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

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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.

te Site Description	Location	Site Type/Time Period
-		
Muscoota/Inwood	196 th -219 th Sts. bet Seaman	Probably Woodland
	Ave. and Academy St.	
Seaman Ave. Indian Burial	204 th -207 th Sts., Seaman	Village
Ground/Village Site	Ave., Cooper St., Academy	Middle Woodland
	St.	
Nagle House (Century	213^{th} St. and	Precontact through 19 th
House)	Harlem River	century
Harlem River Shell heaps	209-211 th Sts. East of 10 th	Shell midden
(dog burials),	Ave., near Harlem River	Late Woodland
Brook Crossing Camp Site	194 th St. and Broadway	Camp
		Woodland
Inwood Station	Tubby Hook	Shell midden
Site/Dyckman St. Site		Woodland
("Tubby Hook")		
213 th St. Village Site	213 th St.	Village
		Archaic
Inwood Park Rockshelters	Just north of Tubby Hook	Rock shelters with
		shell heaps at northern end
		Unknown precontact
"Shorakapkok"/Cold Spring	207 th St. and Broadway	Cave and shell midden
		Archaic-Woodland
"Isham's Garden"	Isham St. and Seaman Ave.	Shell midden
		Unknown precontact
	Seaman Ave. Indian Burial Ground/Village Site Nagle House (Century House) Harlem River Shell heaps (dog burials), Brook Crossing Camp Site Inwood Station Site/Dyckman St. Site ("Tubby Hook") 213 th St. Village Site Inwood Park Rockshelters "Shorakapkok"/Cold Spring	Ave. and Academy St.Seaman Ave. Indian Burial Ground/Village Site204 th -207 th Sts., Seaman Ave., Cooper St., Academy St.Nagle House (Century House)213 th St. and Harlem RiverHarlem River Shell heaps (dog burials),209-211 th Sts. East of 10 th Ave., near Harlem RiverBrook Crossing Camp Site194 th St. and BroadwayInwood Site/Dyckman St. Site ("Tubby Hook")Tubby Hook213 th St. Village Site213 th St.Inwood Park RocksheltersJust north of Tubby Hook"Shorakapkok"/Cold Spring207 th St. and Broadway

Table 1. NYSOPRHP Sites Identified

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
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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.

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

 Table 3. NYS OPRHP Historical Sites

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.

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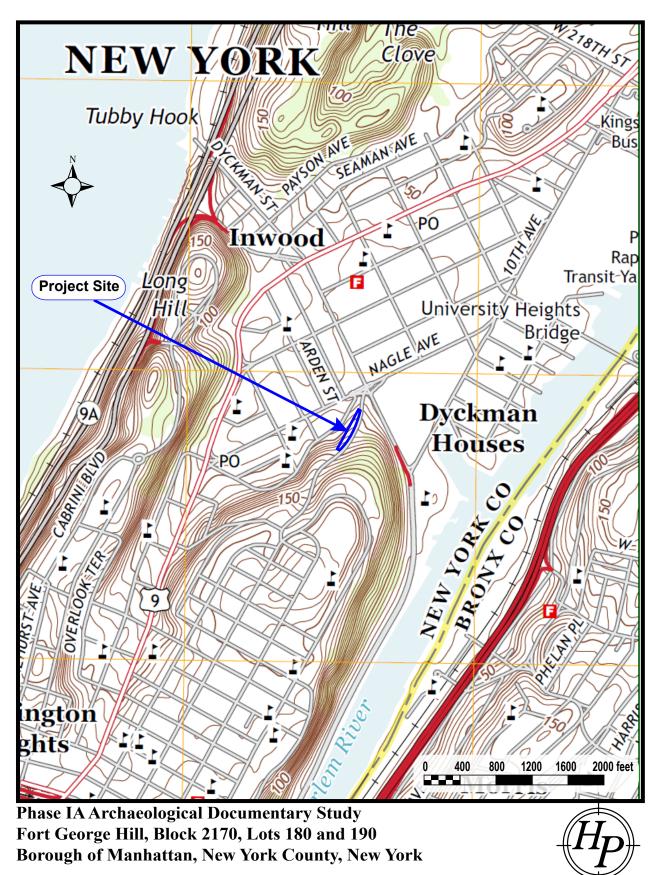
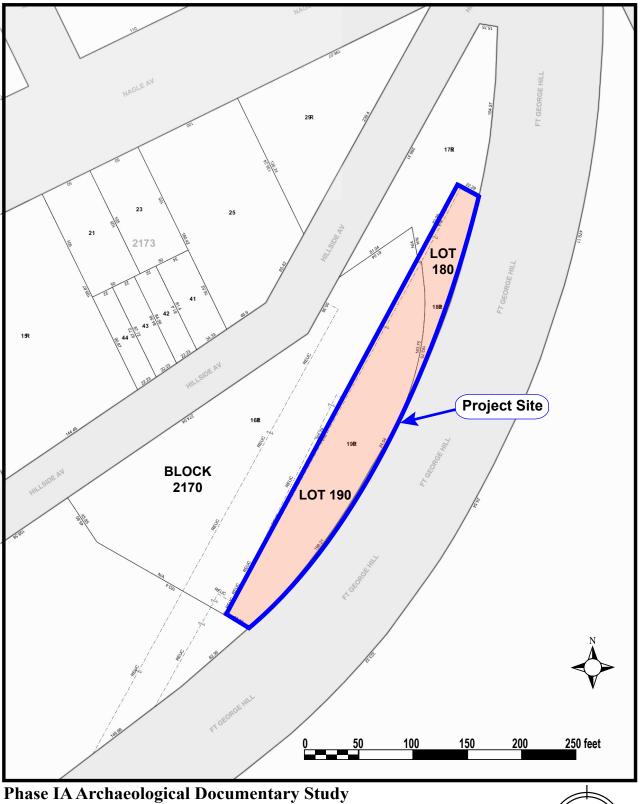


Figure 1: Project Site on *Central Park, NY-NJ 7.5 Minute Topographical Map* (USGS 2013).



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

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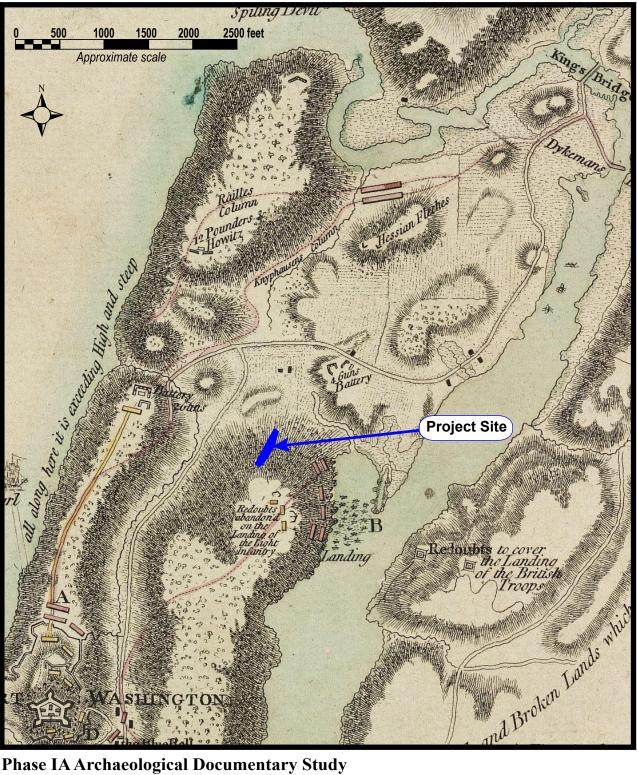
Figure 2: Project Site on Tax Map (2013).



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).

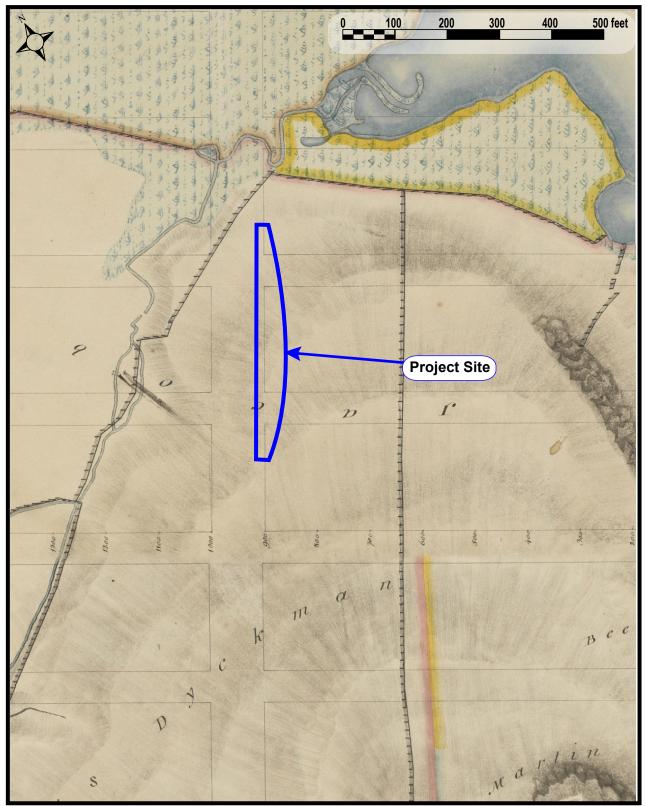




Phase IA Archaeological Documentary Study Fort George Hill, Block 2170, Lots 180 and 190 Borough of Manhattan, New York County, New York

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

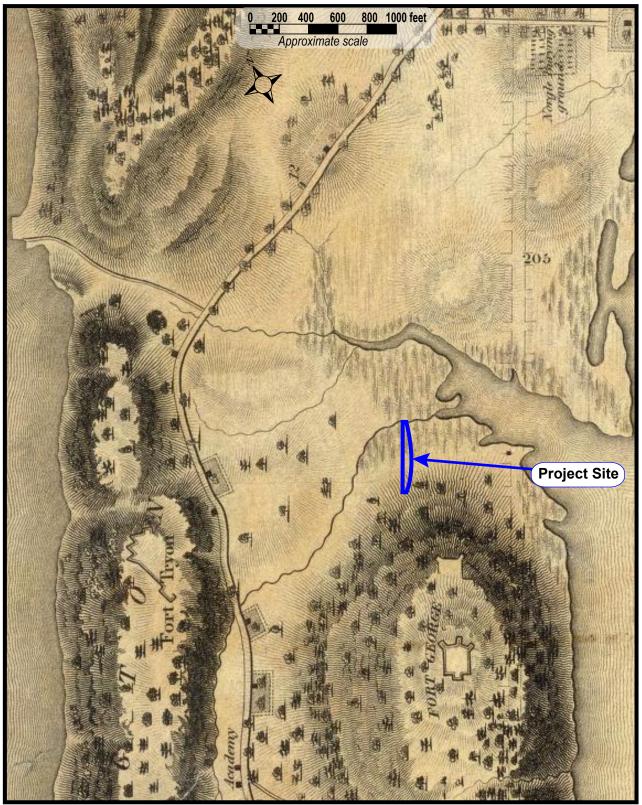




Phase IA Archaeological Documentary Study Fort George Hill, Block 2170, Lots 180 and 190 Borough of Manhattan, New York County, New York



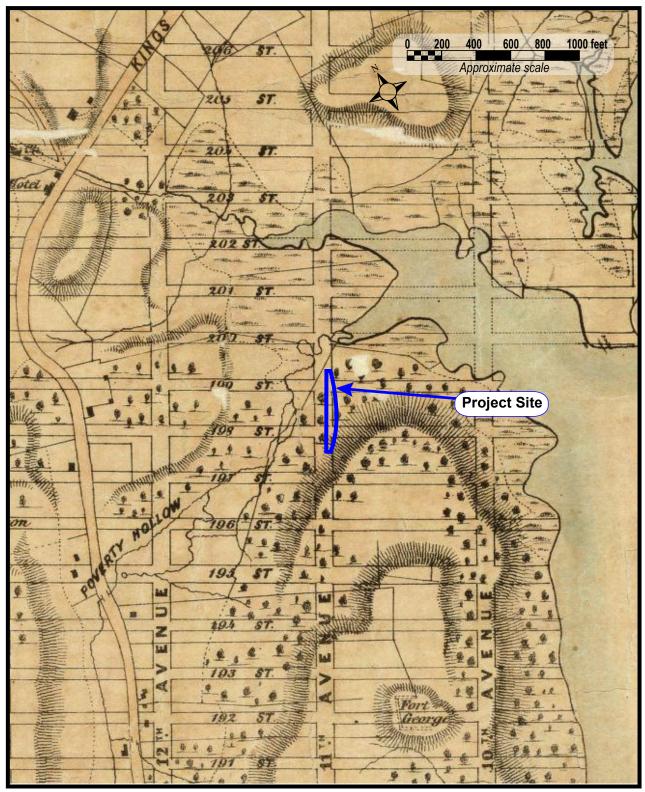
Figure 5: Project Site on Farm Maps (Randel 1820).



