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HISTORICAL PERSPECTIVES INC.

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Phase IA Archaeological Documentary Study

New York City Transit
Staten Island Bus Depot Project Site
501 Industry Road, Block 1801, Lots 150 and 155
Staten Island, Richmond County, New York

LPC Project D-60550

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Staten Island Bus Depot Project Site
501 Industry Road, Block 1801, Lots 150 and 155
Staten Island, Richmond County, New York

LPC Project D-60550

Prepared For:

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Prepared By:

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March 2008

MANAGEMENT SUMMARY

SHPO Project Review Number (if available):

Involved State and Federal Agencies: **New York City Transit (NYCT)**

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

Location Information

Location: **Block 1801, Lots 150 and 155, Staten Island, New York. The project site is bordered to the west by a clean-fill and gravel depository and Industry Road; to the south by South Avenue; to the north by wetlands; and to the east by the Staten Island Railroad.**

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

County: **Richmond**

Survey Area

Length: **varies**

Width: **varies**

Number of Acres Surveyed: **ca. 8.5**

USGS 7.5 Minute Quadrangle Map: **Arthur Kill**

Archaeological Survey Overview

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

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

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

Surface Survey Transect Interval: **N/A, urban area**

Results of Archaeological Survey

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

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

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

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

Date of Report: **March 2008**

EXECUTIVE SUMMARY

New York City Transit (NYCT), an operating entity of the Metropolitan Transportation Authority (MTA), is proposing to construct and operate a bus depot in the Chelsea area of Staten Island, Richmond County, New York. The proposed project would modify, expand, and convert an existing factory – formerly used for the manufacture and distribution of chocolate candy – to meet the basic standards of a functional bus depot. The depot would be used by NYCT's Department of Buses for the storage and servicing of NYCT buses. The proposed bus depot site, located at 501 Industry Road, is approximately 8.5 acres and is located within Tax Block 1801, Lots 150 and 155 (Figures 1 and 2). Approximately 40 percent of the site is wetlands and wetland-adjacent area. The site is bordered to the west by a clean-fill and gravel depository and Industry Road; to the south by South Avenue; to the north by wetlands, wetland-adjacent area, and Sawmill Creek; and to the east by the Staten Island Railroad and the West Shore Expressway.

The NYCT is the lead state agency for the proposed project. An Environmental Assessment (EA) is currently being prepared to evaluate the potential environmental impacts from acquisition, construction and operation of the new bus depot pursuant to the New York State Environmental Quality Review Act (SEQRA). It is Historical Perspectives, Inc. (HPI)'s understanding that the proposed action will not entail any federal funding. In addition, because the proposed project is located in New York City, impact assessment guidance from the *New York City Environmental Quality Review Technical Guidance Manual (CEQR Technical Manual)* will be used where appropriate. The Area of Potential Effect (APE) is the area that could be affected by project development. Since project plans have not been finalized as of this writing, the APE for the proposed bus depot property includes the entire project site.

This Phase IA Archaeological Documentary Study was prepared to satisfy the requirements of SEQRA/CEQR, and to comply with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) and the Landmarks Preservation Commission (LPC) (New York Archaeological Council 1994; NYSOPRHP 2005; LPC 2002; CEQR 2001). According to NYSOPRHP standards, a Phase IA archaeological survey should include evaluation of both precontact and historic period archaeological potential. The LPC has indicated that there is potential for the recovery of remains from Native American occupation on the project site, but not the historic period (Santucci 2008). Where guidelines for the archaeological evaluation and report format of the LPC and the NYSOPRHP varied, those of the LPC, which specifically address New York City conditions and resources, took precedent.

The Phase IA research determined that the majority of the project site appears to have been extensively disturbed during the twentieth century, from grading and filling on the property during construction of the factory building and parking lots on Lot 150, and from reconfiguration of the landform on Lot 155, including filling and/or grading within portions of the wetlands. The soil borings conducted on the property confirm this disturbance.

The project site is located in an area where numerous precontact period archaeological sites have been recorded. These include the Bloomfield site (which has no defined boundaries but should be considered to have encompassed the entire historic Bloomfield area to the north of the project site) and the Chelsea Burying Ground, located several hundred feet northeast of the project site on the other side of Bloomfield Road. In its original state, the project site contained low-lying areas and marshland associated with a perennial drainage that emptied into the Arthur Kill. As noted by Louis Berger Associates (2005), some areas depicted on historic maps as marshland appear to have been dry enough at times to support precontact occupation. Finding sites within marshland is rare, however, and nearly all the precontact sites in the vicinity have been recorded on top of elevated hummocks, generally above the 10-foot contour line. These conditions suggest that in its natural state, the project site may not have had as high a precontact archaeological sensitivity as higher, surrounding areas. Last, based on the degree of disturbance to the overall project site, detailed above, there is little likelihood that any precontact resources could still remain on the project site.

The project site was never developed during the historic era, and appears to have been used primarily as farmland. While historic maps showed several buildings located on adjacent properties, none of these structures appear to have been situated close enough to the site boundaries to have affected the property. Therefore, historic period archaeological sensitivity for the project site is low.

Based on these conclusions, HPI has determined that the project site is not sensitive for either precontact or historic period archaeological resources. Therefore, no additional archaeological studies are recommended for the project site.

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3. East side of factory building on Lot 150, with Staten Island Railroad to right. View looking northwest from interior of property.

4. North side of factory building on Lot 150 in background; undeveloped Lot 155 in foreground. View looking southeast from interior of property.

5. West side of factory building on Lot 150 in background; undeveloped Lot 155 in foreground. View looking northeast from Industry Road to west of property.

6. Lot 155 showing typical vegetation. View looking northwest from interior of property.

7. Lot 155 showing typical vegetation and wet area. View looking northeast from interior of property.

8. Ponded wetland in north part of Lot 155. View looking west from interior of property.

I. INTRODUCTION

New York City Transit (NYCT), an operating entity of the Metropolitan Transportation Authority (MTA), is proposing to construct and operate a bus depot in the Chelsea area of Staten Island, Richmond County, New York. The proposed project would modify, expand, and convert an existing factory -- formerly used for the manufacture and distribution of chocolate candy – to meet the basic standards of a functional bus depot. The depot would be used by NYCT's Department of Buses for the storage and servicing of NYCT buses. The proposed bus depot site, located at 501 Industry Road, is approximately 8.5 acres and is located within Tax Block 1801, Lots 150 and 155 (Figures 1 and 2). Approximately 40 percent of the site is wetlands and wetland-adjacent area. The site is bordered to the west by a clean-fill and gravel depository and Industry Road; to the south by South Avenue; to the north by wetlands, wetland-adjacent area, and Sawmill Creek; and to the east by the Staten Island Railroad and the West Shore Expressway.

As shown on Figure 3, the proposed project includes:

- Clearing existing ground cover and vegetation and site grading;
- Filling approximately one-third acre of isolated wetlands and related on-site wetland mitigation, as determined in concert with the New York State Department of Environmental Conservation (replacement in-kind);
- Retrofitting the existing building, including an approximately 3,200-square-foot expansion, a less than a 10 percent increase in built square footage;
- Repaving approximately one-third of the site for outdoor parking areas;
- Constructing a newly configured entrance along South Avenue;
- Installing a new septic system and stormwater sewer; and
- Relocation of maintenance and storage of up to 155 buses from existing bus depots.

The NYCT is the lead state agency for the proposed project. An Environmental Assessment (EA) is currently being prepared to evaluate the potential environmental impacts from acquisition, construction and operation of the new bus depot pursuant to the New York State Environmental Quality Review Act (SEQRA). It is Historical Perspectives, Inc. (HPI)'s understanding that the proposed action will not entail any federal funding. In addition, because the proposed project is located in New York City, impact assessment guidance from the *New York City Environmental Quality Review Technical Guidance Manual (CEQR Technical Manual)* will be used where appropriate. The Area of Potential Effect (APE) is the area that could be affected by project development. Since project plans have not been finalized as of this writing, the APE for the proposed bus depot property includes the entire project site.

This Phase IA Archaeological Assessment was prepared to satisfy the requirements of SEQRA/CEQR, and to comply with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) and the Landmarks Preservation Commission (LPC) (New York Archaeological Council 1994; NYSOPRHP 2005; LPC 2002; CEQR 2001). According to NYSOPRHP standards, a Phase IA archaeological survey should include evaluation of both precontact and historic period archaeological potential. The LPC has indicated that there is potential for the recovery of remains from Native American occupation on the project site, but not the historic period (Santucci 2008). Where guidelines for the archaeological evaluation and report format of the LPC and the NYSOPRHP varied, those of the LPC, which specifically address New York City conditions and resources, took precedent. The HPI project team consisted of Julie Abell Horn, M.A., R.P.A., who conducted the majority of the research and wrote the report; Christine Flaherty, M.A., who assisted with the research; and Cece Saunders, M.A., R.P.A. who conducted site visits, interviews, managed the project and provided editorial and interpretive assistance.

II. METHODOLOGY

The present study entailed review of various resources.

- Historic maps were reviewed at the New York Public Library, the Staten Island Historical Society, and using various online websites. These maps provided an overview of the topography and a chronology of land usage for the study site, and showed that the project site was not developed until the 1970s.
- Because the historic maps showed no development on the project site during the majority of its history, it was not deemed necessary to review nineteenth- or twentieth-century deeds, tax assessment records or city directories, which are standard resources consulted as part of a documentary study.
- Department of Building index records and certificates of occupancy for Lot 150 were reviewed using the department's website. These records confirmed that Lot 150 was undeveloped until the 1970s. Because Lot 155 was never developed, no records were on file for this lot.
- Several primary and secondary sources concerning the general precontact period and history of Staten Island and specific events associated with the project site were reviewed at the New York Public Library and the Staten Island Historical Society.
- Information about previously recorded archaeological sites and surveys in the area was compiled from data available at the NYSOPRHP and the LPC.
- STV, Inc. provided various maps, photographs, site data, and soil borings for the property.
- Last, a site visit was conducted by Cece Saunders of HPI on January 25, 2008 to assess any obvious or unrecorded subsurface disturbance (Photographs 1-8; Figure 2).

III. CURRENT CONDITIONS AND ENVIRONMENTAL SETTING

A. Current Conditions

As noted above, the proposed project site is located on Block 1801, Lots 150 and 155. In total, the site measures approximately 8.5 acres. Lot 150, containing about 3.1 acres, was developed in 1973 with a factory building used for the light manufacturing of chocolate (Photographs 1-4). The metal and brick building is one and two stories high, and contains approximately 35,770 gross square feet. The building is surrounded on the west and south sides by pavement, formerly used for parking lots, on the north by vacant land, and can be accessed via South Avenue to the south. There is some landscaping along the southern side of property. Lot 150 presently is enclosed by a chain link fence.

Lot 155, which borders Lot 150 on the east and north and measures about 5.4 acres, is undeveloped. It contains low vegetation, including wetland-type plants such as cattails (Photographs 5-6). There are several mapped wetland areas along the northern end of the property, which at the time of the field survey were filled with water (Photographs 7-8).

The project site is bounded by the Staten Island Railroad to the east, and a private clean-fill and gravel operation to the west. Industry Road, presently not open to traffic, separates the project site from the fill and gravel facility.

B. Topography and Hydrology

The project site is nearly level, with elevations ranging from about 2 feet above sea level in the wetland areas to about 10 feet above sea level near the existing factory building. In its natural state, the site ranged from about 2-4 feet above sea level (U.S.G.S. 1890 [see Figure 7]; Borough of Richmond 1911a, 1911b, 1912 [see Figure 8]). During the late twentieth century, it appears that several feet of fill were added across Lot 150 to create the firm surface on which the building and paved areas were then constructed. Lot 155, which is undeveloped, also appears to have been filled in at least some places, as evidenced by the soil boring data presented in Appendix A.

There are two wetland areas on the site, which consist of a small isolated wetland measuring about one-third acre, and a NYS DEC-mapped wetland which is approximately 3.5 acres in size. These wetlands are associated with a perennial drainage located to the north of the project site, which empties into the Arthur Kill. Although these wetlands appear to have been modified during the twentieth-century from grading and/or filling on the property, historic maps indicate that there were always wet areas in the northern portion of the project site.

