

**Phase 1A
Documentary Study
Fort George Hill
Mixed Use Development Project
Block 2170, Lots 180 and 190
Manhattan, New York**

LPC #: DEPARTMENT OF CITY PLANNING / LA-CEQR-M

Phase 1A Archaeological Assessment
Fort George Hill
Mixed Use Development Project
Block 2170, Lots 180 and 190
Manhattan, New York

LPC #: DEPARTMENT OF CITY PLANNING / LA-CEQR-M

Prepared for: South Bronx Overall Economic Development Corporation
555 Bergen Avenue, 3rd Floor
Bronx, NY 10455

Prepared by: Historical Perspectives, Inc.
P.O. Box 529
Westport, CT 06881

June 2013

Contents

Table of Contents

List of Figures

List of Photographs

I.	Introduction	1
II.	Research Goals and Methods	2
III.	Background Research	3
	A. Existing Conditions	3
	B. Topography and Hydrology	3
	C. Geology	3
	D. Soils	3
	E. Soil Borings	3
IV.	Precontact Context	4
V.	Historical Context	6
VI.	Sensitivity	9
VII.	Conclusions and Recommendations	10
VIII.	Bibliography	11

Figures

Photographs

Appendix: Geological Engineering Investigation Report – SESI Consulting Engineers

List of Figures

- Figure 1. Project Site on *Central Park, NY-NJ 7.5 Minute Topographical Map* (USGS 2013).
- Figure 2. Project Site on Tax Map (2013).
- Figure 3. Project Site on *New York City Reconnaissance Soil Survey* (USDA 2006).
- Figure 4. Project Site on *A Topographical Map of the Northern Part of New York Island* (Sauthier 1777).
- Figure 5. Project Site on *Farm Maps* (Randel 1820).
- Figure 6. Project Site on *Topographical Map of the City and County of New York* (Colton 1836).
- Figure 7. Project Site on *Map of that part of the City and County of New-York North of 50th Street* (Dripps 1851).
- Figure 8. Project Site on *Plan of New York City* (Dripps 1867).
- Figure 9. Project Site on *Topographical Atlas of the City of New York* (Viele 1874).
- Figure 10. Project Site on *Atlas of the City of New York* (Bromley 1879).
- Figure 11. Project Site on *Atlas of the City of New York* (Bromley 1891).
- Figure 12. Project Site on *Atlas of the City of New York* (Bromley 1911).
- Figure 13. Project Site on *Insurance Maps of the City of New York, Borough of Manhattan* (Sanborn 1951).
- Figure 14. Historic photographs.
- Figure 15. Historic postcards.

List of Photographs

Photograph 1. Looking North Down Fort George Hill. Project Site is at Left.

Photograph 2. Concrete Sidewalk adjacent to Project Site (at Left), Facing North.

Photograph 3. At Entrance to Project Site, Facing North. IRT Tracks at Left.

Photograph 4. At Entrance to Project Site, Facing South. Concrete Retaining Wall at Left.

Photograph 5. Concrete Retaining Wall on West Side of Site.

Photograph 6. Modern Concrete Block Retaining Wall on East Side of Parking Lot where Surface was Levelled for Parking.

Photograph 7. From Center of Parking Area, Looking South Toward Lot 190.

Photograph 8. Parking Area with Non-Graded Surface at Left, Facing South.

Photograph 9. Dyckman Street Station at Left, Facing North.

Photograph 10. Sub Station #17, Facing South. Project Site is at Left.

I. INTRODUCTION

South Bronx Overall Economic Development Corporation (SoBRO) proposes to build a new, thirteen-story building on an approximately 20,000 square foot vacant lot, at the intersection of Fort George Hill, Hillside Avenue and Dyckman Street, Block 2170, Lots 180 and 190, in the Washington Heights/Inwood section of Upper Manhattan, New York (Figure 1). The New York City Transit Authority (NYCTA) #1 subway line is present along the western edge of the property, running in a northeast/southwest direction. The Dyckman Street Subway Station and Substation #17, both located on the project block, are listed on the National Register of Historic Places (NR).

The proposed development will consist of 125 units of apartments, with approximately 10,000 square feet of community facility on the ground floor where Movimiento Mundial Church will relocate their headquarters, administer a licensed, full-time day care and a food-pantry program. Approximately 44 units of parking will also be provided underground.

The project's site presently consists of two concrete/asphalt and brush covered lots (Lots 180 and 190) on the east side of the street called Fort George Hill (formerly St. Nicholas Avenue) with a limited buildable area measuring less than 45 feet at its widest and 22 feet at its narrowest point (Figure 2). There is an existing NYCTA easement at the southern boundary of the project site.

As part of the proposed project, sponsors submitted project materials to the New York City Landmarks Preservation Commission (LPC) for an initial archaeological review in accordance with New York City Environmental Quality Review (CEQR 2012) regulations and procedures. The LPC responded:

LPC review of archaeological sensitivity models and historic maps indicates that there is potential for the recovery of remains from 18th c., 19th Century and Native American occupation on the project site. Accordingly, the Commission recommends that an archaeological documentary study be performed for this site to clarify these initial findings and provide the threshold for the next level of review, if such review is necessary (see CEQR Technical Manual 2012) (Santucci, April 15, 2013).

At the request of the project sponsors, Historical Perspectives, Inc. (HPI) has conducted this Phase IA Archaeological Documentary Study of Block 2170, Lots 180 and 190 to: 1) identify any potential archaeological resources that may be present on the project site, and 2) assess the construction and development history of the site to determine the potential for archaeological resources and to evaluate the potential that any such resources may have survived and may remain on the site undisturbed.

II. RESEARCH GOALS AND METHODS

This Phase 1A study presents the results of documentary research undertaken to determine the potential archaeological sensitivity and integrity of the project site. According to city review standards, a Phase 1A evaluation encompasses that portion of the project site that will experience direct subsurface impacts, which is referred to as the Area of Project Effect (APE). The APE for the Fort George Hill Development project is the entirety of Lots 180 and 190 (Figure 2).

The documentary research included a variety of tasks discussed below.

- An extensive review of published cartographic data (maps and atlases) was completed. These maps were examined to identify site characteristics, including topographic features and watercourses, as well as land use through time. Evidence of nineteenth- and twentieth-century development disturbances was established in order to determine the potential for the presence of intact cultural remains and site integrity.
- Historic photographs of the project area over time were reviewed to identify any changes to the topography or potential site disturbances (see Figures 14 and 15).
- On-Line records of the New York City Department of Buildings (DOB) were reviewed.
- Selected local histories and historic newspapers were searched for information about the project area. Other print documents included books and a pamphlet by Reginald Pelham Bolton as well as a Jan Dyckman family history.
- Soil borings were provided for HPI review by the project sponsor (SESI Consulting Engineers 2008). The results of the soil boring tests are summarized below.
- A search of the archaeological files at the New York State Museum (NYSM) and the New York State Office of Parks, Recreation & Historic Preservation (NYS OPRHP) was also conducted.
- Previous archaeological sites and surveys were reviewed using data available from the NYSOPRHP and LPC.
- The available National Register data for the Dyckman Street Station and Substation # 17 on Hillside Avenue was reviewed.
- A site visit was conducted on May 31, 2013 to assess any obvious or unrecorded subsurface disturbance (Photographs 1-10).

III. BACKGROUND RESEARCH

A. EXISTING CONDITIONS

Geographically, the project site is located on a hillside to the west of Fort George Hill and Highbridge Park. The site slopes downward from an approximate elevation of 79+/- feet above sea level (ASL) on the southern end of the site to 37+/- feet ASL at the northern limit. Trees are present along the boundaries of the site and thick brush was noted along the western boundary, where it slopes down to the tracks (Photographs 1-8). A concrete retaining wall is present along the west side of the project site (Photographs 4 and 5). Along the eastern edge of the project site, where it borders the concrete sidewalk along Fort George Hill, a concrete block retaining wall, of various heights, is present in various locations where the grade appears to have been leveled to create a flat surface (Photograph 6). At present, much of the surface area of the lots is paved to allow for parking.

B. TOPOGRAPHY AND HYDROLOGY

According to historic maps (e.g. Sauthier 1777; Figure 4, Viele 1874; Figure 9), the project site was situated on the slope of a north-south hill, later named Fort George Hill for the military fort constructed on the top of the hill approximately two blocks to the south of the project site. A small east-west stream, that emptied into the Harlem River, was once present approximately, one block to the north of the hill (see Figure 4).

C. GEOLOGY

Manhattan Island lies within the Hudson Valley region and is considered to be part of the New England Upland Physiographic Province (Schuberth 1968:10). The underlying geology is made up of gneiss and mica schist with heavy, intercalated beds of coarse grained, dolomitic marble and a thinner layer of serpentine. During the three known glacial periods, the land surface in the Northeast was carved, scraped, and eroded by advancing and retreating glaciers. With the final retreat during the Post-Pleistocene, glacial debris, a mix of sand, gravel, and clay, formed the many low hills or moraines that constitute the present topography of the New York City area (USDA 2005).

D. SOILS

The USDA soil survey for New York City maps the project site block and surroundings as Chatfield-Charlton complex, with 15 to 50 percent slopes (Figure 3). This soil is associated with moderately steep to very steep areas of bedrock controlled hills and ridges modified by glacial action; a mixture of moderately deep and deep gneissic till soils located in Manhattan and the Bronx (NYC Soil Survey Staff 2005). It is typically found on the side slopes of broad ridges and small hills.

E. SOIL BORINGS

Soil testing was conducted on the project site by SESI Consulting Engineers in 2008 (Appendix). The report concluded that “below the asphalt and concrete is a stratum of brown coarse to fine sand with varying amounts of gravel and silt” (SESI 2008: 3). This stratum extends to between 10 and 20 feet below the existing grade. Underlying the sandy stratum is a thick layer of weathered/decomposed rock extending to depths between 15 and 85 feet (SESI 2008: 3).

IV. PRECONTACT CONTEXT

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 in the New York City area from three sources: ethnographic reports, Native American artifact collections, and archaeological investigations.

Based on data from these sources, a precontact cultural chronology has been devised for the New York City area. Scholars generally divide the precontact era into three main periods, the Paleo-Indian (c. 14,000-9,500 years ago), the Archaic (c. 9,500-3,000 years ago), and the Woodland (c. 3,000-500 years ago). The Archaic and Woodland periods are further divided into Early, Middle, and Late substages. The Woodland was followed by the Contact Period (c. 500-300 years ago). Artifacts, settlement, subsistence, and cultural systems changed through time with each of these stages.

Scholars often characterize precontact sites by their close proximity to a water source, fresh game, and exploitable natural resources (i.e., plants, raw materials for stone tools, clay veins, etc.). These sites are often separated into three categories: primary (campsites or villages), secondary (tool manufacturing, food processing), and isolated finds (a single or very few artifacts either lost or discarded). Primary sites are often situated in locales that are easily defended against both nature (weather) and enemies. Secondary sites are often found in the location of exploitable resources (e.g., shell fish, lithic raw materials).

Prehistoric Site File and Literature Search Results

Research conducted at the NYSOPRHP, the LPC, and the library of HPI revealed no precontact period sites directly within the project site, although a number of precontact period archaeological sites have been recorded within a one mile radius of the project site. These sites have been primarily recorded along the Harlem and Hudson Rivers, within Inwood Hill and Highbridge Parks, and along the route of Broadway.

Table 1 lists ten NYSOPRHP inventoried precontact sites and four historic period archaeological sites within a one mile radius of the APE. Archaeologists reporting in several northern Manhattan archaeological surveys found that, while there was high potential for cultural remains within their project areas, their specific redevelopment sites were not sensitive for precontact material remains (Geismar 1984, Greenhouse 1985, Hunter Research 2008, John Milner 2008, Panamerican Consultants, Inc. 2003). These researchers found that nineteenth and twentieth century development and filling activities had compromised the precontact archaeological integrity.

Table 1. NYSOPRHP Sites Identified

NYSOPRHP Number	Site	Site Description	Location	Site Type/Time Period
A061-01-000537		Muscoota/Inwood	196 th -219 th Sts. bet Seaman Ave. and Academy St.	Probably Woodland
A061-01-000119		Seaman Ave. Indian Burial Ground/Village Site	204 th -207 th Sts., Seaman Ave., Cooper St., Academy St.	Village Middle Woodland
A061-01-000127		Nagle House (Century House)	213 th St. and Harlem River	Precontact through 19 th century
A061-01-000114		Harlem River Shell heaps (dog burials),	209-211 th Sts. East of 10 th Ave., near Harlem River	Shell midden Late Woodland
A061-01-000116		Brook Crossing Camp Site	194 th St. and Broadway	Camp Woodland
A061-01-000536		Inwood Station Site/Dyckman St. Site (“Tubby Hook”)	Tubby Hook	Shell midden Woodland
A061-01-000533		213 th St. Village Site	213 th St.	Village Archaic
A061-01-000121		Inwood Park Rockshelters	Just north of Tubby Hook	Rock shelters with shell heaps at northern end Unknown precontact
A061-01-000532		“Shorakapkok”/Cold Spring	207 th St. and Broadway	Cave and shell midden Archaic-Woodland
A061-01-000534		“Isham’s Garden”	Isham St. and Seaman Ave.	Shell midden Unknown precontact

During the early twentieth century, Arthur C. Parker investigated and/or reported many precontact sites in Manhattan for the NYSM. He is cited as the reporter for the ten NYSM prehistoric sites in the project site vicinity (Table 2).

Table 2. NYSM Sites Identified

Site Number	Site Description	Location	Time Period
NYSM#4051	Village Midden (Shell)	Inwood Section, Ft. of Dyckman St. and along shore	Unknown precontact
NYSM#4053	“Harlem River Shell Heap” (Village/Shell Midden)	Inwood Hill along Harlem River 209 th St. to 2011 th St.	Unknown Precontact
NYSM#4054	Village	Seaman Ave. and Isham St.	Unknown precontact
NYSM#4055	Stray Find (POT)	214 th Street and 10 th Avenue	“Iroq”. Likely Iroquois
NYSN#4066	Village	Very broad area from 169 th to 185 th Streets, from the Harlem River west to Broadway	Unknown precontact
NYSM#4068	Village	Fort George area	Unknown precontact
NYSM#4069	Traces of Occupation	Fort George area	Unknown precontact
NYSM#8369	Middens	Northern Shore of Manhattan	Unknown precontact
NYSM#8370	Camp	Fort George area	Unknown precontact
NYSM#8371	Camp	North of Fort George	Unknown precontact

Reginald Bolton also compiled detailed information on archeological site data for New York City from this early period of exploration (1922). Bolton had access to much of the original

data as well as intimate knowledge of many of the archeological sites in northern Manhattan. In his 1922 publication, he created a map of “Upper Manhattan, comprising the Inwood valley, the Dyckman tract, and Marble Hill” which is believed by archaeologists to be remarkably accurate. Although the site documentation from this early exploration period provides minimal detailed information, Bolton’s publication corroborates much of the information from the NYSM reports, which indicates that there were prehistoric shell middens and possible camp and village sites within the project site vicinity (NYSM Files).

Bolton conducted much of his scientific archaeological fieldwork during the time period when local farms were being subdivided, blocked, lotted, and the streets laid out in the Inwood section of Manhattan. These activities provided Bolton with an unprecedented opportunity to examine potential sites during the initial phases of urbanization. Among the important sites he identified was one along Seaman Avenue, well north of the project site where he found not only a planting ground, but also food pits, which he took as an indication of an aboriginal village site (Bolton 1922, 1924, 1934). He further identified a dog burial as well as human remains, including a double burial of a man and a woman. Along the Manhattan shoreline, also some distance from the current project site, Bolton found shell heaps and deeply buried shell pits, further evidence of Native American occupation within this portion of New York.

NYSM#4068 and NYSM#8370 are the two NYSM listed sites that are closest to the current project site. The former site is located across the road, approximately 200 feet (60 meters) to the east within the confines of Highbridge Park. Although identified reported in 1922 by Parker and Bolton as a “Village,” very little detailed information about the exact size of the site is provided. The locale of the site is considerably more favorable for habitation as there is access to the well-drained hilltop and flatlands overlooking the Harlem River. The latter site is located approximately 1100 feet (335 meters) to the southeast, adjacent to, and overlooking the Harlem River. It was also identified by Parker in 1922 as a “camp” with no additional detailed information provided.

V. HISTORICAL CONTEXT

Period manuscript maps and published atlases portrayed the project site as located on a steep sloping hillside. The topography of this locale appears to have deterred historical development of the APE as nothing is depicted on any of the historic maps or atlases reviewed.

Historical Summary and Cartographic Study

Jan Dyckman settled and farmed in northern Manhattan in the early 1660s. At one time he held as many as 300 acres, including the project site. His grandson, William Dyckman, inherited the estate and, in 1748, built a typical Dutch Colonial style farmhouse north of what was to become the project site (see Sauthier 1777 and Colton 1836; Figures 4 and 6). During the Revolutionary War, Hessian troops occupied the land around the Dyckman Farm. Rebuilt after the British burned it during the Revolutionary War, the house is the only eighteenth-century farmhouse extant in Manhattan (Tauranac 1979; WPA 1939/1982; New

York City Department of Parks & Recreation 2004). This farmhouse stands .75 mile north of the project site.

The northern section of Manhattan was a strategic location during the American Revolution. Numerous earthworks, batteries, and forts were constructed throughout the project area (Sauthier 1777, Colton 1836, Dripps 1851; Figures 4, 6, and 7). The closest of these was Fort George, which had been built in 1776, south of the project site, near the current intersection of Audubon Avenue and 192nd Street. Originally called Fort Clinton, it was renamed Fort George and is the current site of Fort George High School (USGS 2013).

During the 19th century, the Dyckman Homestead was divided, with maps indicating that the project site was a portion of the property that belonged to Isaac Dyckman (Dripps 1867; Figure 8). The majority of the farm buildings were still located far to the north of the project site. By the second half of the 19th century, a formal road leading up to the top of the hill was established, presently called Fort George Hill (Viele 1874, Bromley 1878; Figures 9 and 10). The Viele topographic map from 1874 continues to show the project site as dominated by steep slope, with the new road skirting the edge of the hilltop (Figure 9).

Although the project area had been divided into city lots by the last quarter of the 19th century, no development occurred on, or immediately around, the project lots (Bromley 1879, 1891; Figures 10 and 11). It was not until the significant expansion of the public transportation system to northern Manhattan, that the project site saw any significant changes. The Dyckman Street Station, located adjacent to the project hillside, was constructed in 1906 (Bromley 1911; Figure 12). The station, which opened on March 16 of that year, had two side platforms and two tracks. It was constructed at the northern portal of the Washington Heights Mine Tunnel, which was cut into the bedrock of northern Manhattan to establish the Seventh Avenue Line (NR Nomination Form, 2004). Historic photographs and post cards record the significant degree of disturbance to the adjacent hillside, including portions of the project site (Lot 180) during and after the construction of the station (see Figures 14 and 15). These historic photographs indicate that the hillside had been cleared and likely graded during construction. The stationhouse, with the entrance leading to the platforms is situated at the intersection of Nagle Avenue, Dyckman Street, and Hillside Avenue. The Dyckman Street Station was listed on the National Register of Historic Places (NR) in 2004.