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



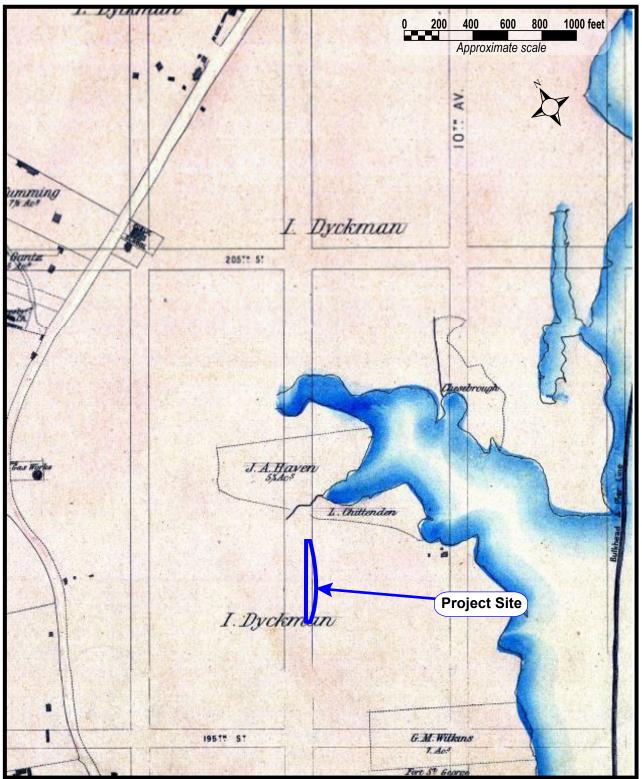
Figure 6: Project Site on *Topographical Map of the City and County of New York* (Colton 1836).



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



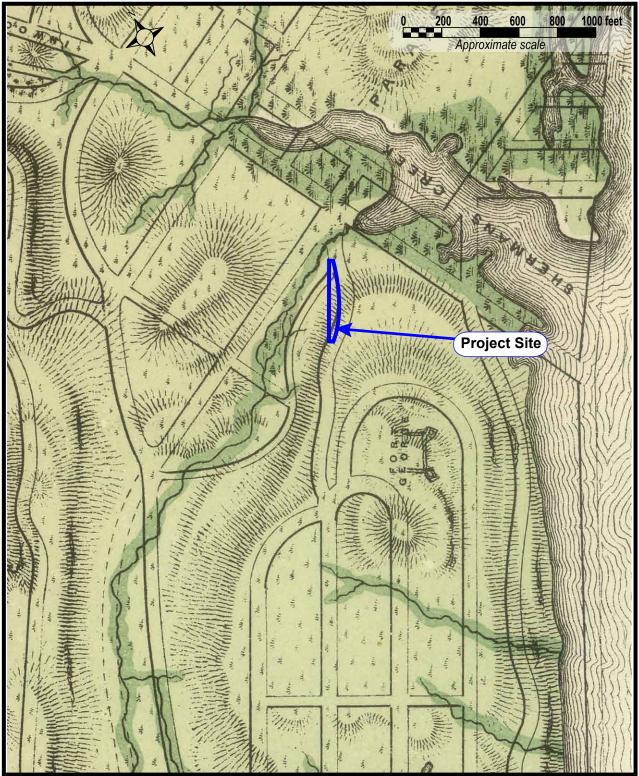
Figure 7: Project Site on Map of that part of the City and County of New-York North of 50th Street (Dripps 1851).



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



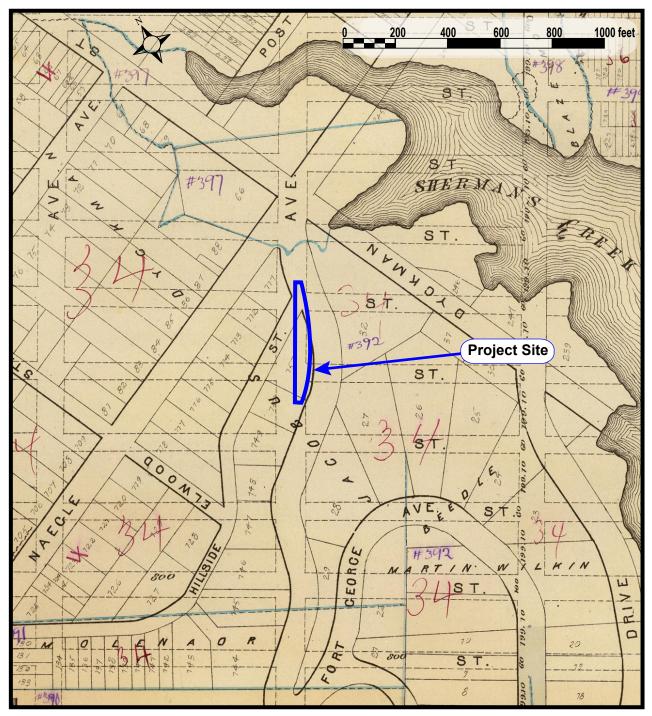
Figure 8: Project Site on *Plan of New York City* (Dripps 1867).



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



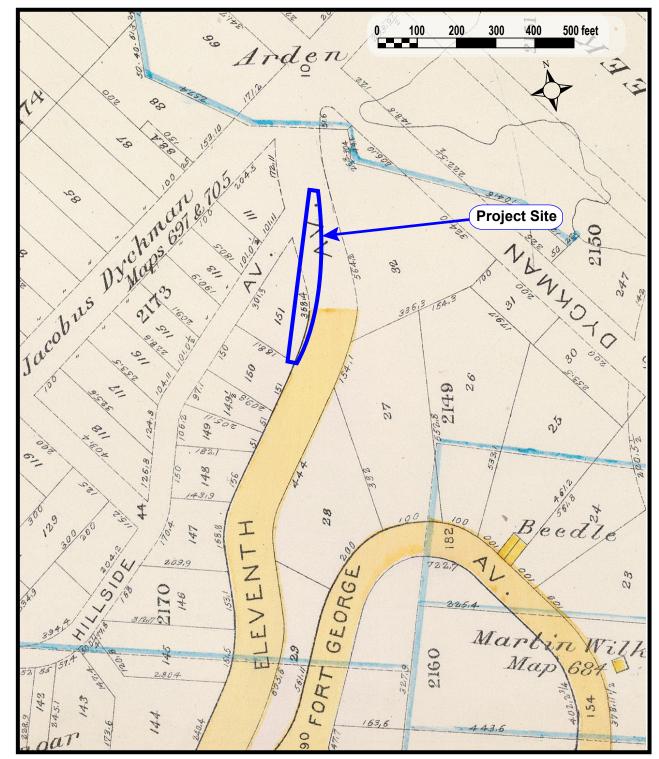
Figure 9: Project Site on *Topographical Atlas of the City of New York* (Viele 1874).



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



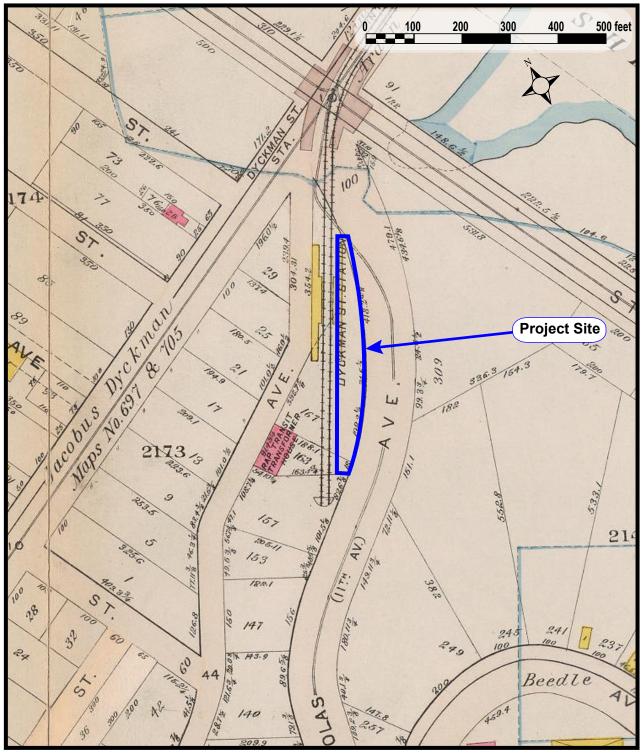
Figure 10: Project Site on Atlas of the City of New York (Bromley 1879).



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



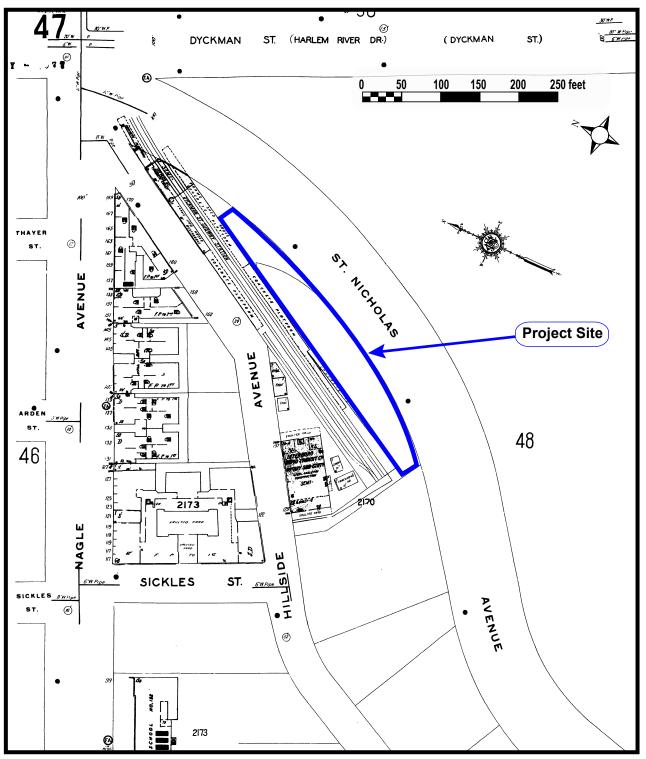
Figure 11: Project Site on Atlas of the City of New York (Bromley 1891).



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



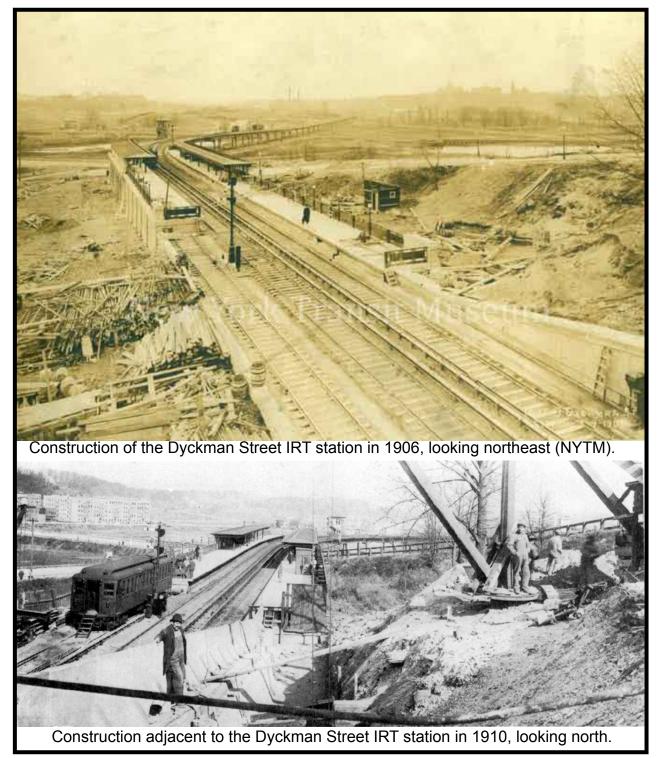
Figure 12: Project Site on Atlas of the City of New York (Bromley 1911).



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



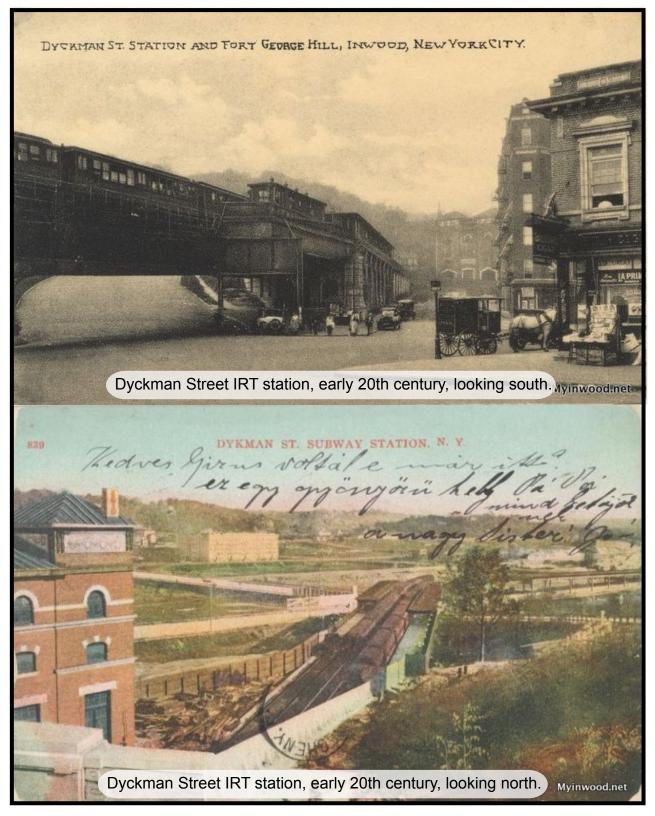
Figure 13: Project Site on Insurance Maps of the City of New York, Borough of Manhattan (Sanborn 1951).



