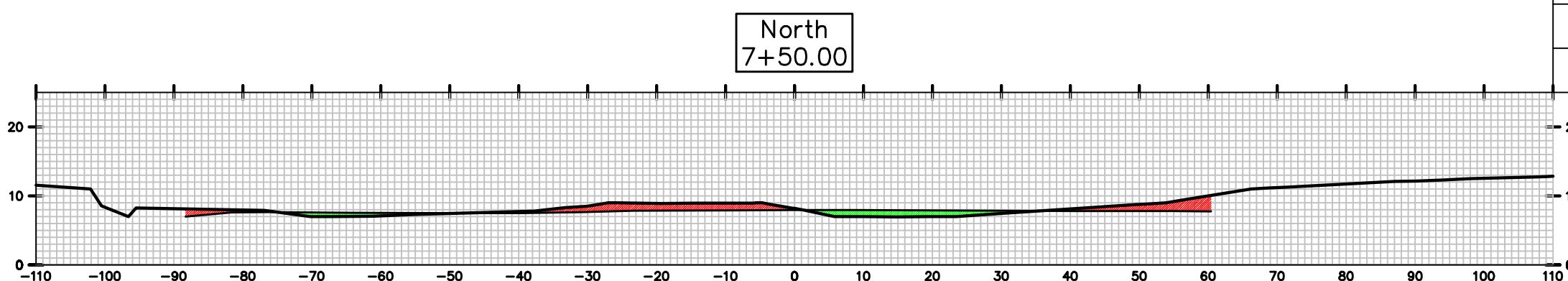


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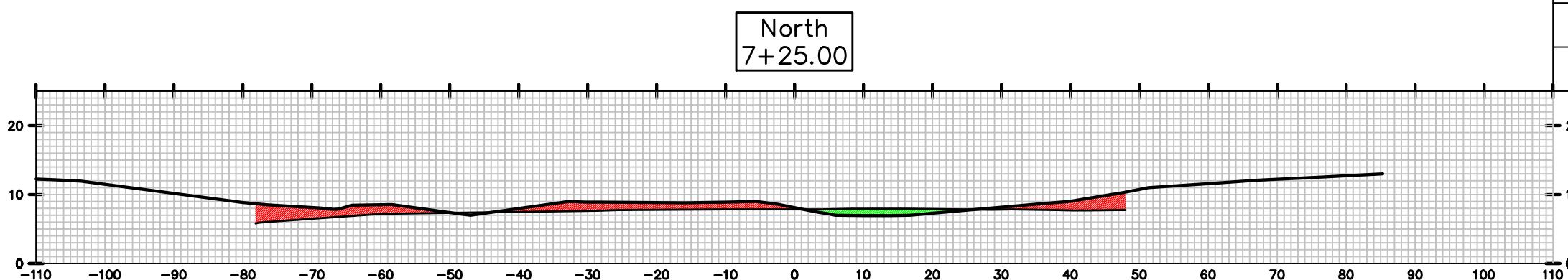
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PROJECT NAME:
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Whitney Pond Section Sheet - (14)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY

Total Volume at Station 7+50.00	
Scour Area	66.61
Sediment Area	33.06
Scour Vol	79.76
Sediment Vol	23.66
Cum Scour Vol	1140.69
Cum Sediment Vol	391.96



Total Volume at Station 7+25.00	
Scour Area	105.68
Sediment Area	18.06
Scour Vol	59.30
Sediment Vol	41.22
Cum Scour Vol	1060.93
Cum Sediment Vol	368.29

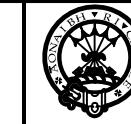


DEPOSIT

SCOUR



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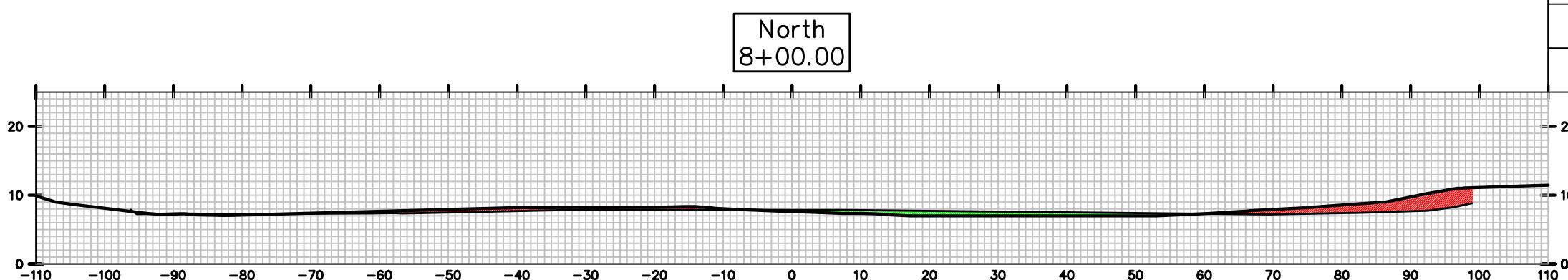


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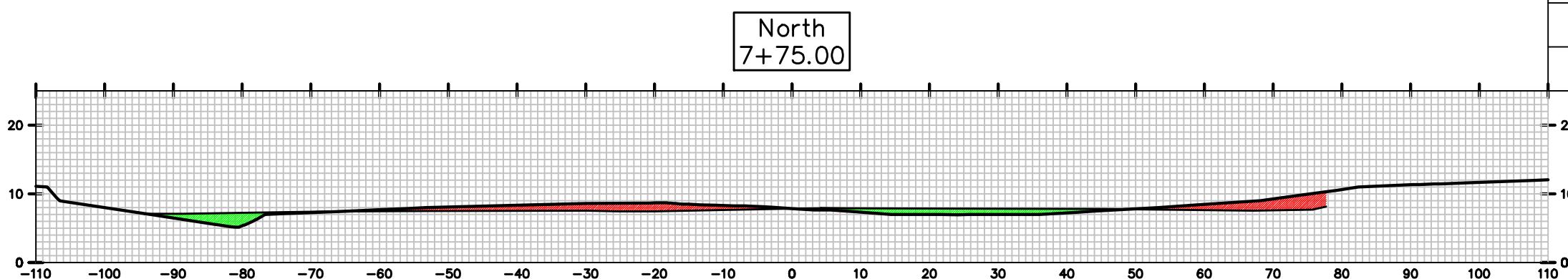
JOB NO:
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PROJECT NAME:
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Whitney Pond Section Sheet - (15)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY

Total Volume at Station 8+00.00	
Scour Area	72.29
Sediment Area	33.73
Scour Vol	70.15
Sediment Vol	39.38
Cum Scour Vol	1278.37
Cum Sediment Vol	470.40



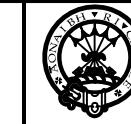
Total Volume at Station 7+75.00	
Scour Area	79.24
Sediment Area	51.33
Scour Vol	67.53
Sediment Vol	39.07
Cum Scour Vol	1208.21
Cum Sediment Vol	431.03



DEPOSIT
 SCOUR



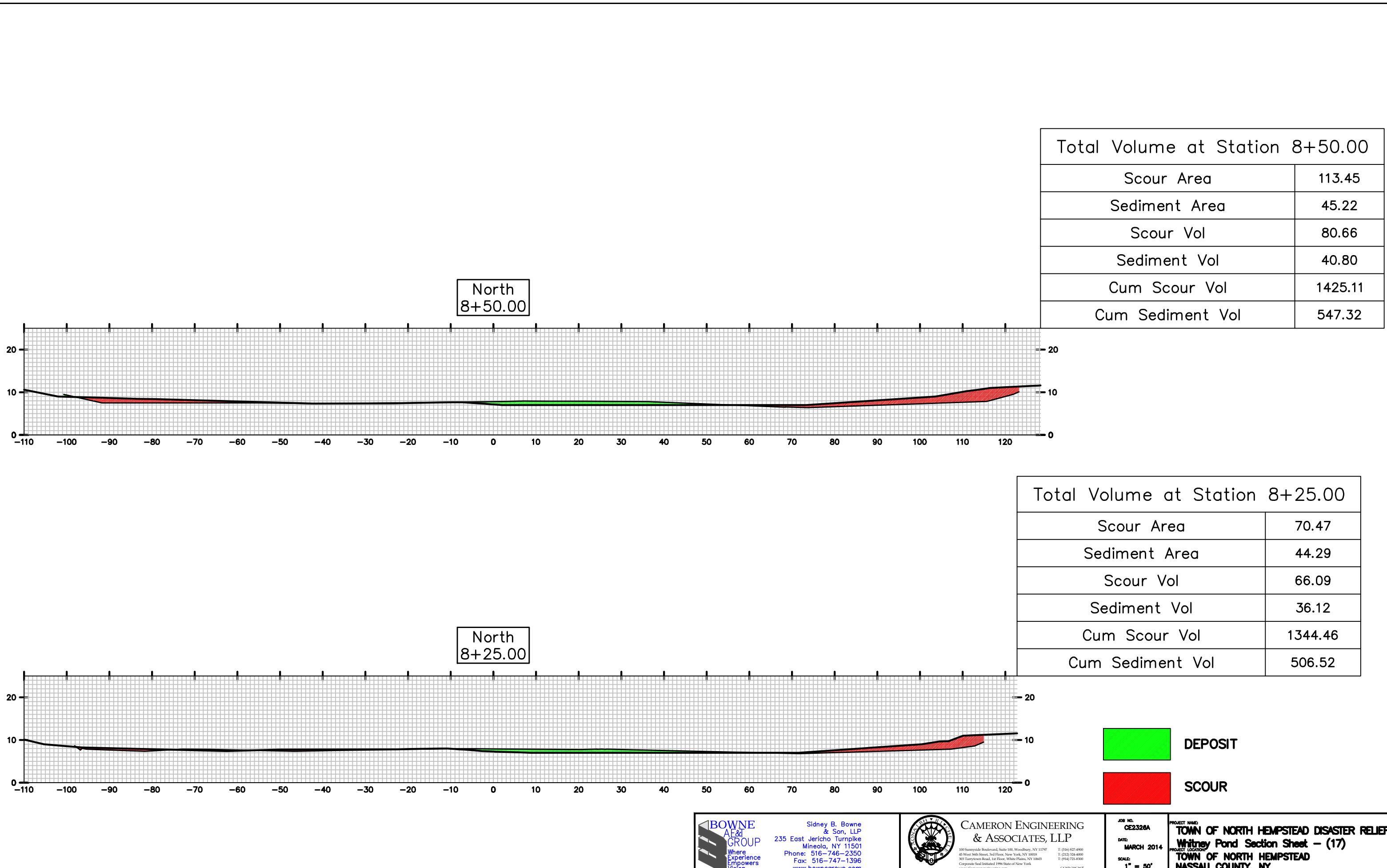
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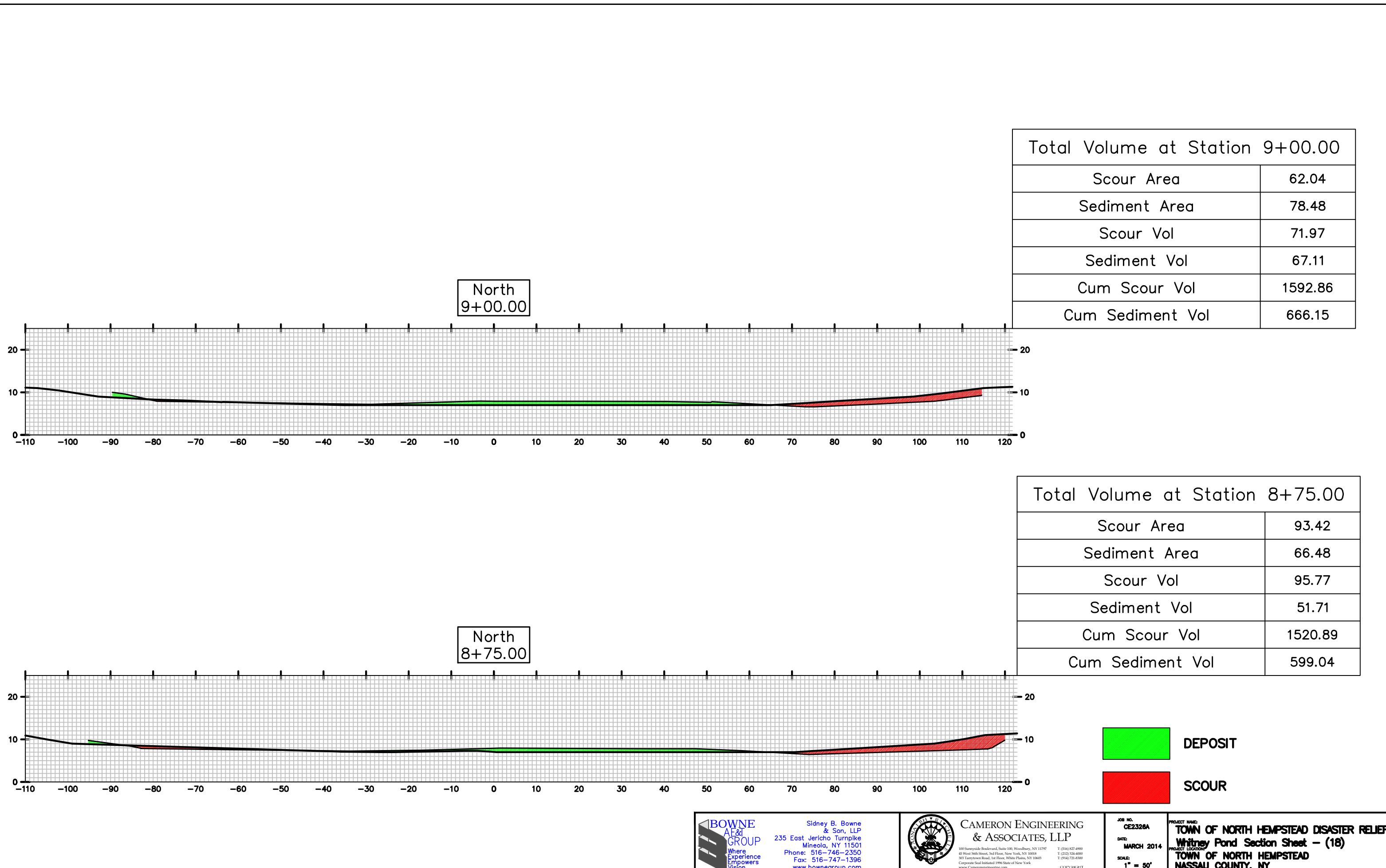