Just prior to the construction of the Dyckman Street Station, Substation #17, also known as Dyckman-Hillside Substation, was built to the southeast of the project site along Hillside Avenue. Substation #17 was one of eight electrical substations constructed by the Interborough Rapid Transit Company in 1904. It is a two-story, free-standing Beaux-Arts style masonry building that features a hipped roof, tower-like projections, scrolled wrought iron brackets, and decorative terra cotta details (NR Nomination Form 2006; Photograph 10). Substation #17 was listed on the NR in 2006.

During the 20th century, High Bridge Park was expanded to include the lots on the eastern side of Fort George Hill. Named after the High Bridge, the city's oldest standing bridge, the

park was assembled piecemeal between 1867 and the 1960s. The park is characterized by open vistas, rocky outcrops, greenways, ball fields and waterside views.

Throughout the remainder of the 20th century, no structures were depicted on maps of the project site (Bromley 1911, Sanborn 1951; Figures 12 and 13). During the early 20th century, a sewer line was installed at the northern end of the property adjoining to the New York City Transit Authority signal building (Bromley 1911; SESI 2008). Further, the more recent changes made to the project site occurred when the surface was leveled to create the present concrete and asphalt parking pads (Photographs 6 and 8).

As mentioned above, historical maps indicate that the project site was always located on a sloping hillside. Although none of the historical maps examined provide exact elevations for the project site, the comparison of 19th century topographic maps to the present consistently indicate that there was a significant change in elevation from the south to the north (from ca.80 to 30 feet at either end) as well as from the east to west (between ca. 80 and 70 feet at the southern boundary and between 50 and 35 feet at the northern boundary). The closest street corner elevations provided on historic maps indicate that the base of the hill at the intersection with Dyckman Street was consistently 10 feet above sea level.

Historical Site File and Literature Search Results

The NYS OPRHP file search identified six historical sites in Manhattan within a one-mile radius of the project site (Table 3). None of the sites are located within the APE.

Table 3. NYS OPRHP Historical Sites

Site Number/ Designation	Site Description	Location	Remarks
A061-01-000111	Fort George	193 rd St and Audubon Ave	Chenoweth, Calver 1901-1932 Revolutionary
A061-01-000119	Seaman Ave Indian Burial Ground/Village Site	204-207 th Sts, Seaman Ave, Cooper St, Academy St	Calver et al. 1895-1907 Revolutionary fireplaces and well, officers' buttons Revolutionary
A061-01-000114	Harlem River Deposit	209 th -211 th Sts on west bank of Harlem River	Calver 1895, 1903-1904 Historic cemetery overlying Indian shell midden, some historic artifacts
A061-01-000115	Negro Graveyard	212 th St and 10 th Ave	Unearthed by street development Colonial
A061-01-000112	Ft Tryon	Terrace and observation platform .25 mi north of entrance to park	Calver & Bolton 1922 (?) Revolutionary 1776-1783
A061-01-000125	Barrier Gate	Ft Tryon to Ft George along 193 rd St	Calver 1920 (?) 1779-1783

The closest site identified was Fort George (OPHP Site A061-01-000111). This site, located approximately 500 feet (150 meters) to the south at the top of Fort George Hill, was recorded by Michael Cohn in 1976 based on historic accounts as well as some surface collection conducted by Calver Chenoweth in 1901-1932. Cohn further reported that the artifacts were

located at the New York Historical Society in 1976. The site of the fort is the current location of George Washington High School. Although primarily dating to the Revolutionary War period, all of the surrounding historical sites were considered to be from the colonial period (1628-1783).

VI. SENSITIVITY

The project site is in the Inwood section of Manhattan Island. The proximity to the waterfront and to a variety of necessary resources clearly made the larger project area one attractive to precontact, or Native American peoples, and thus fits the characteristics for precontact site sensitivity. The abundance of fresh and marine water resources, level planting fields, and a wooded and rocky terrain provided both temporary camps and work stations as well as habitation sites for peoples who were moving through Manhattan Island along a pathway corridor that linked New Jersey with Westchester County and Connecticut. Because this area in the far northwestern section of Manhattan was one of the last neighborhoods to be developed in the late nineteenth- and early twentieth-century, it coincided with an interest in the scientific study of the native peoples, enabling researchers to identify a variety of site types that had been lost in many areas where development occurred at an earlier date.

Although the larger project area was clearly utilized during the precontact era, the topographic characteristics of the current project site made it an unlikely locale for any type of sustained precontact activity. Research indicates that the project site was, and continues to be, between a 15% - 50% sloping hillside. This type of steep slope was not a preferred location for temporary or long-term habitation by native peoples. Further, the project site was severely impacted by the construction of the large transportation facility to the west and the recent leveling of the lot to create the paved parking surface (See Figure 14 and Photographs 1-14). Therefore, it is unlikely that any stray or isolated find that might have been present would still be located *in situ*.

While the project site was located in proximity to the Dyckman homestead (.75 mile north) and Fort George (ca. .2 mile south), there is no sensitivity for the presence of a significant historical site related to the early Dyckman domestic/agricultural estate or to the Revolutionary War within the project APE. Further, the topographic characteristics of the site, which precluded its use by Native Americans, also made it an unfavorable location for any colonial or later historic settlement. No historic structures were identified as present within the project APE, making it unlikely that significant resources are present. It is possible, but unlikely, that a stray historical cultural artifact might have been located on the site, however, the extensive impacts to the site during the construction of the Dyckman Street Station and the installation of the track system, would have likely obliterated any of these resources.

Research identified two NR historic sites within the project block. Both are within 90 feet of the project APE.

VII. CONCLUSION AND RECOMMENDATIONS

Archaeological Resources

The research undertaken for this report found no potential for the presence of undisturbed archaeological cultural resources from the historical or precontact periods within the project APE. Further, the disturbance noted when the Dyckman Street Station was constructed (Figure 14), would have obliterated any stray find in this location. Therefore, no further consideration for archaeological resources is recommended.

Historic Resources

Research did reveal the presence of two historic sites listed on the National Register of Historic Places (Dyckman Street Station and Substation #17) within the project block. Historic resources that are listed in the NR, or that have been found eligible for NR listing, are given a measure of protection from the impacts of federally sponsored, or federally assisted projects under Section 106 of the National Historic Preservation Act, and are similarly protected against impacts resulting from state-sponsored or state-assisted projects under the State Historic Preservation Act. Although preservation is not mandated, federal agencies must attempt to avoid adverse impacts on such resources through a notice, review, and consultation process.

State and National Register Historic Properties, which are within 90 feet of proposed construction, are subject to additional construction protection plans under the Technical Policy and Procedure Notice (TPPN) TPPN 10/88, which is issued by the NYC Department of Buildings. This policy sets forth the procedures for avoidance of damage to historic structures resulting from adjacent construction when subject to controlled inspection by Section 27-724 of the New York City Building Code.

HPI recommends that the construction management plans include a notation that avoidance procedures, including the preparation of a historic resource protection plan, will be followed during project construction. These plans should be maintained on site for the duration of the project.

VIII. BIBLIOGRAPHY

Bolton, Reginald P.

1914 *Index of the Eighty-Eight Named Street and Avenues of Washington Heights, Inwood, and Marble Hill.* Pamphlet available at the New York Public Library.

1922 *Indian Paths in the Great Metropolis.* Indian Notes and Monographs. Museum of the American Indian, Heye Foundation, New York.

1924 *Washington Heights, Manhattan, Its Eventful Past.* The Dyckman Institute, New York.

1934 *Inwood Hill Park on the Island of Manhattan.* The Dyckman Institute, New York.

British Headquarters Map (BHQ)

1782 *British Headquarters Map.* Public Records Office, London. Available at the New York Public Library (NYPL), Map Division.

Bromley, George W.

1879 *Atlas of the entire city of New York : complete in one volume.* G. W. Bromley & E. Robinson, New York, New York.

1891 *Atlas of the City of New York, Manhattan Island..* G.W. Bromley & Co., Philadelphia.

1911 *Atlas of the City of New York, Manhattan Island.* G.W. Bromley & Co., New York.

1916 *Atlas of the City of New York, Borough of Manhattan.* G.W. Bromley & Co., Philadelphia, Pennsylvania.

1921 *Atlas of the City of New York, Borough of Manhattan.* G.W. Bromley & Co., Philadelphia, Pennsylvania.

1925 *Land Book of the Borough of Manhattan, City of New York.* G.W. Bromley, New York.

1934 *Manhattan Land Book, City of New York.* G.W. Bromley, New York.

1943 *Manhattan Land Book, City of New York.* Corrected 1934 edition. G.W. Bromley, New York.

1955 *Land Book of the Borough of Manhattan, City of New York .* Corrected 1934 edition. G.W. Bromley, New York.

City Environmental Quality Review (CEQR)

2012 *City Environmental Quality Review Technical Manual.* City of New York, Mayor's Office of Environmental Coordination.

Colton, J. H.

1836 *Topographical Map of the City and County of New York*. Published by J. H. Colton & Co.

Dripps, Matthew

1851 *Map of the City of New York Extending Northward to 50th Street*. Sheet 2. M. Dripps, New York.

1867 *Map of the City of New York Extending Northward to 50th Street*. Sheet 20 of 20. M. Dripps, New York.

Geismar, Joan H.

1984 *An Archaeological Evaluation of the Community Hospital Site, Baker Field, New York, N.Y.: Phase 2. Field Testing*. Prepared for Konheim & Ketcham.

Greenhouse Consultants, Inc.

1985 *Archaeological Monitoring Report, Community Hospital, Baker Field, Manhattan, New York*. Prepared for Konheim & Ketcham.

Historical Perspectives, Inc. (HPI)

1988a *Preliminary Review of New York City Board of Education Proposed School Sites, Broadway and Academy Street Site, Manhattan*. Prepared for the New York City Landmarks Preservation Commission (LPC).

1988b *Archaeological Assessment Report for the Board of Education Project: Broadway and Academy Site, CEQR 88-126-M*. Prepared for Parsons Brinkerhoff Quade & Douglas, Inc., New York, February 25.

2005 *Phase 1A Archaeological Assessment, 4849-4855 and 4857-4859 Broadway (Block 2238, Lots 35 and 33)*. Prepared for the New York City School Construction Authority.

Hyde, E. Belcher

1947 *Atlas of the Borough of Manhattan, City of New York*. Volume IV. Corrected 1906 edition. E. Belcher Hyde, New York.

Hunter Research, Inc.

2008 *Archaeological Assessment for the Reconstruction of Fort Washington Park from 145th Street to Dyckman Street Along the Hudson River, Borough of Manhattan, New York*. Prepared for Santec.

John Milner Associates

2008 *Evaluation of Prior Disturbance and Archaeological Sensitivity of the Area of Potential Effect Associated with the Manhattan Portion of the M-29 Transmission Line Project, New York County, New York*. Prepared for TRC and Consolidated Edison Company of New York, Inc.

Kitchen, Thomas, Sr.

1869 "Map of New York City 1778." From the *Manual of the Corporation of the City of New York*.

National Register of Historic Places

2004 Nomination Form: Dyckman Street Station

2006 Nomination Form: Substation #17

NYC Department of Buildings (for Block 1070, Lots 180 and 190, Manhattan)

New York City Department of Parks & Recreation

2004 "Dyckman House, Dyckman House Park," at

http://www.nycgovparks.org/sub_about/parks_divisions/historic_houses/hh_dyckman
far...

New York City Soil Survey Staff

2005 New York City Reconnaissance Soil Survey. United States Department of Agriculture, Natural Resources Conservation Service, Staten Island, NY.

New York State Museum (NYSM)

Archaeological Site Files.

New York State Office of Parks, Recreation & Historic Preservation (OPRHP)

Archaeological Site Files.

New York Transit Museum

2013 Historical Postcards. <http://www.sepiatown.com/811405/Dyckman-St-Station-IRT-West-Side-Seventh-Ave-New-York-NY-USA>.

Panamerican Consultants, Inc.

2003 *Phase IA Cultural Resources Investigation of the Hudson-Raritan Estuary Ecosystem Restoration Project, Sherman Creek, New York City, New York*. Prepared for Northern Ecological Associates, Inc., under contract to the Environmental Analysis Branch, Environmental Assessment Section, U.S. Department of the Army, New York District, Corps of Engineers.

Randel

1820 Farm Maps of Manhattan.

http://gigapan.com/gigapans/fa872952d35e237828aea5dda50b3126/options/nosnapshots,hide_title/iframe/flash.html?height=800frameborder=0%25height=80%25scrolling=no&width=100%25

Robinson, Edward

1885 *Atlas of the Twelfth Ward, City of New York*, Vol. II. E. Robinson, New York.

Romer, H. Dorothea and Helen B. Hartman

1981 *Jan Dyckman of Harlem and His Descendants*. New York.

Sackersdorff, Otto

1815 *The Blue Book: Maps of Farms*. Office of the City Surveyor, New York.

Sanborn Map Company

1900 *Manhattan Land Book of the City of New York*. Sanborn Map Co., Inc., Pelham, New York. Also, 1913, 1951.

Santucci, Gina

2013 Environmental Review Letter. Landmarks Preservation Commission. April 15.

Sauthier, Claude J.

1777 *A topographical map of the northn. part of New York Island, exhibiting the plan of Fort Washington, now Fort Knyphausen, with the rebels lines to the southward, which were forced by the troops under the command of the Rt. Honble. Earl Percy, on the 16th Novr. 1776, and survey'd immediately after by order of His Lordship. To which is added the attack made to the northd. by the Hessians.*

SESI Consulting Engineers

2008 Geotechnical Engineering Investigation Report for Proposed Fort George Hill Project, 1769 Fort George Hill, New York, New York. Report prepared for the South Bronx Overall Economic Development Corporation.

Schuberth, Christopher J.

1968 *The Geology of New York City and Environs*. Natural History Press, Garden City, New York.

Tauranac, John

1979 *Essential New York: A Guide to the History and Architecture of Manhattan's Important Buildings, Parks, and Bridges*. Holt, Rinehart and Winston, New York.

Thompson, Cole

2013 My Inwood. Your Guide to Inwood, NYC History. <http://myinwood.net>. Accessed 6/18/2013

Inwood Postcards. <http://myinwood.net/inwood-postcards-2/>, accessed 6/18/2013

United States Department of Agriculture (USDA)

2005 *New York City Reconnaissance Soil Survey*. United States Department of Agriculture, Natural Resources Conservation Service, Staten Island, NY.

United States Geological Service

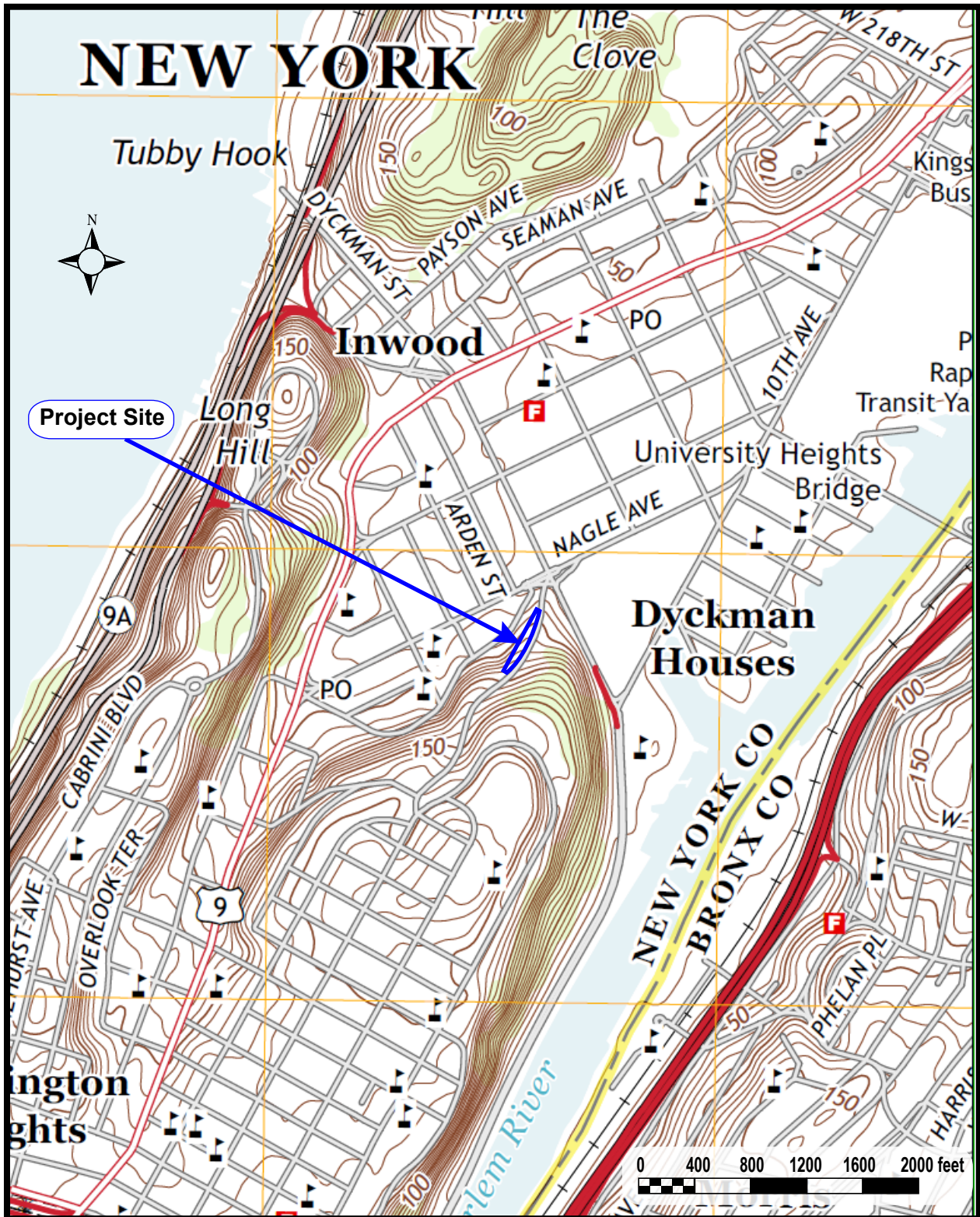
2013 Central Park Quad, 7.5" series.

Viele, Egbert Ludovicus

1874 *Sanitary and Topographical Map of the City and Island of New York*. Sheet 5 of 6.
Egbert L. Viele, New York.