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

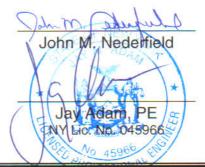
PREPARED BY

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

Project No.: N-7350

DATE:

September 24, 2008



New York, NY

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 $79\pm$ in the south to an elevation of $37\pm$ 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 $5\pm$ -feet to $50\pm$ -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 QUALTIY:

ROCK QUALITY DESIGNATION (RQD) ⁽¹⁾	DESCRIPTION OF ROCK QUALITY
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 cementatious 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.

New York, NY

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

PAR / 1.	VALUE 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) Earth Pressure @ Rest (Ko) Passive Earth Pressure (Kp)	0.33 0.50 3.00
5.	Coefficient of Sliding (concrete over soil/weathered re	ock) 0.40
6.	Subgrade Modulus for Floor Slab Design (Granular Fill)	175 pci
7.	Slopes (Permanent above water table) Maximum Cut Slope in Soil Maximum Fill Slope in Soil	2.5H:1V 2.5H: 1V
8. Se	ismic Design Criteria- Site Class	С

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 $5\pm$ feet permanent walls should not weigh more than 5,000 pounds.

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((55					LOC	ATION:	176	9 Fort G	George Hill, NY 10040 JOB NO. N-735
1		ONSULT	ERS							GROUND ELEVATION: 65.4
BORIN	G BY:AD	т			D	ATE ST	ARTED:	8/12	/2008	GROUNDWATER TABLE DEPTH
NSPE	CTOR:DE	Þ			DATE	COMP	LETED:	8/12	/2008	0 Hr. N/A Date N/A 24 Hr. N/A Date N/A
DEPTH (ft)	T	SAMPLE	DEF	РТН ТО		Blows o	n Spoor	ı	REC	SOIL DESCRIPTION AND STRATIFICATION
0		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	
	SS	S-1	0	2	8	9	8	12	10"	Brown m-f SAND, some c-f Gravel, trace Silt
		1								(class 3b)
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	SS	S-3	10	12	10	11	30	69	8"	Highly Weathered Rock, Mica Schist with mica flake
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20										
	Core	C-1	20	25					1.5	
									2	Orange/ black, medium to low hard, moderately to highly
				-					2	weathered, closely fractured, slightly broken
				-		-	-		2.5	
25				-				-	2.5	
	Core	C-2	25	30					2.5	
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	and the sum of the sum	Split Barre	Samol	ər		-				d users only that they may have access to the same information available
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of the local division of the local divisiono		er on Drive			-					tained in the report from which these logs were extracted.
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/LSESI -							NAME:				NG NO.		-2
G	77	ONSULT	ING			LOC	ATION:	176	9 Fort G	rge Hill, NY 10040 JOB N			.98
		ENGINEE	RS						1000		UND ELEVATION:		.98
	IG BY:AD					ATE ST	No. of Concession, Name of Concession, Name of Street, or other	-	/2008		24 Hr. N/A	Date N//	
	CTOR:DF	>			DATE	COMP	LETED:	8/22	/2008	Hr. N/A Date N/A	24 Hr. N/A	Date N/	Ì
OEPTH (ft)	METHOD	SAMPLE	DEP	TH		Blows o	n Spoor		REC	SOIL DESCRIPTION	AND STRATIFICATI	ON	SYI
0		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)				
	SS	S-1	0	2	9	7	6	7	12	Asphalt			
										own m-f SAND, some c-f Grav	el, trace Silt		-
												(class 3b)	
													\vdash
5								200.0	0.54		071	_	-
	SS	S-2	5	7	6	4	7	14	3	own m-f SAND, trace Gravel,	trace Silt	(alace 21)	
												(class 3b)	\vdash
10					22	17		26	10	eathered Rock, Mica Schist			
	\$\$	S-3	10	12	23	17	24	26	12	camered Rock, Mica Schist			
							<u> </u>						F
15													
	SS	S-4	15	17	7	8	8	13	12		ditto		
	55					-							
20													
	SS	S-5	20	22	8	8	11	12	20		ditto		
25									1000			-	-
	SS	S-6	25	27	4	6	11	17	20		ditto		\vdash
													\vdash
30	<u> </u>												F
00	SS	S-7	30	32	21	21	35	44	22		ditto		
	35	3-7	50	54	-1		55						
35													
	SS	S-8	35	37	36	71	46	31	16		ditto		
40													
_						1							
	al I.D. of I				-					ereon was obtained for the desig			nt.
		Split Barrel				4				rs only that they may have acces			
Neigh	t/type of H	lammer or	Drive P	ipe	300 lb	to our c	lient. It i	s present	ted in goo	aith, but it is not intended as a s	substitute for investigation	ons, interpretat	ions

in engineers recommendations contained in the report from which these logs were extracted. 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.

Drop of Hammer on Drive Pipe

Core Size: NX

FIGURE 3

[]	77 C				PF	ROJECT	NAME:		Fo	rt George Hill	BORING NO.	B-2	
12	45	SE.	5			The subscription of the su	ATION:	176		aeorge Hill, NY 10040	JOB NO.	N-735	50
7	0	ONSULT	ING							-	GROUND ELEVATION:	39.9	8
BORIN	NG BY:A	11.5			DATE	START	ED	8/21	2008	GR	OUNDWATER TABLE DEPTH		
	CTOR:D				-	COMPL		8/22	2008	0 Hr. N/A Date	N/A 24 Hr. N/A	Date N/A	
DEPTH			DEF	PTH		Blowe	n Spoor	1	REC				
(ft)	METHOD	SAMPLE No.	FROM	то	1				HEO	SOIL DESCRI	IPTION AND STRATIFICATION	S	SYN
40			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)				
	SS	S-9	40	42	20	19	22	24	22	Weathered Rock, Mica Sc	hist	-	
										-			_
				-						-		-	
								-	-	-		-	_
45										-	1 mar		_
	SS	S-10	45	45.2	50/2"				2	-	ditto		
										-		-	_
				<u> </u>						-			
50										1		F	
50	SS	S-11	50	50.6	48	50/1"			7	1	ditto	-+	_
	33			2.010						1	EV2032ES		
										1			_
										1			
55										1			
	SS	S-12	55	56.2	38	70	50/2"		12	1	ditto		
]			_
]			
60												-	
	Core	C-1	60	65					1		ditto		_
									1	-			_
					-				1.5			-	_
							-		1.5	REC. = 8"/60" = 13.3%		-	
65		0.12	10	11	100				2	RQD = 0"/60" = 0.0%	(class 1d)	-	
	SS	S-13	65	66	100				6	4		F	
						-				1		F	-
				<u> </u>						1		F	
70										1		F	
	SS	S-14	70	70.2	50/2"				14	Weathered Rock, Mica Sc	chist		
										1			
8]			
75													
	<u>\$\$</u>	S-15	75	75.2	50/2"				2		ditto		
													_
										4			
		-								4		F	
80													_
]							
	al I.D. of		0		-						he design and estimating purposes for		
		Split Barrel									ve access to the same information av		10
		Hammer on Hammer on				-					ed as a substitute for investigations, i s should not be relied upon without		

	in	engineers	recommendations	contained in	the report	from which	these logs	were extracted.
--	----	-----------	-----------------	--------------	------------	------------	------------	-----------------

Approximate Change in Strata: _____ Inferred Change in Strata:

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

in

Drop of Hammer on Drive Pipe

Core Size

7350	R-2	YIS
,000		. Aller

17	SESI					ROJECT	NAME:		For	rt George	e Hill		BORING	NO.			-2
4	50		31			LOC	CATION:	176	9 Fort G	George H	ill, NY 10	040	JOB NO.			N-7	7350
	and the second s	ENGINE								0			GROUN				39
BORI	NG BY:A	т			DATE	START	ED	8/21	/2008			1		1	LE DEPTH		
INSPE	ECTOR:D	Р			DATE	COMPL	ETED	8/22	/2008	0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date N/	A
DEPTH		SAMPLE	DEF	PTH		Blows	on Spoor	1	REC								
(ft)	METHOD	No.	FROM	то				-			SOIL	DESCRI	PTION AN	D STRAT	FIFICATION		SYM
80			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)		1004150 KM 10	20419 BA 13					-
	SS	S-16	80	82	51	54	38	97	12	Weather	ed Rock,	Mica Sc.	hist				
										4							
							-			4							\vdash
										4							-
85									2								-
	SS	S-17	85	85.25	50/3"				3	-							\vdash
										Derine	Complete a	05 2 6					\vdash
	<u> </u>												Encountere	(be			
90										(NO App	arent sou	nu Rock	Lifeountere	(1)			
50										1							
										1							
										1							
										1							
95										1							
										1							
]							
100																	
										4							
105	<u> </u>									•							-
105										•							-
										1							
	<u> </u>																⊢
110																	
110																-	-
	<u> </u>																
										1							
115										1							
										1						_	
										1							
										1							
]							
120																	
Nomina	al I.D. of I	Hole				1									g purposes fo		nt.
Vomina	al I.D. of S	Split Barrel	Sample	r	13/8 in	It is mad	de availat	ole to aut	horized u	isers only	that they	may hav	e access to t	he same ir	nformation av	ailable	
and the second second		lammer on	2.01												vestigations,		
	and the second se	lammer on		rrel		PERCENT AND ADDRESS OF ADDRE									pon without	the geotec	hnical
		r on Drive	Pipe										h these logs		acted.		
Core S	Size				in					OH: Weig			OR: Weigh	t of Rod			

PROJECT N/									t George			BORING NO. JOB NO.				B-		
4	57					LOC	CATION:	176	9 Fort G	ieorge Hill	, NY 10	0040	-				N-73	150
		ONSULT												DELEVA			_	_
BORIN	IG BY:AD	Т				the second s	ARTED:					-	OUNDWA				- Second C	_
NSPE	CTOR:DF				DATE	COMP	LETED:			0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A	
DEPTH	The last of the factors	SAMPLE	DEF			Blows o	on Spoor	n	REC		2011		IPTION A			N		SY
(ft)	METHOD	No.	FROM	TO	0/0	0/10	12/18	18/24	(in)	-	SULL	DESCH		U STIA	in loane			
0			(ft)	(ft)	0/6	0/12	12/18	10/24	(11)								+	
										NOT DRI	LIED						h	_
							-			NOT DRI	LLED						ŀ	
							-			1								
5										1								-
5										1							+	
										1							t	_
										1								_
										1							T	
10										1								
1000										1								
										1								
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15]							\square	
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20										1							+	
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25			-					-	-	4							+	
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							-			1							ŀ	_
30	—						-			1								
50			-			<u> </u>				1							+	_
	<u> </u>			-			-			1							ł	_
										1							ł	
																		-
35										1								_
										1								
										1							ľ	
			-							1							I	
]							[
40																		
Nomin	al I.D. of	Hole			in	The sul	osurface i	nformati	on showr	hereon wa	as obtain	ned for t	he design a	nd estimati	ng purpose	s for our o	lient	4

300 lb to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations140 lb or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical

in 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.

in

Weight/type of Hammer on Split Barrel

Drop of Hammer on Drive Pipe

Core Size: NX

17	ILSES PRO						NAME:	10440040		t George Hill		BORING NO. JOB NO.			B-4 N-73	
4	7	ONSULT	ING			LOC	ATION:	176	9 Fort C	George Hill, NY	10040					
		INGINE											D ELEVAT		Contraction of the second second	5.2
	IG BY:AD					ATE ST		-	/2008	0.11-	-	ROUNDWA	24 Hr.		Date N/	
	CTOR:DF	,	DEF		DATE	COMP	LETED:	8/19	/2008	0 Hr. N/A	Date	N/A	24 11.	N/A	Date N	Î
DEPTH	METHOD	SAMPLE	FROM	то		Blows o	n Spoor	1	REC	SOIL	DESCE	RIPTION A		TIFICATIO	N	SY
(ft) 0	METHOD	No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)		LDLOOI					
0	SS	S-1	0	2	8	7	4	4	12	3" Asphalt						+
}	33	5-1	U	-	0	-			12	Brown m-f SAN	ND some	c-f Gravel.	trace Silt			
															(class 6	
5										1						
	SS	S-2	5	7	5	8	13	18	14	Brown m-f SAN	ND, trace	Silt, trace G	ravel			
															(class 3b	
]						
10															_	
	SS	S-3	10	12	10	19	18	15	18	Ditto						
															(class 3a	
						_			-							⊢
15		2.2	1212													+-
	SS	S-4	15	17	27	10	11	12	12	Weathered Roc	k, Mica S	chist				⊢
				-		-			-							\vdash
	<u> </u>						-									\vdash
20																\vdash
20	SS	S-5	20	22	11	16	25	25	14							+
	35	3-5	20	22	11	10	20	20	14							
										1						
25										1						
	SS	S-6	25	25.9	52	100/5"			10	L						
										Apparent Top o	of Sound I	Rock				
- 2010																
30															-	+
	SS	S-7	30	30.1	100/1"				0							\vdash
									-	1						\vdash
																\vdash
35										1						F
00	Core	C-1	35	40					4	MICA SCHIST					_	\vdash
	COIC		55						3	Gray and black,		edium hard	fresh weat	hered.		
									3	closely to media						
									3	REC = 60"/60"						
40									3.5	RQD = 35"/60")			
Nomin	al I.D. of I	Hole			in	The sub	surface in	nformatio	on shown	hereon was obta	ained for	the design a	nd estimatin	ng purposes	for our clie	nt.
Nomin	al I.D. of S	Split Barrel	Sample	r	13/8 in	It is mad	le availat	ole to aut	horized u	isers only that the	ey may ha	ive access to	the same in	nformation a	available	
Veigh	t/type of H	lammer on	Drive P	ipe	300 lb	to our cl	ient. It i	s present	ed in goo	d faith, but it is r	not intend	ed as a subs	stitute for in	vestigations	s, interpreta	tions
	and the second	lammer on		rrel		1				ers. Information					it the geotec	chnic
		r on Drive	Pipe							ned in the report				racted.		
Core S	Size: NX				in	P	p: Pocket	Penetron	neter; W	OH: Weight of H	Hammer;	WOR: Weig	tht of Rod			

