

HISTORICAL **PERSPECTIVES INC.**



**Phase IA Archaeological Documentary Study
Oakwood Beach Wetland Mitigation
Staten Island, Richmond County, New York**

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Oakwood Beach Wetland Mitigation
Staten Island, Richmond County, New York**

Prepared For:

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and

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March 2025

MANAGEMENT SUMMARY

SHPO Project Review Number (if available):

Involved State and Federal Agencies: **DEC, Army Corps of Engineers**

Phase of Survey: **Phase IA Archaeological Documentary Study**

Location Information

Location: **Portions of Blocks 4754, 4767, 4792 and 4793**

Minor Civil Division: **08501, Staten Island**

County: **Richmond**

Survey Area

Length: **varies**

Width: **varies**

Number of Acres Surveyed: **3.57 acres**

USGS 7.5 Minute Quadrangle Map: **The Narrows**

Archaeological Survey Overview

Number & Interval of Shovel Tests: **N/A**

Number & Size of Units: **N/A**

Width of Plowed Strips: **N/A**

Surface Survey Transect Interval: **N/A**

Results of Archaeological Survey

Number & name of precontact sites identified: **None**

Number & name of historic sites identified: **None**

Number & name of sites recommended for Phase II/Avoidance: **None**

Report Authors(s): **Julie Abell Horn, M.A., R.P.A., Historical Perspectives, Inc.**

Date of Report: **March 2025**

EXECUTIVE SUMMARY

Through the cooperative efforts of the New York City Department of Environmental Protection (DEP), the Department of Parks and Recreation (DPR), the Department of Design and Construction (DDC), and the National Park Service, DEP proposes to create six wetland mitigation areas in the Oakwood Beach neighborhood of Staten Island, Richmond County, New York (Figures 1 and 2). The wetland mitigation areas, labeled Wetlands A-F and which together measure approximately 3.57 acres, are located on portions of Blocks 4754 (Wetland F), 4767 (Wetland A), 4792 (Wetlands B and C) and 4793 (Wetlands D and E) (Figures 3a-3d and Appendix A). These areas previously contained single-family homes that were heavily damaged by Superstorm Sandy in 2012 and have since been demolished. Today, the wetland mitigation lots have a combination of city and state agency ownership. Appendix A provides details of the proposed wetland designs.

As noted by DPR's 2017 Shoreline Parks Plan, the Oakwood Beach mitigation effort is "aligned with other City initiatives, including projects proposed in NY Rising Community Reconstruction Plan, storm resilience approaches in PlaNYC 2013, economic development strategies in Resilient Neighborhoods and stormwater management plans in the Bluebelt Project." This wetland mitigation is an important part of the overall Governor's Office of Storm Recovery (GOSR) effort for Staten Island's south shore. It also strives to protect and enhance existing natural systems like tidal wetlands, marshes and dune landscapes while providing beachfront and functional park spaces for all.

This project is subject to New York City Environmental Quality Review (CEQR) and State Environmental Quality Act (SEQRA). As part of the environmental review processes, a Project Initiation Package was sent to the New York City Landmarks Preservation Commission (LPC) in December 2024. The LPC responded that 75 properties on Blocks 4754, 4767, 4792 and 4793 contain archaeological significance.

The LPC further indicated:

LPC review of archaeological sensitivity models and historic maps indicates that there is potential for the recovery of remains from Indigenous Peoples occupation on the project site. Accordingly, the Commission recommends that an archaeological documentary study be performed for this site to clarify these initial findings and provide the threshold for the next level of review if such review is necessary (see CEQR Technical Manual 2021). (Santucci 1/9/2025).

Historical Perspectives, Inc. (HPI) has been contracted by Hazen and Sawyer to complete the requested Phase IA Archaeological Documentary Study for the Oakwood Beach Wetland Mitigation project. This study was prepared to comply with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP or SHPO) and the LPC (New York Archaeological Council 1994; NYSOPRHP 2005; LPC 2018; CEQR 2019). Where guidelines for the archaeological evaluation and report format of the LPC and the NYSOPRHP varied, those of the LPC, which specifically address New York City conditions and resources, took precedent. This report also will be filed with the NYSOPRHP.

The Area of Potential Effect (APE) is defined as the area that could be affected by project development. For the purposes of this report, the APE and the project site are the same, and include all of the lots flagged by the LPC, above.

From what is known of Indigenous precontact period settlement patterns on Staten Island, most habitation and processing sites are found in sheltered, elevated sites close to wetland features, major waterways, and with nearby sources of fresh water. The project site lots all are in an area that both the NYSOPRHP GIS and LPC's Boesch (1994) study indicate has a high sensitivity for Indigenous precontact archaeological resources. This is undoubtedly because these areas are located in proximity to natural water sources, and in fact the Oakwood Beach location between Old Mill Road and the Lower Bay shoreline originally contained a portion of the Bass Creek drainage as well as surrounding tidal marshland. However, neither agency's database takes into account the level of ground disturbance in any given location, which may have destroyed or compromised the integrity of any extant Indigenous precontact archaeological resources. Further, while Indigenous precontact sites and artifacts have been previously recorded on elevated land in proximity to the Oakwood Beach tidal marshlands, no such sites have been previously recorded within the current or former tidal marshlands themselves in this area.

The areas within the project site lots that in their pre-development condition would have had the greatest likelihood of containing Indigenous precontact archaeological resources are those locations that once had raised hummocks of land immediately adjacent to the tidal marshlands. Two areas within the project site contained these conditions: the portion of Block 4754 bordering Old Mill Road and a small section of the Block 4793 lots. However, all of the project site lots, including those that once sat on small hummocks, have been significantly disturbed from grading and filling during the original street grid and lot creation in this area, as well as multiple episodes of construction and demolition of the residences that once were present on these lots. The photographs from the 2010s prior to the last episode of building demolition indicated that the project site lots contained houses, many with full or partial basements, as well as associated subgrade infrastructure including utilities. Many lots also had swimming pools, outbuildings and other disturbances outside of the house footprints.

Last, it should be noted that project plans in Appendix A indicate that the proposed wetland mitigation areas will be constructed between 1-4 feet below the current grade, with much of the construction extending only 2 feet below grade, or to the approximate depth of the original tidal marshland. In limited locations the wetland mitigation areas will be excavated approximately 1 foot below the original tidal marshland level. Given the fact that the proposed wetland mitigation areas have been previously disturbed from grading and filling associated with the original creation of the city blocks as well as from multiple construction and demolition episodes, there is minimal sensitivity for potential Paleo Indian archaeological resources to be recovered beneath the original marshland strata.

Based on the original tidal marshland conditions across the project site, combined with the very substantial degree of disturbance on all of the lots, HPI concludes there is little to no Indigenous precontact archaeological sensitivity.

Given these conclusions, HPI recommends that no further archaeological investigations are necessary for any of the lots that comprise the project site.

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I. INTRODUCTION

Through the cooperative efforts of the New York City Department of Environmental Protection (DEP), the Department of Parks and Recreation (DPR), the Department of Design and Construction (DDC), and the National Park Service, DEP proposes to create six wetland mitigation areas in the Oakwood Beach neighborhood of Staten Island, Richmond County, New York (Figures 1 and 2). The wetland mitigation areas, labeled Wetlands A-F and which together measure approximately 3.57 acres, are located on portions of Blocks 4754 (Wetland F), 4767 (Wetland A), 4792 (Wetlands B and C) and 4793 (Wetlands D and E) (Figures 3a-3d and Appendix A). These areas previously contained single-family homes that were heavily damaged by Superstorm Sandy in 2012 and have since been demolished. Today, the wetland mitigation lots have a combination of city and state agency ownership. Appendix A provides details of the proposed wetland designs.

As noted by DPR's 2017 Shoreline Parks Plan, the Oakwood Beach mitigation effort is "aligned with other City initiatives, including projects proposed in NY Rising Community Reconstruction Plan, storm resilience approaches in PlaNYC 2013, economic development strategies in Resilient Neighborhoods and stormwater management plans in the Bluebelt Project." This wetland mitigation is an important part of the overall Governor's Office of Storm Recovery (GOSR) effort for Staten Island's south shore. It also strives to protect and enhance existing natural systems like tidal wetlands, marshes and dune landscapes while providing beachfront and functional park spaces for all.

This project is subject to New York City Environmental Quality Review (CEQR) and State Environmental Quality Act (SEQRA). As part of the environmental review processes, a Project Initiation Package was sent to the New York City Landmarks Preservation Commission (LPC) in December 2024. The LPC responded that the following properties contain archaeological significance:

- 1) 495 PROMENADE AVENUE, BBL: 5047540027
- 2) PROMENADE AVENUE, BBL: 5047540029
- 3) 485 PROMENADE AVENUE, BBL: 5047540031
- 4) 479 PROMENADE AVENUE, BBL: 5047540034
- 5) 477 PROMENADE AVENUE, BBL: 5047540035
- 6) 475 PROMENADE AVENUE, BBL: 5047540036
- 7) 471 PROMENADE AVENUE, BBL: 5047540037
- 8) 467 PROMENADE AVENUE, BBL: 5047540038
- 9) 465 PROMENADE AVENUE, BBL: 5047540039
- 10) 461 PROMENADE AVENUE, BBL: 5047540040
- 11) 460 STONEHAM STREET, BBL: 5047540045
- 12) MILL ROAD, BBL: 5047540047
- 13) 12 KISSAM AVENUE, BBL: 5047540051
- 14) 14 KISSAM AVENUE, BBL: 5047540053
- 15) 16 KISSAM AVENUE, BBL: 5047540054
- 16) 18 KISSAM AVENUE, BBL: 5047540055
- 17) 20 KISSAM AVENUE, BBL: 5047540057
- 18) 22 KISSAM AVENUE, BBL: 5047540058
- 19) 24 KISSAM AVENUE, BBL: 5047540059
- 20) 153 FOX BEACH AVENUE, BBL: 5047670007
- 21) 163B FOX BEACH AVENUE, BBL: 5047670012
- 22) 165 FOX BEACH AVENUE, BBL: 5047670013
- 23) 167 FOX BEACH AVENUE, BBL: 5047670015
- 24) 169A FOX BEACH AVENUE, BBL: 5047670016
- 25) 169B FOX BEACH AVENUE, BBL: 5047670017
- 26) 173 FOX BEACH AVENUE, BBL: 5047670018
- 27) 175 FOX BEACH AVENUE, BBL: 5047670020
- 28) FOX BEACH AVENUE, BBL: 5047670021
- 29) 179 FOX BEACH AVENUE, BBL: 5047670022
- 30) FOX LANE, BBL: 5047670035
- 31) FOX LANE, BBL: 5047670036

- 32) FOX LANE, BBL: 5047670037
- 33) 226 FOX LANE, BBL: 5047670038
- 34) 222 FOX LANE, BBL: 5047670039
- 35) FOX LANE, BBL: 5047670042
- 36) 163A FOX BEACH AVENUE, BBL: 5047670048
- 37) 151 FOX BEACH AVENUE, BBL: 5047670054
- 38) MILL ROAD, BBL: 5047920001
- 39) 600 MILL ROAD, BBL: 5047920005
- 40) 176 FOX BEACH AVENUE, BBL: 5047920011
- 41) FOX BEACH AVENUE, BBL: 5047920015
- 42) 162 FOX BEACH AVENUE, BBL: 5047920024
- 43) 156 FOX BEACH AVENUE, BBL: 5047920028
- 44) FOX BEACH AVENUE, BBL: 5047920044
- 45) 128 FOX BEACH AVENUE, BBL: 5047920045
- 46) FOX BEACH AVENUE, BBL: 5047920048
- 47) 120 FOX BEACH AVENUE, BBL: 5047920049
- 48) 118 FOX BEACH AVENUE, BBL: 5047920051
- 49) 71 TARLTON STREET, BBL: 5047920104
- 50) 63 TARLTON STREET, BBL: 5047920109
- 51) 61 TARLTON STREET, BBL: 5047920111
- 52) 59 TARLTON STREET, BBL: 5047920113
- 53) TARLTON STREET, BBL: 5047920132
- 54) 48 TARLTON STREET, BBL: 5047930033
- 55) TARLTON STREET, BBL: 5047930035
- 56) 52 TARLTON STREET, BBL: 5047930036
- 57) 54 TARLTON STREET, BBL: 5047930037
- 58) 56 TARLTON STREET, BBL: 5047930038
- 59) 58 TARLTON STREET, BBL: 5047930040
- 60) 62 TARLTON STREET, BBL: 5047930042
- 61) 66 TARLTON STREET, BBL: 5047930043
- 62) 68 TARLTON STREET, BBL: 5047930045
- 63) 70 TARLTON STREET, BBL: 5047930046
- 64) 74 TARLTON STREET, BBL: 5047930049
- 65) 76 TARLTON STREET, BBL: 5047930050
- 66) 82 TARLTON STREET, BBL: 5047930053
- 67) 84 TARLTON STREET, BBL: 5047930054
- 68) 86 TARLTON STREET, BBL: 5047930055
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- 73) 102 TARLTON STREET, BBL: 5047930064
- 74) 106 TARLTON STREET, BBL: 5047930067
- 75) 46 TARLTON STREET, BBL: 5047930032

The LPC further indicated:

LPC review of archaeological sensitivity models and historic maps indicates that there is potential for the recovery of remains from Indigenous Peoples occupation on the project site. Accordingly, the Commission recommends that an archaeological documentary study be performed for this site to clarify these initial findings and provide the threshold for the next level of review if such review is necessary (see CEQR Technical Manual 2021). (Santucci 1/9/2025).

Historical Perspectives, Inc. (HPI) has been contracted by Hazen and Sawyer to complete the requested Phase IA Archaeological Documentary Study for the Oakwood Beach Wetland Mitigation project. This study was prepared to

comply with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP or SHPO) and the LPC (New York Archaeological Council 1994; NYSOPRHP 2005; LPC 2018; CEQR 2019). Where guidelines for the archaeological evaluation and report format of the LPC and the NYSOPRHP varied, those of the LPC, which specifically address New York City conditions and resources, took precedent. This report also will be filed with the NYSOPRHP. The HPI project team consisted Cece Saunders, M.A., R.P.A., who managed the project, Julie Abell Horn, M.A., R.P.A., who undertook the majority of the research, and wrote the majority of the report; and Elizabeth Eibert, M.A., who conducted the site visit.

The Area of Potential Effect (APE) is defined as the area that could be affected by project development. For the purposes of this report, the APE and the project site are the same, and include all of the lots flagged by the LPC, above.

II. METHODOLOGY

This study entails review of various resources. Because the project site consists of land that was undeveloped marshland through the early twentieth century, and was flagged by LPC for Indigenous Peoples occupation only, many standard historic resources normally consulted to meet LPC standards were not necessary, as described below.

- Primary and secondary sources concerning the general precontact period and history of Staten Island and specific events associated with the project site were reviewed using materials from the New York Public Library, the Staten Island Historical Society, and online resources.
- Historic maps and aerial photographs were reviewed from the New York Public Library, the Staten Island Historical Society, the Staten Island Museum, the Staten Island Topographical Bureau, and using various online websites. These maps and photographs provided an overview of the changing shoreline, the topography, and a chronology of land usage and ownership. While all maps and photographs that were consulted for this report are cited, due to the volume of materials, only a selection of these images is presented in this report.
- Deeds, tax assessment records, federal census records, and city directories, which are standard resources consulted as part of a documentary study, were not reviewed for this project because the project site was not developed during the nineteenth century.
- Department of Building records were consulted as necessary to determine dates of former buildings construction and demolition.
- Information about previously recorded archaeological sites and surveys in the area was compiled from data available on the NYSOPRHP's Cultural Resource Information System (CRIS), which includes data files from the New York State Museum (NYSM), and the LPC, as well as the LPC's Archaeological Sensitivity Study for Staten Island (Boesch 1994).
- DEP and Hazen and Sawyer provided various survey maps and site data for the property.
- Last, a site visit to the project site was conducted by Elizabeth Eibert of HPI on February 5, 2025 to assess any obvious or unrecorded subsurface disturbance and to provide comparisons to conditions prior to demolition of the former buildings on the lots (Photographs 1-12; Figure 2a).

III. CURRENT CONDITIONS AND ENVIRONMENTAL SETTING

A. Current Conditions

The six proposed wetland mitigation areas that comprise the project site are vacant, level parcels that prior to Superstorm Sandy in 2012 contained occupied twentieth-century residences fronting Old Mill Road, Mill Road, Kissam Avenue, Promenade Avenue, Fox Lane, Fox Beach Avenue, and Tarlton Street. These buildings were demolished over the course of the last dozen years, leaving open, undeveloped land. Photographs 1-12 illustrate the current conditions juxtaposed with the pre-demolition conditions.

B. Topography and Hydrology

All the proposed wetland mitigation areas were once covered by tidal marshland, generally at, or just above, sea level. The review of historic topographical maps (e.g. U.S.C.S. 1856 [Figure 5], Beers 1874 [Figure 6] Bien and

Vermeule 1891 [Figure 7], Borough of Richmond 1911 [Figure 8]) showed that the proposed wetland mitigation areas were mapped as marshland through the early twentieth century. This marshland extended along the shoreline of Oakwood Beach. Bass Creek, which during the nineteenth century ran from Great Kills to just south of what is now Fox Lane, was the perennial drainage around which the marshland formed. The historic topographical maps also showed that there was a small hummock of land that rose about two feet above the level of the marshland within what is now the southern portion of Block 4793. Some of the historic topographical maps also suggested that the northern edge of Block 4754, bordering Old Mill Road, might also have been slightly above the marshland edge.

Beginning by the 1920s, grading and landfilling occurred within the project site locations to create the present non-marshland existing conditions. Topographic maps on Staten Island use several different elevation datums. The Borough of Richmond Datum is 3.192 feet above the U.S.C.S. Sandy Hook Datum, and is the datum used on the 1911 Borough of Richmond Topographical map and shown as Figure 8. Modern survey maps (Appendix A) use the NAVD88 Datum, which is 2.112 feet higher than the Borough of Richmond Datum. Thus, the difference between elevations on these two sets of maps is approximately 2 feet. The 1911 topographic map indicated the marshland elevation was “0 feet” (using the Borough of Richmond Datum). Today, Appendix A shows that elevations within the proposed wetland mitigation areas range from approximately 2-5 feet (using the NAVD88 Datum), suggesting that 1-3 feet of fill was placed on top of the natural marshland soils to create today’s ground surface. It is likely, however, that this landfilling occurred in tandem with grading and compacting the underlying natural soils, so that the fill likely extends deeper than the original marshland elevation in many places. The natural landform was further disturbed by multiple episodes of construction and demolition of buildings on the lots from the 1920s through the 2010s, along with the installation of utilities, fencing, swimming pools, and the like. Many of these former buildings had subgrade components, including basements or partial basements, and associated foundations.

C. Soils

All of the block and lots that comprise the project site fall within soil mapping unit UVA1—Urban land-Verrazano complex, 0 to 3 percent slopes, low impervious surface, as shown on Figure 4. The U.S.D.A. indicates that a typical soil profile Urban land is:

M1 - 0 to 6 inches: cemented material
M2 - 6 to 20 inches: cemented material
2^C - 20 to 72 inches: coarse sand

A typical profile for the Verrazano series is:

^A - 0 to 3 inches: sandy loam
^Bw - 3 to 17 inches: sandy loam
^BC - 17 to 24 inches: loam
2C - 24 to 72 inches: sand

As noted above, in its pre-development condition, all areas of the project site were within or abutting tidal marshland. The present tidal marshland portions of Oakwood Beach that are in proximity to the project site are mapped as either JaA—Jamaica sand, 0 to 3 percent slopes, frequently ponded, or IPA—Ipswich-Pawcatuck complex, 0 to 1 percent slopes, very frequently flooded. It is therefore likely that prior to the development of the project site, those soil types would have been more characteristic of the entire area.

No soil borings have been completed on the proposed wetland mitigation area lots.

IV. BACKGROUND RESEARCH/HISTORICAL OVERVIEW

A. Indigenous Precontact Summary

For this report, the word Indigenous precontact is used to describe the period prior to the use of formal written records. In the western hemisphere, the Indigenous precontact period also refers to the time before European exploration and settlement of the New World. Archaeologists and historians gain their knowledge and understanding

of Indigenous Peoples on Staten Island from three sources: ethnographic reports, Indigenous artifact collections, and archaeological investigations.

The Paleo Indian Period (c. 10,500 B.C. - c. 8000 B.C.) represents the earliest known human occupation of Staten Island. Approximately 14,000 years ago the Wisconsin Glacier retreated from the area leading to the emergence of a cold dry tundra environment. Sea levels were considerably lower than modern levels during this period (they did not reach current levels until circa 5,000 B.C., in the Early to Middle Archaic Period). As such, Staten Island was situated much further inland from the Atlantic Ocean shore than today, and was characterized by higher ground amid glacial lakes and rivers (Boesch 1994). The material remains of the Indigenous Peoples during the Paleo Indian period include lithic tools such as Clovis-type fluted projectile points, bifacial knives, drills, graters burins, scrapers, flake cores, and flake tools, although sites generally are represented by limited small surface finds. The highly mobile nomadic bands of this period specialized in hunting large game animals such as mammoth, moose-elk, bison, and caribou and gathering plant foods. It has been theorized that the end of the Paleo Indian Period arose from the failure of over-specialized, big-game hunting (Snow 1980:150-157). Based on excavated Paleo Indian sites in the Northeast, there was a preference for high, well-drained areas in the vicinity of streams or wetlands (Boesch 1994). Sites have also been found near lithic sources, rock shelters and lower river terraces (Ritchie 1980). Paleo Indian materials have been recovered at several sites on Staten Island including Port Mobil, the Cutting site, Smoking Point and along the beach in the Kreischerville area. One isolated fluted point was reportedly found in the Great Kills Park area.

During the Archaic Period (c. 8000 B.C. - 1000 B.C.) a major shift occurred in the subsistence and settlement patterns of Indigenous Peoples. Archaic period peoples still relied on hunting and gathering for subsistence, but the emphasis shifted from hunting large animal species, which were becoming unavailable, to smaller game and collecting plants in a deciduous forest. The settlement pattern of the Archaic people consisted of small bands that occupied larger and relatively more permanent habitations sites along the coast of Staten Island, its estuaries and streams and inland areas (Boesch 1994). Typically such sites are located on high ground overlooking water courses. This large period has been divided up into four smaller periods, the Early, Middle, Late and Terminal Archaic.

The environment during the Early Archaic (c. 8000 B.C. - 6000 B.C.) displayed a trend toward a milder climate and the gradual emergence of a deciduous-coniferous forest with a smaller carrying capacity for the large game animals of the previous period (Ritchie and Funk 1971). The large Pleistocene fauna of the previous period were gradually replaced by modern species such as elk, moose, bear, beaver, and deer. New species of plant material suitable for human consumption also became abundant. The increasing diversification of utilized food sources is further demonstrated by a more complex tool kit. The tool kit of the Early Archaic people included bifurcated or basally notched projectile points generally made of high quality stone. Tool kits were more generalized than during the Paleo-Indian period, showing a wider array of plant processing equipment such as grinding stones, mortars and pestles. Although overall evidence of Early Archaic sites on Staten Island is sparse, there are some significant Early Archaic component sites from this period, including the Old Place, Hollowell, Charleston Beach, Wards Point, Travis, and Richmond Hill sites (Ritchie and Funk 1971; Boesch 1994).

The archaeological record suggests that a population increase took place during the Middle Archaic Period (c. 6000 - c. 4000 B.C.). This period is characterized by a moister and warmer climate and the emergence of an oak-hickory forest. The settlement pattern during this period displays specialized sites and increasing cultural complexity. The exploitation of the diverse range of animal and plant resources continued with an increasing importance of aquatic resources such as mollusks and fish (Snow 1980). In addition to projectile points, the tool kits of Middle Archaic peoples included grinding stones, mortars, and pestles. Such artifacts have been found throughout Staten Island, including the Old Place and Wards Point sites (Boesch 1994).

Late Archaic people (c. 4000 - c. 1000 B.C.) were specialized hunter-gatherers who exploited a variety of upland and lowland settings in a well-defined and scheduled seasonal round. The period reflects an increasingly expanded economic base, in which groups exploited the richness of the now established oak-dominant forests of the region. It is characterized by a series of adaptations to the newly emerged, full Holocene environments. As the period progressed, the dwindling melt waters from disappearing glaciers and the reduced flow of streams and rivers promoted the formation of swamps and mudflats, congenial environments for migratory waterfowl, edible plants and shellfish. The new mixed hardwood forests of oak, hickory, chestnut, beech and elm attracted white-tailed deer, wild turkey, moose and beaver.

