

Supplemental Archaeological Assessment

Second Avenue Subway: 63rd Street Station

New York, New York

Prepared for:

Metropolitan Transportation Authority New York City Transit New York, NY

Prepared by:

AKRF, Inc. 440 Park Avenue South New York, New York 10016

July 2009

Management Summary

SHPO Project Review Number:	05PR00975
Involved Agencies:	Metropolitan Transportation Authority, New York City Transit, and the Federal Transit Administration
Phase of Survey:	Supplemental Phase 1A Archaeological Assessment
Project Location:	East 63rd Street between Second and Park Avenues and Third Avenue between East 63nd and East 64th Streets
Minor Civil Division:	06101: Manhattan
County:	New York County
Location Information: Survey Area Length:	Approximately 1200 feet (365.76 meters)
Survey Area Width:	Variable; between approximately 60 feet (18.28 meters) and 470 feet (143.25 meters)
Number of Acres Surveyed:	Approximately 2.6
USGS 7.5 Minute Quadrangle Map:	Central Park
Report Author:	Elizabeth D. Meade, RPA
Date of Report:	July 2009

Table of Contents

Chapter 1: Introduction	1
A. Project Overview and Background	1
B. Previously Analyzed Portions of the 63rd Street APE	1
C. Research Goals and Methodology	2
Chapter 2: Environmental Context	3
A. Original Topographical Setting	3
B. Soil Profile	3
Chapter 3: Precontact Archaeological Resources	6
A. Previous Precontact Archaeological Resources Sensitivity Assessments	6
Chapter 4: Historic Period Archaeological Resources	7
A. Historic Context	7
B. Locations of Disturbance for the 63rd Street Station	8
Chapter 5: Conclusions and Recommendations	12
A. Project Site Sensitivity	12
B. Recommendations	13
References	14
Figures	
Appendix A: Soil Boring Logs for the 63rd Street Station Provided by MTA NYCT	

List of Figures

- Figure 1: Project Location; USGS Map: Central Park Quadrangle.
- Figure 2: APE Location, 63rd Street Station; Sanborn Map 2007.
- Figure 3: Topographical Map of the City of New York; E. Viele, 1865.
- Figure 4: British Headquarters Map, ca. 1782.
- Figure 5: "The Commissioners' Plan;" W. Bridges, 1811.
- Figure 6: Map of That Part of the City and County of New York North of 50th Street; M. Dripps, 1851.
- Figure 7: Atlas of New York City; G.W. Bromley, 1891.

Chapter 1:

Introduction

A. PROJECT OVERVIEW AND BACKGROUND

The Metropolitan Transportation Authority (MTA), in cooperation with New York City Transit (NYCT), is planning to construct the 63rd Street Station of the Second Avenue Subway (see Figure 1). This Supplemental Archaeological Assessment to the Second Avenue Subway Phase 1A Archaeological Assessment (Historical Perspectives, Inc. 2003a) has been prepared in accordance with the provisions of the Second Avenue Subway project's Programmatic Agreement (PA) among the Federal Transit Administration (FTA), MTA NYCT, and the New York State Historic Preservation Officer (SHPO), executed April 8, 2004. The PA sets forth the steps to be followed for "any changes to the project that introduce new project elements that would involve subsurface construction and for which the effects of such construction have not yet been analyzed." For these areas, archaeological investigation should be conducted in consultation with the SHPO and the New York City Landmarks Preservation Commission (LPC).

FTA issued a Record of Decision (ROD) for the Second Avenue Subway project on July 8, 2004. The ROD was issued based on the findings presented in the *Second Avenue Subway Final Environmental Impact Statement and Final Section 4(f) and 6(f) Evaluation* (FEIS; AKRF April 2004), which examined the potential impacts of the 8.5-mile-long Second Avenue Subway from East 125th Street in Harlem to Hanover Square in Lower Manhattan. The FEIS identified the environmental impacts of the Second Avenue Subway during its construction and the permanent impacts once the subway is operational. It also identified mitigation measures to alleviate the identified impacts. The assessment of the Second Avenue Subway's proposed alignment, ancillary facilities, stations, and station entrances presented in the FEIS was based on conceptual and preliminary engineering. As part of the FEIS, the aforementioned Phase 1A Archaeological Assessment of the Second Avenue Subway and several addenda were prepared by Historical Perspectives, Inc. (HPI) in March 2003.