FIGURE 5

[]	77 C			PF	ROJEC	T NAME:			rt George Hill		BORING	NO.			-4	
4	50-					LOC	CATION:	176	9 Fort C	George Hill, NY 10	040	JOB NO.				350
	17 °	ONSULT	ERS									GROUNE	ELEVATIO	DN:	4	5.2
BORI	NG BY:AD	т			DATE	START	ED	8/19/	/2008		GR	OUNDWAT	TER TABLE	DEPTH		
INSPE	ECTOR:D	P			DATE	COMPL	ETED	8/19/	/2008	0 Hr. N/A	Date	N/A	24 Hr.	N/A	Date N/	4
DEPTH (ft)	METHOD	SAMPLE	DEF	ртн то		Blows	on Spoor	ı	REC	SOIL	ESCR	IPTION AN	D STRATIF	ICATION		SYN
40	METHOD	No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)							
	Core	C-2	40	45					3	Ditto						
									3	1						
									3.5							
									3.5	REC. = 59"/60" =	98.3%					
45									3.5	RQD = 32"/60" =	53.3%	(class 1b)				
										Boring Complete a	t 45.0 f	t.				
								-								
50]					_	
]						
]						
										1						
]						
55										1						
										1						
										1						
										1						
										1						
60										1						
										1						
										1						
										1						
										1						
65										1						
								-		1						
										1						
										1						
										1						
70										1						
										1						
										1						
										1						
										1						
75										1						
										1					-	
										1						
							-			1						
							+			1						
80							-			1						
00										1						-
Vomin	al I.D. of I	Hole			in	The sul	osurface in	nformatio	on shown	hereon was obtain	ed for th	ne design and	l estimating p	ourposes fo	or our clier	nt.
and the last of the local division of	and the second se	Split Barrel	Sample	r						users only that they						
		lammer on								od faith, but it is not						ions
		lammer on				1				ers. Information on						

in eng	gineers recommendations contained in the report from which these logs were extracted.
in	Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of Rod

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

Approximate Change in Strata: ____

Drop of Hammer on Drive Pipe

Core Size

D	177 C		C I		PF	ROJECT	NAME:			rt Georg			BORING	NO.			3-5
4	50-		31			LOC	ATION:	176	9 Fort C	George	Hill, NY 10	0040	JOB NO.				7350
	· ·	ONBULT	ERS										GROUND	ELEVAT	ION:	63	3.93
BORIN	NG BY:AD				D	ATE ST	ARTED:	8/8/	2008			GR	OUNDWA	TER TAB	LE DEPTI	+	
	CTOR:DF				-		LETED:	8/8/	2008	0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date N/	A
DEPTH	1		DEF	РТН													
(ft)	METHOD	SAMPLE	FROM	ТО		Blows o	n Spoor	1	REC		SOIL	DESCR	IPTION AN	D STRAT	TIFICATIO	N	SY
0		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	1							
U		S-1	0	2	5	6	10	10	18"	8" Con	crete						+
		5-1	0	- 4	2	U	10	10	10) some (-f Gravel, t	race Silt			
				<u> </u>						BIOWI	III-I SANL	, some v	PI Gravel, a	lace one		(class 3b	
						-				1						(01035 50	1
										-							\vdash
5		1015.0	1000														+
		S-2	5	5.1	50/1"				0		completed						\vdash
						_				Obstru	ction (Mo	ved Bori	ng 5' South))			\vdash
										4							
										4							
10	-									4						-	+
										4							
										4							
										4							
										4							
15										1						_	
20]							
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25										1							
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30										1							
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										1							
35										1							
00	-							-		1						_	
	-									1							
										1							
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40	-								-	1							
40	1			1	L					1							-
							12 2										1000
	nal I.D. of I															s for our clie	nt.
		Split Barrel											ve access to				
		lammer or				•										is, interpreta	
		lammer or		arrel	-	and the second										ut the geoted	chnic
		r on Drive	Pipe		-								ch these log		acted.		
Core S	Size				in	P	p: Pocket	Penetron	meter; W	OH: We	eight of Ha	mmer; V	VOR: Weigl	ht of Rod			

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

FIGURE 6

5	177 C				PI	ROJECT	NAME:		Fo	rt George Hill	BORING I	NO.	B-	5A
((50		21			10 M 40000	CATION:	-		George Hill, NY 10040	JOB NO.		N-7	350
7	STREET, STORE STORE	ENGINE									GROUND	ELEVATION:	. 64	.31
BORIN	NG BY:AD	т			D	ATE ST	ARTED:	8/8/	2008	GRO	DUNDWAT	ER TABLE DEPTH		
	CTOR:DE						LETED:		/2008	0 Hr. N/A Date		24 Hr. N/A	Date N//	1
DEPTH	1		DE	PTH										
(ft)	METHOD	SAMPLE	FROM	TO	1	Blows o	n Spoor	1	REC	SOIL DESCRI	PTION AN	D STRATIFICATION		SYN
5		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)					
	SS	S-1	6	8	6	5	5	8	12"	8" Concrete				
										Brown m-f SAND with, tra	ice Gravel, t	race Silt		
													(class 6)	
										1				
10										1				
	SS	S-2	10	12	3	6	6	8	18"	Brown m-f SAND, and Sili	trace Grav	el		
									10	brown in Foreite, and bit	, unce ora,		(class 6)	
										1			(0.000 0)	
15										1				
	55	S-3	15	17	20	30	25	28	10	Weathered Rock, Mica Sch	nist			
									10	in callered Rock, Mica Ser	1130			
										1				
										1				-
20										1				-
	SS	S-4	20	20.3	50/4"				4	1			1	2
	33	54	20	20.5	50/4				+	Apparent Top of Sound Ro				~
										Apparent Top of Sound Ro	CK			-
					-					1				
25										1				
	Core	C-1	25	30					2	MICA SCHIST			_	-
	Core	01	40	50					2.5	Orange and Black, medium	to low here	highly to		
				-					2.5	completely weathered, clos				
									2.5	REC. = 5"/60" = 8.3%	cry mactured	, slightly to broken		
30			-			-			2.5	RQD = 0''/60'' = 0% (class	1d)			
00	Core	C-2	30	35					1.5	Ditto	10)		-	
	COIC	0-2	50	- 55						REC. = 49.5"/60" = 82.5%				
									2.5	RQD = 25''/60'' = 41.7% (4)	class 1c)			-
									3	$RQD = 25700^{\circ} = 41.7\%$ (6)	ciass (c)			-
35									3.5	1				
	Core	C-3	35	40					1	Ditto			-	
	0.010			10					0.5	REC. = 47"/60" = 78.3%				-
									1	RQD = 38.4"/60" = 64.1%	(clase 1b)			
									1.5	- 50.4 /00 = 04.1%	(01035 10)			
40									2					
	Core	C-4	40	45					1.5	Ditto			-	
	COIC	~~	-70	45					2	REC. = 30"/60" = 50.0%				
									2		alace 1a)			_
										RQD = 25''/60'' = 41.7% (4)	ciass (C)			
45									2.5	Poring complete at 15.0.0				-
-10									2.5	Boring complete at 45.0 ft.				
Vomin	al I.D. of H				in	Thomas	urfore !-	forment	n chow	haroon was abtained for the	danierand	actimating	e ou e alia	
	San Della Maria	Split Barrel	Sample	r						hereon was obtained for the				
					-					sers only that they may have d faith, but it is not intended				and a
		ammer on ammer on								ers. Information on the logs				
-		r on Drive I				and the second second				ned in the report from which			ne geoteen	mici

in	engineers recommendations contained in the report from which these logs were extracted.
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.

in

Core Size: NX

17	TLC	SES	51		PF		NAME:			t George		00.40	BORIN				B-6
9	77 .	ONSULT	ING			LOC	ATION:	176	9 Fort G	eorge Hi	ill, NY 1	0040	JOB NO			- N	-7350
		INGINE												ND ELEVAT			
	IG BY:AD						ARTED:				the second of	-		ATER TAB		-	
INSPE	CTOR:DF	>			DATE	COMP	LETED:			0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date 1	N/A
DEPTH		SAMPLE	DEF			Blows o	n Spoor	1	REC								
(ft)	METHOD	No.	FROM	то							SOIL	DESCH	RIPTION /	AND STRAT	TIFICATIO)N	SY
0			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)								_
										NOT DR	RILLED						
5																	
]							
]							
										1							
10										1							
										1							
										1							
										1							
										1							
15										1							
10										1						-	
							-			1							
			-	-			-										
20	<u> </u>						-										
20			-	-				<u> </u>		1							+-
										1							
			-	-						1							
			-	-						1							
	<u> </u>						-			4							
25										-							+
			-	-						-							
	<u> </u>							-		-							
										1							
	<u> </u>			-													
30				-			-									-	+
			-							1							
				-													
				-		-	-										
35																	-
40																	
Nomin	al I.D. of I	Hole			in	The sub	surface i	nformatio	on shown	hereon v	vas obtai	ined for t	he design	and estimati	ng purpose	s for our cl	ient.
and the second designed to the second designed to the second designed as the second designe		Split Barrel	I Sample	r	13/8 in	It is ma	de availal	ble to aut	horized u	isers only	that the	y may ha	we access	to the same i	nformation	available	
		lammer or												bstitute for in			ations
		lammer or			-									not be relied			

Inferred Change in Strata:

Approximate Change in Strata:

in

Core Size: NX

17	72 C				PF	ROJECT	NAME:			t George			BORIN				_	-7
CC	57)~					LOC	CATION:	176	9 Fort G	ieorge H	ill, NY 1	0040	JOB N			4	N-7	350
	Constant of the local division of the local	ONBULT											GROU	ND ELEVAT	ION:			
BORIN	IG BY:AD				D	ATE ST	ARTED:					GR	OUNDV	VATER TAB	LE DEPT	Н		
	CTOR:DF						LETED:			0 Hr.	N/A	Date		24 Hr.	N/A	Date	N//	1
DEPTH			DEF	РТН														
(ft)	METHOD	SAMPLE	FROM	TO	1	Blows o	n Spoor	1	REC		SOIL	DESCR	IPTION	AND STRA	TIFICATIO	DN		SY
100	METHOD	No.			0/6	6/12	12/18	18/24	(in)		COIL	2200.						
0			(ft)	(ft)	0/6	0/12	12/10	10/24	(11)	<u> </u>								
							-											-
										NOT DF	ULLED							-
5																	_	
							1											
										1								
										1								
										1								
10										1								
10		-		1						1							_	
			-		-		-			1								-
			<u> </u>		-													
				-	-		-			1								⊢
					-			-		-								-
15										4							_	-
20]							_	
										1								
										1								
										1								
			-				-			1								
25					-					1								
20			-	-	-	-				1							2	\vdash
			-	-	-		-			1								⊢
						<u> </u>			<u> </u>	1								\vdash
			-			<u> </u>				4								⊢
1221			-			-												-
30										1								-
				-						4								\vdash
										-								\vdash
35																	_	
]								
8										1								
										1								
										1								
40			-							1								
40										1								-
	110 1	I.I.			1					1	3 1	10				e for	ali	
	al I.D. of I				-									and estimati				IL.
		Split Barrel		and the second se	-									to the same i				
		lammer or			-									ibstitute for in				
Weigh	t/type of H	lammer or	n Split Ba	arrel	-									not be relied		out the ge	otecl	hnic
Drop o	f Hamme	r on Drive	Pipe		in	enginee	ers recom	mendatio	ns contai	ined in the	e report	from whi	ich these	logs were ext	racted.			