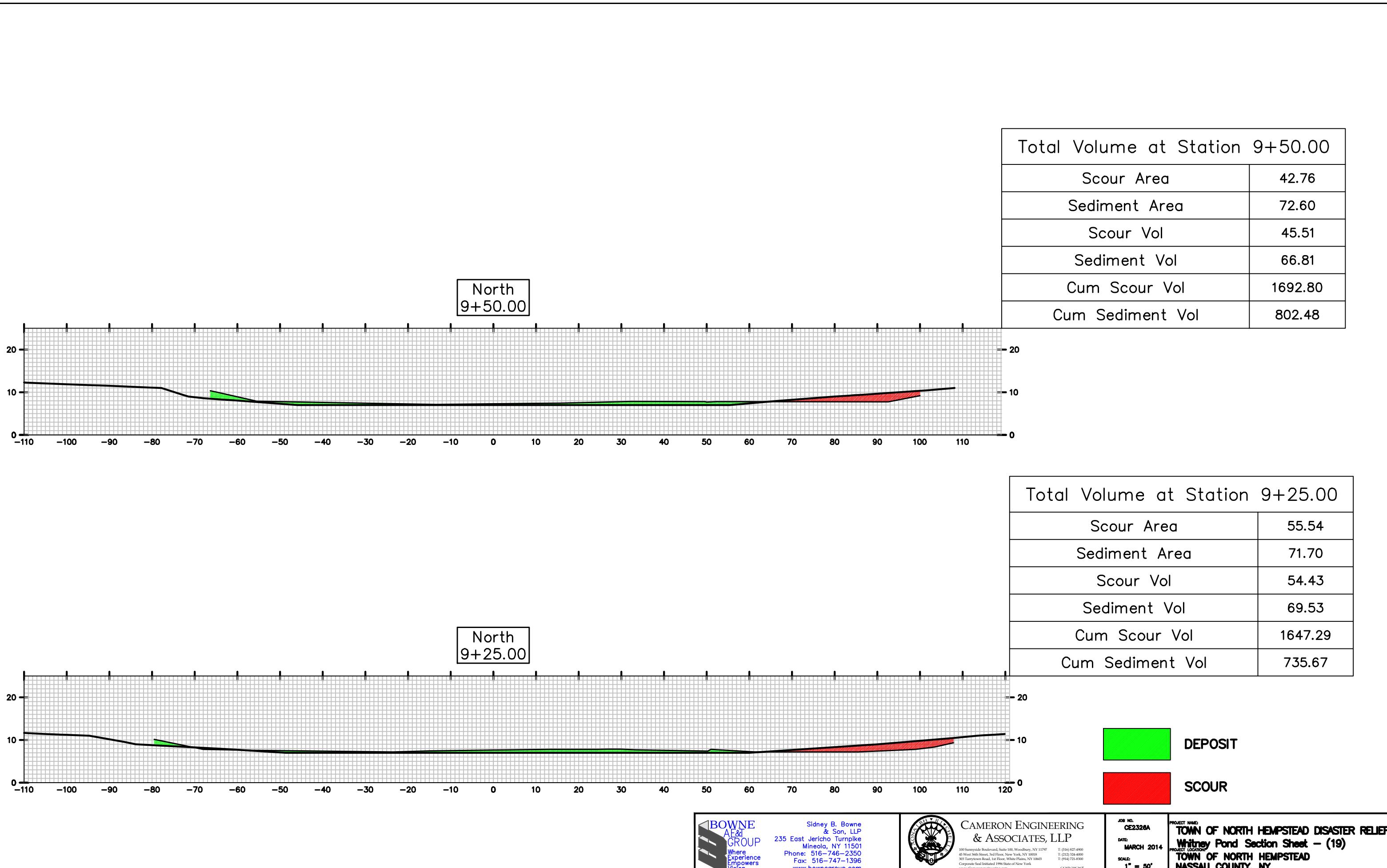
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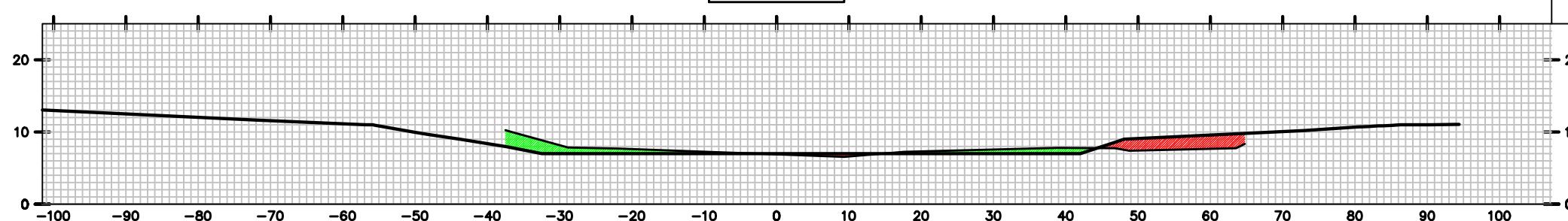
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (16)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
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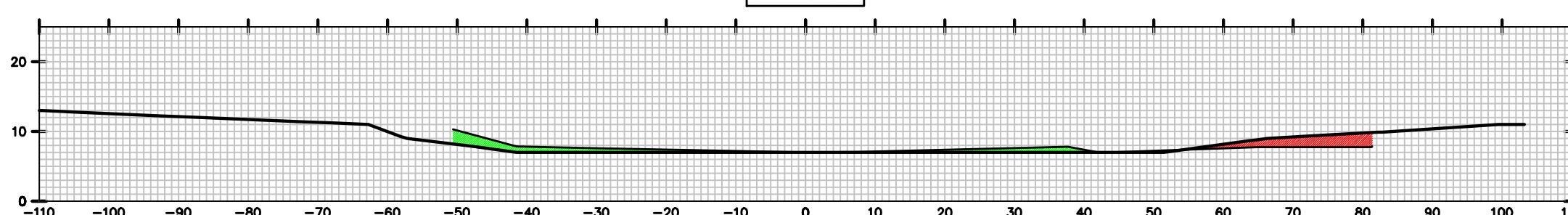


North
10+00.00



Total Volume at Station 10+00.00	
Scour Area	35.91
Sediment Area	42.43
Scour Vol	29.61
Sediment Vol	42.55
Cum Scour Vol	1751.77
Cum Sediment Vol	901.76

North
9+75.00



Total Volume at Station 9+75.00	
Scour Area	32.06
Sediment Area	48.64
Scour Vol	29.36
Sediment Vol	56.73
Cum Scour Vol	1722.16
Cum Sediment Vol	859.20

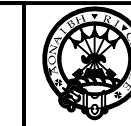
DEPOSIT
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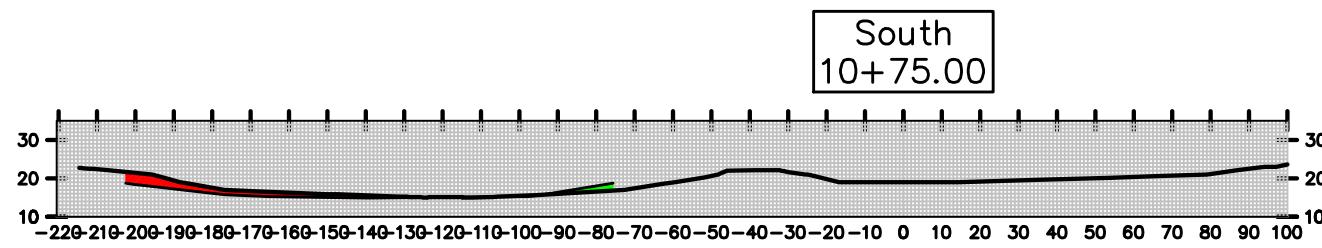
JOB NO.
CE2326A

