

Arthur Kill Drainage and Road Improvements: Capital Project RED366/HWR1140A

STATEN ISLAND, RICHMOND COUNTY, NEW YORK

Phase 1A Archaeological Documentary Study

Prepared for:

The New York City Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

Prepared by:



NOVEMBER 2022

Management Summary

SHPO Project Review Number: 22PR08087

Involved Agencies: New York City Department of Design and Construction
New York City Department of Transportation
New York State Department of Environmental Conservation
United States Army Corps of Engineers

Phase of Survey: Phase 1A Archaeological Documentary Study

Location Information

Location: Arthur Kill Road between Richmond and Clarke Avenues
Staten Island, New York

Minor Civil Division: 08501

County: Richmond County

Survey Area

Length: Approximately 8,000 feet

Width: Approximately 80 to 550 feet

Area: 15.5 acres (675,288 square feet)

USGS 7.5 Minute Quadrangle Map: Arthur Kill

Report Author: Elizabeth D. Meade, PhD, RPA
Registered Professional Archaeologist 16353

Date of Report: November 2022

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A. INTRODUCTION

The New York City Department of Design and Construction (DDC), on behalf of the New York City Departments of Environmental Protection (NYCDEP) and Transportation (NYCDOT) is proposing Capital Project RED366/HWR1140A which is a road reconstruction and drainage project along a 1.5-mile segment of Arthur Kill Road located in the Eltingville, Great Kills, and Richmond neighborhoods of Staten Island, NY. The proposed project corridor is the full mapped right-of-way (ROW) of Arthur Kill Road and adjacent intersections between Richmond Avenue to the west and Clarke Avenue to the east (see **Figure 1**).

This segment of Arthur Kill Road has been identified for a number of deficiencies related to street design, traffic flow and delays, and drainage improvement needs. As it relates to drainage, the project corridor is in need of a comprehensive drainage collection system to alleviate persistent street flooding from rainstorm and storm tide events, particularly at the intersection of Arthur Kill Road and Getz Avenue. Therefore, a primary objective of a project here is to eliminate both wet weather and tidal flooding at this intersection and in doing so, improve drainage in the community. As part of the infrastructure improvements, DEP has also identified the need to upgrade the water mains along the project corridor to comply with latest DEP water main standards. With respect to the street improvements, the proposed project would improve this street corridor by reconstructing the roadway surface with widening where needed to the mapped width and, in doing so, improving vehicle and pedestrian functions and safety. In addition, as part of these improvements, a shared-use path is proposed to support alternative transportation modes and to improve connections with Brookfield Park. Finally, any missing segments of sidewalk or substandard corners would be completed to support pedestrian and Americans with Disabilities Act (ADA) accessibility between residences and businesses along Arthur Kill Road.

This project will require United States Army Corps of Engineers (USACE) nationwide permits in addition to permits from the New York State Department of Environmental Conservation (NYSDEC) for tidal and freshwater wetlands impacts, and a State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities. As the lead City agency, NYCDOT is, with this submission, initiating consultation with New York State Office of Parks, Recreation and Historic Preservation (OPRHP) under Section 106 of the National Historic Preservation Act.

B. PROPOSED PROJECT DESCRIPTION

The proposed project corridor is generally the mapped right-of-way (ROW) of Arthur Kill Road and would include currently unbuilt ROW of Arthur Kill Road bounded by Richmond Avenue to the west, Clarke Avenue (aka Richmond Town Road) to the east, with Brookfield Park on the north, and including limited lengths of several interconnecting cross streets (see **Figures 1 and 2**). The elements included within the proposed project design are summarized below.

PROPOSED ROADWAY WORK

The proposed project design includes the following roadway improvements:

- Reconstructing to NYCDOT design standards approximately 8,000 linear feet of Arthur Kill Road and widening the road to a width of 80 to 100 feet from its current width of 70 to 80 feet, inclusive of the road surface and sidewalks;
- Installing 10-foot-wide concrete center medians;
- Converting Arthur Kill Road from two through-lanes to four through-lanes between Richmond Avenue and Clarke Avenue, tapering back to three lanes at the intersection with Clarke Avenue;
- Establishing a 15-foot-wide path inclusive of a bicycle/pedestrian facility and buffer on the north side of Arthur Kill Road within both the mapped ROW and Brookfield Park;
- Building out the sidewalk on the south side of Arthur Kill Road from 5 feet to 10 feet;
- Upgrading sidewalks at the intersecting streets;
- Installing new and replacement street lighting and traffic signals;
- Relocating light poles to the new curb lines; and
- Repaving the intersections of Arthur Kill Road that abut the project limits.

The western limit of the project corridor would terminate before the Richmond Avenue intersection and would include sidewalk improvements on the north- and southeast corners. The eastern limit of the project corridor would terminate approximately 150 feet east of the Clarke Avenue intersection (as measured from the center of the intersection). Project work at this intersection on the northside of Arthur Kill Road include removal of an existing catch basin and new concrete curbing. Project work at this intersection on the south include sidewalk improvements on the southwest corner of Clarke Avenue.

PROPOSED UTILITY WORK

The proposed project design includes the following utility improvements:

- Installing new and replacement sanitary sewers, water mains, and hydrants in both the existing and expanded/unbuilt ROW (typically along Arthur Kill Road);
- Installing new stormwater collection sewers and catch basins, and improving drainage channels, where needed; and
- Installing three new or modified outfalls at Getz Avenue, Tanglewood Drive and Clarke Avenue at the north side of Arthur Kill Road.

PROPOSED PROPERTY ACQUISITION

To implement the proposed road widening, the City must acquire approximately 38,904 square feet of privately-owned land and 313,593 square feet of unbuilt but mapped streetbed on the north and south sides of Arthur Kill Road from Cortelyou Road on the west to Clarke Avenue on the east. Actions on the privately-owned land could involve the removal of encroachments within mapped but unbuilt ROW. The land to be acquired includes sidewalks; grassy lawns in front yards; driveways; trees, bushes, and landscaping; utility poles; fences/gates; planters; front yard sheds; steps leading from elevated lawns to the sidewalk or the front steps of individual houses; retaining walls; parking area, concrete pads and walkways. The intersecting streets will not be widened. Acquisition of property from 721 Arthur Kill Road, the location of an existing trolley barn, may be required to accommodate widening on the north side which may necessitate the removal of the building.

C. DEFINITION OF THE AREA OF POTENTIAL EFFECTS

Pursuant to *36 CFR 800.4(a)(1)*, the area of potential effects (APE) is defined as the geographic area(s) within which an undertaking may directly or indirectly affect historic resources. Based on the proposed scope of work, NYCDOT has determined that the architectural and archaeological APE for this project consists of the full width of proposed widening on Arthur Kill Road from Clarke Avenue to Richmond Avenue, for a distance to include properties within line-of-sight, and areas of work on intersecting streets (see **Table 1-1** and **Figures 1 and 2**). Depths of disturbance will range from 2-15 feet along all segments in both previously disturbed and undisturbed soils. The APE includes areas in which identification efforts would occur for archaeological properties.

Table 1-1
Definition of the Archaeological APE

Streetbed Segment	Length (in feet)	Width (in feet)
Arthur Kill Road from 75 feet west of Richmond Avenue to 120 feet northeast of Clarke Avenue	8,000	100
Richmond Avenue from 75 feet north of Arthur Kill Road to 300 feet southeast of Arthur Kill Road	365	90
Getz Avenue from Arthur Kill Road running southeast	375	80
Ridgewood Avenue from Arthur Kill Road to Opp Court, running southeast	485	60
Cortelyou Avenue from Arthur Kill Road running southeast	50	60
Armstrong Avenue from Arthur Kill Road running southeast	50	80
Lennon Court (private drive) from Arthur Kill Road running southeast	30	10
Abbey Road (private drive) from Arthur Kill Road running southeast	30	10
Abingdon Avenue from Arthur Kill Road running southeast	60	80
Brookfield Avenue from Arthur Kill Road running southeast	50	60
Colon Avenue from Arthur Kill Road running southeast	50	80
Doane Avenue from Arthur Kill Road running southeast	50	60
Elverton Avenue from Arthur Kill Road running southeast	50	55
Gifford Avenue from Arthur Kill Road running southeast	50	60
Miles Avenue from Arthur Kill Road running southeast	50	60
Greaves Avenue from Arthur Kill Road running southeast	50	80
Troy Street from Arthur Kill Road running southeast	50	50
Corbin Avenue from Arthur Kill Road running southeast	50	60
Tanglewood Drive from Arthur Kill Road running southeast	50	64
Newale Avenue from Arthur Kill Road running southeast	50	48
West side Clarke Avenue from Arthur Kill Road running southeast	10	100

Note: See **Figure 2**.

D. SUMMARY OF PREVIOUS ENVIRONMENTAL REVIEW

The proposed project requires approvals that are subject to New York City Environmental Quality Review (CEQR) and the State Environmental Quality Review Act (SEQRA). Among these required approvals are permits from the New York State Department of Environmental Conservation (NYSDEC)—and the US Army Corps of Engineers (USACE), and as such, the project is also subject to Section 106 of the National Historic Preservation Act. NYCDOT is serving as the lead agency for the environmental review process.

The project was originally proposed in 2010, at which time consultation was initiated with the New York City Landmarks Preservation Commission (LPC). At that time, the project corridor was significantly larger and included the current project area as well as the remainder of Arthur Kill Road as far west as its terminus at Main Street in Tottenville in southwestern Staten Island. In a comment letter dated October 7,

2010, LPC determined that the entire project corridor was potentially archaeologically significant and that an archaeological documentary study was required to confirm the site's archaeological sensitivity. This Phase 1A Archaeological Documentary Study ("Phase 1A Study") has been prepared for the reduced project limits in compliance with LPC's request as issued in 2010.

E. RESEARCH GOALS AND METHODOLOGY

This Phase 1A Archaeological Documentary Study ("Phase 1A Study") of the APE has been designed to satisfy the requirements of LPC and the New York State Historic Preservation Office (SHPO) while also following the guidelines of the New York Archaeological Council (NYAC). The study documents the development history of the APE and its potential to yield archaeological resources, including precontact and historic cultural resources. In addition, this report documents the current conditions of the APE, as well as previous cultural resource investigations that have taken place in the vicinity.

The Phase 1A Study has four major goals: (1) to determine the likelihood that the APE was occupied during the precontact (Native American) and/or historic periods; (2) to determine the effect of subsequent development and landscape alteration on any potential archaeological resources that may have been located within the APE; (3) to make a determination of the APE's potential archaeological sensitivity; and (4) to make recommendations for further archaeological analysis, if necessary. The steps taken to fulfill these goals are explained in greater detail below.

The first goal of this Phase 1A Study is to determine the likelihood that the APE was inhabited during the precontact and/or historic periods and identify any activities that may have taken place in the vicinity that would have resulted in the deposition of archaeological resources.

The second goal is to determine the likelihood that archaeological resources could have survived intact within the APE after development and landscape alteration (e.g., erosion, grading, filling, etc.). Potential disturbance—associated with paving, utility installation, and other previous construction impacts—was also considered. As described by NYAC in their *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State*, published in 1994 and subsequently adopted by OPRHP:

An estimate of the archaeological sensitivity of a given area provides the archaeologist with a tool with which to design appropriate field procedures for the investigation of that area. These sensitivity projections are generally based upon the following factors: statements of locational preferences or tendencies for particular settlement systems, characteristics of the local environment which provide essential or desirable resources (e.g., proximity to perennial water sources, well-drained soils, floral and faunal resources, raw materials, and/or trade and transportation routes), the density of known archaeological and historical resources within the general area, and the extent of known disturbances which can potentially affect the integrity of sites and the recovery of material from them (NYAC 1994: 2).

The third goal of this study is to make a determination of the APE's archaeological sensitivity. As stipulated by the NYAC standards, sensitivity assessments should be categorized as low, moderate, or high to reflect "the likelihood that cultural resources are present within the project area" (NYAC 1994: 10). For the purposes of this study, those terms are defined as follows:

- *Low*: Areas of low sensitivity are those where the original topography would suggest that Native American sites would not be present (i.e., locations at great distances from fresh and saltwater resources), locations where no historic activity occurred before the installation of municipal water and

sewer networks, or those locations determined to be sufficiently disturbed so that archaeological resources are not likely to remain intact.

- *Moderate*: Areas with topographical features that would suggest Native American occupation, documented historic period activity, and with some disturbance, but not enough to eliminate the possibility that archaeological resources are intact on the APE.
- *High*: Areas with topographical features that would suggest Native American occupation, documented historic period activity, and minimal or no documented disturbance.

As mentioned above, the fourth goal of this study is to make recommendations for additional archaeological investigations where necessary. According to NYAC standards, Phase 1B archaeological testing is generally warranted for areas determined to have moderate sensitivity or higher. Archaeological testing is designed to determine the presence or absence of archaeological resources that could be impacted by a proposed project. Should they exist within the APE, such archaeological resources could provide new insight into precontact occupation in central Staten Island, the transition from Native American to European settlement, or the historic period occupation of the APE.

To satisfy the four goals as outlined above, documentary research was completed to establish a chronology of the APE's development, landscape alteration, and to identify any individuals who may have owned the land or worked and/or resided there, and to determine if buildings were present there in the past. Data were gathered from various published and unpublished primary and secondary resources, such as historic maps, topographical analyses (both modern and historic), historic and current photographs (including aerial imagery), newspaper articles, local histories, and previously conducted archaeological surveys. These published and unpublished resources were consulted at various repositories, including the Main Research Branch of the New York Public Library (including the Local History and Map Divisions), the Library of Congress, and the Staten Island Historical Society. Previously identified sites and previously conducted archaeological resources in the vicinity were collected from the files of LPC, SHPO, and the New York State Museum (NYSM). Information on previously identified archaeological sites and previous cultural resources assessments was accessed through the New York State Cultural Resource Information System (CRIS).¹ Online textual archives, such as Google Books and the Internet Archive Open Access Texts, were also accessed. Attempts were made to identify the owners and occupants of the APE using historical maps.

F. SUMMARY OF PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS IN VICINITY OF THE PROJECT CORRIDOR

A small area of the eastern end of the project corridor is included within or immediately adjacent to the locations of two previous archaeological surveys described below.

PROPOSED TELECOMMUNICATIONS FACILITY AT 122 ARTHUR KILL ROAD, 2002

In 2002, the Louis Berger Group prepared a Phase 1A Study of the site of a proposed telecommunications facility/wireless tower within an area of United Hebrew Cemetery at 122 Arthur Kill Road (Block 4475, Lot 1). Because documentary research indicated that the site was potentially sensitivity for precontact archaeological resources, a single shovel test pit (STP) was excavated in the location of the proposed tower. No archaeological resources were identified, and no further analysis was recommended. The tower was constructed within a triangular traffic median and is visible within the cemetery from Arthur Kill Road.

¹ <https://cris.parks.ny.gov>

STATEN ISLAND BIKE PATHS, 2008

In 2008, Cultural Resource Consulting Group (CRCG) prepared a Phase 1A Study for segments of a proposed bicycle pathway through portions of Latourette Park to the north of the APE. The study area analyzed during the investigation included an area adjacent to and partially including Clarke Avenue (aka Richmondtown Road) and Arthur Kill Road that overlap with the current Arthur Kill Road Drainage and Road Improvements project area. Based on a review of maps and other information, the Clarke Avenue segment of the bike path study area was determined to have moderate to high sensitivity for archaeological resources associated with both precontact and historic period occupation of the area. The bike path does not appear to have been constructed as proposed in the study and no further work was completed in the vicinity of the current project area.

A. CURRENT CONDITIONS

The proposed project area is primarily comprised of built and unbuilt street right-of-way (see **Photographs 1 through 8**). The land acquisition areas are situated along the northern and southern sides of Arthur Kill Road. The majority of these areas include sidewalks; grassy lawns within front yards; paved driveways and parking areas; trees, bushes, and other landscaping; utility poles; fences/gates; planters; steps leading from elevated lawns to the sidewalk or the front steps of individual houses; retaining walls; and concrete pads and walkways. The majority of the structures within the project area consist of non-descript small wood frame sheds that are located within the unbuilt right-of-way on Block 4589, Lots 2, 6, and 64; Block 5451, Lot 24; and Block 5459, Lots 1 and 6. In addition, the project corridor includes a portion of a two-story former trolley barn at 721 Arthur Kill Road (Block 5570, Lot 1) that may be demolished with the proposed project, pending the project's final design.