The large herbivores of the Pleistocene were rapidly becoming extinct and the Archaic people depended increasingly on smaller game and the plants of the deciduous forest. The projectile point types attributed to this period include the Lamoka, Brewerton, Normanskill, Lackawaxen, Bare Island, and Poplar Island. The tool kit of these peoples also included milling equipment, stone axes, and adzes. A large number of Late Archaic Period sites have been found on Staten Island. These include the Pottery Farm, Bowman's Brook, Smoking Point, Goodrich, Sandy Brook, Wort Farm, Old Place, and Arlington Avenue sites (Boesch 1994).

During the Terminal Archaic Period (c. 1700 B.C. - c. 1000 B.C.), Indigenous Peoples developed new and radically different broad bladed projectile points, including Susquehanna, Perkiomen and Orient Fishtail types. The use of steatite or stone bowls is a hallmark of the Terminal Archaic Period. Sites on Staten Island from the Terminal Archaic Period include the Old Place, Pottery Farm, Wards Point, and Travis sites (Boesch 1994).

The Woodland Period (c. 1000 B.C. - 1600 A.D.) is generally divided into Early, Middle and Late Woodland on the basis of cultural materials and settlement-subsistence patterns. Settlement pattern information suggests that the broad based strategies of earlier periods continued with a possibly more extensive use of coastal resources. The Early Woodland was essentially a continuation of the tool design traditions of the Late Archaic. However, several important changes took place. Clay pottery vessels gradually replaced the soapstone bowls during the Early Woodland Period (c. 1000 B.C. to A.D. 1). The earliest ceramic type found on Staten Island is called Vinette 1, an interior-exterior cordmarked, sand tempered vessel. The Meadowood-type projectile point is a chronological indicator of the Early Woodland Period.

Cord marked vessels became common during the Middle Woodland Period (c. A.D. 1 to c. 1000 A.D.). Jacks Reef and Fox Creek-type projectile points are diagnostic of the Middle Woodland. Another characteristic projectile point of the early to Middle Woodland Period is the Rossville type, named for the site at Rossville where it predominated. It is believed to have originated in the Chesapeake Bay area and is found in New Jersey, southeastern New York and southern New England (Lenik 1989:29). The Early and Middle Woodland periods displayed significant evidence for a change in settlement patterns toward a more sedentary lifestyle. The discovery of large storage pits and larger sites in general has fueled this theory. Some horticulture may have been practiced at this point but not to the extent that it was in the Late Woodland period.

In the Late Woodland period (c. 1000 A.D. - 1600 A.D.), triangular projectile points, such as the Levanna and Madison types, were common throughout the Northeast, including Staten Island (Lenik 1989:27). Made both of local and non-local stones, brought from as far afield as the northern Hudson and Delaware River Valleys, these artifacts bear witness to the broad sphere of interaction between groups of native peoples in the Northeast. Additionally, during this period collared ceramic vessels, many with decorations, made their appearance.

Woodland Period Indigenous Peoples in Staten Island and surrounding regions shared common attributes. The period saw the advent of horticulture and with it, the appearance of large, permanent or semi-permanent villages. Plant and processing tools became increasingly common, suggesting an extensive harvesting of wild plant foods. Maize cultivation may have begun as early as 800 years ago. The bow and arrow, replacing the spear and javelin, pottery vessels instead of soap stone ones, and pipe smoking, were all introduced at this time. A semi-sedentary culture, the Woodland Indians moved seasonally between villages within palisaded enclosures and campsites, hunting deer, turkey, raccoon, muskrat, ducks and other game and fishing with dug-out boats, bone hooks, harpoons and nets with pebble sinkers. Their shellfish refuse heaps, called "middens," sometimes reached immense proportions of as much as three acres (Ritchie 1980:80, 267). Habitation sites of the Woodland Period people increased in size and permanence. A large number of Woodland Period archaeological sites have been found on Staten Island in a variety of environmental settings. A favored setting for occupation during this period was well-drained ground near stream drainages and coastal waterways. One such site, dating to the Middle Woodland period and including net and fabric impressed pottery, was discovered within DEP Bluebelt property overlooking Lemon Creek and was excavated in 2009 and 2010 (HPI 2009a, 2009b, 2010a, 2010b).

During the early Contact period (1500 to 1700 A.D.) there was a continuation of the Late Woodland settlement patterns of the coastal Algonquians. By the 17th century the Dutch settlers of lower New York were in frequent contact with the many Indigenous Peoples who lived in the vicinity. Historic accounts describe both peaceful and violent interchanges between these two groups (Brasser 1978, Flick 1933). Through at least the 1650s, Indigenous

Peoples known as the Raritans occupied portions of Staten Island and New Jersey's Raritan Valley (Ruttenber 1872). The Raritans were but one of many Indigenous groups, which were known as the Delaware Indians by the European settlers. As the European population increased, and internecine warfare due to increased competition for trade with the Europeans intensified, the Raritans, and the Delaware in general, retreated inland away from the eastern coast. By the 1800s their migration had scattered them across the Midwest and even into Canada (Weslager 1972), where they have continued living to the present day. Journal accounts by European explorers, settlers and travelers describe Indigenous settlements and lifeways. However, only a few Historic Contact Period sites have been found on Staten Island. They include those at Wards Point, Old Place, Corsons Brook, Travis, New Springfield, and at the PS56R Site in Woodrow (Boesch 1994; HPI 1996).

B. Previously Recorded Archaeological Sites and Surveys

Records on file at the NYSOPRHP and the New York State Museum (NYSM) as well as the Boesch (1994) *Archaeological and Sensitivity Assessment of Staten Island, New York* indicate that there have been a number of both Indigenous precontact period archaeological sites and historic period archaeological sites documented within one mile of the project site, although no sites have been recorded within the project site boundaries. They are listed in the table, below. Of note, NYSM site locations and descriptions often are vague, due to the fact that many of these sites were documented based on non-professional records (such as information from local landowners, avocational collectors, or historic accounts); descriptions and distances of these sites from the project site are given based on available mapping and other data, but should not be considered definitive. Finally, as some sites have had different numbers and names applied to them over time, all known appellations are listed in the first column.

Archaeological Sites within One Mile of the Project Site

Site # and Name	Location	Time Period	Site Type
NYSM 8481	Approx. intersection of Guyon Ave. and Lynn St.	Unknown Indigenous precontact	Camp
NYSM 4628 Boesch 60	Approx. area between New Dorp Lane, Old Mill Road, Tysens Lane and shoreline	Unknown Indigenous precontact	Traces of occupation
08501.000129 SI-13	New Dorp Beach shore area	Mid-20 th century	Concrete and brick structure
08501.000153 SI-14	New Dorp Beach shore area	Mid-20 th century	Concrete platform
08501.000154 SI-15	New Dorp Beach shore area	20 th -century	Concrete and brick foundation
08501.000155 SI-16	New Dorp Beach shore area	Mid-20 th century	Concrete foundation
08501.000156 SI-17	Oakwood Beach, near foot of Kissam Ave.	Mid-20 th century	Concrete well
08501.000164 STD-0	Great Kills Park	Unknown Indigenous precontact	Shell midden and camp
08501.000165 STD-GK Boesch 88	Great Kills Harbor	Late Indigenous precontact-early historic	Camp location, no evidence remaining
NYSM 4617 08501.000166 ACP Rich-27 Boesch 83, 86	Large area between Amboy Road and Hylan Blvd and part of Great Kills Park	Unknown Indigenous precontact	Shell middens, possible camp, no evidence remaining
08501.000168 SI-4 Lake's Tide Mill and Homestead	Great Kills Park, Oakwood Beach Sewage Treatment Plant area	Ca. 1709-1723	Grist mill location, no evidence remaining

Site # and Name	Location	Time Period	Site Type
08501.003596 Vanderbilt Stable	Miller Field	1870s-1937	Historic stable
08501.004322 Lake Family Enslaved Persons Burial Ground	Unknown, 1000 feet from Lake Family Cemetery	Unknown	Enslaved Persons Burying Ground
08501.004323 Lake Family Cemetery	Block 5607, Lot 1 and streetbed	1783-1841	Family Burying Ground
08501.004324 Holmes-Perine Family Cemetery	Unknown	1777-1823	Family Burying Ground
Unnamed Site	Southwest corner of Dugdale Street and Mill Road	Unknown Indigenous precontact	Unclear: jasper, argillite and chert flakes and a jasper core recovered from shovel tests. Site was subsequently destroyed by development. See Rakos 1996.

None of the archaeological sites listed in the above table were recorded in tidal marshland locations such as those that characterized the project site blocks prior to twentieth-century landfilling. While the unnamed site in the last row of the above table was located in proximity to the project site, the landform was an upland location and not within marshland.

In addition to the previously documented archaeological sites, there have been a number of archaeological surveys conducted within a one mile radius of the project site, submitted to both the NYSOPRHP and the LPC. Several studies addressed beachfront resources along the south shore of Staten Island and Oakwood Beach (Lipson et al. 1978, JMA 1978, USACOE 1994, Panamerican Consultants 2005). The Panamerican 2005 study also included field testing along the Lower Bay shoreline. The most recent geomorphological shoreline study was completed by Hunter Research in 2020, which concluded that there were no areas of archaeological sensitivity along the current Oakwood Beach shoreline.

The Oakwood Beach WWTP, located just southwest of the project site in Great Kills Park, has also been subjected to a series of archaeological studies (Pickman and Yamin 1984, Greenhouse Consultants 1990a, 1990b), as have various storm damage reduction projects near this plant (Rakos 1996).

During the 2010s, several additional archaeological studies were completed in vicinity. HPI completed an extensive Phase IA Archaeological Documentary Study for the Oakwood Beach Watershed within the larger Mid-Island Bluebelt project area (HPI 2011b). One of the loci for that project was for a large Best Management Practice (BMP) designated OB-1, which covered much of the tidal marshland abutting the current project site. The report recommended no archaeological sensitivity for the disturbed tidal marshlands.

HPI also completed a Phase IA Archaeological Documentary Study for the Cedar Grove Rehabilitation Project (HPI 2011a). HPI concluded that in its natural state, any areas of the Cedar Grove project site on firm ground and that have not sustained disturbance due to either natural or man-made events would have a high precontact sensitivity and would require archaeological testing if these areas would be impacted by subsurface development. In 2015, Richard Holmes et al. completed a Phase I Archaeological Survey of the Vanderbilt Stable site at Miller Field, where remains of the historic stable were found. Last, in 2017 the Edward Otter, Inc. completed a Phase IA Archaeological Study for Telecommunications Facility 278X at 20 Ebbitts Street where no further work was recommended.

No archaeological sites, other than those noted in the above table, have been recorded as a result of these surveys within this area.

C. Historic Period Summary

The project site vicinity includes the neighborhood of New Dorp, which was established near the foot of modern New Dorp Lane in 1671, and was the earliest historic period settlement in the Oakwood Beach area (Leng and Davis 1930). Early roads in and around the Oakwood Beach area included New Dorp Lane, Amboy Road, Richmond Road, and what is now Old Mill Road, which led from New Dorp Lane to Lake's Mill at the edge of Great Kills. Revolutionary War era maps, such as the 1780-1783 Anglo-Hessian Map, the 1781 Taylor and Skinner map, and McMillen's *A Map of Staten Island During the Revolution, 1775-1783* (1933) depicted only sparse settlement in the Oakwood Beach area, with structures located along or branching off from the four major roads. The project site, which was entirely within tidal marshland surrounding Bass Creek and south of Old Mill Road, was undeveloped.

By the mid-nineteenth century, maps had become more precise. The 1856 U.S.C.S. map (Figure 5) showed that although the project site was within tidal marshland, there were also small areas of higher ground and a roadway that crossed through the marshland running from Old Mill Road to the waterfront, where there were two structures. This unnamed roadway ran parallel to modern day Fox Lane, outside of the project site. The 1860 Walling map clarified that the roadway terminated at the "Fish House," which was located right on the beach, approximately 1500 feet southeast of the project site. This roadway was shown on both the 1872 Dripps map and the 1874 Beers atlas (Figure 6). The 1874 Beers map also confirmed that there was a small area of higher ground, or hummock, along this roadway, which extended partially into the Block 4793 portion of the project site. Presumably the roadway was built to take advantage of this raised hummock, which anchored the alignment between marshy areas. There was no development within the project site on any of these maps.

Topographical maps made in the 1890s (Bien and Vermeule 1891 [Figure 7]) further showed that project site and vicinity, like most of the marshy areas in the region, were crossed by a series of drainage ditches that channeled water into the natural creeks of the area. These maps also showed the general locations of raised hummocks within and adjacent to the tidal marshes, and the roadway leading through from Old Mill Road to the beach. Atlases made during the first decades of the twentieth century (e.g. Robinson 1907, Bromley 1917) noted that the marshlands were divided into long, narrow lots, running from Old Mill Road to the waterfront that were owned by various individuals.

The 1911 Borough of Richmond Topographical Survey map (Figure 8), which remains one of the most detailed series of maps made of Staten Island to date, gave remarkable clarity concerning the topographical features within the project site at that time. The roadway from earlier maps was shown clearly extending from Old Mill Road to the shoreline, as were the outlines of the raised hummocks and drainage ditches within the tidal marshland.

Beginning in the 1910s, the first concerted development of the project site began to occur. The 1917 Bromley map showed some small frame buildings along Kissam Avenue and Fox Lane, which were the first new roadways within the project site to be created. The 1924 New York City Bureau of Engineering aerial photograph (Figure 9) showed that by this time, all of the remaining roadways bordering the project site blocks had been laid out, and sporadic structures had been built along them. Over the course of the next few decades, the project site blocks became more heavily developed with residences (Sanborn 1937, 1951), such that nearly every project site lot contained development by the end of the twentieth century. As the older homes aged, many were replaced with newer buildings.

The project site was heavily affected by Superstorm Sandy in 2012, which flooded the entire neighborhood and destroyed much of the building stock. Many of the homes were condemned, and over time, they were purchased by the City of New York and other entities and demolished. Today, the project site is virtually devoid of structures and the former lot lines are no longer readily distinguishable, as shown in the existing conditions photographs.

V. CONCLUSIONS

From what is known of Indigenous precontact period settlement patterns on Staten Island, most habitation and processing sites are found in sheltered, elevated sites close to wetland features, major waterways, and with nearby sources of fresh water. The project site lots all are in an area that both the NYSOPRHP GIS and LPC's Boesch (1994) study indicate has a high sensitivity for Indigenous precontact archaeological resources. This is undoubtedly

because these areas are located in proximity to natural water sources, and in fact the Oakwood Beach location between Old Mill Road and the Lower Bay shoreline originally contained a portion of the Bass Creek drainage as well as surrounding tidal marshland. However, neither agency's database takes into account the level of ground disturbance in any given location, which may have destroyed or compromised the integrity of any extant Indigenous precontact archaeological resources. Further, while Indigenous precontact sites and artifacts have been previously recorded on elevated land in proximity to the Oakwood Beach tidal marshlands, no such sites have been previously recorded within the current or former tidal marshlands themselves in this area.

The areas within the project site lots that in their pre-development condition would have had the greatest likelihood of containing Indigenous precontact archaeological resources are those locations that once had raised hummocks of land immediately adjacent to the tidal marshlands. Two areas within the project site contained these conditions: the portion of Block 4754 bordering Old Mill Road and a small section of the Block 4793 lots. However, all of the project site lots, including those that once sat on small hummocks, have been significantly disturbed from grading and filling during the original street grid and lot creation in this area, as well as multiple episodes of construction and demolition of the residences that once were present on these lots. The photographs from the 2010s prior to the last episode of building demolition indicated that the project site lots contained houses, many with full or partial basements, as well as associated subgrade infrastructure including utilities. Many lots also had swimming pools, outbuildings and other disturbances outside of the house footprints.

Last, it should be noted that project plans in Appendix A indicate that the proposed wetland mitigation areas will be constructed between 1-4 feet below the current grade, with much of the construction extending only 2 feet below grade, or to the approximate depth of the original tidal marshland. In limited locations the wetland mitigation areas will be excavated approximately 1 foot below the original tidal marshland level. Given the fact that the proposed wetland mitigation areas have been previously disturbed from grading and filling associated with the original creation of the city blocks as well as from multiple construction and demolition episodes, there is minimal sensitivity for potential Paleo Indian archaeological resources to be recovered beneath the original marshland strata.

Based on the original tidal marshland conditions across the project site, combined with the very substantial degree of disturbance on all of the lots, HPI concludes there is little to no Indigenous precontact archaeological sensitivity.

VI. RECOMMENDATIONS

Given these conclusions, HPI recommends that no further archaeological investigations are necessary for any of the lots that comprise the project site.

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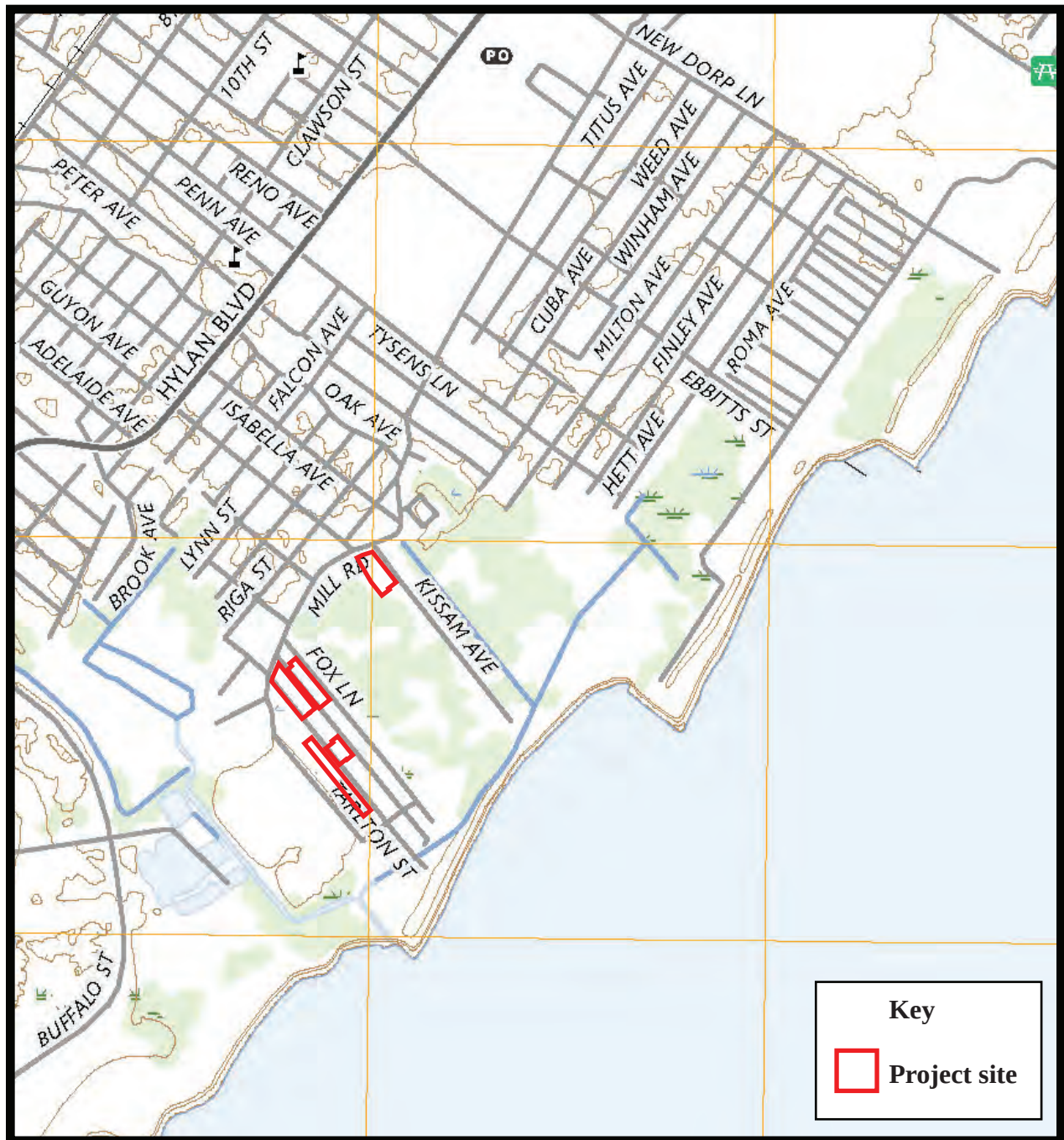
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FIGURES



**Phase IA Archaeological Documentary Study
Oakwood Beach Wetland Mitigation
Staten Island, Richmond County, New York**



Figure 1: Project site on *The Narrows*, NY 7.5 Minute Topographic Quadrangle (U.S.G.S. 2019).

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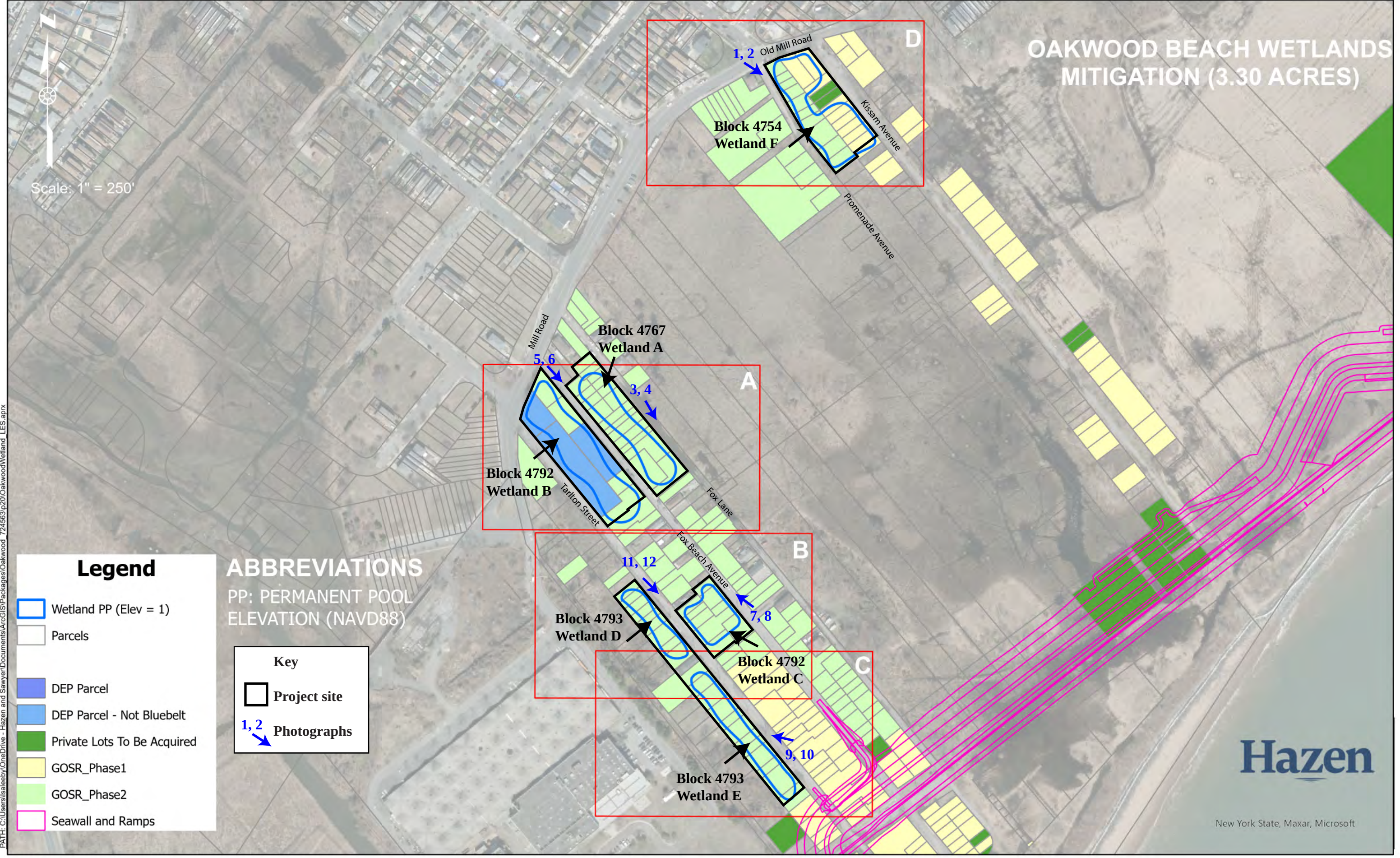


Figure 2a. Project site key map and photograph locations (HPI 2025 and Hazen and Sawyer 2024).