DATE:
MARCH 2014

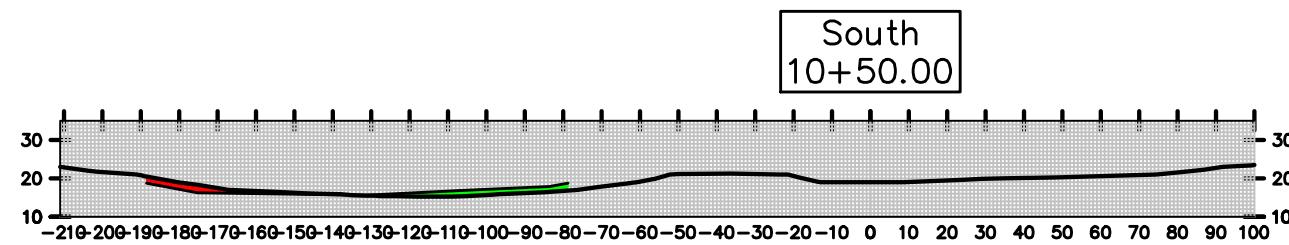
SCALE:
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PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (20)

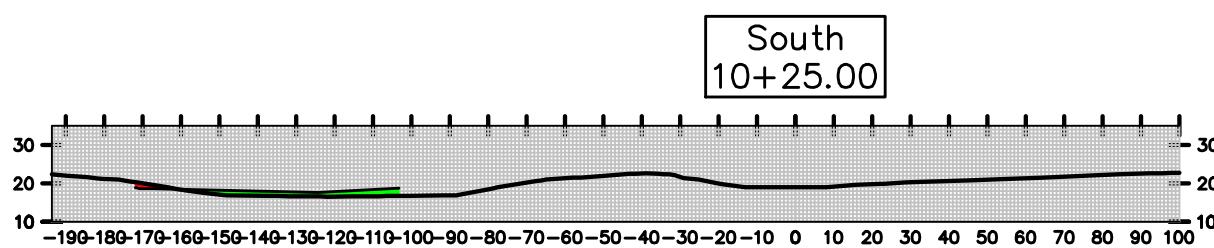
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 10+75.00	
Scour Area	104.47
Sediment Area	18.62
Scour Vol	71.23
Sediment Vol	38.42
Cum Scour Vol	98.54
Cum Sediment Vol	99.72



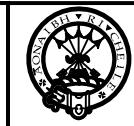
Total Volume at Station 10+50.00	
Scour Area	49.38
Sediment Area	64.36
Scour Vol	27.31
Sediment Vol	61.30
Cum Scour Vol	27.31
Cum Sediment Vol	61.30



Total Volume at Station 10+25.00	
Scour Area	9.62
Sediment Area	68.05
Scour Vol	0.00
Sediment Vol	0.00
Cum Scour Vol	0.00
Cum Sediment Vol	0.00



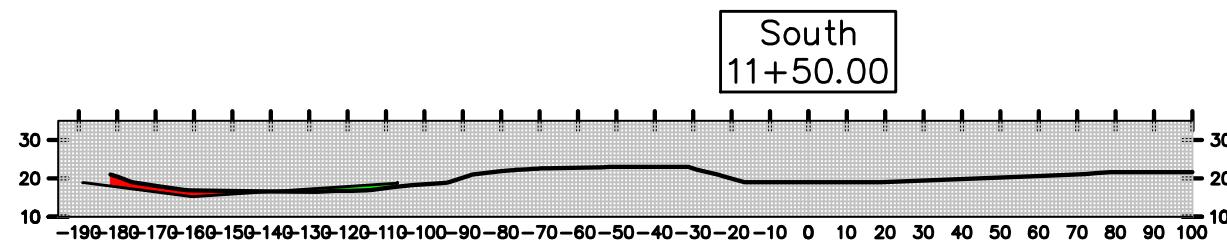
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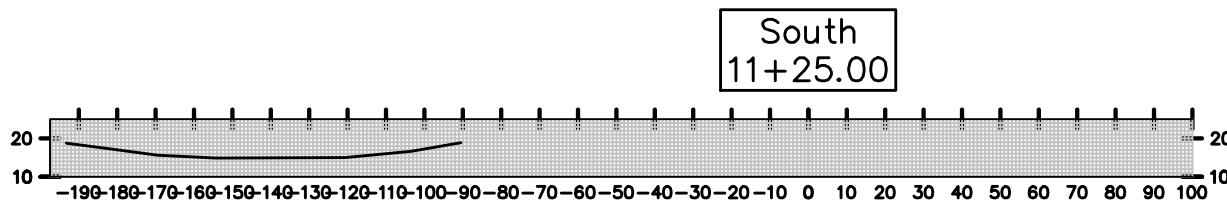
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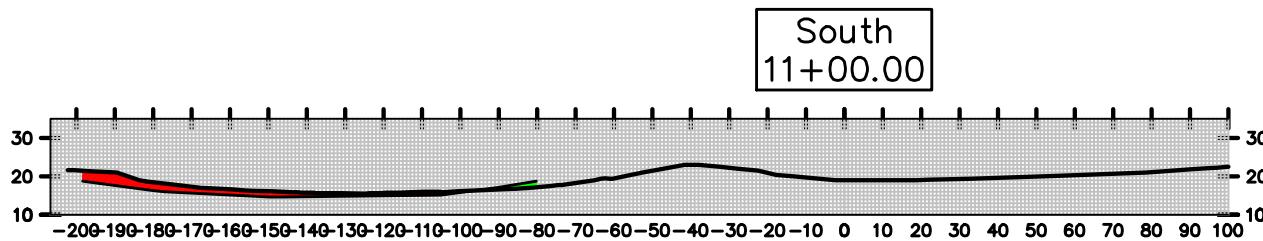
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (24)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 11+50.00	
Scour Area	56.93
Sediment Area	28.25
Scour Vol	26.35
Sediment Vol	13.08
Cum Scour Vol	305.67
Cum Sediment Vol	132.63



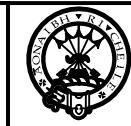
Total Volume at Station 11+25.00	
Scour Area	0.00
Sediment Area	0.00
Scour Vol	66.20
Sediment Vol	5.61
Cum Scour Vol	279.31
Cum Sediment Vol	119.55



Total Volume at Station 11+00.00	
Scour Area	143.00
Sediment Area	12.12
Scour Vol	114.57
Sediment Vol	14.23
Cum Scour Vol	213.11
Cum Sediment Vol	113.94



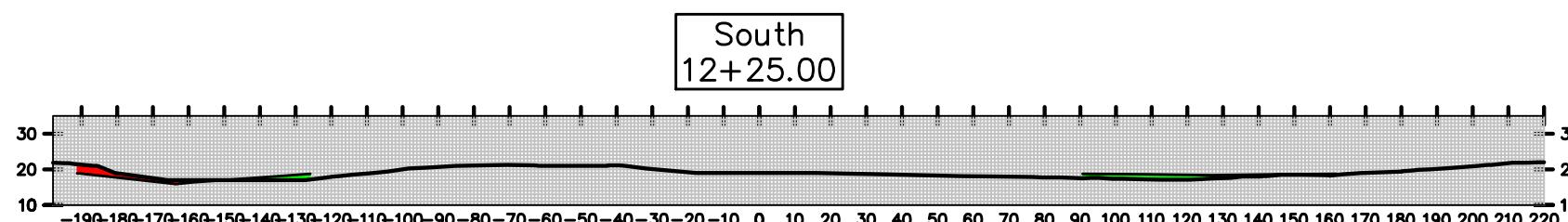
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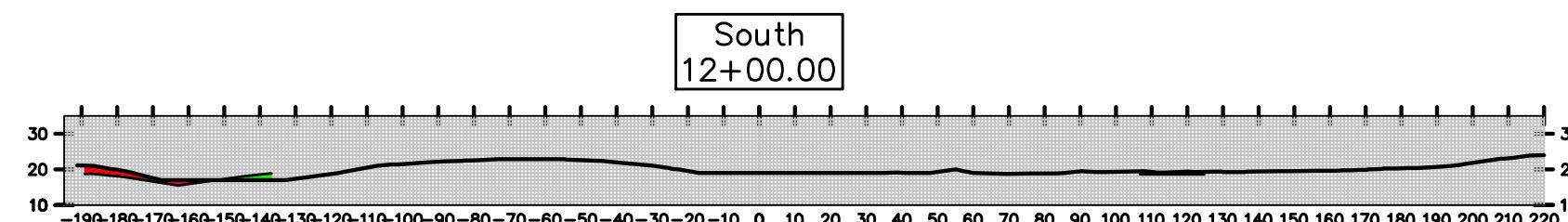
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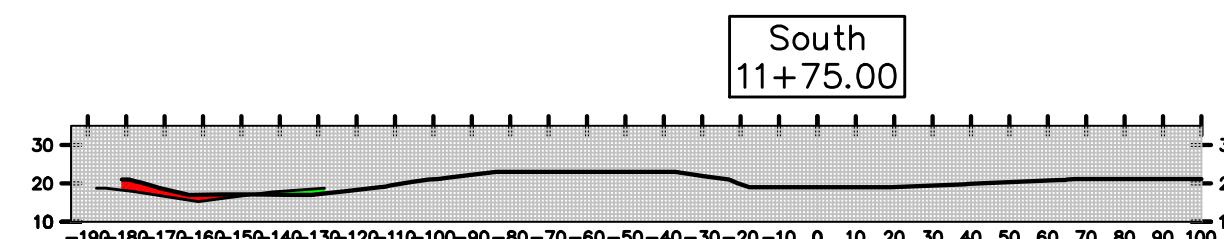
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (25)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 12+25.00	
Scour Area	49.49
Sediment Area	81.29
Scour Vol	49.88
Sediment Vol	45.27
Cum Scour Vol	494.89
Cum Sediment Vol	226.19



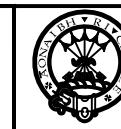
Total Volume at Station 12+00.00	
Scour Area	58.25
Sediment Area	16.50
Scour Vol	87.70
Sediment Vol	26.74
Cum Scour Vol	445.01
Cum Sediment Vol	180.92



Total Volume at Station 11+75.00	
Scour Area	54.62
Sediment Area	18.29
Scour Vol	51.64
Sediment Vol	21.55
Cum Scour Vol	357.31
Cum Sediment Vol	154.18