B. GEOLOGY AND TOPOGRAPHY

The APE is situated within a geographic province known as the Atlantic Coastal Plain (Isachsen, et al. 2000). The island's physical setting was shaped by massive glaciers up to 1,000 feet thick that retreated from the area toward the end of the Pleistocene Epoch. There were four major glaciations that began approximately 17,000 years ago and lasted until roughly 12,000 years ago when the Wisconsin period—the last glacial period—came to an end. During the Wisconsin ice age, a glacial moraine known as the “Terminal Moraine” traveled southwest across Staten Island. The progression of the Terminal Moraine resulted in the separation of the Atlantic Coastal Plain in southern Staten Island from the remainder of the island to the northwest, which is characterized by hard bedrock rather than glacial deposits (ibid; Reeds 1925). The project area is situated along the northern border of the moraine and the path of Arthur Kill Road may have been defined by the rocky ridge to the south. Bedrock in southern Staten Island is associated with the coastal plain deposits of the Raritan Formation (clay, silty clay, sand, and gravel) dating to the Upper Cretaceous epoch, which ended approximately 66 years ago (Fisher, et al. 1995; Isachsen, et al. 2000). Surficial geological deposits in the vicinity of the APE are identified as till; “till moraine,” which is more permeable and more variably sorted and drained than other till deposits; and artificial fill in the vicinity of Latourette Park (Cadwell 1989).

C. HYDROLOGY

As the glaciers receded, the ensuing runoff created streams, rivers, and lakes as well as thick tracts of marshland in the low-lying areas along Staten Island's coasts. As recently as a few thousand years ago, the sea level was 2 to 4 meters lower than it is at present and the coastline was located further out into the bay hundreds of meters south of its present location (GRA 2014). The APE is located immediately south of the vast wetland network of the Fresh Kills. Though portions have been filled in to create modern Latourette Park, the Kills were historically bounded by dense tracts of marsh that were located within 400 to 1000 feet north of the project corridor. In at least four locations, tributaries extended south from the kills and crossed under bridges that carried Arthur Kill Road. Many additional swamps, marshes, streams,

and ponds were located to the north and south of Arthur Kill Road in the vicinity of the project area, as shown on **Figure 3**.

D. SOILS

The Web Soil Survey maintained by the United States Department of Agriculture (USDA)'s National Resource Conservation Service indicates that the APE is in the vicinity of eighteen mapped soil complexes, most of which are closely related and typically associated with highly developed urban areas. These soil types include the following (see **Table 2-1**):

- **Appoquinimink Mucky Peat (ApA)**: mapped in a small waterfront area near the APE's northeast corner, these types of soils are found in frequently flooded tidal wetland areas with 0 to 1 percent slopes;
- **Greenbelt Loam (GbA, GbB, GbC, GbD, GbE)**: well-drained loam and sandy loam found in areas of 0 to 3, 3 to 8, 8 to 15, 15 to 25, and 25 to 35 percent slopes, respectively;
- **Greenbelt-Urban Land Complex (GUA, GUAw, GUB, GUBw)**: well-drained soils typically found on summits with 0 to 3 (GUA) or 3 to 8 (GUB) percent slopes and comprising loam and sandy loam. GUAw and GUBw denote areas with a very deep water table;
- **Haledon-Hasbrouk Complex (HHA)**: a somewhat poorly drained soil type associated with ground moraines in generally level areas with 0 to 3 percent slopes. The only area where these soils were identified was located on the northern side of Richmond Valley Road in the vicinity of the existing gully near the northeastern portion of the APE;
- **Laguardia-Greenbelt (LGA)**: well-drained cobbly and very cobbly sandy loam found in summits/shoulders with slopes of 0 to 3 percent;
- **North Meadow Sandy Loam (NoA)**: moderately well drained soils with a surface layer of highly decomposed plant material over layers of fine sandy loam, stony fine sandy loam, sandy loam, and silt loam in areas with 0 to 3 percent slopes.
- **Urban Land Greenbelt Complex (UGA/UGAI, UGB, UGC/UGCI)**: well-drained soils typically found on summits with 0 to 3, 3 to 8, or 8 to 15 percent slopes (respectively) and comprising gravelly sandy loam beneath up to 15 inches of cemented material;
- **Urban Land, tidal marsh substratum (UmA)**: typically found on summits with 0 to 3 percent slope and comprising very gravelly sand formerly associated with tidal marshes beneath up to 20 inches of cemented material/pavement; and
- **Urban Land, Till Substratum (UtA)**: urban fill materials over glacial till on summit landforms with 0 to 3 percent slopes comprising gravelly sandy loam beneath up to 15 inches of cemented material.

**Table 2-1
Project Area Soils**

Series Name	Typical Soil Profile			Slope (%)	Drainage	Landform
	Level	Soil Horizon Depth (inches)	Soil Type			
Appoquinimink Mucky Peat (ApA)	Oe	0 to 3	Mucky Peat	0 to 1	Very poorly drained	Tidal Marshes
	Cg	3 to 28	Silt Loam			
	Oa	28 to 35	Muck			
	Oe	35 to 47	Mucky Peat			
Greenbelt Loam (GbA, GbB, GbC, GbD, GbE)	^A	0 to 5	Loam	A:0 to 3 B:3 to 8 C:8 to 15 D:15 to 25 E: 25 to 35	Well drained	Footslope, summit, backslope
	^Bw1	5 to 16	Loam			
	^Bw2	16 to 30	Loam			
	^C	30 to 89	Sandy Loam			
Greenbelt-Urban Land Complex (GUA, GUAw, GUB, GUBw)	^A	0 to 5	Loam	A:0 to 3 B:3 to 8	Well-drained	Summit, backslope, footslope
	^Bw1	5 to 16	Loam			
	^Bw2	16 to 30	Loam			
	^C	30 to 89	Sandy Loam			
Haledon-Hasbrouk Complex (HHA)	Oe	0 to 2	Moderately decomposed plant material	0 to 3	Somewhat poorly drained	Ground moraines
	A	2 to 6	Loam			
	BEg	6 to 12	Silt Loam			
	Btg	12 to 29	Silt Loam			
	B/Etx	29 to 63	Loam			
Laguardia-Greenbelt (LGA)	^Au	0 to 8	Cobbly: artifactual coarse sandy loam	0 to 3	Well-drained	Summit, shoulder, backslope, footslope, toeslope
	^BCu	8 to 26	Very cobbly: artifactual coarse sandy loam			
	^Cu	26 to 79	Very cobbly: artifactual coarse sandy loam			
North Meadow Sandy Loam (NoA)	Oi	0 to 1	Highly decomposed plant material	0 to 3	Moderately well-drained	Backslope, footslope, toeslope
	^A	1 to 2	Fine sandy loam			
	^Bw1	2 to 20	Stony fine sandy loam			
	^Bw2	20 to 24	Sandy loam			
	^Bw3	24 to 28	Sandy loam			
	2Bwb1	28 to 39	Silt Loam			
2Bwb2	39 to 72	Silt Loam				
Urban Land Greenbelt Complex (UGA/UGAI, UGB, UGC)	M	0 to 15	Cemented Material	A:0 to 3 B:3 to 8 C/l:8 to 15	Well-drained	Summit
	2^C	15 to 79	Gravelly sandy loam			
	2^C	15 to 79	Gravelly sandy loam			
Urban Land, Tidal Marsh Substratum (UmA)	M1	0 to 6	Cemented Material	0 to 3	Unknown	Summit, shoulder, backslope, toeslope, footslope
	M2	6 to 20	Cemented Material			
	2^C	20 to 79	Gravelly sandy loam			
Urban Land, Till Substratum (UtA)	M	0 to 15	Cemented Material	0 to 3	Well-drained	Summit, backslope, footslope
	2^C	15 to 79	Gravelly sandy loam			

Sources: USDA Natural Resources Conservation Service Web Soil Survey: <https://websoilsurvey.sc.egov.usda.gov> (accessed July 2022).

A. PRECONTACT CONTEXT

Archaeologists have divided the time between the arrival of the first humans in northeastern North America and the arrival of Europeans more than 10,000 years later into three periods: Paleo-Indian (11,000 to 10,000 BP), Archaic (10,000 to 2,700 BP), and Woodland (2,700 BP to AD 1500). These divisions are based on certain changes in environmental conditions, technological advancements, and cultural adaptations, which are observable in the archaeological record.

PALEO-INDIAN PERIOD

Human populations did not inhabit the Northeast until the glaciers retreated more than 11,000 years ago. These new occupants included Native American populations referred to by archaeologists as Paleo-Indians, the forebears of the Delaware—also called the Lenape Indians—who would inhabit the land in later years. Archaeological evidence suggests that the Paleo-Indians were likely highly mobile hunters and gatherers who utilized a distinct style of lithic technology, typified by fluted points. They appear to have lived in small groups of fewer than 50 individuals (Dincauze 2000) and maintained no permanent campsites. In addition, most of the Paleo-Indian sites that have been investigated were located near water sources. Because of the close proximity of Paleo-Indian sites to the coastline, few have been preserved in the New York City area. Of the few Paleo-Indian sites that have been discovered in New York City, nearly all have been found on Staten Island. One such site is that of Port Mobil, on Staten Island, located on the southwestern coast of Staten Island (Cantwell and Wall 2000). Like most precontact sites, this location is situated on high ground overlooking the water. Because of heavy disturbance in the area—it is currently an oil tank farm—the site has yielded nothing more than a collection of fluted points and other stone tools characteristic of the period (Ritchie 1980). Paleo-Indian artifacts were also found along the eroding shoreline 500 yards south of the Port Mobil site and at the Cutting site in the Rossville section of Staten Island (ibid). Recent excavations at the Old Place site in northwestern Staten Island by the Public Archaeology Laboratory (PAL) have yielded new evidence regarding the site's occupation during the Paleo-Indian period through the Late Woodland, although the majority of the collected artifacts date to the Archaic (PAL 2014).

ARCHAIC PERIOD

The Archaic period has been sub-divided into three chronological segments, based on trends identified in the archaeological record which reflect not only the ecological transformations that occurred during this period, but the cultural changes as well. These have been termed the Early Archaic (10,000–8,000 BP), the Middle Archaic (8,000–6,000 BP), and the Late Archaic (6,000–2,700 BP) (Cantwell and Wall 2001). The Late Archaic is sometimes further divided to include the Terminal Archaic (3,000-2,700 BP). The abundance of food resources that arose during this period allowed the Archaic Native Americans to occupy individual sites on a permanent or semi-permanent basis, unlike their nomadic Paleo-Indian predecessors. Fishing technology was developed during the Middle Archaic in response to an increasing dependence on the area's marine resources. Tools continued to be crafted in part from foreign lithic

materials, indicating that there was consistent trade among Native American groups from various regions in North America throughout the Archaic period (ibid).

Few Early Archaic sites have been identified in New York City due to rising sea levels and the rapid development of the area, including at the time the dominance of coniferous forests, which generated a habitat ill-fit for human habitation (Boesch 1994). Most of the sites that have been identified are located on Staten Island, including Ward's Point at the southwestern tip of the island; Richmond Hill; the H. F. Hollowell site; and the Old Place site. Sites such as Ward's Point—a domestic habitation location that due to lowered sea levels was originally inland—tend to be deep and stratified and have yielded stone tools related to cooking, woodworking, and hide processing. The many years of constant occupation caused the artifacts to be deeply buried under more recent debris deposits (Cantwell and Wall 2001). However, at the Old Place Site, the only artifacts that were discovered—stone tool assemblages—were found at relatively shallow depths of around 42 inches or 3.5 feet (Ritchie 1980).

There are also few known Middle Archaic sites in the region. The majority of these tend to consist of large shell middens, which are often found near major watercourses such as the Hudson River, although stone points have also been found in such locations. These sites were in great danger of obliteration because of their proximity to the shrinking coastlines. Unlike the Early and Middle periods, many Late Archaic sites have been found throughout the New York City area including many in Staten Island. Late Archaic habitation sites are often found in areas of low elevation near watercourses and temporary hunting sites are often located near sandy areas (Boesch 1994). Late Archaic sites identified in Staten Island include the Pottery Farm, Smoking Point, and the Wort Farm site, all of which are in close proximity to the APE (ibid).

Finally, many Terminal Archaic sites from all across New York City have provided examples of what archaeologists call the Orient culture, which is characterized by long fishtail stone points and soapstone bowls. Extremely elaborate Orient burial sites have been found on eastern Long Island, but none have been identified on Staten Island. Orient-style fishtail points have been discovered along the shores of the Charleston neighborhood, and it is assumed that they fell from eroding cliffs located nearby (Boesch 1994).

WOODLAND PERIOD

The Woodland period represents a cultural revolution of sorts for the Northeast. During this time, Native Americans began to alter their way of life, focusing on a settled, agricultural lifestyle rather than one of nomadic hunting and gathering. Social rituals become visible in the archaeological record at this time. Composite tools, bows and arrows, domesticated dogs, and elaborately decorated pottery were introduced to Native American culture, and burial sites grew increasingly complex. Woodland-era sites across North America indicate that there was an overall shift toward full-time agriculture and permanently settled villages. Archaic sites in New York City, however, suggest that the Native Americans there continued to hunt and forage on a part-time basis. This was most likely due to the incredibly diverse environmental niches that could be found across the region throughout the Woodland period (Cantwell and Wall 2001; Grumet 1995).

The Woodland period ended with the arrival of the first European colonists in the 17th century. One Woodland period archaeological site that has been identified on Staten Island is the Bowman's Brook site, located along the island's northwest coastline. That site yielded a type of incised pottery, which has since become known as the Bowman's Brook Phase. Sites with this particular type of pottery are most often located near tidal streams or coves and are usually associated with large shell middens and refuse pits, indicating long periods of occupation (Ritchie 1980). The Bowman's Brook site also contained several human and dog graves, as well as bundle burials (Cantwell and Wall 2001). The Ward's Point site was

also occupied during the Woodland period, and many Native American artifacts and elaborate burials with varied grave offerings have been uncovered there (ibid).

CONTACT PERIOD

At the time that the New York area was first colonized by European occupiers, a division of the Munsee Indians known as the Raritan occupied southern Staten Island (Bolton 1975). They entered the area toward the end of the Woodland period (Boesch 1994). They referred to Staten Island as “Aquehonga Manacknong,” possibly meaning “haunted woods,” “bushnet fishing place,” or “the high bank fort place” (Grumet 1981: 2). The name may have also referred to the village settlement at Ward’s Point (ibid). In land transactions with the Europeans, the island was also referred to as “Matawucks” and “Eghquaous” (Boesch 1994).

The contact period in the New York City area began with the arrival of European expeditions led by Giovanni de Verrazano in 1524 and Henry Hudson in 1609, and the area was first colonized by Dutch settlers in the early 17th century. Shortly after Hudson’s men explored Staten Island, a skirmish ensued with the local Indians, resulting in the death of one of Hudson’s crewmen (Burrows and Wallace 1999). Because of this incident, the Native Americans residing on Staten Island were extremely wary of Europeans and set up lookouts on tall hills in an effort to spot approaching ships so as to prevent vessels from landing (Historical Records Survey 1942: xii).

Beginning in 1621, Dutch West India Company (WIC) managed Dutch interests in the New World and began to purchase large tracts of land from the Native American groups that inhabited the region. Although the land had been “sold” to the Europeans in 1630 (Grumet 1981), it was not until 1638 that a successful European colony, that of Olde Dorpe, could be established on the island, which continues to retain its Dutch name of “Staaten Island.” Violence between the Native Americans and the Europeans would cause this village to be burned down and rebuilt several times throughout the contact period (ibid). Several incidents occurred in which the Dutch and the Native Americans engaged in violent, deadly clashes on Staten Island, including a war attributed to Dutch Director-General William Kieft in the 1640s and the “Peach War” of 1655 (Grumet 1981). Following the end of the latter altercation and facing a growing European population, the Native American residents of the area sold the remainder of the land on Staten Island between 1657 and 1670, finally paving the way for extensive European settlement on the island (Grumet 1981; Bolton 1975).