C. Geology

The project site sits within the western edge of the Piedmont Lowlands. As described by Boesch (after Wolfe 1977),

> The Piedmont Lowlands make up about one fifth of the land area of Staten Island and consist of gently rolling terrain, generally between 50 and 100 feet in elevation, which gradually slopes to the southeast. The undulating surface is interrupted by an intrusive ridge, 200 to 250 feet in elevation, and by slightly lower, plateau-like topographic features. The rolling lowlands are generally underlain by Triassic and Jurassic age shales, siltstones, and sandstones of the Brunswick Formation of the Newark Group[,] while the ridges are composed of basaltic lava flows and diabase traprock. The plateau-like features developed on erosion resistant Lockatong Formation Argillites. (Boesch 1994: 3)

During the precontact era the woodlands of the Piedmont Lowlands consisted of broadleaf deciduous trees, which provided a habitat for "game birds, small mammals, deer, bear, and during at least a portion of the precontact period, elk" (Boesch 1994: 6). Mixed wetland ecologies provided numerous floral and faunal resources, the most important faunal resources being the shellfish found in saltwater and brackish environments. Freshwater faunal resources include "mussels, fish, certain amphibians and reptiles, migratory fowl, and semi-aquatic mammals. Anadromous fish species would have been present seasonally within Staten Island via streams emptying into the estuary system" (Boesch 1994: 5-6).

D. Soils

According to the soil survey for New York City, there are two soil mapping units that fall within the project site. Much of the project site is mapped as "Pavement & buildings, wet substratum-Laguardia-Ebbets complex, 0 to 8 percent slopes." It is described as:

> Nearly level to gently sloping urbanized areas filled with a mixture of natural soil materials and construction debris over swamp, tidal marsh, or water; a mixture of anthropogenic soils which vary in coarse fragment content, with 50 to 80 percent of the surface covered by impervious pavement and buildings (USDA 2005:16).

The remainder of the project site is mapped as Windsor-Windsor, loamy substratum-Deerfield loamy sands, 0 to 8 percent slopes. It is described as:

> Nearly level to gently sloping areas of sandy outwash plains and dunes that are relatively undisturbed and mostly wooded; a mixture of excessively drained and moderately well drained sandy outwash soils; located in western Staten Island (USDA 2005:19).

Figure 4 illustrates the location of the project site on the soil survey map for New York City.

As part of the proposed project, a total of ten soil borings was completed at locations within the project site (see Appendix A for locations and logs). Four borings were situated inside the existing building, and six borings were situated at various locations on the property grounds, as described below. All the borings were located in Lot 150, except Boring SB-1, which was located in Lot 155.

Boring ID	Description
SB-2	Building Interior near Dry Well.
SB-5	Former AST Area # 2 (2-275 gallon Fuel Oil) and near Dry Well.
SB-6	Random Building Interior.
SB-8	Mechanical/Maintenance Area.
SB-1	Demo/Debris field.
SB-3	Building exterior near.
SB-4	Former AST Area # 1 (2-215 gallon Fuel Oil) and near Dry Well.
SB-7	Septic field leaching.
SB-9	Dry well near loading area and drum storage
SB-10	Random.

The soil borings were advanced from the ground surface to either 12 or 20 feet below grade (bgs). In all borings, the upper layer was noted as fill (in some cases capped by a concrete surface), generally mixed with ash, wood, and brick fragments. The depth of the fill ranged from 2-4 feet bgs. Beneath the fill were naturally occurring soils consisting of silty sand, silt, sand, or silty clay, often mixed with gravel. There was no stratum that might correspond to a buried A horizon noted beneath the fill, suggesting that the original ground surface in the boring locations had been destroyed. Groundwater was quite shallow throughout the property, ranging from approximately 0.5 ft bgs to 1.9 ft bgs (Appendix A).

IV. BACKGROUND RESEARCH/HISTORICAL OVERVIEW

A. Precontact Summary

For this report, the word precontact is used to describe the period prior to the use of formal written records. In the western hemisphere, the precontact period also refers to the time before European exploration and settlement of the New World. Archaeologists and historians gain their knowledge and understanding of precontact Native Americans on Staten Island from three sources: ethnographic reports, Native American artifact collections, and archaeological investigations.

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

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

The environment during the Early Archaic (c. 8000 B.C. - 6000 B.C.) displayed a trend toward a milder climate and the gradual emergence of a deciduous-coniferous forest with a smaller carrying capacity for the large game animals of the previous period (Ritchie and Funk 1971). The large Pleistocene fauna of the previous period were gradually replaced by modern species such as elk, moose, bear, beaver, and deer. New species of plant material suitable for human consumption also became abundant. The increasing diversification of utilized food sources is further demonstrated by a more complex tool kit. The tool kit of the Early Archaic people included bifurcated or basally notched projectile points generally made of high quality stone. Tool kits were more generalized than during the Paleo-Indian period, showing a wider array of plant processing equipment such as grinding stones, mortars and pestles. Although overall evidence of Early Archaic sites on Staten Island is sparse, it should be noted that the Old Place site, located approximately two miles north of the project site, is recognized as one of the most important Early Archaic component sites in the area (Ritchie and Funk 1971; Ritchie 1980; Cantwell and Wall 2001). Other Early Archaic component sites on Staten Island include the Hollowell, Charleston Beach, Wards Point, Travis, and Richmond Hill sites (Ritchie and Funk 1971; Boesch 1994).

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

Late Archaic people (c. 4000 - c. 1000 B.C.) were specialized hunter-gatherers who exploited a variety of upland and lowland settings in a well-defined and scheduled seasonal round. The period reflects an increasingly expanded economic base, in which groups exploited the richness of the now established oak-dominant forests of the region. It is characterized by a series of adaptations to the newly emerged, full Holocene environments. As the period progressed, the dwindling melt waters from disappearing glaciers and the reduced flow of streams and rivers promoted the formation of swamps and mudflats, congenial environments for migratory waterfowl, edible plants and shellfish. The new mixed hardwood forests of oak, hickory, chestnut, beech and elm attracted white-tailed deer, wild turkey, moose and beaver. The large herbivores of the Pleistocene were rapidly becoming extinct and the Archaic Indians depended increasingly on smaller game and the plants of the deciduous forest. The projectile point types attributed to this period include the Lamoka, Brewerton, Normanskill, Lackawaxen, Bare Island, and Poplar Island. The tool kit of these peoples also included milling equipment, stone axes, and adzes. A large number of Late Archaic Period sites have been found on Staten Island. These include the Pottery Farm, Bowman's Brook, Smoking Point, Goodrich, Sandy Brook, Wort Farm, and Arlington Avenue sites. In addition, the Old Place Site contained a Late Archaic component (Boesch 1994).

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

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

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

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

Woodland Period Native Americans in Staten Island and surrounding regions shared common attributes. The period saw the advent of horticulture and with it, the appearance of large, permanent or semi-permanent villages. Plant and processing tools became increasingly common, suggesting an extensive harvesting of wild plant foods. Maize

cultivation may have begun as early as 800 years ago. The bow and arrow, replacing the spear and javelin, pottery vessels instead of soap stone ones, and pipe smoking, were all introduced at this time. A semi-sedentary culture, the Woodland Indians moved seasonally between villages within palisaded enclosures and campsites, hunting deer, turkey, raccoon, muskrat, ducks and other game and fishing with dug-out boats, bone hooks, harpoons and nets with pebble sinkers. Their shellfish refuse heaps, called "middens," sometimes reached immense proportions of as much as three acres (Ritchie 1980:80, 267). Habitation sites of the Woodland Period Indians increased in size and permanence. A large number of Woodland Period archaeological sites have been found on Staten Island in a variety of environmental settings. A favored setting for occupation during this period was well-drained ground near stream drainages and coastal waterways. The Old Place Site, which also had a Woodland component, exhibited all of these locational characteristics.

During the early Contact period (1500 to 1700 A.D.) there was a continuation of the Late Woodland settlement patterns of the coastal Algonquians. By the 17th century the Dutch settlers of lower New York were in frequent contact with the many Native Americans who lived in the vicinity. Historic accounts describe both peaceful and violent interchanges between these two groups (Brasser 1978, Flick 1933). Through at least the 1650s, Native Americans known as the Raritans occupied portions of Staten Island and New Jersey's Raritan Valley (Ruttenber 1872). The Raritans were but one of many native groups which as a whole were known as the Delaware Indians by the European settlers. As the European population increased, and internecine warfare due to increased competition for trade with the Europeans intensified, the Raritans, and the Delaware in general, retreated inland away from the eastern coast. By the 1800s their migration had scattered them across the Mid West and even into Canada (Weslager 1972), where they have continued living to the present day. Journal accounts by European explorers, settlers and travelers describe Native settlements and lifeways. However, only a few Historic Contact Period sites have been found on Staten Island. Sites include those at Wards Point, Old Place, Corsons Brook, Travis, New Springfield, and at the PS56R Site in Woodrow (Boesch 1994; HPI 1996).

B. Previously Recorded Archaeological Sites and Surveys

Records on file at the NYSOPRHP and the New York State Museum as well as the Boesch (1994) *Archaeological and Sensitivity Assessment of Staten Island, New York* indicate that numerous precontact sites have been documented within one mile of the project site. The following table summarizes archaeological sites that have been documented by the NYSM, the NYSOPRHP, and by Boesch (1994) within a one mile radius of the project site (within New York; sites on the New Jersey shore that fall within one mile of the project site were not reviewed). In some cases, the sites appear to have been recorded duplicate times, often obtaining several different site number designations. Where the duplication was obvious, the sites and their attributes are combined into one listing in the table. Of note, NYSM site locations and descriptions often are vague, due to the fact that many of these sites were documented based on non-professional records (such as information from local landowners, avocational collectors, or historic accounts); descriptions and distances of these sites from the project site are given based on available mapping and other data, but should not be considered definitive.

NYSOPRHP Site # and Site Name	***NYSM Site # and* Site Name**	***Distance from* project site**	**Time Period**	**Site Type**
	NYSM #4596 Bloomfield	Vague location; see below	Unknown Precontact	Camps
	NYSM #4597 Bulls Head	Circa 0.9 mile northeast	Unknown Precontact	Burying Ground
	NYSM #4598 Long Neck Sites	Circa 0.5 mile south	Unknown Precontact	Camps? Hamlets? Middens?
	NYSM #4627 Chelsea 2	Circa 0.2 mile west	Unknown Precontact	Camps
	NYSM #7324	Circa 0.2 mile north	Transitional	Isolated point?

NYSOPRHP Site # and Site Name	NYSM Site # and Site Name	Distance from project site	Time Period	Site Type
	NYSM #8323	Circa 0.2 mile south	Unknown Precontact	Unknown
	NYSM #8501	Circa 0.1 mile northwest	Unknown Precontact	Camp
	NYSM #8502	Circa 0.1 mile south	Unknown Precontact	Traces of occupation
	NYSM #8503	Circa 0.9 mile north	Unknown Precontact	Camp
	NYSM #8504	Circa 0.6 mile north	Unknown Precontact	Traces of occupation
08501.000135	NYSM #746, 4597; Chelsea Burying Ground	Circa 0.1 mile northeast	Archaic? Transitional?	Burying Ground

Two of the archaeological sites listed in the table are worth describing in further detail, as they are within close proximity to the project site.

Bloomfield Site

The first mention of the Bloomfield archaeological site is from the Skinner (1909) publication, which summarized precontact period sites on Staten Island:

> *Bloomfield (Watchogue).* There is no special large village site in this region, but relics occur more or less abundantly on all of the dunes and sand-hills. A stone plummet (?), grooved axes, Iroquoian pottery, pipes, arrow points, etc. have been found here. Mr. Isaiah Merrill has a fine collection of objects said to have been collected about here, among which is a steatite bead. An inscribed clay bead, with incised figures, is also said to have been found here. This site is peculiar on account of the scarcity of shell pits and similar remains. Relics occur almost entirely as surface finds. Celts have been found. A fine perforated brass arrow point was found by the writer some years ago at a spot where Iroquoian pottery was frequent. Objects which seem to be gun flints, but are chipped from native yellow jasper, etc. were in the collection of Mr. Merrill. These seemed to the writer to be authentic, and it is possible that the Indians did manufacture these useful objects rather than buy the English flints from the Whites. The stone bead in Mr. Merrill's collection is of pink steatite – thick, square, and altogether remarkable. It is said that Mr. Merrill had at one time a "handful" of these beads; but when the writer viewed this collection, some years ago, only one remained. Other notable objects in his collection were a banner stone, fragments of others, and several celts (Skinner 1909:9).