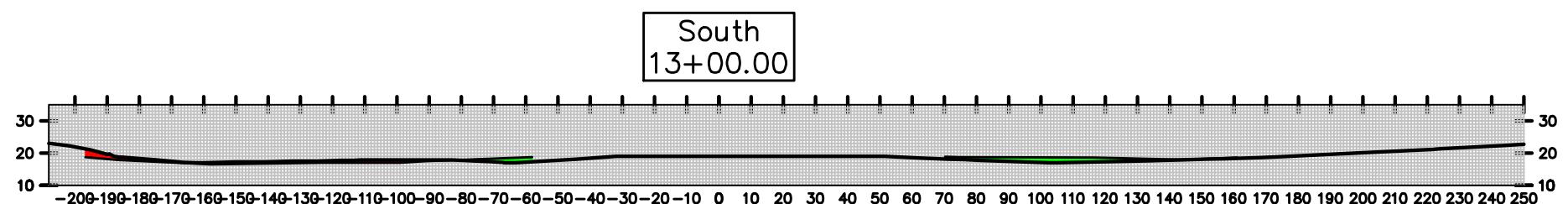
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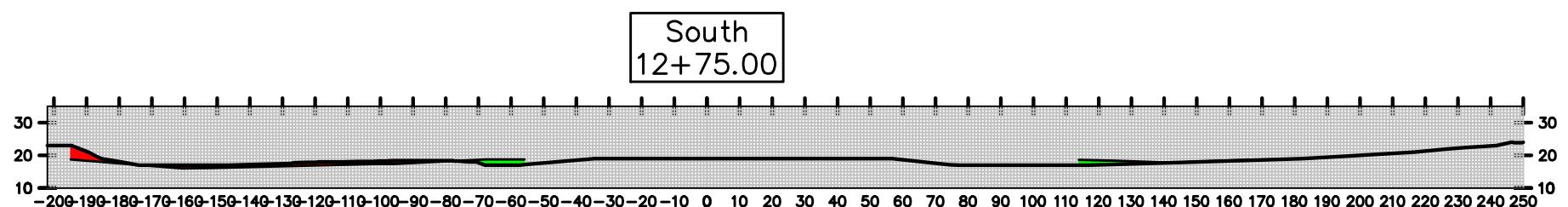
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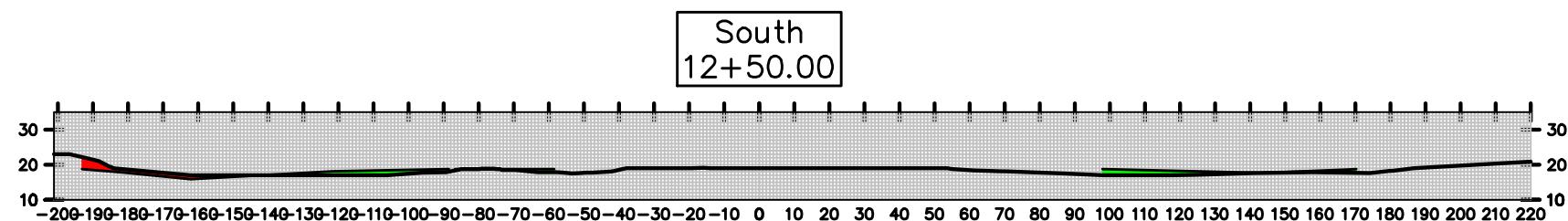
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (26)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 13+00.00	
Scour Area	78.77
Sediment Area	101.96
Scour Vol	85.44
Sediment Vol	73.46
Cum Scour Vol	701.59
Cum Sediment Vol	473.03



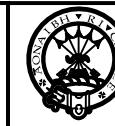
Total Volume at Station 12+75.00	
Scour Area	105.78
Sediment Area	56.71
Scour Vol	73.66
Sediment Vol	81.00
Cum Scour Vol	616.16
Cum Sediment Vol	399.57



Total Volume at Station 12+50.00	
Scour Area	53.34
Sediment Area	118.25
Scour Vol	47.61
Sediment Vol	92.38
Cum Scour Vol	542.49
Cum Sediment Vol	318.57

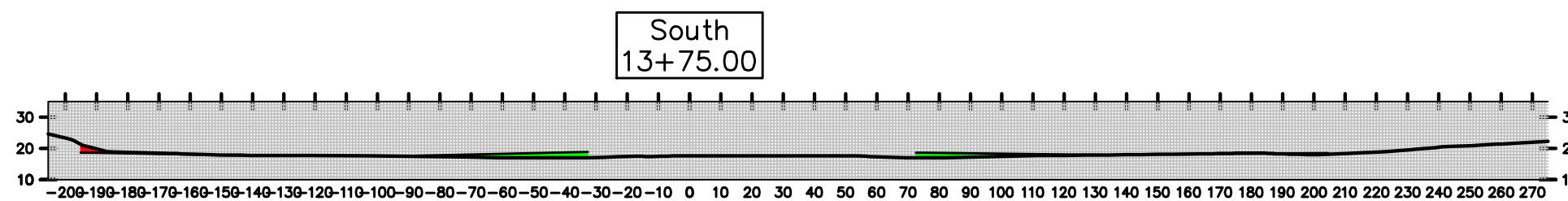


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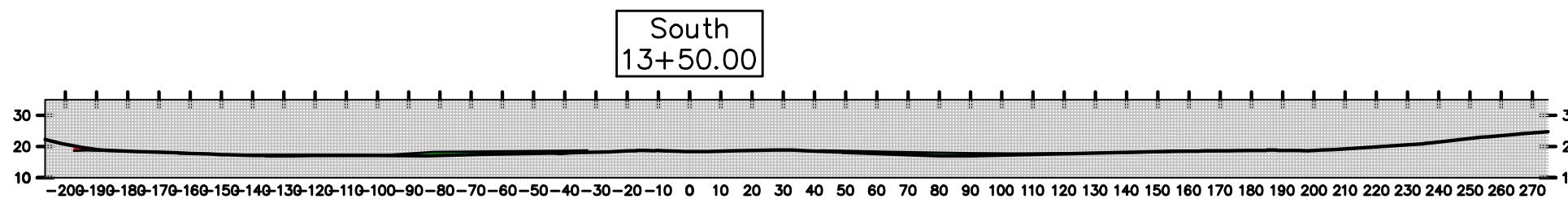


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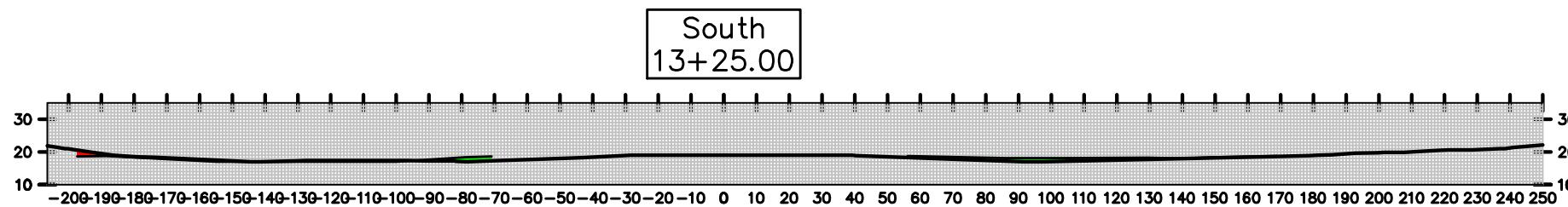
JOB NO.: CE2326A
DATE: MARCH 2014
SCALE: 1" = 50'
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
Whitney Pond Section Sheet - (27)
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



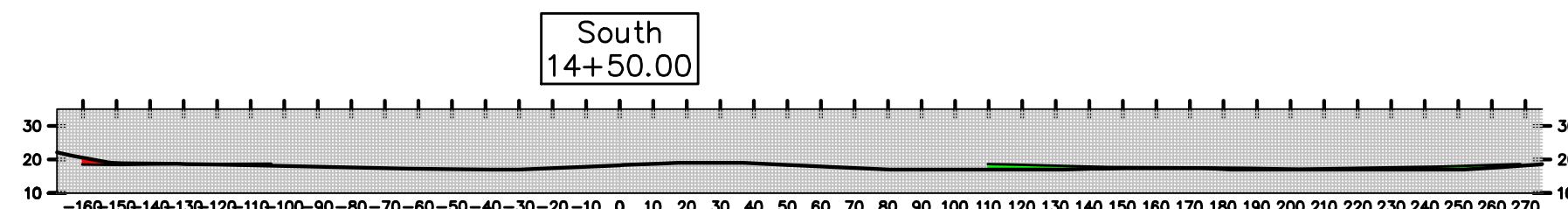
Total Volume at Station 13+75.00	
Scour Area	30.41
Sediment Area	123.86
Scour Vol	20.43
Sediment Vol	111.87
Cum Scour Vol	799.60
Cum Sediment Vol	769.18



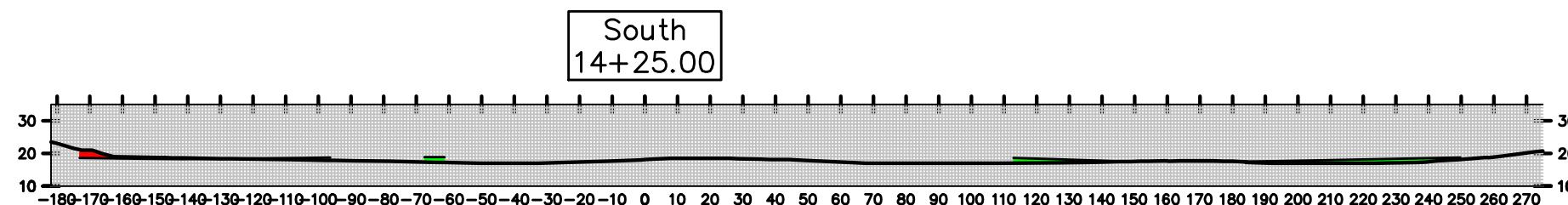
Total Volume at Station 13+50.00	
Scour Area	13.72
Sediment Area	117.78
Scour Vol	23.73
Sediment Vol	95.80
Cum Scour Vol	779.16
Cum Sediment Vol	657.31



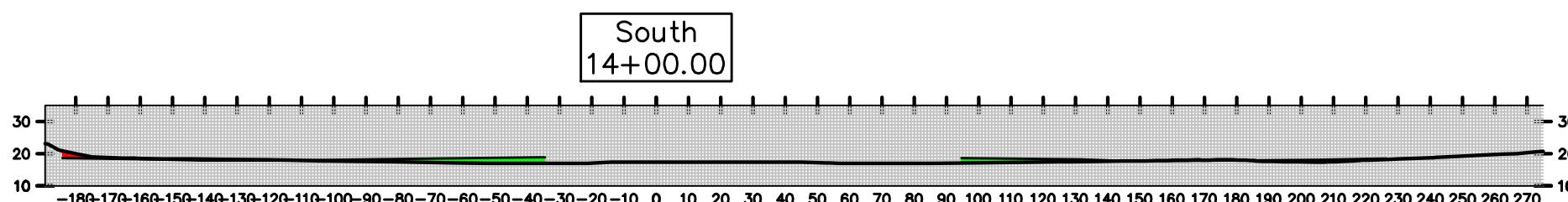
Total Volume at Station 13+25.00	
Scour Area	37.53
Sediment Area	89.15
Scour Vol	53.84
Sediment Vol	88.48
Cum Scour Vol	755.44
Cum Sediment Vol	561.51