Works Progress Administration (WPA)

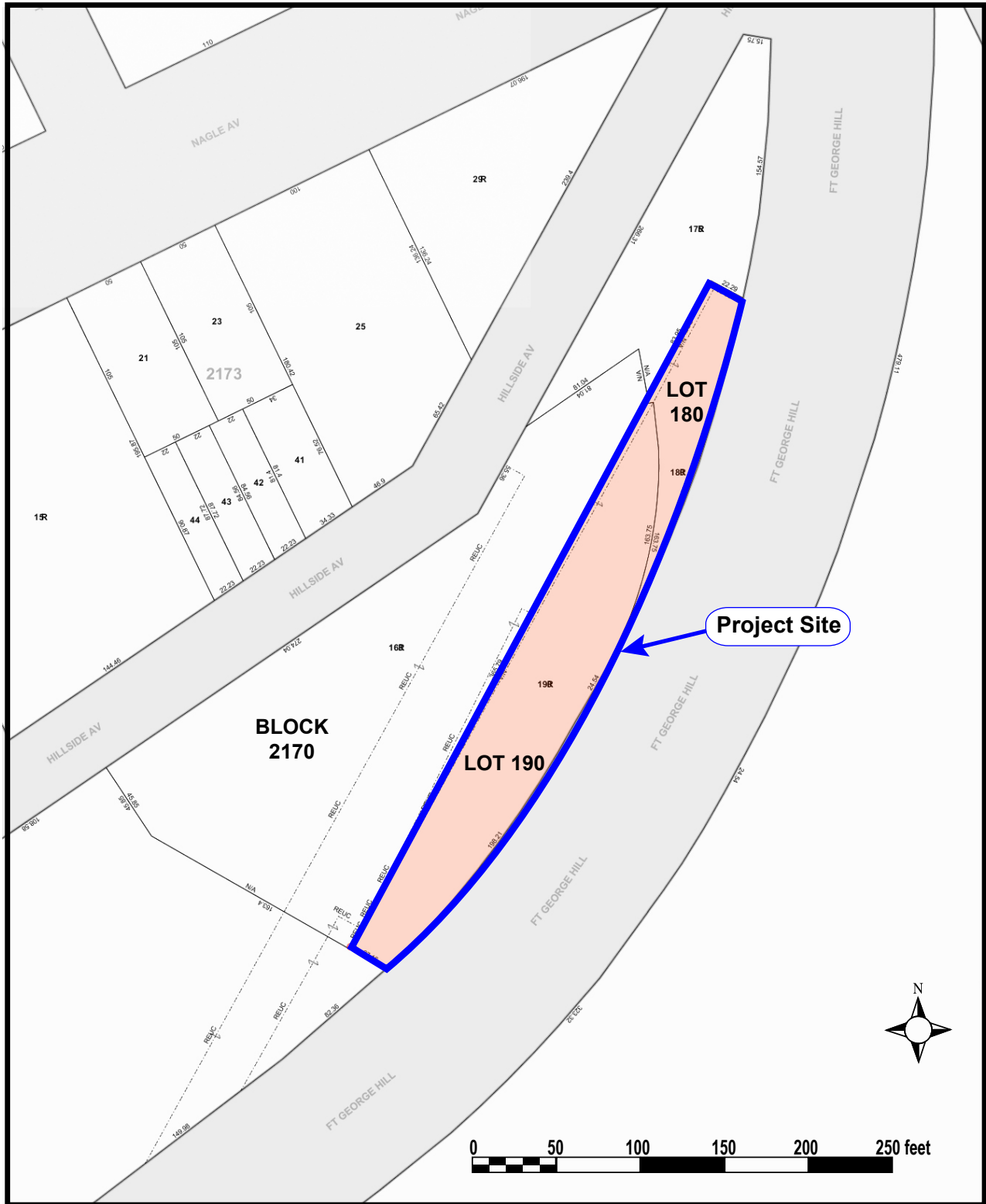
1982 *The Federal Writer's Project Guide to 1930s New York*. Introduction by William H.
Whyte. Pantheon Books, New York.



Phase IA Archaeological Documentary Study
 Fort George Hill, Block 2170, Lots 180 and 190
 Borough of Manhattan, New York County, New York



Figure 1: Project Site on *Central Park, NY-NJ 7.5 Minute Topographical Map* (USGS 2013).



**Phase IA Archaeological Documentary Study
 Fort George Hill, Block 2071, Lots 180 and 190
 Borough of Manhattan, New York County, New York**

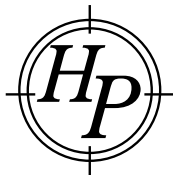


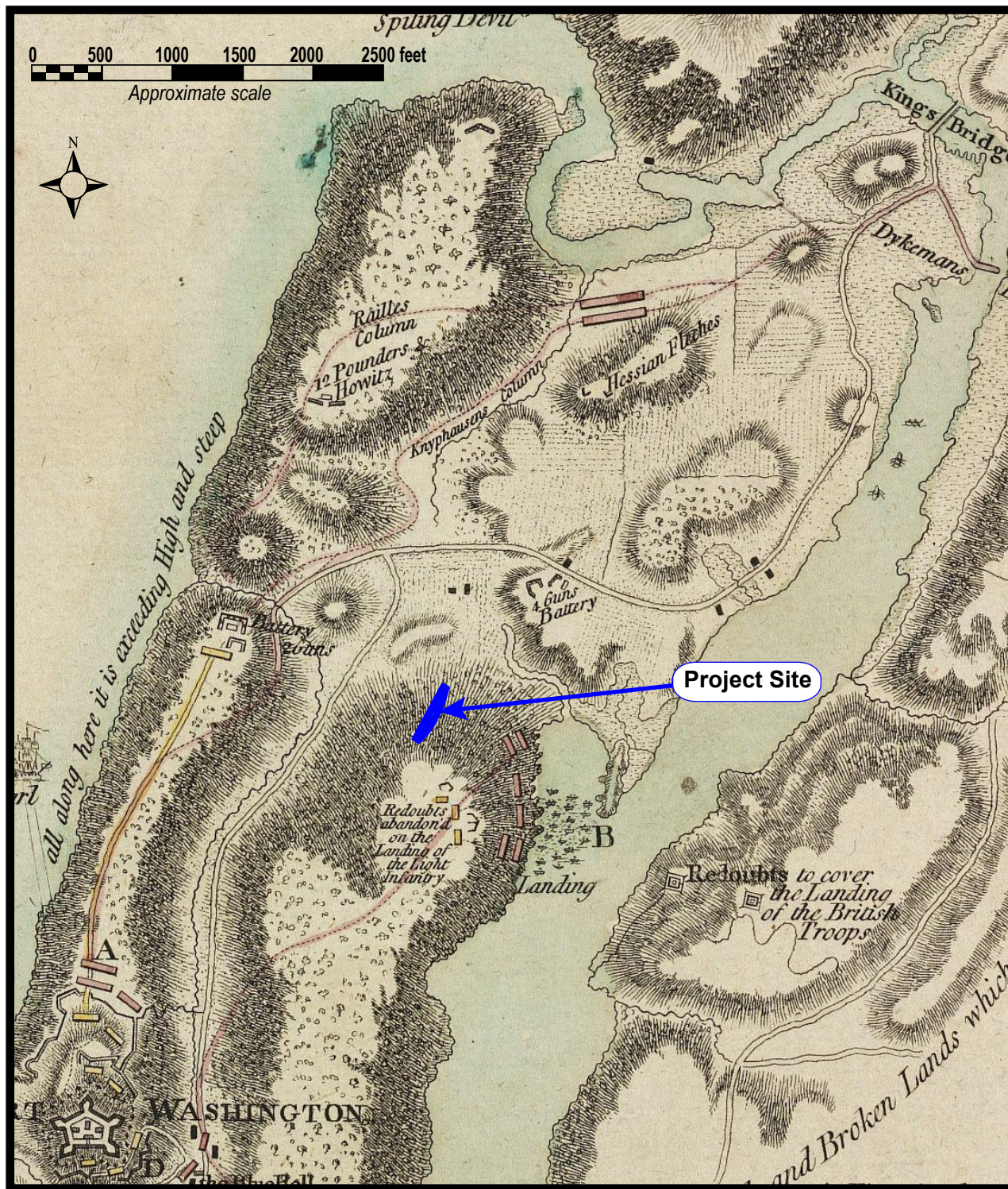
Figure 2: Project Site on Tax Map (2013).



**Phase IA Archaeological Documentary Study
Fort George Hill, Block 2170, Lots 180 and 190
Borough of Manhattan, New York County, New York**

Figure 3: Project Site on *New York City Reconnaissance Soil Survey* (USDA 2006).

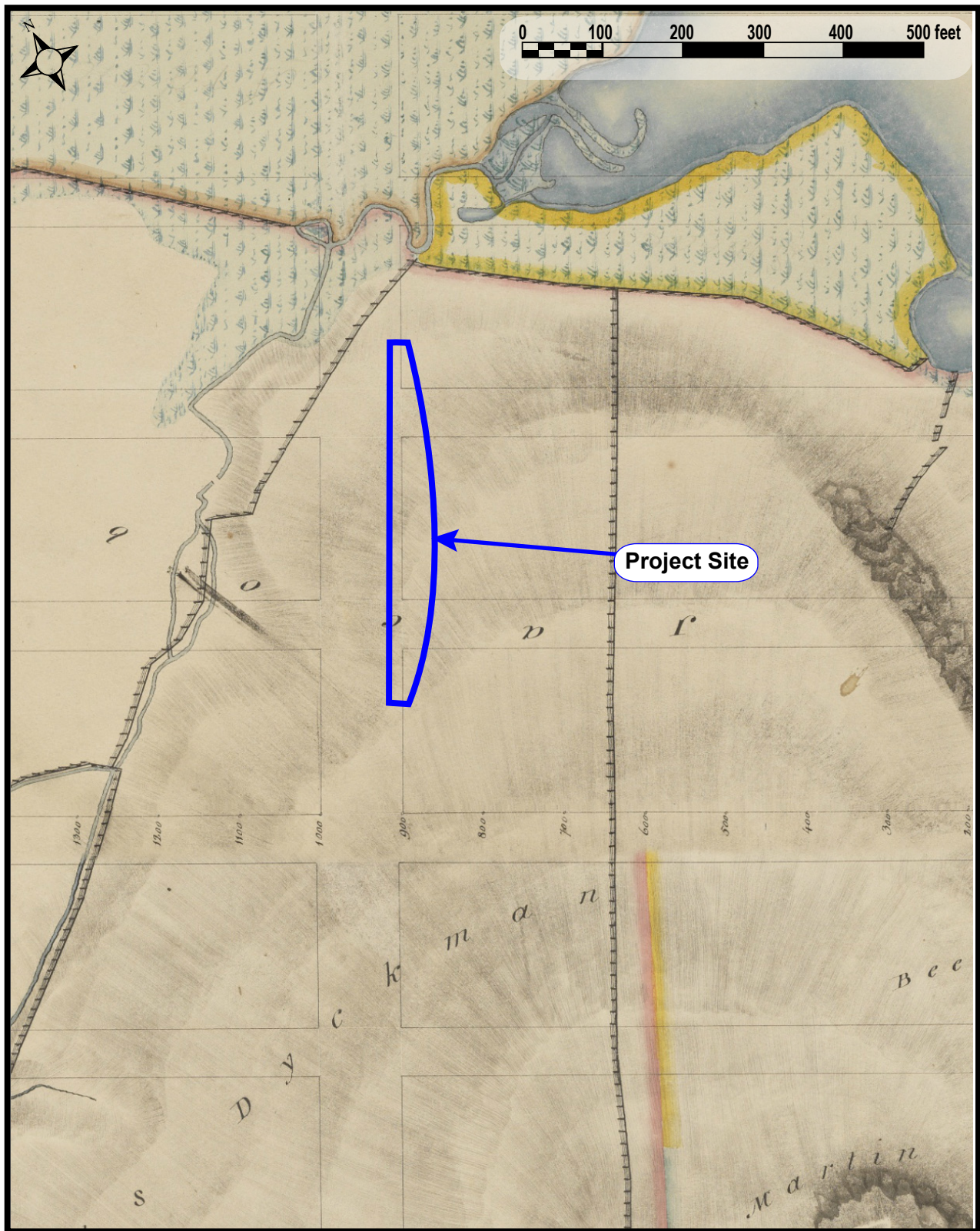




**Phase IA Archaeological Documentary Study
 Fort George Hill, Block 2170, Lots 180 and 190
 Borough of Manhattan, New York County, New York**

Figure 4: Project Site on A Topographical Map of the Northern Part of New York Island (Sauthier 1777).





**Phase IA Archaeological Documentary Study
 Fort George Hill, Block 2170, Lots 180 and 190
 Borough of Manhattan, New York County, New York**

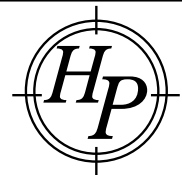
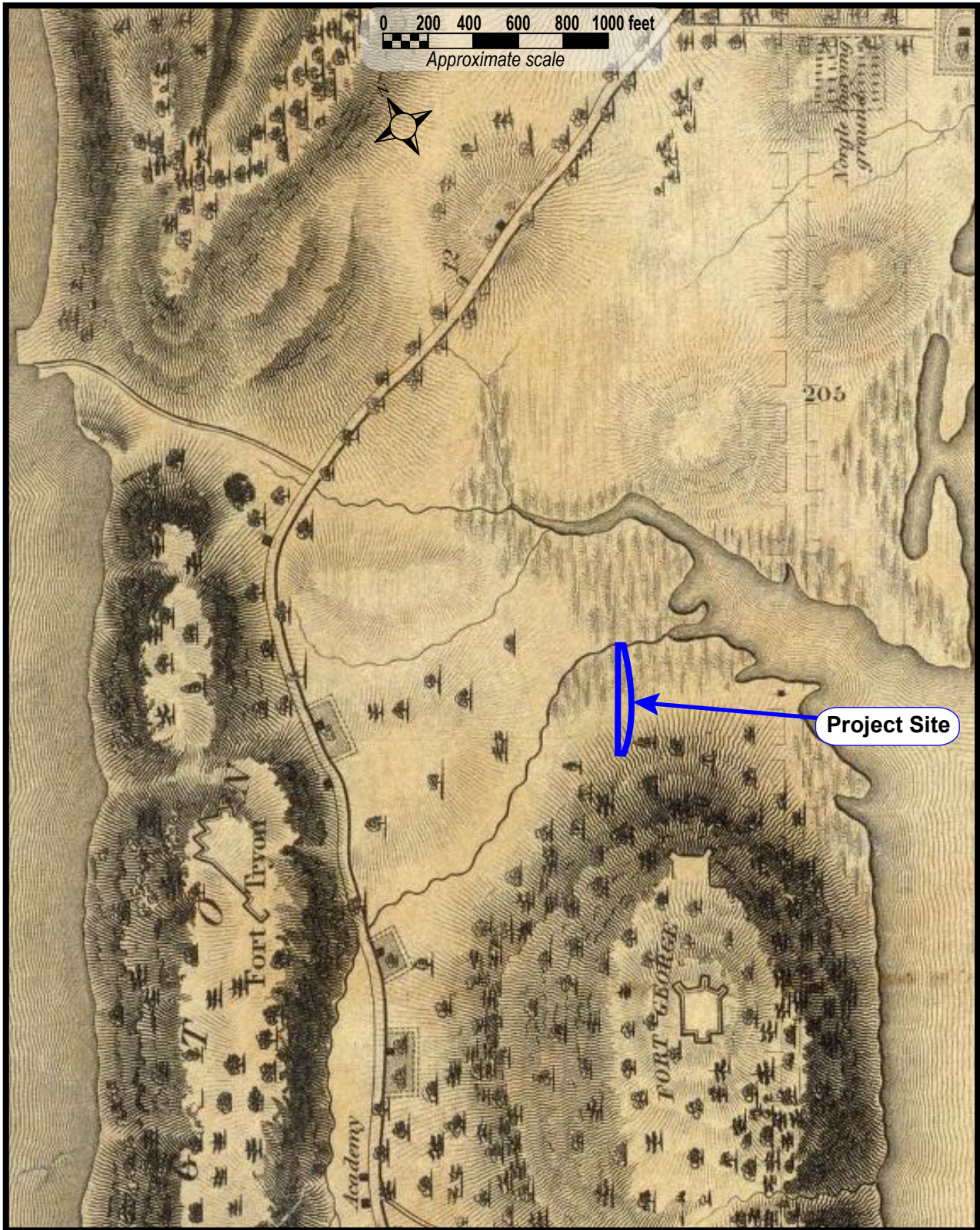


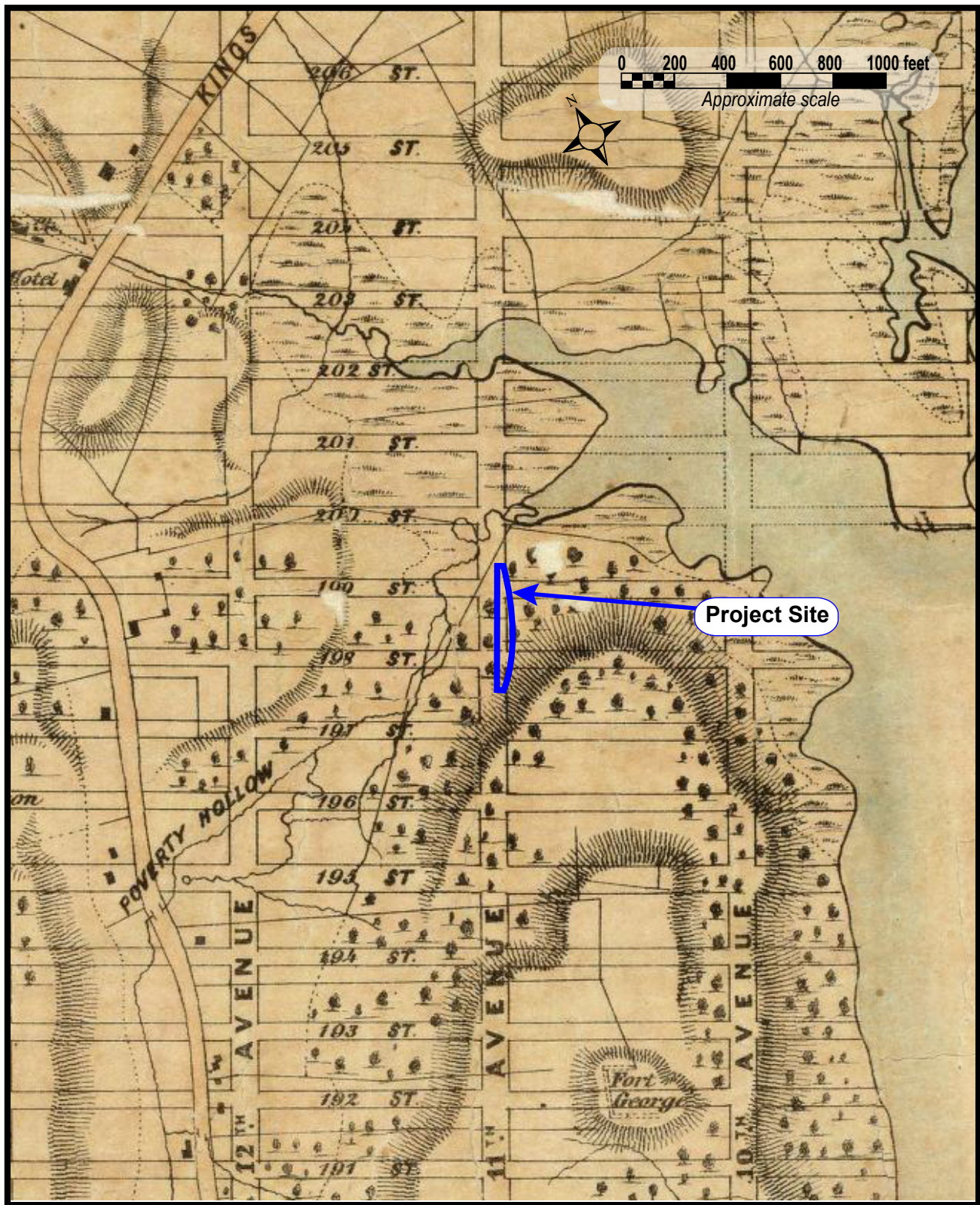
Figure 5: Project Site on *Farm Maps* (Randel 1820).