According to historic maps, the property of Isaiah Merrill, who was interviewed by Skinner, was on the southwest corner of Bloomfield Road and Water/River Road. However, it appears that Merrill collected artifacts from various locations around Bloomfield, not just on his own property.

All subsequent references to this site derive from the original description (i.e. Parker 1920); no professional excavations ever occurred at this site and little new data were ever assembled beyond the Skinner description, above. The few bits of follow up information about this vaguely-defined site are from accounts in the local newspaper. Two *Staten Island Advance* articles noted that as late as 1934-1935, precontact period artifacts were still being found in Bloomfield. Local resident Marcellus T. Merrill found an "Indian Hatchet" on his farm property in 1934 (*Staten Island Advance* 11/20/1934). Merrill's property was on the west side of Bloomfield Road, two properties south of the road's intersection with Bloomfield/Decker Avenue. In 1935, the paper reported that high school students had befriended another Merrill family member, Orvil Merrill, who lived on Bloomfield Road, although the exact location was not given. He was quoted as saying he hunted for artifacts in sandy, "higher up" locations, but not in

marshes. The students also were regularly collecting artifacts in Bloomfield at this time (*Staten Island Advance* 3/21/1935).

The last attempt to officially locate the Bloomfield site came in the early 1980s, when Edward Lenik undertook a development project just east of the West Shore Expressway, encompassing a portion of the former Bloomfield community. Despite a research strategy that included intensive archival work including comparison of historic and modern topographic maps, interviews with local residents, and a comprehensive field testing program, Lenik failed to find the Bloomfield site. He concluded:

> The documentary references to the Bloomfield Site are vague and the community of Bloomfield or Watchogue is a general or ill-defined area. Furthermore, Skinner and Parker both describe Indian relics as being found on the surface of "dunes and sandhills" in the area (Skinner 1914: 102; Parker 1920:681). Such dunes and sandhills do not exist in this locality at the present time. The Bloomfield Site was undoubtedly destroyed by the construction of the West Shore Expressway, as well as by the continued development, utilization, and alteration of the landscape in the remaining portions of this former community (Lenik 1983:62).

Burying Ground Site

The second archaeological site that deserves mention is the Burying Ground Site, located in Chelsea, only a few hundred feet northeast of the project site, on the other side of Bloomfield Road. This was another site recorded initially by Skinner (1909), but which was never precisely defined on the modern landscape. The description clearly indicates that the site was located in Chelsea, and not in Bloomfield:

> *Chelsea*. At the angle of Watchogue Road, near its junction with Union Avenue, graves are reported to have been found. The site is well known locally as the "Burying Ground." Several grooved axes have come from this site. Attempts to locate any remaining graves have been unsuccessful. Another dune with relics is between Chelsea and Travisville (Skinner 1909:9).

Watchogue Road is the former name of Bloomfield Road, and Union Avenue was another name for Chelsea Road. The angle of the road referred to in the description is several hundred feet northeast of the project site.

Surveys

In addition to the previously documented archaeological sites, a number of cultural resources investigations have occurred within a one or two mile radius of the project site. Although studies were completed for a variety of clients in a range of locational settings, several issues were addressed repeatedly in these reports and are worth reiterating here. Most importantly, archaeologists working in this part of Staten Island knew definitively that the area was once highly sensitive for precontact period sites. The sheer number of sites recorded in this vicinity is a testament to this fact. However, pinpointing the locations of precontact sites that had been previously recorded by amateur archaeologists, on the basis of historic accounts, or using data from early nineteenth century scholars such as Skinner or Parker proved to be difficult, and sometimes impossible. Often, locations or vicinities where sites were supposed to have been situated yielded no precontact materials, even where disturbance to the ground surface was minimal (e.g. Roberts and Stehling 1988). In other cases, modern construction and other earthmoving activities associated with recent development in the area rendered project sites too disturbed to recover any precontact resources, even if they had existed (e.g. Lenik 1983; Hunter and Liebeknecht 2003). Lenik (1983:63-64) summed up the frustrations of trying to pinpoint the location of the Bloomfield and Bulls Head sites this way:

> In summary, the early twentieth century survey reports, which are often cited in cultural resource management studies, must be examined critically and with a great deal of skepticism. These early reports are often vague as to location, and frequently refer to collections long since gone or dispersed, or to hearsay reports. Such data must be carefully cross-checked and correlated with historical maps and present-day maps. The names, places, roads and sites often change or disappear entirely as time passes by.

In general, the only locations where precontact sites or artifacts in an undisturbed context have been documented have been north of Old Place Creek, where development through the late twentieth century has been less intense and intact soil horizons have survived (e.g. Payne and Baumgardt 1986; Louis Berger Associates 2005). In nearly all cases, these areas were upland landforms (generally terraces or hummocks) in close proximity to waterways. To date, the recent Goethals Bridge investigations provide the only example of precontact materials found in areas historically depicted as marshland in this part of Staten Island.

C. History of the Project Site

The project site and what would later become the hamlet of Chelsea fall within an area originally situated between Daniel's Neck to the north and Long Neck to the south, and which was surrounded by marshland. According to a reconstructed map of colonial patents, a 120-acre parcel, including the project site and much of the surrounding Chelsea area, originally was granted to Jonissa Cronsoon in 1685, while the marshy areas were unpatented (Skene 1907).

The earliest known occupants of the Chelsea area were the Prall family, for which nearby Prall's Island is named. During the American Revolution, the area was known as Pralltown (Leng and Davis 1930). The Anglo-Hessian map of 1780-1783 shows two structures attributed to Prall in the Chelsea area, although both were some distance from the project site, which was shown as undeveloped.

By the mid-nineteenth century, when the 1850 Dripps map was published, both Bloomfield and Chelsea Roads had been laid out, and there were a number of structures depicted along them. The Cary and Simonson families had houses northeast and west of the project site, which was still shown as vacant. Nearly identical conditions were shown on the 1853 Butler map (Figure 5), as well as the 1859 Walling map and the 1866 Colton map. The 1872 Dripps map, which showed more detail concerning property boundaries, did not indicate ownership, although the project site again was illustrated as vacant.

The 1874 Beers map (Figure 6), is one of the first historic maps to show property boundaries as well as structures and owners. In some instances acreage of parcels also is included. On this map, the project site falls primarily within a 36-acre parcel attributed to W.F. Cary, with the western edge of the project site within a 13-acre parcel attributed to W. Bartley. Although both individuals had houses within their parcels, neither fell within or immediately adjacent to the project site boundaries. Neither the 1889 Colton map nor the 1890 U.S.G.S. map (Figure 7) showed any appreciable changes from conditions shown on the 1874 map.

The ca. 1911 Borough of Richmond Topographical Survey maps are some of the most detailed depictions of Staten Island ever made. For the project site, this series of maps illustrates that the southern portion of the property was farmland (it is labeled "cultivated") and the northern end was not (Borough of Richmond 1911a, 1911b, 1912; Figure 8). Of note, on this map the project site does not appear to contain any of the small hummocks like those that dotted the surrounding area, and which generally were the locations where structures were built (and frequently precontact sites were located). Only the southern tip of the project site was slightly raised, with an elevation of 4 feet above sea level. Generally, most structures in the area were constructed on hummocks located above the 10-foot elevation contour line. Considering the swampy conditions of the surrounding area, and the tendency for the area to flood, this is not surprising.

Maps and aerial photographs that included the project site during the remainder of twentieth century continued to show the project site as vacant and/or farmland. The 1917 Bromley map (Figure 9) shows that by this time the property was part of a ca. 27-acre parcel on the east belonging to William T. Meredith, and overlapping a ca. 9-acre parcel on the west attributed to Frederick Denker. Again, the project site was shown as undeveloped. A 1924 aerial photograph including the project site (Figure 10) clearly shows that the southern side of the project site was farmland. Portions of the northern side of the project also may have been farmed. A 1969 aerial photograph (Figure 11), while less detailed, seems to show that farming had ceased on the property.

As noted earlier, the extant factory building on Lot 150 was constructed in 1973, and was altered several times during the later 1970s and 1980s (DOB records). It appears that the Lot 150 portion of the project site was graded and filled during the early 1970s in order to create the firm surface on which to build the factory and its parking lots. It also appears that Lot 155 sustained an uncertain degree of grading and filling during the twentieth century.

Comparison of the 1924 aerial map with modern aerial images suggests that at least some of the original wetland areas have been filled, and likely others were reconfigured.

V. CONCLUSIONS

A. Disturbance Record

The majority of the project site appears to have been extensively disturbed during the twentieth century, from grading and filling on the property during construction of the factory building and parking lots on Lot 150, and from reconfiguration of the landform on Lot 155, including filling and/or grading within portions of the wetlands. The soil borings conducted on the property confirm this disturbance.

B. Precontact Archaeological Sensitivity

The project site is located in an area where numerous precontact period archaeological sites have been recorded. These include the Bloomfield site (which has no defined boundaries but should be considered to have encompassed the entire historic Bloomfield area to the north of the project site) and the Chelsea Burying Ground, located several hundred feet northeast of the project site on the other side of Bloomfield Road. In its original state, the project site contained low-lying areas and marshland associated with a perennial drainage that emptied into the Arthur Kill. As noted by Louis Berger Associates (2005), some areas depicted on historic maps as marshland appear to have been dry enough at times to support precontact occupation. Finding sites within marshland is rare, however, and nearly all the precontact sites in the vicinity have been recorded on top of elevated hummocks, generally above the 10-foot contour line. These conditions suggest that in its natural state, the project site may not have had as high a precontact archaeological sensitivity as higher, surrounding areas. Last, based on the degree of disturbance to the overall project site, detailed above, there is little likelihood that any precontact resources could still remain on the project site.

B. Historic Period Archaeological Sensitivity

As described above, the project site was never developed, and appears to have been used primarily as farmland. While historic maps showed several buildings located on adjacent properties, none of these structures appear to have been situated close enough to the site boundaries to have affected the property. Therefore, historic period archaeological sensitivity for the project site is low.

VI. RECOMMENDATIONS

HPI has determined that the project site is not sensitive for either precontact or historic period archaeological resources. Therefore, no additional archaeological studies are recommended for the project site.