In the vicinity of the 63rd Street Station, the APE analyzed in HPI's 2003 Phase 1A Archaeological Assessment included the streetbed of Second Avenue from western building line to eastern building line. An addendum to the Phase 1A completed in June 2003 analyzed the location of the "63rd Street Curve," which included the streetbed of East 63rd Street and a portion of East 64th Street between Second and Third Avenues as well as portions of Blocks 1418 and 1419 (HPI 2003b).

Plans for station entrances and ancillary facilities were not finalized at the time of the completion of the FEIS and at that time no evaluation was conducted for any of those areas or for utility relocations west of Third Avenue. Since that time, however, the design for the 63rd Street Station has advanced considerably and includes areas of potential disturbance located outside the APEs analyzed in the FEIS. Therefore, consistent with the requirements of the PA, this assessment was prepared to evaluate the potential for impacts to archaeological resources in the new APE for the 63rd Street Station.

The 63rd Street/Lexington Avenue Station is already constructed and in operation. The station is situated beneath 63rd Street, extending from the west side of Park Avenue to the east side of Third Avenue and is currently used by the F line. The Second Avenue Subway will share this station with the F line. To accommodate usage as part of the Second Avenue Subway, ventilation systems and new station entrances will be constructed and utilities installed or relocated.

This Supplemental Archaeological Assessment of the 63rd Street Station analyzes the archaeological sensitivity of all of the areas of planned construction including station entrances and ancillary facilities and utility installation/relocation within streetbeds (see Figure 2). The majority of the APE is located immediately to the west of the APE analyzed in the 2003 Phase 1A study. However, utility installation/relocation is proposed in an approximately 150-foot portion of East 63rd Street east of Third Avenue. The streetbed of East 63rd Street between Second and Third Avenues, including the 150-foot section included within the current APE, was among the areas

Second Avenue Subway: 63rd Street Station—Supplemental Archaeological Assessment

analyzed for archaeological sensitivity in the 2003 Phase 1A study. Because new data have been obtained from soil borings taken after the 2003 Phase 1A was completed, the streetbed of East 63rd Street between Second and Third Avenues was reevaluated as part of the present study.

The APE for the 63rd Street Station for the purposes of this archaeological assessment includes the following:

- An ancillary facility at 124 East 63rd Street, on the southern side of the street between Lexington and Park Avenues;
- An ancillary facility 169 East 63rd Street, within an existing paved public plaza on the north side of the street between Third and Lexington Avenues;
- An entrance at the southeast corner of East 63rd Street and Third Avenue;
- A new stairwell and expansion of the station within the streetbed of Third Avenue between East 62nd and East 64th Streets; and
- Utility installations and relocations within the streetbed of Third Avenue between East 62nd and East 64th Streets and in the streetbed of East 63rd Street east and west of Third Avenue (including sidewalks). Utility relocation/installation is only expected to occur in a 150 foot-long section of the streetbed immediately east of the eastern line of Third Avenue, though the entire streetbed of East 63rd Street between Second and Third Avenues has been conservatively included within the APE.

B. PREVIOUSLY ANALYZED PORTIONS OF THE 63RD STREET APE

A supplement to HPI's 2003 Phase 1A study completed in June 2003 and entitled "Section 7.13, East 63rd Street Curve Site" analyzed a portion of the 63rd Street Station APE. Among other locations adjacent to the 63rd Street Station APE, the supplemental study investigated the archaeological sensitivity of the streetbed of East 63rd Street between Second and Third Avenues. The supplement showed that while no structures had ever been present within the modern streetbed, the road was located in the vicinity of an 18th century farmhouse depicted on B.F. Stevens' facsimile of the 1782 British Headquarters map (published in 1900).

The assessment concluded that while no structures were ever situated within the roadbed itself, the majority of the street (an approximately 500 foot-long area west of the location of the former Post Road) was sensitive for historic period archaeological resources associated with an 18th century farmhouse that is depicted to the north of the street on the 1782 British Headquarters Map. B.F. Stevens' facsimile of the map depicts a property line around the farmstead, indicating that the property extended partially into the streetbed of East 63rd Street between Second and Third Avenues. Although the farmhouse itself was not located within the street, HPI determined that there was a moderate possibility that shaft features associated with the property may have been located within East 63rd Street. These resources were determined to be located between the ground surface and a depth of 8 feet below grade.