Total Volume at Station 14+50.00	
Scour Area	17.71
Sediment Area	117.63
Scour Vol	24.27
Sediment Vol	107.80
Cum Scour Vol	887.47
Cum Sediment Vol	1129.25

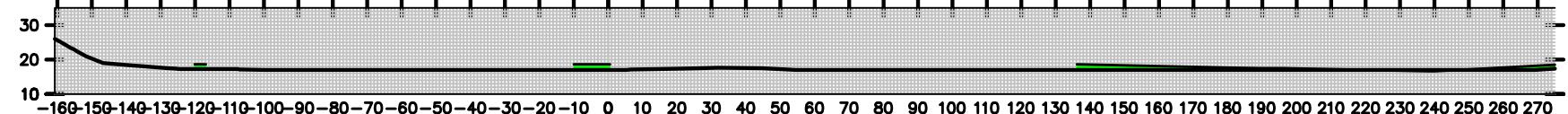


Total Volume at Station 14+25.00	
Scour Area	34.71
Sediment Area	115.22
Scour Vol	32.80
Sediment Vol	124.13
Cum Scour Vol	863.20
Cum Sediment Vol	1021.45



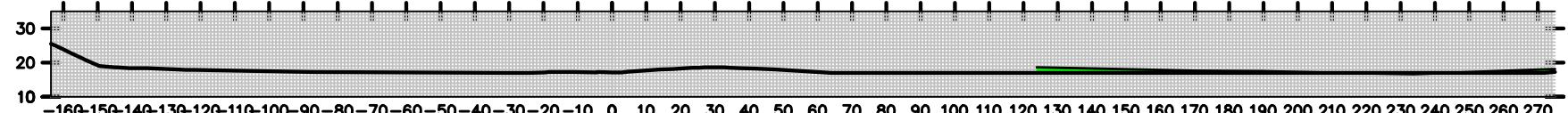
Total Volume at Station 14+00.00	
Scour Area	36.14
Sediment Area	152.91
Scour Vol	30.81
Sediment Vol	128.14
Cum Scour Vol	830.40
Cum Sediment Vol	897.32

South
15+25.00



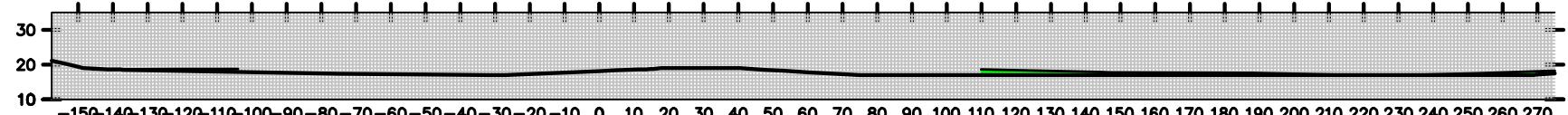
Total Volume at Station 15+25.00	
Scour Area	4.57
Sediment Area	111.28
Scour Vol	3.82
Sediment Vol	93.86
Cum Scour Vol	902.67
Cum Sediment Vol	1435.59

South
15+00.00



Total Volume at Station 15+00.00	
Scour Area	3.68
Sediment Area	91.46
Scour Vol	2.44
Sediment Vol	100.18
Cum Scour Vol	898.85
Cum Sediment Vol	1341.72

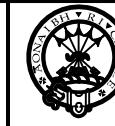
South
14+75.00



Total Volume at Station 14+75.00	
Scour Area	1.59
Sediment Area	124.92
Scour Vol	8.94
Sediment Vol	112.29
Cum Scour Vol	896.41
Cum Sediment Vol	1241.55



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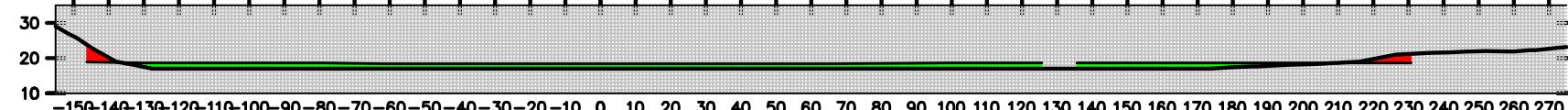


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JOB NO.
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DATE
MARCH 2014
SCALE:
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PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (30)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY

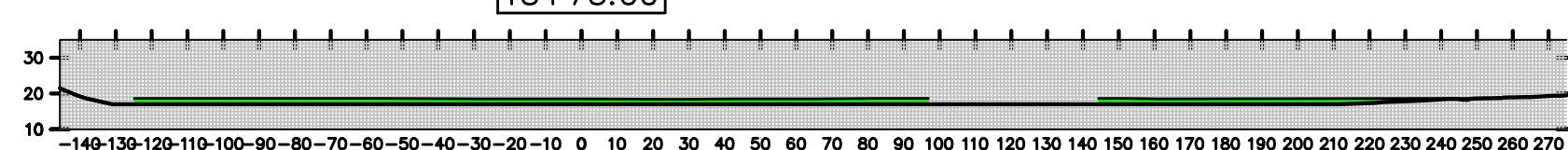
South
16+00.00



Total Volume at Station 16+00.00

Scour Area	46.28
Sediment Area	480.36
Scour Vol	21.43
Sediment Vol	446.18
Cum Scour Vol	926.21
Cum Sediment Vol	2631.94

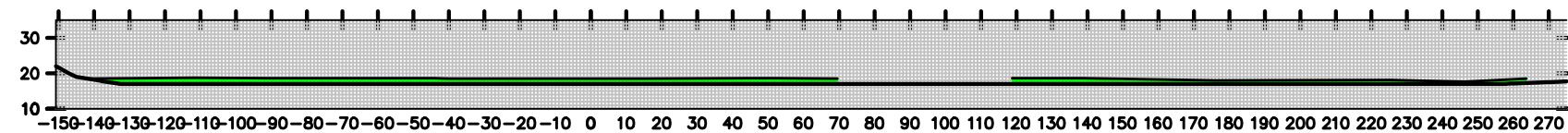
South
15+75.00



Total Volume at Station 15+75.00

Scour Area	0.00
Sediment Area	483.39
Scour Vol	0.00
Sediment Vol	461.23
Cum Scour Vol	904.78
Cum Sediment Vol	2185.76

South
15+50.00



Total Volume at Station 15+50.00

Scour Area	0.00
Sediment Area	512.86
Scour Vol	2.11
Sediment Vol	288.95
Cum Scour Vol	904.78
Cum Sediment Vol	1724.54



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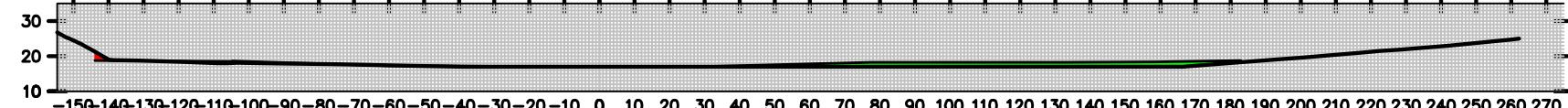


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PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (31)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY

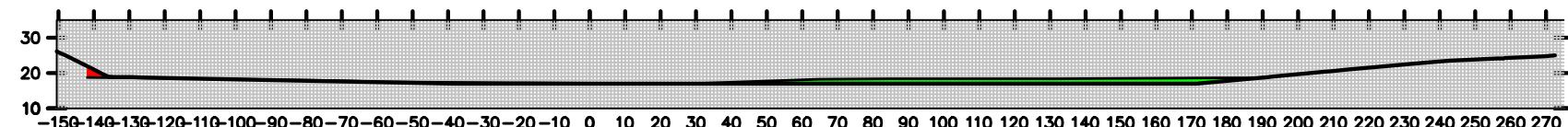
South
16+75.00



Total Volume at Station 16+75.00

Scour Area	8.24
Sediment Area	187.23
Scour Vol	10.02
Sediment Vol	186.78
Cum Scour Vol	1007.58
Cum Sediment Vol	3494.14

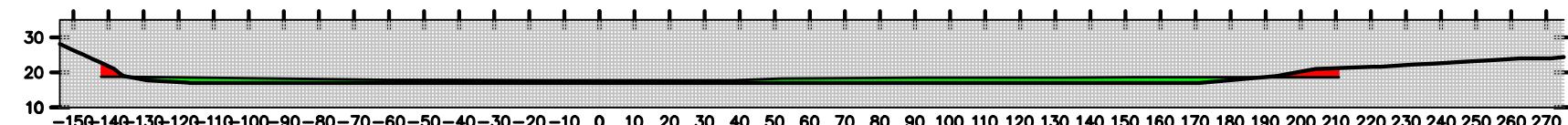
South
16+50.00



Total Volume at Station 16+50.00

Scour Area	13.40
Sediment Area	216.21
Scour Vol	28.06
Sediment Vol	276.56
Cum Scour Vol	997.56
Cum Sediment Vol	3307.36

South
16+25.00



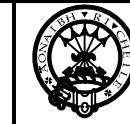
Total Volume at Station 16+25.00

Scour Area	47.22
Sediment Area	381.17
Scour Vol	43.29
Sediment Vol	398.85
Cum Scour Vol	969.50
Cum Sediment Vol	3030.80