Approximate Change in Strata:

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

FIGURE 8

Inferred Change in Strata:

17	77 C	SF			PI	ROJECT	NAME:		Foi	rt George	e Hill		-	IG NO.			-8
CL	-	Street, Street	Sil and			and the second	ATION:	176		George H		0040	JOB N	0.		N-7	350
	°	ENGINEI											GROU	ND ELEVAT	TION:	. 45	5.8
BORIN	G BY:AD	Т			D	ATE ST.	ARTED:	8/20	/2008			GR	OUNDV	VATER TAB	LE DEPT	-	
INSPE	CTOR:DE	C			DATE	COMP	LETED:	8/20	/2008	0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date N//	A
DEPTH		SAMPLE	DEF	тн		Blowe	n Spoor	i	REC								
(ft)	METHOD	No.	FROM	TO		DIOW3 C		'	HEO		SOIL	DESCR	IPTION	AND STRA	TIFICATIO	N	SY
0			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)								
	SS	S-1	0	2	3	4	7	6	12								
										Brown r	n-f SAN	D, little c	-f Gravel	, little Silt			
																(class 6)	
			-														
5																	
	88	S-2	5	7	2	3	2	3	8	Brown r	n-f SAN	D, trace (fravel, tr	ace Silt			
			-							-						(class 6)	
										-							
										-							\vdash
10				15			-										┝
	SS	S-3	10	12	4	6	7	9	8	Ditto						(class 21)	
										-						(class 3b)	⊢
							-			-							⊢
15										1							⊢
15		S-4	15	17	11	17	18	16	10	Dine						-	⊢
	SS	5-4	15	17	11	17	18	10	10	Ditto						(class 3a)	\vdash
	<u> </u>				-	-				1						(class 5a)	F
										1							F
20										1							F
	SS	S-5	20	22	8	11	13	10	10	Weather	red Rock	, Mica So	hist				
					1000												
										1							
										1							
25]							
	SS	S-6	25	27	9	17	23	34	12]							
30																	-
	SS	S-7	30	32	22	35	32	65	8								
							-			-							\vdash
				-						-							
0-	<u> </u>								-	-							\vdash
35		0.0	25	27	20	24	10	57									⊢
	\$\$	S-8	35	37	35	26	42	55	22	-							H
	<u> </u>								-	1							\vdash
	<u> </u>					-				1							\vdash
40	<u> </u>			-													F
TV	1	1							1								<u> </u>

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	13/8 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

ter; WOH: Approximate Change in Strata: _____ Inferred Change in Strata:

																/350B-8	AID
5	17 C				PI	ROJEC	T NAME:		For	rt Georg	e Hill		BORING	NO.		E	3-8
4	500						CATION:	176	9 Fort C	George H	Hill, NY 10	040	JOB NO.	R		N-	7350
	°,	ONSULT	ERB										GROUN	D ELEVAT	TION:	4	5.8
BORI	NG BY:AD	T			DATE	START	ED	8/20	/2008			GR	OUNDWA	TER TAB	LE DEPTH		
NSP	ECTOR:DI	P			DATE	COMPL	LETED	8/20	/2008	0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date N/	A
DEPTH		SAMPLE		РТН		Blows	on Spoor	١	REC		201000						
(ft)	METHOD	No.	FROM	TO						4	SOILD	ESCRI	PTION AN	ID STRAT	IFICATION	1	SYM
40			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)				2				
	SS	S-9	40	40.25	50/3"		-		3	Apparen	nt Top of S	ound Ro	ock				40.
				<u> </u>						-							
					-					-							
45										1							
40	Core	C-1	45	50	+				3	MICAS	CHIST					-	+
	Core	0-1	45						4			nedium	to low hard,	slighty we	athered		
									4		fractrued, s						
									2		57"/60" =						
50									2	RQD =	26.5"/60" =	= 44.2%	(class 1c)				
	Core	C-2	50	55						Ditto						_	
										REC. =	36"/60" =	60.0%					
55										RQD =	18.5"/60" =	= 30.8%	(class 1d)				-
					-												
									-	Boring	Complete a	it 55.0 ft	<u>.</u>				
					-					-							⊢
60				<u> </u>						-							-
00					-		-									_	-
						<u> </u>				1							
					<u> </u>		-			1							
		-								1							
65										1							
										1							
										1							
70								-								_	
										-							
										-							
							-										-
75										-							
75						-				-							-
			-			-	-										
																	-
						-				1							
80																	
and a				L		1	1										1
omin	al I.D. of H	lole			in	The sub	osurface in	oformatio	on shown	hereon	was obtaine	ed for th	e design and	d estimatin	g purposes f	or our clie	nt.
the second second second	al I.D. of S	And the second se	Sample	r	-										formation a		1923
	t/type of H				-	-									vestigations,		ions
	t/type of H				-	-									pon without		
the second s	of Hammer	the second s	and the second se										h these logs				
ore S					in								OR: Weigh				

Pp: Pocket Penetrometer; WOH: Weight of Hammer; WOR: Weight of F Approximate Change in Strata: ______ Inferred Change in Strata: ______

F	77 C		01		PF	ROJECT	NAME:		Fo	rt George Hill BORING NO. B-9
(()	50	DE	21				ATION:			George Hill, NY 10040 JOB NO. N-7350
7	· ·	ONSULT	ERS			and share of				GROUND ELEVATION: 61.84
BORIN	IG BY:AD				D	ATE ST	ARTED:	8/12	/2008	GROUNDWATER TABLE DEPTH
	CTOR:DF						LETED:		/2008	0 Hr. N/A Date N/A 24 Hr. N/A Date N/A
DEPTH	1		DEF	РТН						
(ft)	METHOD	SAMPLE		то		Blows o	n Spoor	١	REC	SOIL DESCRIPTION AND STRATIFICATION
0		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	
0		S-1	(11)	2	16	17	12/10	5		2" Apphalt
	SS	5-1	0	2	10	1/	12	2	14"	3" Asphalt
										Brown m-f SAND, some c-f Gravel, trace Silt (class 3b)
									<u> </u>	(class 50)
-									-	4
5				-			17			
	SS	S-2	5	7	5	7	7	9	18"	Brown m-f SAND, some Silt, trace Gravel
				-						(class 3b)
										4 –
Constant of									-	┥ ┣
10									-	+
	SS	S-3	10	12	10	12	13	13	12"	Weathered Rock
										┥ ┣
										┥ ┣
										╡ ┣
15										1
	\$\$	S-4	15	15.1	50/2"				1"	Apparent Top of Sound Rock
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	1
									2.5	1
									2.5	REC. = 28"/60" = 46.7%
35				**					3	RQD = 6''/60'' = 10.0% (class 1d)
										Boring Complete at 35 ft.
	<u> </u>									1
										1 –
40			-							1 –
40										
Ner		lala				The		- Farmer -	an ch	a horson was abtained for the desire and estimating any store for our store
	al I.D. of I		0							n hereon was obtained for the design and estimating purposes for our client.
		Split Barrel								users only that they may have access to the same information available
		lammer on	Second Sections	211.2		1		- C		od faith, but it is not intended as a substitute for investigations, interpretations
		lammer on		arrel						sers. Information on the logs should not be relied upon without the geotechnica
		r on Drive	Pipe							ined in the report from which these logs were extracted.
Core S	Size: NX				in	P	p: Pocket	Penetron	meter; W	/OH: Weight of Hammer; WOR: Weight of Rod

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

17	ZC	SFS	SI		PF		NAME:			t George		0.40	BORING				-10
5	27/ 0	ONSULT	ING			LOC	ATION:	176	9 Fort C	eorge H	III, NY 10	0040	JOB NC				7350
		ENGINE	ERS											ID ELEVAT		5	7.5
	IG BY:AD						ARTED:		/2008		The company and	-		-	LE DEPTH	1-	
INSPE	CTOR:DF	>			DATE	COMP	LETED:	8/13	/2008	0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date N/	A
DEPTH	1	SAMPLE	DEP			Blows o	n Spoor	1	REC		the second second						
(ft)	METHOD	No.	FROM	TO							SOIL	DESCR	IPTION A	ND STRA	TIFICATION	1	SYI
0			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)								
	SS	S-1	0	2	4	3	5/0"		12"	3" Aspha	alt						
										Brown n	n-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 S	Silt, trace C	Fravel			
																(class 3)	
10																-	
	SS	S-3	10	12	11	7	7	7	0"	Ditto						1. 	
																(class 3)	
]							
]							
15																	
	SS	S-4	15	17	9	14	18	26	14"	Weather	ed 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						100	
]							
]							
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																	
Nomin	al I.D. of H	Hole			in	The sub	surface in	nformatio	on shown	hereon v	vas obtain	ed for t	he design a	and estimati	ng purposes f	for our clien	nt.
Nomin	al I.D. of S	Split Barrel	Sample	r	1¾ in	It is mad	de availat	ole to aut	horized u	isers only	that they	may ha	ve access t	o the same i	nformation a	vailable	
Weigh	t/type of H	lammer or	Drive P	ipe	300 lb	to our c	lient. It i	s present	ed in goo	d faith, b	ut it is no	t intende	ed as a sub	stitute for ir	vestigations,	interpretat	ions
	t/tune of H	lammer or	Solit Ba	rrel	140 lb	or juder	ment of si	ich autho	prized us	ers Infor	mation or	the los	s should n	ot be relied	upon without	the geotec	hnic

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

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

in

Core Size: NX

FIGURE 11

17	TZC	SEC	21		PF		NAME:			t George Hill		BORING	NO.		-10
4	5					LOC	ATION:	176	9 Fort G	eorge Hill, NY 100	40	JOB NO.		N-7	7350
		ONBULT										GROUNE	ELEVATION:	1	57
BORI	NG BY:AD	T			DATE	START	D	8/13/	/2008		GR	OUNDWAT	ER TABLE DEPT	H	
INSPE	CTOR:D	Р			DATE	COMPL	ETED	8/13/	/2008	0 Hr. N/A	Date	N/A	24 Hr. N/A	Date N/	A
DEPTH			DEF	TH		Diama a	n Casar		REC						
(ft)	METHOD	SAMPLE No.	FROM	TO	1	DIOWS 0	n Spoor		I REC	SOIL DI	ESCRI	PTION AN	D STRATIFICATIO	N	SYM
40		140.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)						
	SS	S-9	40	40.9	21	50/4"			6"	Apparent Top of Sc	ound Ro	ock			4(
										1					
										1					
45										1					
	Core	C-1	45	50					2	MICA SCHIST					
									2.5	Gray and black, hig	h to me	dium hard,	fresh weathered,		
									3.5	closely fractured, sl	ightly b	oroken			
									5	REC. = 57"/60" = 9	5.0%				
50									8	RQD = 12"/60" = 2	0.0% (class 1d)		13	
	Core	C-2	50	55	-				4	Ditto					
									5						
									8						
									8.5	REC. = 60"/60" = 1	00.0%				
55									9	RQD = 21.5"/60" =	35.9%	(class 1c)			
										Boring completed a	t 55 ft.				
60														-	-
5															
															-
65										-				-	-
										{					⊢
						-				-					\vdash
-										1					
70															\vdash
70						_				1					-
					-					1					
5										1					\vdash
										1					
75										1					
15										1				_	+
										1					
										1					-
										1					
80				-						1					
00															1
lomin	al I.D. of H				in	The cub	eurfoca is	formatic	n chours	hereon was obtained	d for th	e decian and	estimating purpose	for our clies	at.
-		Split Barrel	Sample	r						isers only that they n					
		lammer on			300 lb	at 15 mide	avaiidi	au auu	unized t	sets only that they fi	my nav		are sume intermation	- Turturit	

in engineers recommendations contained in the report from which these logs were extracted.

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.