In addition, because of the lack of development in the area and the presence of potentially intact soils seen in soil borings from an adjacent block, HPI also determined that the entire length of East 63rd Street between Second and Third Avenues was moderately sensitive for precontact archaeological resources. HPI determined that these precontact resources were likely to be located between the ground surface and a depth of up to 13 feet.

C. RESEARCH GOALS AND METHODOLOGY

The goal of this Supplemental Archaeological Assessment is to determine the likelihood that potential archaeological resources have survived in the portions of the APE not evaluated in previous archaeological assessments. The study has been designed to satisfy the requirements of SHPO (2005) and LPC (2002) and it follows the guidelines of the New York Archaeological Council (NYAC, 1994). The study documents the history of the APE as well as its potential to yield archaeological resources dating to both the precontact and historic periods.

In order to determine the extent to which archaeological resources within the APE may have been disturbed, numerous primary and secondary sources were examined. Cultural resources assessments of the APE and vicinity were reviewed including the 2003 Phase 1A Archaeological Assessment. In addition, historic maps and atlases were examined to determine a chronology for the development of the APE. Soil boring records (including soil borings analyzed for the FEIS and others that were completed after the FEIS was published) were reviewed to create a soil profile for the APE which could be used to assess its archaeological sensitivity. Finally, local histories, historic newspapers, and historic photographs were also reviewed as necessary.

A. ORIGINAL TOPOGRAPHICAL SETTING

Viele's 1865 map (Figure 3) shows that the eastern portion of the 63rd Street station was originally flat meadowland, while the western portion, between Lexington and Park Avenues, was interrupted by hills. A large marsh-bordered stream ran to the north and west of the station, but does not appear to have entered the APE.

Several historic atlases from the mid- and late 19th century include information regarding the elevations of street intersections in the vicinity of the 72nd and 86th Street stations. A summary of the street elevation changes as depicted on three maps (dating to 1850, 1885, and 2007) is presented in Table 1, below. George Hayward's circa 1850 map, *Profile of the Twelve Avenues in the City of New York from 24th to 161st Streets Shewing* (sic) *the Elevations at the Streets*, shows that the elevation of some of the streets in the vicinity of the APE have been modified very little since the mid-19th century. Some slight changes in elevation occurred in the mid- to late-19th century although elevations have remained nearly constant between 1885 and the present day. The landscape modification that occurred between 1850 and 1885 was likely due to the cutting of streets, leveling of hills, and filling of streams and marshes in preparation for the neighborhood's residential development (discussed in greater detail in Chapter 4).

Intersection	1850 Hayward	1885 Robinson and Pidgeon	2007 Sanborn
East 62nd Street & Second Avenue	65.2	61.1	Not given
East 62nd Street & Third Avenue	59.4	58.2	58.3
East 62nd Street & Lexington Avenue	Not given	48.2	48.2
East 62nd Street & Park Avenue	47.5	50.4	50.4
East 63rd Street & Second Avenue	62.1	59.3	59.3
East 63rd Street & Third Avenue	60.2	60.3	60.3
East 63rd Street & Lexington Avenue	Not given	50.2	50.2
East 63rd Street & Park Avenue	48.6	51.65	51.8
East 64th Street & Second Avenue	49.4	56.8	56.8
East 64th Street & Third Avenue	65	62.6	62.6
East 64th Street & Lexington Avenue	Not given	52	52
East 64th Street & Park Avenue	48.7	52.8	52.9

attempts to transcribe the data accurately but there may be some errors. In addition, none of the maps included above indicate the datum from which the elevation was measured with the exception of the 1885 Robinson atlas, which presents elevations "above high tide." Therefore, it is assumed that all measurements are with respect to sea level.

B. SOIL PROFILE

For the purposes of this study, numerous soil borings logs within and adjacent to the APE were provided by MTA NYCT. The borings were taken at various times between 1969 and 1975 and 2002 and 2009 and were located within the sidewalks lining the northern and southern sides of East 63rd Street between Second and Park Avenues and on the eastern and western sides of Third Avenue between East 62nd and East 64th Streets. Location maps and soil boring logs can be found in Appendix A.