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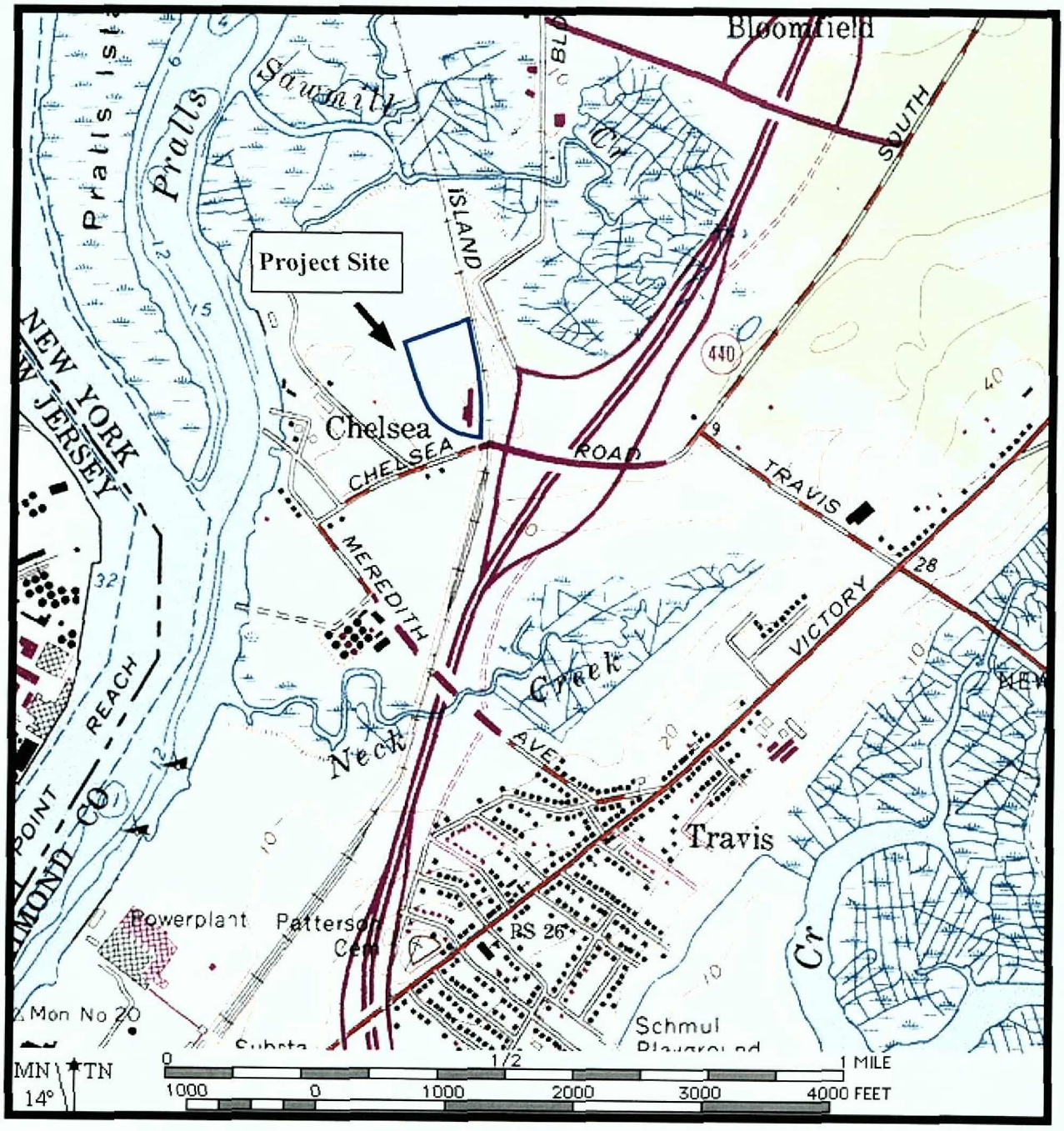
Figures



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501 Industry Road, Block 1801, Lots 150 and 155
Staten Island, Richmond County, New York

Figure 1: Project site on *Arthur Kill, N.Y-N.J.* topographic quadrangle (U.S.G.S. 1976).

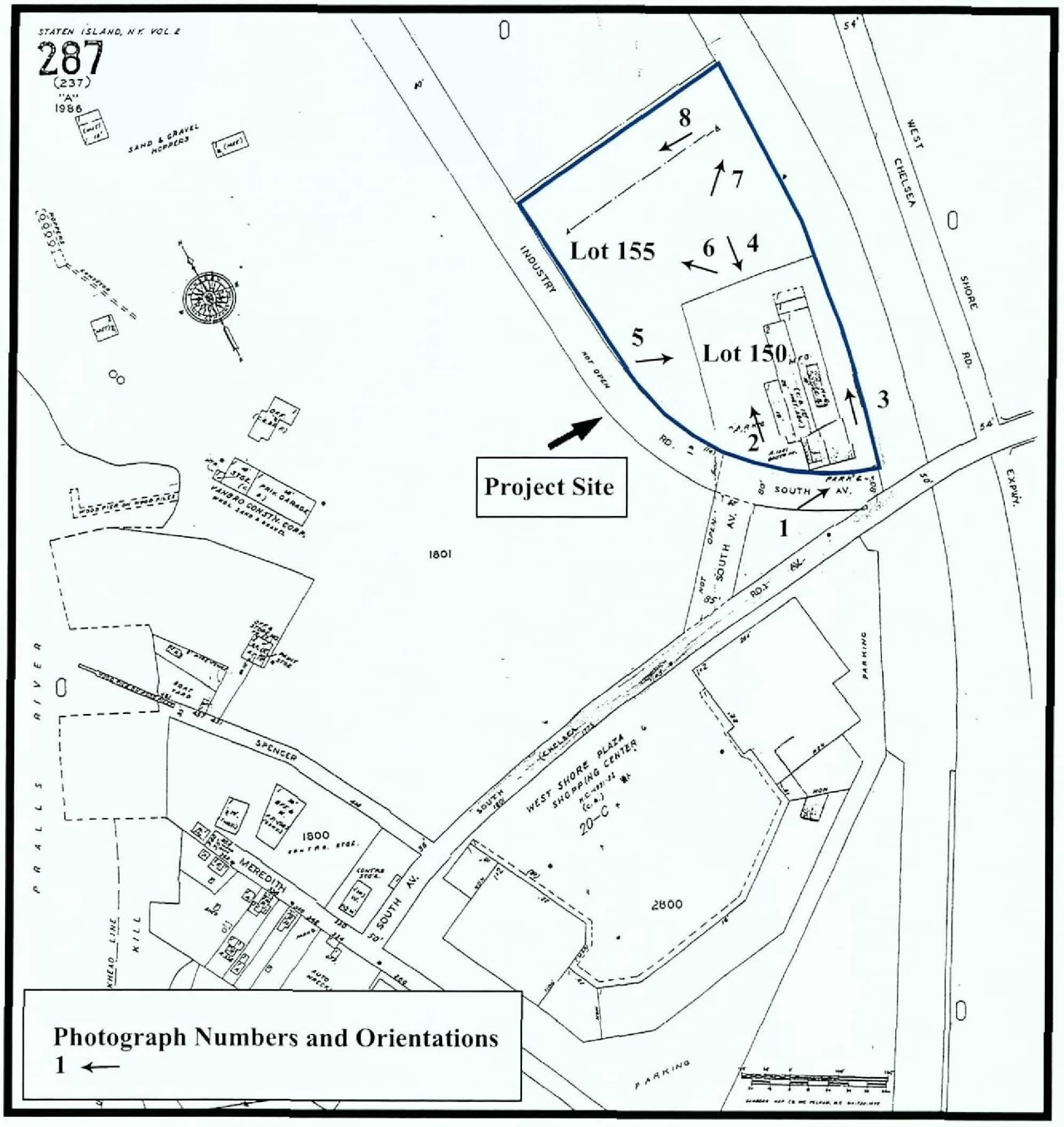

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Figure 2: Project site and photograph locations on modern map (Sanborn 1990).

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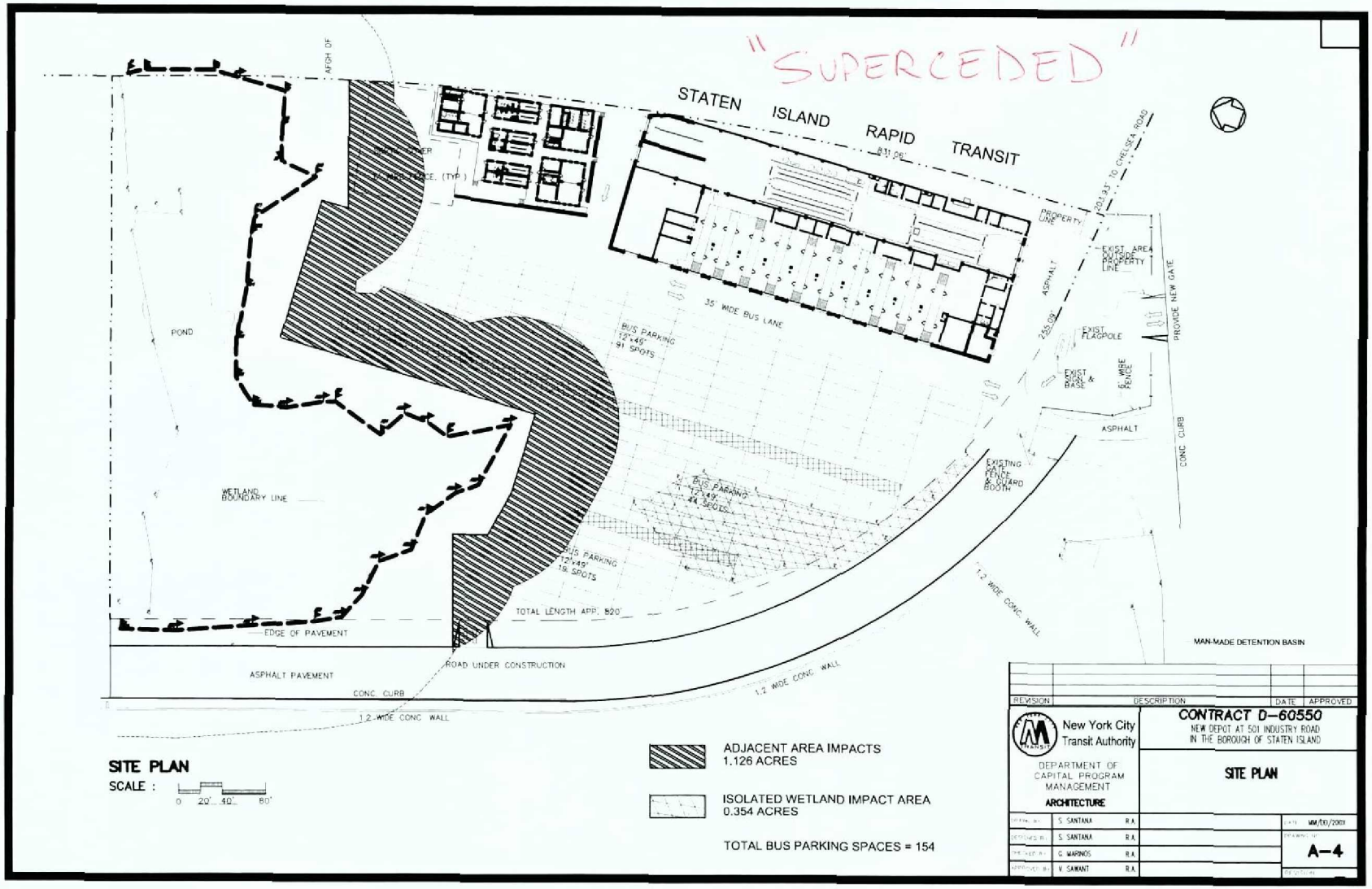

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Figure 3: Proposed project development (NYCTA *n.d.*)

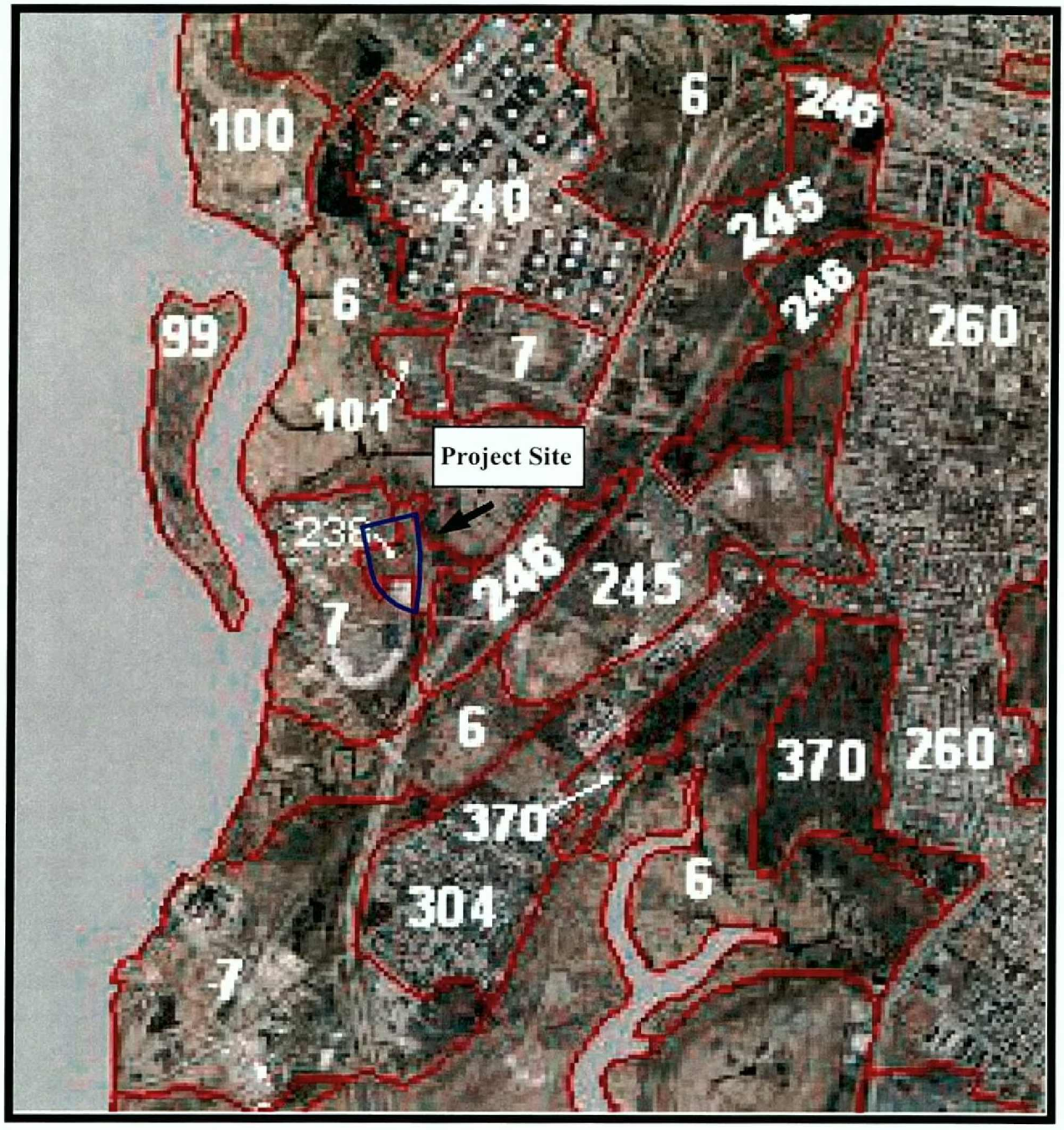

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Figure 4: Project site on *New York City Reconnaissance Soil Survey* (USDA 2005).