B. PREVIOUSLY IDENTIFIED NATIVE AMERICAN ARCHAEOLOGICAL SITES NEAR THE PROJECT CORRIDOR

In general, Native American habitation sites are most often located in coastal areas with access to marine resources and near fresh water sources and areas of high elevation and level slopes of less than 12 to 15 percent (NYAC 1994). Further indication of the potential presence of Native American activity near a project site is indicated by the number of precontact archaeological sites that have been previously identified in the vicinity. Information regarding such previously identified archaeological sites was obtained from various locations including the site files of SHPO, LPC, NYSM, and from published accounts. Many archaeological sites have been identified within one mile of the APE in databases maintained by SHPO and NYSM (accessed via CRIS) and the site is located within a generalized area of archaeological sensitivity as mapped by SHPO and partially in areas of moderate or high sensitivity as mapped by LPC (Boesch 1994). Eleven sites are mapped within one mile of the APE in CRIS and in LPC’s site files (ibid). These sites are summarized in **Table 3-1**, below. The majority of these sites were discovered and reported by early archaeologists or avocational excavators in the early 20th century and are poorly documented.

Table 3-1

Previously Identified Precontact Archaeological Sites within One Mile of the APE

OPRHP Site Number	NYSM Site Number	LPC Site Number	Site Name	Distance to APE	Time Period	Site Description	Additional Source(s)
n/a	745	B	Greenridge	2,500 feet	Precontact	Campsite	Boesch 1994; Bolton 1922
08501.000109	749	22	Richmond Hill	4,500 feet	Precontact	Complex of three sites, including a campsite with lithic scatter	Boesch 1994
n/a	4601	n/a	n/a	1,000 feet	Precontact	Campsite	Parker 1920
n/a	4616	n/a	n/a	3,500 feet	Precontact	Large campsite with lithic artifacts	Parker 1920
n/a	4617	n/a	n/a	4,300 feet	Precontact	Shell midden with lithic artifacts	Parker 1920
n/a	8321	n/a	n/a	Overlaps site	Precontact	Traces of occupation	Parker 1920
n/a	8499	n/a	n/a	1,700 feet	Precontact	Campsite	
080501.000005	n/a	79	Fiddler's Green	2,800 feet	Precontact	Small campsite with lithics and debitage	Boesch 1994
n/a	n/a	97	Ketchum Hill	4,500 feet	Precontact	Native American artifacts	Boesch 1994
n/a	n/a	L	Old Mill Road	750 feet	Precontact	Unknown	Boesch 1994
n/a	n/a	J	Old Wagon Road/ Richmond Hill	1,000 feet	Precontact	Unknown	Boesch 1994

Sources: CRIS database (<https://cris.parks.ny.gov/>) and Boesch 1994

Bolton (1922) indicates that the stretch of Arthur Kill Road that includes the project area was originally constructed as a Native American trail. The pathway served as a major indigenous throughfare that passed between the Fresh Kills and the hills of the terminal moraine, connecting indigenous settlements across Staten Island. During the region's earliest periods of human occupation, indigenous groups appear to have lived in the high lands adjacent to the Arthur Kill, frequently exploiting the resources in the low-lying coastal region below (Boesch 1994). The sites in **Table 3-1** confirm that there was at least short-term occupation of the island's interior as well as more established occupation sites surrounding the Fresh Kills. Archaeological evidence suggests that many of these seasonal campsites were consistently reoccupied through the Late Woodland period (ibid). Many of the sites included in **Table 3-1** represent temporary and seasonal campsites used by Native Americans. These sites and others like them have yielded large amounts of lithic debitage—waste flakes created during the manufacture of stone tools—as well as occasional stone tools, fire-cracked rock, and shell middens, among other artifacts representing multiple phases of Native American occupation.

A. THE HISTORICAL COMMUNITIES OF RICHMOND AND GREENRIDGE

The Dutch colony of New Netherland became the British colony of New York in 1664, and though the Dutch were later able to reclaim the colony in 1673, they traded it back in 1674 for “the far more lucrative colony of Surinam” (Cantwell and Wall 2001: 181). Conflicts between Dutch colonizers and Native Americans prevented the formation of a successful European settlement on Staten Island until the late 1630s. Even afterwards, peaceful relations between the two groups were not established until after the British had seized the colony.

Richmond County was established in 1683 and the area that is now New York City would remain under British control for the next hundred years. Under British rule, Staten Island’s open farmland and vast coastline became essential for the production of agricultural products and collection of marine resources for export to the city (Leng and Davis 1930). By the late 17th century, a number of communities had been established on Staten Island. The neighborhood now known as Richmondtown was one of the first European villages established on Staten Island. The settlement was established by the late 17th century and was historically known as Cuckoldstown, Richmond, or Richmond Towne (Leng and Davis 1930). The 1733 Popple map of Staten Island depicts the village of “Cuckold’s Town” southeast of the Fresh Kills in what is now Richmondtown and no other settlements are identified in the vicinity. The town was the seat of Richmond County and in addition to residences, its earliest developments included municipal buildings such as a courthouse, a jail, a tavern, commercial buildings/stores, and several houses of worship (Staten Island Historical Society 1946). These facilities were expanded and replaced over time, and more than 45 historical buildings, outbuildings, and structural foundations dating between the 17th and 20th centuries—including those that were relocated to the area—and other historical elements such as cemeteries, mills, and landscape elements are preserved as part of Historic Richmond Town, a historical village recreation and educational center.¹ One of the early churches established in the town was the Richmond Reformed Dutch Church, which was found in 1769 at the southeast corner of Arthur Kill Road (historically called Church Street in the vicinity of Richmondtown) and Center Street. As described in greater detail below, the churchyard was in use as a cemetery for over a century.

The historical settlement of Greenridge—also known as Fresh Kill or Marshland—located to the west of the project corridor was founded by French Huguenots emigrants fleeing persecution in the late 17th century (Morris 1898). Many of the early settlers included members of the Cropsey, Cortelyou, Bedell, Banker, and Metcalfe families, who would reside in the area—including in homes formerly located along the project corridor—for generations. The residents of the town engaged in commercial efforts linked to the natural resources provided by the Fresh Kills, including milling, salt hay farming, and clay harvesting/brickmaking (Leng and Davis 1930; Morris 1898). The natural ecological setting of the Green Ridge area, with its thick marshes and tall hills, proved to be useful for defensive purposes by British and American troops during the Revolutionary War (Morris 1898).

¹ <https://www.historicrichmondtown.org/>

In part due to the defensive advantages provided by places like the Fresh Kills area, Staten Island proved to be a key asset to the British during the Revolutionary War. In 1776, unsuccessful peace negotiations were held at the “Conference House” on the southern tip of Staten Island, which continues to stand in what is now known as Conference House Park. The house was built in 1680 by Captain Christopher Billop (also spelled Billopp), who four years earlier had been granted a massive plot of land comprising more than 960 acres and represents the first long-term European settlement in the southern half of Staten Island (Burrows and Wallace 1999). Throughout the remainder of the Revolutionary War, the British continued to use Staten Island as a rudimentary home base due to its strategic location at the mouth of the harbor (Historical Records Survey 1942).

Despite New York City’s loyalty to the British during the war, after the American victory the conversion to the new American government was relatively smooth (Burrows and Wallace 1999). Land that had been previously owned by British loyalists was divided and sold, creating a surge in population and development in the outer boroughs. This trend continued through the 19th century. In 1788, the island was officially divided into four townships, Castleton, Northfield, Southfield, and Westfield, where the project area is situated (Leng and Davis 1930). The boundary between towns passed through the project corridor in the vicinity of what is now Gifford’s Lane, with the western portion of the site within Westfield and the eastern portion in Southfield. Arthur Kill Road, originally known as Fresh Kills Road, was constructed along the path of an indigenous trail in the early 18th century to connect the eastern and western halves of Southern Staten Island (ibid). As it had for the Native American population of Staten Island, the road served as a major throughfare that helped to connect all quadrants of the island to a central location.

Between 1840 and 1880, the population of Staten Island nearly quadrupled (Leng and Davis 1930). This surge was caused in part by the increasing population density in Manhattan, which drove many people to the outer boroughs. The region’s prosperity caused the counties in the New York City region to become increasingly codependent, both economically and culturally. Staten Island was the site of several prominent industrial facilities and the role of industry in the area grew after the Civil War (ibid). It was therefore suggested that the counties around New York Harbor be consolidated under the name New York City. Although there was some resistance from some Staten Island residents, it officially became a borough of New York City on New Year’s Day, 1898 (Burrows and Wallace 1999).

As part of the integrated city, Staten Island flourished throughout the 20th century. Increased mass transit connected all the boroughs and allowed more people to live outside of Manhattan while still having access to the city’s varied resources. The remainder of the 20th century saw continued growth and increasing population density throughout Staten Island.

B. DEVELOPMENT HISTORY OF THE PROJECT CORRIDOR

EARLY COLONIAL HISTORY

As shown on the Skene map of original land patents in Staten Island, land south of the Fresh Kills was granted in large, linear parcels. The corridor passed through portions of at least seven late-17th century land grants of various size (from west to east): Francis Lee, 1680 (67 acres); Francis Ulston, 1680 (80 acres); Stephanus van Cortlandt, 1697 (130 acres); Tunis Egberts, 1697 (80 acres); Robert Rider, 1680 (320 acres); Arent Prall, c. 1694 (120 acres); and James Hubbard, date unknown (160 acres).

Few detailed maps exist that depict development conditions on Staten Island before the mid-19th century. Taylor and Skinner’s 1781 map of Staten Island depicts the precursor to modern Arthur Kill Road cutting across Staten Island. The map depicts the historical community of Richmond to the northeast of the project area and depicts approximately 12 residences adjacent to the project corridor on either side of the

road, making it one of the most densely developed stretches of the road. Loring McMillen's 1933 map incorporating information from Taylor and Skinner's map as well as two maps produced during the Revolutionary War depicts similar conditions.

RESIDENTIAL AND INDUSTRIAL DEVELOPMENT IN THE 19TH AND 20TH CENTURIES

Hassler's 1844 coastal survey of Staten Island continues to depict the precursor to Fresh Kills or Arthur Kill Road in the vicinity of the project corridor. The northern and southern sides of the road were lined with farmhouses and agricultural land. At that time, precursors to Richmond Avenue and Giffords Lane crossed Arthur Kill Road and the locations of all other modern streets were situated in agricultural or residential areas. The map identifies the relatively densely developed historical community of Richmond to the northeast of the project area.

The 1850 Sidney map and the 1853 Butler map (see **Figure 4**) depict the site in a similar manner, although they identify the names of property owners in the immediate vicinity of the APE. While Richmond Avenue and Gifford's Lane continue to be depicted, the maps indicate that a precursor to modern Clarke Avenue—formerly known as “Court House Road”—had already been constructed. However, its alignment near Arthur Kill Road was slightly different and that portion situated within the modern APE was not constructed in its present location. The road did not extend as far as Arthur Kill Road due to the presence of the Richmond Reformed Dutch Church cemetery. Several other long linear paths extended south from Arthur Kill Road into private properties, several of which may have later become roads. The families that occupied the land north and south of the project corridor included the descendants of some of Staten Island's earliest colonizers, including members of the Seaman, Benham, Taylor, Stillwell, Mesereau, Cortelyou, Dissocial, Prior, Van Pelt, and Lake families. Many of the same owners are identified on the 1859 and 1860 Walling, 1866 Colton, and 1872 Drip's maps of Staten Island, which reflects the development of additional houses adjacent to the project corridor, particularly on the southern side of the street.

Beers' 1874 atlas of Staten Island (see **Figure 5**) is among the first to clearly depict both building footprints and property boundaries in this portion of Staten Island. Many of the properties extended on both the north and south sides of Arthur Kill Road. A detailed discussion of the map-documented structures associated with these parcels is presented in the following section. The majority of these parcels were large in size and irregular in shape and stayed in those configurations through the early 20th century. Many of the parcels were owned by the same families for generations. The beginnings of the divisions of ancestral farms and estates is visible on historical maps and atlases beginning in the early 20th century. **Table 4-1** summarizes the history of property ownership changes as seen on historical maps published by Beers in 1874 and 1887; Robinson in 1898 and 1907 (see **Figure 6**); and Bromley in 1917.

Table 4-1
Summary of Changes in Ownership and Development, 1874–1917

Parcel #	1874	1887	1898	1907	1917
1	Property of J.S. Underhill (Richmond Avenue to Cortelyou Avenue): 240 acres south and north of Arthur Kill Road, house and outbuilding on the south side of the street	George W. White	Same; identified as "Green Ridge Stock Farm"	Same	White property/buildings still depicted; remainder of estate sub-divided for planned development
2	Property of L.H. Cortelyou (Cortelyou Avenue to Lemon Court): 60 acres south and north of Arthur Kill Road, house on the north side of the street	Same	David H. Cortelyou	"South New York Villa Site Co;" property depicted as a planned (but not constructed) residential subdivision with	South New York Villa Site Co.; development conditions similar to 1898
3	Property of the estate of T.G. Benham, (Lemon Court to Abingdon Avenue): 130 acres south and north of Arthur Kill Road, two houses and ornamental driveway on northern side of the street	Same	Same	Same	Same
4	Property of H.B. Metcalfe (Abingdon Avenue to Colon Avenue): 45 acres south and north of Arthur Kill Road, house on the southern side of the street	Mrs. M.C. Metcalfe	Mary C. Metcalfe Estate; buildings at Arthur Kill Road identified as "Homestead"	Heirs Mary C. Metcalfe	Same
5	Property of H.B. Metcalfe (Colon Avenue to east of Elverton Avenue): 28 acres south of Arthur Kill Road, undeveloped	Mrs. M.C. Metcalfe	Mary C. Metcalfe Estate	Heirs Mary C. Metcalfe	Same
6	Property of Mrs. Freedman (Colon Avenue to Doane Avenue): property of unknown size on north side of Arthur Kill Road developed with a house	Same	Cath. Breen; property line has shifted to include part of Parcel 7; now 12 acres	Cath. Breen; 10.7 acres	Same
7	Property of W. McClean (Doane Avenue to east of Elverton Avenue): 3 acres north of Arthur Kill Road developed with house	Same	See above	See above	See above
8	Property of A. Bigelow (west of Pemberton Avenue to Gifford's Lane): 10 acres south of Arthur Kill Road, undeveloped	Same	Mrs. Rizpah Boehm; developed with buildings far south of the road	Divided into multiple parcels; property of G. Gottschaldt adjacent to project corridor	Same parcels, owners not identified

Table 4-1 (cont'd)
Summary of Changes in Ownership and Development, 1874–1917

Parcel #	1874	1887	1898	1907	1917
9	Property of H.B. Metcalfe (west of Pemberton Avenue to Gifford's Lane): 16 acres north of Arthur Kill Road, undeveloped	Mrs. M.C. Metcalfe	Mary C. Metcalfe Estate	Heirs Mary C. Metcalfe	Same
10	Property of J.W. Mesereau (Gifford's Lane to Greaves Avenue): 82 acres south of Arthur Kill Road with house and ornamental driveway	Same	Same	Dr. Guy C. Bagler, 71.342 acres	Staten Island & Manhattan Realty Co., 17.342 acres
11	Properties of Mrs. van Dolsen and Mrs. Boehm (north of Gifford's Lane): 5 acres developed with at least two houses and an outbuilding	Same	Property of Mrs. Boehm	Mary B. Ferentes, 4 acres	Owner not identified
12	Property of H.S. Samuels (west of Miles Avenue to Gifford's Lane): 38 acres developed with a house north of Arthur Kill Road	Same	Divided into two parcels: 32-acre property of Adelaide A. Bellows and property of C. Simonson (size not indicated)	Adelaide A. Bellows, 31.4 acres; Chas. Rosenberg, 10.8 acres	David H. Hanckel; Chas. Rosenberg
13	Property of A. Hooper (in vicinity of Greaves Avenue): parcel of unknown size developed with house in what is now the streetbed south of Arthur Kill Road	Same	Property division not identified in the same location; property of similar size shown further to the east; owner unidentified	Eastern parcel property of F.W. Tonges	F. W. Tonges
14	Property of Leary family (Greaves Avenue to east of Corbin Avenue): 80 acres south of Arthur Kill Road, developed with a house at a great distance south of the road	Same	Property of Charles Leary	Countess Ann Leary	Charles Leary, 69.5 acres
15	Property of H. Brower (Troy Street to Tanglewood Avenue): 20 acres with a house north of Arthur Kill Road	Same	G. H. Munroe, 12 acres	Same	Same
16	Property of William Prier (Corbin Avenue to east of Tanglewood Avenue): 27 acres with a house and barn south of Arthur Kill Road	Same	Partially consolidated with Parcel 18; now a 26.6-acre property south of Arthur Kill Road owned by Felice Tocci	Part of Ocean View Cemetery	Same