THIRD AVENUE BETWEEN EAST 62ND AND EAST 64TH STREETS

Six soil borings were located within or immediately adjacent to the streetbed of Third Avenue between East 62nd and East 64th Streets. Five of these borings, all of which were taken between 1969 and 1975, identified a layer of fill immediately below the surface of the streetbed that ranged in thickness from 8 to 15 feet. Below the level of fill,

each boring also identified layers of sand, silt, and/or clay between the fill and bedrock. Bedrock was encountered between 14 and 25 feet in those locations. A fifth boring, located at the northeast corner of East 63rd Street and Third Avenue was recorded in 1974 and indicated the presence of 14 feet of silt between the street surface and bedrock with no fill layers present. The final boring located in this area, taken in 2009 (the only one that post-dates the construction of the existing subway station), showed only a 15-foot layer of fill located directly over bedrock.

EAST 63RD STREET BETWEEN THIRD AND PARK AVENUES

All of the borings located within East 63rd Street between Park and Lexington Avenues showed that only fill levels—ranging from 4 to 7 feet in thickness—were present over layers of decomposing rock and/or bedrock. The existing subway station is located in this area, and these fill levels are consistent with the extensive disturbance generated during the station's construction. Between Third and Lexington Avenues, borings at the western end of the street also indicated the presence of only fill (6 to 14 feet) above the bedrock. However, borings taken within the streetbed east of Lexington Avenue show the presence of a 4 to 15-foot layer of fill, followed by a layer of sand, silt, and/or clay, and finally bedrock at depths ranging between 6.5 and 23 feet below the surface. However, these sediments are also located above the existing subway station which documentary evidence suggests was constructed through cut-and-cover construction (discussed in greater detail below). Therefore, any natural sediments in this area are likely to be confined to the sidewalks (where the borings were located) as the soils in this portion of the streetbed would have been extensively disturbed during the construction of the existing subway station.

EAST 63RD STREET BETWEEN SECOND AND THIRD AVENUES

This portion of the streetbed was previously analyzed in HPI's 2003 Phase 1A study. However, at that time, no soil boring data was available for this portion of the APE with the exception of two borings taken in 1935 near East 63rd Street's intersections with Second and Third Avenues. These borings indicated the presence of 8 to 10 feet of fill within the streetbed above natural sediments including sand and silty sand. Bedrock was identified at approximately 19 to 20 feet below ground surface. Newly available soil boring data provide a great deal more information about the soil profile in this portion of the APE. All of the soil borings in this section of East 63rd Street between Second and Third Avenues are summarized in Table 2, below.

	Su	ininary of Soli bo	rings for East 63rd	Street Between	Second and Third Avenue
Boring	Year	Lo Sidewalk of E.	cation Distance East of	Within Area of Expected Utility	Summary of Soil Profile*
Number	Tear	63rd Street	Third Avenue (feet)	Work?	Summary of Son Frome
					0-9' Fill
					9'-25' Sandy Silty Clay
16	1969	South	6	Yes	25'- Rock
					0-10' Fill
					10'-20' Sand
B63-8	2009	South	54	Yes	20'- Rock
					0-18' Fill
63X-13	1971	North	108	Yes	18'- Rock
					0-4' Fill
					4-8' Clay
					8'-14' Clayey Silt
5-20	1974	South	120	Yes	14'- Rock
					0-9' Fill
					9'-18' Sand
5-21	1974	North	174	No	18'- Rock
					0-2' Fill
					2'-5- Sand and Clay
					5'-12' Sand
17	1969	North	228	No	12'- Rock
					0-6' Fill
					6'-18.5' Sand/Gravel/Silt
B63-6	2005	North	264	No	18.5'- Rock
					0-16' Fill
5-22	1974	South	318	No	16'- Rock

Table 2 ummary of Soil Borings for East 63rd Street Between Second and Third Avenues

 Table 2 (continued)