Phase IA Archaeological Documentary Study
Fort George Hill, Block 2170, Lots 180 and 190
Borough of Manhattan, New York County, New York



Figure 6: Project Site on *Topographical Map of the City and County of New York* (Colton 1836).



Phase IA Archaeological Documentary Study
Fort George Hill, Block 2170, Lots 180 and 190
Borough of Manhattan, New York County, New York

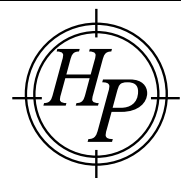
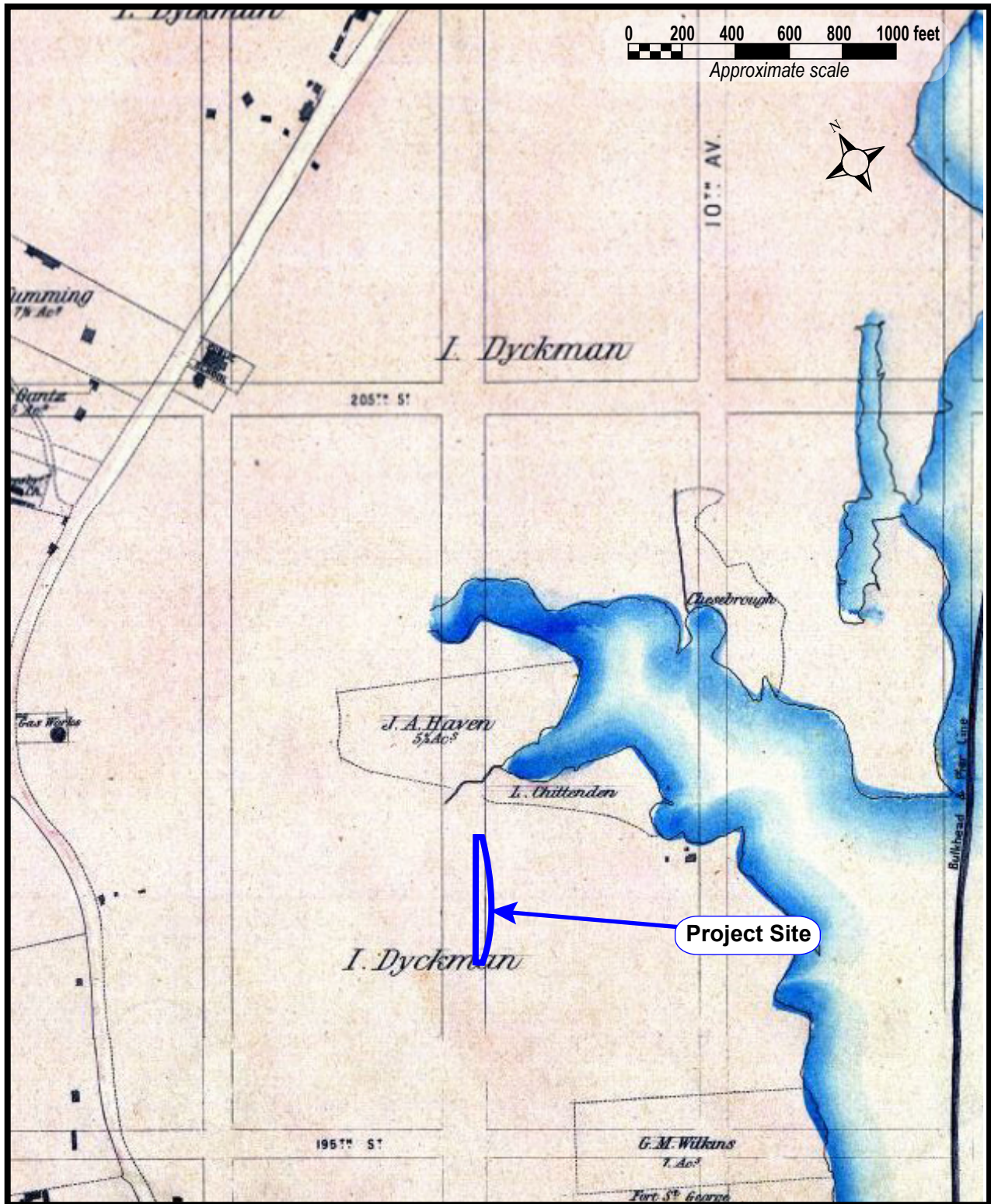
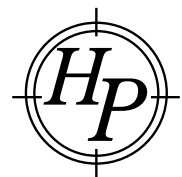


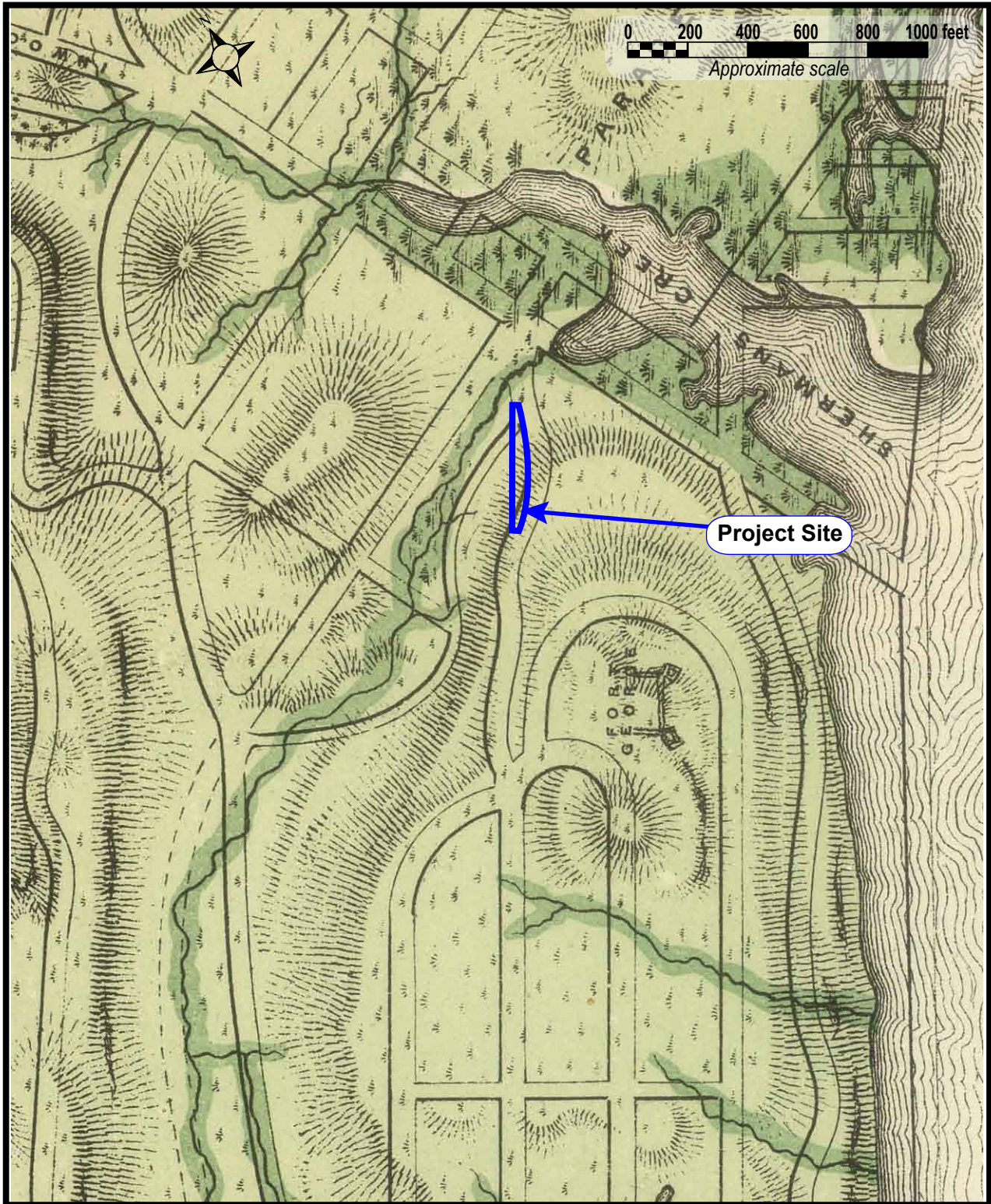
Figure 7: Project Site on *Map of that part of the City and County of New-York North of 50th Street (Dripps 1851)*.



Phase IA Archaeological Documentary Study
Fort George Hill, Block 2170, Lots 180 and 190
Borough of Manhattan, New York County, New York

Figure 8: Project Site on *Plan of New York City* (Dripps 1867).

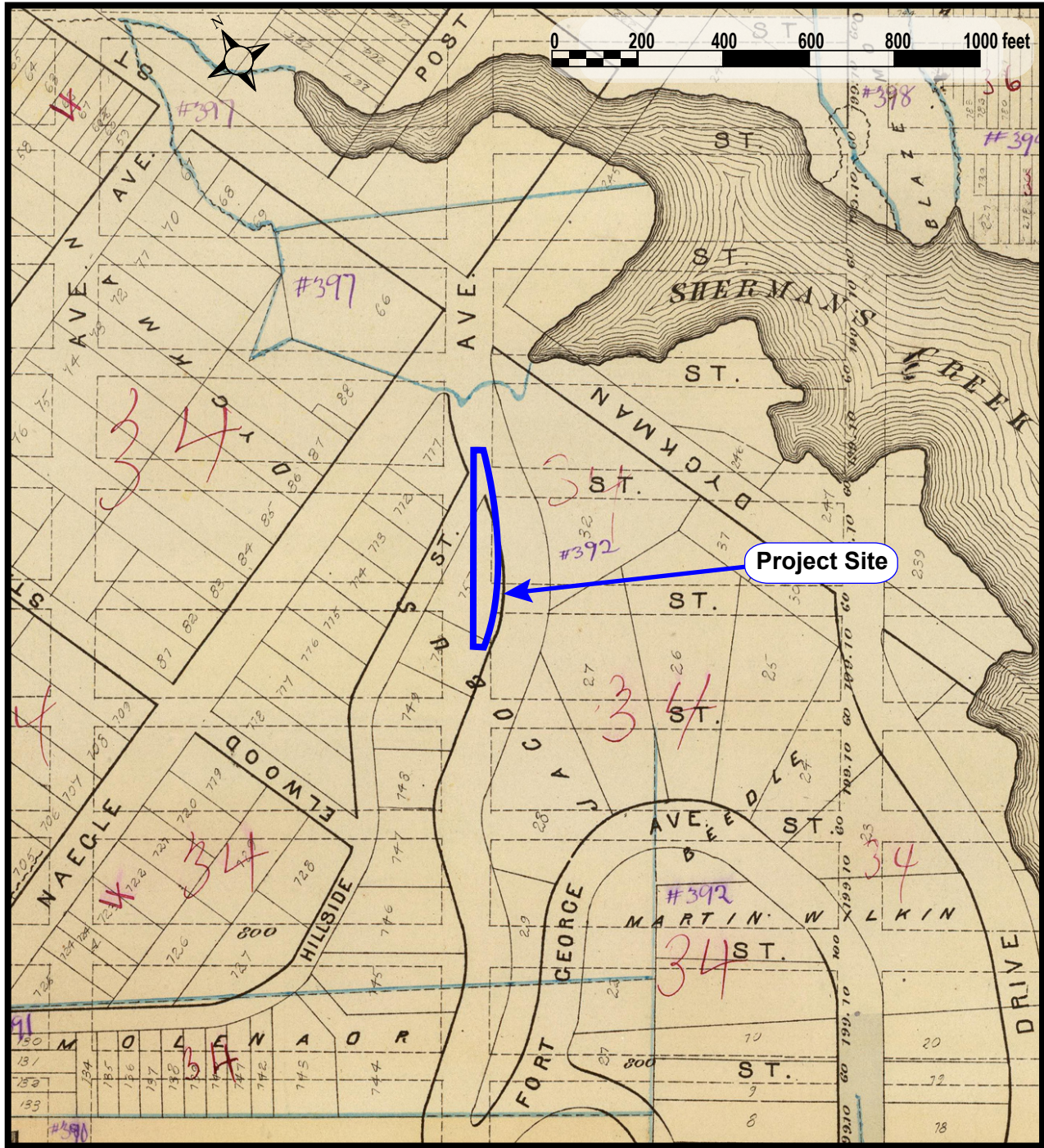




**Phase IA Archaeological Documentary Study
Fort George Hill, Block 2170, Lots 180 and 190
Borough of Manhattan, New York County, New York**



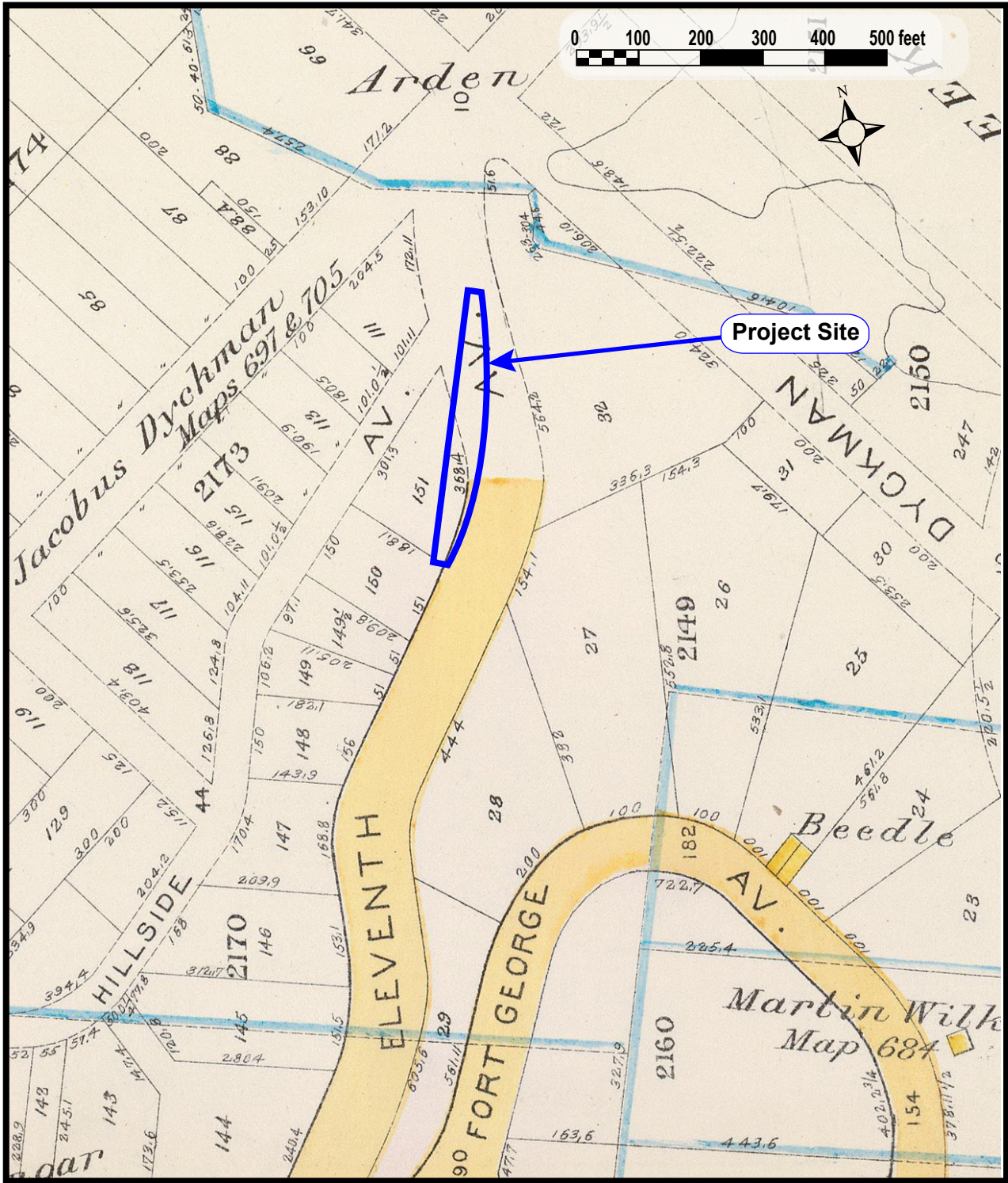
Figure 9: Project Site on *Topographical Atlas of the City of New York* (Viele 1874).



**Phase IA Archaeological Documentary Study
Fort George Hill, Block 2170, Lots 180 and 190
Borough of Manhattan, New York County, New York**



Figure 10: Project Site on *Atlas of the City of New York* (Bromley 1879).