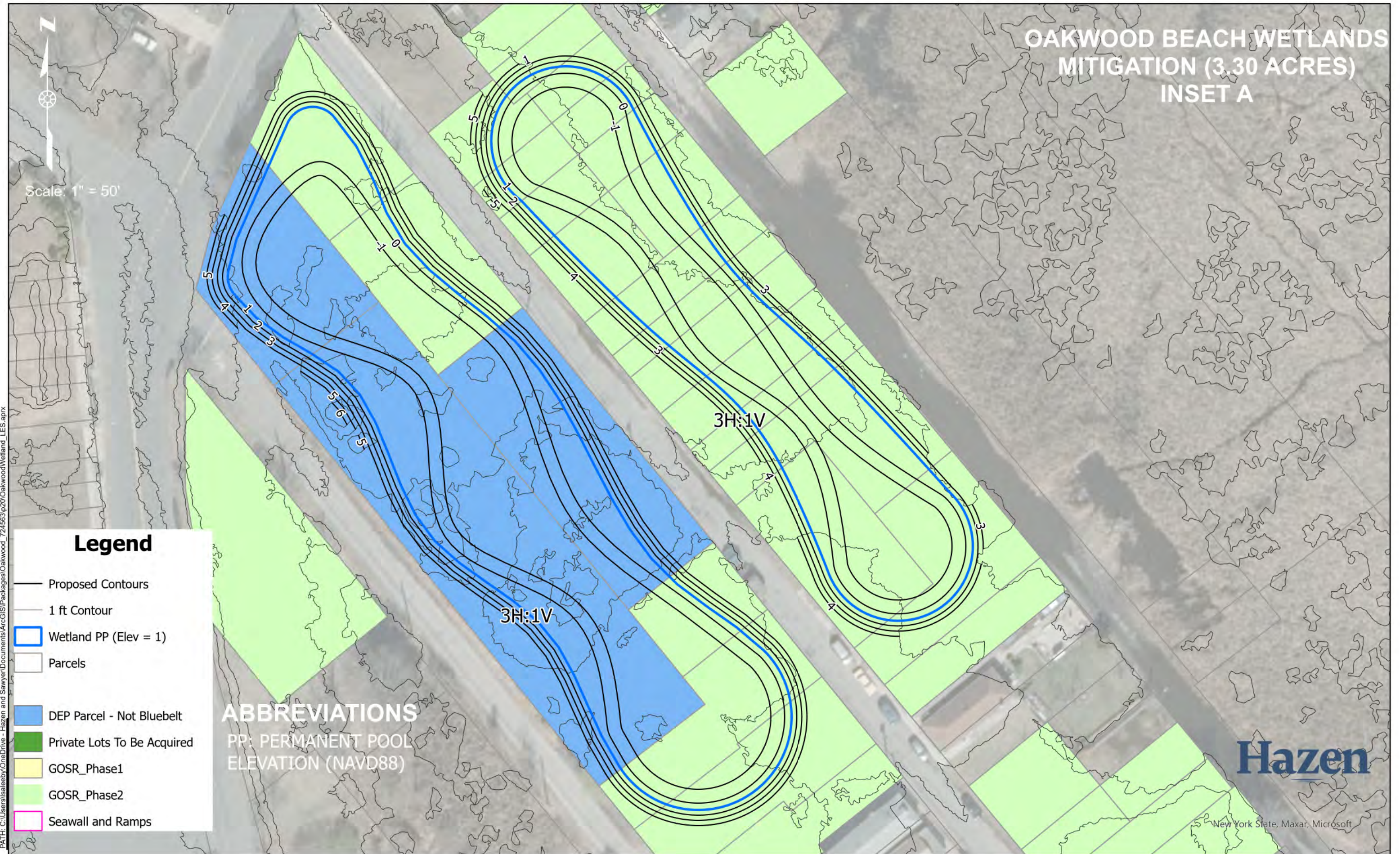


Figure 2b. Detail of proposed Wetlands A and B (Hazen and Sawyer 2024).

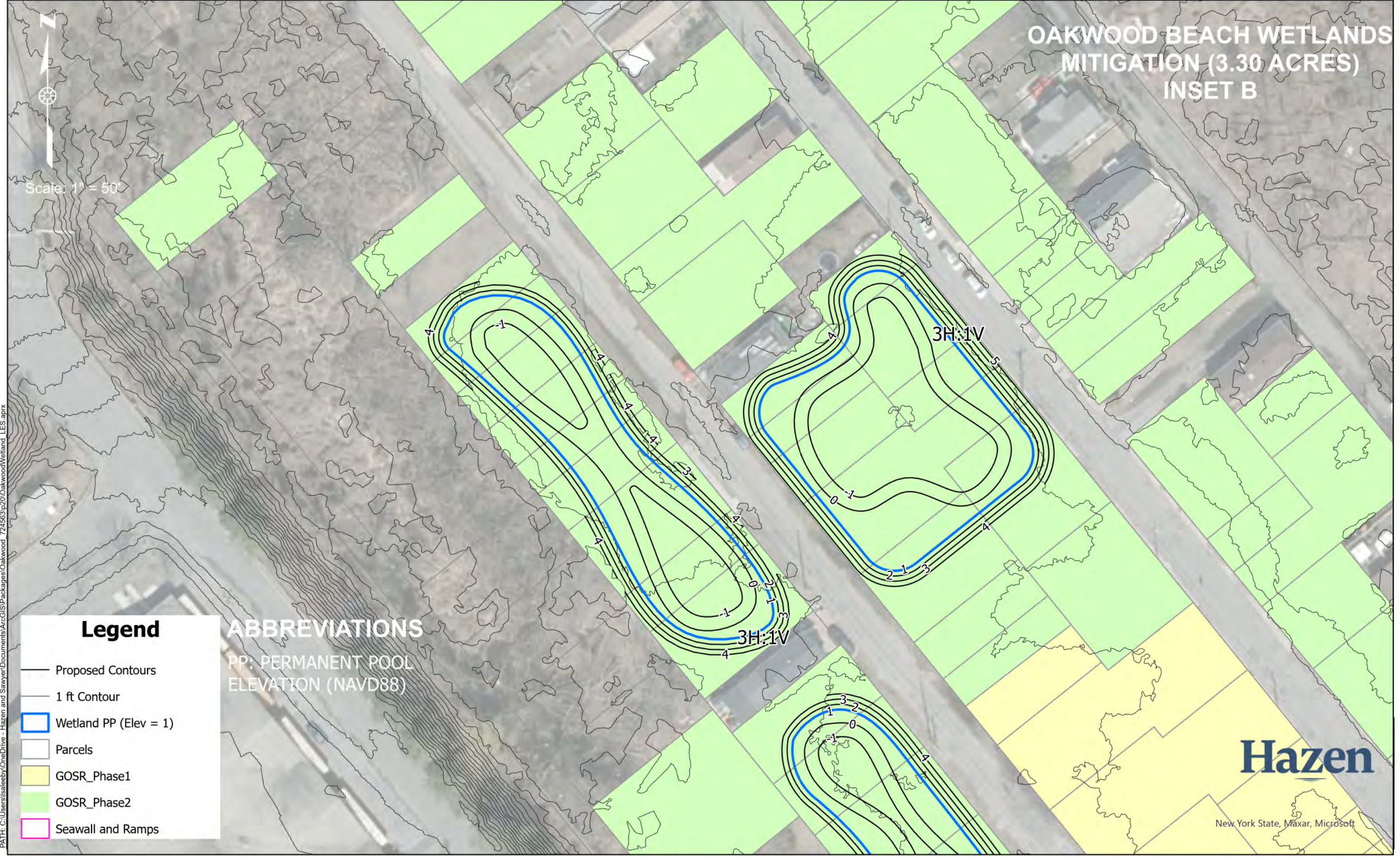


Figure 2c. Detail of proposed Wetlands C, D, and a part of E (Hazen and Sawyer 2024).

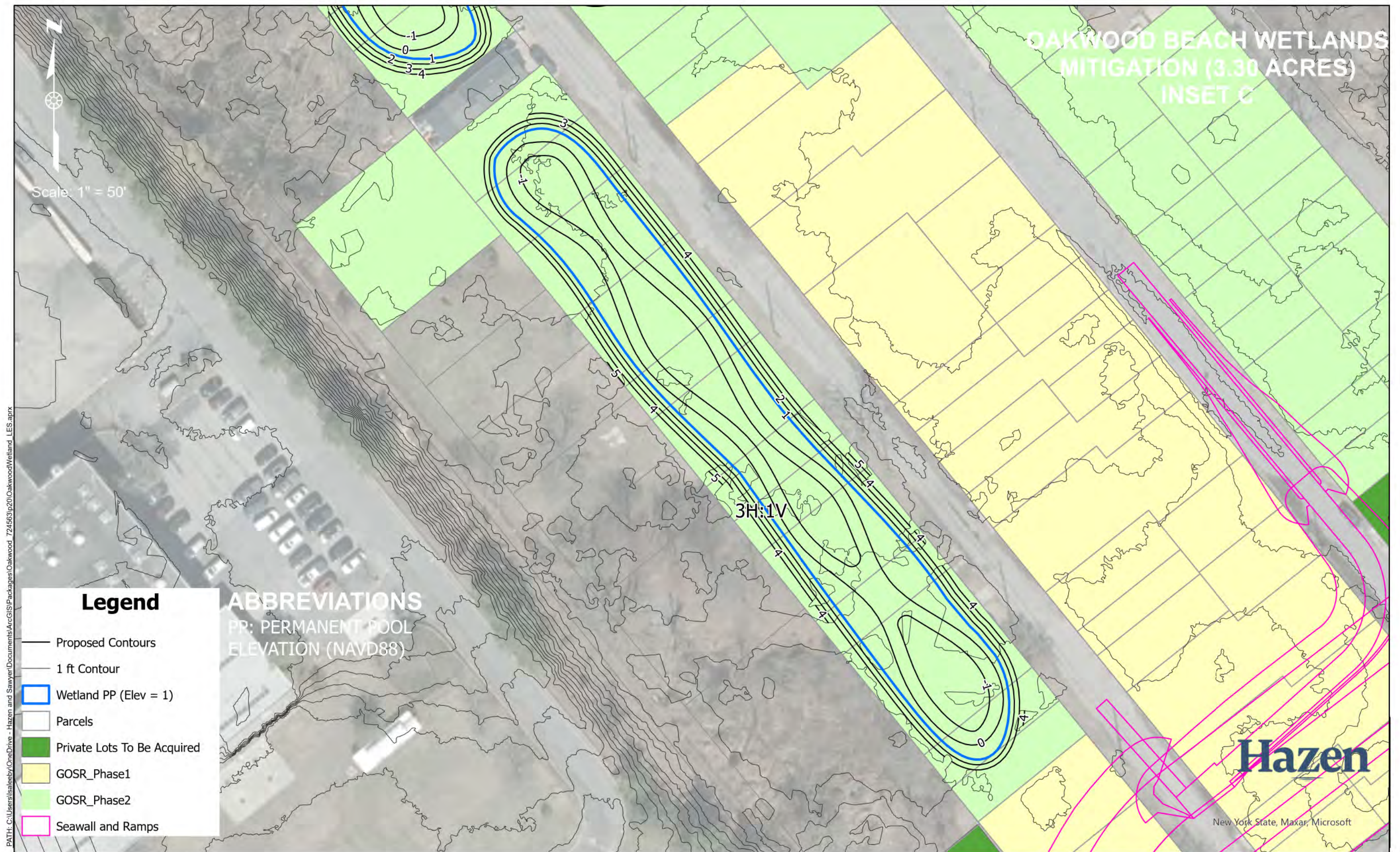


Figure 2d. Detail of proposed Wetland E (Hazen and Sawyer 2024).

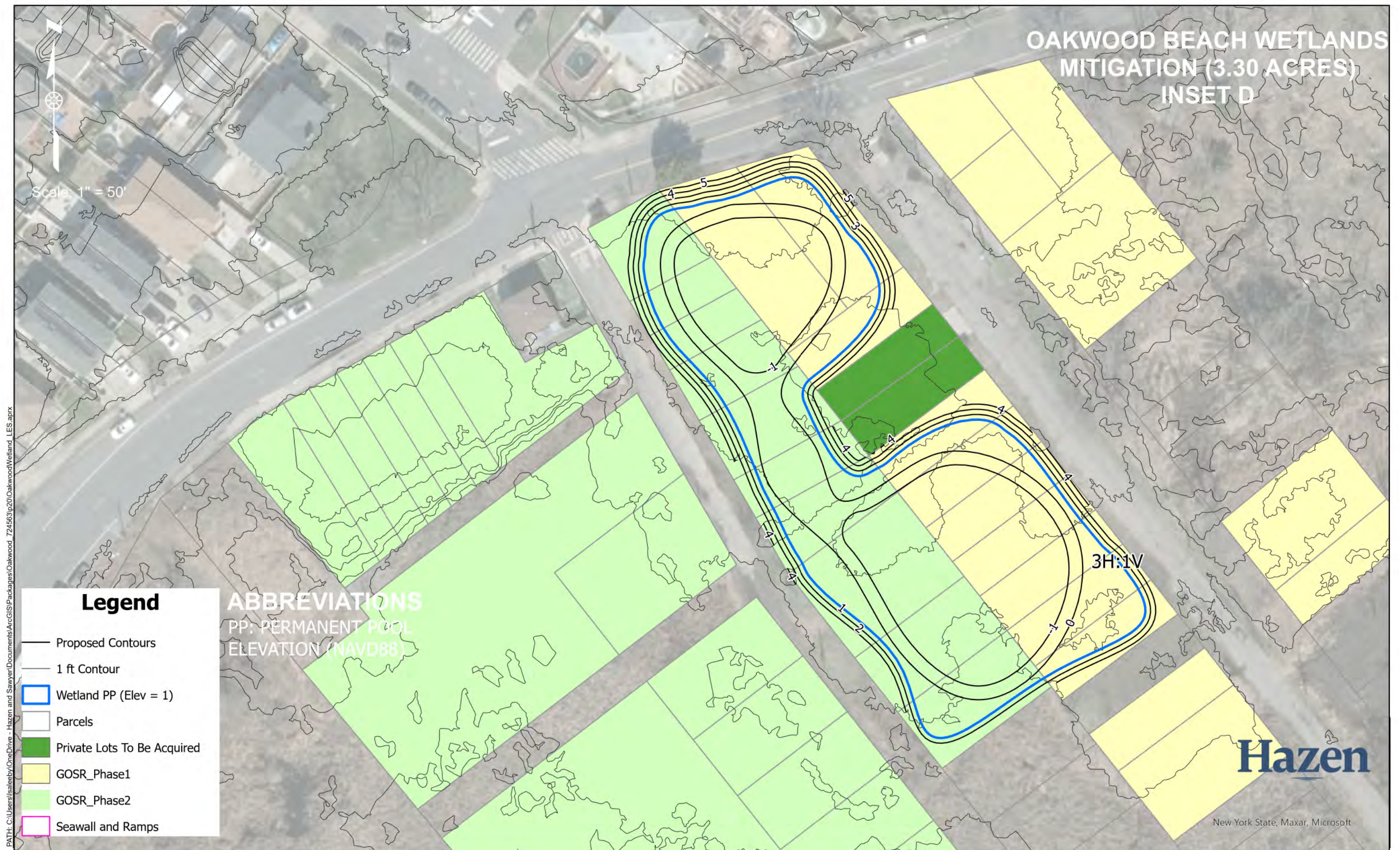
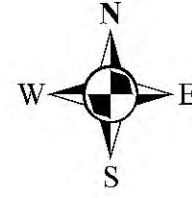


Figure 2e. Detail of proposed Wetland F (Hazen and Sawyer 2024).



NYC Digital Tax Map

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End Date : Current
Staten Island Block: 4754



Legend

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- Boundary Lines
- Lot Face Possession Hooks
- Regular
- Underwater
- Tax Lot Polygon
- Condo Number
- Tax Block Polygon

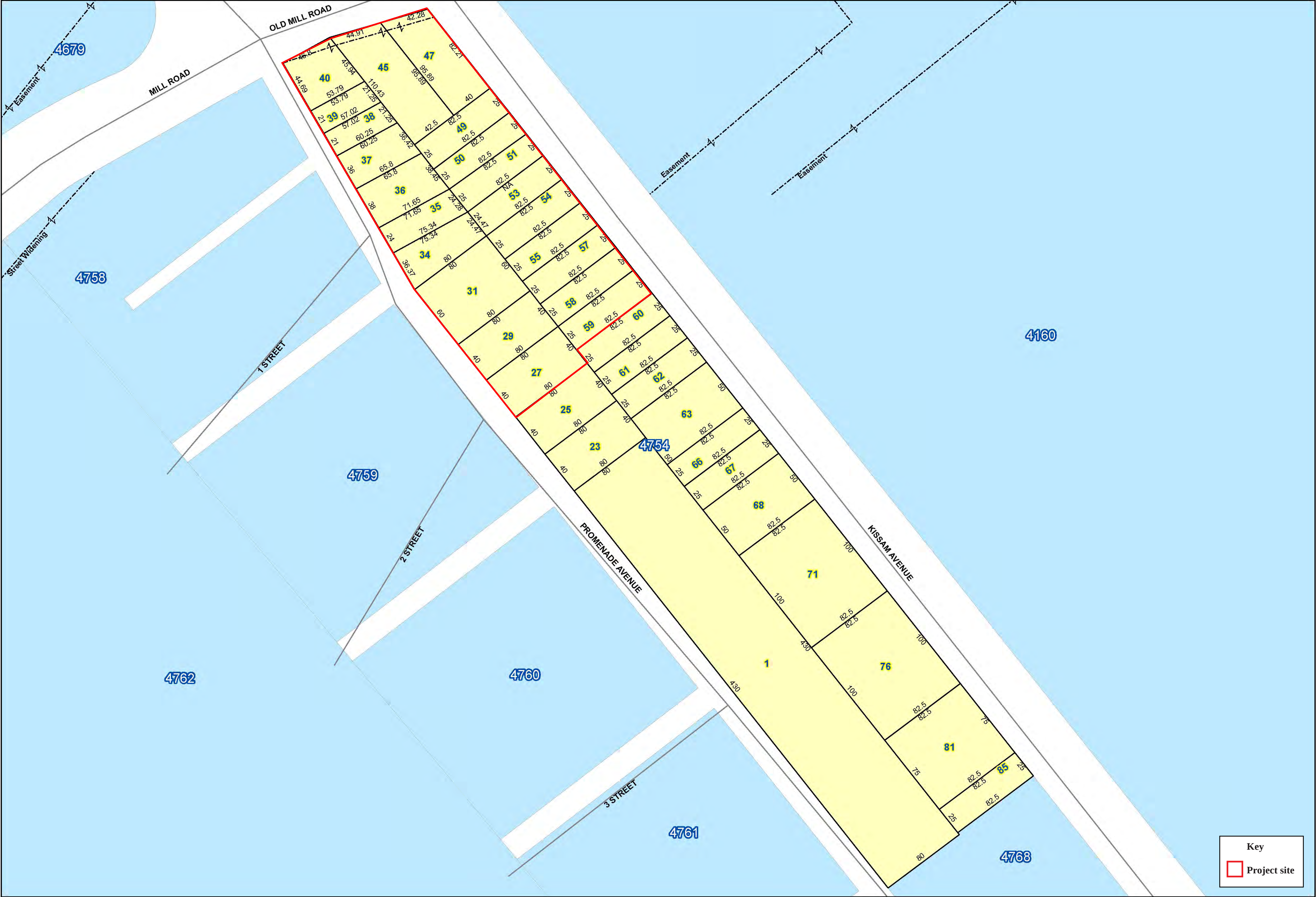


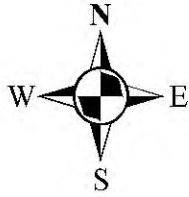
Figure 3a. Block 4754 project site on NYC Digital Tax Map (Department of Finance 2025).

Key

Project site

NYC Digital Tax Map

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End Date : Current
Staten Island Block: 4767



Legend

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- Boundary Lines
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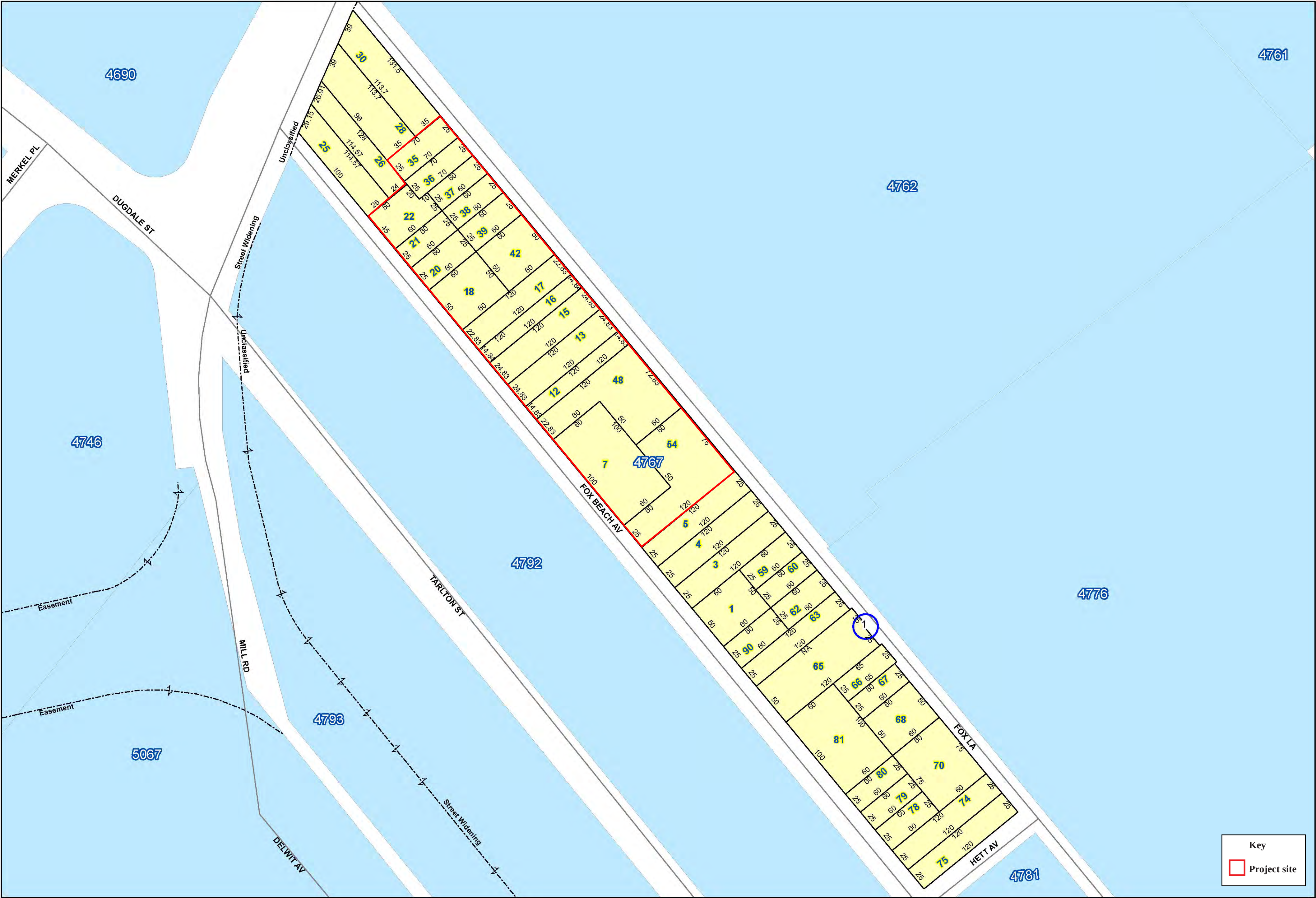


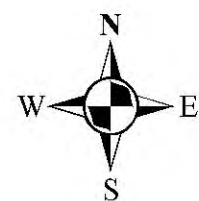
Figure 3b. Block 4767 project site on NYC Digital Tax Map (Department of Finance 2025).