Summary of Soil Borings for East 63rd Street Between Second and Third Avenues

Daring		Lo	cation	Within Area of	
Boring Number	Year	Sidewalk of E. 63rd Street	Distance East of Third Avenue (feet)	Expected Utility Work?	Summary of Soil Profile*
					0-16' Fill
18	1969	South	372	No	16'- Rock
					0-8' Fill
63F-1	1975	North	372	No	8'- Rock
					0-9' Fill
					9'-14' Sandy Clay
5-23	1974	North	408	No	14'- Rock
					0-14' Fill
63F-2	1975	South	434	No	14'- Rock
					0-14' Sand
5-24	1974	South	450	No	14'- Rock
					0-10' Fill
63F-3	1975	North	474	No	10'- Rock
					0-6' Fill
63F-4	1975	South	492	No	6'- Rock
					0-3' Fill
63F-5	1975	North	558	No	3'- Rock
Notes:	etc.) see soil b				cluding color, texture, inclusions, dentified in soil borings is
Sources:	See Appendix	A for original boring	records provided by M	TA NYCT.	

Many of the ca. 1969-1975 borings located within the streetbed of East 63rd Street between Second and Third Avenues—most of which were located at the extreme eastern and western ends of the block—indicated that by that time only layers of fill were present between the street surface and the underlying bedrock throughout portions of the APE. Other borings, however, showed that other sediments including silt, sand, and/or clay were present between the fill and the bedrock.

Two recent borings were located in this area. The first, taken in 2009, was located on the southern side of East 63rd Street approximately 54 feet east of Third Avenue. This boring indicated the presence of 10 feet of fill below the street surface, followed by a 10-foot layer of sand (which could have been used as a filling material) and then bedrock. The second boring dates to 2005 and was taken within the northern sidewalk of East 63rd Street approximately 264 feet east of Third Avenue. That boring identified a 6-foot layer of fill above a 12.5-foot layer of sand, gravel, and silt. Bedrock was identified at a depth of 18.5 feet below grade.

While the existing subway tunnel passes below this portion of the street, it was constructed with a tunnel boring machine, rather than by the cut-and-cover method that was used to build the existing 63rd Street Station (HPI 2003b). Therefore, this portion of the streetbed would have experienced less disturbance as a result of subway construction activities, although soil borings indicate that there has been some disturbance to the area, likely as the result of road construction and maintenance and utility installation.

A. PREVIOUS PRECONTACT ARCHAEOLOGICAL RESOURCES SENSITIVITY ASSESSMENTS IN THE VICINITY OF THE APE

The precontact sensitivity of project sites in New York City is generally evaluated by the presence of level slopes, water courses, well-drained soils, and close proximity to previously identified precontact archaeological sites. HPI's 2003 Phase 1A and its various addenda included an analysis of soil borings, historic maps, previously identified Native American archaeological sites, and other documentary evidence which could indicate if the project site was sensitive for precontact archaeological resources. The Phase 1A noted that a Native American trail known as *Wickquasgeck*, ran in the vicinity of the project site and crossed Second Avenue near East 62nd Street. In addition, one previously identified archaeological site was located in the immediate vicinity of the APE. The site (NYSM #4061) involved "traces of occupation" between East 61st and East 63rd Streets along the shore (Parker 1922). As seen on the Viele map, the area where precontact archaeological resources were identified was in proximity to level high ground and a stream.

The 2003 Phase 1A and its addenda concluded that there were several locations in the vicinity of the APE that would have been appealing to Native Americans as habitation or resources exploitation sites. Because soil borings in the vicinity of East 63rd Street between Second and Third Avenues (but not within the streetbed itself) indicated that intact soil levels may have been present beneath layers of fill in the area, the 2003 Phase 1A identified large areas of precontact archaeological sensitivity near the 63rd Street Station. Among the locations identified as sensitive for precontact resources was the streetbed of East 63rd Street between Second and Third Avenues. The addendum to the Phase 1A stated that precontact resources in this area were likely to be found between the ground surface and a depth of 13 feet.

Chapter 4:

A. HISTORIC CONTEXT

Despite its large population during the historic period, the urban center of New York City was largely restricted to the southern end of Manhattan until the mid-19th century. Before that time, most of the northern portion of the island was occupied by large tracts of saltwater marshes, hills, uncultivated meadows, and farmland. The 1865 Viele map (Figure 3) shows that the location of the 63rd Street station was in an area that was originally occupied by both hills and meadow and was adjacent to a large stream.