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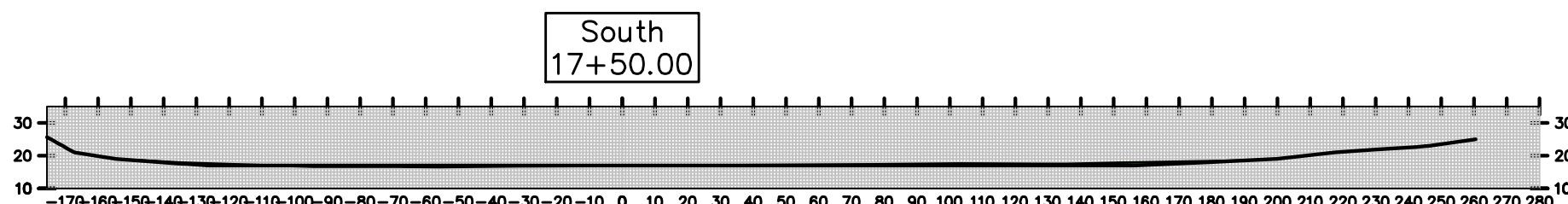
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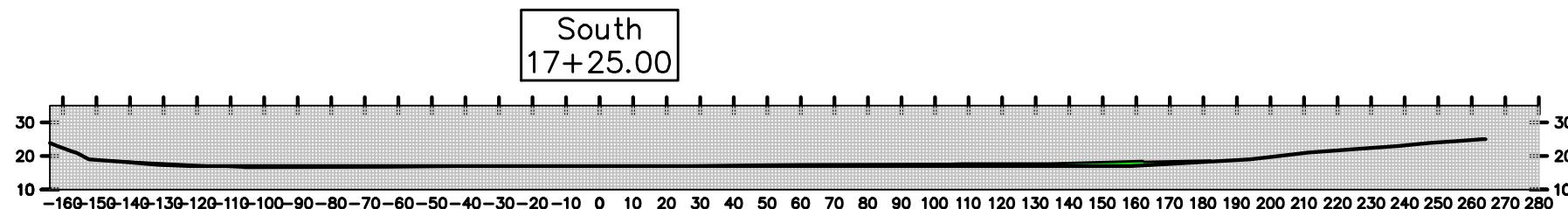
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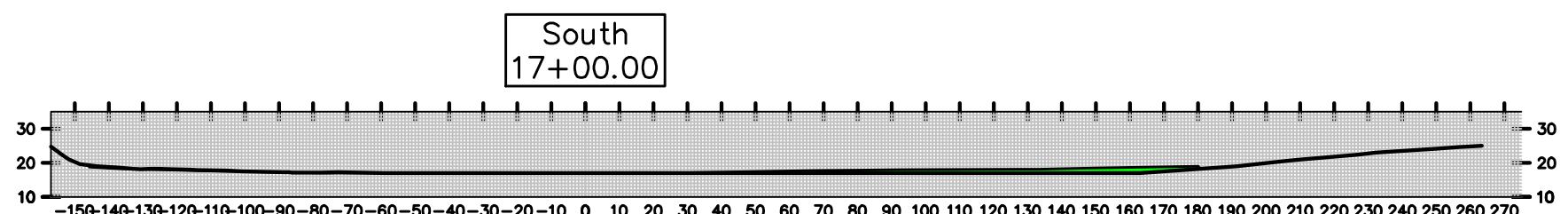
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (32)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 17+50.00	
Scour Area	30.68
Sediment Area	94.90
Scour Vol	27.36
Sediment Vol	97.43
Cum Scour Vol	1066.38
Cum Sediment Vol	3872.14



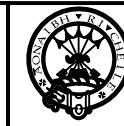
Total Volume at Station 17+25.00	
Scour Area	28.42
Sediment Area	115.55
Scour Vol	20.39
Sediment Vol	123.70
Cum Scour Vol	1039.02
Cum Sediment Vol	3774.71



Total Volume at Station 17+00.00	
Scour Area	15.63
Sediment Area	151.63
Scour Vol	11.05
Sediment Vol	156.88
Cum Scour Vol	1018.63
Cum Sediment Vol	3651.02



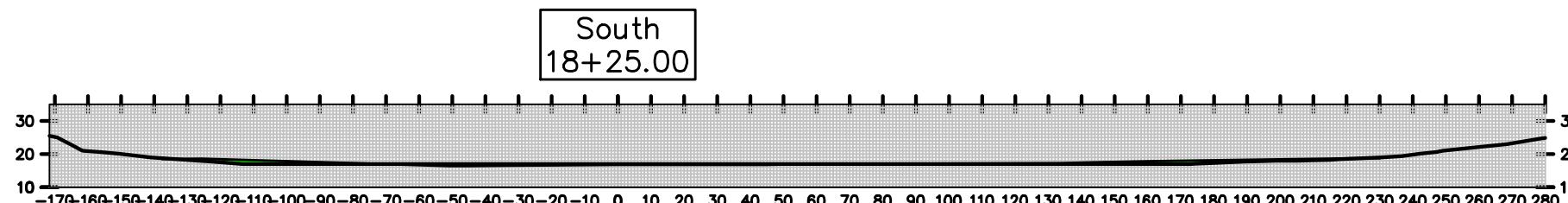
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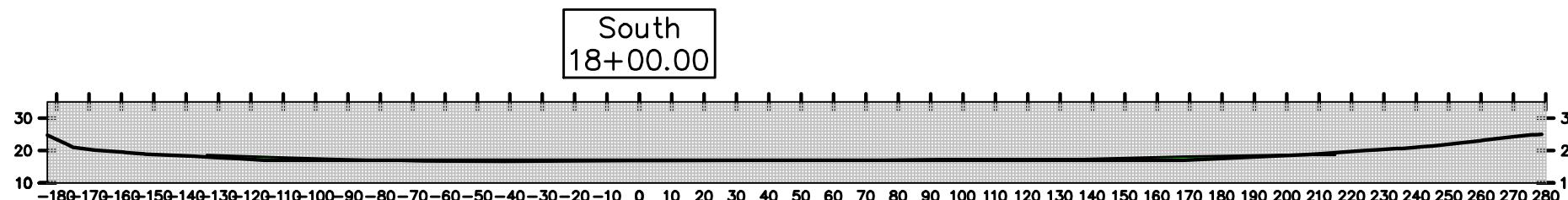
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SCALE:
1" = 50'

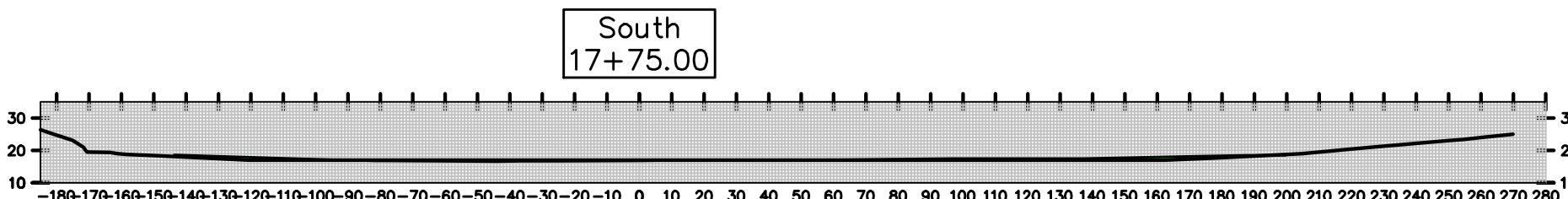
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (33)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 18+25.00	
Scour Area	43.00
Sediment Area	111.34
Scour Vol	38.45
Sediment Vol	99.30
Cum Scour Vol	1164.41
Cum Sediment Vol	4165.09



Total Volume at Station 18+00.00	
Scour Area	40.04
Sediment Area	103.15
Scour Vol	31.96
Sediment Vol	98.73
Cum Scour Vol	1125.96
Cum Sediment Vol	4065.79



Total Volume at Station 17+75.00	
Scour Area	28.99
Sediment Area	110.11
Scour Vol	27.62
Sediment Vol	94.91
Cum Scour Vol	1094.00
Cum Sediment Vol	3967.06



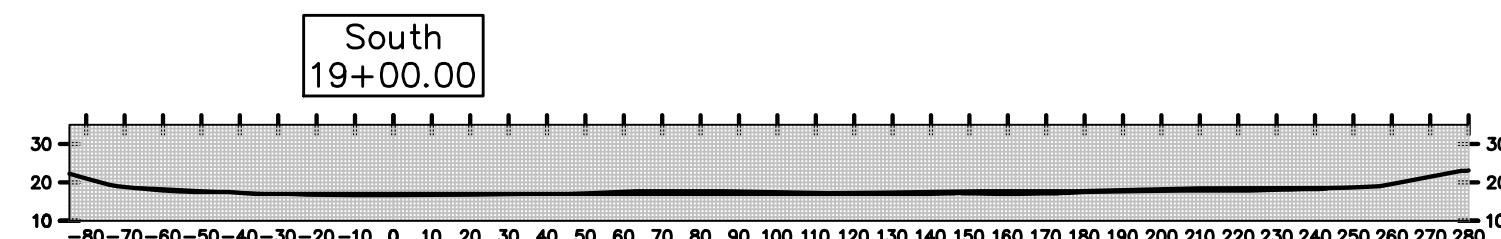
Sidney B. Bowne
& Son, LLP
235 East Jericho Turnpike
Mineola, NY 11501
Phone: 516-746-2350
Fax: 516-747-1396
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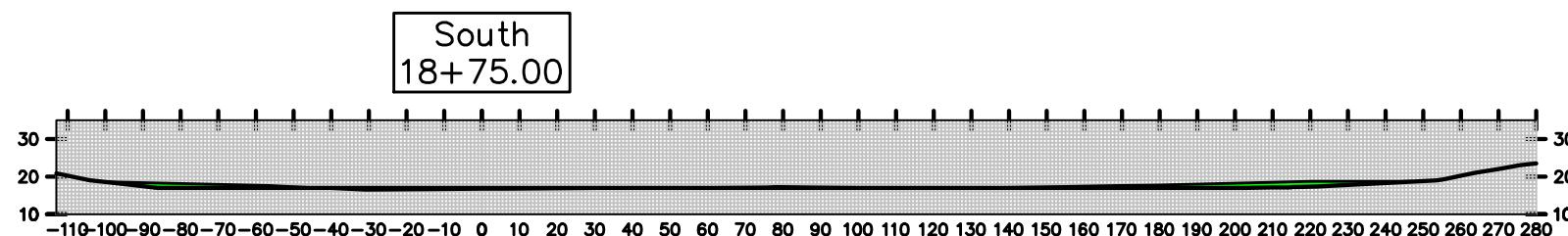
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420 West 36th Street, 1st Floor, New York, NY 10018
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JOB NO.
CE2326A
DATE:
MARCH 2014
SCALE:
1" = 50'

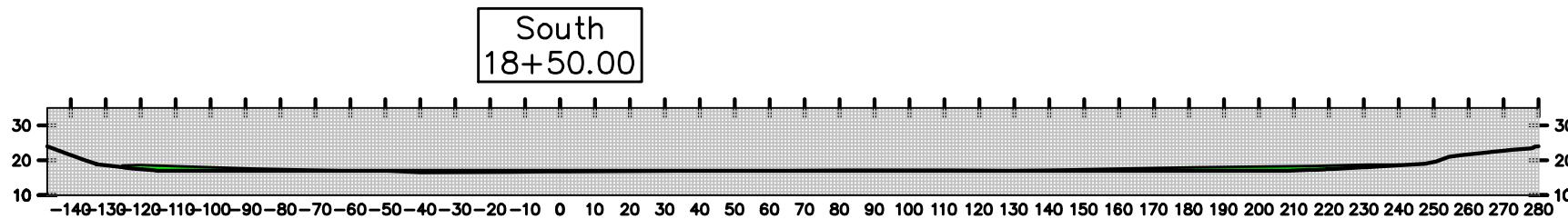
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (34)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 19+00.00	
Scour Area	24.56
Sediment Area	146.44
Scour Vol	24.00
Sediment Vol	137.54
Cum Scour Vol	1250.59
Cum Sediment Vol	4572.27



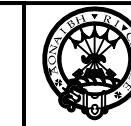
Total Volume at Station 18+75.00	
Scour Area	27.28
Sediment Area	150.64
Scour Vol	27.45
Sediment Vol	143.92
Cum Scour Vol	1226.59
Cum Sediment Vol	4434.73



Total Volume at Station 18+50.00	
Scour Area	32.01
Sediment Area	160.23
Scour Vol	34.73
Sediment Vol	125.72
Cum Scour Vol	1199.14
Cum Sediment Vol	4290.81