Table 4-1 (cont'd)
Summary of Changes in Ownership and Development, 1874–1917

Parcel #	1874	1887	1898	1907	1917
17	Property of J.S. Lake (Corbin Avenue to east of Tanglewood Avenue): parcel of unknown size with a house north of Arthur Kill Road	Same	John Elliot (size not indicated)	Same, 6 acres	Same
18	Property of N.A. Turner (near western branch of United Hebrew Cemetery): 35 acres with a house, outbuilding, and preserving factory south of Arthur Kill Road	Mrs. Garrett	Partially consolidated with Parcel 16; now a 26.6-acre property south of Arthur Kill Road owned by Felice Tocci	Part of United Hebrew Cemetery	Same
19	Property of E.S. Crocheron (opposite United Hebrew Cemetery): undeveloped 3-acre parcel north of Arthur Kill Road	Same	John Elliot	Divided: 2-acre parcel of Hugh Murphy and small parcel owned by John Elliot	Further divided; one parcel unidentified; others owned by Leon E. Daniel and S.H. Bailey
20	Property of the Moring family (west of Knight Loop to east of Chess Loop): 22 acres south of Arthur Kill Road with a house at a distance from the road	Mrs. McCaffrey	Property of Henry S. Crocheron; subdivided for proposed development; depicts Millvale Avenue (now Newvale Avenue)	Part of United Hebrew Cemetery	Part of Ocean View Cemetery
21	Property of the estate of B. Simonson (west of Knight Loop to east of Chess Loop): 12 acres north of Arthur Kill Road with a residence and an outbuilding	McVeigh	Cyrus McVeigh, 12 acres	G&J Henry, 12 acres	Same
22	Property of the estate of B. Simonson (Chess Loop to a point within United Hebrew Cemetery): 40-acre undeveloped parcel south of Arthur Kill Road	Same	Partially subdivided	Part of United Hebrew Cemetery	Part of United Hebrew Cemetery
23	Property of E.S. Crocheron (eastern branch of United Hebrew Cemetery adjacent to Clarke Avenue): 47 acres with a residence near the modern line of Clarke Avenue	Same	Mrs. L. Crocheron	Depicted as part of United Hebrew Cemetery with a small lot owned by E. Crocheron; other buildings from the Crocheron property are depicted in the cemetery	Much larger parcel owned by the Heirs of E. Crocheron depicted as separate from the cemetery south of the road

Table 4-1 (cont'd)
Summary of Changes in Ownership and Development, 1874–1917

Parcel #	1874	1887	1898	1907	1917
24	Former Reformed Dutch Church Cemetery: extending into the streetbed of Clarke Avenue south of Arthur Kill Road	Owner not identified	W.L. Fluke	L.S. Fluke	Leah S. Flake (sic)
25	Property of Miss H. Wheatley (Revere Lane to Center Street): Parcel of unknown side north of Arthur Kill Road with a building set far back from the road	Wheatley's heirs	Owner not identified	C.M. Conner	Same

Sources: 1874 Beers; 1887 Beers; 1898 Robinson; 1907 Robinson; and 1917 Bromley atlases.

EXPANSION OF DEVELOPMENT IN THE SECOND HALF OF THE 20TH CENTURY

During the mid and late 20th century, the pace of urban development intensified across Staten Island. This was accompanied by several large public works improvement projects, including the construction of Fresh Kills Landfill to the west of the project corridor in the 1940s and Latourette Park and golf course to the north in the 1950s. The reclamation of the Fresh Kills wetland networks involved cutting down tall hills and using the spoils—as well as those generated by other municipal improvement project such as the construction of roads and subways—to fill in marshes and waterways (AKRF 2008). Further modifications resulted from the deposition of household refuse from around New York City in the landfill over the course of decades (ibid). As the mid-20th century continued, other major development projects transformed central Staten Island, including the construction of the West Shore Expressway between the 1950s and 1970s.

As described previously, the area surrounding the APE became increasingly developed in the second half of the 20th century. An aerial photograph taken in 1924 (see **Figure 7**) depicts conditions similar to those seen on the 1917 Bromley atlas, one of the last detailed historical maps of the area. The image continues to depict large, undeveloped and/or cultivated parcels adjacent to Arthur Kill Road. An aerial image taken in 1951 (see **Figure 8**) reflects the increased subdivision of those larger parcels for development. Many of the streets surrounding and connecting with Arthur Kill Road were constructed by that time. The images also show that extensive filling had occurred in the former wetlands to the north and that Union Cemetery was expanded to its current dimensions and laid out for burial use. The residential and commercial development adjacent to Arthur Kill Road continued through the second half of the 20th century.

C. MAP-DOCUMENTED STRUCTURES WITHIN AND IMMEDIATELY ADJACENT TO THE APE

This section documents those structures that are situated within or immediately adjacent to the APE as seen on the 1911–1912 topographical survey, the most accurate historical map of Staten Island (see **Figure 3**). In addition to these buildings, a historic trolley barn at 721 Arthur Kill Road constructed in the early 1920s extends into the northern side of Arthur Kill Road opposite Cortelyou Avenue, the only extant structure within the mapped ROW.

OUTBUILDING AT THE NORTHEAST CORNER OF RICHMOND AVENUE AND ARTHUR KILL ROAD

The 1911–1912 topographical survey depicts a small building within the APE at the northeast corner of this intersection on what was formerly the northern part of the George W. White property in the early 20th century. At that time, Richmond Avenue was known as Eltingville Lane to the south of Arthur Kill Road and as Bridge Lane to the north. The building is not identified on any other historical maps and was not in association with other buildings or identified landscape elements.

OUTBUILDINGS ON THE PROPERTY OF GEORGE W. WHITE

Two one-story frame buildings were located near the southern terminus of the portion of Ridgewood Avenue that is included within the project corridor although neither building appears to have extended into the APE. The larger of the two structures was a barn constructed on a small hilltop. As discussed in greater detail below, a colonial cemetery is believed to have been disturbed by the construction of this barn. A smaller outbuilding is shown to the west of the barn that partially extended into what is now the streetbed of Getz Avenue at the southern end of the portion included within the project corridor. This long, thin outbuilding was situated on the same hilltop as the barn and may therefore have also been located in the former cemetery location.

FORMER CORTELYOU HOUSE

A house situated on the northern side of Arthur Kill Road between Cortelyou and Armstrong Avenues may have extended partially into what is now the mapped roadbed. The survey identifies it as a square, 2.5-story house with a front porch and a small addition at the northeast corner and an outbuilding (possibly an outhouse) in the rear yard approximately 70 feet to the north. A house owned by L.H. Cortelyou is depicted in this general location on the 1853 Butler and 1874 Beers maps. The 1898 Robinson atlas identifies the owner as David H. Cortelyou. The 1907 Robinson map indicates that the former Cortelyou property, including the portions both north and south of Arthur Kill Road, were slated for subdivision and development as part of a planned redevelopment by the South New York Villa Site Co. The 1917 Bromley map continues to identify the same corporation as the property owner but indicates that the subdivision and development did not occur. The house remains visible on an aerial photograph taken in 1924 but is not visible on an aerial photograph taken in 1951.¹ It may have been demolished during the transformation of the Fresh Kills area into a landfill and park in the early 20th century.

FORMER METCALFE HOUSE

A two-story, L-shaped wood frame house formerly associated with the Metcalfe family was located near what is now the southeast corner of Arthur Kill Road and Abingdon Avenue. The house extended into what is now the streetbed of Abingdon Avenue and was historically situated east of a large stream. The 1853 Butler map identifies a house owned by the Taylor family in the area south of Arthur Kill Road and east of the stream. The same house is identified as the property of “Judge H.B. Metcalfe” on the 1859 Walling map. Metcalfe continues to be identified as the owner on the 1874 Beers atlas, which depicts a property line to the west of the house near the midpoint of what is now Abingdon Avenue separating the Metcalfe and Benham properties. The 1887 Beers, 1898 and 1907 Robinson, and 1917 Bromley atlases identify the property owner as Mary C. Metcalfe or her heirs. Abingdon Road was not constructed until the second half of the 20th century and the date of the house’s demolition is unclear.

¹ <https://maps.nyc.gov/then&now/>

FORMER CROPSEY/MCCLEAN/BREEN HOUSE

A small portion of a 2.5-story wood frame house extended into the northern side of the APE west of the line of Everton Avenue as seen on the 1911-1912 topographical map. The 1850 Dripps, 1853 Butler, and 1859 and 1860 Walling maps depict a home occupied by the Cropsey family in the general vicinity of this location. The 1874 Beers atlas identifies the house on the 3-acre property of W. McClean, who continues to be identified as the owner/occupant on the 1887 Beers map. Catherine Breen is identified as the owner on the 1898 and 1907 Robinson atlases and the 1917 Bromley atlas. The house appears on the 1924 aerial photograph and appear to have been demolished by 1951, as seen on an aerial photograph taken in that year.

FORMER BOEHM/VAN DOLSEN HOUSES

Two buildings extended into northern side of the APE north of the terminus of Gifford's Lane. The 1911–1912 survey identifies them as wood frame dwellings, both of which had barns and other small outbuildings in the rear yards 70 to 90 feet north of the houses. Another small building was situated on the northern side of the APE approximately 115 feet east of the eastern house that is not depicted on other historical maps. A single house in this location is identified as “Vine Cottage” on the 1853 Butler map of Staten Island. The 1860 Walling map identifies two buildings in this vicinity as a school to the west and the house of “M.H. Boehm.” The 1874 Beers atlas indicates that the Westfield-Southfield border ran through these properties. The map shows both houses on a single, irregularly shaped 5-acre parcel developed with three buildings owned or occupied by “Mrs. Boehm” and “Mrs. Van Dolsen.” Only Mrs. Boehm is identified as the owner on the 1887 Beers map as is “Mrs. Rizpah Boehm” on the 1898 Robinson atlas. Mary B. Ferentes is identified as the property owner on the 1907 Robinson atlas and no owner is identified on the 1917 Bromley atlas. The houses appear on the 1924 aerial photograph and appear to have been demolished by 1951, as seen on an aerial taken in that year.

FORMER MURDY/SAMUELS HOUSE

A small portion of the front porch of 3-story frame house historically situated on the north side of Arthur Kill Road opposite the terminus of what is now Miles Avenue extended into the APE. A house in this location owned/occupied by “Dr. Murdy” appears on the 1850 Dripps and 1853 Butler maps. The 1859 and 1860 Walling maps identify the owner as B.F. Smith. The 1874 and 1887 Beers maps depict the house on the 38-acre property of H.S. Samuels; the 1898 and 1907 Robinson maps identify the property owner as Adelaide Bellows; and the 1917 Bromley atlas identifies the owner as Daniel H. Hackel. The house appears on the 1924 aerial photograph and appears to have been demolished by 1951, as seen on an aerial taken in that year.

FORMER LAKE/ELLIOT HOUSE

The front porch of a 2-story wood frame house entered the APE on the northern side of Arthur Kill Road east of the terminus of Tanglewood Drive. A small shed on the same property was also partially within or immediately adjacent to the APE approximately 85 feet northeast of the house. The house appears as the home of J. Lake on the 1859 and 1860 Walling, 1874 and 1887 Beers maps. The 1898 and 1907 Robinson and 1917 Bromley atlases identify it as the property of John Elliot. These buildings appear on the 1924 aerial photograph and appear to have been demolished by 1951, as seen on an aerial taken in that year.

FORMER MURPHY HOUSE

A one-story wood frame house was almost entirely situated within the APE on the north side of Arthur Kill Road midway between Tanglewood Drive and Newvale Avenue. This house first appears on the

1907 Robinson map and appears to have been constructed on a former portion of the John Elliot property that had been sold to Hugh Murphy. Leon E. Daniels is identified as the building's owner on the 1917 Bromley atlas. The house appears on the 1924 aerial photograph and appears to have been demolished by 1951, as seen on an aerial taken in that year.

FORMER ELLIOT HOUSE

A 2-story wood frame house was situated on the northern side of Arthur Kill Road east of the Murphy house described above that partially entered the northern side of the APE. The house appears on the 1924 aerial photograph and appears to have been demolished by 1951, as seen on an aerial taken in that year. The house first appears at the corner of the former Elliot property on the 1898 Robinson atlas and is shown as a separate parcel owned by Elliot on the 1907 Robinson atlas and by S.H. Bailey on the 1917 Bromley atlas. The house appears on the 1924 aerial photograph and appears to have been demolished by 1951, as seen on an aerial taken in that year.

D. CEMETERIES IN THE VICINITY OF THE PROJECT CORRIDOR

RICHMOND REFORMED DUTCH CHURCH

As described previously, the Richmond Reformed Dutch Church, also known as the “South Richmond Reformed Dutch Church,” was founded in 1769 at the southeast corner of what are now Arthur Kill Road and Center Street (east of the project corridor). Prior to the construction of the church, local residents worshipped in private homes or in other area churches, including another local church built in 1717 (Leng and Davis 1930; Salmon 2006). Even after its construction, it did not have its own dedicated pastor until the 1850s and it was led by a pastor from the Port Richmond Reformed Dutch Church in northern Staten Island (Leng and Davis 1930). The church was destroyed during the Revolutionary War and was reconstructed and reopened on the same land in 1807 (ibid). The earliest stone documented in the cemetery surrounding the church dated to 1817, and the churchyard was in use for burials until the 1880s (ibid). The cemetery was a trapezoidal parcel measuring approximately 41,356 square feet and it extended into what is now the streetbed of Clarke Avenue (Meade 2020).

Services at the church were ended in 1878 and the cemetery was closed by the early 1880s (Salmon 2006). An order to remove the remains from the cemetery was issued to the church's trustees by the Supreme Court of the Second Judicial District, “empowering the trustees to remove the bodies buried in the cemetery...and to inter them” at Moravian Cemetery (*The Sun* 1885: 3). The court order also allowed the trustees to sell the three-acre parcel on which the church and parsonage sat to pay off the church's debts (ibid). In November and December 1885, the remains within thirty graves within the churchyard—seven of which were unidentified—were disinterred and removed to Moravian Cemetery in the Egbertville neighborhood of Staten Island (ibid).

Following the closure of the cemetery, the parcel was sold, and historical maps continue to depict the parcel as largely intact through the 20th century. The 1898 Robinson map identifies the property's owner as W.L. Fluke and shows that it was developed with several buildings, including the former parsonage. The 1907 Robinson map identifies L.S. Fluke as the owner of the parcel

Given the cemetery's active use for more than a century, it is presumed that there were far greater than 30 burials within the churchyard. Inskeep (2000) and Salmon (2006) indicate that the church's records were transferred to the Gardiner Sage Library of the New Brunswick Theological Seminary; however, the library confirmed that it does not hold those records. The records appear to be located within the archives of the Reformed Church of America, which is housed inside, but is separate from, the Gardiner Sage Library. A finding aid for that repository indicates that it does hold records associated with a Richmond

Church on Staten Island but that death records only cover the period between 1854 and 1857. It may therefore be difficult to estimate the exact number of individuals who were interred within the cemetery.¹ However, it is likely that individual families were responsible for disinterring individual graves and reintering them elsewhere and that the church trustees were responsible for removing any remaining graves, as was a common practice when former church cemeteries were disinterred (Meade 2020). However, the possibility remains that some graves may have been missed during the relocation process.

FRENCH CHURCH CEMETERY

The French Church established by Huguenot refugees in the vicinity of Greenridge circa 1683 and was one of the first formally organized churches on Staten Island (Salmon 2006). A church building was constructed on land in the Greenridge area in 1698 (ibid). Its first worshippers included residents of Dutch, English, and French extraction worshipping in both Huguenot and Episcopalian services until other local houses of worship were built for other denominations in the early 18th century (ibid). Historian Richard Bayles (1887:94) described the site of the cemetery as follows:

The church stood on the half-acre which lay on the south side of the highway [Arthur Kill Road]. Some vestiges of its foundation remained till [sic] the beginning of the present [19th] century. It occupied the northern slope of the rising ground to the south of the old road, and about two hundred feet in the same direction from the present road. The dimensions of the church were about 32 by 45 feet...south of the church was the repository of the dead. These graves were once marked by rough stones, bearing no inscriptions, but of which as many as two hundred could at one time be counted. The only inscriptions that have been read upon stones found in this ground are those of Teunis Van Pelt, died 1765, aged 65 years; Mary, his wife, died 1762, aged 59 years; another from which the part bearing the name was broken off, but the date of which was 1784; and another bearing the initials J.L. and date 1784.