Throughout the early colonial period, the British and Dutch governments conveyed land to settlers in large parcels. However, the APE was located within lands that were instead reserved as Common Lands that were granted to the City of New York by the Dongan Charter in 1686 (Stokes 1968). These lands were divided and sold by the City of New York in the early 19th century. To the north of the APE, between approximately East 65th and East 69th Streets and Third and Park Avenues, was a small parcel of land known as the "Dove Lots." The Dove Lots were named after the Dove Tavern (also called "The Sign of the Dove"), a late 18th century tavern that was located near the modern intersection of Third Avenue and East 66th Street (Kelby 1893). During the Revolutionary War, the Dove Lots were used as an artillery park and camp by the British Army (Johnston 1914). The British Royal Artillery was camped just below modern East 70th Street, near what are now the grounds of Hunter College (ibid). This camp adjacent to the Dove Tavern is famously known as the site where Captain Nathan Hale—a spy for the American Army who was captured by the British and hung for treason—was executed in 1776 and where he allegedly said the last words, "I regret that I have but one life to give my country." Hale's body was never found, but it is believed that he was buried nearby, possibly within the grounds of Hunter College (Kelby 1893). The Dove Tavern stood to the east of the project site until circa 1798 (Stokes 1968).

The 1782 British Headquarters Map (Figure 4) shows that the APE itself was undeveloped, with the exception of two structures were located to the northeast along the former Boston Post Road: the Dove Tavern and a farmhouse. The Post Road is also depicted on Bridges' 1811 map of Manhattan (Figure 5), which shows that in the vicinity of the APE, the Post Road ran northwest-southeast from the intersection of modern East 62nd Street and Second Avenue to the intersection of modern East 66th Street and Third Avenue. The fifth milestone of the road was located near the intersection of East 63rd Street and Second Avenue.

The farmhouse depicted on the British Headquarters map appears to be represented on the 1811 Bridges map alongside an additional unidentified structure. The two structures are depicted on the 1811 map within the streetbed of East 64th Street between Second and Third Avenues, east of the former Post Road. These structures were located on what was formerly the farm of Abraham and William K. Beekman, which included the majority of the APE. The Beekman brothers owned property to the east of the APE on the eastern side of the Post Road. They purchased the portion of their farm west of the Post Road (including the majority of the APE) in 1801, when the City of New York began to dispose of city-owned common lands as the population began its slow northward expansion (Stokes 1968). The western boundary of the Beekman farm was the eastern line of modern Park Avenue and the southern boundary was located between East 62nd and East 63rd Streets. This farm line is reflected in the irregular shape of the lots within Block 1397, bounded by East 62nd and East 63rd Streets and Third and Park Avenues.

South of the Beekman farm was the farm of Peter Praa Van Zandt. Van Zandt's father, also named Peter, had been granted farmland to the east of the APE in the 18th century and was accused by the city government of encroaching on the common lands. Therefore, the ownership of a portion of his farm in the vicinity of Third Avenue was disputed, with both the elder Van Zandt and the City of New York claiming ownership. The matter was resolved circa 1771 and the disputed lands were given to Peter Praa Van Zandt. Then in 1801, on the same day that the Beekmans purchased their property, Van Zandt purchased a portion of the common lands adjacent to his property. This land extended as far west as Park Avenue and a farmhouse was constructed on the property near the northwest corner of East 60th Street and Second Avenue (Stokes 1968).

With the exception of the farmhouse depicted to the northeast of the APE on the ca. 1782 British Headquarters Map (Figure 4) and the 1811 Bridges map (Figure 5), no early 19th century maps, including the 1820 Randel, and 1836 Colton maps, depict any structures in the immediate vicinity of the APE. The 1836 map shows that the Post Road was still present even though both Third and Park Avenues had already been cut through. At that time, East 63rd Street had not yet been constructed and was instead lined with hills, which were partially leveled to accommodate the Harlem Railroad which had been established along Park Avenue.

By the mid-19th century, however, the population of New York began to move northward and neighborhoods began to develop in the Upper East Side. Much of the development was brought about by the Tammany political machine and was heavily influenced by William Tweed, who at that time was the commissioner of the Department of Public Works (Burrows and Wallace 1999). The majority of development was located between Third and Fifth Avenues and East 59th and East 110th Streets because this area was "easy to grade, dig up, and build upon" (ibid: 929). Industrial development shifted east toward the river while crews of workers constructed streets and laid down sewer, water, and gas lines for the homes that were to be developed there (ibid). The growth of these neighborhoods was also due to the establishment of train lines along Second, Third, and Park Avenues, which allowed individuals to work in Manhattan's downtown commercial center while living in residential districts uptown.