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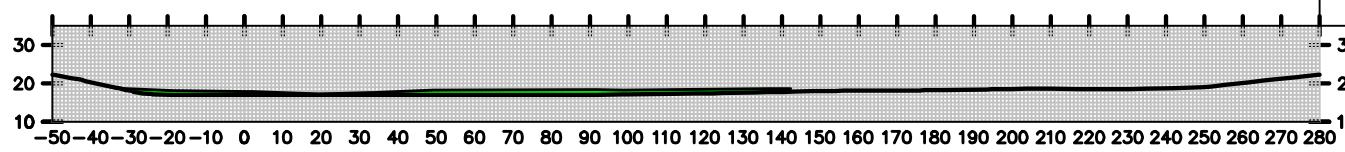


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JOB NO:
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DATE:
MARCH 2014
SCALE:
1" = 50'

PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (35)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY

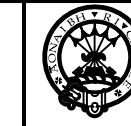
South
19+25.00



Total Volume at Station 19+25.00	
Scour Area	0.06
Sediment Area	175.70
Scour Vol	11.40
Sediment Vol	149.14
Cum Scour Vol	1261.99
Cum Sediment Vol	4721.41



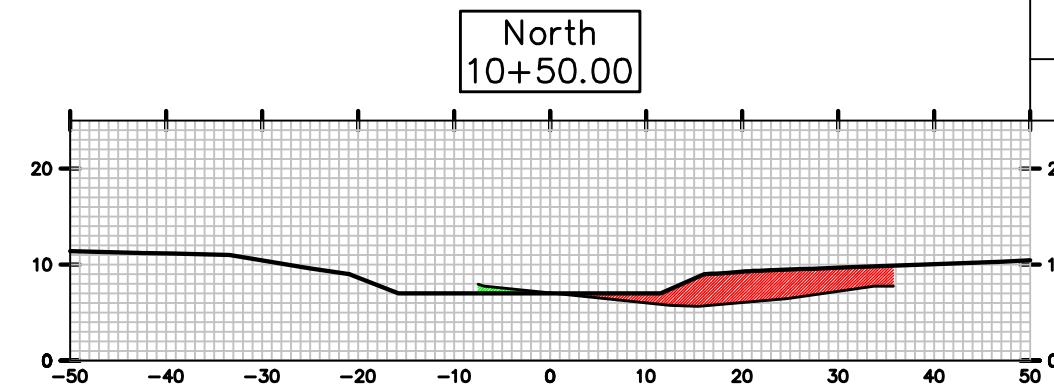
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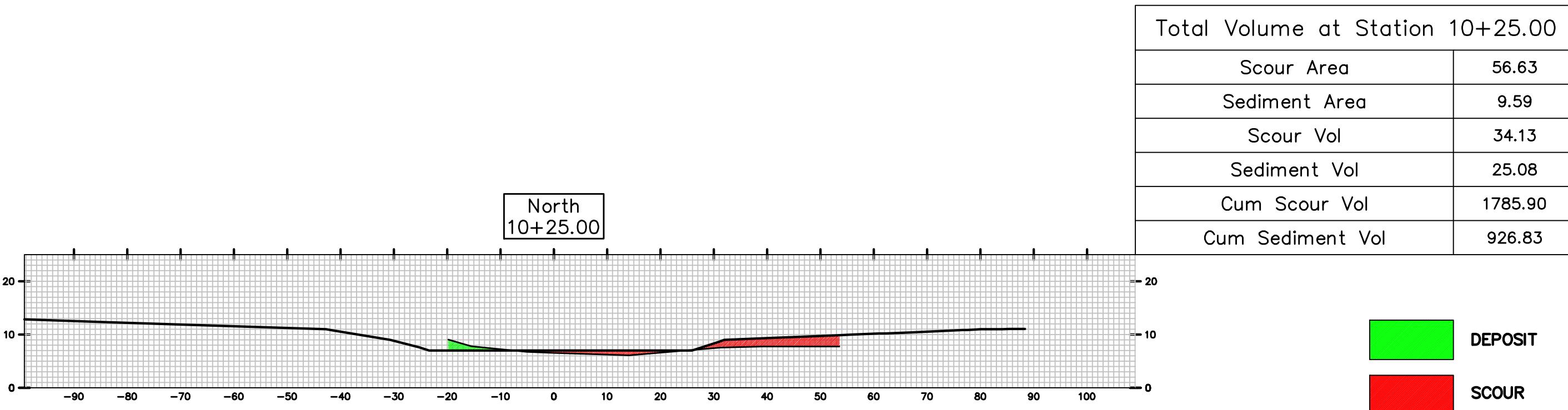
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JOB NO.: CE2326A
DATE: MARCH 2014
SCALE: 1" = 50'
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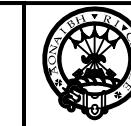
PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (36)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



Total Volume at Station 10+50.00	
Scour Area	71.63
Sediment Area	3.37
Scour Vol	50.52
Sediment Vol	6.43
Cum Scour Vol	1836.41
Cum Sediment Vol	933.26



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JOB NO:
CE2326A
DATE:
MARCH 2014
SCALE:
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PROJECT NAME:
TOWN OF NORTH HEMPSTEAD DISASTER RELIEF
Whitney Pond Section Sheet - (21)
PROJECT LOCATION:
TOWN OF NORTH HEMPSTEAD
NASSAU COUNTY, NY



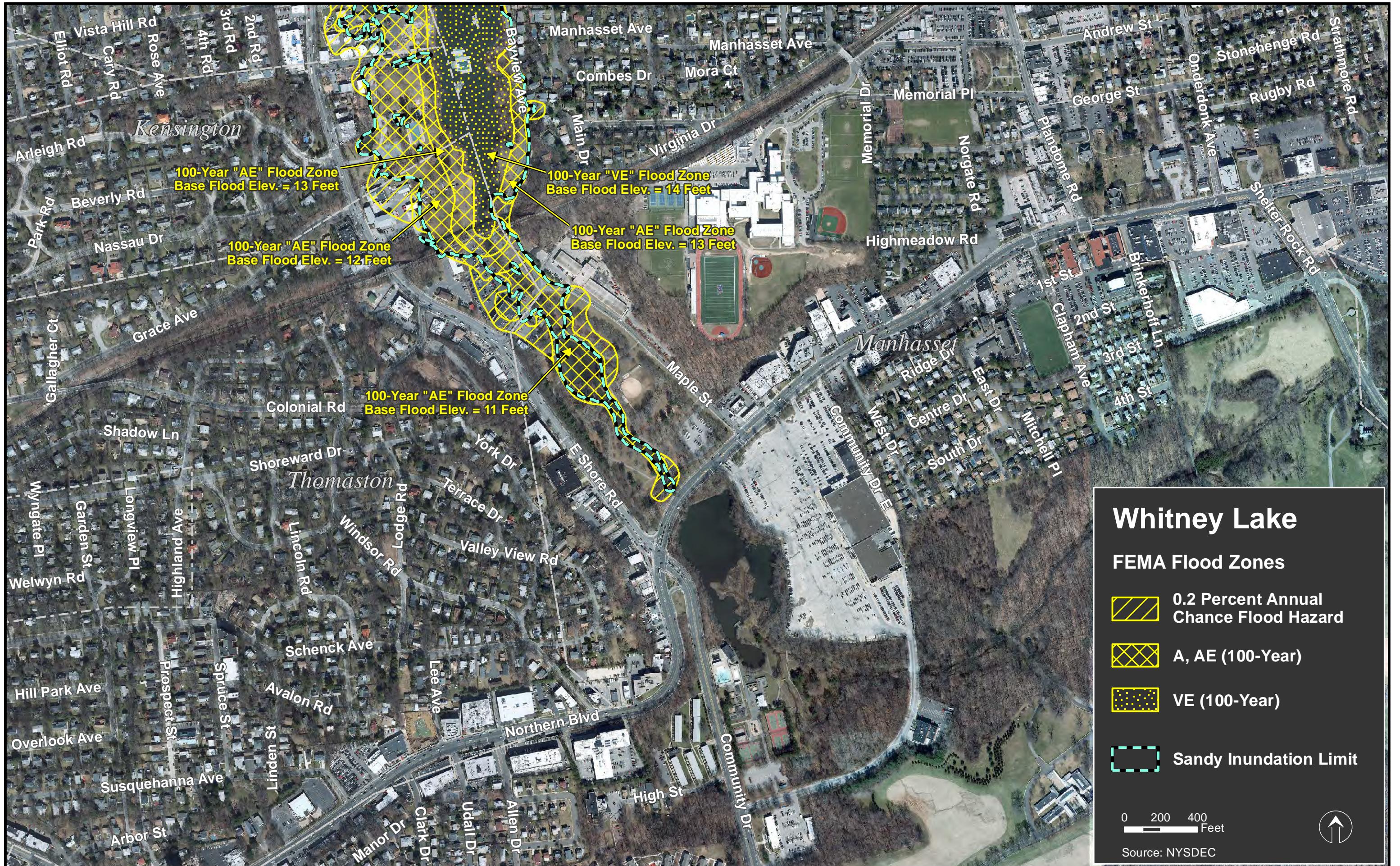
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**TOWN OF NORTH HEMPSTEAD
WHITNEY LAKE/MANHASSET VALLEY POND, MANHASSET, NY
HURRICANE SANDY AQUATIC SAND REMOVAL**

April 2014

APPENDIX C

Hurricane Sandy Flood Inundation Map (FEMA Flood Zones)