Drop of Hammer on Drive Pipe

Core Size: NX

[]	77 C		01		PI	ROJECT	NAME:		Foi	ort George Hill BORING NO.	P-	-1
14	55	>E	3				CATION:	176		George Hill, NY 10040 JOB NO.	N-7	-
7	0	ONSULT	TING			LUI	A HON.	170	o i on c			
BORIN	IG BY:AD		C R S		D	ATE OT	ARTED:	0.001	2008	GROUND ELEVATION:	79.	.07
	CTOR:DF									GROUNDWATER TABLE DEPTH		6
DEPTH	CTOR:DF		00	РТН	DATE	COMP	LETED:	8/6/	2008	0 Hr. N/A Date N/A 24 Hr. N/A Dat	e N/A	
	METHOR	SAMPLE		-	-	Blows of	on Spoor	1	REC			
(ft)	METHOD	No.	FROM	TO				_		SOIL DESCRIPTION AND STRATIFICATION		SY
0	10.00	Calleo	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)			_
	SS	S-1	0	2	3	6	5	5	18"	Brown m-f SAND, some c-f Gravel, trace Silt		
										(cli	uss 6)	
											[
5												
	SS	S-2	5	7	6	6	7	11	24"	Highly Weathered Rock, Mica Schist with mica flake		
											1	
										1	ł	
										1	ŀ	
10				<u> </u>						1	ŀ	
	SS	S-3	10	12	10	11	14	12	12"	Weathered Rock	-	_
ŀ	00	5-5	10	12	10	11	14	12	12	Weathered ROCK	ŀ	_
ł										4	ŀ	
ł					-					4		
-										4		_
15												
	Core	C-1	15	20					2.5	Apparent Top of Sound Rock - MICA SCHIST		
ļ									3.5	Gray and black, high to medium hard, fresh weathered,		
ļ			_						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		
ſ									4	1		
t									3.5	1		
t										REC. = 50"/60" = 98.3%		-
25										RQD = 31.5"/60" = 52.5% (class 1b)		
										Boring completed at 25 ft.		-
ŀ											ŀ	
ŀ										*Probe changed to a boring	ŀ	_
ŀ										4	ŀ	_
30										1	H	
30										4	-	
ŀ										4		
ŀ										4		
ŀ										•		
35												
l												
										1		
										1		
40										1	H	-
										1		
	II.D. of H	olo			in	Thomas		Constant	3		11	
Inmine			Comel							hereon was obtained for the design and estimating purposes for our		-
		pill Barrel	Sampler		178 IN	it is mad	e availabl	e to auth	orized us	sers only that they may have access to the same information available	Э	
Iomina		and the second		and and								
lomina Veight/	type of Ha	ammer on	Drive Pi		300 lb	to our cli	ient. It is	presente	d in good	d faith, but it is not intended as a substitute for investigations, interp	retatio	
lomina Veight/ Veight/	type of Ha type of Ha	and the second	Drive Pi Split Ba		300 lb 140 lb	to our cli or judgm	ient. It is ment of suc	presente ch author	d in good rized use		retatio	

Approximate Change in Strata: _____ Inferred Change in Strata:

F	117 C				P	BOJEC	T NAME:		Fo	rt George Hill		POPINIC	NO			P-2.xls
1 ((45	SE	5			and the second se				and the second		BORING	NO.			P-2
7	0// 0	ONSUL				LU	CATION:	176	9 Fort (George Hill, NY 10040 JOB NO.						N-7350
POD		ENGINE	ERS		-					1		GROUND		and the second se		74.27
	NG BY:AD						ARTED:					DUNDWA	H			
	ECTOR:DE	I			DATI	DATE COMPLETED:		8/7/	2008	0 Hr. N/A	Date	N/A	24 Hr.	N/A	Date	N/A
DEPTH		SAMPLE		PTH		Blows	n Spoor	1	REC							
(ft)	METHOD	No.	FROM	TO			in opeoi		1.20	SOIL DESCRIPTION AND STRATIFICATION						
0			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)							
	Probe		0	29						5" Concrete						
										Soil						
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1										Weathered Rock						-
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										Apparent Top of Sou	und Roc	k			-	-
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ŀ																
30																
00										Probe completed at 2	29 ft.				-	
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omina	II.D. of Ho	ole			in	The subsi	irface info	ormation	shown b	nereon was obtained	for the	lecion and	ectimatin	DUPDOCO	or our all	
		lit Barrel S	Sampler		13/8 in 1	t is made	available	to autho	rized us	ers only that they ma	whome of	congri and	comating	purposes f	or our che	int.
		mmer on [be	300 lb +	o our elie	nt It is -	resented	in good	faith but it is not in	ly nave a	iccess to the	e same inf	ormation av	anable	
		mmer on S			140 lb	r indom	ent of such	hauthor	and used	faith, but it is not in	a landed a	is a substitu	the for inve	estigations,	interpreta	tions
		on Drive Pi	the second s		in	n juugine	THE OF SUC	n aution	zed user	s. Information on the	e logs sh	iould not be	e relied up	on without	the geote	chnical
	ze: NX		20		in					ed in the report from				ted.		
10 012					111	Pp:	POCKet P	enetrome	ter; WO	H: Weight of Hamm	er; WOI	R: Weight o	of Rod			

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

FIGURE 13

5	2 .						Contraction of the	25.5 m (Ma)				Contactor and an	LIGALIA						
	C New		1 41 -			LOC	ATION:	176	9 Fort G	ieorge H	Hill, NY 10	0040	JOB NO.				N-7350		
	ONBULT	ERS							GROUND ELEVATION:							71.	89		
BORING	BY:AD	Т			DA	ATE ST	ARTED:	8/7/	2008			GR	OUNDWA	TER TAB	E DEPT	Н			
INSPEC						COMP				0 Hr.	N/A	Date		24 Hr.	N/A	Date	N/A		
DEPTH		DEPTH																	
10000000000	METHOD	SAMPLE	FROM	TO		Blows o	n Spoor	1	REC		SOIL	DESCR	IPTION A	ND STRAT	IFICATIO	N		SY	
0		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	1									
_	Ducho		0	26	0/0	UTL	1210	10/24	(11)	8" Conc	roto						+	-	
-	Probe	_	0	20		-				100000000000000000000000000000000000000	itele						ł	_	
- F				-						Soil							ł	_	
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L										Apparen	nt Top of	Sound R	ock					_	
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										Probe co	ompleted	at 26 ft.					[
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40									_										
Nominal	I.D. of H	lole			in	The sub	surface in	nformatio	on shown	hereon	was obtain	ned for t	he design a	nd estimation	ng purpose	s for our c	lient	L	
Nominal	I.D. of S	Split Barrel	Sample	r	13/8 in	It is mad	de availat	ble to aut	horized u	isers only	y that they	may ha	ve access to	the same is	nformation	available			
		lammer on			300 lb	to our c	lient. It i	s present	ed in goo	d faith, b	out it is no	ot intende	ed as a sub	stitute for in	vestigation	ns, interpre	tatio	ons	
States and the states of the		lammer on						88						ot be relied					

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

17	TLC		C 1	5	PF		NAME:			ort George Hill BORING NO. P-4					
C	500					LOC	CATION:	176	9 Fort G	George Hill, NY 10040 JOB NO. N-7350					
	And a state of the	ONSULT								GROUND ELEVATION: 69.32					
BORIN	NG BY:AD				D	ATE ST	ARTED:	8/8/	2008	GROUNDWATER TABLE DEPTH					
							LETED:		2008	0 Hr. N/A Date N/A 24 Hr. N/A Date N/A					
DEPTH	SPECTOR:DP		тн	DAIL	CONF	LLILD.	0/0/								
	METHOD	SAMPLE	FROM	то		Blows o	n Spoor	1	REC	SOIL DESCRIPTION AND STRATIFICATION					
(ft)	METHOD	No.			10.00					SOIL DESCRIPTION AND STRATIFICATION					
0			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)						
	Probe		0	30						8" Concrete					
										Soil					
5										1 – – – – – – – – – – – – – – – – – – –					
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25										Apparent Top of Sound Rock					
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30															
										Probe completed at 30 ft.					
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40															
Nomir	nal I.D. of	Hole								n hereon was obtained for the design and estimating purposes for our client.					
Nomir	nal I.D. of	Split Barrel	Sample	r	13/8 in	It is ma	de availal	ble to aut	horized u	users only that they may have access to the same information available					
Weigh	nt/type of H	lammer or	Drive P	Pipe	300 lb	to our c	lient. It i	s present	ed in goo	bod faith, but it is not intended as a substitute for investigations, interpretations					
		Hammer or	(-					sers. Information on the logs should not be relied upon without the geotechnic					
		r on Drive					gineers recommendations contained in the report from which these logs were extracted.								

Approximate Change in Strata: _____ Inferred Change in Strata:

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

Core Size: NX

in

1	77 0		91		PF	ROJECT	NAME:		For	rt George	Hill		BORIN		P-5				
C	500					LOC	ATION:	176	9 Fort G	eorge Hill	I, NY 1	0040	JOB NO	N-7350					
		ONSULT	ERS							GROUND ELEVATION:							60.24		
BORIN	NG BY:AD	Т		10	D	ATE ST.	ARTED:	8/14	2008					ATER TAB	LE DEPT	-			
INSPE	CTOR:D	0		DATE COMPLETE			8/14	8/14/2008		N/A	Date	N/A	24 Hr.	N/A	Date	N/A			
DEPTH		CAMPLE	DEF	PTH		Blowe	n Spoor	1	REC										
(ft)	METHOD	SAMPLE No.	FROM	TO	1	DIOWS C	in spoor		HEU		SOIL	DESCR	IPTION /	AND STRAT	FIFICATIO	N	5	SYN	
0		NO.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	1									
	Probe		0	47						8" Concre	te								
										Soil									
										1									
										1									
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40										1									
Nomin	al I.D. of I	Hole			in	The sub	surface in	nformatio	n shown	hereon wa	as obtain	ned for the	he design	and estimatin	ng purpose	s for our cl	ient.		
And in case of the local division of the	NAME AND ADDRESS OF TAXABLE PARTY.	Split Barrel	Sample	r	+	0.0000000000000000000000000000000000000								to the same in					
		lammer on			-									ostitute for in			tatior	ns	
-	and the second se	lammer on			-	1								not be relied u					
A DESCRIPTION OF TAXABLE PARTY.	and the second se	r on Drive	and the second second second											ogs were extr		800			
	Size: NX				in					OH: Weigh									

Approximate Change in Strata: ____

Inferred Change in Strata:

															7350P-5	XIS
[7	77 C		\bigcirc		PF	ROJECT	NAME:		For	rt George Hill		BORING	F	-5		
(4	500		21				CATION:	-		George Hill, NY 10040 JOB NO.						7350
7		ONSULT										GROUN	DELEVA	TION:).24
BORIN	NG BY:AD	T			DATE	START	ED	8/14	/2008		GR			LE DEPTH		
	ECTOR:D					COMPL			/2008	0 Hr. N/A	Date		24 Hr.	N/A	Date N/	A
DEPTH	T		DEF	PTH		Plane	n Corre		REC							
(ft)	METHOD	SAMPLE No.	FROM	то	1	Blows	on Spoor	1	REC	SOIL DESCRIPTION AND STRATIFICATION						
40		NO.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	1						
										Apparent Top of	f Sound Re	ock				4
										1						
										1						
45										1						
										1						
1										1						
										Probe Complete	at 47.0 ft.					
50																
										1						
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Parent I																
80																
	al I.D. of H		-							hereon was obta						nt.
		Split Barrel								sers only that the						
		lammer on								d faith, but it is n						
		lammer on		arrel		a second second				ers. Information					the geotec	hnical
and the second se		on Drive I	Pipe							ned in the report				acted.		
Core S	Size				in		: Pocket	Penetron	neter; We	OH: Weight of H	ammer; W	OR: Weigh	t of Rod			

17	TLC		C 1		PF		NAME:			t George			BORIN				P-	-
G	2	ONSULT				LOC	CATION:	176	9 Fort G	eorge Hi	II, NY 10	040	JOB NO				N-7	
	Concerning of Concerning	NGINEI										_	-	ND ELEVAT			60.	.99
BORIN	G BY:AD	Т			D	ATE ST.	ARTED:	8/11	/2008			-		ATER TAB	LE DEPT	_		
INSPEC	CTOR:DF	, ,			DATE	COMP	LETED:	8/11	/2008	0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A	1
DEPTH		CAMPLE	DEF	РТН		Blowe	n Spoon		REC									
(ft)	METHOD	SAMPLE No.	FROM	TO		DIOWSC	in opoor		TILU		SOIL	DESCR	IPTION /	AND STRA	TIFICATI	ON		SYI
0		10.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)									
	Probe		0	30						8" Concre	ete							
										Soil							[
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20										1								
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										Apparent	Top of S	Sound R	lock					
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										Probe co	mpleted a	at 30 ft.						
35																	_	
40																		
	al I.D. of I			1	in in	The out	eurface i	formati	n show	hereon	as obtair	ed for t	he design	and estimati		es for our	clien	IT.
		Split Barrel	Sample	r	-	a second designed as a second								to the same i				
		lammer or			-	-								bstitute for in				ons
	a formation of the second s	lammer or		-									not be relied					
Weight					1 10 10	In Jung	ment or st	and during	un us	www. annohi	Contraction Of			and the remove				
		r on Drive	and it is the second		-	enginee	TS TROOM	mendatio	ins conta	ined in the				ogs were ext				

Approximate Change in Strata: _____ Inferred Change in Strata:

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

17	17 C				PF	ROJECT	NAME:		For	rt Georg	e Hill		BORING	NO.			P-7
((500		31			LOC	ATION:	176	9 Fort G	George H	lill, NY 1	0040	JOB NO.			N-	7350
7		ONBULT											GROUNI	D ELEVAT	ION:	5	2.11
BORIN	NG BY:AD	т			D	ATE ST	ARTED:	8/26	2008			GR	OUNDWA	TER TAB	LE DEPTH	-	
INSPE	CTOR:DE	C					LETED:		2008	0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date N	/A
DEPTH		0444515	DEF	РТН		Blowe	n Spoor		REC								
(ft)	METHOD	SAMPLE No.	FROM	ТО		BIOWS C	an Spoor		MEC		SOIL	DESCR	IPTION A	ND STRAT	FIFICATIC	N	SYN
0		140.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)								
	Probe		0	50						4" Asph	alt						
										Soil							
5																	
10										-						-	-
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	nal I.D. of I	A TRACK AND A TRAC														s for our clie	nt.
		Split Barrel				1							ve access to				
		lammer on				1										s, interpreta	
		lammer on	and the second se	arrel	-	1										ut the geote	chnica
		r on Drive	Pipe		-								ch these log		acted.		
Core S	Size: NX				in	P	p: Pocket	Penetror	neter; W	OH: Wei	ght of Ha	ammer; V	VOR: Weig	ht of Rod			