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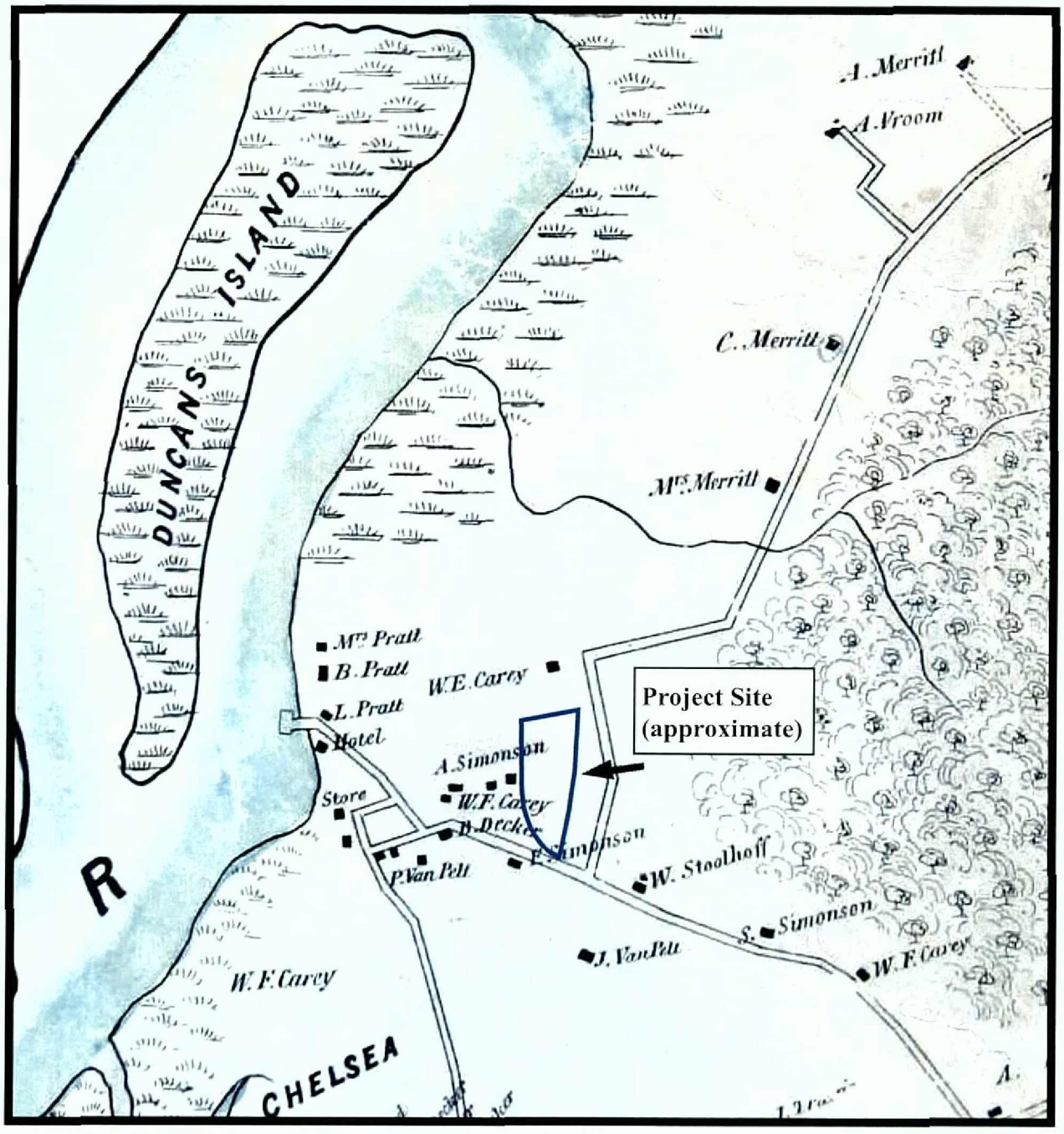

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Figure 5: Project site on *Map of Staten Island or Richmond County* (Butler 1853).

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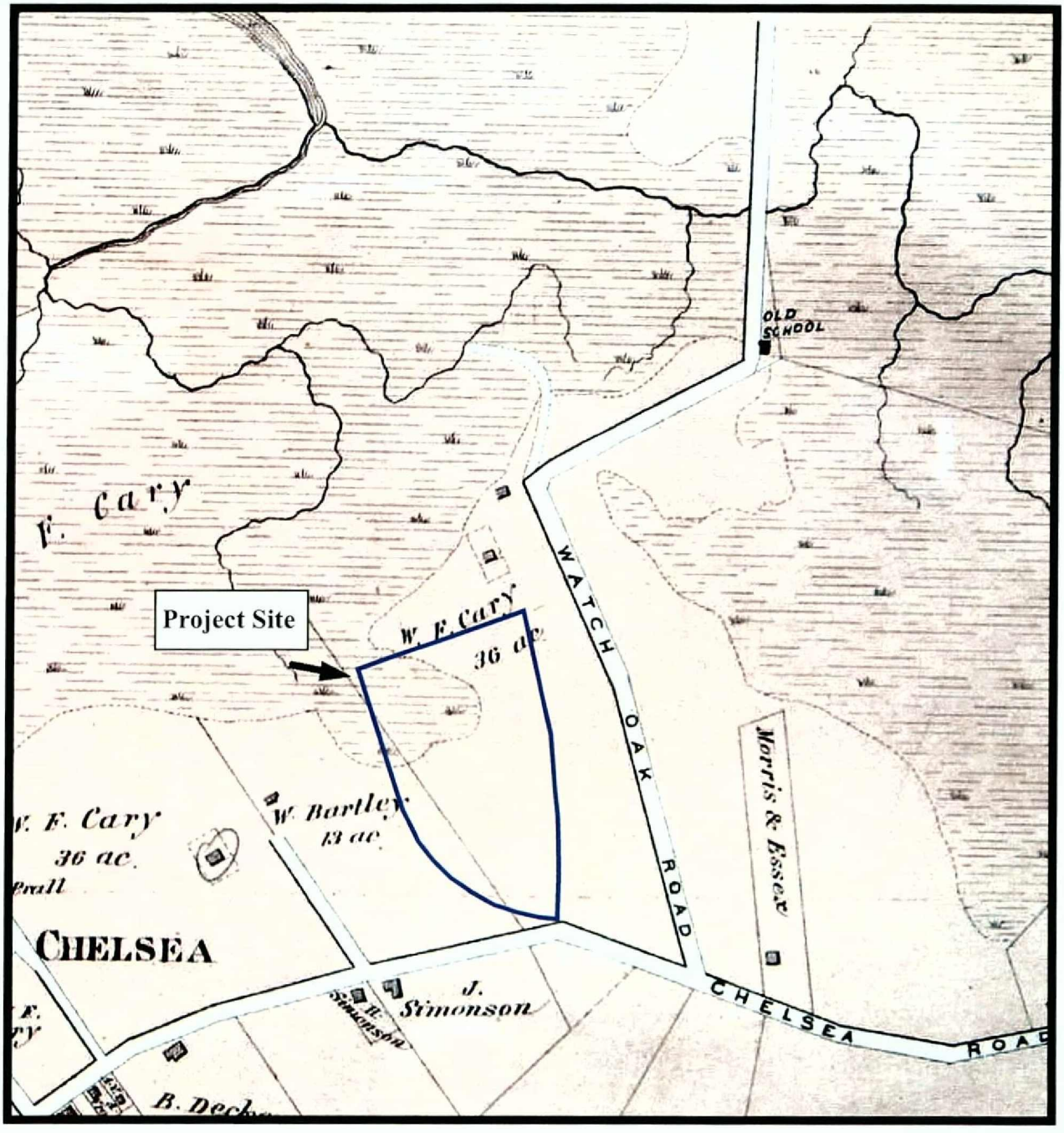

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Figure 6: Project site on *Atlas of Staten Island, Richmond County, New York* (Beers 1874).

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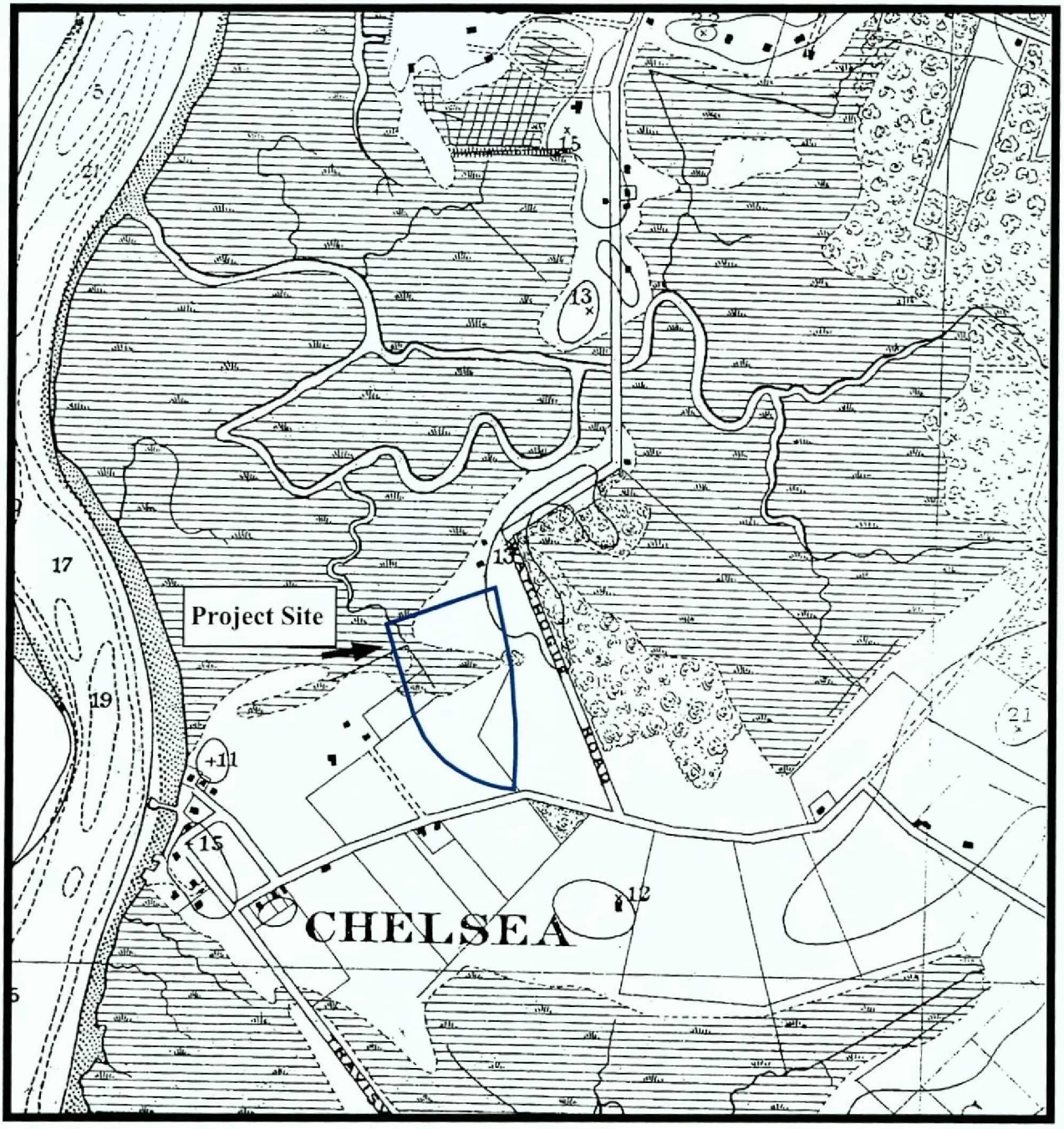

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Figure 7: Project site on *Staten Island, New York* 15 Minute Quadrangle (U.S.G.S. 1890).