NYC Digital Tax Map

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End Date : Current

Staten Island Block: 4792



Legend

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- Tax Block Polygon

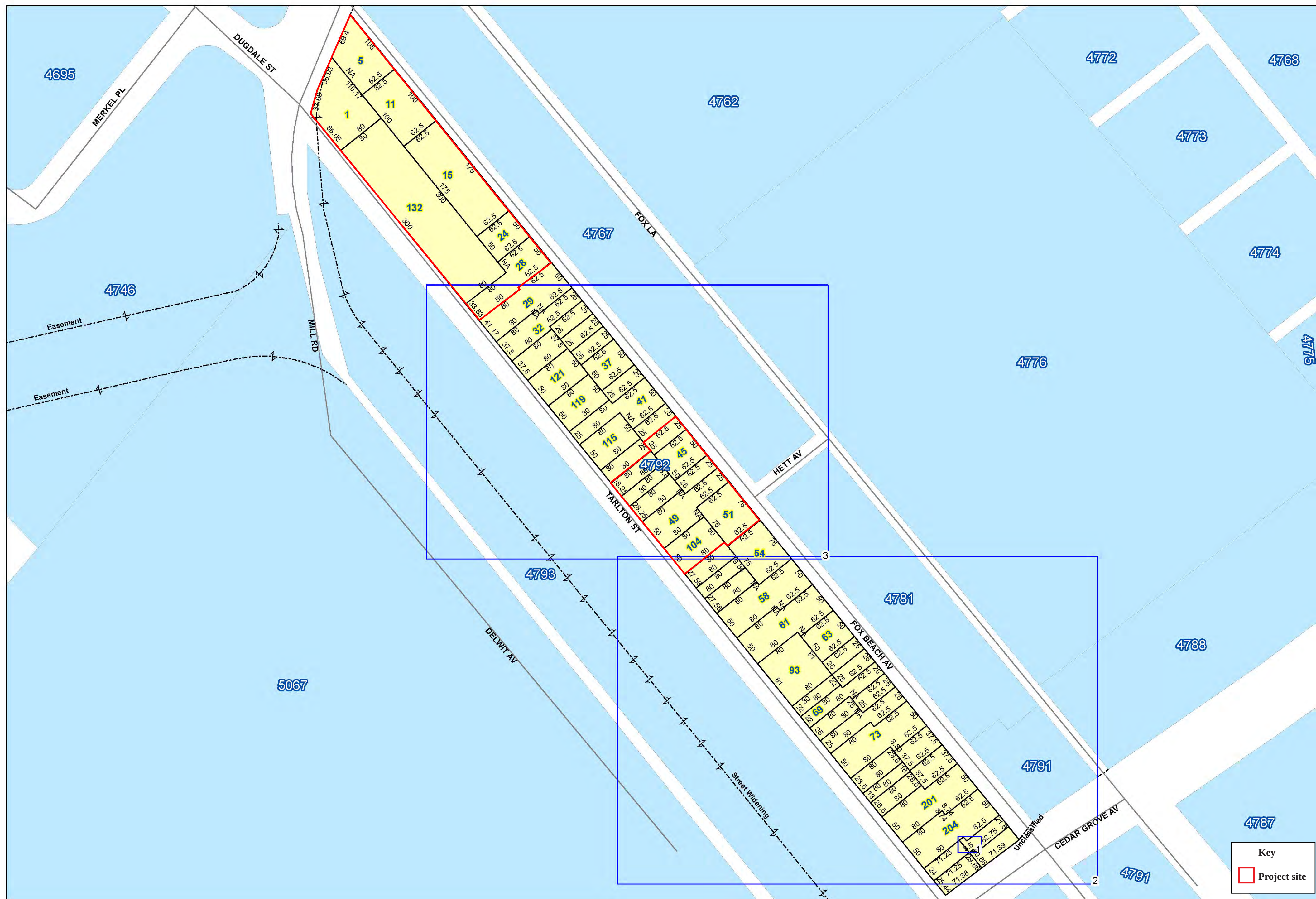
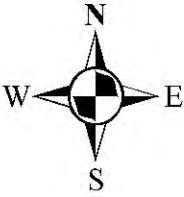


Figure 3c. Block 4792 project site on NYC Digital Tax Map (Department of Finance 2025).

NYC Digital Tax Map

Effective Date : 03-06-2009 10:48:10
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Legend

- Streets
- Miscellaneous Text
- Possession Hooks
- Boundary Lines
- Lot Face Possession Hooks
- Regular
- Underwater
- Tax Lot Polygon
- Condo Number
- Tax Block Polygon

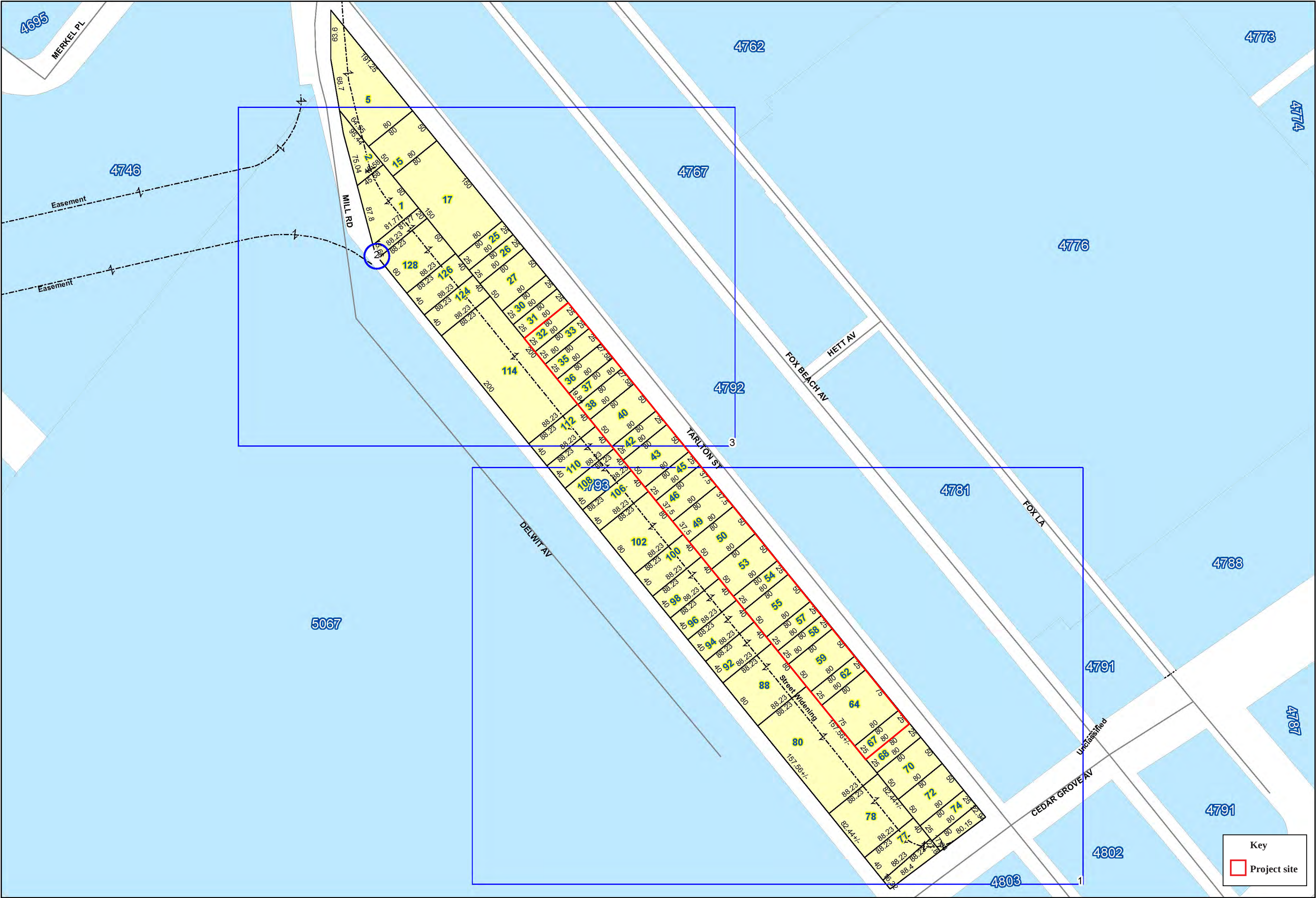
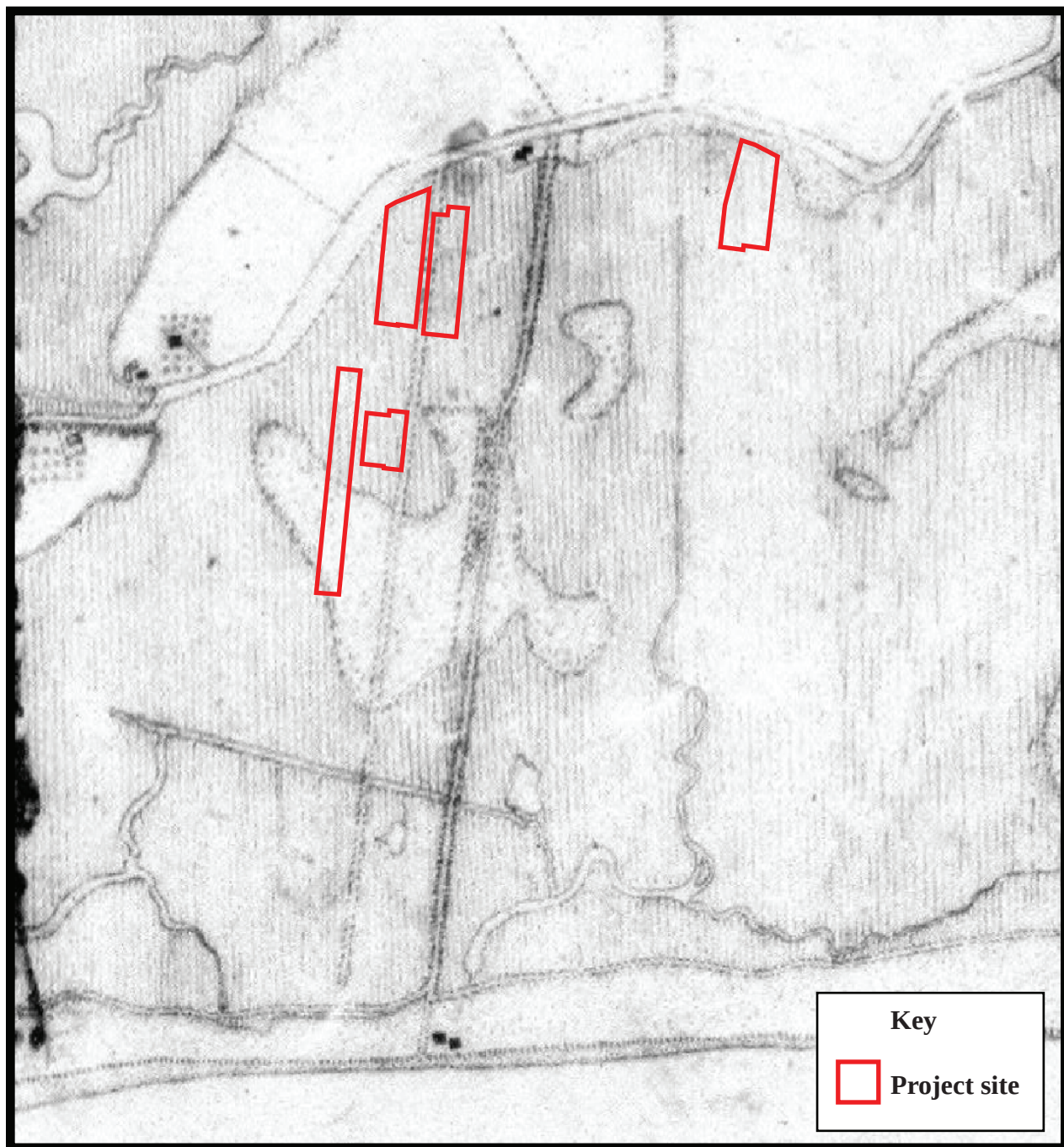


Figure 3d. Block 4793 project site on NYC Digital Tax Map (Department of Finance 2025).

[illegible]

Figure 4: Project site on web soil survey (U.S.D.A. 2025).

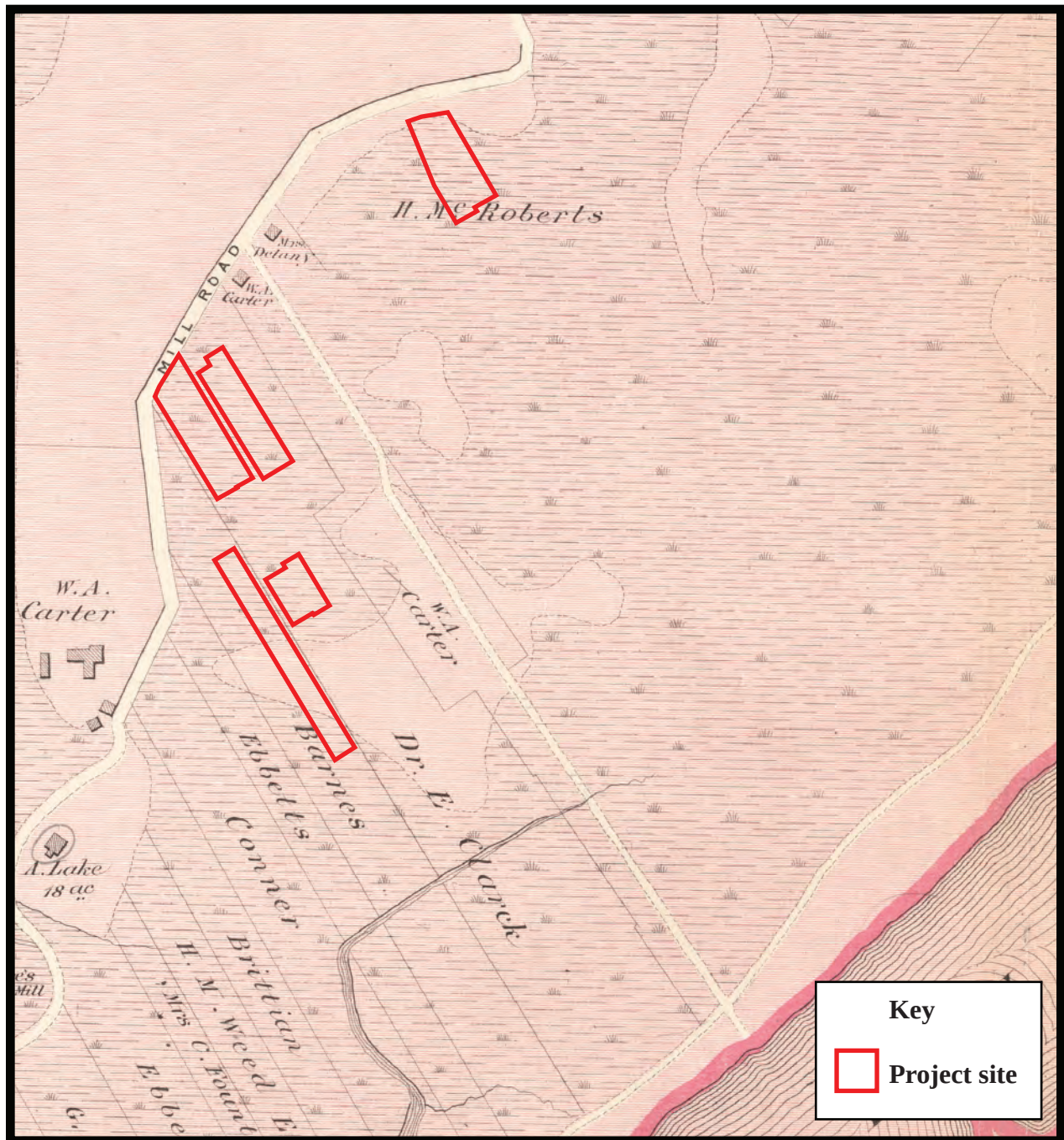


Phase IA Archaeological Documentary Study
Oakwood Beach Wetland Mitigation
Staten Island, Richmond County, New York



Figure 5: Project site on *Staten Island From New Brighton to Great Kills* (U.S.C.S. 1856).

0 250 500 750 1000 1250 FEET

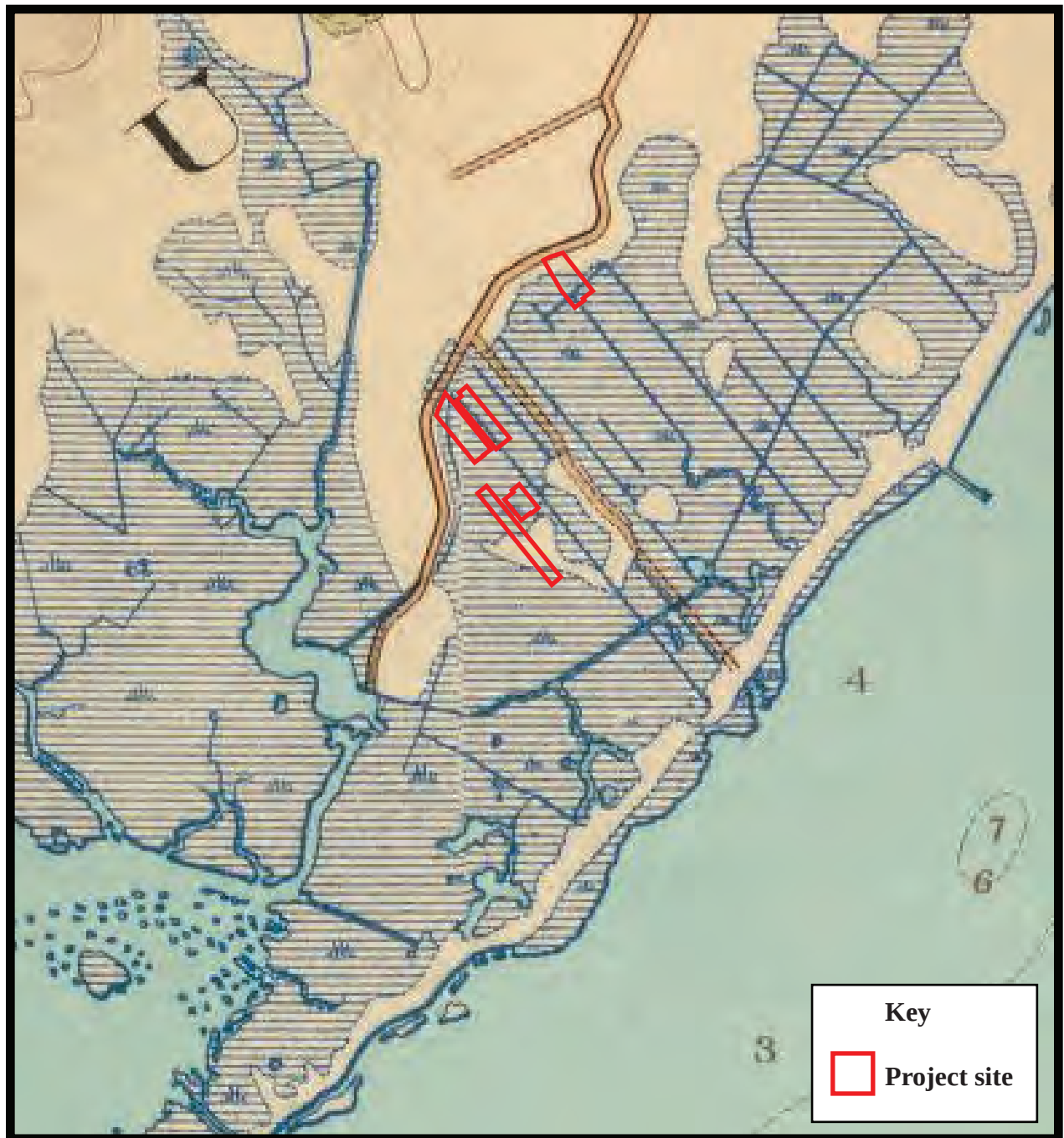


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Oakwood Beach Wetland Mitigation
Staten Island, Richmond County, New York



Figure 6: Project site on *Atlas of Staten Island, Richmond County, New York* (Beers 1874).

0 500 1000 1500 2000 2500 FEET

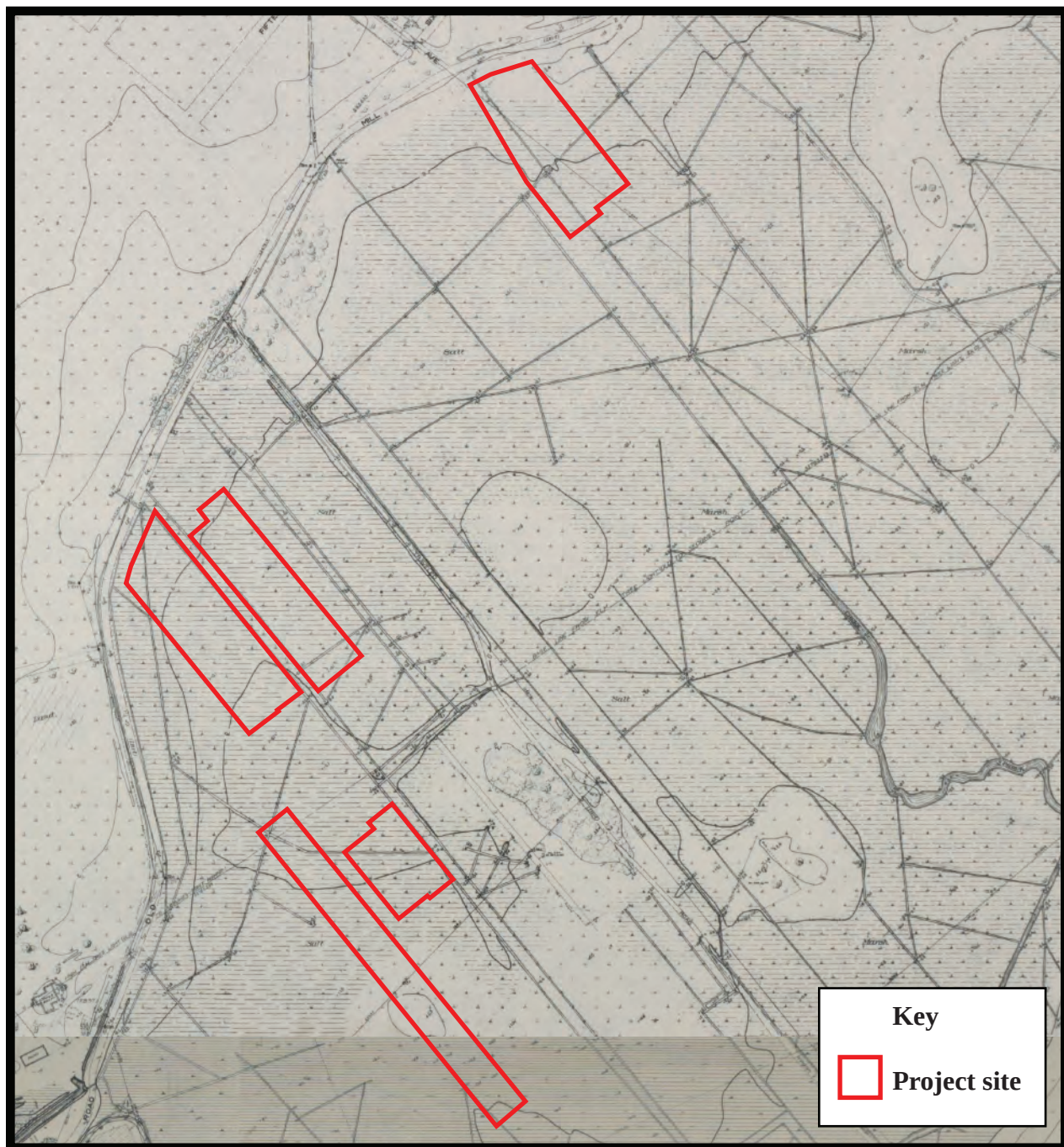


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Figure 7: Project site on *Atlas of the Metropolitan District and adjacent country...*
(Bien and Vermuele 1891).

0 500 1000 1500 2000 2500 FEET



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Staten Island, Richmond County, New York

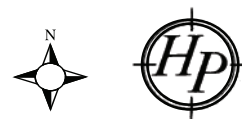


Figure 8: Project site on *Borough of Richmond Topographical Survey, Sheets 71 and 79* (Borough of Richmond 1911).