Other reports indicated that the Van Pelt tombstones were decorated with winged death's head emblems and the 1784 stone was decorated with a cherub's head, both of which were common iconographic symbols on many 18th century tombstones (Salmon 2006). Bayles suggests that the cemetery was still extant in the late 19th century even though the church foundation was long since removed, which was supported by other late-19th century historians (Bayles 1887: 351; Salmon 2006: 86-87). The property on which the church was located was later owned by Billopp B. Seaman and then George W. White (Salmon 2006). The burial ground is believed to have been located in the vicinity of White's barn or near a dairy that was constructed in the 1920s (Salmon 2006). A report of the church published in 1908 suggested that the construction of early 20th century buildings disturbed graves within the former cemetery (Burch 1908). There is no indication that remains within the cemetery were ever formally disinterred (Meade 2020).

Based on the general location of the Seaman/White properties, the location of the former cemetery is believed to have been located within the general area bounded by Arthur Kill Road, Richmond Avenue, Barlow Avenue, and Ridgewood Avenue (Meade 2020). The 1907 Robinson map identifies the property of George W. White and suggests that the northwest corner of the property's largest barn was approximately 350 feet south of Arthur Kill Road and its northeast corner was approximately 25 feet west of Ridgewood Avenue.² As seen on the 1911-12 topographical surveys, the barn's location was on the summit of a hill that began approximately 200 feet south of Arthur Kill Road, consistent with the

¹ <http://images.rca.org/docs/archives/churchrecords.pdf>

² The map depicts three other smaller barns or stables further to the south.

description provided by Bayles (1887). As such, while the burials were likely not in the vicinity of the Arthur Kill Road segment of the project corridor, the southern termini of those portion of the project corridor situated within Ridgewood Avenue and Getz Avenue were located on the hill on which the burial ground was reportedly located and could therefore have been used for burials.

UNITED HEBREW CEMETERY

Of several large extant cemeteries located south of Arthur Kill Road in the vicinity of the APE, only United Hebrew Cemetery is adjacent to the project corridor and Mount Richmond and Oceanview Cemeteries are further to the south and east. The cemetery was formally opened in 1908, but as seen on historical maps, it was planned for at least one year before it opened, and its size and shape have changed over time. The cemetery happened to be established over the location of an older, smaller family cemetery maintained by the Swaim family in the early 19th century, although the exact location of that burial place is unknown (Salmon 2006).

The 1907 Robinson atlas depicts United Hebrew Cemetery as a larger parcel that encompassed what is now Mount Richmond Cemetery—which opened in 1909—and a portion of Oceanview Cemetery, which opened in 1900. The 1917 Bromley atlas continues to depict different property lines: suggesting that Oceanview Cemetery continued to extend as far north as Arthur Kill Road through the western portion of what is now United Hebrew Cemetery and identifying part of what later became Mount Richmond Cemetery and Frederick Douglass Cemetery as “St. Agnes’ Cemetery.” St. Agnes is believed to have been planned but never used (Salmon 2006). These inconsistent property lines appear to reflect transfers of portions of the cemeteries as originally proposed to other burial organizations.

While burial plots within the cemetery are located near the northern boundary (see **Photograph 6**), it is not expected that graves within the United Hebrew Cemetery are situated within the mapped streetbed of Arthur Kill Road. The northern boundary of the cemetery has remained consistent over time and the road widening easement along Arthur Kill Road extends on the northern side of the road opposite the cemetery.

Chapter 5: Assessment of Landscape Modification and Site Disturbance

A. INTRODUCTION

The APE was included within an extensive survey of Staten Island that was completed by the Richmond County Topographical Bureau in 1911 and 1912¹ (see **Figure 3**). The information from this map was compared with modern topographical information in order to identify any areas of landscape modification (e.g., areas that have been graded or filled). This involved the georeferencing of the c. 1912 survey to align with the modern street grid and the overlay of topographical information obtained from Lidar information published by the United States Geological Survey (USGS) in 2014. The c. 1912 map includes elevation data measured relative to the Richmond Borough Datum and the Lidar data was measured relative to the North American Vertical Datum of 1988 (NAVD88). The Richmond Borough datum is located 2.092 feet below NAVD88. Therefore, to convert Borough of Richmond datum elevations to NAVD88, 2.092 feet must be added to the elevation's height. For example, an elevation of 10 feet above the Borough of Richmond Datum is 12.092 feet above NAVD88. Therefore, the Lidar elevations presented in **Figure 3** have been converted from NAVD88 to the Richmond Borough Datum for the purposes of comparison. For the purposes of this assessment, all converted elevations have been rounded to the nearest whole number.

B. RESULTS OF ANALYSIS

The c. 1912 survey indicates that across the majority of the project corridor, modern ground surface elevations are within 1 foot of historical elevations. In some places, the direction or orientation of slopes and ground surfaces have been altered as a result of the construction of modern paved roads and associated infrastructure. Denser fill deposits are visible in limited areas, particularly to the north of Arthur Kill Road where wetland filling efforts occurred in the mid to late 20th century. A summary of observed landscape modification in specific portions of the project corridor is included in **Table 5-1**.

Table 5-1
Documented Landscape Modification in Specific Portions of the Project Corridor

Streetbed Segment	Segment Location	Landscape Modification	Disturbance Characterization
Arthur Kill Road	Point west of Richmond Avenue to Getz Avenue	Ground surface 1 to 2 feet higher than historical surface in most locations; raised by up to 6 feet north of Arthur Kill Road at Richmond Avenue	Historical ground surface directly impacted by road construction and utility installation except within Richmond Avenue north of Arthur Kill Road

¹ The survey was completed between 1906 and 1913; however, the three sheets depicting the project site (Sheets 60, 61, and 69) were issued in 1912, 1911, and 1912, respectively.

Table 5-1 (cont'd)
Documented Landscape Modification in Specific Portions of the Project Corridor

Streetbed Segment	Segment Location	Landscape Modification	Disturbance Characterization
Arthur Kill Road	Getz Avenue to Ridgewood Avenue	Ground surface 1 to 5 feet higher than historical surface; extensive modification to fill in former stream that crossed the road in this location and eliminate small hills	Historical ground surface directly impacted by road construction, utility installation, and landscape modification
Arthur Kill Road	Ridgewood Avenue to Cortelyou Avenue	Ground surface 1 to 2 feet higher than historical surface in western portion of segment; 4 to 8 feet higher along; and northern side; and 1 to 2 feet lower in eastern portion	Historical ground surface mostly directly impacted by road construction, utility installation, and landscape modification
Arthur Kill Road	Cortelyou Avenue to Armstrong Avenue	Ground surface raised by 2 to 4 feet at western end of segment; lowered by up to 3 feet along northern side; and within 2 feet of historical surface in location of built street	Historical ground surface mostly directly impacted by road construction, utility installation, and landscape modification
Arthur Kill Road	Armstrong Avenue to Abingdon Avenue	Ground surface raised 2 to 6 feet above historical surface in association with landscape modification and filling of a wetland area and stream	Historical ground surface potentially situated beneath protective fill layers except where deeper utilities are present
Arthur Kill Road	Abingdon Avenue to Colon Avenue	Ground surface within 1 to 2 feet of historical surface except where large hills were removed/graded down by up to 4 feet in southern half of road and along northern side of the APE	Historical ground surface directly impacted by road construction and utility installation
Arthur Kill Road	Colon Avenue to Everton Avenue	Landscape modification removed hills and lowered ground surface by 2 to 6 feet	Historical ground surface directly impacted by road construction and utility installation
Arthur Kill Road	Everton Avenue to Gifford's Lane	Ground surface within 1 to 2 feet of the historical surface; evidence of landscape modification and filling of a wetland area and stream where the grade was raised 2 to 6 feet	Historical ground surface mostly directly impacted by road construction, utility installation, and landscape modification
Arthur Kill Road	Gifford's Lane to Miles Avenue	Ground surface lowered by 2 to 4 feet within built street and within 1 to 2 feet of the historical surface elsewhere	Historical ground surface directly impacted by road construction and utility installation
Arthur Kill Road	Miles Avenue to Greaves Avenue	Ground surface within 1 to 2 feet of historical surface; pond filled in near eastern side of road	Historical ground surface directly impacted by road construction and utility installation
Arthur Kill Road	Greaves Avenue to Corbin Avenue	Ground surface within 1 to 2 feet of historical surface	Historical ground surface directly impacted by road construction and utility installation
Arthur Kill Road	Corbin Avenue to Tanglewood Avenue	Ground surface within 1 to 2 feet of historical surface in most of streetbed; ground surface lowered up 2 to 4 feet in vicinity of filled wetland area/stream south of Arthur Kill Road and raised by 2 to 6 feet along north side of road	Historical ground surface mostly directly impacted by road construction, utility installation, and landscape modification

Table 5-1 (cont'd)

Documented Landscape Modification in Specific Portions of the Project Corridor

Streetbed Segment	Segment Location	Landscape Modification	Disturbance Characterization
Arthur Kill Road	Tanglewood Avenue to Clarke Avenue	Ground surface within 1 to 2 feet of historical surface	Historical ground surface directly impacted by road construction and utility installation
Richmond Avenue	Points north and south of Arthur Kill Road	Ground surface within 1 foot of historical surface	Historical ground surface directly impacted by road construction and utility installation
Getz Avenue	Point north of Arthur Kill Road to the southern side of the intersection with Gurley Avenue	North of Arthur Kill Road, ground surface has been raised by 6 to 8 feet as a result of filling in wetlands; ground surface has been raised approximately 2 to 4 feet to the south of Arthur Kill Road; in extreme southeast corner, grade has been lowered by up to 6 feet as a result of the removal of a hill	Historical ground surface potentially situated beneath protective fill layers except where deeper utilities are present
Ridgewood Avenue	Arthur Kill Road to Opp Court	Former hill modified; grade raised by up to 2 feet at northern end of segment and up to 4 feet at extreme southern end of segment; lowered by up to 2 feet in vicinity of former hill.	Historical ground surface directly impacted by road construction and utility installation in most of segment
Cortelyou Avenue	Extends approximately 30 feet south of Arthur Kill Road	Ground surface 1 to 2 feet higher than historical surface	Historical ground surface directly impacted by road construction and utility installation
Armstrong Avenue	Extends approximately 40 feet south of Arthur Kill Road	Ground surface raised by 2 to 4 feet	Historical ground surface potentially situated beneath protective fill layers except where deeper utilities are present
Abingdon Avenue	Extends approximately 25 feet south of Arthur Kill Road	Ground surface raised by 4 to 8 feet; stream in western side filled in	Historical ground surface potentially situated beneath protective fill layers except where deeper utilities are present
Brookfield Avenue	Extends approximately 20 feet south of Arthur Kill Road	Ground surface lowered by 5 to 6 feet	Historical ground surface directly impacted by road construction and utility installation
Colon Avenue	Extends approximately 30 feet south of Arthur Kill Road	Ground surface lowered by 2 to 3 feet	Historical ground surface directly impacted by road construction and utility installation
Doane Avenue	Extends approximately 30 feet south of Arthur Kill Road	Ground surface lowered by 5 to 6 feet	Historical ground surface directly impacted by road construction and utility installation
Everton Avenue	Extends approximately 30 feet south of Arthur Kill Road	Ground surface lowered by 0 to 3 feet with the realignment of a hill	Historical ground surface directly impacted by road construction and utility installation

Table 5-1 (cont'd)

Documented Landscape Modification in Specific Portions of the Project Corridor

Streetbed Segment	Segment Location	Landscape Modification	Disturbance Characterization
Gifford's Lane	Extends approximately 90 feet south of Arthur Kill Road	Ground surface within 1 foot of historical surface	Historical ground surface directly impacted by road construction and utility installation
Miles Avenue	Extends approximately 60 feet south of Arthur Kill Road	Ground surface lowered by 2 to 6 feet with the realignment of a hill	Historical ground surface directly impacted by road construction and utility installation
Greaves Avenue	Extends approximately 45 feet south of Arthur Kill Road	Ground surface within 1 foot of historical surface	Historical ground surface directly impacted by road construction and utility installation
Troy Street	Extends approximately 35 feet south of Arthur Kill Road	Ground surface within 1 foot of historical surface	Historical ground surface directly impacted by road construction and utility installation
Corbin Avenue	Extends approximately 35 feet south of Arthur Kill Road	Ground surface within 1 foot of historical surface	Historical ground surface directly impacted by road construction and utility installation
Tanglewood Drive	Extends approximately 25 feet south of Arthur Kill Road	Ground surface raised 2 to 4 feet due to filling in of stream and wetland area	Historical ground surface potentially situated beneath protective fill layers except where deeper utilities are present
Newvale Avenue	Extends approximately 10 feet south of Arthur Kill Road	Ground surface within 1 foot of historical surface	Historical ground surface directly impacted by road construction and utility installation
Clarke Avenue	Extends approximately 90 feet south of Arthur Kill Road	Ground surface within 1 foot of historical surface	Historical ground surface directly impacted by road construction and utility installation

Source: See Figure 3.

A. CONCLUSIONS

As part of the background research for this Phase 1A Archaeological Documentary Study, various primary and secondary resources were analyzed, including historic maps and atlases, historic photographs and lithographs, newspaper articles, and local histories. The information provided by these sources was analyzed to reach the following conclusions.

PREVIOUS DISTURBANCE

As described in **Chapter 5, “Documentation of Landscape Modification,”** the topography of the project corridor has been changed dramatically as a result of the construction of the road and the development of the surrounding areas. This modification included leveling hills and filling wetlands and streams to create a level road surface consistent with that required for automobile traffic. Initial disturbance would have occurred during the construction and modification of the original historical road. Further disturbance occurred as a result of its modernization, widening, and the introduction of utilities as shown on **Figure 3** and described in the previous chapter. In most locations, the modern ground surface is within 1 to 2 feet of the historical ground surface, suggesting that landscape modification would have disturbed the original ground surface. In limited areas, the grade has been raised by 2 to 8 feet, potentially burying older ground surfaces by protective layers of fill material. Many of these locations are associated with filled streams, wetlands, ponds, and other bodies of water.

The APE in its entirety—including all areas within and outside of existing built streets—is determined to be disturbed to a depth of at least 2 feet below the ground surface as a result of road/sidewalk construction or landscape modification. The entire length of the APE to the north side of Arthur Kill Road appears to have been extensively disturbed as a result of intensive landscape modification that followed the demolition of a number of historical houses, the removal of hills, filling of streams and wetlands, and the creation of massive berms and other landscape elements at the southern side of the parks that currently line the northern side of the APE. Within the built streetbeds, it is assumed that the locations of any existing utilities are considered to be disturbed from the ground surface to a depth of 1 to 2 feet below the bottom of the utility line and to a distance of 1 to 2 feet on either side, representing the trench that was likely dug as part of the line’s installation. Any location where there is a space of 5 feet or more between existing utilities should be considered to be undisturbed unless landscape modification has been documented.

PRECONTACT SENSITIVITY ASSESSMENT

As described in **Chapter 3, “Precontact Period,”** the precontact sensitivity of project sites in New York City is generally evaluated by a site’s proximity to level slopes (less than 12 to 15 percent), watercourses, well-drained soils, and previously identified precontact archaeological sites (NYAC 1994). The APE is located along a generally level area in close proximity to both fresh water and marine resources. Furthermore, nearly a dozen precontact archaeological sites have been identified within the APE and in the immediate vicinity. Absent disturbance associated with development, the APE would be expected to be in an area of extremely high archaeological sensitivity. However, precontact archaeological sites are

typically shallowly buried and located within 5 feet of the ground surface. Given the extent to which the APE has been disturbed as a result of landscape modification, road construction, and modern development, the majority of the corridor is expected to have no to low sensitivity for precontact archaeological resources.

However, in those locations where protective fill may have been deposited over older ground surfaces as a result of landscape modification—but where such modification is not so extreme to have resulted in disturbance—precontact sensitivity is considered low to moderate in areas without existing utility-related disturbance as described previously (see **Figure 9**). Those areas include:

- Streetbed of Getz Avenue between Arthur Kill Road and Gurley Avenue; and
- Streetbed of Arthur Kill Road between and including portions of Armstrong Avenue and Abingdon Avenue: ground surface raised 2 to 8 feet in association with the filling of a stream and wetland.