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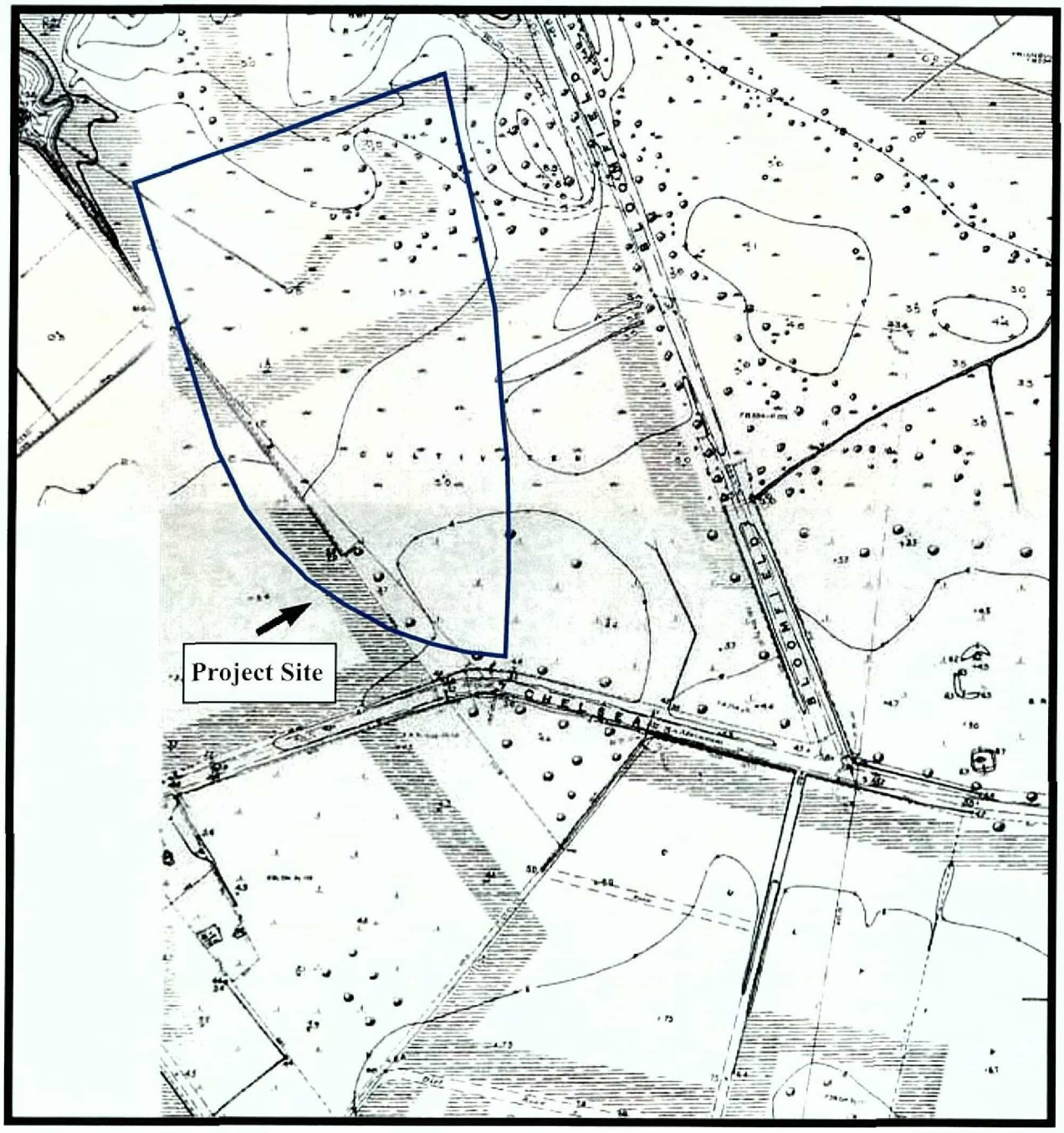

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Figure 8: Project site on *Borough of Richmond, Topographical Survey* (Borough of Richmond 1911a, 1911b, and 1912). Note: sheet with southwest area was not available.

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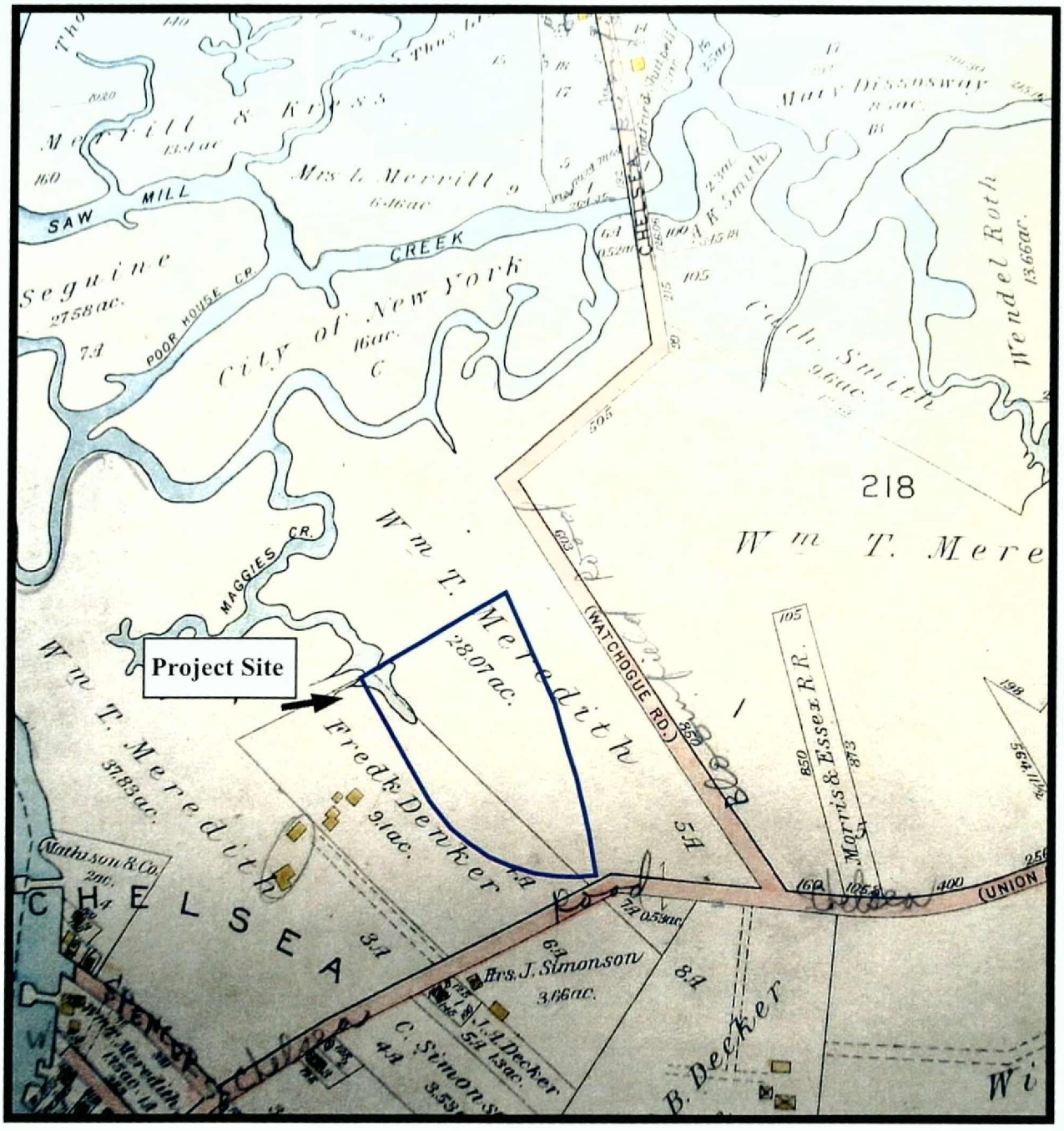

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Figure 9: Project site on *Atlas of the City of New York, Borough of Richmond, Staten Island* (Bromley 1917).

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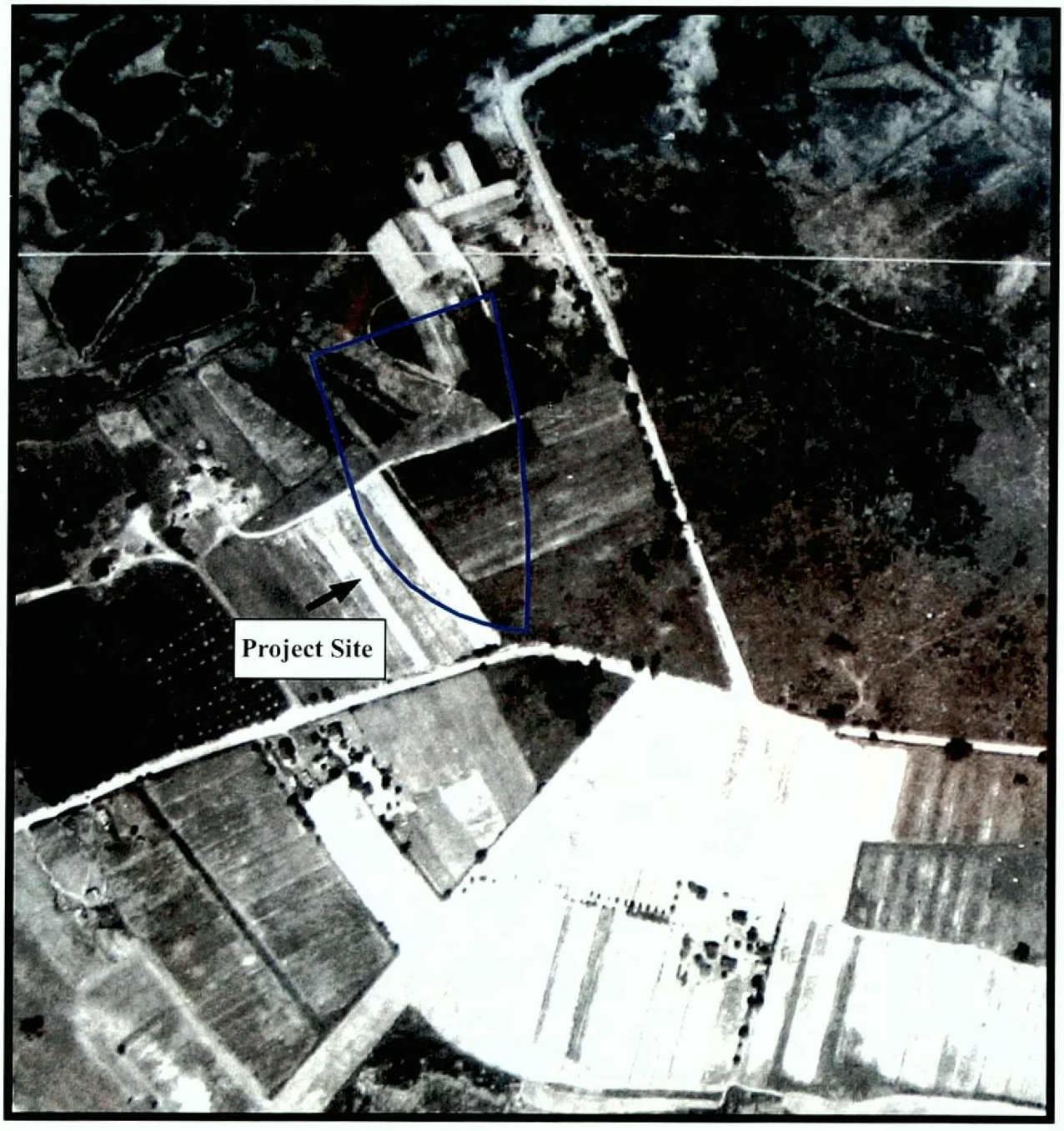

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Figure 10: Project site on *Sectional aerial maps of the City of New York* (New York City Bureau of Engineering 1924).