Phase IA Archaeological Documentary Study
Fort George Hill, Block 2170, Lots 180 and 190
Borough of Manhattan, New York County, New York

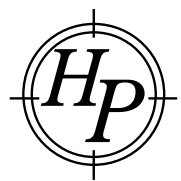
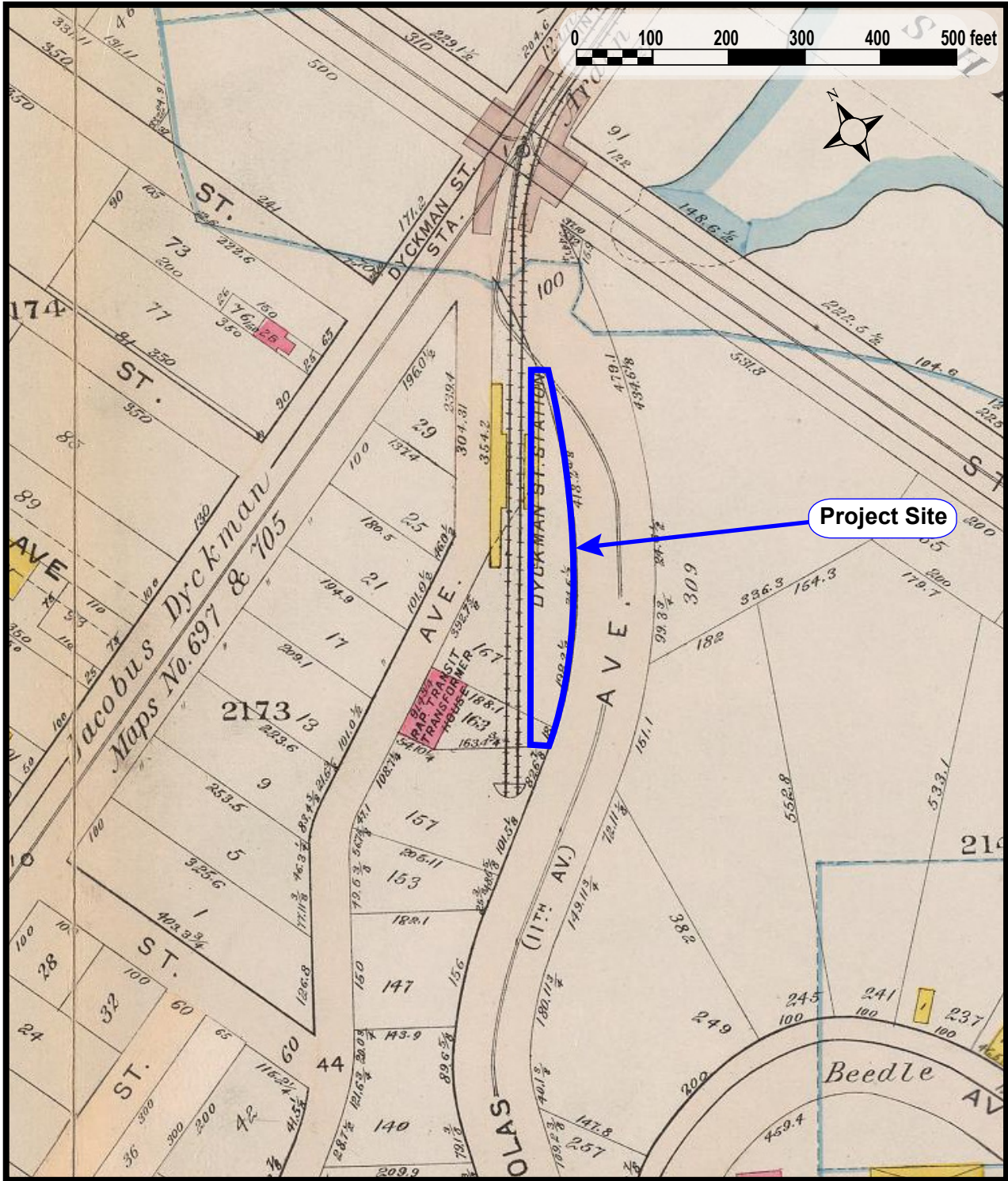


Figure 11: Project Site on Atlas of the City of New York (Bromley 1891).



Phase IA Archaeological Documentary Study
 Fort George Hill, Block 2170, Lots 180 and 190
 Borough of Manhattan, New York County, New York

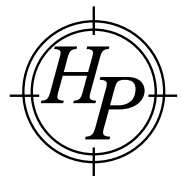
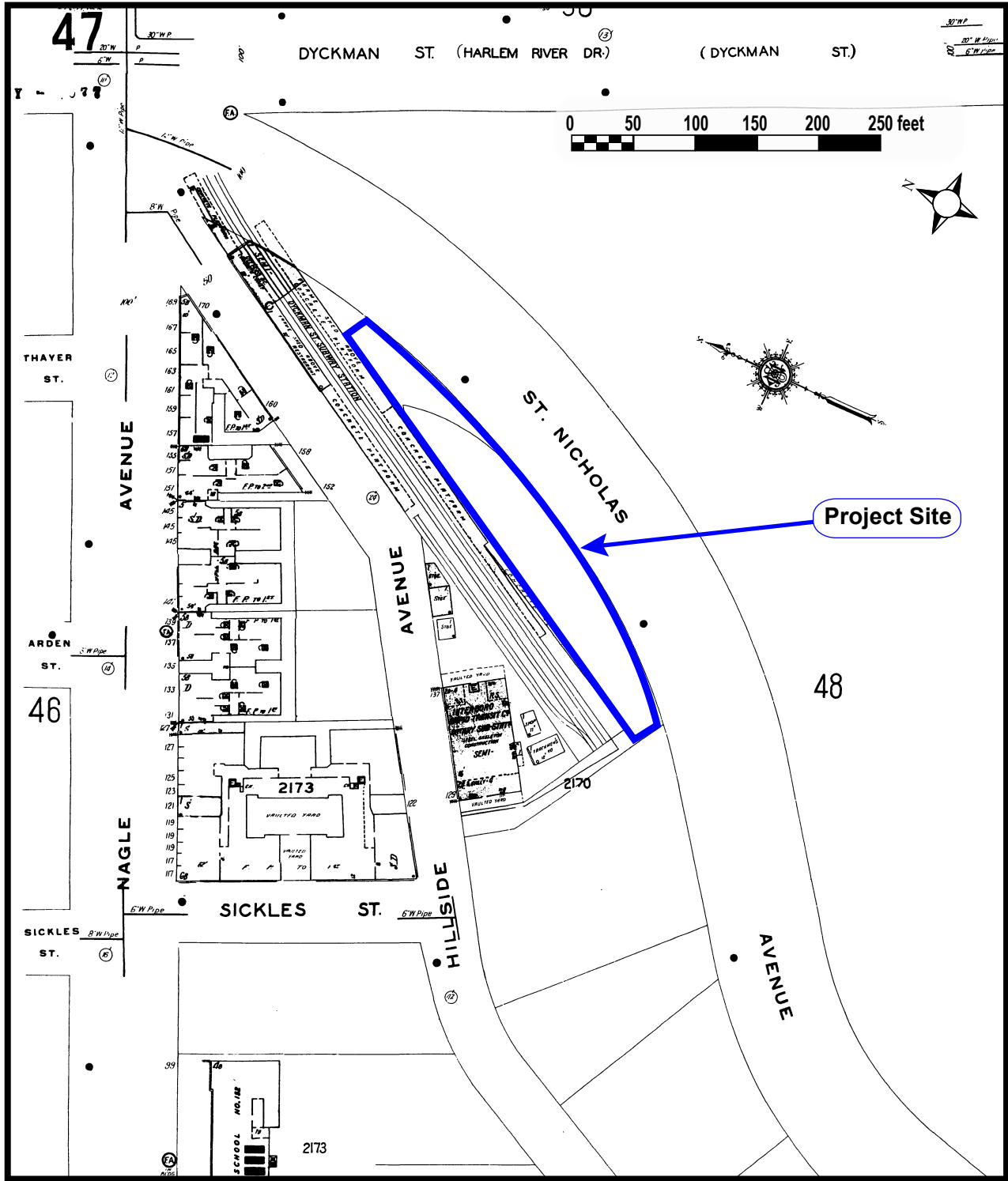


Figure 12: Project Site on Atlas of the City of New York (Bromley 1911).



**Phase IA Archaeological Documentary Study
 Fort George Hill, Block 2170, Lots 180 and 190
 Borough of Manhattan, New York County, New York**

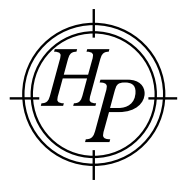


Figure 13: Project Site on *Insurance Maps of the City of New York, Borough of Manhattan* (Sanborn 1951).



Construction of the Dyckman Street IRT station in 1906, looking northeast (NYTM).



Construction adjacent to the Dyckman Street IRT station in 1910, looking north.

**Phase IA Archaeological Documentary Study
Fort George Hill, Block 2170, Lots 180 and 190
Borough of Manhattan, New York County, New York**

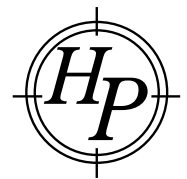
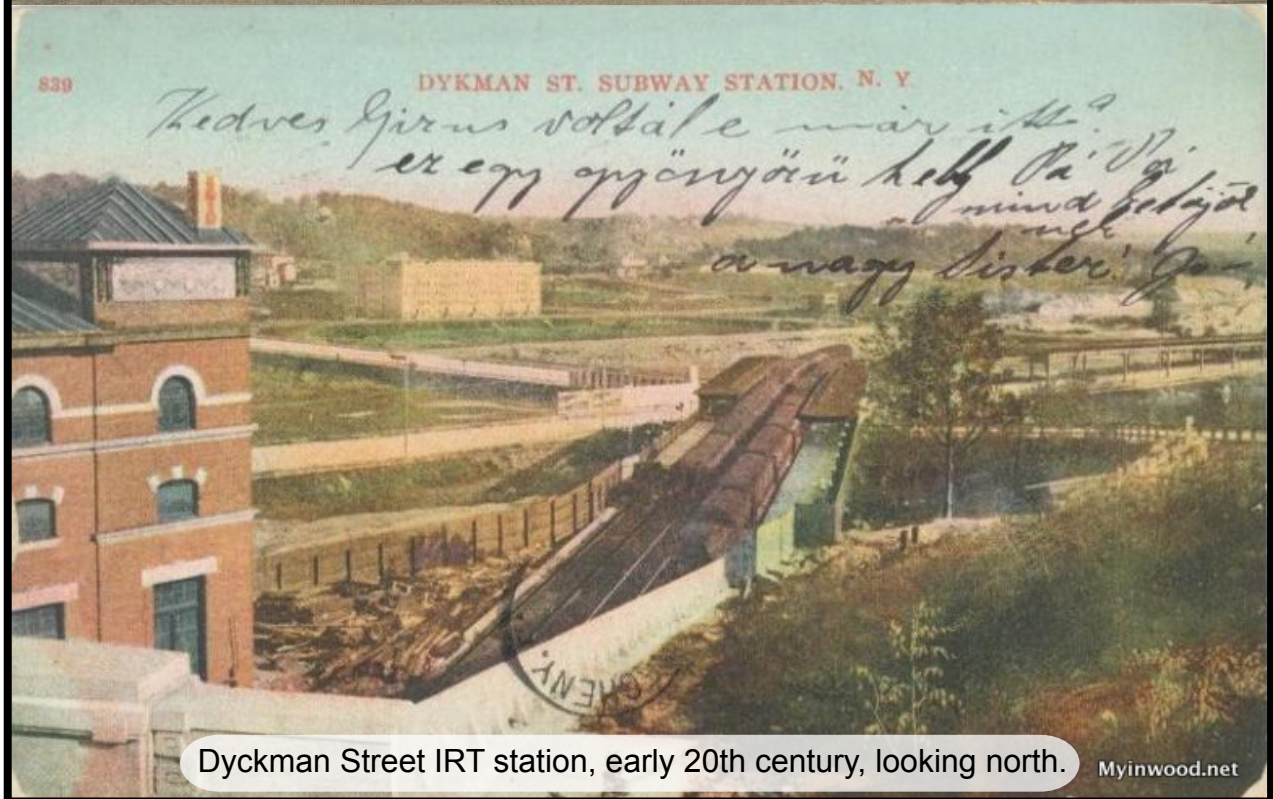
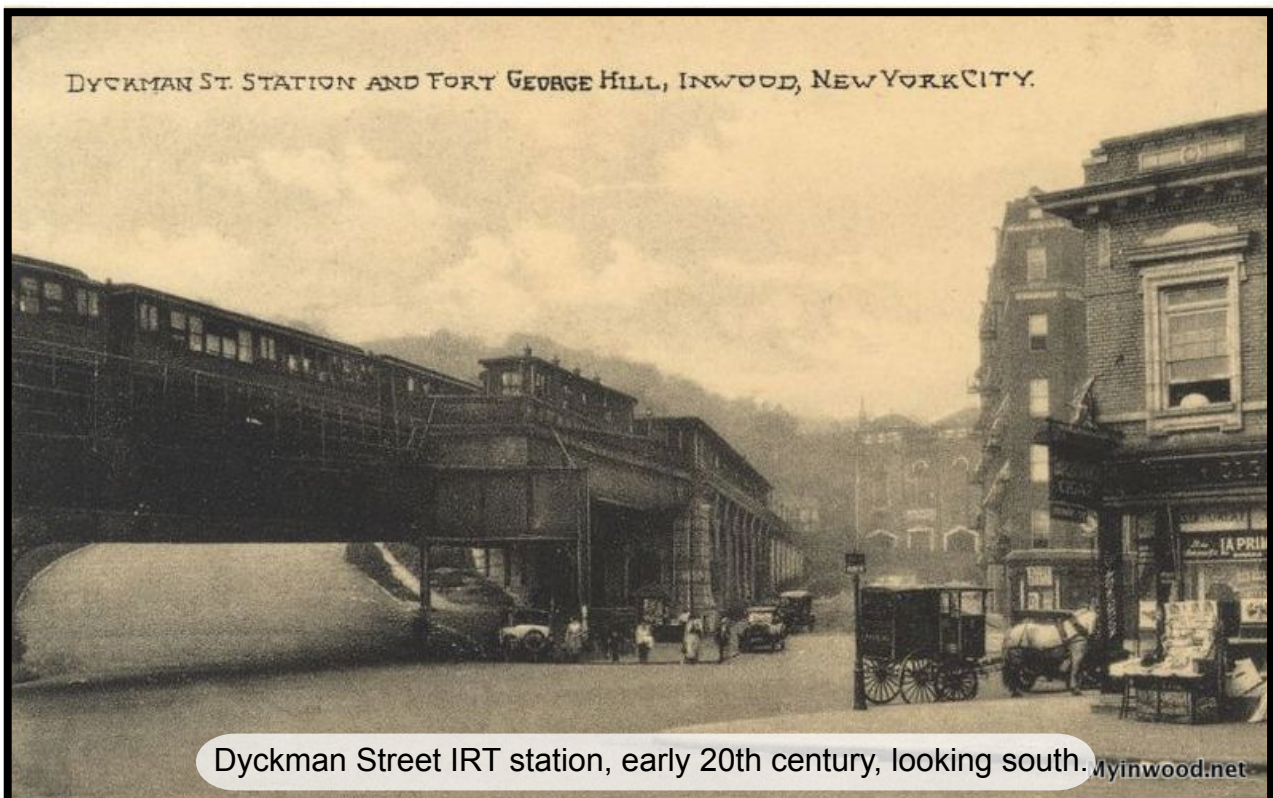


Figure 14: Historic photographs.



**Phase IA Archaeological Documentary Study
 Fort George Hill, Block 2170, Lots 180 and 190
 Borough of Manhattan, New York County, New York**

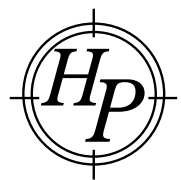
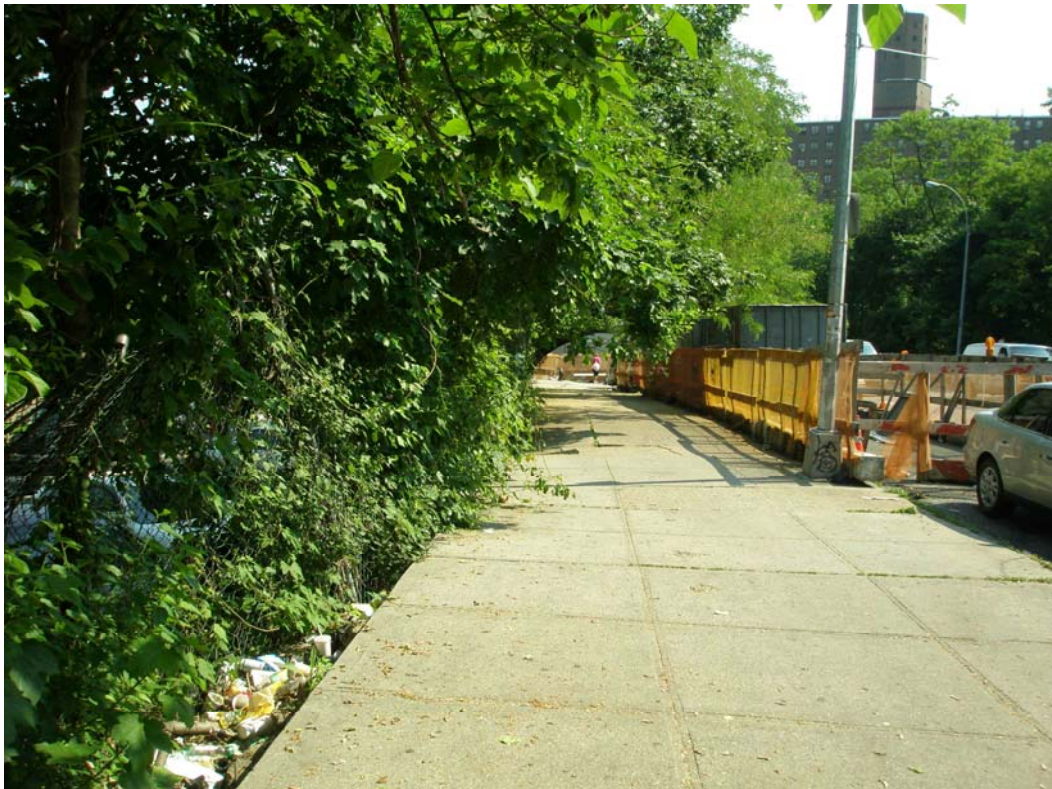


Figure 15: Historic postcards.



Photograph 1. Looking North Down Fort George Hill. Project Site is at Left.



Photograph 2. Concrete Sidewalk adjacent to Project Site (at Left), Facing North.



Photograph 3. At Entrance to Project Site, Facing North. IRT Tracks at Left.



Photograph 4. At Entrance to Project Site, Facing South. Concrete Retaining Wall at Left.



Photograph 5. Concrete Retaining Wall on West Side of Site.



Photograph 6. Modern Concrete Block Retaining Wall on East Side of Parking Lot where Surface was Leveled for Parking.



Photograph 7. From Center of Parking Area, Looking South Toward Lot 190.



Photograph 8. Parking Area with Non-Graded Surface at Left, Facing South.



Photograph 9. Dyckman Street Station at Left, Facing North.