HISTORIC SENSITIVITY ASSESSMENT

The APE is located along one of the oldest major thoroughfares in Staten Island and colonial settlements were located near its eastern and western ends. The older road surface was likely disturbed partially or entirely by the construction of the modern road and its associated utilities, as suggested by the landscape modification analysis presented in the previous chapter. Numerous residential, agricultural, and commercial properties lined the northern and southern sides of Arthur Kill Road during the historic period. However, because of the age of the road, the majority of the buildings associated with these properties were located outside of the APE, which for the most part passed through what were the front yards of these properties. As such, any historic period archaeological resources located within the APE are expected to have been related to surficial deposits/accumulations associated with the residential occupation of adjacent buildings and the construction and use of the historical and modern road surfaces. Such deposits would have been more susceptible to disturbance associated with urban development.

In several locations, the 1911–1912 topographical survey—the only map to accurately depict the locations of buildings and outbuildings—identifies a number map-documented structures that were partially or wholly situated within the APE. However, none of these structures extended into the APE to such an extent that all or portions of their rear yards were located within the APE or were not built within the APE until after the turn of the 20th century, when indoor plumbing was more common for newly constructed houses. Historical rear yards are more likely to contain domestic shaft features (e.g., privies, cisterns, and wells) that would have been constructed for the purposes of water gathering and sanitation and later repurposed for the disposal of household garbage. Such features were often deeply buried and more likely to survive later development and disturbance. The APE is therefore determined to have low sensitivity for shaft features associated with the historical development of these houses.

In addition to residential properties, at least four current and former cemeteries were located within and adjacent to the APE. The United Hebrew and Mount Richmond Cemeteries were established following the establishment of the modern route of Arthur Kill Road and its associated side streets. Both cemeteries are still active and maintain detailed records regarding the locations of burials. Burials associated with these cemeteries are not expected to extend into Arthur Kill Road or any of its associated side streets. However, historical cemeteries associated with the Richmond Reformed Dutch Church and the former French Church were located in the vicinity of the APE. The streetbed of what is now Clarke Avenue southeast of Arthur Kill Road extends directly through the former Richmond Reformed Dutch Church cemetery. The streetbed of Ridgewood Avenue extends through a former hillside where the French Church cemetery was reported to have been located. These streetbed segments (see **Figure 9**) are determined to have moderate sensitivity for human remains associated with both intact graves and disarticulated human remains.

B. RECOMMENDATIONS

Given the identified archaeological sensitivity of the APE, further archaeological analysis is recommended within certain areas of archaeological sensitivity in the event that project impacts in those locations will extend to a depth greater than 2 feet below the ground surface. It is recommended that upon the completion of the proposed project's final design, those plans be reviewed by an archaeologist to determine if the project could impact potentially undisturbed soil levels. Recommendations for the three types of potential archaeological sensitivity in the locations shown on **Figure 9** are summarized below:

- **Locations with low to moderate sensitivity for potential buried ground surfaces or shaft features associated with map-documented structures:** further archaeological analysis in the form of archaeological monitoring during construction is recommended during all construction activities in these locations that will result in subsurface impacts greater than 2 feet below the ground surface and outside or below existing utility trenches (e.g., installation of new catch basins and associated piping, new sewers, or new water mains).
- **Locations with moderate sensitivity for human remains:** A Human Remains Discoveries Plan should be prepared in consultation with LPC that will include the protocols to be followed in the event that the project impacts human remains in these locations regardless of the locations of project impacts. Archaeological monitoring is recommended in these locations during all construction activities that will result in subsurface impacts greater than 2 feet below the ground surface and outside or below existing utility trenches (e.g., installation of new catch basins and associated piping, new sewers, or new water mains).

The Phase 1B Archaeological Investigation should be completed in coordination with LPC and OPRHP and an Archaeological Work Plan including a Human Remains Discovery Plan should be submitted to LPC and OPRHP for review and approval prior to the completion of any archaeological monitoring.

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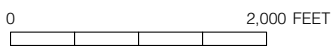
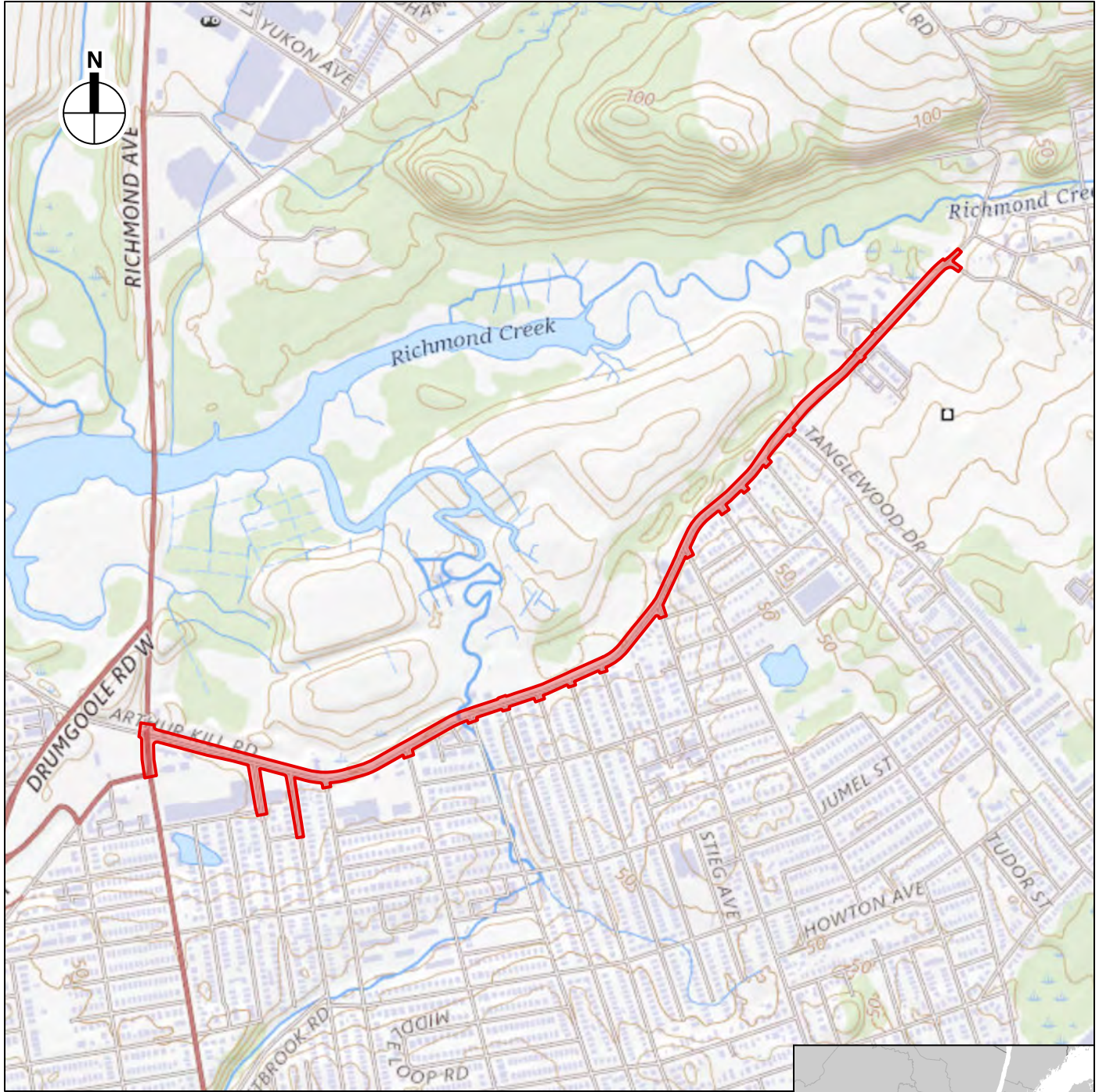
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Figures

11.1.22

Data source: USGS The National Map, <https://basemap.nationalmap.gov/arcgis/rest/services/USGSTopo/MapServer>



 Proposed Project Corridor

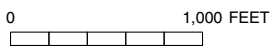
Approximate coordinates of Project Site:
74°9'32"W 40°33'54"N



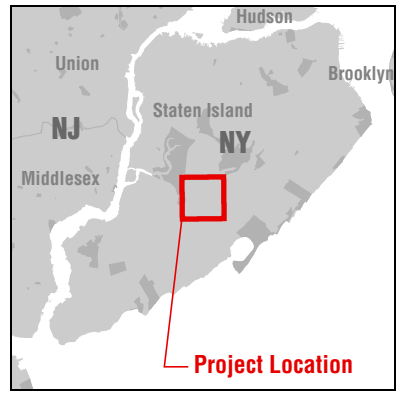
**ARTHUR KILL ROAD DRAINAGE AND ROAD IMPROVEMENTS
NYCDDC PROJECT ID: RED366/HWR1140A**

USGS Topographic Map –
Arthur Kill Quadrangle
Figure 1

11.1.22

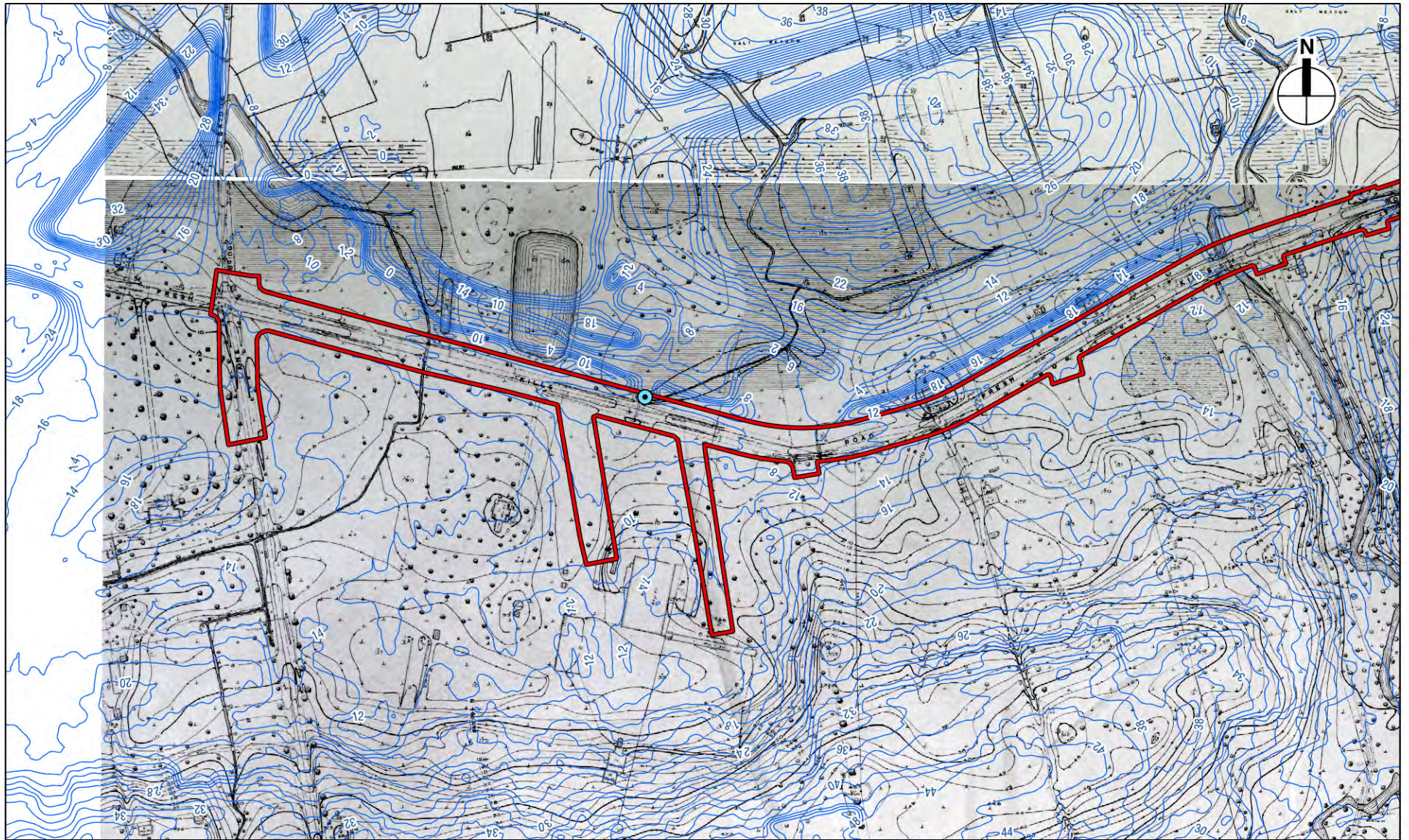


- Proposed Project Corridor
- New Outfall
- Outfall Extension
- ➔ Photograph View Direction and Reference Number

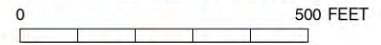


ARTHUR KILL ROAD DRAINAGE AND ROAD IMPROVEMENTS
NYCDDC PROJECT ID: RED366/HWR1140A

Project Location
Figure 2



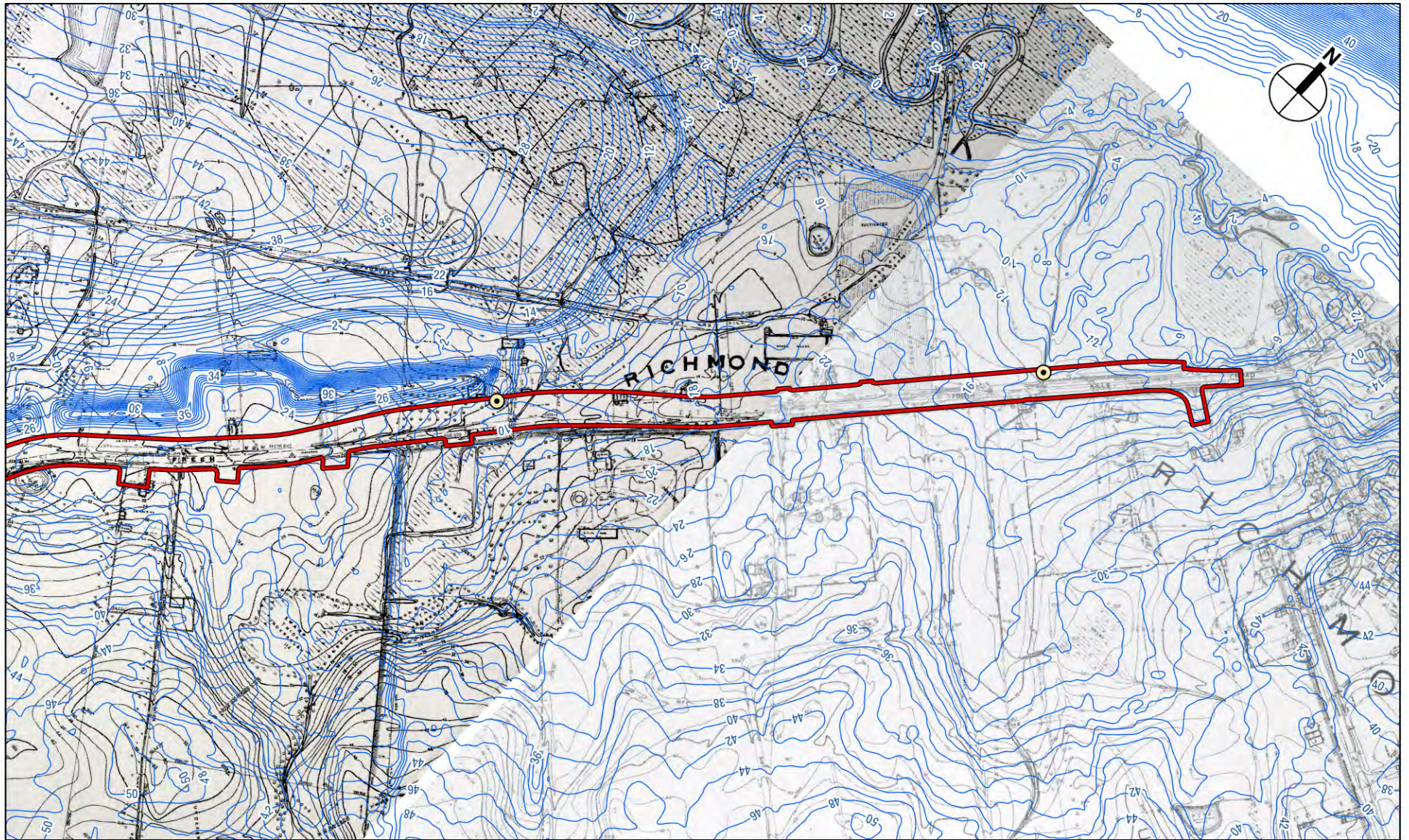
-  Proposed Project Corridor
-  New Outfall
-  2-foot contours
-  Outfall Extension