17	77 C		PF	ROJECT	NAME:		For	t George Hill	BORING NO.	P-7	-		
Q	2					LOC	CATION:	176	9 Fort G	eorge Hill, NY 10040	JOB NO.	N-73	
		ENGINEE	ERS								GROUND ELEVATION:		52.
BORIN	NG BY:AD	т			DATE	START	ED	8/26/	2008	GR	OUNDWATER TABLE DEPTI	H	
INSPE	CTOR:D	Ρ			DATE	COMPL	ETED	8/26/	/2008	0 Hr. N/A Date	N/A 24 Hr. N/A	Date N/A	
DEPTH			DEF	PTH		Plaura a	n Spoor		REC				
(ft)	METHOD	SAMPLE No.	FROM	TO	1	DIOWS 0	in Spool		HEU	SOIL DESCRI	IPTION AND STRATIFICATIC	N S	SYME
40		NO.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)				
													4
45										Apparent Top of Sound Ro	ock		
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75													
80													
Nomin	al I.D. of	Hole			in	The sub	osurface i	nformatio	on showr	hereon was obtained for th	he design and estimating purpose	s for our client.	
Contract of the local division of the local	And in case of the local division in the loc	Split Barrel		er	-						ve access to the same information		
		Hammer or			-	-					ed as a substitute for investigation		ns
and the second se		lammer or									s should not be relied upon witho		
			the local data is not in the local data of the l	aner	-	a second second second second					ch these logs were extracted.	Sectore Becker	
		r on Drive	ripe										
Core S	bize				ir					OH: Weight of Hammer; W	ange in Strata:		

[]	77 C		\bigcirc		PF	ROJECT	NAME:		For	rt George I	Hill		BORIN	G NO.			P-	-8
((50						ATION:	176		George Hill,		0040	JOB NO).			N-7	350
7		ONSULT												ND ELEVAT	TION:	1	50.	
RODIA	IG BY:AD		- 110		D	ATE OT	ARTED:	9/14	/2008			GR		ATER TAB		н		-
	CTOR:DI				-		LETED:		/2008	0 Hr.	N/A	Date		24 Hr.	N/A	Date	N/A	l
	T	1	DE	PTH	DATE	COMP	LETED:	0/15	2000	0 111.		Date	IVA	1-4 m.	11/13	Date	14/2	
DEPTH		SAMPLE				Blows of	n Spoor	1	REC		001			AND STRA	TIEICAT	ON		SYI
(ft)	METHOD	No.	FROM	то						-	SUILI	DESCR	IPTION A	AND STRA	TIFICATI	UN		511
0			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)									-
	Probe		0	46						3" Asphalt								
										Soil								
]								
5										1							_	
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Nomin	al I.D. of	Hole			in	The ent	surface i	nformatio	on show	hereon we	s obtain	ned for th	he design	and estimati	ne purpos	es for our	clien	L
			Sample	r	-									to the same i				
		Split Barrel	-	•												000		
	t/type of H	-	1		1.5						ostitute for in							
and the second se		lammer or	and the second se	arrel	-									ot be relied		out the ge	otech	inic
		r on Drive	Pipe											ogs were ext	racted.			
Core S	Size: NX				in	P	p: Pocket	Penetron	meter; W	OH: Weigh	t of Ha	mmer; V	VOR: Wei	ight of Rod				

Inferred Change in Strata: Approximate Change in Strata: ____

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

																7350P	0.40
17	TIC				PF	ROJECT	NAME:			rt George			BORIN				P-8
Q	5					LOC	ATION:	176	9 Fort G	George Hil	I, NY 10	040	JOB N	0.		Ν	1-7350
	e c	ONSULT	EAS										GROU	ND ELEVA	TION:		50.85
BORIN	NG BY:AD	T			DATE	START	ED	8/14	2008			GR	OUNDW	ATER TAB	LE DEPT	н	
INSPE	CTOR:D	Р			DATE	COMPL	ETED	8/15	2008	0 Hr.	N/A	Date	N/A	24 Hr.	N/A	Date	N/A
DEPTH			DEF	PTH		Plaws o	n Spoor		REC								
(ft)	METHOD	SAMPLE No.	FROM	TO	1	DIOWS C	n Spoor	1	HEU.		SOIL [DESCR	IPTION A	AND STRAT	FIFICATIO	N	SYN
40		140.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)								
										Apparent	Top of S	Sound Re	ock				4
]							
]							
45																	
										Boring Co	omplete	at 47.0 f	t.				
50				-													
										4							
										1							
										4							
									-	4							
55										-							_
										4							
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60				-						-							
										4							
	<u> </u>			-	-	<u> </u>	-			4							
			-	-	-	-	-			-							
0E	<u> </u>									-							
65	<u> </u>									-							+
	<u> </u>		-	-						1							
	<u> </u>					-				1							
	<u> </u>		-							1							
70										1							
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										1							
										1							
75										1							
]							
80																	
Nomin	al I.D. of I	Hole			-	-								and estimation			
Nomin	al I.D. of	Split Barre	I Sample	er	-									to the same i			
and the second se		Hammer or			-	-								ostitute for in			
		Hammer or		arrel	-									tot be relied		out the geo	technica
		r on Drive	Pipe											ogs were extr	racted.		
Core S	Size				in	P	p: Pocket		meter; W Strata:	OH: Weig	ht of Ha	mmer; V	VOR: Wei	ight of Rod			

17	TIC		C 1		PF	ROJECT	NAME:			t George Hill	BORING	NO.		P	
CL	500					LOC	CATION:	176	9 Fort G	eorge Hill, NY 10040	JOB NO.			N-7	350
1		ONSULT									GROUND	ELEVATION	t:	49.	.58
BORIN	G BY:AD				D	ATE ST	ARTED:	8/15	/2008	GF	and the second sec	ER TABLE D			
	CTOR:DF						LETED:		/2008	0 Hr. N/A Date		1		te N/A	1
DEPTH	1		DEF	РТН											
(ft)	METHOD	SAMPLE	FROM	ТО		Blows o	n Spoor	1	REC	SOIL DESCR	IPTION AN	D STRATIFIC	CATION		SYN
0		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)			REAL TRANSPORT			
5	Probe		0	41	0/0	0112	1210	I SIL-I	(m)	3" Asphalt					
	TIOOC		0	41			-			Soil				1	
										500					-
F										1					-
5									-	4				_	-
										4					-
							-			1					-
					-										-
							-								
10														_	_
															_
										ł					_
										Weathered Rock					
15														_	
										Į					
					_										
20]					
]					
										1					
25										1					
										1				_	
										1					
										1					
										1					-
30										1					
														-	
			-							1					-
										1					-
															-
25															-
35				-						Apparent Top of Sound F	COCK			_	-
							-			4					-
										4					-
															-
2345															_
40															
						1									
of a participation of the local distance of	al I.D. of H				-					hereon was obtained for t					t.
Nomin	al I.D. of S	Split Barrel	Sample	r	_					isers only that they may ha					
Weigh	t/type of H	lammer on	Drive P	ipe	300 lb	to our c	lient. It is	s presente	ed in goo	d faith, but it is not intend	ed as a substi	tute for investi	gations, inter	pretati	ons

in 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.

in

Drop of Hammer on Drive Pipe

Core Size: NX

5	117 -			_		01503	- NIALAE		-	+ Cassas Lill	DODING NO	
11	LC	SE	SI		PF		NAME:			rt George Hill	BORING NO.	P-9
5	27/ 0	ONSULT	ING			LOC	CATION:	176	9 Fort C	eorge Hill, NY 10040	JOB NO.	N-735
_		ENGINE	ERS								GROUND ELEVATION:	49.58
	NG BY:A					START			2008		OUNDWATER TABLE DEPTH	
	ECTOR:D	P	DE		DATE	COMPL	ETED	8/15/	/2008	0 Hr. N/A Date	N/A 24 Hr. N/A	Date N/A
DEPTH	METHOD	SAMPLE	DEF	-		Blows of	n Spoor	١	REC		PTION AND STRATIFICATION	s
(ft)	METHOD	No.	FROM	TO	0/0	0/10	10/10	10/04	(:-)	SUIL DESCRI	PTION AND STRATIFICATION	0
40			(ft)	(ft)	0/6	6/12	12/18	18/24	(in)			
								-		Darks Complete et 41.0.6		+-
										Probe Complete at 41.0 ft.		
										1		- F
45			-							1		F
40										1		-
	<u> </u>											
										1		F
										1		
50										1		
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	<u> </u>											-
	<u> </u>											-
	<u> </u>								-			
75	<u> </u>											-
15												-
												-
			-							1		
	<u> </u>									1		
80										1		
~~												
omin	al I.D. of I	Hole			in	The sub	surface in	formatio	n shown	hereon was obtained for th	e design and estimating purposes for	or our client
		Split Barrel	Sample	r	-	1					e access to the same information av	
and the local division of the local division of the	and the second	lammer on									d as a substitute for investigations,	
		lammer on				1					should not be relied upon without	

in engineers recommendations contained in the report from which these logs were extracted. 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.

Drop of Hammer on Drive Pipe

Core Size

[]	77 C		21		PF	ROJECT	NAME:		For	t George	Hill		BORIN	G NO.			P-	10
C.	500					LOC	CATION:	176	9 Fort G	eorge Hil	II, NY 1	0040	JOB N	0.			N-7	350
	· ·	ONSULT											GROU	ND ELEVAT	ION:		47	.1
BORIN	NG BY:AD	т			D	ATE ST	ARTED:	8/18	2008			GF		ATER TAB		Н		
	CTOR:DE						LETED:		/2008	0 Hr.	N/A	Date		24 Hr.	N/A	Date	N/A	1
DEPTH	T		DEF	тн								_						
(ft)	METHOD	SAMPLE	FROM	то		Blows o	on Spoor	1	REC		SOIL	DESCR	IPTION	AND STRA	TIFICATI	ON		SYN
0		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	1								
	Probe		0	54	0.0	0/12	1210	10/21	(,	3" Aspha	lt						-	
	TIOUC		- V	54						Soil								-
										301								
										1								
5																		-
5		<u> </u>	<u> </u>							1							-	-
										1								-
										•								-
										{								-
10										1								-
10										1							-	-
										1								-
		-								1								-
								1								-		
						-										-		
15								Weathere	d Rock						-	-		
										1								_
										-								-
										1								-
10000				-						4								-
20										4							8	_
										4								
										4								-
								-		4								_
	L									-								-
25																	-	_
					-					-								_
										-								_
	L									4								
							-			1							1	-
30										1							-	-
	L									4								
										-								
	L									-								-
										-								
35										-							_	_
										-								_
										1								
40																		
Nomin	nal I.D. of I	Hole			in	The sub	surface in	nformatio	on shown	hereon w	as obtai	ined for t	he design	and estimation	ng purpose	es for our	clien	t.
Nomin	al I.D. of	Split Barrel	Sample	r	13/8 in	It is mad	de availal	ble to aut	horized u	isers only	that the	y may ha	ve access	to the same i	nformatio	n availabl	e	
		lammer on			300 lb	to our c	lient. It i	s present	ed in goo	d faith, bu	t it is no	ot intend	ed as a su	bstitute for in	vestigatio	ns, interp	retati	ons
		lammer or			140 lb	or judgi	ment of su	uch autho	orized us	ers. Inform	nation o	on the log	s should	not be relied	upon with	out the ge	otech	nnica
		r on Drive			-									logs were extr				
	Size: NX				in									ight of Rod				

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

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

1	450	SES	S		F		T NAME			rt George	and the second se		BORING	NO.			P-10
5	2// 0	ONSULT	TING			LO	CATION	: 176	69 Fort C	George Hill	, NY 10	040	JOB NO.	-			1-7350
-		NGINE	ERS										GROUN	ELEVA	TION:		47.1
the second s	NG BY:AD				DATE	START	ED	8/18	3/2008			GR	OUNDWA				
	ECTOR:DI	C	_		DATE	COMP	ETED	8/18	3/2008	0 Hr.	N/A	Date	the second se	24 Hr.	N/A	Date	N/A
DEPTH		SAMPLE	-	PTH		Blowe	on Spoor	2	REC								Τ
(ft)	METHOD	No.	FROM	TO		510113 (on opool	,			SOIL D	DESCRI	PTION AN	D STRAT	IFICATIO	N	SY
40		SAME TAKES	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	1							
																	+
										1							
										1							
										1							
45																	
																-	-
																	-
					-												+
50										Apparent 7	op of S	ound Ro	ck				
																_	
ŀ					_			-									
ŀ																	
ŀ																	
55								Probe Com	plete at	54.0 ft.							
ŀ																	
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60																	
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65																	-
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70																	⊢
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75																	
-																	
H																	
30																	
																	-
minal	I.D. of Ho	le			in	The subsu	urface inf	ormation	shown h	ereon was o	obtained	for the o	lesign and e	stimating	purposes fo	r our clier	t
minal	I.D. of Spl	it Barrel S	ampler		13/8 in]	t is made	available	to autho	orized use	ers only that	they ma	y have a	access to the	same info	rmation av	ailable	
eight/ty	ype of Har	nmer on D	rive Pip	e	300 lb t	o our clie	nt. It is r	presented	in good	faith, but it	is not in	tended	is a substitut	e for inve	stigatione -	nterprototi	0.00
	ype of Har				140 lb	or judgme	ent of such	h authori	zed users	. Informati	on on th	e loos et	ould not be	relied up	m without t	he geoto-	ous
		n Drive Pip			ine	ngineers	recomme	ndations	containe	d in the rep	on on th	e logs si	iouid not De	reneu upo	a without t	ne geoteci	inical
op of H	lammer 0											uphiah *	haca lago				