Photograph 10. Sub Station #17, Facing South. Project Site is at Left.

APPENDIX
Geological Engineering Investigation Report
SESI Consulting Engineers



GEOTECHNICAL ENGINEERING INVESTIGATION REPORT

FOR

**Proposed Fort George Hill Project
1769 Fort George Hill
New York, New York**

PREPARED FOR:

South Bronx Overall Economic Development Corporation
555 Bergen Avenue, 3rd Floor
Bronx, New York 10455

PREPARED BY

SESI Consulting Engineers, P.C.
12A Maple Avenue
Pine Brook, NJ 07058

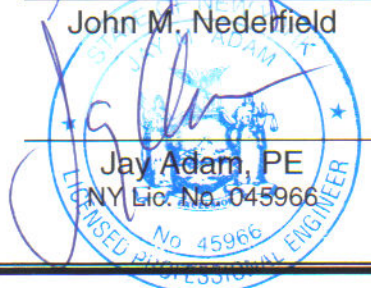
Project No.: N-7350

DATE:

September 24, 2008



John M. Niederfeld



Jay Adam, PE

NY Lic. No. 045966

INTRODUCTION

We have completed our engineering investigation and evaluation of the subsurface conditions as they pertain to establishing site preparation procedure and foundation design criteria for the proposed construction to be located on the east side of Fort George Hill at 1769 Fort George Hill in New York, New York. The proposed construction will consist of a 15,000 square foot, 14-story residential building with associated utilities, a church, and two underground levels of parking.

The site is located along the west side of Fort George Hill and is currently being used for the storage of vehicles. The NYCTA # 1 train subway line runs along the western edge of the property in a northeast/ southwest direction; the Dyckman Street station platforms for the northbound #1 train abut the west property line. The property is designated on the Tax Map as Block 2170, Lot 180 and 190. Two concrete/CMU walls exist within the property. A sewer line runs through the northern end of the property in a northwest/southeast direction adjoining to a NYCTA signal building at the north property boundary. There is an existing NYCTA easement at the south boundary of the site; an "IRT" manhole was found in general vicinity of that easement. Trees border the property line adjacent to the sidewalk and the slope down to the railroad tracks is vegetated.

Topographically, the site slopes downward from an approximate elevation of 79± in the south to an elevation of 37± in the north along the east property line on Fort George Hill. In addition, the property slopes generally down from Fort George Hill to the west property line varying in elevation from approximately 76 in the south to approximate elevation in the north of 36.

The proposed basement floor elevation is 33.83, which based on a review of the proposed grades and the survey, will require cuts of 5±-feet to 50±-feet to achieve finished basement floor grade.

FIELD AND LABORATORY INVESTIGATIONS

Our engineering study included a site reconnaissance, a review of published geologic information of the area, a review of the plan entitled "ALTA/ACSM Land Title Survey" prepared by Albert A. Bianco, dated January 31, 2005, upgraded August 16, 2006, and a field investigation consisting of the drilling of ten (10) borings (two were originally designated as probes but borings were made) and ten (10) rock probes (the probes were made to delineate depth to apparent weathered and sound rock respectively, for design of the perimeter support of excavation system).

The borings and probes were drilled to depths of 5.0 to 85.0 feet below existing grade, using a truck-mounted drill rig, at the locations shown on Figure 1. Rock coring was attempted at all the boring locations when competent rock was encountered. Individual boring and probe logs, which describe the materials encountered, are presented in Figures 2 through 23. A key to soil terminology is included as Figure 24. Also shown on Figure 1 are two cross sectional profiles of the geotechnical conditions extrapolated from the boring logs.

Soil samples suitable for identification purposes were extracted from the borings in accordance with the procedures of the Standard Penetration test (ASTM D 1586). For this test, a standard split-spoon sampler (2 inches outside diameter, one and three-eighths inches diameter) is driven into the soil by a 140-pound weight falling 30 inches. After discounting the initial six inches of penetration due to possible disturbance of the material resulting from the drilling operation, the number of blows required to drive the sampler a distance of 12 inches is recorded and designated as the standard penetration resistance or "N" value. The "N" value is an indication of the relative compactness of the soil in-situ.

Rock cores were drilled in B-1 and B-2. Boring B-1 had two five-foot rock cores taken with percent core recoveries of 100.0 and 100.0 respectively and RQD values (rock quality designation) of 40.0 and 11.7 indicating a poor to very poor rock quality as shown in the Table below. Boring 2 had one five-foot core taken with a percent core recovery of 70.0 and an RQD value of 0.0 indicating a very poor rock quality.

RELATIONSHIP OF RQD AND ROCK QUALITY:	
<u>ROCK QUALITY DESIGNATION (RQD)⁽¹⁾</u>	<u>DESCRIPTION OF ROCK QUALITY</u>
0 – 25	VERY POOR
25 – 50	POOR
50 – 75	FAIR
75 – 90	GOOD
90 – 100	EXCELLENT

(1) "Rock Quality Designation" is defined as a modified core recovery ratio that considers only pieces of the core that are at least 4 inches long. Obvious fractures caused by drilling are ignored in this system.

Utilizing the definitions in the July 1, 2008 NYC-DOB Code, the rock quality ranges from class 1a to 1d (where 1d is soft rock).

All field work was performed under the direct technical observation of a geotechnical engineer/technician from SESI Consulting Engineers. Our representative maintained continuous logs of the explorations as work proceeded and supervised the soil sampling operations so as to develop the required subsurface information.

All soil samples and rock cores extracted in the field were brought to our office where they were examined in our soil mechanics laboratory.

GENERALIZED SUBSURFACE CONDITIONS

Some of the borings encountered a layer of asphalt that varies from 3 inches to 4 inches. The borings and probes drilled in the sidewalk and upper lot encountered approximately 8-inches of concrete.

Below the asphalt and concrete exists a stratum of brown coarse to fine sand with varying amounts of gravel and silt that extends to approximately 10 to 20 feet below existing grade.

Underlying this stratum is weathered/decomposed rock, which extends to varying depths of 15 to more than 85 feet below existing grade.

Apparent sound rock was encountered below the weathered rock in all but borings B-5, which was abandoned due to an obstruction, and boring B-2, which did not encounter apparent sound rock to a depth of 85 feet below existing grade.

Groundwater was not encountered during the short period that the holes were left open, however the method of drilling did not lend itself to making meaningful water level determinations.

EVALUATION AND RECOMMENDATIONS

General

From a soils and foundation standpoint, this site may be considered good with respect to providing satisfactory support for the proposed construction. The natural soils/weathered rock below the asphalt and concrete are suitable for support of the anticipated building loads on conventional spread/strip foundations.

After satisfactory completion of the following site preparation procedures, the proposed building may be founded on conventional spread/strip footings with a slab-on-grade.

From an excavation standpoint, the boring results suggest that most of the rock should be readily removed by earth moving equipment but it should be anticipated that some hard rock may be encountered which will have to be broken up by means of mechanical impact (because of proximity to NYCTA facility we suggest that blasting not be considered).

Site and Building Area Preparation Procedures

The depth of excavation for the building construction will require an excavation restraint system along much of the building perimeter (particularly along the east and south property boundary). Because of the variable depth of overburden soils and variable rock quality encountered along the east property line, we recommend that a sheeting system consisting of perimeter "soldier beams" with timber lagging (or spray applied concrete) between the soldier beams, be utilized. The sheeting system would be restrained by "tiebacks"; anchors drilled into the soil or rock beyond the face of the sheeting. The NYCTA will not permit pile driving to be done close to their facilities so the installation of the soldier piles will have to be done by drilling. SESI's additional scope of service (not part of this report) is to design the excavation restraint system for approval by NYCTA; this approval is a condition precedent to obtaining NYC Building Department approval for the project.

Depending on the sheeting system chosen, it may be necessary to stabilize the exposed rock excavation adjacent to and below the tips of the soldier beams by spray applied concrete and/or the installation of "soil nails" with a structural spray applied concrete facing. "Soil Nailing" is a method of stabilizing an excavated face by the drilling of relatively closely spaced steel reinforcing bars beyond the face of the excavation and embedding the reinforcing in cementitious grout. Anchoring a structural spray applied concrete facing to the soil nails stabilizes the exposed face. The soil nail installation is done as the excavation is advanced downward, in horizontal lifts, typically five-feet in height. If spray applied concrete is applied, positive drainage has to be installed, in the form of plastic geocomposite drainage media, between the rock face and the concrete.

Installation of the excavation restraint system will involve construction work east of the east building line, in the Fort George Hill west sidewalk area. In addition, a suitable construction fence needs to be erected along the west side of Fort George Hill with possible closures of the sidewalk to *pedestrian traffic if permitted by NYC DOT.*

After the site is stripped of existing asphalt, concrete paving, existing walls and other constructed facilities it will be necessary to construct an equipment access pad along the south boundary for the installation of the drilled soldier beams.

Soldier beam installation can proceed along the east boundary by drilling within the sidewalk area. After the soldier beams are installed the excavation would be advanced vertically downward and the timber lagging fastened to the soldier piles (or spray applied concrete used in lieu of lagging). Where tieback and/or soil nails are installed, drilling would be done as the excavation progress vertically downward.

If groundwater seepage is encountered during construction, gravel filled sumps with pumps should be installed below the subgrade elevation to allow for unwatering of the excavation.

Because of the weathered nature of the rock, we recommend that as the footing subgrade elevation is attained, "mud mat" concrete (approximately 4-6 inch thick) be placed to protect and seal the rock subgrade against further degradation.

Backfill in confined areas such as utility trenches and foundations walls should have a maximum particle size of 3 inches and the maximum amount of fines (percentage passing a No. 200 mesh sieve) should be 15% to help facilitate construction during wet weather. The "fines" should be non-plastic. The fill should be placed in maximum 6-inch thick layers and compacted to a minimum of 92 percent Modified Proctor Density (ASTM D 1557) and average of 95 percent density.

Foundation Design Criteria

Footings should be designed to be placed on natural soils or weathered rock proportioned for an average net allowable bearing pressure of 6.0 TSF (12,000 psf). Should sound rock be encountered during excavation in areas not explored by borings or rock probes it may be feasible to make redesigns for higher bearing pressures.

The floor slab for the lowest level cellar should be designed using a subgrade modulus of 175 pci, assuming that 6 inches of dense graded aggregate is placed beneath the slab.

The site soils have been classified as Site Class C for seismic design purposes in accordance with the NYC Building Code Tables 1616.3 (1) & (2). There is no potential for Soil Liquefaction at this site.

All retaining walls, including foundation walls, and the lowest level slab on grade should be provided with positive drainage to preclude hydrostatic pressures from developing. The drainage shall be collected and disposed of by means of an approved drainage system in compliance with the New York City Plumbing Code.

All retaining walls, including foundation walls shall be designed for a trapezoidal distributed load varying with the height of the wall from the bottom of the foundation to the final grade ("H" in feet). The design pressure at the base of the wall shall be 65H psf and the design pressure at the top of the wall shall be 300 psf.

Foundations at the north end of the building which fall within a line of influence 1.5:1 (H: V) from the invert of the existing sewer should be designed on deep foundations. The foundations may be designed as drilled in place "Caisson Piles in Soil" in accordance with provisions of New York City Building Code section 1810.7.9. It should be anticipated that load testing of at least one of the Caisson Piles would be required.

TESTING REQUIREMENTS

The New York City Building Code of July 2008 requires Special Inspections of the following items during the foundation construction:

- *Excavation –Sheeting Shoring and Bracing*
- *Soils-Site Preparation*
- *Soils-Fill placement & In-Place Density*
- *Pile Foundations & Drilled Pier Installation*

In addition the Code requires Progress Inspections during the construction of:

- *Footings and Foundation*

QUALITY ASSURANCE

The recommendations in the previous sections of this report are based on the assumptions that the site and building area preparation procedures will be completed under the full-time inspection of a qualified geotechnical engineer.

LIMITATIONS

The subsurface investigation performed identifies the subsurface conditions only at the locations of the test holes and at the depths where the samples were taken. SESI Consulting Engineers, PC reviews the published geologic data and the field and laboratory data and uses their professional judgment and experience to render an opinion on the subsurface conditions throughout the site. Because the actual subsurface conditions may differ, we recommend that SESI be retained to provide construction inspection in order to minimize the risks associated with unanticipated conditions.

This report should not be used:

- When the nature of the proposed structure is changed;
- When the size or configuration of the proposed structure is altered;
- When the location or orientation of the proposed structure is modified;
- When there is a change in ownership; or
- For application to an adjacent or any other site.

SESI shall not accept any responsibility for problems, which may occur if SESI is not consulted when there are changes to the factors considered in this report's development.

The boring and probe logs should not be separated from the Engineering Report in order to minimize the likelihood of boring and probe log misinterpretation.

DISCLAIMER

This Report was prepared by SESI for the sole and exclusive use of South Bronx Overall Economic Development Corporation. Nothing shall be construed to give any rights or benefits to anyone other than client, South Bronx Overall Economic Development Corporation and SESI, and all duties and responsibilities undertaken will be for the sole and exclusive benefit of South Bronx Overall Economic Development Corporation and SESI and not for the benefit of any other party. This Report has been prepared and issued subject to the express condition that same is not to be disseminated to anyone other than South Bronx Overall Economic Development Corporation, without the advance written consent of SESI (which SESI, in its sole discretion, is free to grant or withhold). Use of the Report by any other person is unauthorized and such use is at the sole risk of the user.

TABLE 1


SUMMARY OF SOIL DESIGN PARAMETERS

PARAMETER	VALUE
1. Allowable Bearing Capacity (net)	12,000 psf
2. Total Unit Weight (Onsite/Imported Soil)	125 pcf
3. Angle of Internal Friction - Backfill Against Structures	30 degrees
4. Earth Pressure Coefficient (See Note 1)	
Active Earth Pressure (Ka)	0.33
Earth Pressure @ Rest (Ko)	0.50
Passive Earth Pressure (Kp)	3.00
5. Coefficient of Sliding (concrete over soil/weathered rock)	0.40
6. Subgrade Modulus for Floor Slab Design (Granular Fill)	175 pci
7. Slopes (Permanent above water table)	
Maximum Cut Slope in Soil	2.5H:1V
Maximum Fill Slope in Soil	2.5H: 1V
8. Seismic Design Criteria- Site Class	C

Notes:

A drainage medium should be installed along all retaining and foundation walls and under lowest level cellar slab to avoid hydrostatic pressures from developing.

Compaction equipment used within 5± feet permanent walls should not weigh more than 5,000 pounds.

				PROJECT NAME: Fort George Hill		BORING NO. B-1					
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350					
						GROUND ELEVATION: 65.4					
BORING BY: ADT		DATE STARTED: 8/12/2008		GROUNDWATER TABLE DEPTH							
INSPECTOR: DP		DATE COMPLETED: 8/12/2008		0 Hr. N/A	Date N/A	24 Hr. N/A	Date N/A				
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0	ss	S-1	0	2	8	9	8	12	10"	Brown m-f SAND, some c-f Gravel, trace Silt (class 3b)	
5											
10	ss	S-2	5	7	6	8	8	12	12"	Brown m-f SAND, some m-f Gravel, trace Silt (class 3b)	
15	ss	S-3	10	12	10	11	30	69	8"	Highly Weathered Rock, Mica Schist with mica flake	15'
20	ss	S-4	15	15.10	50/1"				0"	Apparent Top of Sound Rock	
25	Core	C-1	20	25					1.5	MICA SCHIST	
									2	Orange/ black, medium to low hard, moderately to highly weathered, closely fractured, slightly broken	
									2.5	REC. = 60"/60" = 100.0%	
									2.5	RQD = 43"/60" = 71.7% (class 1b)	
30	Core	C-2	25	30					2.5	Ditto	
									3	REC. = 54"/60" = 90.0%	
									3.5	RQD = 37.8"/60" = 62.9% (class 1b)	
									3.5		
									4		
35										Boring Completed at 30 ft.	
40											


Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 2

				PROJECT NAME: Fort George Hill		BORING NO. B-2					
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350					
BORING BY: ADT				DATE STARTED: 8/21/2008		GROUNDWATER TABLE DEPTH					
INSPECTOR: DP				DATE COMPLETED: 8/22/2008		0 Hr. N/A	Date N/A	24 Hr. N/A	Date N/A		
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0	ss	S-1	0	2	9	7	6	7	12	3" Asphalt	
										Brown m-f SAND, some c-f Gravel, trace Silt	(class 3b)
5											
	ss	S-2	5	7	6	4	7	14	3	Brown m-f SAND, trace Gravel, trace Silt	(class 3b)
10											
	ss	S-3	10	12	23	17	24	26	12	Weathered Rock, Mica Schist	
15											
	ss	S-4	15	17	7	8	8	13	12	ditto	
20											
	ss	S-5	20	22	8	8	11	12	20	ditto	
25											
	ss	S-6	25	27	4	6	11	17	20	ditto	
30											
	ss	S-7	30	32	21	21	35	44	22	ditto	
35											
	ss	S-8	35	37	36	71	46	31	16	ditto	
40											


Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: - - - - -

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 3


				PROJECT NAME: Fort George Hill		BORING NO. B-2						
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
BORING BY: ADT				DATE STARTED: 8/21/2008		GROUNDWATER TABLE DEPTH						
INSPECTOR: DP				DATE COMPLETED: 8/22/2008		0 Hr. N/A	Date N/A					
DEPTH (ft)		METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
40				FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
45		ss	S-9	40	42	20	19	22	24	22	Weathered Rock, Mica Schist	
50		ss	S-10	45	45.2	50/2"				2	ditto	
55		ss	S-11	50	50.6	48	50/1"			7	ditto	
60		ss	S-12	55	56.2	38	70	50/2"		12	ditto	
65		Core	C-1	60	65					1	ditto	
										1		
										1.5		
										1.5	REC. = 8"/60" = 13.3%	
										2	RQD = 0"/60" = 0.0% (class 1d)	
70		ss	S-13	65	66	100				6		
75		ss	S-14	70	70.2	50/2"				14	Weathered Rock, Mica Schist	
80		ss	S-15	75	75.2	50/2"				2	ditto	

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: - - - - -

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 3


			PROJECT NAME:		Fort George Hill				BORING NO.		B-2					
			LOCATION:		1769 Fort George Hill, NY 10040				JOB NO.		N-7350					
					0				GROUND ELEVATION:		39.98					
BORING BY:ADT			DATE STARTED		8/21/2008				GROUNDWATER TABLE DEPTH							
INSPECTOR:DP			DATE COMPLETED		8/22/2008				0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL					
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24								
80	ss	S-16	80	82	51	54	38	97	12	Weathered Rock, Mica Schist						
85																
90	ss	S-17	85	85.25	50/3"				3	Boring Complete at 85.3 ft. (No Apparent Sound Rock Encountered)						
95																
100																
105																
110																
115																
120																

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/8 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 3

			PROJECT NAME: Fort George Hill		BORING NO. B-3						
			LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
BORING BY: ADT			DATE STARTED:		GROUNDWATER TABLE DEPTH						
INSPECTOR: DP			DATE COMPLETED:		0 Hr. N/A	Date N/A					
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0											
5									NOT DRILLED		
10											
15											
20											
25											
30											
35											
40											


Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1 3/4 in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size: NX	in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.