0 200 400 600 800 1000 FEET



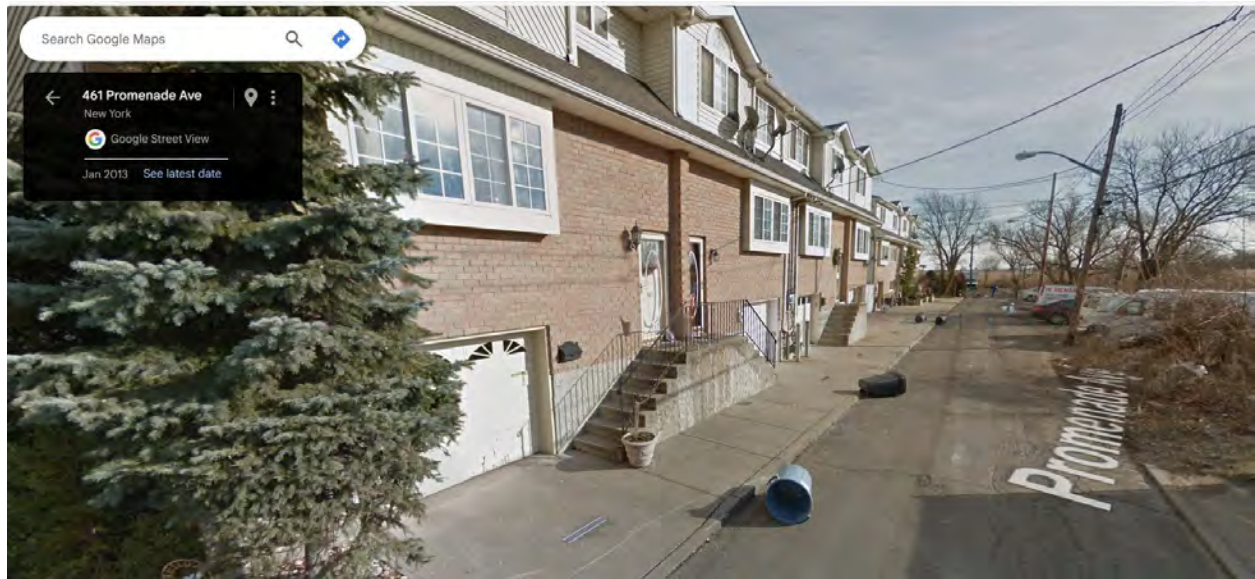
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 Staten Island, Richmond County, New York



Figure 9: Project site on *Sectional Aerial Maps of the City of New York* (Bureau of Engineering 1924).

0 500 1000 1500 2000 2500 FEET

PHOTOGRAPHS



Photograph 1. Promenade Avenue in 2013 with the Block 4754 project site lots on the left. View looking southeast from Old Mill Road.



Photograph 2. The same view of the Block 4794 project site lots in 2025.



Photograph 3. Fox Lane in 2013 with the Block 4767 project site lots on the right. View looking southeast.



Photograph 4. The same view of the Block 4767 project site lots in 2025.



Photograph 5. Fox Beach Avenue in 2013 with the Block 4767 project site lots on the left and the Block 4792 project site lots on the right. View looking southeast from Mill Road. Courtesy Google Street view.



Photograph 6. The same view of the Block 4767 and 4792 project site lots in 2025.



Photograph 7. Fox Beach Avenue in 2013 with the Block 4792 project site lots on the left. View looking northwest. Courtesy Google Street view.



Photograph 8. The same view of the Block 4792 project site lots in 2025.



Photograph 9. Tarlton Street in 2013 with the Block 4793 project site lots on the left side of the street. View looking northwest. Courtesy Google Street view.



Photograph 10. The same view of the Block 4793 project site lots in 2025.



Photograph 11. Tarlton Street in 2013 with the Block 4792 project site lots on the left and the Block 4793 project site lots on the right. View looking southeast. Courtesy Google Street view.



Photograph 12. The same view of the Block 4792 and 4793 project site lots in 2025.

APPENDIX A: PROJECT PLANS

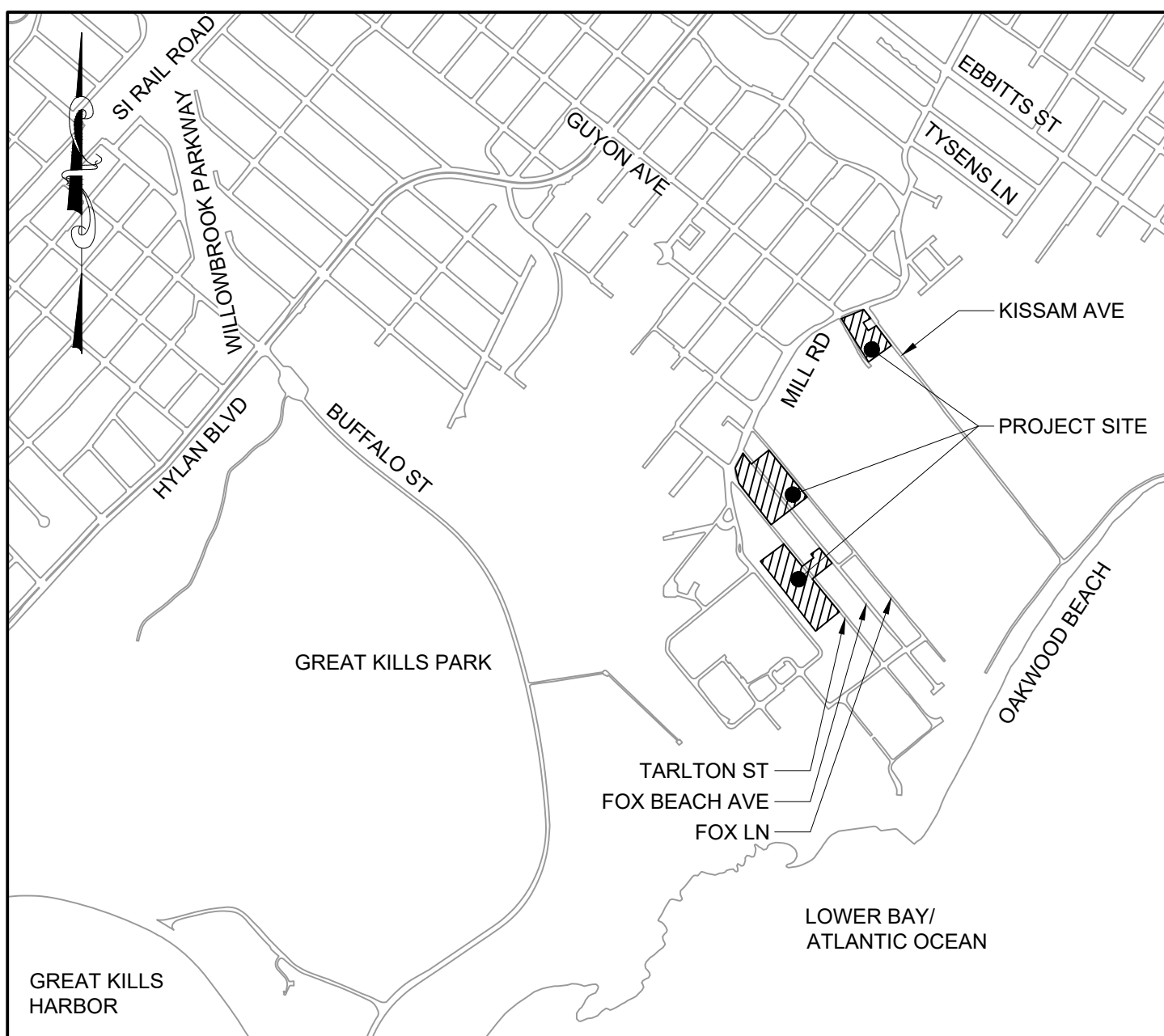
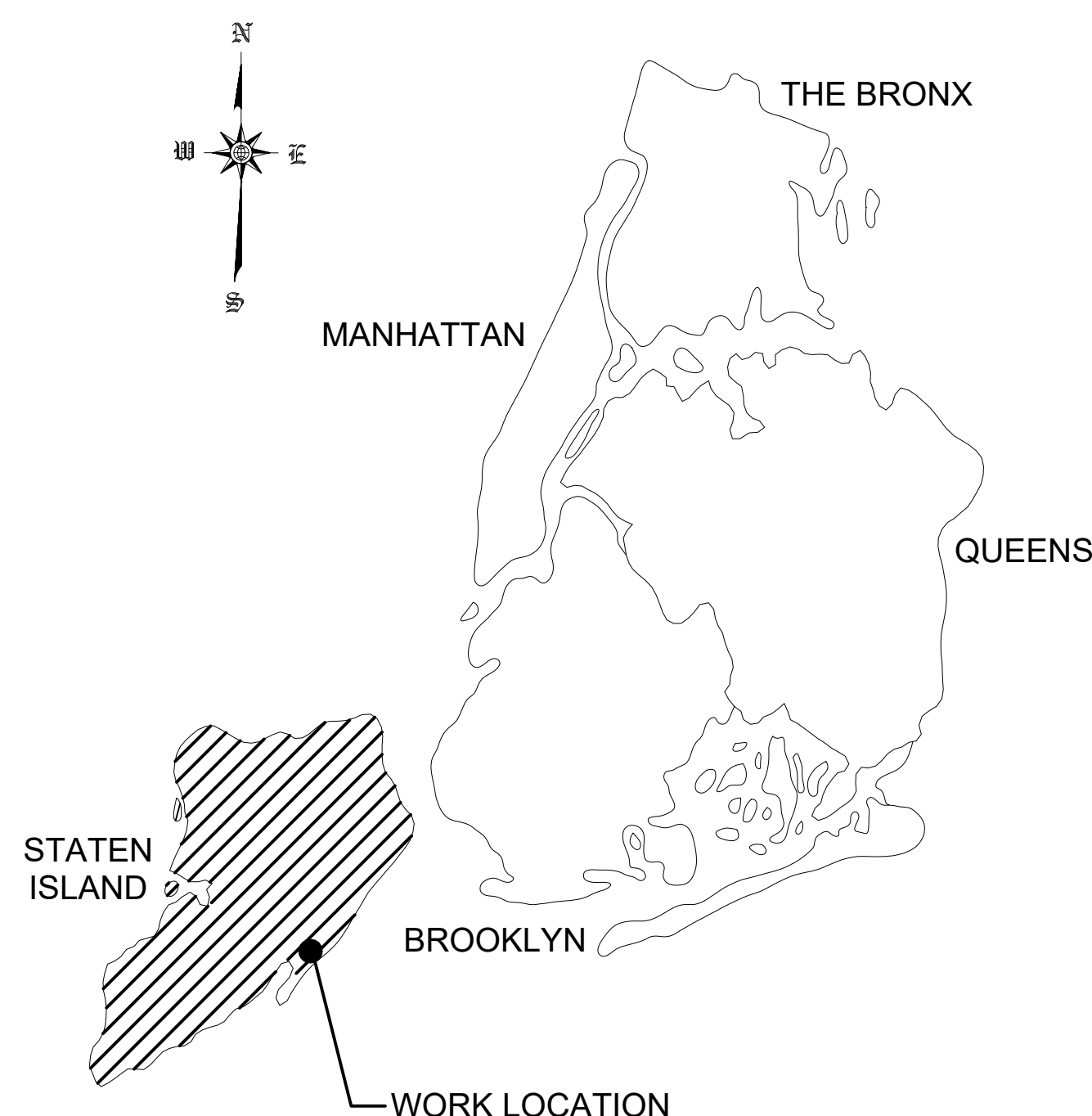


CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER AND SEWER OPERATIONS

CAPITAL PROJECT SER-200285 FORESTED WETLANDS MITIGATION AT OAKWOOD BEACH

CONSTRUCTION OF STORMWATER BEST MANAGEMENT PRACTICES
AND ASSOCIATED FACILITIES: OAKWOOD BEACH
BOROUGH OF STATEN ISLAND

JANUARY 2025



LOCATION MAP
NTS

APPROVED BY: SANGAMITHRA IYER, PE, CHIEF OF BLUEBELTS
AND URBAN STORMWATER PLANNING
NYCDEP DATE: _____

WARNING
IT IS A VIOLATION OF SECTION 2209.2 OF THE NEW YORK STATE
EDUCATION LAW FOR ANY PERSON, UNLESS ACTING UNDER THE
DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER IN
ANY WAY PLANS, SPECIFICATIONS, PLATS OR REPORTS TO WHICH
THE SEAL OF A PROFESSIONAL ENGINEER HAS BEEN APPLIED. IF AN
ITEM BEARING THE SEAL OF A PROFESSIONAL ENGINEER IS ALTERED,
THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL, AND
THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, THE
DATE, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

Hazen
HAZEN AND SAWYER
498 SEVENTH AVENUE, 11TH FLOOR
NEW YORK, NEW YORK 10018

SCAPE
SCAPE/LANDSCAPE
ARCHITECTURE DPC
277 BRONXWAY, 8th Floor
NEW YORK, NY 10468
T: 212 462-2028 F: 212 462-4164
info@scapelandscape.com

100% SUBMITTAL
DRAWINGS
DO NOT USE FOR CONSTRUCTION

GENERAL NOTES

- TOPOGRAPHIC NOTES:
- ALL ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM 1988. HORIZONTAL DATUM USED IS NEW YORK LONG ISLAND STATE PLANE NORTH AMERICAN DATUM 1983.
 - EXISTING TOPOGRAPHIC CONDITIONS OF THE WORK SITE, AS SHOWN ON THE CONTRACT DRAWINGS, ARE OBTAINED FROM THE MOST CURRENT INFORMATION AVAILABLE BUT ARE NOT GUARANTEED TO BE ACCURATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY EXISTING AND PROPOSED GRADES.
 - SITE SURVEY WAS PERFORMED BY MATRIX NEW WORLD ENGINEERING FROM 06/03/2024 TO 08/02/2024.
- UTILITY NOTES:
- EXISTING UNDERGROUND AND OVERHEAD UTILITIES AS SHOWN OR DESCRIBED HEREIN HAVE BEEN DETERMINED BY STANDARD SURVEYING METHODS, FIELD RECONNAISSANCE AND AVAILABLE RECORDS. NEITHER THE EXACT LOCATION NOR THE INFORMATION OF THESE EXISTING UTILITIES IS GUARANTEED TO BE COMPLETE OR CORRECT.
 - EXCAVATION AND FILL IN AREAS WHERE UTILITIES ARE PRESENT SHALL BE DONE WITH UTMOST CARE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN EXISTING GAS, ELECTRIC, TELEPHONE, COMMUNICATIONS, SEWER, AND WATER LINES. ANY DAMAGE OR INJURY RESULTING FROM THIS OPERATION TO UTILITY LINES SHALL BE REPAIRED IMMEDIATELY AT NO COST TO THE CITY.
 - THE CONTRACTOR SHALL COORDINATE HIS WORK WITH UTILITY COMPANIES AND AGENCIES PRIOR TO THE START OF WORK.
 - UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEY INFORMATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THEIR EXACT LOCATION AND TO AVOID DAMAGE TO THEM. THE CONTRACTOR SHALL CONTACT NEW YORK 811 AT PHONE NUMBER 811 OR 1-800-272-4480 TO REQUEST UNDERGROUND UTILITY LOCATION MARK-OUT AT LEAST TWO (2) WORKING DAYS BUT NO MORE THAN TEN (10) WORKING DAYS PRIOR TO BEGINNING EXCAVATION, INCLUDING SOIL DRILLING. THE CONTRACTOR SHALL ALSO CONTACT AND REQUEST UTILITY LOCATION MARK-OUT FROM BURIED UTILITY OWNERS WITH UTILITIES ON THE PROJECT SITE THAT ARE NOT PARTICIPANTS OF NEW YORK 811.
- EROSION AND SEDIMENT CONTROL:
- THE IMPACTS TO ADJACENT NATURAL AREAS DUE TO EROSION AND SEDIMENTATION FROM STREAM RESTORATION AND ASSOCIATED BMP CONSTRUCTION WITHIN THIS CONTRACT SHALL NOT BE ANY GREATER DURING AND FOLLOWING LAND DISTURBANCE ACTIVITIES THAN UNDER PRE-CONSTRUCTION CONDITIONS.
 - EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED PRIOR TO BEGINNING ANY LAND DISTURBANCES AS REQUIRED BY THE SOIL EROSION AND SEDIMENTATION CONTROL PLAN. ALL RUNOFF FROM DISTURBED AREAS SHALL BE DIRECTED TO THE SEDIMENT CONTROL DEVICES. THESE DEVICES SHALL NOT BE REMOVED UNTIL THE DISTURBED LAND AREAS ARE STABILIZED.
 - ALL WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE "NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL", 2016 1ST EDITION, OR LATEST EDITION.
 - CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE ENGINEER, OWNER, AND REGULATORY AGENCIES FOR DEVIATIONS FROM THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
 - NO LAND DISTURBANCE, DEMOLITION OR CONSTRUCTION ACTIVITIES SHALL BEGIN UNTIL ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES, INCLUDING, BUT NOT LIMITED TO, SILT FENCING, INLET PROTECTION, TEMPORARY DIVERSIONS, SEDIMENT BASIN, AND TREE PROTECTION HAVE BEEN INSTALLED AS SHOWN ON THE CONTRACT DRAWINGS. IF CLEARING IS REQUIRED FOR INSTALLATION OF A PARTICULAR MEASURE, ALL MEASURES NOT REQUIRING CLEARING SHALL BE INSTALLED FIRST. CLEARING OF THE NECESSARY LAND FOR INSTALLATION OF THE PARTICULAR MEASURE MAY THEN PROCEED.
 - CLEARING SHALL BE LIMITED AS MUCH AS POSSIBLE TO AREAS REQUIRED FOR CURRENT CONSTRUCTION ACTIVITIES. MASS CLEARING AND GRADING SHALL BE AVOIDED.
 - ALL EROSION CONTROL MEASURES SHALL BE INSPECTED BY A QUALIFIED INSPECTOR WITHIN 24 HOURS FOLLOWING EVERY RAINFALL, BUT IN NO CASE LESS THAN ONCE EVERY SEVEN CALENDAR DAYS.
 - EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REPAIRED OR REPLACED IMMEDIATELY AS REQUIRED TO MAINTAIN PERFORMANCE OF MEASURE. MEASURES SHALL BE CLEANED WHEN SEDIMENT VOLUME REACHES ⅓ OF TOTAL VOLUME OF MEASURE. REMOVED SEDIMENT SHALL BE DISPOSED OF IN SUCH A MANNER AND LOCATION AS TO INSURE FURTHER SEDIMENT TRANSPORT DOES NOT OCCUR.
 - CONTRACTOR SHALL INITIATE STABILIZATION MEASURES AS SOON AS PRACTICABLE ON STOCKPILES AND IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN 7 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. THIS REQUIREMENT DOES NOT APPLY IN THE FOLLOWING INSTANCES:
 - WHERE THE INITIATION OF STABILIZATION MEASURES BY THE 7TH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASED IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE;
 - WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN FOURTEEN (14) DAYS, TEMPORARY STABILIZATION MEASURES NEED NOT BE INITIATED ON THAT PORTION OF THE SITE.
 - ALL DISTURBED AREAS SHALL DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBANCE ACTIVITIES AND UNTIL FINAL STABILIZATION IS ACHIEVED. SEDIMENT-LADEN GROUNDWATER ENCOUNTERED DURING TRENCHING, BORING, OR OTHER ACTIVITIES SHALL BE PUMPED INTO A SEDIMENT TRAPPING DEVICE PRIOR TO BEING DISCHARGED INTO A STREAM, POND, SWALE, OR CATCH BASIN.
 - SOIL STOCKPILE AND LAYDOWN AREAS SHALL HAVE PERIMETER SEDIMENT CONTROL MEASURES AND TEMPORARY OR PERMANENT STABILIZATION MEASURES INSTALLED AS SOON AS POSSIBLE AND AT COMPLETION OF STOCKPILING AND LAYDOWN ACTIVITIES. STOCKPILE SIDE SLOPES SHALL NOT EXCEED 3:1 V UNLESS APPROVED BY ENGINEER. TOP OF STOCKPILE SHALL BE GRADED WITH A MINIMUM 5% SLOPE TO INSURE PROPER DRAINAGE.
 - ALL DISTURBED AREAS, EXCEPT FOR CONCRETE AND PAVED AREAS, SHALL BE FERTILIZED, SEEDED AND MULCHED IN ACCORDANCE WITH THE SPECIFICATIONS AND THE SEEDING SCHEDULE, AND RE-SEEDED AS NECESSARY, TO ESTABLISH AND MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER.
 - ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED TO PREVENT THE DEPOSITION OF MATERIALS ONTO TRAVERSED OFFSITE ROADWAYS. IF MATERIAL IS TRACKED ONTO OFFSITE ROADWAYS, IT SHALL BE REMOVED IMMEDIATELY. DO NOT UTILIZE A WATER HOSE TO CLEAN ROADS UNLESS THE RUNOFF IS DIRECTED TO A PROPERLY DESIGNED AND FUNCTIONING SEDIMENT CONTROL DEVICE. PROPER PRECAUTIONS SHALL BE TAKEN TO ENSURE THAT MATERIALS DEPOSITED ONTO OFFSITE ROADWAYS ARE REMOVED SO THAT THEY DO NOT ENTER YARD INLETS, CATCH BASINS, SEWERS, WETLANDS, SURFACE WATER BODIES, OR ROADSIDE SWALES.
 - WHERE CONCRETE EQUIPMENT WASHING IS REQUIRED, THIS MUST BE DONE IN AN APPROVED "CONCRETE CONTAINMENT AREA". CONTRACTOR SHALL NOT DISCHARGE ANY CONCRETE WASHOUT WATER INTO SEWERS, SURFACE WATER BODIES OR ONTO THE GROUND. ALL WASHOUT WATER MUST BE REMOVED FROM THE SITE(S) DAILY.
 - EARTHEN-MATERIAL STOCKPILES MUST BE LOCATED A MINIMUM OF 50' FROM STORM DRAINS AND STREAMS UNLESS NO REASONABLE ALTERNATIVES ARE AVAILABLE.
 - DEDICATED AREAS FOR DEMOLITION, CONSTRUCTION, AND OTHER WASTES MUST BE LOCATED A MINIMUM OF 50' FROM STORM DRAINS AND STREAMS UNLESS NO REASONABLE ALTERNATIVES ARE AVAILABLE.
 - PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES. DO NOT UTILIZE A FIRE OR GARDEN HOSE TO CLEAN ROADS UNLESS THE RUNOFF IS DIRECTED TO A PROPERLY DESIGNED AND FUNCTIONING SEDIMENT CONTROL DEVICE. WATER PUMPED OUT OF THE EXCAVATED AREAS CONTAINS SEDIMENTS THAT MUST BE REMOVED PRIOR TO DISCHARGING TO RECEIVING BODIES OF WATER USING REMOVABLE PUMPING STATIONS, PUMP PITS, PORTABLE SEDIMENTATION TANKS AND/OR SILT CONTROL BAGS.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, INSTALLATION, PERMITTING, AND OPERATION OF A DEWATERING SYSTEM AS REQUIRED FOR THE COMPLETION OF THE WORK. PROCEDURES FOR DEWATERING INCLUDING ASSOCIATED EROSION AND SEDIMENT CONTROL PROPOSED BY THE CONTRACTOR SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO ANY EARTHWORK OPERATIONS. ALL WATER REMOVED BY DEWATERING OPERATIONS SHALL BE DISPOSED OF IN ACCORDANCE WITH THE ILLINOIS PROCEDURES AND STANDARDS FOR URBAN SOIL EROSION AND SEDIMENT CONTROL. CONTRACTOR MAY USE PORTABLE SETTLING TANK, SEDIMENT FILTER BAG, OR OTHER APPROVED METHOD TO SETTLE DEWATERING FLOW OF SEDIMENT BEFORE DISCHARGE.
 - ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE. PERMANENT VEGETATION IS ESTABLISHED ON ALL DISTURBED AREAS, AND LOCAL AUTHORITIES HAVE GIVEN PERMISSION FOR REMOVAL.
- GENERAL:
- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL ITEMS REQUIRED TO COMPLETE ALL WORK ACCORDING TO PLANS AND SPECIFICATIONS.
 - SLOPE, X:Y,

X

Y
 - CONTRACTOR SHALL REPLACE ANY LOST OR DAMAGED SIGNS.
 - CONTRACTOR SHALL REPAINT ROADMARKINGS AFTER COMPLETION OF WORK.
 - SIGN LOCATIONS (AS SHOWN ON THE CONTRACT DRAWINGS) ARE APPROXIMATE. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER.
 - ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DRAWINGS, AND UPON APPROVAL OF THE PROJECT ENGINEER AND THE DEP REPRESENTATIVE. STAKE OUT AND RECEIVE APPROVAL FROM THE DEP REPRESENTATIVE FOR THE LIMITS OF WORK, DEWATERING PROCEDURES, SHARP, ALL SEDIMENT AND EROSION CONTROL PROCEDURES, AND NECESSARY TREE GUARDS BEFORE BEGINNING ANY CLEARING.
 - A GEOTECHNICAL INVESTIGATION SHALL BE PERFORMED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE GEOTECHNICAL INVESTIGATION SHALL INCLUDE BORINGS AND A GEOTECHNICAL REPORT. EACH STRUCTURE SHALL BE A MINIMUM OF 2 BORINGS LOCATED AS SHOWN TO A MINIMUM DEPTH OF 35 FEET OR REFUSAL WITH CONTINUOUS SAMPLING. THE GEOTECHNICAL REPORT SHALL INCLUDE BORING LOGS, SOIL TESTING RESULTS, BEARING CAPACITY AND BEARING ELEVATION, SOIL PROPERTIES, RECOMMENDATIONS ON FOUNDATION TYPE, DEWATERING TECHNIQUES AND SUBGRADE PREPARATION RECOMMENDATIONS. SCOUR SHALL BE CONSIDERED IN THE FOUNDATION RECOMMENDATION. THE GEOTECHNICAL REPORT SHALL BE SIGNED AND SEALED BY AN ENGINEER LICENSED IN THE STATE OF NEW YORK. THE GEOTECHNICAL REPORT SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER AND

THE OWNER, THE CONTRACTOR MAY BE REQUIRED TO REVISE THE DESIGN IN ORDER TO COMPLY WITH RECOMMENDATIONS MADE BY THE GEOTECHNICAL ENGINEER. ALL MODIFICATIONS ARE TO BE SUBMITTED TO THE OWNER AND ENGINEERING FOR REVIEW.