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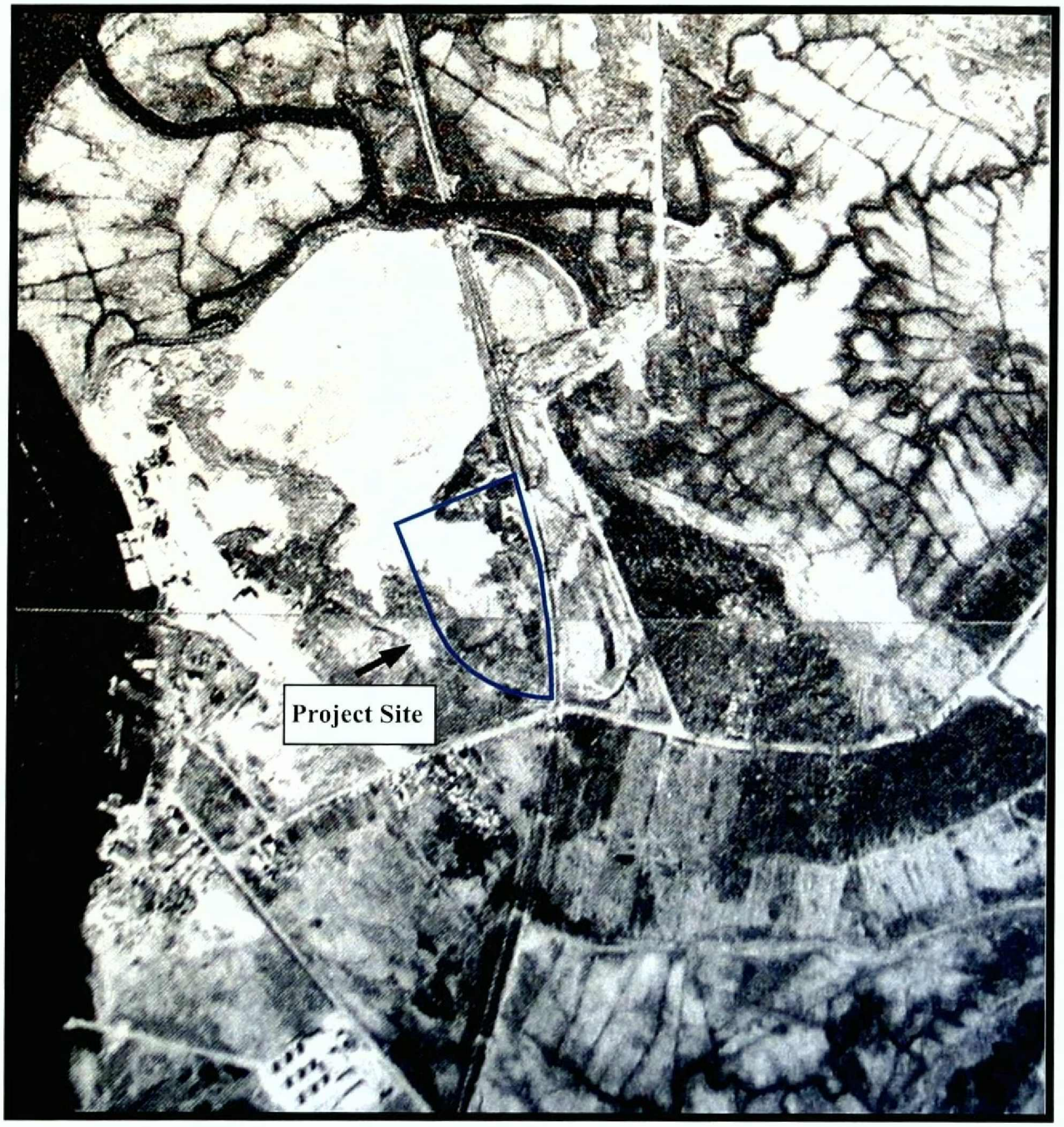

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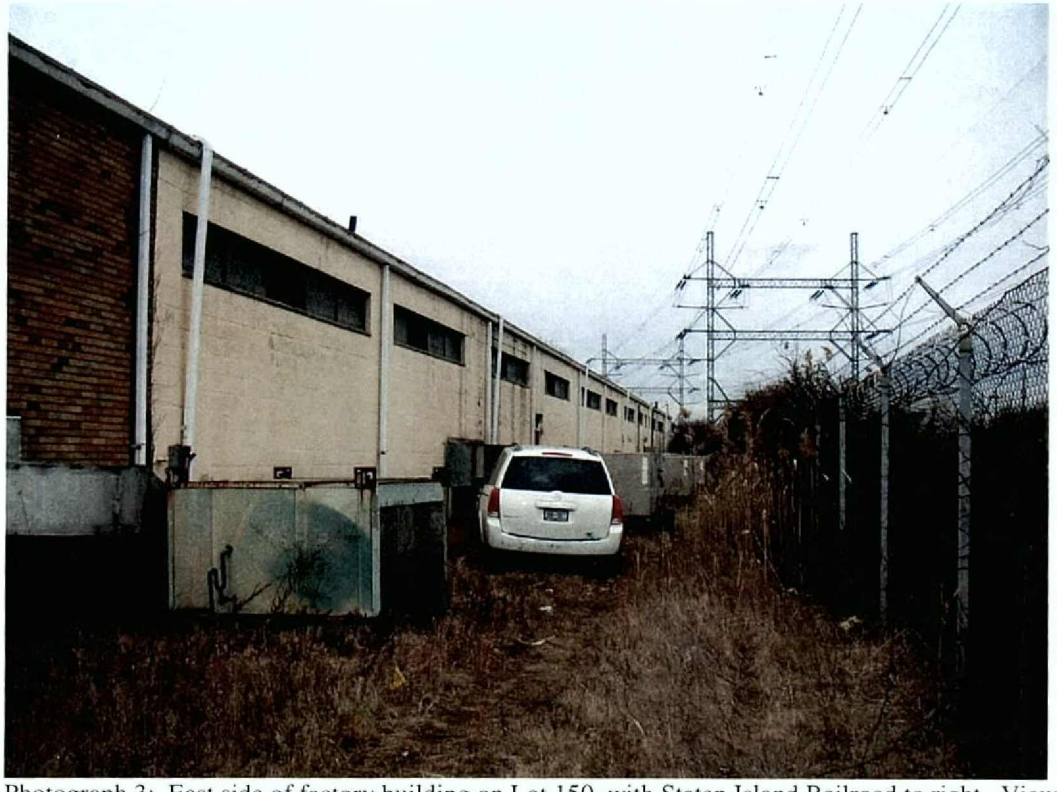
Figure 11: Project site on *Plan for New York City, 1969; a proposal* (New York City Planning Commission 1969).

0 500 1000 1500 2000 2500 FEET

Photographs

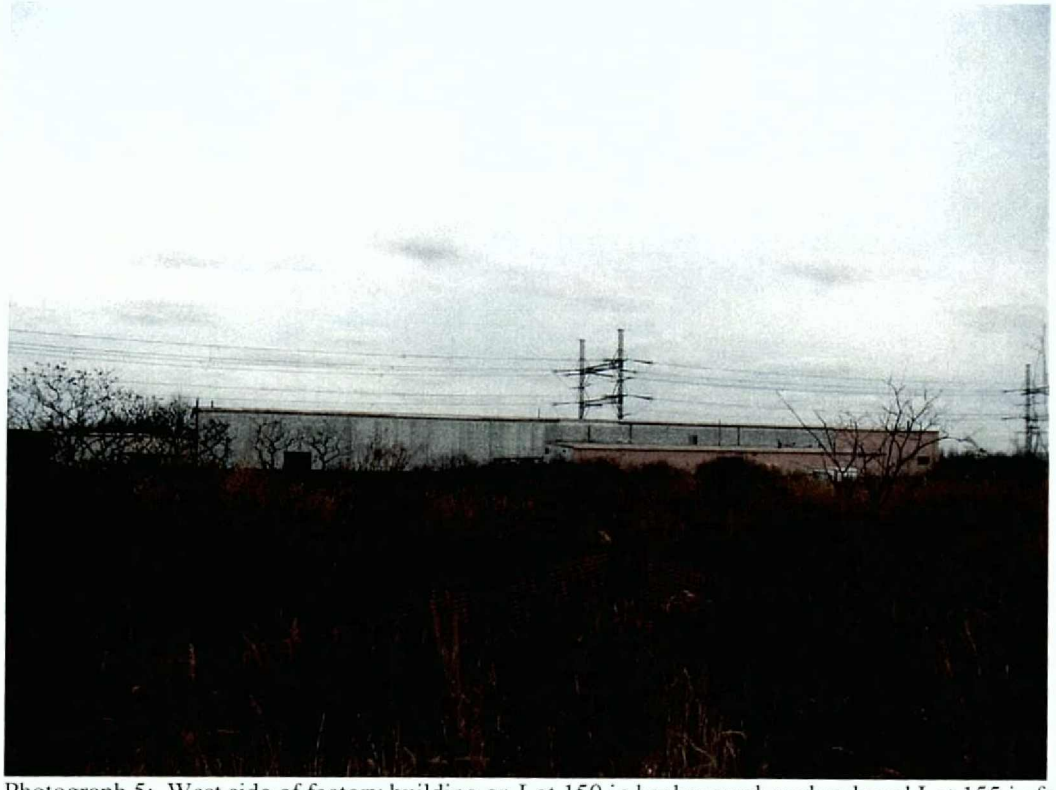
Photograph 1: South side of factory building on Lot 150, with former parking lot on right and Staten Island Railroad in background. View looking east from interior of property.

Photograph 2: West side of factory building on Lot 150, with former parking lot on left. View looking northwest from interior of property.



Photograph 3: East side of factory building on Lot 150, with Staten Island Railroad to right. View looking northwest from interior of property.

Photograph 4: North side of factory building on Lot 150 in background; undeveloped Lot 155 in foreground. View looking southeast from interior of property.