FIGURE 4

			PROJECT NAME:		Fort George Hill				BORING NO.		B-4					
			LOCATION:		1769 Fort George Hill, NY 10040				JOB NO.		N-7350					
BORING BY: ADT			DATE STARTED:		8/19/2008				GROUNDWATER TABLE DEPTH							
INSPECTOR: DP			DATE COMPLETED:		8/19/2008				0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL					
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24								
0	ss	S-1	0	2	8	7	4	4	12	3" Asphalt						
5										Brown m-f SAND, some c-f Gravel, trace Silt	(class 6)					
10	ss	S-2	5	7	5	8	13	18	14	Brown m-f SAND, trace Silt, trace Gravel	(class 3b)					
15	ss	S-3	10	12	10	19	18	15	18	Ditto	(class 3a)					
20	ss	S-4	15	17	27	10	11	12	12	Weathered Rock, Mica Schist						
25	ss	S-5	20	22	11	16	25	25	14							
30	ss	S-6	25	25.9	52	100/5"			10	Apparent Top of Sound Rock	25.9					
35	ss	S-7	30	30.1	100/1"				0							
40	Core	C-1	35	40					4	MICA SCHIST						
									3	Gray and black, high to medium hard, fresh weathered,						
									3	closely to medium fractured, massive to slightly broken						
									3	REC = 60"/60" = 100.0%						
									3.5	RQD = 35"/60" = 58.3% (class 1b)						

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	It is made available to authorized users only that they may have access to the same information available
Weight/type of Hammer on Drive Pipe	300 lb	to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations
Weight/type of Hammer on Split Barrel	140 lb	or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical
Drop of Hammer on Drive Pipe	in	engineers recommendations contained in the report from which these logs were extracted.
Core Size: NX	in	Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
Approximate Change in Strata: _____		Inferred Change in Strata: -----

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 5

				PROJECT NAME: Fort George Hill		BORING NO. B-4					
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350					
BORING BY: ADT				DATE STARTED: 8/19/2008		GROUNDWATER TABLE DEPTH					
INSPECTOR: DP				DATE COMPLETED: 8/19/2008		0 Hr. N/A	Date N/A				
DEPTH (ft)		METHOD	SAMPLE No.	DEPTH		Blows on Spoon		REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL	
				FROM (ft)	TO (ft)	0/6	6/12				12/18
40		Core	C-2	40	45			3	Ditto		
								3			
								3.5			
								3.5			
45								3.5			
									REC. = 59"/60" = 98.3%		
									RQD = 32"/60" = 53.3% (class 1b)		
50									Boring Complete at 45.0 ft.		
55											
60											
65											
70											
75											
80											


Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: - - - - -

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 5


		PROJECT NAME: Fort George Hill		BORING NO. B-5						
		LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
BORING BY: ADT		DATE STARTED: 8/8/2008		GROUNDWATER TABLE DEPTH						
INSPECTOR: DP		DATE COMPLETED: 8/8/2008		0 Hr. N/A	Date N/A					
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon	REC	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL		
			FROM (ft)	TO (ft)					0/6	6/12
0		S-1	0	2	5	6	10	10	18"	8" Concrete Brown m-f SAND, some c-f Gravel, trace Silt (class 3b)
5										
		S-2	5	5.1	50/1"				0	Boring completed at 5.1 ft. Obstruction (Moved Boring 5' South)
10										
15										
20										
25										
30										
35										
40										

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/8 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 6

			PROJECT NAME:		Fort George Hill				BORING NO.		B-5A					
			LOCATION:		1769 Fort George Hill, NY 10040				JOB NO.		N-7350					
									GROUND ELEVATION:		64.31					
BORING BY:ADT			DATE STARTED:		8/8/2008				GROUNDWATER TABLE DEPTH							
INSPECTOR:DP			DATE COMPLETED:		8/11/2008				0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL					
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24								
5	ss	S-1	6	8	6	5	5	8	12"	8" Concrete						
										Brown m-f SAND with, trace Gravel, trace Silt	(class 6)					
10																
	ss	S-2	10	12	3	6	6	8	18"	Brown m-f SAND, and Silt, trace Gravel	(class 6)					
15																
	ss	S-3	15	17	20	30	25	28	10	Weathered Rock, Mica Schist						
20																
	ss	S-4	20	20.3	50/4"				4	Apparent Top of Sound Rock	20.3'					
25																
	Core	C-1	25	30					2	MICA SCHIST						
									2.5	Orange and Black, medium to low hard, highly to						
									2.5	completely weathered, closely fractured, slightly to broken						
									2.5	REC. = 5"/60" = 8.3%						
									2.5	RQD = 0"/60" = 0% (class 1d)						
30																
	Core	C-2	30	35					1.5	Ditto						
									2	REC. = 49.5"/60" = 82.5%						
									2.5	RQD = 25"/60" = 41.7% (class 1c)						
									3							
									3.5							
35																
	Core	C-3	35	40					1	Ditto						
									0.5	REC. = 47"/60" = 78.3%						
									1	RQD = 38.4"/60" = 64.1% (class 1b)						
									1.5							
40									2							
	Core	C-4	40	45					1.5	Ditto						
									2	REC. = 30"/60" = 50.0%						
									2	RQD = 25"/60" = 41.7% (class 1c)						
									2.5							
45									2.5	Boring complete at 45.0 ft.						


Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/8 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 6A

			PROJECT NAME: Fort George Hill		BORING NO. B-6						
			LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
BORING BY: ADT			DATE STARTED:		GROUNDWATER TABLE DEPTH						
INSPECTOR: DP			DATE COMPLETED:		0 Hr. N/A	Date N/A					
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0											
5									NOT DRILLED		
10											
15											
20											
25											
30											
35											
40											


Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/8 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: - - - - -

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 7


		PROJECT NAME: Fort George Hill		BORING NO. B-7				
		LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350				
BORING BY: ADT		DATE STARTED:		GROUNDWATER TABLE DEPTH				
INSPECTOR: DP		DATE COMPLETED:		0 Hr. N/A	Date N/A			
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon	REC	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)				
0								
5							NOT DRILLED	
10								
15								
20								
25								
30								
35								
40								

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Split Barrel Sampler	1 3/8 in	It is made available to authorized users only that they may have access to the same information available
Weight/type of Hammer on Drive Pipe	300 lb	to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations
Weight/type of Hammer on Split Barrel	140 lb	or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical
Drop of Hammer on Drive Pipe	in	engineers recommendations contained in the report from which these logs were extracted.
Core Size: NX	in	Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 8

			PROJECT NAME: Fort George Hill		BORING NO. B-8						
			LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
BORING BY: ADT			DATE STARTED: 8/20/2008		GROUNDWATER TABLE DEPTH						
INSPECTOR: DP			DATE COMPLETED: 8/20/2008		0 Hr. N/A	Date N/A					
					24 Hr. N/A	Date N/A					
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0	ss	S-1	0	2	3	4	7	6	12	Brown m-f SAND, little c-f Gravel, little Silt	(class 6)
5											
	ss	S-2	5	7	2	3	2	3	8	Brown m-f SAND, trace Gravel, trace Silt	(class 6)
10											
	ss	S-3	10	12	4	6	7	9	8	Ditto	(class 3b)
15											
	ss	S-4	15	17	11	17	18	16	10	Ditto	(class 3a)
20											
	ss	S-5	20	22	8	11	13	10	10	Weathered Rock, Mica Schist	
25											
	ss	S-6	25	27	9	17	23	34	12		
30											
	ss	S-7	30	32	22	35	32	65	8		
35											
	ss	S-8	35	37	35	26	42	55	22		
40											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Split Barrel Sampler	1 1/4 in	It is made available to authorized users only that they may have access to the same information available
Weight/type of Hammer on Drive Pipe	300 lb	to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations
Weight/type of Hammer on Split Barrel	140 lb	or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical
Drop of Hammer on Drive Pipe	in	engineers recommendations contained in the report from which these logs were extracted.
Core Size: NX	in	Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 9

SESI CONSULTING ENGINEERS			PROJECT NAME:		Fort George Hill				BORING NO.		B-8					
			LOCATION:		1769 Fort George Hill, NY 10040				JOB NO.		N-7350					
									GROUND ELEVATION:		45.8					
BORING BY:ADT			DATE STARTED		8/20/2008				GROUNDWATER TABLE DEPTH							
INSPECTOR:DP			DATE COMPLETED		8/20/2008				0 Hr. N/A		Date N/A		24 Hr. N/A		Date N/A	
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL					
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24								
40	ss	S-9	40	40.25	50/3"				3	Apparent Top of Sound Rock	40.25					
45	Core	C-1	45	50					3	MICA SCHIST						
50									4	Gray and Black, medium to low hard, slightly weathered,						
									4	closely fractured, slightly broken						
									2	REC. = 57"/60" = 95.0%						
									2	RQD = 26.5"/60" = 44.2% (class 1c)						
55	Core	C-2	50	55						Ditto						
										REC. = 36"/60" = 60.0%						
										RQD = 18.5"/60" = 30.8% (class 1d)						
60										Boring Complete at 55.0 ft.						
65																
70																
75																
80																

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/8 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size	in	
Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod		
Approximate Change in Strata: _____		Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 9


SESI CONSULTING ENGINEERS			PROJECT NAME:		Fort George Hill				BORING NO.		B-9					
			LOCATION:		1769 Fort George Hill, NY 10040				JOB NO.		N-7350					
									GROUND ELEVATION:		61.84					
BORING BY:ADT			DATE STARTED:		8/12/2008				GROUNDWATER TABLE DEPTH							
INSPECTOR:DP			DATE COMPLETED:		8/12/2008				0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL					
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24								
0	ss	S-1	0	2	16	17	12	5	14"	3" Asphalt						
										Brown m-f SAND, some c-f Gravel, trace Silt	(class 3b)					
5																
	ss	S-2	5	7	5	7	7	9	18"	Brown m-f SAND, some Silt, trace Gravel	(class 3b)					
10																
	ss	S-3	10	12	10	12	13	13	12"	Weathered Rock						
15																
	ss	S-4	15	15.1	50/2"				1"	Apparent Top of Sound Rock	15.1					
20																
	Core	C-1	20	25					1	MICA SCHIST						
									2	Orange and black, medium to low hard, moderately to						
									2	completely weathered, closely fractured, slightly to broken						
									2.5	REC. = 53"/60" = 88.3%						
25									3	RQD = 26"/60" = 43.3% (class 1c)						
	Core	C-2	25	30					0.5	Ditto						
									1							
									1.5							
									2	REC. = 55"/60" = 91.7%						
30									2	RQD = 6"/60" = 10.0% (class 1d)						
	Core	C-3	30	35					2	Ditto						
									2							
									2.5							
									2.5	REC. = 28"/60" = 46.7%						
35									3	RQD = 6"/60" = 10.0% (class 1d)						
										Boring Complete at 35 ft.						
40																

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Split Barrel Sampler	1 3/8 in	It is made available to authorized users only that they may have access to the same information available
Weight/type of Hammer on Drive Pipe	300 lb	to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations
Weight/type of Hammer on Split Barrel	140 lb	or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical
Drop of Hammer on Drive Pipe	in	engineers recommendations contained in the report from which these logs were extracted.
Core Size: NX	in	Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 10

			PROJECT NAME:		Fort George Hill				BORING NO.		B-10					
			LOCATION:		1769 Fort George Hill, NY 10040				JOB NO.		N-7350					
									GROUND ELEVATION:		57.5					
BORING BY:ADT			DATE STARTED:		8/13/2008				GROUNDWATER TABLE DEPTH							
INSPECTOR:DP			DATE COMPLETED:		8/13/2008				0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL					
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24								
0	ss	S-1	0	2	4	3	5/0"		12"	3" Asphalt						
										Brown m-f SAND, some c-f Gravel, trace Silt	(class 6)					
5																
	ss	S-2	5	7	5	7	8	6	4"	Brown c-f SAND, trace Silt, trace Gravel	(class 3)					
10																
	ss	S-3	10	12	11	7	7	7	0"	Ditto	(class 3)					
15																
	ss	S-4	15	17	9	14	18	26	14"	Weathered Rock						
20																
	ss	S-5	20	22	26	25	36	48	12"	Ditto						
25																
	ss	S-6	25	27	12	16	18	25	18"	Ditto						
30																
	ss	S-7	30	30.6	20	60/2"			8"	Ditto						
35																
	ss	S-8	35	35.9	69	50/4"			6"	Ditto						
40																

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

SESI CONSULTING ENGINEERS			PROJECT NAME: Fort George Hill		BORING NO. B-10						
			LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
					GROUND ELEVATION: 57.50						
BORING BY: ADT			DATE STARTED: 8/13/2008		GROUNDWATER TABLE DEPTH						
INSPECTOR: DP			DATE COMPLETED: 8/13/2008		0 Hr. N/A	Date N/A					
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
40	ss	S-9	40	40.9	21	50/4"			6"	Apparent Top of Sound Rock	40.9
45											
50	Core	C-1	45	50					2	MICA SCHIST	
									2.5	Gray and black, high to medium hard, fresh weathered,	
									3.5	closely fractured, slightly broken	
									5	REC. = 57"/60" = 95.0%	
									8	RQD = 12"/60" = 20.0% (class 1d)	
55	Core	C-2	50	55					4	Ditto	
									5		
									8		
									8.5	REC. = 60"/60" = 100.0%	
									9	RQD = 21.5"/60" = 35.9% (class 1c)	
60										Boring completed at 55 ft.	
65											
70											
75											
80											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Split Barrel Sampler	1 3/4 in	It is made available to authorized users only that they may have access to the same information available
Weight/type of Hammer on Drive Pipe	300 lb	to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations
Weight/type of Hammer on Split Barrel	140 lb	or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical
Drop of Hammer on Drive Pipe	in	engineers recommendations contained in the report from which these logs were extracted.
Core Size: NX	in	Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

SESI CONSULTING ENGINEERS			PROJECT NAME:		Fort George Hill				BORING NO.		P-1	
BORING BY: ADT			LOCATION:		1769 Fort George Hill, NY 10040				JOB NO.		N-7350	
INSPECTOR: DP			DATE STARTED:		8/6/2008				GROUNDWATER TABLE DEPTH			
			DATE COMPLETED:		8/6/2008				0 Hr. N/A		Date N/A	
									24 Hr. N/A		Date N/A	
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL	
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24				
0	ss	S-1	0	2	3	6	5	5	18"	Brown m-f SAND, some c-f Gravel, trace Silt (class 6)		
5												
	ss	S-2	5	7	6	6	7	11	24"	Highly Weathered Rock, Mica Schist with mica flake		
10												
	ss	S-3	10	12	10	11	14	12	12"	Weathered Rock		
15											15'	
	Core	C-1	15	20					2.5	Apparent Top of Sound Rock - MICA SCHIST		
									3.5	Gray and black, high to medium hard, fresh weathered,		
									3.5	closely fractured, slightly broken		
									4	REC. = 58"/60" = 96.9%		
20									4.5	RQD = 36.5"/60" = 60.8% (class 1b)		
	Core	C-2	20	25					3	Ditto		
									4			
									3.5			
									3.5	REC. = 50"/60" = 98.3%		
25									4	RQD = 31.5"/60" = 52.5% (class 1b)		
										Boring completed at 25 ft.		
										*Probe changed to a boring		
30												
35												
40												

Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1 3/8 in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size: NX	in


The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 12

				PROJECT NAME: Fort George Hill				BORING NO. P-2							
				LOCATION: 1769 Fort George Hill, NY 10040				JOB NO. N-7350							
BORING BY: ADT				DATE STARTED: 8/7/2008				GROUNDWATER TABLE DEPTH							
INSPECTOR: DP				DATE COMPLETED: 8/7/2008				0 Hr. N/A		Date N/A		24 Hr. N/A		Date N/A	
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL				
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24							
0	Probe		0	29						5" Concrete Soil					
5															
10															
15										Weathered Rock					
20															
25										Apparent Top of Sound Rock	24				
30															
35										Probe completed at 29 ft.					
40															


Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1 1/2 in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size: NX	in

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 13


				PROJECT NAME: Fort George Hill		BORING NO. P-3					
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350					
BORING BY: ADT				DATE STARTED: 8/7/2008		GROUNDWATER TABLE DEPTH					
INSPECTOR: DP				DATE COMPLETED: 8/7/2008		0 Hr. N/A	Date N/A				
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0	Probe		0	26						8" Concrete Soil	
5											
10											
15										Weathered Rock	
20											20
25										Apparent Top of Sound Rock	
30										Probe completed at 26 ft.	
35											
40											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 14


				PROJECT NAME: Fort George Hill		BORING NO. P-4				
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350				
BORING BY: ADT				DATE STARTED: 8/8/2008		GROUNDWATER TABLE DEPTH				
INSPECTOR: DP				DATE COMPLETED: 8/8/2008		0 Hr. N/A	Date N/A			
DEPTH (ft)		METHOD	SAMPLE No.	DEPTH		Blows on Spoon		REC	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
0				FROM (ft)	TO (ft)	0/6	6/12			
5		Probe		0	30				8" Concrete Soil	
10										
15									Weathered Rock	
20										
25									Apparent Top of Sound Rock	24
30										
35									Probe completed at 30 ft.	
40										

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: - - - - -

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 15

				PROJECT NAME: Fort George Hill		BORING NO. P-5				
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350				
BORING BY: ADT				DATE STARTED: 8/14/2008		GROUNDWATER TABLE DEPTH				
INSPECTOR: DP				DATE COMPLETED: 8/14/2008		0 Hr. N/A	Date N/A			
DEPTH (ft)		METHOD	SAMPLE No.	DEPTH		Blows on Spoon		REC	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
0				FROM (ft)	TO (ft)	0/6	6/12			
5		Probe		0	47				8" Concrete Soil	
10										
15									Weathered Rock	
20										
25										
30										
35										
40										


Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 16


			PROJECT NAME: Fort George Hill		BORING NO. P-5						
			LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
BORING BY: ADT			DATE STARTED: 8/14/2008		GROUNDWATER TABLE DEPTH						
INSPECTOR: DP			DATE COMPLETED: 8/14/2008		0 Hr. N/A	Date N/A					
					24 Hr. N/A	Date N/A					
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
40										Apparent Top of Sound Rock	40
45											
50										Probe Complete at 47.0 ft.	
55											
60											
65											
70											
75											
80											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/8 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 16


				PROJECT NAME: Fort George Hill		BORING NO. P-6					
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350					
						GROUND ELEVATION: 60.99					
BORING BY: ADT		DATE STARTED: 8/11/2008		GROUNDWATER TABLE DEPTH							
INSPECTOR: DP		DATE COMPLETED: 8/11/2008		0 Hr. N/A	Date N/A	24 Hr. N/A	Date N/A				
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0	Probe		0	30						8" Concrete Soil	
5											
10											
15										Weathered Rock	
20											
25										Apparent Top of Sound Rock	23
30											
35										Probe completed at 30 ft.	
40											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.