[]	77 C				PF	ROJECT	NAME:		For	rt George Hill	BORING NO.	P-11	1
((500					LOC	ATION:	176	9 Fort G	George Hill, NY 10040	JOB NO.	N-738	50
7	4/ °	ONSULT	ERS							-	GROUND ELEVATION:	41.79	9
BORIN	IG BY:AD				D	ATE ST	ARTED:	8/18	/2008	GR	OUNDWATER TABLE DEPT	Н	
	CTOR:DP						LETED:	-	/2008	0 Hr. N/A Date		Date N/A	
DEPTH			DEP	тн									
(ft)	METHOD	SAMPLE	FROM	то		Blows o	n Spoon	1	REC	SOIL DESCR	IPTION AND STRATIFICATIO	ON s	SYN
0		No.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	1			
	Probe		0	24						3" Asphalt			
										Soil			
										1			
										1			
5										1			
										1			
										1			
										1			
										1			
10]			
										1			
												[
										Weathered Rock			
15]			
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]			
												[1
20										Apparent Top of Sound R	ock		
										1			
25												_	
										Probe Complete at 24.0 ft.			
										-			
30										4		-	_
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										4		Ļ	
										4			_
										4			_
35										4		-	
								-		4		F	_
										4			
										4			
										4			
40													_
						1							
	al I.D. of H										he design and estimating purpose		
		Split Barrel				•					ve access to the same information		
	the second s	lammer or				-					ed as a substitute for investigation		
Weigh	t/type of H	lammer or	n Split Ba	arrel	140 lb	or judg	ment of su	uch autho	orized us	ers. Information on the log	s should not be relied upon with	out the geotechn	lica

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.

in

Core Size: NX

11	TZC		21		PF		NAME:			rt George Hill BORING NO. P-12
4	22					LOC	ATION:	176	9 Fort G	George Hill, NY 10040 JOB NO. N-7350
	THE COLOR ST. NO.	ONSULT								GROUND ELEVATION: 40.12
BORIN	IG BY:AD	Т					ARTED:	8/25/	/2008	GROUNDWATER TABLE DEPTH
INSPE	CTOR:DF	>			DATE	COMP	LETED:	8/26/	/2008	0 Hr. N/A Date N/A 24 Hr. N/A Date N/A
DEPTH (ft)	METHOD	SAMPLE No.	DEF	тн то		Blows o	n Spoor	ı	REC	SOIL DESCRIPTION AND STRATIFICATION
0		NO.	(ft)	(ft)	0/6	6/12	12/18	18/24	(in)	
	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										4
	SS	S-2	5	7	5	14	19	12	14	Ditto
										(class 2)
										4 –
-										↓ ⊢
10										l
	SS	S-3	10	12	12	8	5	6	14	Ditto
				-			<u> </u>			(class 3)
				-						┥ ┣─
15									-	4 –
15		8.4	15	17	12	45	50/1"		Ä	4 +
	SS	S-4	15	1/	12	45	50/1		0	Waatharad Dock
										Weathered Rock
										{
20										{
	SS	S-5	20	22	50/1"					Apparent Top of Sound Rock
										1
										1
25										1
	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	4 –
									3	4 –
									3.5	REC. = 57"/60" = 95.0%
35				-					3.5	RQD = 49.5"/60" = 82.5% (class 1b)
										4
										Boring Complete at 35.0 ft.
										*Probe changed to a boring
					-					┥ ┣─
40	1									
40										
	al I.D. of I	Hole			in	The sub	surface in	nformatio	on shown	a hereon was obtained for the design and estimating purposes for our client.
Nomin		Hole Split Barrel	Sample	r	-					n hereon was obtained for the design and estimating purposes for our client. users only that they may have access to the same information available

1	
in	engineers recommendations contained in the report from which these logs were extracted.
111	lengineers recommendations contained in the report from which these logs were extracted.
	chighteets recommendations contained in the report from which there rogs which the

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.

in

Drop of Hammer on Drive Pipe

Core Size: NX

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

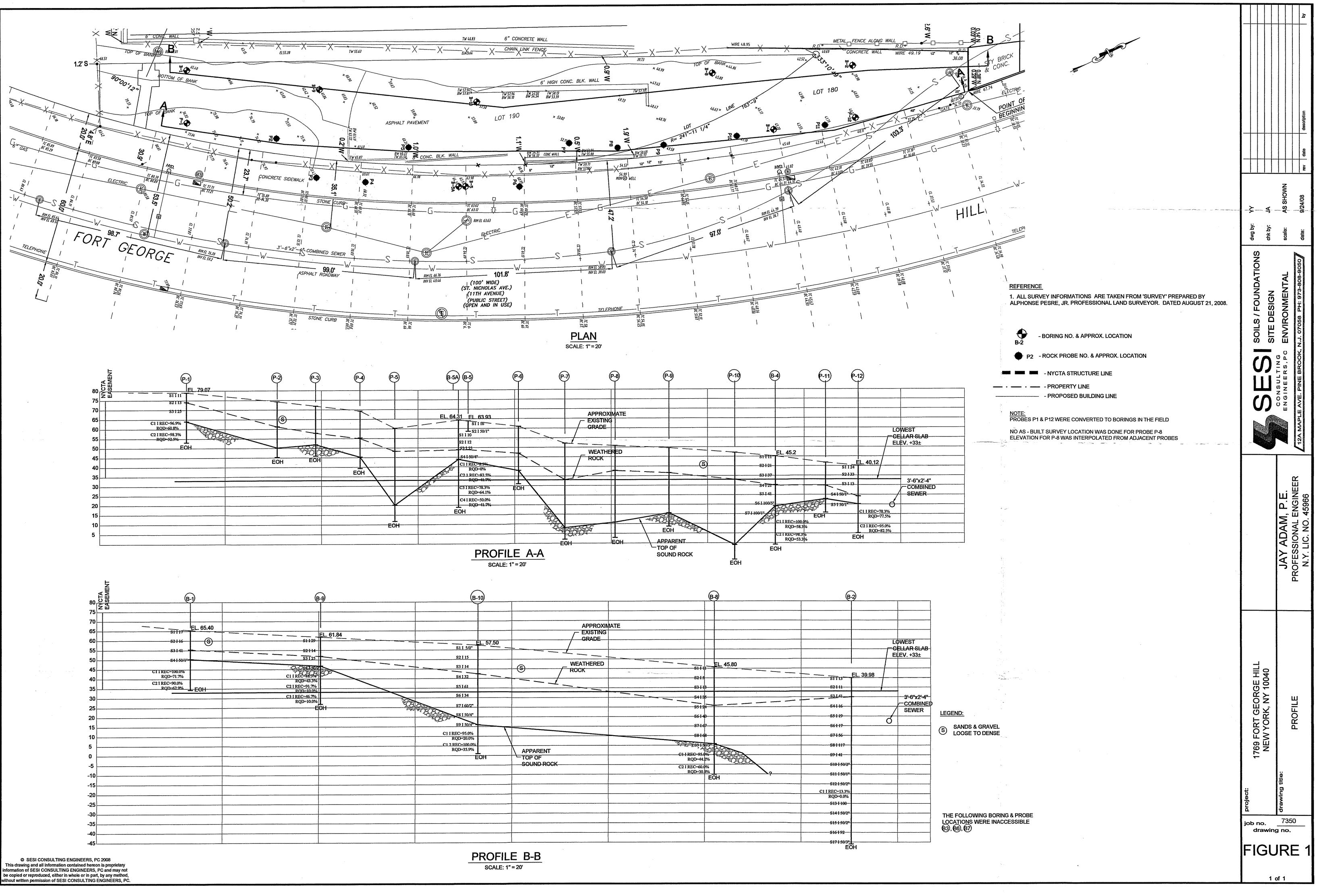
Size of Soil Components

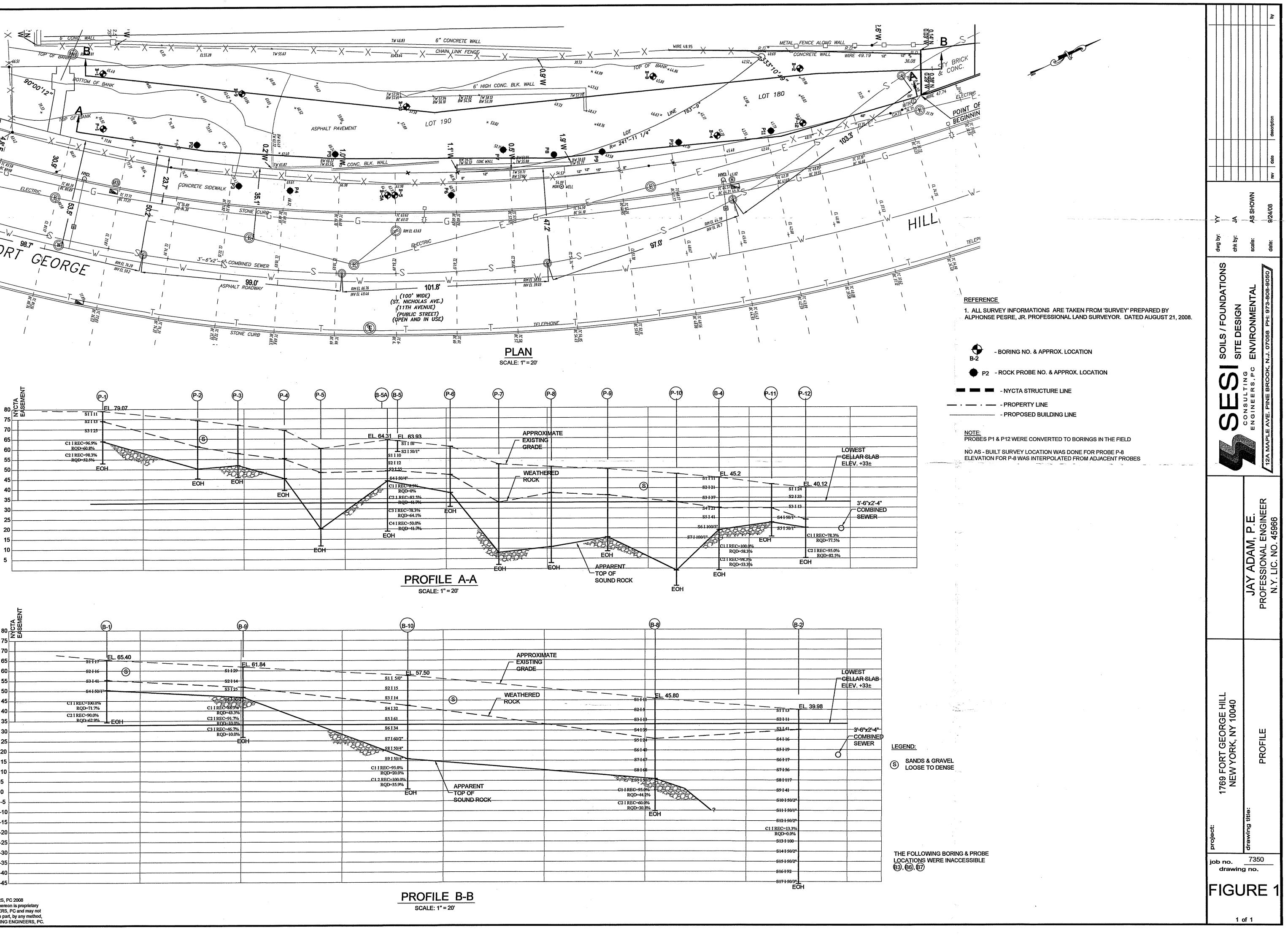
- Gravel
 - o Coarse gravel ranges from 3 inches to 1 inch
 - Medium gravel ranges from 1 inch to 3/8 inch
 - Fine gravel ranges from 3/8 inch to No. 10 sieve
- Sand
 - Coarse sand ranges from No. 10 sieve to No. 30 sieve
 - Medium sand ranges from No. 30 sieve to No. 60 sieve
 - Fine sand ranges from No. 60 sieve to No. 200 sieve
- Silt
 - o Material which passes the No. 200 sieve
- Clay
 - o 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
- Medium to fine (m-f)
- Coarse (c)
- Medium (m)
- Fine (f)

- Less than 10% of the component is fine
- Less than 10% of the component is coarse
- Less than 10% of the component is medium and fine
- Less than 10% of the component is coarse and fine
 - Less than 10% of the component is coarse and medium





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	F	L. 65.40			
-				<u>EL.</u> 61.84	
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	1				
	<u></u>				
	<u>84-1-50/1"</u>		\$3125		
		<u> </u>			
	CI I REC=100.0% RQD=71.7%		C1 I REC=88.3%	50°	
	C2 I REC=90.0%		ROD=43.3%		
		-E0H	C2 I REC=91.7% ROD=10.0%		
			C3 I REC=46.7%		
			<u>C3 I REC=46.7%</u> RQD=10.0%		2 Alexandre
			E	он	
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