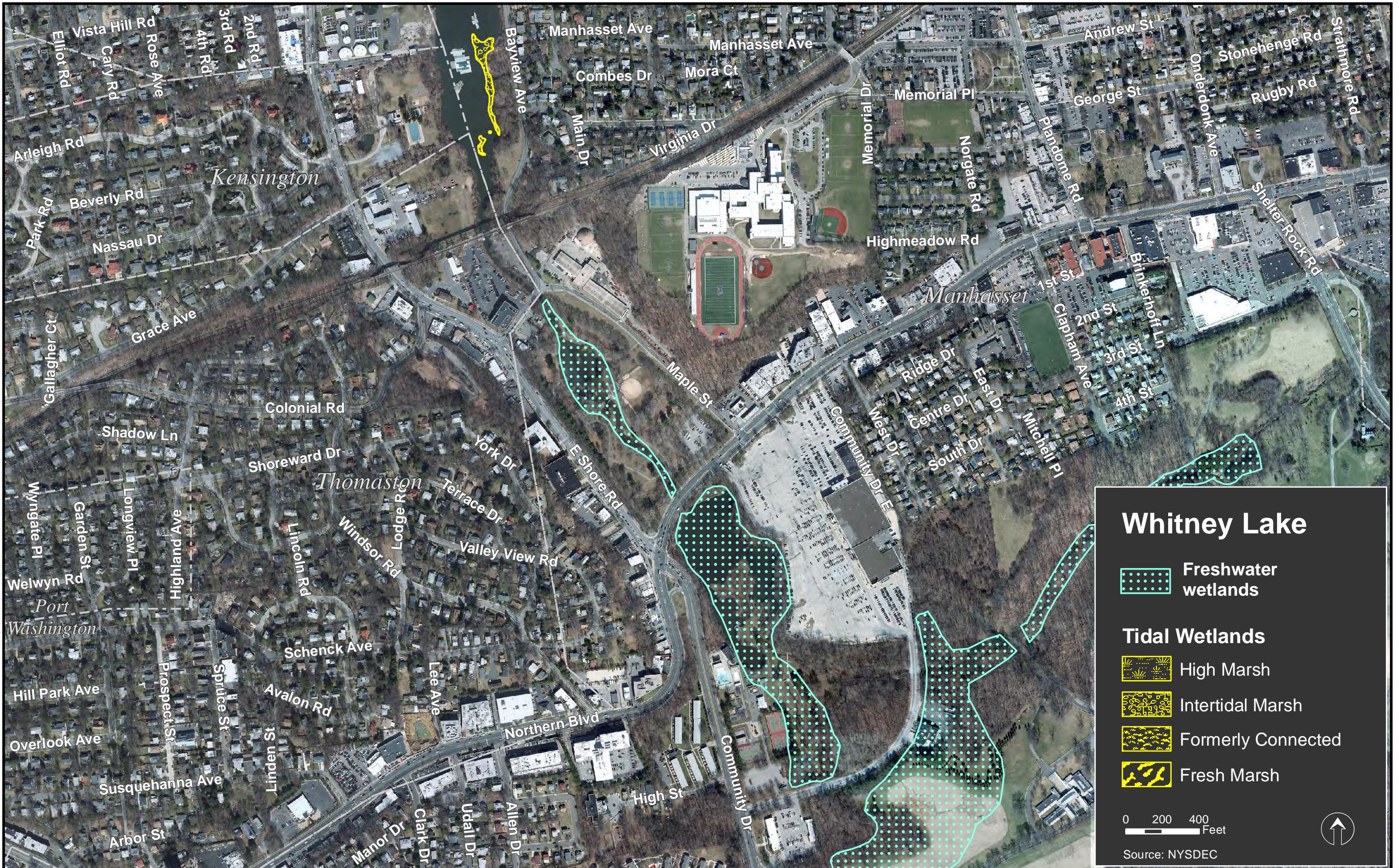
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**TOWN OF NORTH HEMPSTEAD
WHITNEY LAKE/MANHASSET VALLEY POND, MANHASSET, NY
HURRICANE SANDY AQUATIC SAND REMOVAL**

April 2014

APPENDIX D

Map of Protected Natural Areas





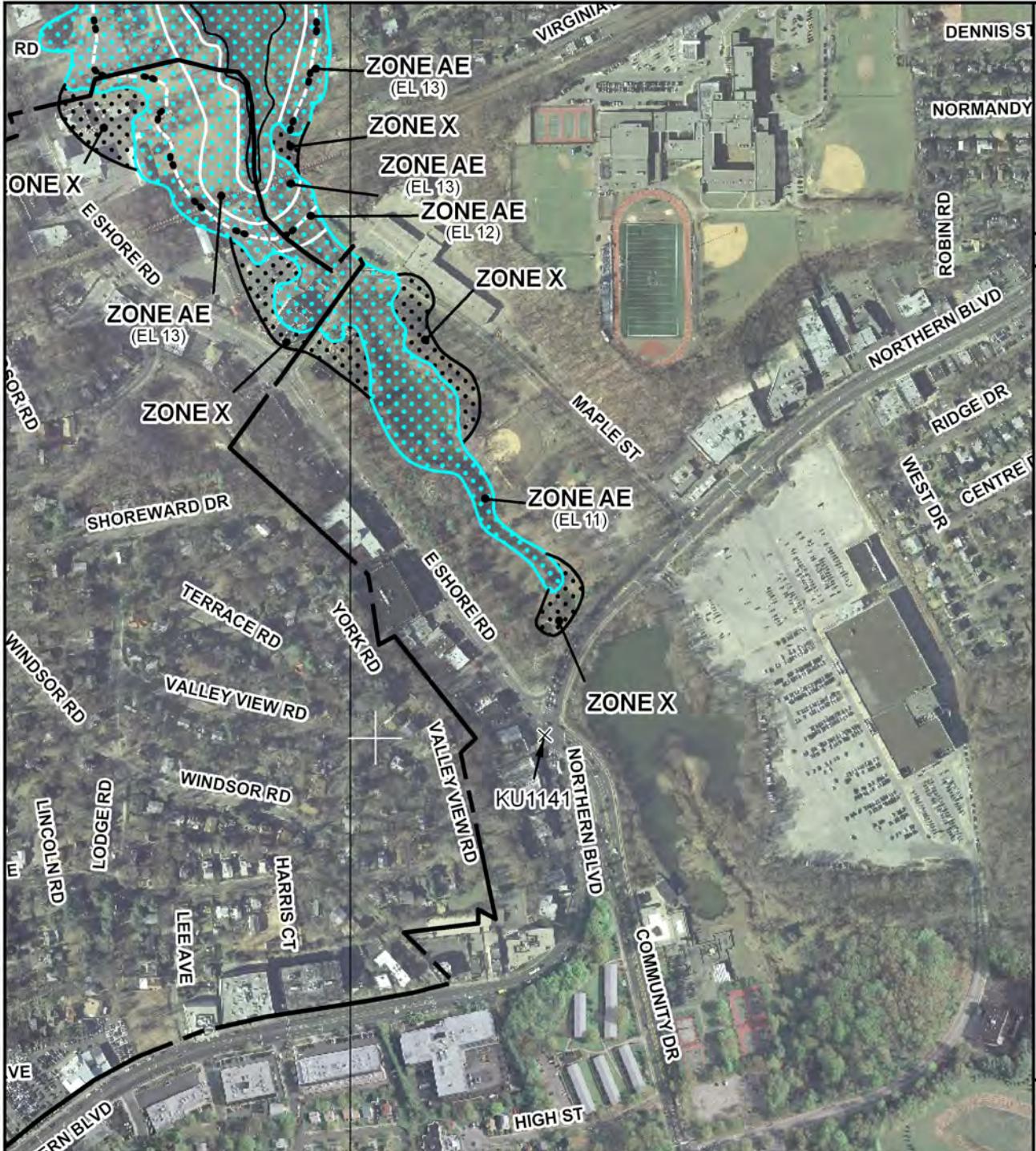
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HURRICANE SANDY AQUATIC SAND REMOVAL**

April 2014

EXHIBIT E

FEMA Flood Zones



MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 M

LEGEND



SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A No Base Flood Elevations determined.
- ZONE AE Base Flood Elevations determined.
- ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.



FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.



OTHER FLOOD AREAS

Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.



OTHER AREAS

Areas determined to be outside the 0.2% annual chance floodplain.
Areas in which flood hazards are undetermined, but possible.



COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS



OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msfc.fema.gov



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**TOWN OF NORTH HEMPSTEAD
WHITNEY LAKE/MANHASSET VALLEY POND, MANHASSET, NY
HURRICANE SANDY AQUATIC SAND REMOVAL**

April 2014

EXHIBIT F

Photographs

SITE PHOTOS

Whitney Pond Park

(Whitney Lake)

Manhasset, NY

Photos Taken 04-09-14





Photograph No. 1 – Whitney Lake – West Side; Facing North



Photograph No. 2 – Whitney Lake – West Side; Facing East



Photograph No. 3 – Whitney Lake – West Side; Facing East

SITE PHOTOS

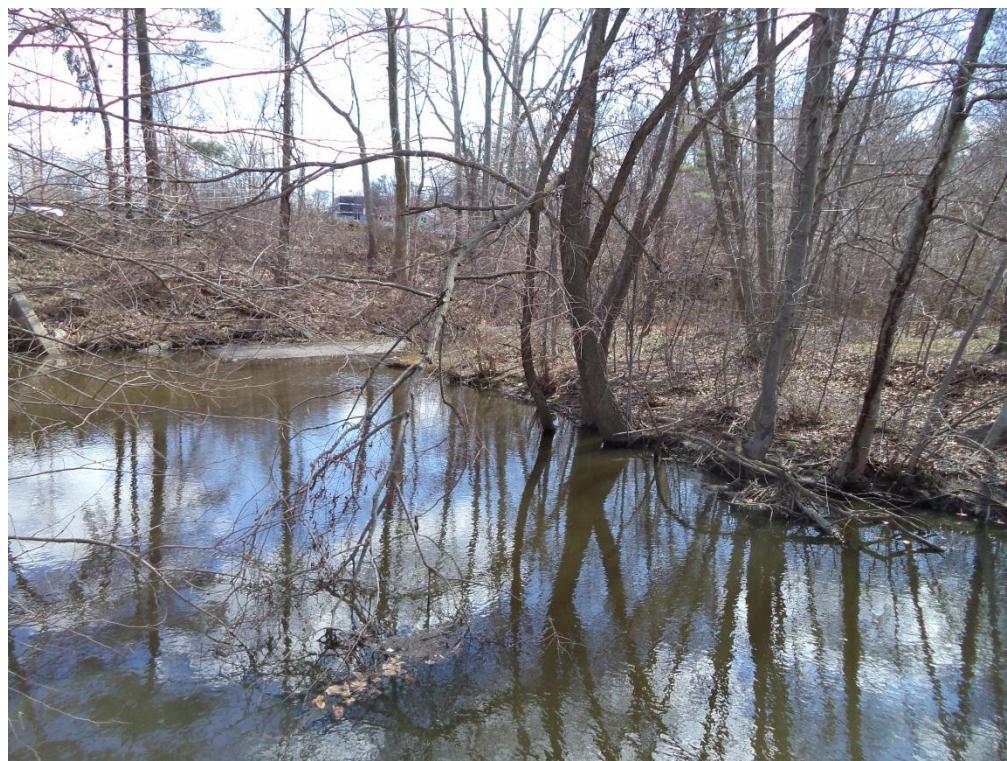
Manhasset Valley Pond

Manhasset, NY

Photos Taken 04-09-14



Photograph No. 4 – Manhasset Valley Pond – Facing North



Photograph No. 5 – Sedimentation Pond



Photograph No. 6 – Sedimentation Pond



Photograph No. 7 – Stream from Sedimentation Pond to Manhasset Valley Pond



Photograph No. 8 – Concrete & Stone Weir at Entrance to Manhasset Valley Pond



Photograph No. 9 – Concrete & Stone Weir at Entrance to Manhasset Valley Pond



Photograph No. 10 – Manhasset Valley Pond – West Side, Facing South



Photograph No.11 – Manhasset Valley Pond – West Side, Facing South



Photograph No. 12 – Manhasset Valley Pond – West Side, Facing South



Photograph No. 13 – Manhasset Valley Pond – West Side, Facing East



Photograph No. 14 – Concrete Weir at Manhasset Valley Pond Exit



Photograph No. 15 – Concrete Weir at Manhasset Valley Pond Exit