				PROJECT NAME: Fort George Hill		BORING NO. P-7				
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350				
BORING BY: ADT				DATE STARTED: 8/26/2008		GROUNDWATER TABLE DEPTH				
INSPECTOR: DP				DATE COMPLETED: 8/26/2008		0 Hr. N/A	Date N/A			
DEPTH (ft)		METHOD	SAMPLE No.	DEPTH		Blows on Spoon		REC	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
0				FROM (ft)	TO (ft)	0/6	6/12			
5		Probe		0	50				4" Asphalt Soil	
10										
15										
20									Weathered Rock	
25										
30										
35										
40										

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: - - - - -


Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

		PROJECT NAME: Fort George Hill		BORING NO. P-7							
		LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350							
				GROUND ELEVATION: 52.11							
BORING BY: ADT		DATE STARTED: 8/26/2008		GROUNDWATER TABLE DEPTH							
INSPECTOR: DP		DATE COMPLETED: 8/26/2008		0 Hr. N/A	Date N/A						
				24 Hr. N/A	Date N/A						
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
40											
45										Apparent Top of Sound Rock	44
50											
55										Probe completed at 50.0 ft.	
60											
65											
70											
75											
80											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client.
Nominal I.D. of Split Barrel Sampler	1 3/4 in	It is made available to authorized users only that they may have access to the same information available
Weight/type of Hammer on Drive Pipe	300 lb	to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations
Weight/type of Hammer on Split Barrel	140 lb	or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical
Drop of Hammer on Drive Pipe	in	engineers recommendations contained in the report from which these logs were extracted.
Core Size	in	Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.


		PROJECT NAME: Fort George Hill		BORING NO. P-8				
		LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350				
BORING BY: ADT		DATE STARTED: 8/14/2008		GROUNDWATER TABLE DEPTH				
INSPECTOR: DP		DATE COMPLETED: 8/15/2008		0 Hr. N/A	Date N/A			
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon	REC	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)				
0	Probe		0	46			3" Asphalt Soil	
5								
10								
15							Weathered Rock	
20								
25								
30								
35								
40								

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 3/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
 Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.


FIGURE 19

			PROJECT NAME: Fort George Hill		BORING NO. P-8						
			LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
BORING BY: ADT			DATE STARTED: 8/14/2008		GROUNDWATER TABLE DEPTH						
INSPECTOR: DP			DATE COMPLETED: 8/15/2008		0 Hr. N/A	Date N/A					
					24 Hr. N/A	Date N/A					
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
40										Apparent Top of Sound Rock	40
45											
50										Boring Complete at 47.0 ft.	
55											
60											
65											
70											
75											
80											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted. Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
Nominal I.D. of Split Barrel Sampler	1 3/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size	in	

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.


				PROJECT NAME: Fort George Hill		BORING NO. P-9					
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350					
BORING BY: ADT				DATE STARTED: 8/15/2008		GROUNDWATER TABLE DEPTH					
INSPECTOR: DP				DATE COMPLETED: 8/15/2008		0 Hr. N/A	Date N/A				
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0	Probe		0	41						3" Asphalt Soil	
5											
10											
15										Weathered Rock	
20											
25											
30											
35										Apparent Top of Sound Rock	34
40											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted. Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
Nominal I.D. of Split Barrel Sampler	1 3/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 20

		PROJECT NAME: Fort George Hill		BORING NO. P-9				
		LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350				
BORING BY: ADT		DATE STARTED: 8/15/2008		GROUNDWATER TABLE DEPTH				
INSPECTOR: DP		DATE COMPLETED: 8/15/2008		0 Hr. N/A	Date N/A			
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon	REC	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)				
40								
							Probe Complete at 41.0 ft.	
45								
50								
55								
60								
65								
70								
75								
80								


Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 20


				PROJECT NAME: Fort George Hill		BORING NO. P-10					
				LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350					
BORING BY: ADT				DATE STARTED: 8/18/2008		GROUNDWATER TABLE DEPTH					
INSPECTOR: DP				DATE COMPLETED: 8/18/2008		0 Hr. N/A	Date N/A				
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
0	Probe		0	54						3" Asphalt Soil	
5											
10											
15										Weathered Rock	
20											
25											
30											
35											
40											

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

			PROJECT NAME: Fort George Hill		BORING NO. P-10						
			LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350						
BORING BY: ADT			DATE STARTED: 8/18/2008		GROUND ELEVATION: 47.1						
INSPECTOR: DP			DATE COMPLETED: 8/18/2008		GROUNDWATER TABLE DEPTH						
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24			
40											
45											
50									Apparent Top of Sound Rock	48	
55									Probe Complete at 54.0 ft.		
60											
65											
70											
75											
80											

Nominal I.D. of Hole	in
Nominal I.D. of Split Barrel Sampler	1 3/4 in
Weight/type of Hammer on Drive Pipe	300 lb
Weight/type of Hammer on Split Barrel	140 lb
Drop of Hammer on Drive Pipe	in
Core Size	in


The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 21


		PROJECT NAME: Fort George Hill		BORING NO. P-11				
		LOCATION: 1769 Fort George Hill, NY 10040		JOB NO. N-7350				
BORING BY: ADT		DATE STARTED: 8/18/2008		GROUNDWATER TABLE DEPTH				
INSPECTOR: DP		DATE COMPLETED: 8/19/2008		0 Hr. N/A	Date N/A			
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon	REC	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL
			FROM (ft)	TO (ft)				
0	Probe		0	24			3" Asphalt Soil	
5								
10								
15							Weathered Rock	
20							Apparent Top of Sound Rock	19
25								
30							Probe Complete at 24.0 ft.	
35								
40								

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted. Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod
Nominal I.D. of Split Barrel Sampler	1 3/4 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 22

			PROJECT NAME:		Fort George Hill				BORING NO.		P-12					
			LOCATION:		1769 Fort George Hill, NY 10040				JOB NO.		N-7350					
BORING BY:ADT			DATE STARTED:		8/25/2008				GROUNDWATER TABLE DEPTH							
INSPECTOR:DP			DATE COMPLETED:		8/26/2008				0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A
DEPTH (ft)	METHOD	SAMPLE No.	DEPTH		Blows on Spoon				REC (in)	SOIL DESCRIPTION AND STRATIFICATION	SYMBOL					
			FROM (ft)	TO (ft)	0/6	6/12	12/18	18/24								
0	ss	S-1	0	2	15	14	10	10	12	4" Asphalt						
										Brown c-f SAND, some c-f Gravel, little Silt	(class 3)					
5																
	ss	S-2	5	7	5	14	19	12	14	Ditto	(class 2)					
10																
	ss	S-3	10	12	12	8	5	6	14	Ditto	(class 3)					
15																
	ss	S-4	15	17	12	45	50/1"		0	Weathered Rock						
20											20					
	ss	S-5	20	22	50/1"					Apparent Top of Sound Rock						
25																
	Core	25	30						4	MICA SCHIST						
									3	Gray and black, high to medium hard, slightly weathered,						
									3	medium to closely fractured, massive to slightly broken						
									3	REC. = 47"/60" = 78.3%						
30									3.5	RQD = 46.5"/60" = 77.5% (class 1b)						
	Core	30	35						3	Ditto						
									3							
									3							
									3.5	REC. = 57"/60" = 95.0%						
35									3.5	RQD = 49.5"/60" = 82.5% (class 1b)						
										Boring Complete at 35.0 ft.						
										*Probe changed to a boring						
40																

Nominal I.D. of Hole	in	The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted.
Nominal I.D. of Split Barrel Sampler	1 1/2 in	
Weight/type of Hammer on Drive Pipe	300 lb	
Weight/type of Hammer on Split Barrel	140 lb	
Drop of Hammer on Drive Pipe	in	
Core Size: NX	in	

Approximate Change in Strata: _____ Inferred Change in Strata: _____

Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE 23

Definitions of Identification Terms for Granular Soils

Our experience has shown that the following field identification system, which is patterned somewhat after the Burmister System, permits a more detailed breakdown of the components within a soil sample than other identification systems allow. It also compels the supervising technician to examine a sample quite closely in order to accurately describe the components within the sample.

Principal Component (All Capitalized)

- GRAVEL More than 50% of the sample by weight is Gravel
- SAND More than 50% of the sample by weight is Sand
- SILT More than 50% of the sample by weight is Silt

Minor Component (Proper Case)

- Gravel Less than 50% of the sample by weight is Gravel
- Sand Less than 50% of the sample by weight is Sand
- Silt Less than 50% of the sample by weight is Silt

Proportion Terms

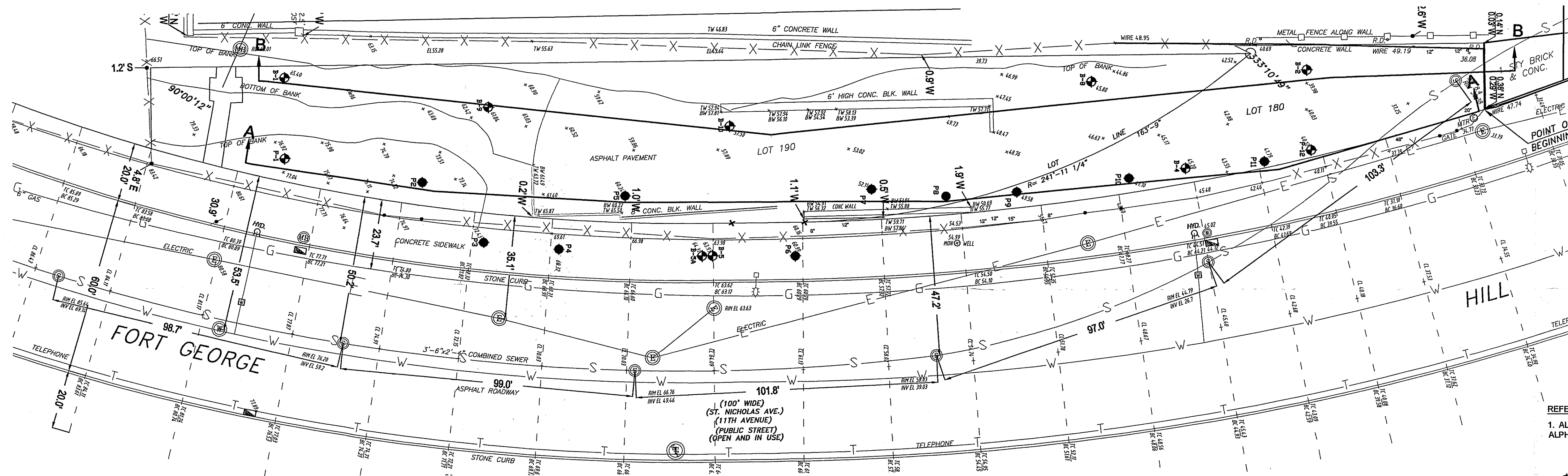
- and Component ranges from 35% to 50% of the sample by weight
- some Component ranges from 20% to 35% of the sample by weight
- little Component ranges from 10% to 20% of the sample by weight
- trace Component ranges from 0% to 10% of the sample by weight

Size of Soil Components

- Gravel
 - Coarse gravel ranges from 3 inches to 1 inch
 - Medium gravel ranges from 1 inch to 3/8 inch
 - Fine gravel ranges from 3/8 inch to No. 10 sieve
- Sand
 - Coarse sand ranges from No. 10 sieve to No. 30 sieve
 - Medium sand ranges from No. 30 sieve to No. 60 sieve
 - Fine sand ranges from No. 60 sieve to No. 200 sieve
- Silt
 - Material which passes the No. 200 sieve
- Clay
 - Material which passes the No. 200 sieve
 - Exhibits varying degrees of plasticity

Gradation Designations

- Coarse to fine (c-f) All fractions greater than 10% of the component
- Coarse to medium (c-m) Less than 10% of the component is fine
- Medium to fine (m-f) Less than 10% of the component is coarse
- Coarse (c) Less than 10% of the component is medium and fine
- Medium (m) Less than 10% of the component is coarse and fine
- Fine (f) Less than 10% of the component is coarse and medium

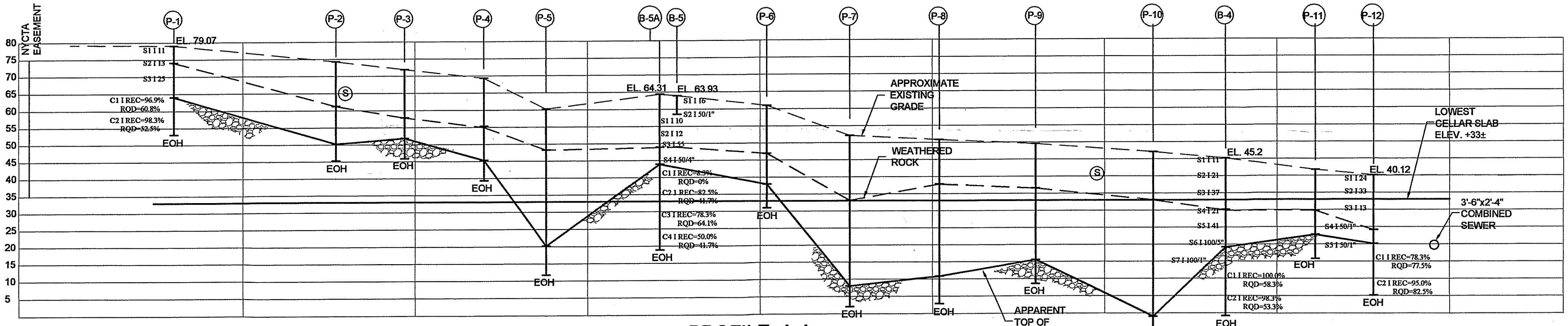


PLAN
SCALE: 1" = 20'

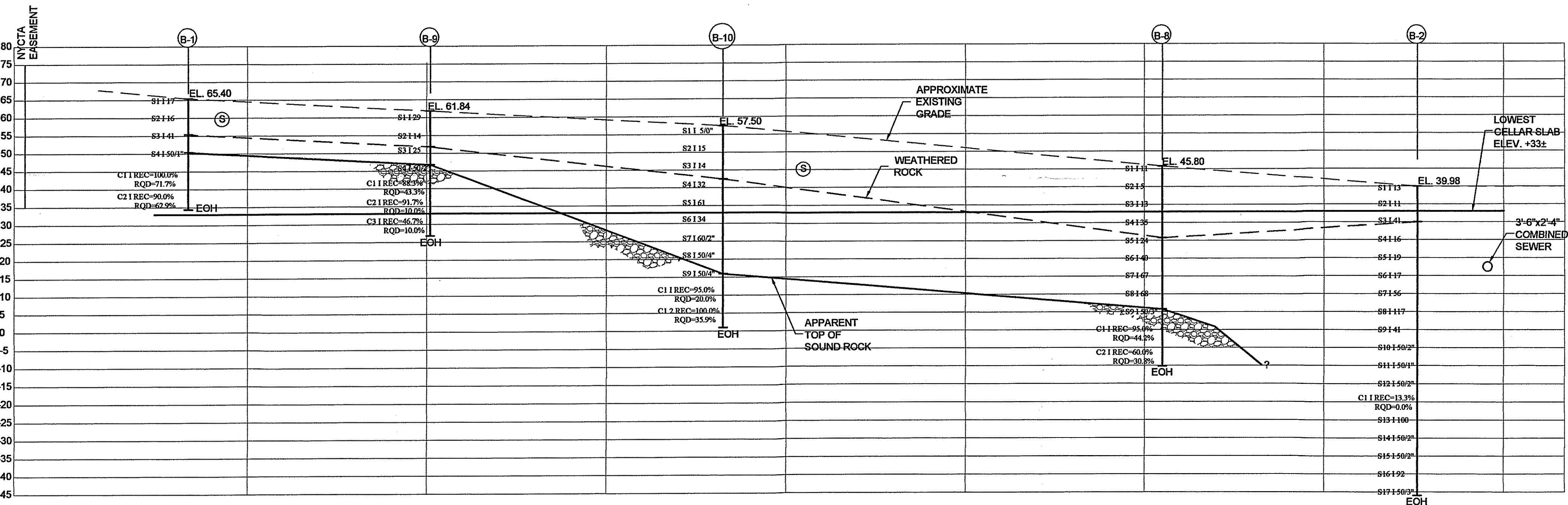
REFERENCE
1. ALL SURVEY INFORMATIONS ARE TAKEN FROM 'SURVEY' PREPARED BY ALPHONSE PESRE, JR. PROFESSIONAL LAND SURVEYOR. DATED AUGUST 21, 2008.

- B-2 - BORING NO. & APPROX. LOCATION
- P-2 - ROCK PROBE NO. & APPROX. LOCATION
- NYCTA STRUCTURE LINE
- PROPERTY LINE
- PROPOSED BUILDING LINE

NOTE:
PROBES P-1 & P-12 WERE CONVERTED TO BORINGS IN THE FIELD
NO AS - BUILT SURVEY LOCATION WAS DONE FOR PROBE P-8
ELEVATION FOR P-8 WAS INTERPOLATED FROM ADJACENT PROBES



PROFILE A-A
SCALE: 1" = 20'



PROFILE B-B
SCALE: 1" = 20'

LEGEND:
⊙ SANDS & GRAVEL LOOSE TO DENSE

THE FOLLOWING BORING & PROBE LOCATIONS WERE INACCESSIBLE
Ⓟ, Ⓟ, Ⓟ

© SESI CONSULTING ENGINEERS, PC 2008
This drawing and all information contained herein is proprietary information of SESI CONSULTING ENGINEERS, PC and may not be copied or reproduced, either in whole or in part, by any method, without written permission of SESI CONSULTING ENGINEERS, PC.

Project:	1769 FORT GEORGE HILL NEW YORK, NY 10040
Job no.:	7350
Drawing no.:	

dwg by:	JA
chk by:	AS SHOWN
scale:	
date:	9/24/08

SESI SOILS / FOUNDATIONS
CONSULTING ENGINEERS, P.C. ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, N.J. 07058 PH: 973-808-8050

JAY ADAM, P.E.
PROFESSIONAL ENGINEER
N.Y. LIC. NO. 45986

1769 FORT GEORGE HILL
NEW YORK, NY 10040
PROFILE
drawing title:

FIGURE 1