GRADING NOTES

- ELEVATIONS SHOWN ARE REFERENCED TO NAVD 1988 (GEOID 18) DATUM. CONVERSION EQUATION FROM NAVD 1988 TO NAD83 BOROUGH OF RICHMOND SEWER/HIGHWAY DATUM (RICHMOND DATUM): RICHMOND DATUM = ELEVATION (NAVD 1988) - 2.092 FEET.
- THE CONTRACTOR SHALL LAYOUT AND DETERMINE THE ELEVATIONS OF ALL SITE ELEMENTS AND PROPOSED UTILITIES BASED ON CONTRACT DRAWINGS FOR APPROVAL BY THE LANDSCAPE ARCHITECT AND FIELD ENGINEER PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES IN WRITING TO THE CONSTRUCTION MANAGER. THE CONTRACTOR SHALL PROVIDE ELEVATIONS SIMULTANEOUSLY WITH LAYOUT.
- THE CONTRACTOR SHALL FIELD VERIFY GRADES AND NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES FOR RESOLUTION PRIOR TO STARTING CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL NOT PROCEED UNDER UNCERTAINTY AND SHALL ASSUME FULL RESPONSIBILITY OF ALL COSTS FOR REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATIONS.
- TO ENSURE SUCCESS OF WETLAND, CONTRACTOR SHALL GRADE SITE IN STRICT COMPLIANCE WITH THE CONTRACT DRAWINGS. MAXIMUM TOLERANCE SHALL BE 6".
- GRADING TO BE BENCHMARKED AND VERIFIED WITH SURVEY EQUIPMENT.
- ALL GRADING SHALL BE COMPLETED IN A WAY TO MAINTAIN POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES. THE CONTRACTOR SHALL REPORT ANY CONFLICTS WITH THIS REQUIREMENT TO THE CONSTRUCTION MANAGER FOR RESOLUTION PRIOR TO FINAL GRADING OPERATIONS.
- DURING THE REVIEW OF ROUGH GRADING AND FINISH GRADE GRADING STAKES, THE LANDSCAPE ARCHITECT MAY MAKE MINOR ADJUSTMENTS TO ROUGH GRADING WITHOUT INCURRING ADDITIONAL COST TO THE PROJECT.
- WHERE NEW CONSTRUCTION ABUTS EXISTING CURB OR PAVEMENTS, THE EXISTING MATERIAL SHALL BE CLEANLY SAW CUT TO PROVIDE A FLUSH AND NEAT MATCH WITH NO TIP HAZARD.
- THE CONTRACTOR SHALL ADJUST ALL UTILITY ELEMENTS OR COVERS (INCLUDING BUT NOT LIMITED TO: CLEAN OUTS, MANHOLES, CATCH BASINS, INLETS, GATE VALVES) TO BE FLUSH WITH THE FINAL FINISH GRADE WHETHER SHOWN ON THE DRAWINGS OR NOT.
- SEE CIVIL ENGINEERING DRAWINGS FOR ALL CLEARING AND SEDIMENT CONTROL PLANS, GEOMETRY PLANS, AND PROFILES.

TREE PROTECTION NOTES

- NOTIFY AND COORDINATE WITH THE BOROUGH FORESTER OR THEIR REPRESENTATIVE A MINIMUM OF 48 HOURS IN ADVANCE OF ANY WORK ON EXISTING NYC TREES, INCLUDING BUT NOT LIMITED TO TREE PROTECTION, PRUNING, TREE REMOVAL, EXCAVATION WITHIN TREE PROTECTION ZONES, DECOMPACTION, TOPSOIL, AND PLANTING WORK. FOR ALL OTHER TREES THAT MAY BE IMPACTED THAT ARE NOT UNDER NYC PARKS JURISDICTION, NOTIFY AND COORDINATE WITH THE ENGINEER. THIS COORDINATION DIRECTION SHALL APPLY TO ALL TREE PROTECTION NOTES.
- NO LAND DISTURBANCE, DEMOLITION, OR CONSTRUCTION ACTIVITIES SHALL BEGIN UNTIL ALL TREE PROTECTION MEASURES HAVE BEEN INSTALLED AS SHOWN ON THE CONTRACT DRAWINGS.
- CONSTRUCTION ACCESS ROUTE SHALL BE FINALIZED ON SITE AND APPROVED BY THE RESIDENT ENGINEER, IN CONSULTATION WITH THE BOROUGH FORESTER OR THEIR REPRESENTATIVE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL EXISTING TREES NOT LISTED FOR REMOVAL THAT ARE LOCATED COMPLETELY OR PARTIALLY WITHIN THE CONTRACT LIMIT LINE.
- TAKE EXTREME CARE TO PROTECT THE ROOT SYSTEMS OF EXISTING TREES. MATERIAL, EQUIPMENT, OR VEHICLES SHALL NOT BE STOCKPILED OR PARKED WITHIN THE CRITICAL ROOT ZONE (CRZ) OF ANY TREE COMPLETELY OR PARTIALLY WITHIN THE CONTRACT LIMIT LINE TO MINIMIZE SURFACE AND SUBSURFACE ROOT AND SOIL. NO CONSTRUCTION, IF STOCKPILING OCCURS WITHIN THE CRZ, A STOP WORK ORDER SHALL BE ISSUED IMMEDIATELY, AND WORK SHALL NOT RE-COMMENCE UNTIL ALL STOCKPILED MATERIAL IS REMOVED FROM THE CRZ AND MITIGATION MEASURES ARE PERFORMED TO THE SATISFACTION OF THE RESIDENT ENGINEER IN CONSULTATION WITH THE BOROUGH FORESTER OR THEIR REPRESENTATIVE.
- IF DIRECTED, THE CRZ SHALL BE COVERED WITH WOOD CHIPS TO A DEPTH OF AT LEAST SIX (6) INCHES, WITH PLYWOOD OR GROUND PROTECTION MATS, OR A COMBINATION THEREOF, SUCH COVERING SHALL BE MAINTAINED FOR THE DURATION OF THE CONTRACT AND IS NOT TO BE REMOVED UNTIL DIRECTED BY THE BOROUGH FORESTER OR THEIR REPRESENTATIVE. REMOVAL SHALL BE BY HAND OR AS SPECIFIED BY THE BOROUGH FORESTER OR THEIR REPRESENTATIVE (ITEM "PROTECT EXIST. TREE ROOTS W/ WOOD CHIPS 6" DEPTH" AND "PROTECT EXIST. TREE ROOTS W/ PLYWOOD").
- TEMPORARY WOODEN TREE GUARDS WITH WRAP FOR INDIVIDUAL TREES, TEMPORARY WOODEN TREE GUARD FOR GROVES, AND TEMPORARY CONSTRUCTION LIMIT FENCE BOUNDARY SHALL BE MAINTAINED FOR THE DURATION OF THE CONTRACT AND ARE NOT TO BE REMOVED UNTIL DIRECTED BY THE BOROUGH FORESTER OR THEIR REPRESENTATIVE.
- ALL TREES COMPLETELY OR PARTIALLY WITHIN THE CONTRACT LIMIT LINE ARE TO RECEIVE AT LEAST ONE (1) INCH (THE EQUIVALENT OF 750 GALLONS OF WATER PER 1,000 SQUARE FEET OF TREE PROTECTION ZONE) OF WATER PER WEEK BETWEEN THE MONTHS OF MARCH AND OCTOBER. IF RAINWATER IN ANY GIVEN WEEK IS BELOW THIS QUANTITY, THE CONTRACTOR MUST SUPPLEMENT THE AMOUNT RECEIVED BY A METHOD APPROVED BY THE BOROUGH FORESTER OR THEIR REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.
- ALL TREE PRUNING AND TREE REMOVAL IS TO BE PERFORMED IN ACCORDANCE WITH ANSI A300 STANDARDS BY AN ARBORIST HOLDING CERTIFICATION FROM THE INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA) OR EQUIVALENT EDUCATION AND EXPERIENCE. ANSI PRUNING TYPES SPECIFIED ON TREE PROTECTION SCHEDULE AND TREE DIAMETERS AT BREAST HEIGHT ARE TO BE CONFIRMED BY THE BOROUGH FORESTER OR THEIR REPRESENTATIVE BEFORE PRUNING WORK IS PERFORMED.
- EXERCISE EXTREME CARE IN REMOVING CONCRETE OR ASPHALT WITHIN THE CRZ OF EXISTING TREES LIFTING RATHER THAN DRAGGING PIECES OF PAVING. TOOLS FOR THIS ACTIVITY SHALL BE APPROVED BY THE BOROUGH FORESTER OR THEIR REPRESENTATIVE PRIOR TO THE START OF EXCAVATION.
- ALL EXCAVATION AND PLANT INSTALLATION WITHIN THE CRZ SHALL BE PERFORMED BY HAND OR PNEUMATICALLY, WITH MINIMAL SOIL DISTURBANCE, AND UNDER THE SUPERVISION OF THE BOROUGH FORESTER OR THEIR REPRESENTATIVE. PLANTS SHALL NOT BE PLACED WITHIN THREE (3) FEET OF THE TREE TRUNK UNLESS APPROVED.
- NO ROOTS SHALL BE CUT WITHOUT THE WRITTEN AUTHORIZATION OF THE BOROUGH FORESTER OR THEIR REPRESENTATIVE.
- EXCAVATED AREAS WITHIN THE CRZ SHALL BE BACKFILLED IMMEDIATELY OR ROOTS SHALL BE KEPT CONSTANTLY MOIST WITH BURLAP COVERED WITH WHITE PLASTIC AND CHECKED A MINIMUM OF TWO (2) TIMES A DAY, ONCE IN THE MORNING AND ONCE IN THE AFTERNOON, FOR A MAXIMUM OF FORTY-EIGHT (48) HOURS, UNTIL BACKFILL IS COMPLETE. IF DIRECTED, SOAKER HOSES SHALL BE INSTALLED TO FACILITATE PROPERLY MOIST CONDITIONS. NO POOLING OF OR CONTINUOUS RUNNING WATER SHALL OCCUR WITHIN THE CRZ OTHER THAN THAT DURING THE IRRIGATION PROCESS. IF ROOTS ARE TO BE EXPOSED FOR A PERIOD GREATER THAN 48-HOURS, THE EXPOSED AREA SHALL BE COVERED WITH AT LEAST 6-INCHES OF MULCH AND MAINTAINED DURING THE COURSE OF CONSTRUCTION UNTIL THE AREA CAN BE PROPERLY BACKFILLED.
- WHEN A TREE PROTECTION DEFICIENCY, AS DETERMINED BY THE BOROUGH FORESTER OR THEIR REPRESENTATIVE, IS IDENTIFIED, IT MUST BE REMEDIED WITHIN 24-HOURS OF NOTIFICATION BY THE AGENCY. FAILURE TO CORRECT THE DEFICIENCY WITHIN THIS TIMEFRAME WILL RESULT IN A STOP WORK ORDER, LIQUIDATED DAMAGES, OR BOTH.
- ANY DAMAGE TO EXISTING TREES DURING CONSTRUCTION SHALL BE THE CONTRACTOR'S RESPONSIBILITY. MITIGATE SUCH DAMAGE AS DIRECTED BY THE BOROUGH FORESTER OR THEIR REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL BE ASSESSED RESTITUTION, AS SOLELY DETERMINED BY THE DEPARTMENT OF PARKS AND RECREATION (NYDCPR), FOR TREES THAT ARE INJURED, IRREPARABLY DAMAGED, DESTROYED, OR REMOVED WITHOUT AUTHORIZATION.

SITE PREPARATION:

- THE CONTRACTOR SHALL, DURING THE BIDDING PROCESS, BE RESPONSIBLE FOR VISITING THE SITE TO DETERMINE THE EXTENT OF DEMOLITION, PREPARATION, AND REMOVALS NECESSARY (WHETHER SHOWN ON DRAWINGS OR NOT) TO CONSTRUCT THE PROPOSED SITE IMPROVEMENTS. THE CONTRACTOR SHALL REPORT, IN WRITING, ANY DISCREPANCIES BETWEEN THE EXISTING AND PROPOSED WORK TO THE LANDSCAPE ARCHITECT, FIELD ENGINEER, AND OWNER PRIOR TO PROCEEDING WITH CONSTRUCTION. FAILURE TO INSPECT, NOTICE, OR REPORT THESE DISCREPANCIES PRIOR TO CONSTRUCTION SHALL NOT RELIEVE THE CONTRACTOR FROM THEIR RESPONSIBILITY TO PERFORM THE NECESSARY OPERATION FOR THE SUCCESSFUL COMPLETION OF THE PROPOSED IMPROVEMENTS.
- CONTRACTOR SHALL PROVIDE PROTECTIONS NECESSARY TO PREVENT DAMAGE TO EXISTING IMPROVEMENTS INDICATED TO REMAIN IN PLACE AND NEWLY CONSTRUCTED IMPROVEMENTS ON OWNER'S PROPERTY. THE CONTRACTOR SHALL RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE TO THE LANDSCAPE ARCHITECT AND PARTIES HAVING JURISDICTION, AT NO COST TO THE OWNER AND PARTIES HAVING JURISDICTION.
- EXISTING MATERIALS DESIGNATED FOR SALVAGE BY LANDSCAPE ARCHITECT, ENGINEER, OR CONTRACTOR SHALL BE STOCKPILED OR STORED IN LOCATIONS APPROVED BY THE OWNER. THE CONTRACTOR SHALL PROTECT ALL MATERIALS DESIGNATED TO REMAIN AND SHALL BE SOLELY RESPONSIBLE FOR REPLACEMENT OF ANY MATERIALS SO DESIGNATED THAT ARE DAMAGED DURING CONSTRUCTION. THE EXTENT OF REPLACEMENT AND/OR REPAIR TO DAMAGED ITEMS OR WORK SHALL BE DETERMINED BY THE LANDSCAPE ARCHITECT AND SHALL BE TO OWNER'S SATISFACTION.
- THE CONTRACTOR SHALL CLEAR AND REMOVE ALL ORGANIC MATTER, DEBRIS, AND RUBBISH FROM THE JOB SITE NOT DESIGNATED FOR SALVAGE OR RELOCATION. THE REMOVAL OF SUCH ITEMS SHALL BE DONE IN A MANNER SO AS NOT TO DAMAGE ITEMS AND VEGETATION TO REMAIN. THE CONTRACTOR SHALL DISPOSE OF SAID MATERIALS IN A LEGAL MANNER.
- NO PAINT SHALL BE APPLIED TO SITE ELEMENTS TO REMAIN. THE CONTRACTOR SHALL REVIEW THE METHOD OF

MARKING SITE ELEMENTS TO REMAIN WITH THE LANDSCAPE ARCHITECT PRIOR TO BEGINNING CONSTRUCTION. CONSTRUCTION FENCE TO FOLLOW LIMIT OF WORK (L.O.W.) LINE UNLESS OTHERWISE REVIEWED AND AGREED UPON BY OWNER AND LANDSCAPE ARCHITECT PRIOR TO COMMENCEMENT OF LANDSCAPE CONSTRUCTION. LIMITS OF THE WORK AREA SHALL BE IDENTIFIED AND STAKED PRIOR TO THE START OF LANDSCAPE CONSTRUCTION. WORK OUTSIDE THE LIMIT OF WORK LINE IS NOT TO BE PERFORMED WITHOUT WRITTEN APPROVAL FROM THE OWNER.

PLANTING NOTES:

- SEE DRAWINGS C-41 TO C-44 FOR PLANTING SCHEDULES.
- SEE DRAWINGS C-45 AND C-46 FOR LANDSCAPE DETAILS.
- THE CONTRACTOR SHALL INSTALL PLANTS GROWN AND ACCLIMATED TO THE PROPER USDA CLIMATIC ZONE AND HYDROPHYTIC REGIME FOR THE PROJECT SITE AS INDICATED IN THE CONTRACT SPECIFICATIONS.
- ALL TREES SHALL BE FURNISHED LOW TO THE GROUND. CLUMP FORMS ARE ACCEPTABLE PROVIDED THEY DO NOT HAVE WEAK CROTCHES.
- ROOTS OF CONTAINERIZED PLANT MATERIAL SHALL BE WELL DEFINED AND DEVELOPED TO SIDES AND BOTTOM OF CONTAINERS. ROOT-BOUND CONTAINERIZED PLANT MATERIAL WILL BE REJECTED.
- ALL PLANT MATERIAL SHALL BE INSTALLED DURING TIMEFRAMES IDENTIFIED IN THE CONTRACT SPECIFICATIONS.
- ALL PLANTS SHALL BE CERTIFIED AND INSPECTED FREE OF ALL FUNGUS, GRUBS, AND INSECTS THAT MAY HAVE A DELETERIOUS EFFECT ON THE SURROUNDING FAUNA AND FLORA.
- MIX SPECIES IN A RANDOM, NATURALIZED MANNER WITHIN EACH HABITAT ZONE.
- THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE ENGINEER AND NYDCPR REPRESENTATIVE OF DAMAGE TO ANY TREES NOT SCHEDULED FOR REMOVAL. ANY TREE DAMAGED BY THE CONTRACTOR NOT SCHEDULED TO BE REMOVED SHALL BE REPLACED WITH TREES OF EQUAL CALIPER AND VARIETY AS APPROVED BY THE RESTORATION SPECIALIST AND NYDCPR REPRESENTATIVE.
- THE CONTRACTOR SHALL INSTALL GOOSE EXCLUSION FENCING AROUND WETLAND PLANTINGS INCLUDING OPEN WATER, AQUATIC, SHALLOW EMERGENT MARSH, AND HIGH MARSH. GOOSE EXCLUSION FENCE SHALL BE INSTALLED AS WETLAND PLANTING OCCURS SUCH THAT ALL NEW PLANTINGS ARE PROTECTED BY GOOSE EXCLUSION FENCE ON THE SAME DAY. THE GOOSE EXCLUSION FENCE SHALL BE INSPECTED AND REPAIRED AS OFTEN AS NECESSARY DURING THE PLANT GUARANTEE PERIOD AND U.S. ARMY CORPS OF ENGINEERS AND NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PERMIT MONITORING PERIOD. GOOSE EXCLUSION FENCE SHALL BE REMOVED AT THE END OF THE U.S. ARMY CORPS OF ENGINEERS AND NEW YORK STATE, DEPARTMENT OF ENVIRONMENTAL CONSERVATION PERMIT MONITORING PERIOD.
- PLANTS SHALL BE PLANTED IN DRY CONDITIONS BUT NOT WHEN PLANTING LOCATIONS ARE SUBMERGED. IF NECESSARY, THE CONTRACTOR SHALL USE APPROVED MEANS TO DIVERT FLOWS TO ACHIEVE THE PREFERRED PLANTING CONDITIONS AND SHALL RESTORE THESE FLOWS UPON COMPLETION OF PLANTING OPERATIONS.
- PRIOR TO INSTALLATION, CONTRACTOR SHALL STAKE OUT AND RECEIVE APPROVAL FROM THE ENGINEER AND RESTORATION SPECIALIST FOR LOCATIONS OF ALL PLANTINGS.
- THE CONTRACTOR SHALL INSTALL DEER EXCLUSION FENCE PRIOR TO THE INSTALLATION OF UPLAND PLANTINGS. THE DEER EXCLUSION FENCE SHALL BE INSPECTED AND REPAIRED AS OFTEN AS NECESSARY DURING THE PLANT GUARANTEE PERIOD AND U.S. ARMY CORPS OF ENGINEERS AND NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION PERMIT MONITORING PERIOD. DEER EXCLUSION FENCE SHALL BE REMOVED AT THE END OF THE U.S. ARMY CORPS OF ENGINEERS AND NEW YORK STATE.
- NO SUBSTITUTIONS OF SPECIFIED PLANTS WILL BE ACCEPTED WITHOUT PRIOR APPROVAL OF THE ENGINEER AND RESTORATION SPECIALIST.
- ANY AREAS DISTURBED OUTSIDE OF THE LIMIT OF WORK, SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE CLIENT.
- ALL PLANTS SHALL BE PLANTED AT THE TIME OF DELIVERY DUE TO LIMITED STORAGE ON SITE. PLANTS IN THE SAME PLANTING BED SHALL BE PLANTED AT THE SAME TIME. ANY PLANTS REMAINING UNPLANTED ON THE SITE FOR MORE THAN 24 HOURS SHALL BE PROTECTED AND MAINTAINED INCLUDING BUT NOT LIMITED TO PROVIDING WATER AND SHADE. ANY PLANTS THAT DIE OR ARE DAMAGED DUE TO ON-SITE STORAGE SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
- MATERIAL WILL BE INSPECTED AND APPROVED AT PLACE OF GROWTH BY THE ENGINEER, HOWEVER, PLANT MATERIAL WHICH HAS BECOME DAMAGED OR DISEASED OR WHICH IS UNACCEPTABLE TO THE ENGINEER MAY BE REJECTED UPON DELIVERY TO THE SITE.
- SHOULD THERE BE ANY DISCREPANCIES BETWEEN THE QUANTITIES CALLED FOR ON THE PLANT LIST AND THOSE INDICATED ON THE PLAN, NOTIFY LANDSCAPE ARCHITECT FOR CLARIFICATION.
- AT ALL TIMES, THE SITE SHALL BE KEPT NEAT AND FREE OF DEBRIS LEFT FROM THE PLANTING OPERATION.
- ALL PLANT MATERIAL SHALL BE KEPT VIGOROUS, AND FREE OF ANY INJURY AND DEFECTS. ALL PLANT MATERIAL SHALL BE A TRUE REPRESENTATION OF THEIR SPECIES.
- PLANT GROUPINGS AND LOCATIONS ARE DIAGRAMMATIC. THE LOCATION OF PLANTS SHALL BE APPROVED IN THE FIELD BY THE ENGINEER PRIOR TO INSTALLATION. THE ENGINEER RESERVES THE RIGHT TO MAKE ADJUSTMENTS TO ANY AND ALL PLANTING LAYOUT IN THE FIELD AT NO ADDITIONAL COST TO THE OWNER.
- ALL PLANT TAGS MUST REMAIN ON THE PLANT MATERIAL UNTIL THE ENGINEER REVIEWS THE LAYOUT AND APPROVES THE QUANTITIES.
- PLANTING BEDS IN UPLAND ZONES ONLY SHALL RECEIVE A 3" THICK LAYER OF MULCH
- ALL UPLAND, FORESTED WETLAND, AND FORESTED WETLAND TRANSITION ZONES TO BE OVERSEEDDED. ALL SEED SHALL BE INTERFERED BY THE INTERVIEW OF A STATE SEED IMPROVEMENT COOPERATIVE AND MUST BEAR THEIR SEALS OF CERTIFICATION ON BAG. PERMANENT SEED SHALL BE 75% PURE LIVE SEED MINIMUM.