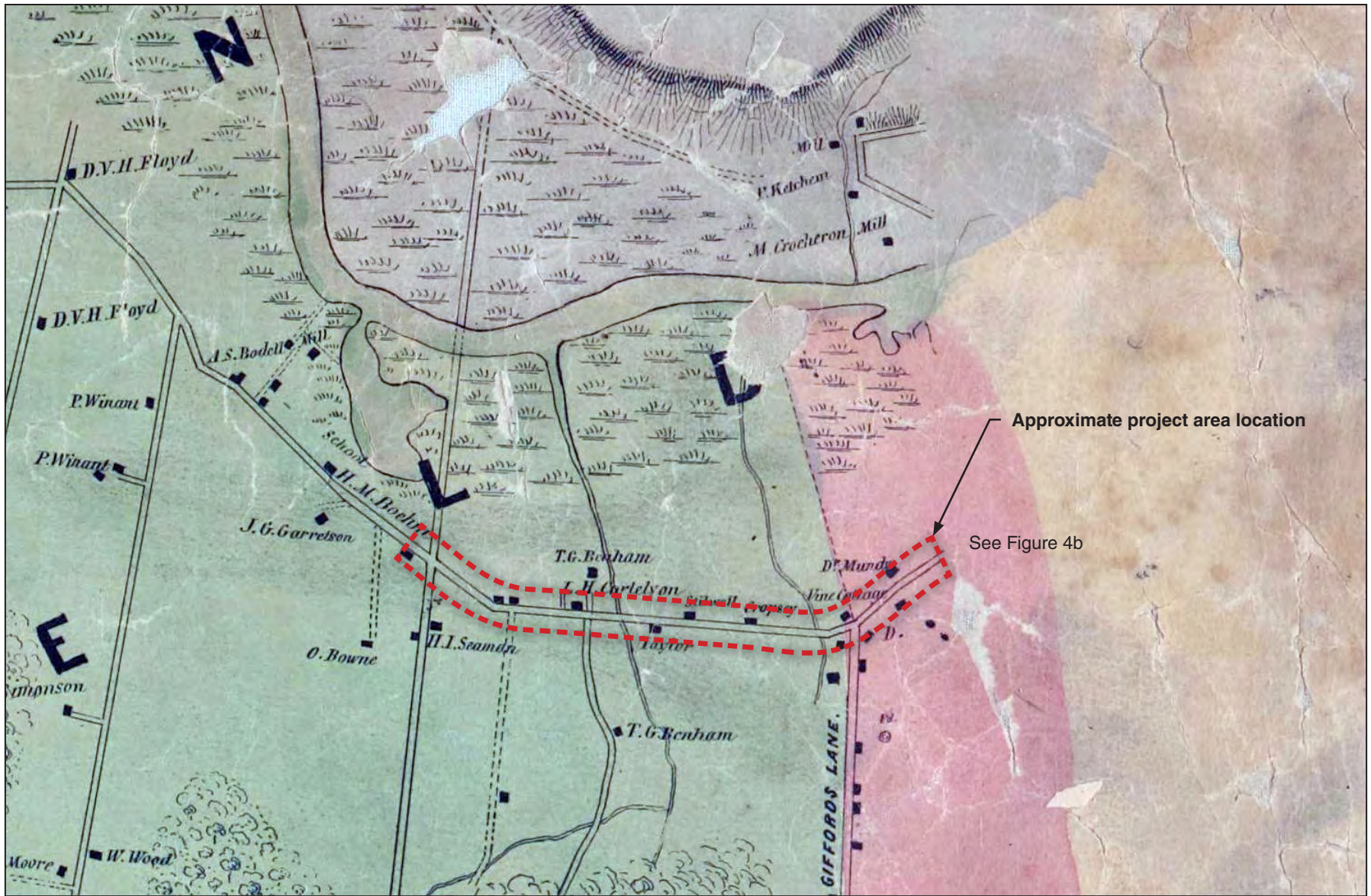
-  Proposed Project Corridor
-  New Outfall
-  2-foot contours
-  Outfall Extension

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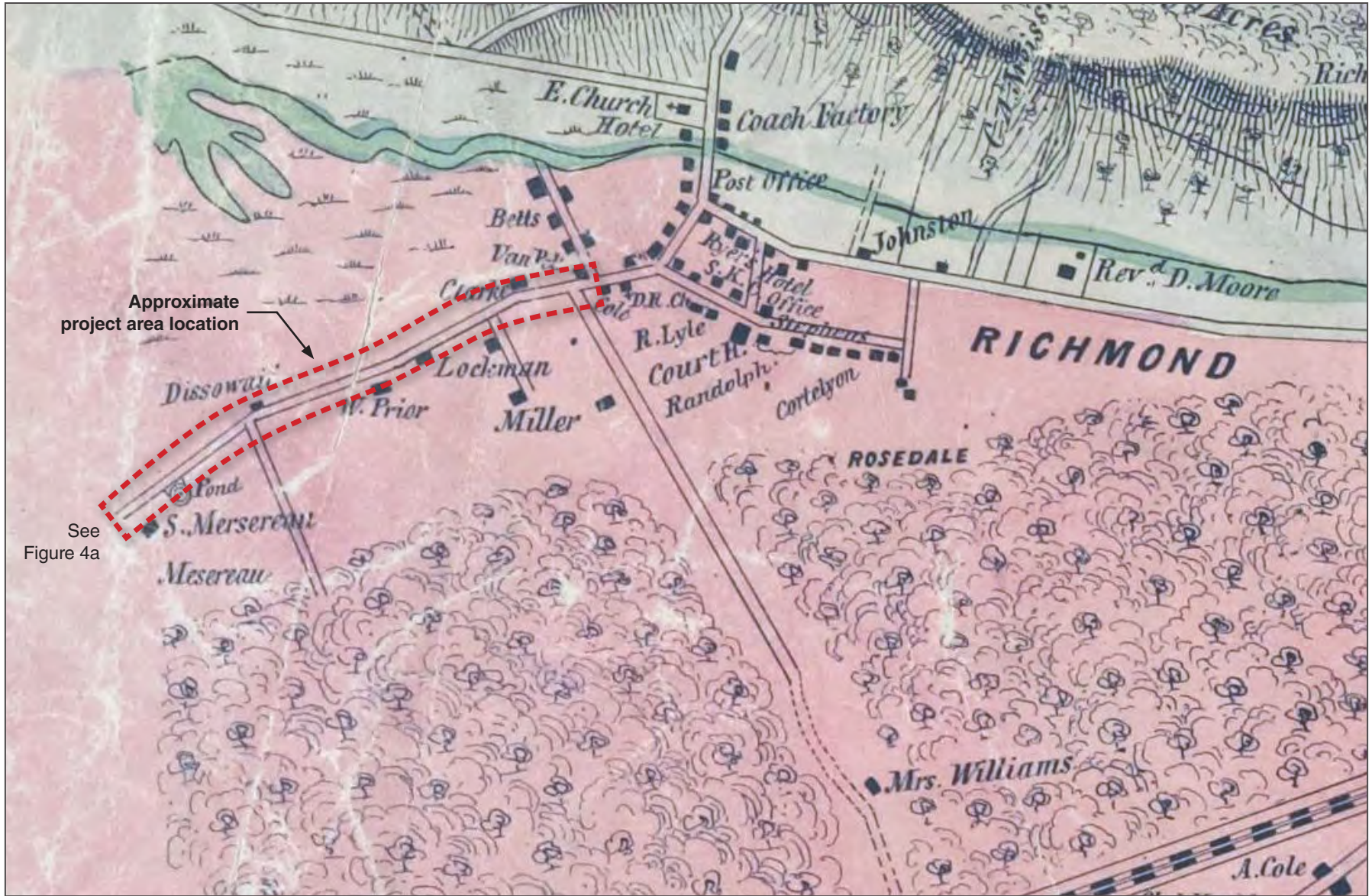


-  Proposed Project Corridor
-  New Outfall
-  2-foot contours
-  Outfall Extension

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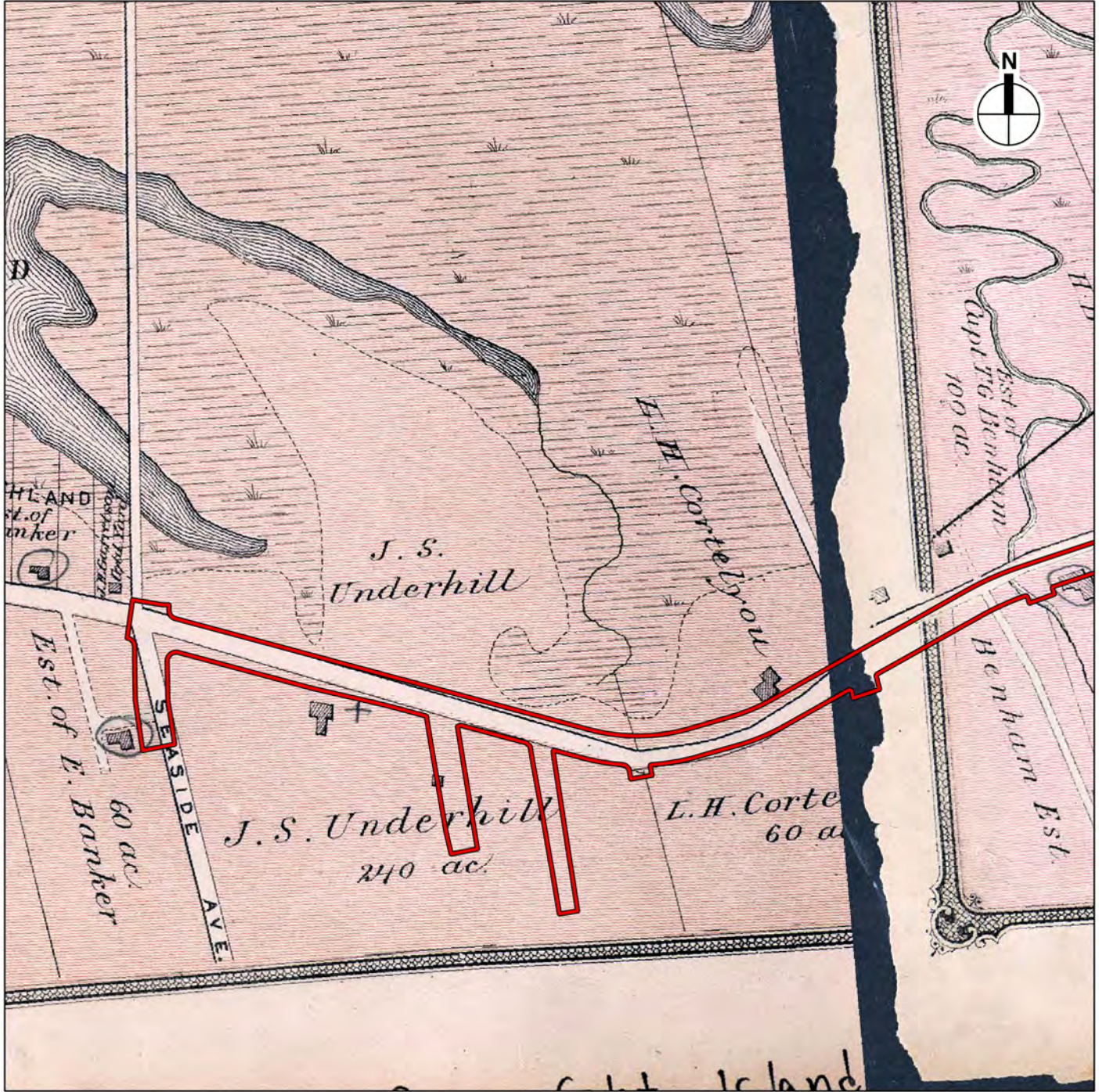
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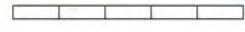
Approximate project area location

See Figure 4a


NOT TO SCALE



 Proposed Project Corridor

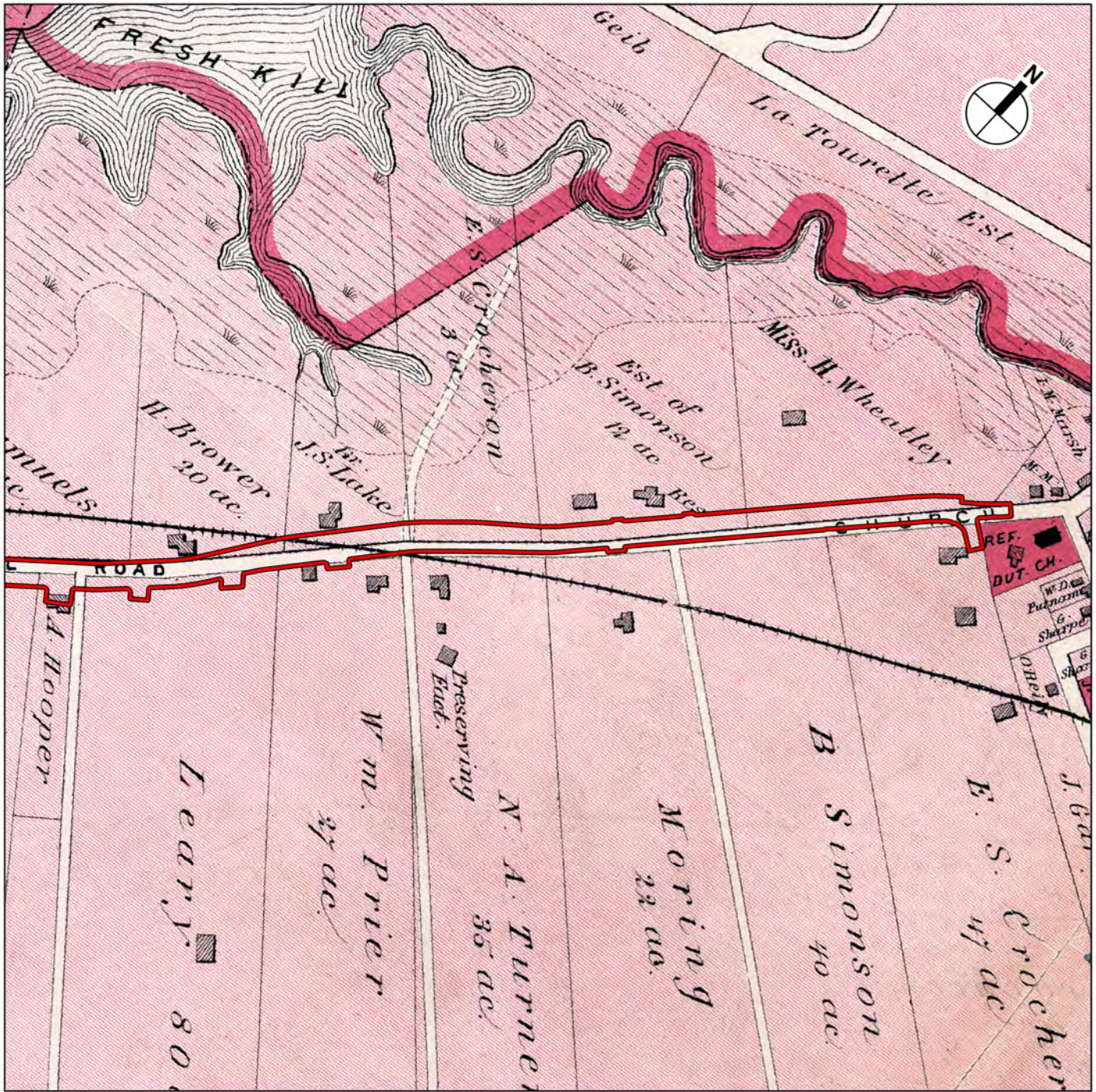
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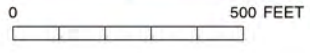
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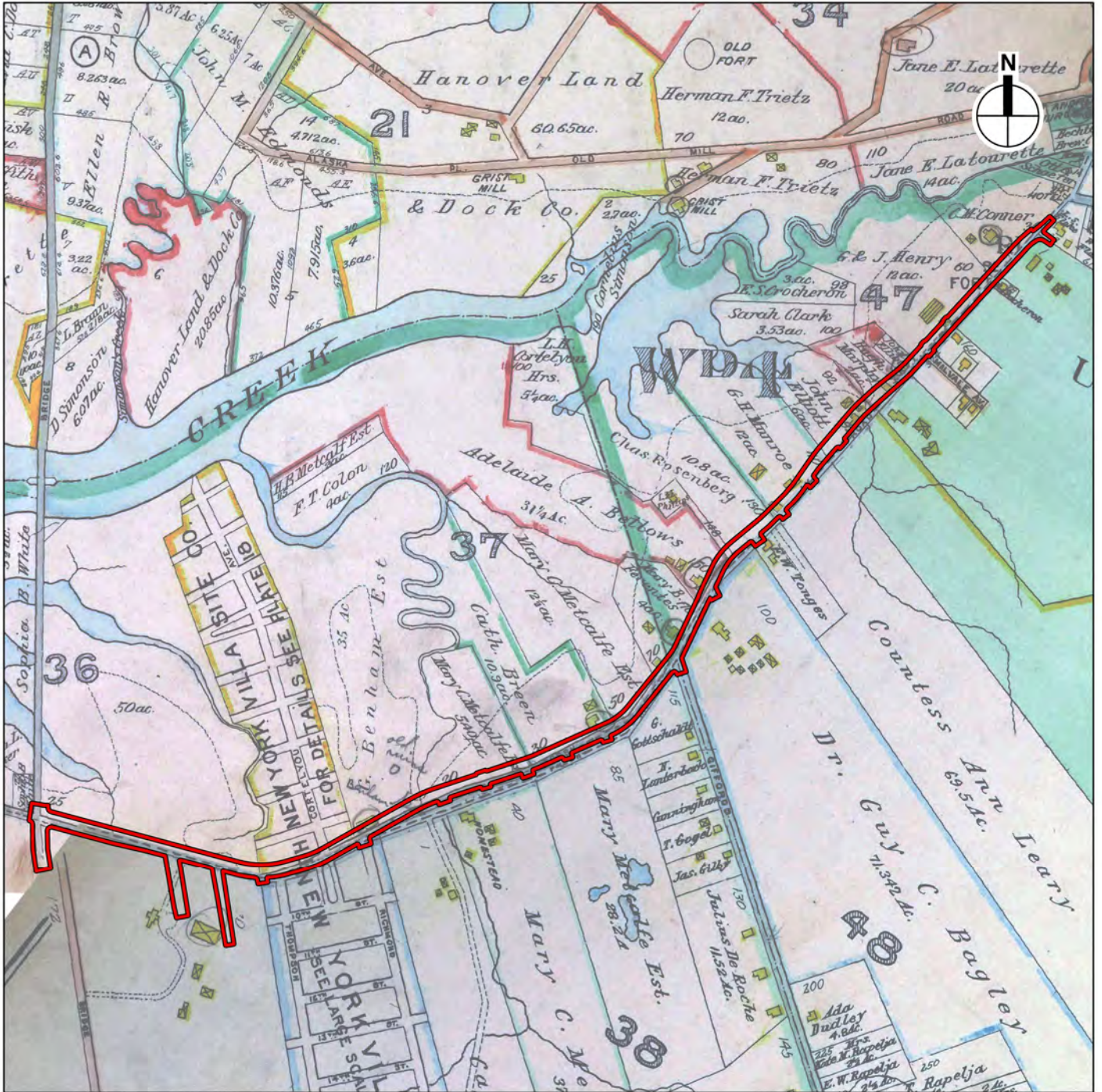
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 Proposed Project Corridor