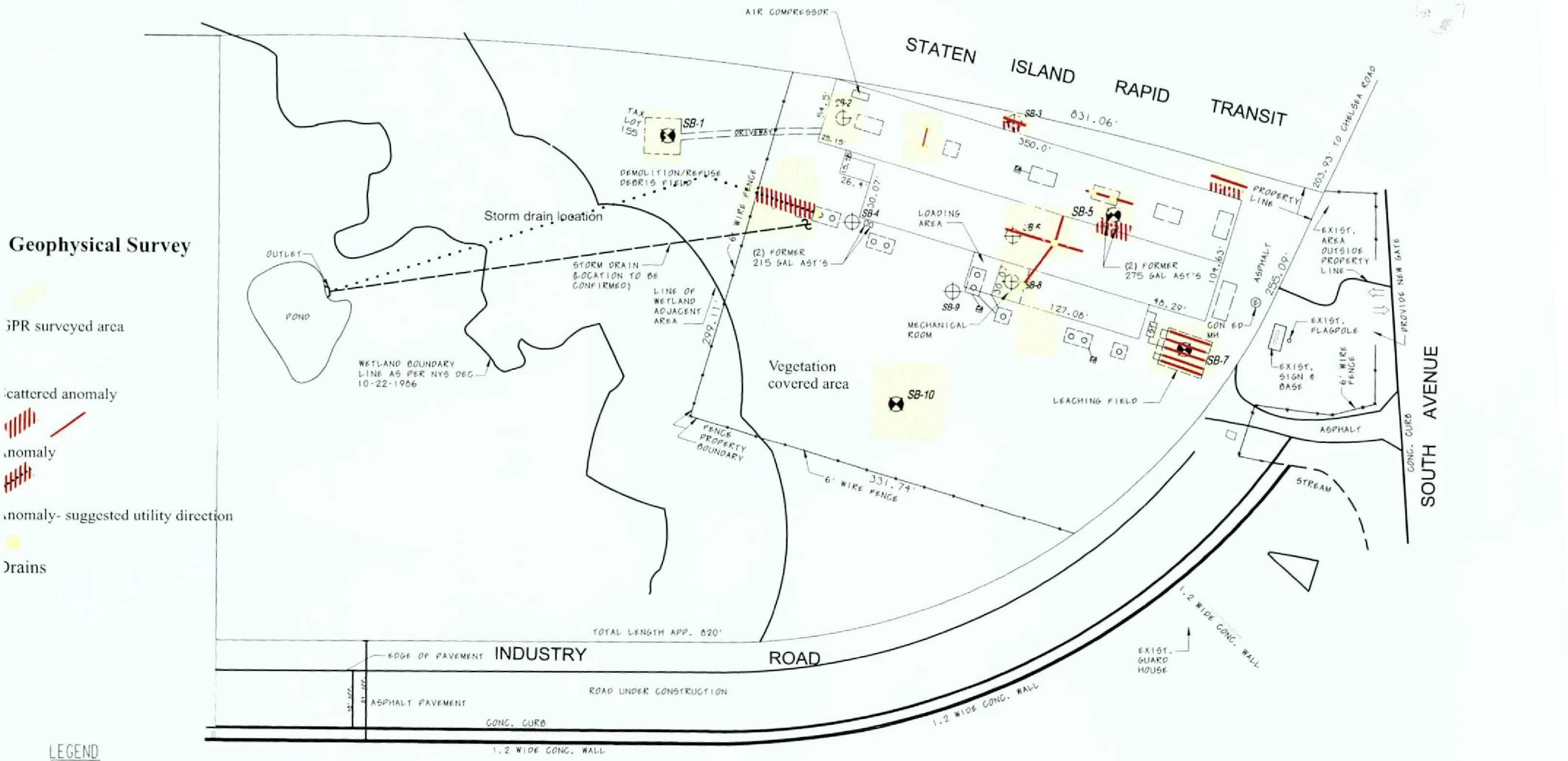
Photograph 5: West side of factory building on Lot 150 in background; undeveloped Lot 155 in foreground. View looking northeast from Industry Road to west of property.

Photograph 6: Lot 155 showing typical vegetation. View looking northwest from interior of property.

Photograph 7: Lot 155 showing typical vegetation and wet area. View looking northeast from interior of property.

Photograph 8: Ponded wetland in north part of Lot 155. View looking west from interior of property.

Appendix A – Soil Boring Logs and Location Map



LEGEND

- -SOIL BORING/GROUND WATER
- -SOIL BORING LOCATION
- ST SEPTIC TANK
- LF LEACHING FIELD
- EXTERIOR DRYWELL
- INTERIOR DRYWELL

1"=80' | 80' 0 80' 160'

NOVA Geophysical Services 67-25 Clyde Street, Forest Hills NY 11375	PREPARED FOR: **STV Incorporated**	CHOCOLATE FACTORY 501 INDUSTRY ROAD STATEN ISLAND, NEW YORK 10314	DATE: JANUARY, 2008 SCALE: AS NOTED
		SITE PLAN	SHEET NO: FIGURE 1

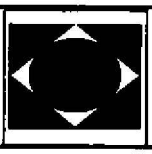
BORING #: SB-1

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/18/2008		
TOTAL DEPTH :	12 ft Below Grade	DEPTH TO WATER:	0.5 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A				
2	0.0		100	Topsoil, roots, organic material, brown silty SAND, little coarse gravel, b rick fragments, FILL **Groundwater @ 0.5 ft** gray silty SAND	Sample SB-1: TCL VOCs, SVOCs RCRA Metals, Pesticides, PCBs at 1 ft bgs
4 6	0.0		90	gray silty CLAY	
8 10	0.0		65	gray silty coarse SAND, little silt	
12 14 16 18 20 22				**End of Boring 12 ft**	

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW
SCALE: NTS APP'D BY: PB
FILE NAME:



STV Inc
225 Park Avenue South
New York, NY 10029

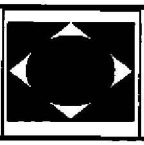
BORING #: SB-2

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/18/2008		
TOTAL DEPTH :	12 ft Below Grade	DEPTH TO WATER:	0.9 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A			concrete	Sample SB-2: TCL SVOCs RCRA Metals, Pesticides, PCBs at 1-4 ft bgs
2	0.0		50	brown silty SAND, brick fragments, wood, FILL **Groundwater @ 0.9 ft**	Sample SB-2: TCL VOCs at 4'
4	8.3		100	coarse GRAVEL, little silt, FILL light gray silty SAND	
6				reddish brown silty CLAY	
8	7.6		90	gray silty CLAY	
10				siilty coarse SAND, little coarse gravel	
12				**End of Boring 12 ft**	
14					
16					
18					
20					
22					

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW
SCALE: NTS APP'D BY: PB
FILE NAME:



STV Inc
225 Park Avenue South
New York, NY 10029

BORING #: SB-3

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver/B. Connolly
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/17/2008		
TOTAL DEPTH :	12 ft Below Grade	DEPTH TO WATER:	1.8 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A				
2	0.0		75	topsoil, roots, organic material brown silty SAND, brick fragments, ash, FILL **Groundwater @ 1.8 ft**	Sample SB-3: TCL SVOCs RCRA Metals, Pesticides, PCBs at 1-4 ft bgs Duplicate REP011708 collected Sample SB-3: TCL VOCs at 4'
4 6	0.0		100	brown silty SAND gray silty CLAY grayish brown silty SAND	
8 10	0.0		90	gray silty CLAY gray clayey SAND	
12 14 16 18 20 22				**End of Boring 12 ft**	

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW

SCALE: NTS APP'D BY: PB

FILE NAME:

STV Inc
225 Park Avenue South
New York, NY 10029

BORING #: SB-4

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/18/2008		
TOTAL DEPTH :	12 ft Below Grade	DEPTH TO WATER:	1 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A				
2	0.0		90	topsoil, roots, organic material brown silty SAND, brick fragments, FILL **Groundwater @ 1 ft**	Sample SB-4: TCL VOCs, TCL SVOCs RCRA Metals, Pesticides, PCBs at 1 ft bgs
4 6	0.0		90	gray SILT gray silty coarse SAND	
8 10	0.0		60	gray silty coarse SAND	
12 14 16 18 20 22				**End of Boring 12 ft**	

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW

SCALE: NTS APP'D BY: PB

FILE NAME:

STV Inc
225 Park Avenue South
New York, NY 10029

BORING #: SB-5

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver/B. Connolly
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/17/2008		
TOTAL DEPTH :	12 ft Below Grade	DEPTH TO WATER:	1.8 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A			concrete	Sample SB-5: TCL SVOCs RCRA Metals, Pesticides, PCBs at 1-4 ft bgs
2	0.0		90	brown silty SAND, brick fragments, FILL **Groundwater @ 1.8 ft**	Sample SB-5: TCL VOCs at 4'
4	0.0		100	reddish brown silty CLAY	
6				gray silty SAND gray silty CLAY	
8	0.0		60	gray silty coarse SAND	
10					
12				**End of Boring 12 ft**	
14					
16					
18					
20					
22					

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW
SCALE: NTS APP'D BY: PB
FILE NAME:

STV Inc
225 Park Avenue South
New York, NY 10029

BORING #: SB-6

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/18/2008		
TOTAL DEPTH :	12 ft Below Grade	DEPTH TO WATER:	1.5 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A			concrete	Sample SB-6: TCL SVOCs RCRA Metals, Pesticides, PCBs at 1-4 ft bgs
2	17.3		60	brown silty SAND, brick fragments, FILL **Groundwater @ 1.5 ft**	Sample SB-6: TCL VOCs at 4'
4 6	24.6		50	gray silty SAND, little	
8 10	13.4		50	brown silty coarse SAND	
12 14 16 18 20 22				**End of Boring 12 ft**	

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW
SCALE: NTS APP'D BY: PB
FILE NAME:

STV Inc
225 Park Avenue South
New York, NY 10029

BORING #: SB-7

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver/B. Connolly
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/17/2008		
TOTAL DEPTH :	20 ft Below Grade	DEPTH TO WATER:	1.9 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A				
2	17.3		60	brown silty SAND, FILL **Groundwater @ 1.9 ft** coarse GRAVEL, FILL	Sample SB-7: TCL VOCs, TCL SVOCs RCRA Metals, Pesticides, PCBs at 0-2 ft bgs
4 6	24.6		50	gray SAND and GRAVEL, FILL brown silty SAND, little gravel, FILL gray silty CLAY brown coarse SAND	
8 10	13.4		50	brown coarse SAND	
12 14				reddish brown silty CLAY	
16 18				reddish brown silty CLAY	
20 22				**End of Boring 20 ft**	

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW
SCALE: NTS APP'D BY: PB
FILE NAME:

STV Inc
225 Park Avenue South
New York, NY 10029

BORING #: SB-8

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver/B. Connolly
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/17/2008		
TOTAL DEPTH :	12 ft Below Grade	DEPTH TO WATER:	1 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A				
2	64.0		60	concrete brown sandy GRAVEL, FILL Groundwater @ 1 ft brown SAND	Sample SB-8: TCL SVOCs RCRA Metals, Pesticides, PCBs at 1-4 ft bgs Sample SB-8: TCL VOCs at 4'
4 6	12.4		100	gray SILT, little gravel brown silty SAND	
8 10 12	8.4		75	brown silty coarse SAND	
14 16 18 20 22				**End of Boring 12 ft**	

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW
SCALE: NTS APP'D BY: PB
FILE NAME:

STV Inc
225 Park Avenue South
New York, NY 10029

BORING #: SB-9

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/18/2008		
TOTAL DEPTH :	12 ft Below Grade	DEPTH TO WATER:	0 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A				
2	0.0		100	brown sandy GRAVEL, little silt, FILL **Groundwater @ grade** gray silty SAND, little gravel, FILL	Sample SB-9: TCL VOCs, TCL SVOCs RCRA Metals, Pesticides, PCBs at 1 ft bgs
4 6	9.3		100	gray silty SAND gray silty CLAY, little sand	
8 10 12	0.0		90	light gray SAND light brown SAND	
14 16 18 20 22				**End of Boring 12 ft**	

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW
SCALE: NTS APP'D BY: PB
FILE NAME:

STV Inc
225 Park Avenue South
New York, NY 10029

BORING #: SB-10

PROJECT ID:	New York City Transit	STV PROJECT NO.:	40-13376
LOCATION:	501 Industry Road, Staten Island, NY		
DRILLER:	Aquifer Drilling and Testing	GEOLOGIST:	S. Weaver
DRILLING METHOD:	GeoProbe		
SOIL SAMPLING METHOD:	Macrocore	ELEVATION:	Grade
DATE BORING INSTALLED:	1/18/2008		
TOTAL DEPTH:	12 ft Below Grade	DEPTH TO WATER:	1 ft bgs

DEPTH (FT) BELOW SURFACE	PID READING (PPM)	BLOWS PER 6" OF SAMPLE	RECOVERY (%)	LITHOLOGIC DESCRIPTION (INCLUDING ENVIRONMENTAL OBSERVATIONS)	SAMPLE DESIGNATION
0	N/A				
2	0.0		100	brown sandy GRAVEL, little silt, FILL **Groundwater @ 1**	Sample SB-10: TCL VOCs, TCL SVOCs RCRA Metals, Pesticides, PCBs at 1 ft bgs
4 6	0.0		100	gray silty coarse SAND	
8 10 12	0.0		100	gray silty coarse SAND gray SILT, little sand	
14 16 18 20 22				**End of Boring 12 ft**	

SOIL BORING LOG

DATE: 2/14/2008 DRAWN BY: SW

SCALE: NTS APP'D BY: PB

FILE NAME:

STV Inc
225 Park Avenue South
New York, NY 10029