SEEDING NOTES:

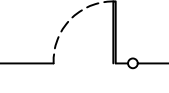
- SEE DRAWINGS C-42 TO C-44 FOR SEED SCHEDULES.
- SIXTY (60) DAYS PRIOR TO SEEDING, THE GERMINATION AND PURITY TEST RESULTS FOR EACH SPECIES IN THE SEED MIX SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- ALL SEEDING OPERATIONS MUST BE SCHEDULED AND APPROVED AT LEAST FIVE (5) DAYS IN ADVANCE TO ENSURE THE ENGINEER IS PRESENT TO OBSERVE THE WORK.
- TWO (2) WEEKS PRIOR TO SEEDING, SOIL NUTRIENT, SALINITY, AND PH SHALL BE TAKEN FROM SIX (6) REPRESENTATIVE LOCATIONS IN THE AREA TO BE SEEDED. TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE COMMENCEMENT OF SEEDING OPERATIONS.
- ALL SEED SHALL BE INTERAGENCY CERTIFIED UNDER THE AUSPICES OF A STATE SEED IMPROVEMENT COOPERATIVE AND SHALL BEAR THEIR SEALS OF CERTIFICATION ON EACH 50 POUND BAG. PERMANENT SEED SHALL BE 75% PURE LIVE SEED MINIMUM AND SEED QUANTITY SHALL BE ADJUSTED BASED UPON THE PURE LIVE SEED PERCENTAGE OF EACH SPECIES IN THE SEED MIX.
- SEED BROUGHT TO THE PROJECT SITE SHALL BE IN UNOPENED BAGS SHOWING THE NET WEIGHT, COMPOSITION OF THE MIX, SUPPLIERS NAME AND GUARANTEE OF ANALYSIS. SEED SHALL BE STORED IN ORIGINAL UNOPENED PACKAGES, KEPT DRY, AND NOT OPENED UNTIL NEEDED FOR USE. DAMAGED OR FAULTY PACKAGES SHALL NT BE USED AND WILL BE REJECTED. SEED SHALL HAVE BEEN HARVESTED FOR PLANTING IN THE CURRENT OR PREVIOUS GROWING SEASON AND SHALL HAVE BEEN PACKED WITHIN THE LAST NINE (9) MONTHS.
- SEED MIXTURES SHALL BE AS SPECIFIED IN THE CONTRACT DRAWINGS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- SEED MATERIALS WILL BE INSPECTED BY THE RESTORATION SPECIALIST AND ENGINEER UPON ARRIVAL AT THE PROJECT SITE AND PRIOR TO PLANTING. ANY MATERIALS NOT IN COMPLIANCE WITH SPECIFICATIONS SHALL BE REJECTED AND REMOVED FROM THE PROJECT SITE BY THE CONTRACTOR.
- ALL SEED MATERIALS SHALL BE PROTECTED FROM DRYING OUT AND FROM WIND DAMAGE DURING DELIVERY.
- ALL SEEDING SHALL OCCUR PRIOR TO INSTALLATION OF PLANT MATERIAL.
- SEED BED PREPARATION SHALL CONSIST OF DECOMPACTION AS NEEDED TO THE SATISFACTION OF THE ENGINEER AND RESTORATION SPECIALIST AND REMOVAL OF ALL DEBRIS AND OBSTACLES SUCH AS ROCKS AND STUMPS.
- DO NOT BROADCAST SEED BY MECHANICAL APPLICATION WHEN THE WIND VELOCITY IS SUCH AS TO PREVENT UNIFORM DISTRIBUTION.
- ALL SEEDING SHALL BE INSTALLED DURING TIMEFRAMES IDENTIFIED IN THE CONTRACT SPECIFICATIONS.
- SEED SHALL BE BROADCAST BY HAND OR MECHANICALLY USING A DROP HOPPER. SEED SHALL BE BLENDED THOROUGHLY WITH A SAND FILLER AND UNIFORMLY BROADCAST OVER THE ENTIRE AREA TO BE SEEDED THEN HAND RAKED 1/8 TO 1/4 INCH INTO THE SOIL.
- UPLAND SEEDED AREAS SHALL BE COVERED WITH ECS-1B SINGLE NET STRAW BIODEGRADABLE ROLLED EROSION CONTROL PRODUCT.
- SEED SHALL BE WATERED AS RECOMMENDED BY THE SEED MANUFACTURER TO ACHIEVE SPECIFIED GROWTH AND COVERAGE.
- ACCEPTABLE SEEDING WILL BE 85% GERMINATION AND COVERAGE OF THE SEEDED AREA WITH THE SEEDED SPECIES. ANY AREA NOT MEETING THIS REQUIREMENT SHALL BE RESEEDDED WITH THE ORIGINAL SEED MIX AT NO COST TO THE CITY.

NATURAL RESOURCES NOTES:

- THE CONTRACTOR IS OBLIGATED TO FOLLOW ALL RESTRICTIONS SET FORTH IN ALL PERMITS FOR THIS PROJECT, INCLUDING NYSDEC PERMIT NO. 2-6499-00047/00063.
- IF WORK ON THE SITE IS TIDALLY INFLUENCED, THE CONTRACTOR MAY BE REQUIRED TO MODIFY THE WORK SCHEDULE TO ACCOMMODATE FLUCTUATIONS.
- DUE TO RESTRICTIONS FOR BIRD BREEDING SEASON, WORK ON THE SITE BETWEEN APRIL 1 TO OCTOBER 31 MAY ONLY OCCUR AFTER APPROVAL AND CERTIFICATION FROM NYC PARKS THAT NO NESTING HAS BEEN OBSERVED AT THE SITE.
- NO EQUIPMENT OTHER THAN HAND HELD EQUIPMENT IS ALLOWED WITHIN THE WETLAND AREA.

- RESIDENT ENGINEER SHALL INSPECT THE SITE FOR SETTLING AND MAY DIRECT CONTRACTOR TO PERFORM HAND GRADING. ALL WETLAND SURFACES SHALL BE FINISHED NOT MORE THAN 0.1 FOOT ABOVE OR BELOW THE FINAL GRADE SHOWN ON THE CONTRACT DRAWINGS.
- THE WETLAND AREA MUST BE INSPECTED AND APPROVED BY NYC PARKS PRIOR TO PLANTING.
- TIME PERIODS WHEN WORK IS ALLOWED:
 - TREE CLEARING / GRUBBING ALLOWED OCTOBER - MARCH.
 - INVASIVE SPECIES REMOVAL-FIRST HERBICIDE APPLICATION ALLOWED MID-MARCH - JULY.
 - INVASIVE SPECIES REMOVAL - FOLLOW-UP HERBICIDE APPLICATION ALLOWED MID-MARCH - SEPTEMBER.
 - INVASIVE SPECIES REMOVAL - CUT STUMP METHOD ALLOWED OCTOBER - EARLY MARCH.
 - WETLAND PLANTING ALLOWED MARCH - MID-JUNE.
 - UPLAND SEEING ALLOWED OCTOBER - MID-MARCH.
 - UPLAND PLANTING SHRUBS / TREES ALLOWED APRIL - MAY AND OCTOBER - NOVEMBER.

LEGEND

- -- LIMIT OF DISTURBANCE
-  MAINTENANCE ACCESS PATH
- X.X — CONTOUR LINE (1.0' INTERVAL)
- - X.X - - CONTOUR LINE (0.5' INTERVAL)
- - - X.X - - - EXISTING CONTOUR
-  DEER FENCE AND GATE
-  STAGING AREA
-  OAKWOOD BEACH BLUEBELT SIGN, SEE DWG SD-C-6
-  EXISTING TREE TO REMAIN

ABBREVIATIONS

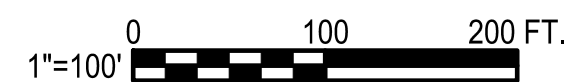
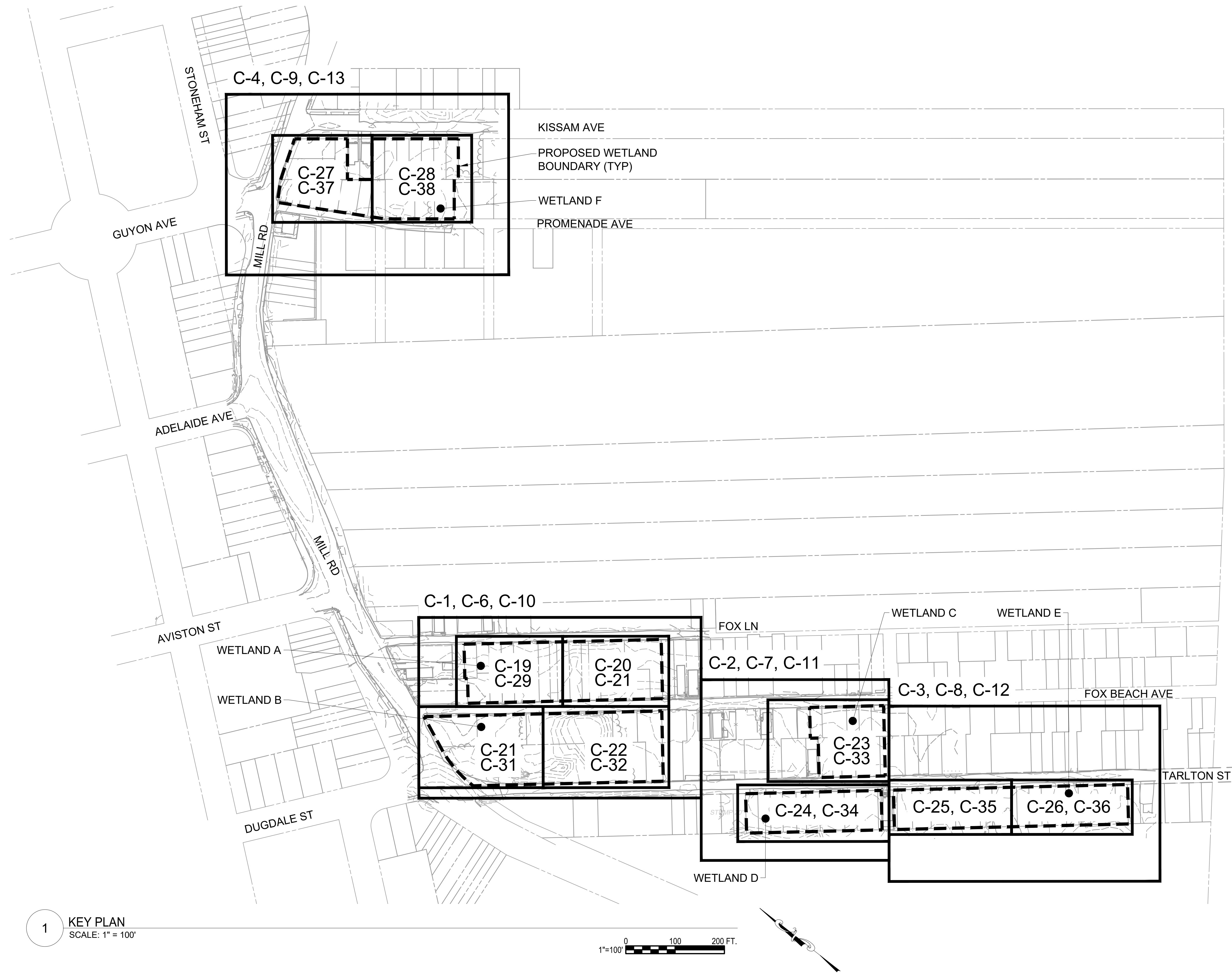
APPD.	APPROVED
ASPH.	ASPHALT
B&B	BALLED & BURLAPPED
BMP	BEST MANAGEMENT PRACTICE
C to c.	CENTER TO CENTER
CB	CATCH BASIN
CI	CAST IRON
CJ	CONSTRUCTION JOINT CONC CONCRETE
CV	CROSS VANE
D ₅₀ or d ₅₀	RIP-RAP SIZE
DIA	DIAMETER
EA	EACH
EF	EACH FACE
EL	ELEVATION
E.S.V.P.	EXTRA STRENGTH VITRIFIED PIPE
EW	EACH WAY
EXP	EXPAND OR EXPOSED
FTRC	FLAT TOP REINFORCED CONCRETE
GAL	GALLONS
GALV.	GALVANIZED
H	HIGH
HP or HPT	HIGH POINT
HYD	HYDRANT
INV	INVERT
JT	JOINT
LBS	POUNDS
L.F.	LINEAR FEET
LJH	LOG J-HOOK
LI	LIVE LOAD
LP or LPT	LOW POINT
MAX	MAXIMUM
MH	MANHOLE MIN MINIMUM
N.T.S.	NOT TO SCALE
NYC DDC	NEW YORK CITY DEPARTMENT OF DESIGN AND CONSTRUCTION
ON CENTER	ON CENTER
OPENG.	OPENING
RC	ROCK CASCADE
RCF.	REINFORCED
REQD.	REQUIRED
RGC	RIFLE GRADE CONTROL
RJH	ROCK J-HOOK
R.O.W.	RIGHT OF WAY
RS	ROCK SILL
S.F.	SQUARE FEET
SPECS.	SPECIFICATIONS
SQ	SQUARE
316 or SST	316 STAINLESS STEEL
T&B	TOP AND BOTTOM
TYP	TYPICAL
VERT	VERTICAL
W	WIDE
W.S.	WATER STOP
W.V.	WATER VALVE
WWF	WELDED WIRE FABRIC

SHEET LIST TABLE

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49	C-46	DETAILS - 2



WARNING
IT IS A VIOLATION OF SECTION 7209.2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO BE USED IN ANY WAY PLANS, SPECIFICATIONS, PLATS OR REPORTS TO WHICH THE SEAL OF A PROFESSIONAL ENGINEER HAS BEEN APPLIED. IF AN ITEM BEARING THE SEAL OF A



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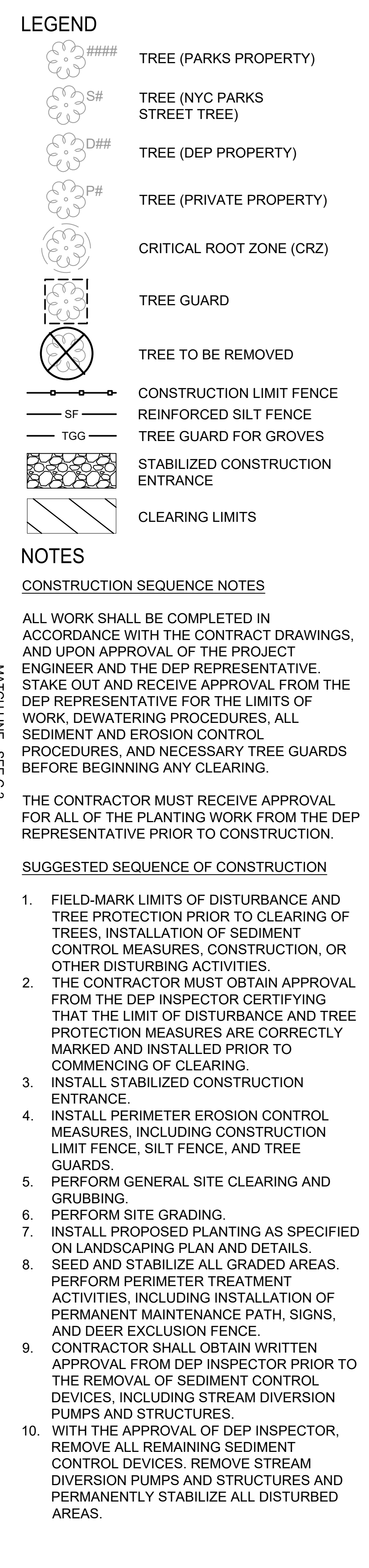
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CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER AND SEWER OPERATIONS
CAPITAL PROJECT SER-200285
FORESTED WETLANDS MITIGATION
PLAN AT OAKWOOD BEACH
STATEN ISLAND, NEW YORK

DATE JANUARY 2025

SHEET 3 OF 49

DWG. NO. G-3



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WARNING

IT IS A VIOLATION OF SECTION 7209.2 OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER IN ANY WAY PLANS, SPECIFICATIONS, PLATS OR REPORTS TO WHICH THE SEAL OF A PROFESSIONAL ENGINEER HAS BEEN APPLIED. IF AN ITEM BEARING THE SEAL OF A PROFESSIONAL ENGINEER IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE SAME HIS OR HER OWN SEAL AND BE "ALTERED BY" FOLLOWED BY HIS SIGNATURE, THE DATE, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER AND SEWER OPERATIONS
CAPITAL PROJECT SER-200285
FORESTED WETLANDS MITIGATION
PLAN AT OAKWOOD BEACH
STATEN ISLAND, NEW YORK

DATE JANUARY 2025

SHEET 3 OF 49

DWG. NO. _____ C-1

File: C:\USERS\HARKINS\ADDC\DCS\HAZEN AND SAWYER\030338-13C-OAKWOOD BEACH WETLANDS MITIGATION\PROJECT FILES\01_DESIGN\WETLANDS MITIGATION\02 DEMO & ESCP-2.dwg, Saved by: HARKINS, Save date: 1/20/2025 3:12 PM
PLOT DATE: 1/20/2025 3:58 PM BY: JHARKINS

1 TARTLTON STREET
SCALE: 1" = 20'-0"

DESIGNED E. ROSENBERG
DRAWN N. SARAWAT
CHECKED J. RIVAS
SECT. CHIEF S. MEHROTRA
PROJ. ENGR. J. HARKINS
IF THIS BAR DOES NOT MEASURE 1"
THEN DRAWING IS NOT TO FULL SCALE

100% DESIGN DRAWING
DO NOT USE FOR
CONSTRUCTION

Hazen
SCAPE

WARNING
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FOR ANY PERSON, UNLESS ACTING UNDER
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DESCRIPTION OF THE ALTERATION.

NYC
Environmental
Protection

CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER AND SEWER OPERATIONS
CAPITAL PROJECT SER-200285
FORESTED WETLANDS MITIGATION
PLAN AT OAKWOOD BEACH
STATEN ISLAND, NEW YORK

OAKWOOD BEACH

CLEARING AND EROSION &
SEDIMENT CONTROL PLAN - 2

DATE JANUARY 2025

SHEET 4 OF 49

DWG. NO. C-2

LEGEND

- #### TREE (PARKS PROPERTY)
- S# TREE (NYC PARKS STREET TREE)
- D## TREE (DEP PROPERTY)
- P# TREE (PRIVATE PROPERTY)
- CRITICAL ROOT ZONE (CRZ)
- TREE GUARD
- TREE TO BE REMOVED
- CONSTRUCTION LIMIT FENCE
- SF REINFORCED SILT FENCE
- TGG TREE GUARD FOR GROVES
- STABILIZED CONSTRUCTION ENTRANCE
- CLEARING LIMITS
- STAGING AREA

NOTES

CONSTRUCTION SEQUENCE NOTES

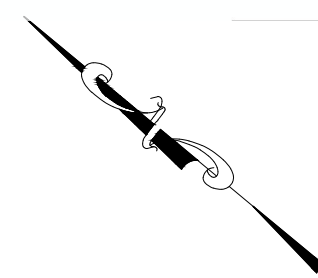
ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DRAWINGS, AND UPON APPROVAL OF THE PROJECT ENGINEER AND THE DEP REPRESENTATIVE. STAKE OUT AND RECEIVE APPROVAL FROM THE DEP REPRESENTATIVE FOR THE LIMITS OF WORK, DEWATERING PROCEDURES, ALL SEDIMENT AND EROSION CONTROL PROCEDURES, AND NECESSARY TREE GUARDS BEFORE BEGINNING ANY CLEARING.

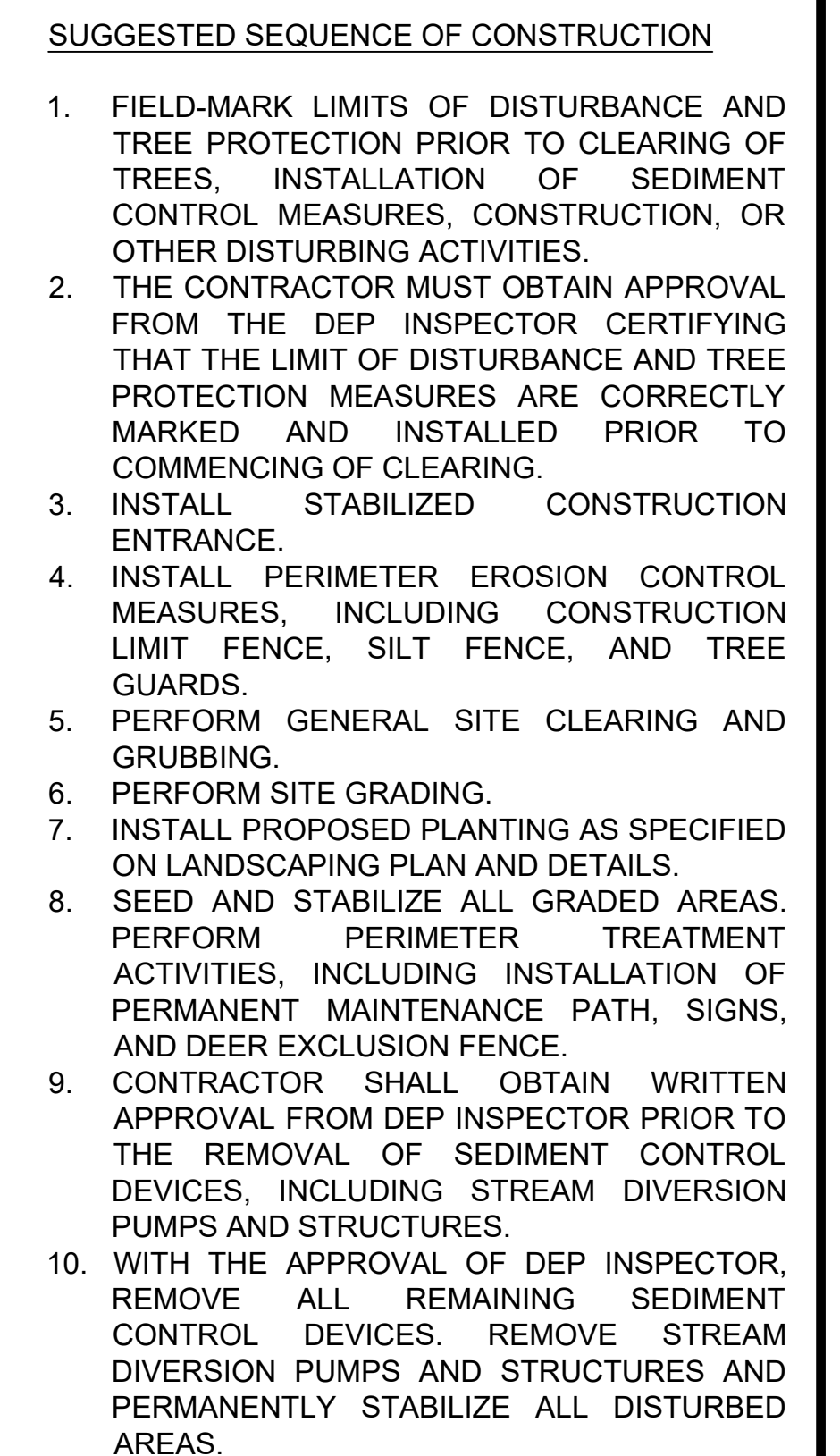
THE CONTRACTOR MUST RECEIVE APPROVAL FOR ALL OF THE PLANTING WORK FROM THE DEP REPRESENTATIVE PRIOR TO CONSTRUCTION.

SUGGESTED SEQUENCE OF CONSTRUCTION

- FIELD-MARK LIMITS OF DISTURBANCE AND TREE PROTECTION PRIOR TO CLEARING OF TREES, INSTALLATION OF SEDIMENT CONTROL MEASURES, CONSTRUCTION, OR OTHER DISTURBING ACTIVITIES.
- THE CONTRACTOR MUST OBTAIN APPROVAL FROM THE DEP INSPECTOR CERTIFYING THAT THE LIMIT OF DISTURBANCE AND TREE PROTECTION MEASURES ARE CORRECTLY MARKED AND INSTALLED PRIOR TO COMMENCING OF CLEARING.
- INSTALL STABILIZED CONSTRUCTION ENTRANCE.
- INSTALL PERIMETER EROSION CONTROL MEASURES, INCLUDING CONSTRUCTION LIMIT FENCE, SILT FENCE, AND TREE GUARDS.
- PERFORM GENERAL SITE CLEARING AND GRUBBING.
- PERFORM SITE GRADING.
- INSTALL PROPOSED PLANTING AS SPECIFIED ON LANDSCAPING PLAN AND DETAILS.
- SEED AND STABILIZE ALL GRADED AREAS. PERFORM PERIMETER TREATMENT ACTIVITIES, INCLUDING INSTALLATION OF PERMANENT MAINTENANCE PATH, SIGNS, AND DEER EXCLUSION FENCE.
- CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM DEP INSPECTOR PRIOR TO THE REMOVAL OF SEDIMENT CONTROL DEVICES, INCLUDING STREAM DIVERSION PUMPS AND STRUCTURES.
- WITH THE APPROVAL OF DEP INSPECTOR, REMOVE ALL REMAINING SEDIMENT CONTROL DEVICES. REMOVE STREAM DIVERSION PUMPS AND STRUCTURES AND PERMANENTLY STABILIZE ALL DISTURBED AREAS.