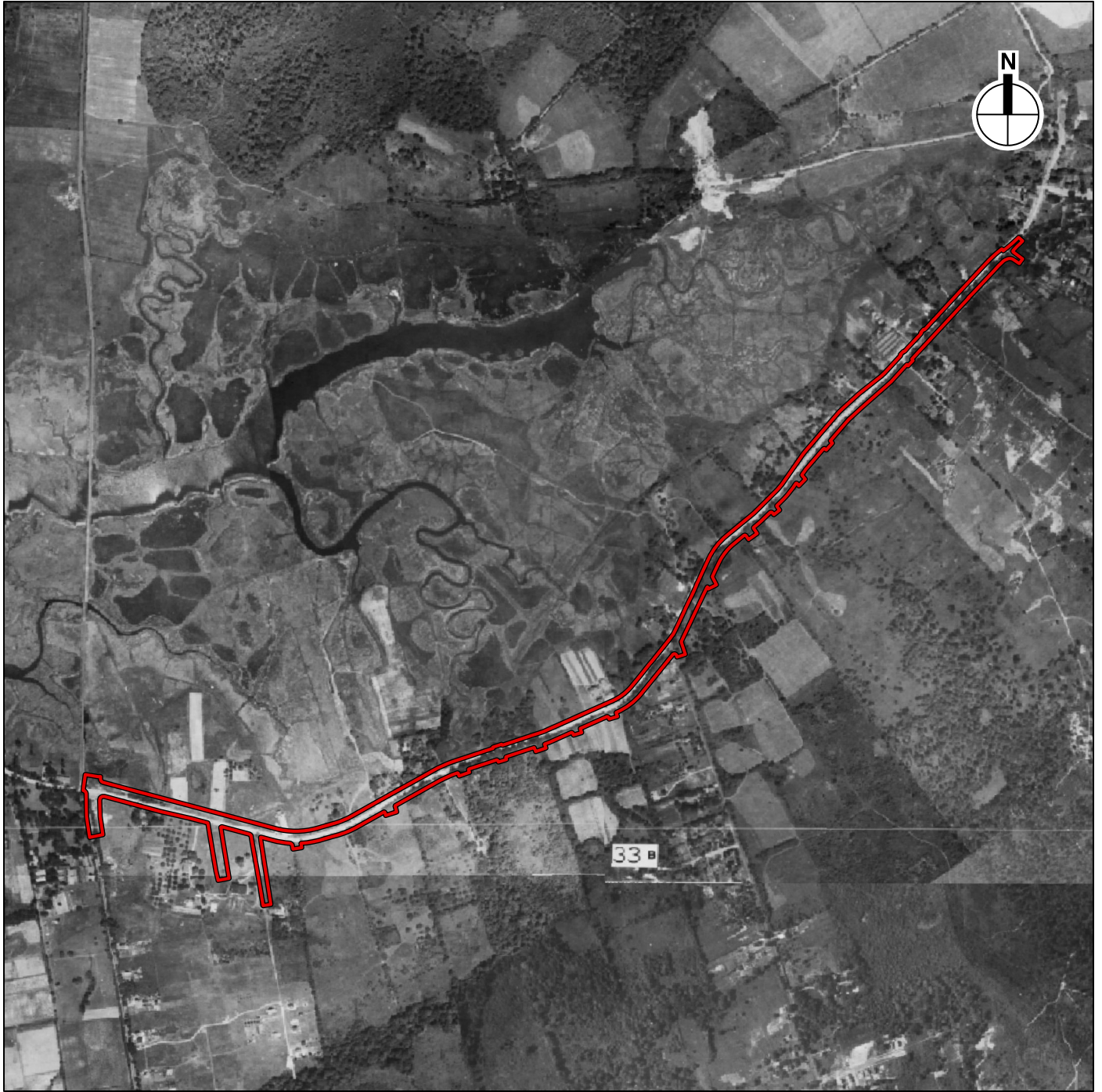




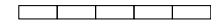
 Proposed Project Corridor

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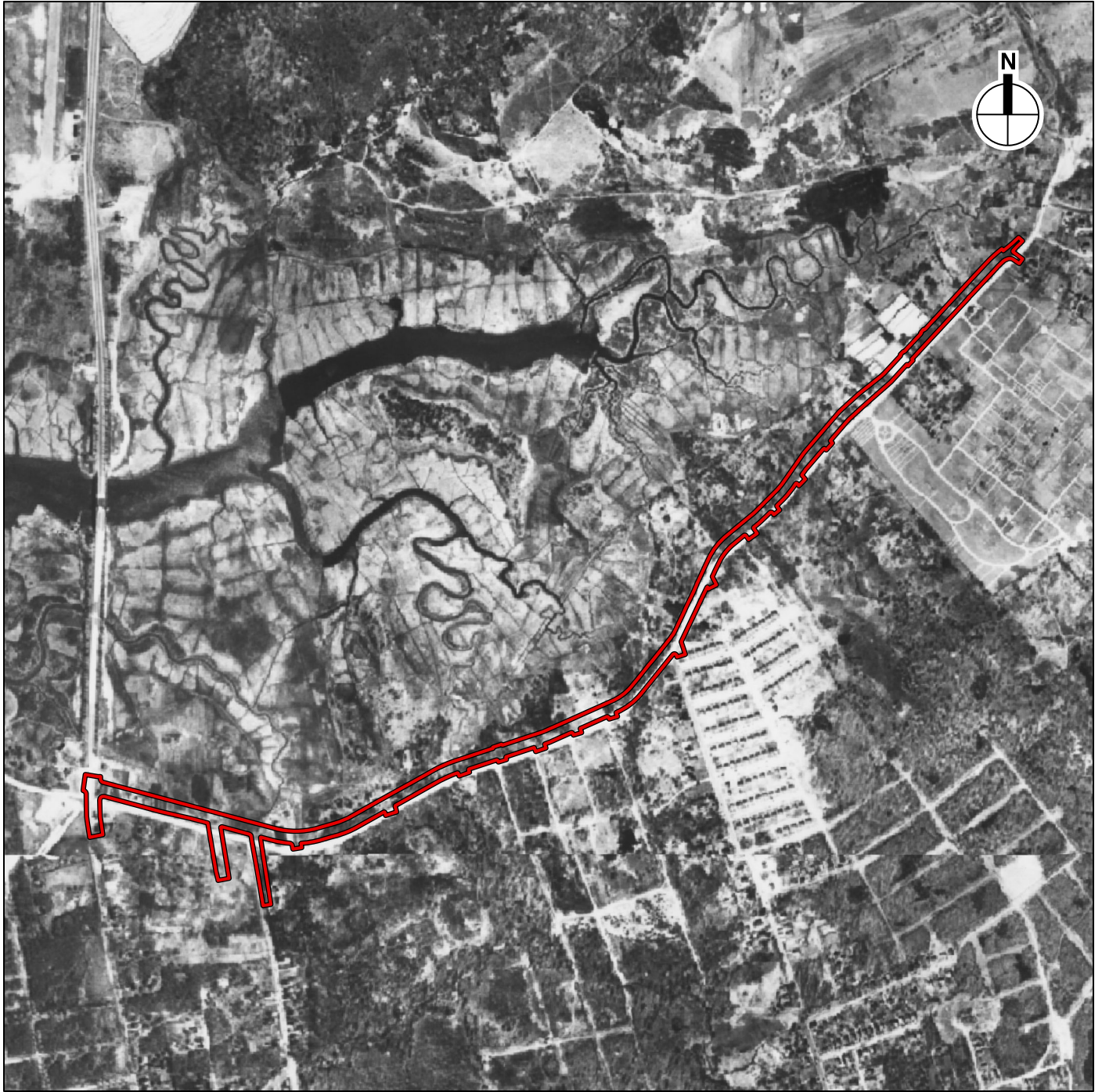


 Proposed Project Corridor

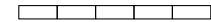
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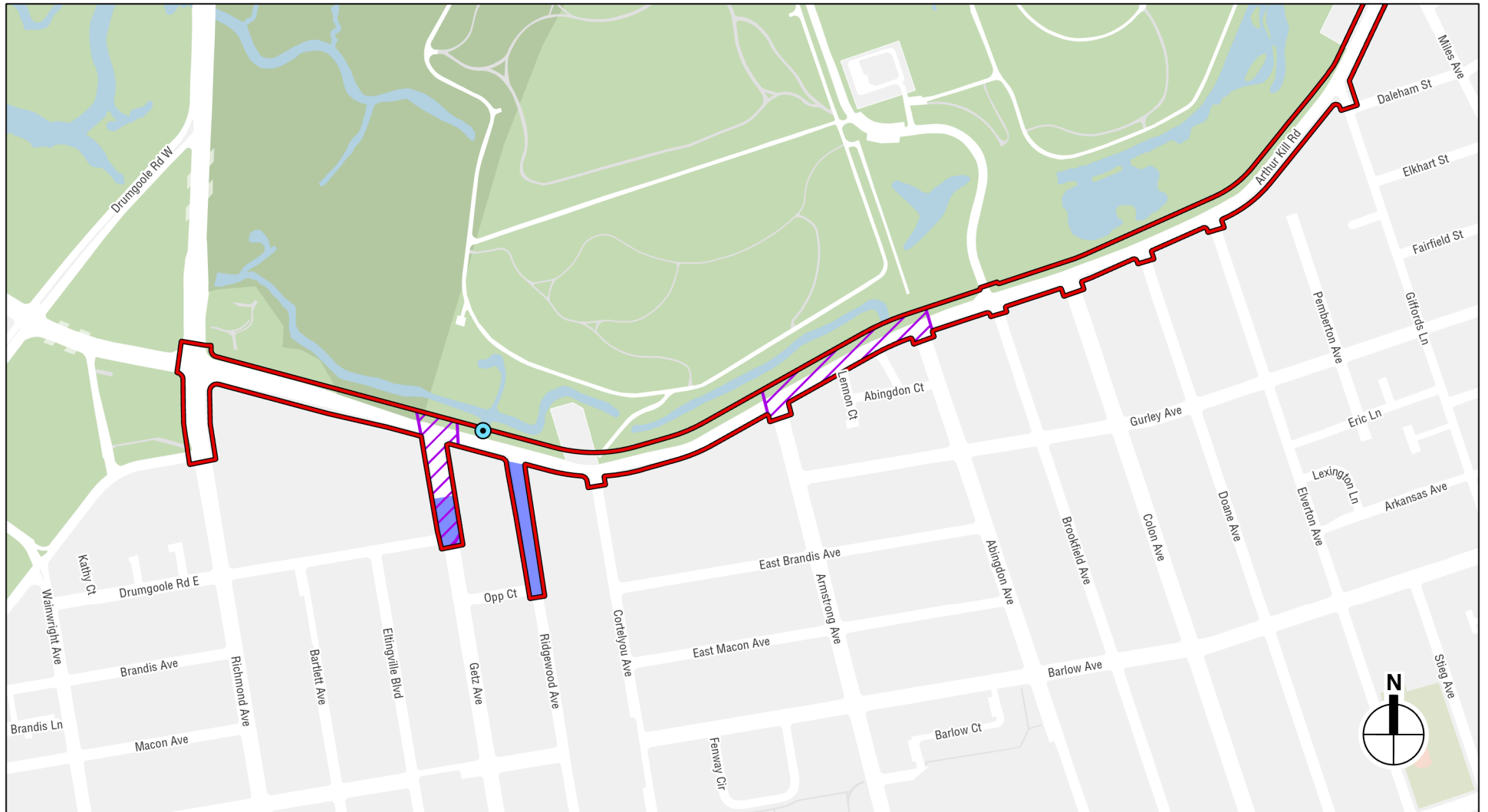
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Source: GeoWebCache on maps.nyc.gov.wmts



 Proposed Project Corridor

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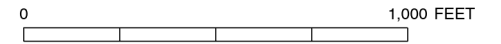


-  Proposed Project Corridor
-  New Outfall
-  Cemetery Sensitivity
-  Potentially Buried Ground Surface
-  Outfall Extension

0 1,000 FEET



-  Proposed Project Corridor
-  Outfall Extension
-  New Outfall
-  Cemetery Sensitivity



Photographs



Looking east down Arthur Kill Road from a point near Richmond Avenue 1



Looking east down Arthur Kill Road from a point near Ridgewood Avenue; the building in the image is a historical trolley barn situated within the project corridor 2



Looking east down Arthur Kill Road from a point near Abingdon Avenue 3



Looking northeast down Arthur Kill Road from a point between Gifford's Lane and Miles Avenue 4



Looking northeast down Arthur Kill Road from a point near Corbin and Troy Avenues 5



The southern side of Arthur Kill Road, looking east with Mount Richmond/United Hebrew Cemetery to the right of the photograph 6



View southeast down Clark Avenue from Arthur Kill Road in the vicinity of the former Dutch Reformed Church cemetery. The former church rectory is at left

7



Looking west down Arthur Kill Road from a point near Clarke Avenue

8