0 20 40 FT.
1"=20'





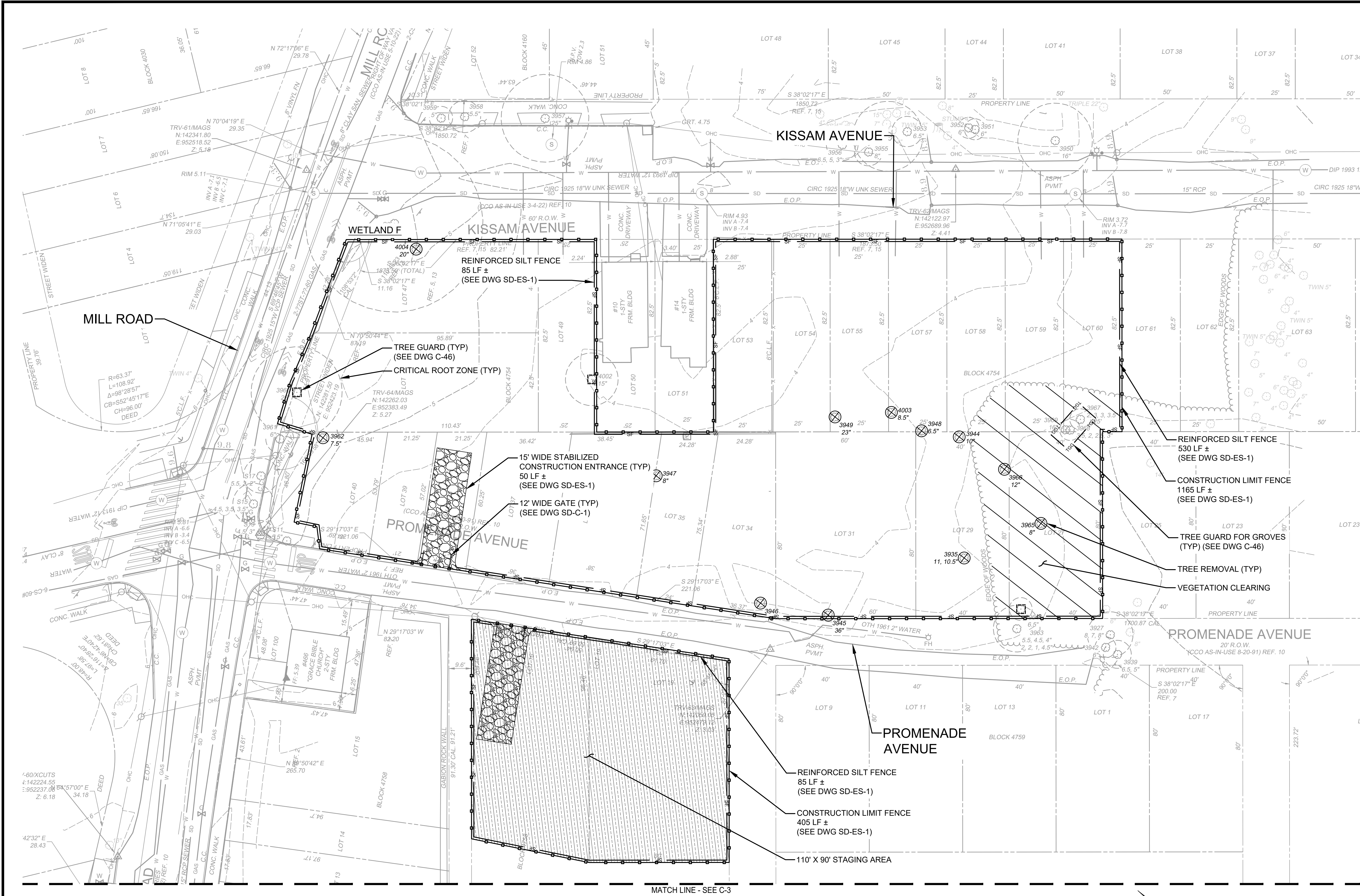
0 20 40 FT.
1"=20'

DATE JANUARY 2025

SHEET 5 OF 49

DWG. NO. C-3

File: C:\USERS\HARKINS\ADDC\DCS\HAZEN AND SAWYER\03038-13C-OAKWOOD BEACH WETLANDS MITIGATION\PROJECT FILES\01 DESIGN\DWG\13C-1 DEMO & ESCP-4.dwg Saved by: HARKINS Save date: 1/20/2025 3:16 PM
PLOT DATE: 1/20/2025 9:00 PM BY: JHARKINS



LEGEND

- #### TREE (PARKS PROPERTY)
- S# TREE (NYC PARKS STREET TREE)
- D## TREE (DEP PROPERTY)
- P# TREE (PRIVATE PROPERTY)
- CRITICAL ROOT ZONE (CRZ)
- TREE GUARD
- TREE TO BE REMOVED
- CONSTRUCTION LIMIT FENCE
- SF REINFORCED SILT FENCE
- TGG TREE GUARD FOR GROVES
- STABILIZED CONSTRUCTION ENTRANCE
- CLEARING LIMITS
- STAGING AREA

NOTES

CONSTRUCTION SEQUENCE NOTES

ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DRAWINGS, AND UPON APPROVAL OF THE PROJECT ENGINEER AND THE DEP REPRESENTATIVE. STAKE OUT AND RECEIVE APPROVAL FROM THE DEP REPRESENTATIVE FOR THE LIMITS OF WORK, DEWATERING PROCEDURES, ALL SEDIMENT AND EROSION CONTROL PROCEDURES, AND NECESSARY TREE GUARDS BEFORE BEGINNING ANY CLEARING.

THE CONTRACTOR MUST RECEIVE APPROVAL FOR ALL OF THE PLANTING WORK FROM THE DEP REPRESENTATIVE PRIOR TO CONSTRUCTION.

SUGGESTED SEQUENCE OF CONSTRUCTION

- FIELD-MARK LIMITS OF DISTURBANCE AND TREE PROTECTION PRIOR TO CLEARING OF TREES, INSTALLATION OF SEDIMENT CONTROL MEASURES, CONSTRUCTION, OR OTHER DISTURBING ACTIVITIES.
- THE CONTRACTOR MUST OBTAIN APPROVAL FROM THE DEP INSPECTOR CERTIFYING THAT THE LIMIT OF DISTURBANCE AND TREE PROTECTION MEASURES ARE CORRECTLY MARKED AND INSTALLED PRIOR TO COMMENCING OF CLEARING.
- INSTALL STABILIZED CONSTRUCTION ENTRANCE.
- INSTALL PERIMETER EROSION CONTROL MEASURES, INCLUDING CONSTRUCTION LIMIT FENCE, SILT FENCE, AND TREE GUARDS.
- PERFORM GENERAL SITE CLEARING AND GRUBBING.
- PERFORM SITE GRADING.
- INSTALL PROPOSED PLANTING AS SPECIFIED ON LANDSCAPING PLAN AND DETAILS.
- SEED AND STABILIZE ALL GRADED AREAS. PERFORM PERIMETER TREATMENT ACTIVITIES, INCLUDING INSTALLATION OF PERMANENT MAINTENANCE PATH, SIGNS, AND DEER EXCLUSION FENCE.
- CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM DEP INSPECTOR PRIOR TO THE REMOVAL OF SEDIMENT CONTROL DEVICES, INCLUDING STREAM DIVERSION PUMPS AND STRUCTURES.
- WITH THE APPROVAL OF DEP INSPECTOR, REMOVE ALL REMAINING SEDIMENT CONTROL DEVICES. REMOVE STREAM DIVERSION PUMPS AND STRUCTURES AND PERMANENTLY STABILIZE ALL DISTURBED AREAS.

1 PROMENADE AVE
SCALE: 1" = 20'-0"

0 20 40 FT.
1"=20'

REV	ISSUED FOR	DATE	BY

DESIGNED	E. ROSENBERG
DRAWN	N. SARAWAT
CHECKED	J. RIVAS
SECT. CHIEF	S. MEHROTRA
PROJ. ENGR.	J. HARKINS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
0 1/2" 1"	

100% DESIGN DRAWING
DO NOT USE FOR
CONSTRUCTION

Hazen
SCAPE

WARNING
IT IS A VIOLATION OF SECTION 7209.2 OF
THE NEW YORK STATE EDUCATION LAW
FOR ANY PERSON, UNLESS ACTING UNDER
THE DIRECTION OF A LICENSED
PROFESSIONAL ENGINEER, TO ALTER IN
ANY WAY PLANS, SPECIFICATIONS, PLATS
OR REPORTS TO WHICH THE SEAL OF A
PROFESSIONAL ENGINEER HAS BEEN
APPLIED, IF AN ITEM BEARING THE SEAL OF
A PROFESSIONAL ENGINEER IS ALTERED.
THE ALTERING ENGINEER SHALL AFFIX TO
THE ITEM HIS SEAL AND THE NOTATION
"ALTERED BY:" FOLLOWED BY HIS
SIGNATURE, THE DATE, AND A SPECIFIC
DESCRIPTION OF THE ALTERATION.

NYC
Environmental
Protection

CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER AND SEWER OPERATIONS
CAPITAL PROJECT SER-200285
FORESTED WETLANDS MITIGATION
PLAN AT OAKWOOD BEACH
STATEN ISLAND, NEW YORK

OAKWOOD BEACH

CLEARING AND EROSION &
SEDIMENT CONTROL PLAN - 4

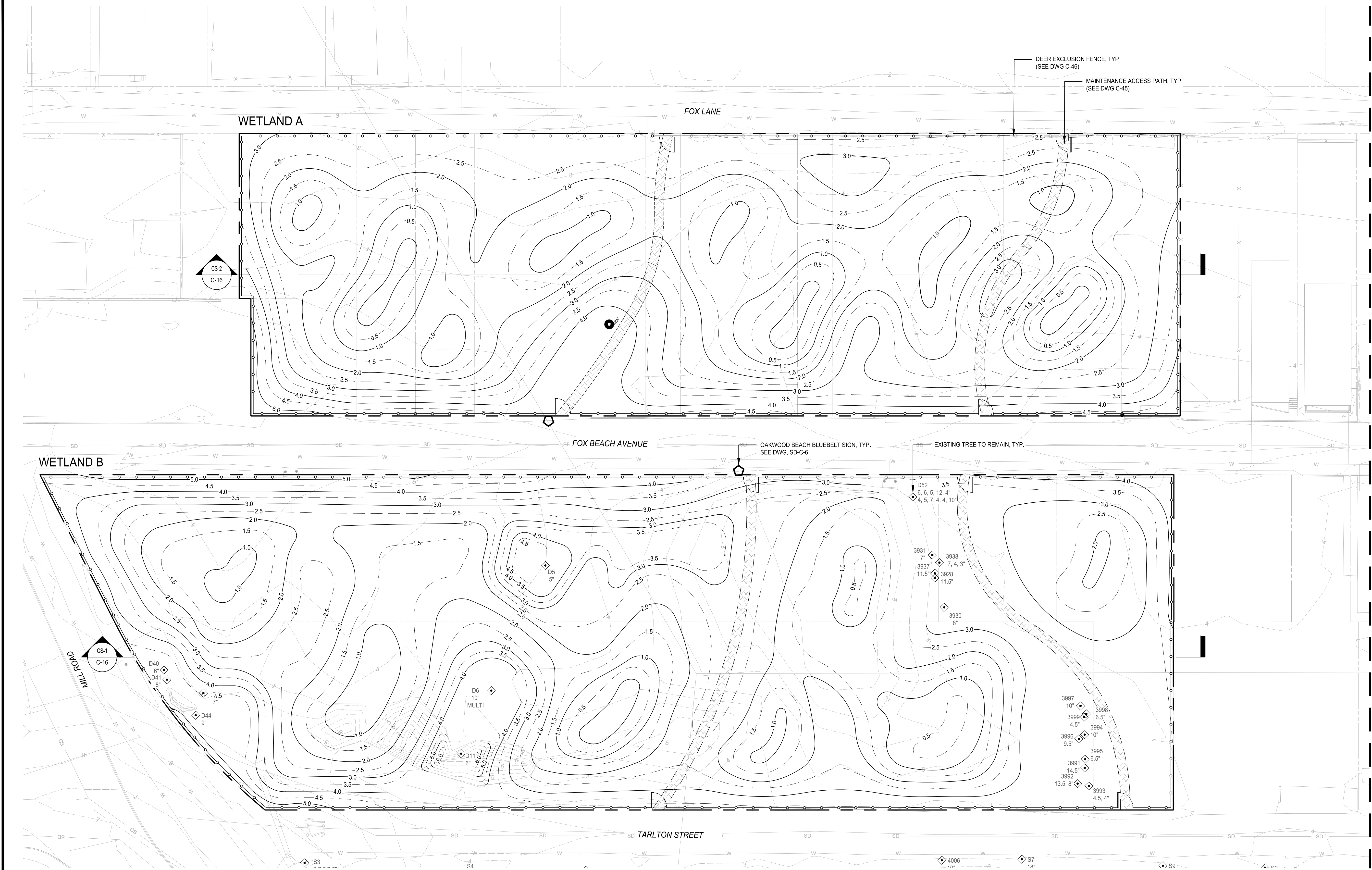
DATE JANUARY 2025

SHEET 6 OF 49

DWG. NO. C-4

PROJECT ID: SER-200285

File: C:\USERS\HARKINS\DOCUMENTS\HAYZEN AND SAWYER\03038-13C-OAKWOOD BEACH WETLANDS MITIGATION\PROJECT FILES\01 - DESIGN\SCAPE\OAKWOOD BEACH_100PCT - STANDARD\01-6 FINAL SITE PLAN - 1 Saved by BSHERRILL Save date: 1/20/2025 8:43 PM
PLOT DATE: 1/20/2025 9:02 PM BY: JHARKINS



- LEGEND**
- LIMIT OF DISTURBANCE
 - MAINTENANCE ACCESS PATH
 - X.X CONTOUR LINE (1.0' INTERVAL)
 - X.X- CONTOUR LINE (0.5' INTERVAL)
 - - -X.X- - - EXISTING CONTOUR
 - DEER FENCE AND GATE
 - STAGING AREA
 - OAKWOOD BEACH BLUEBELT SIGN, SEE DWG SD-C-6
 - EXISTING TREE TO REMAIN

MATCH LINE - SEE C-7

1 FOX BEACH AVENUE
SCALE: 1" = 20'

NOTES
SEE NOTES ON SHEET G-2.
SEE DETAILS ON C-46.

DESIGNED	SCAPE
DRAWN	H. VERMA
CHECKED	M. HARWOOD
SECT. CHIEF	S. MEHROTRA
PROJ. ENGR.	J. HARKINS
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE	
0 1/2" 1"	
REV	ISSUED FOR
DATE	BY

100% DESIGN DRAWING
DO NOT USE FOR
CONSTRUCTION



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CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER AND SEWER OPERATIONS
CAPITAL PROJECT SER-200285
FORESTED WETLANDS MITIGATION
PLAN AT OAKWOOD BEACH
STATEN ISLAND, NEW YORK

OAKWOOD BEACH

FINAL SITE PLAN - 1

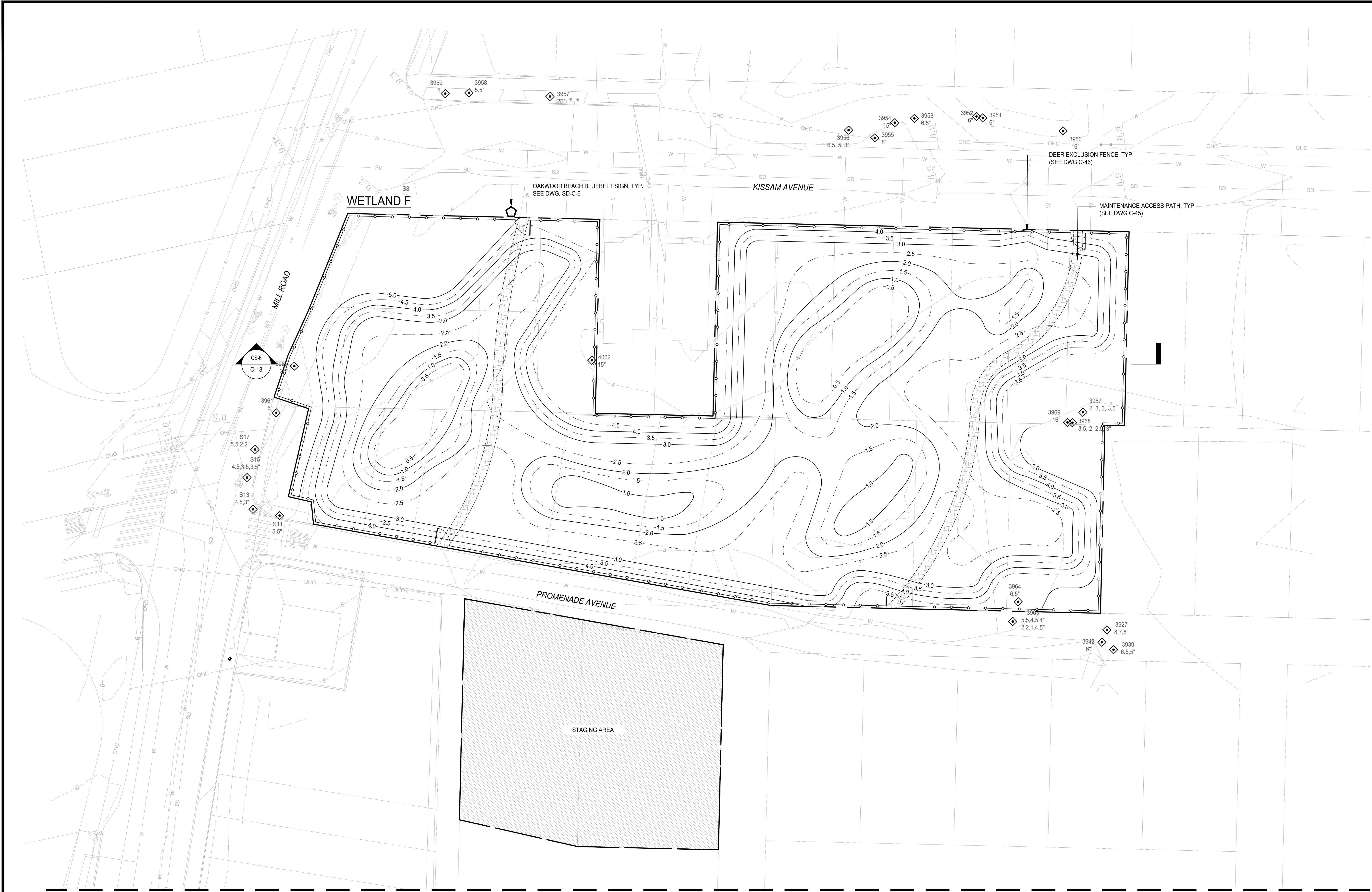
DATE JANUARY 2025
SHEET 9 OF 49
DWG. NO. C-6

PROJECT ID: SER-200285



1

File: C:\USERS\HARKINS\ADDC\SCAPE\Hazen and Sawyer\03038-13C-Oakwood Beach Wetlands Mitigation\PROJECT FILES\01 - DESIGN\SCAPE\OAKWOOD BEACH_100PCT - STANDARD\01-9 FINAL SITE PLAN-4.dwg Saved by: BSHERRILL Save date: 1/20/2025 8:32 PM
PLOT DATE: 1/20/2025 9:03 PM BY: JHARKINS



- LEGEND
- LIMIT OF DISTURBANCE
 - [Hatched Box] MAINTENANCE ACCESS PATH
 - X.X- CONTOUR LINE (1.0' INTERVAL)
 - X.X- CONTOUR LINE (0.5' INTERVAL)
 - - -X.X- - - - EXISTING CONTOUR
 - [Line with Gate] DEER FENCE AND GATE
 - [Hatched Box] STAGING AREA
 - [Pentagon] OAKWOOD BEACH BLUEBELT SIGN, SEE DWG SD-C-6
 - [Diamond] EXISTING TREE TO REMAIN

1 PROMENADE AVE
SCALE: 1" = 20'

MATCH LINE - SEE C-8



						DESIGNED <u>SCAPE</u>
						DRAWN <u>H. VERMA</u>
						CHECKED <u>M. HARWOOD</u>
						SECT. CHIEF <u>S. MEHROTRA</u>
						PROJ. ENGR <u>J. HARKINS</u>
						IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE
						0 1/2" 1"
REV	ISSUED FOR		DATE	BY		

100% DESIGN DRAWING
DO NOT USE FOR
CONSTRUCTION



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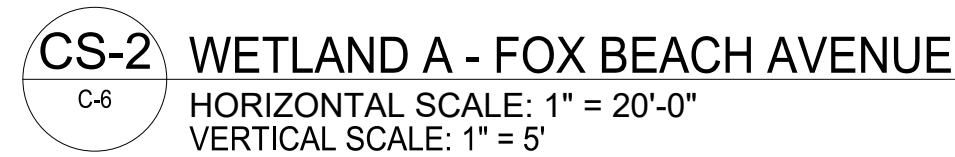
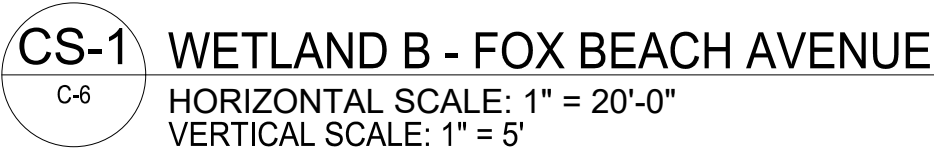
CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER AND SEWER OPERATIONS
CAPITAL PROJECT SER-200285
FORESTED WETLANDS MITIGATION
PLAN AT OAKWOOD BEACH
STATEN ISLAND, NEW YORK

OAKWOOD BEACH

FINAL SITE PLAN - 4

DATE JANUARY 2025
SHEET 12 OF 49
DWG. NO. C-9

PROJECT ID: SER-200285

[illegible]

DESIGNED E. ROSENBERG
DRAWN J. HARKINS
CHECKED J. RIVAS
SECT. CHIEF S. MEHROTRA
PROJ. ENGR. J. HARKINS

IF THIS BAR DOES NOT MEASURE 1"
THEN DRAWING IS NOT TO FULL SCALE

0 1/2" 1"



Hazen

SCAPE

WARNING

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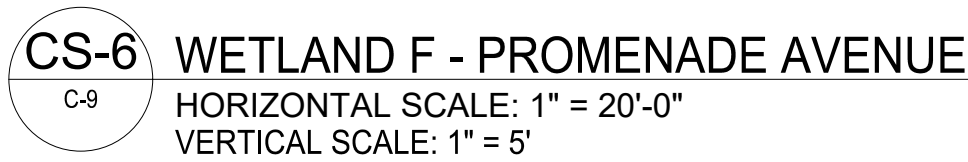
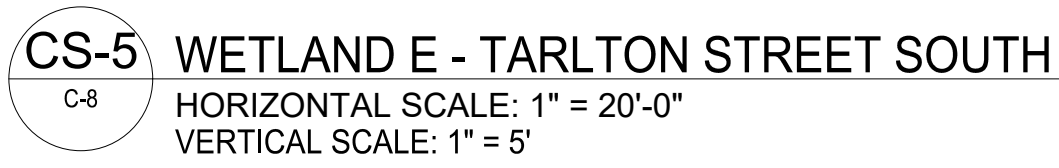


CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER AND SEWER OPERATIONS
CAPITAL PROJECT SER-200285
FORESTED WETLANDS MITIGATION
PLAN AT OAKWOOD BEACH
STATEN ISLAND, NEW YORK

CROSS-SECTIONS - 1

SHEET 19 OF 49

DWG. NO. C-16



REV	ISSUED FOR	DATE	BY

DESIGNED E. ROSENBERG
DRAWN J. HARKINS
CHECKED J. RIVAS
SECT. CHIEF S. MEHROTRA
PROJ. ENGR. J. HARKINS

IF THIS BAR DOES NOT MEASURE 1"
THEN DRAWING IS NOT TO FULL SCALE

0 1/2" 1"



Hazen

SCAPE

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STATEN ISLAND, NEW YORK

DATE JANUARY 2025

SHEET 21 OF 49

DWG. NO. C-18