The Dripps map of 1851 (Figure 6) shows that while uptown neighborhoods like Yorkville, north of the 63rd Street Station, had grown substantially by the mid-19th century, only a handful of structures had been erected within the blocks adjacent to the APE, although none were located within it. The Perris atlas of 1862 and the Dripps map of 1867 show that the APE continued to remain vacant well into the 19th century. The lots along East 63rd Street between Third and Park Avenues were not depicted as substantially developed until the publication of the 1879 Bromley atlas. By that time, the map shows, water (and likely sewer) lines were already present in the streetbed of East 63rd Street.

The vicinity of the 63rd Street Station has remained a developed neighborhood since the late-19th century and many of the buildings constructed at that time continue to stand there to this day. Little change came to the neighborhood until 1976, at which time the existing subway station within the streetbed of East 63rd Street between Third and Park Avenues was constructed to link Manhattan and Queens via the IND (now F) line. The station was constructed via the cut-and-cover method, which resulted in the "tearing up [of] almost all of 63d Street from Park Avenue to Third Avenue" (*New York Times* 5/18/1976). Additional construction was done with tunneling machines to cut through the bedrock below the streetbed (*New York Times* 9/24/1976). The construction of the station was opposed by the residents, who stood inside test pits in protest of the construction and who hired private security guards to prevent workers from arriving at the site (*New York Times* 5/13/1976). Eventually, a judge ruled that the construction of the station, which was expected to take at least four years, commence and the excavation of the streetbed of East 63rd Street was begun (Solochek 1976). The entrances to the station were planned at Lexington and Third Avenues and additional staircases were constructed in anticipation of the eventual link between this station and the Second Avenue Subway. Those staircases were never used, however, but will be opened up to the public as part of the Second Avenue Subway project.

B. LOCATIONS OF DISTURBANCE FOR THE 63RD STREET STATION APE

There are several locations where new excavation will be required in order to connect the new Second Avenue Subway line with the existing 63rd Street Station. A summary of the archaeological sensitivity of these locations is provided below.

ANCILLARY FACILITY 1:

The construction of Ancillary Facility 1 will involve the installation of an air vent shaft within an existing parking garage at 124 East 63rd Street (Block 1397, Lot 61 [part]). Current Sanborn maps identify this structure as a 4-story garage with a basement and buried gasoline tanks. As stated earlier, in the early 19th century, East 63rd Street had not yet been constructed and the APE was covered with hills. The 1851 Dripps map (Figure 6) suggests that the hills in this area had been leveled although no structures had been erected within the block by that time. The 1862 Perris atlas shows that several small wood frame structures had been erected in the southern half of the block, although the APE remained vacant.

The 1879 Bromley atlas is the first to depict any development within Lot 61. That map shows that the lot was at that time occupied by a large barn or stable, but no additional information about the building is given. The 1885

Robinson-Pidgeon and 1891 Bromley atlases (Figure 7) depict the same structure, which is identified on that map as being constructed of brick. A Sanborn map dating to 1892 depicts what appears to be the current structure on the lot, which was at that time used as a livery stable. The 1907 Sanborn identifies it as a boarding stable and by 1951 it had become a garage. The 1951 Sanborn map is the first to depict gas tanks buried beneath the eastern side of the structure.

Block 1397, Lot 61 was not developed until after water (and likely sewer) lines were available in East 63rd Street and there is no evidence that the lot was ever used for residential purposes. The existing building was constructed by the late-19th century with a basement in an area that maps suggest was formerly occupied by a series of hills that were leveled by the mid-19th century. Because of the lack of development in the lot until the late-19th century and the construction of the existing building, which has a basement, it is not likely that archaeological resources dating to the historic period would be impacted by the construction of the Second Avenue Subway within this lot.

ANCILLARY FACILITY 2:

Ancillary Facility 2 will be constructed along East 63rd Street in an approximately 10- by 20-foot portion of a public plaza that is currently located to the south of the "Royale," the 42-story structure at 188 East 64th Street (Block 1398, Lot 7501 [part]). Current Sanborn maps show that this structure was constructed between 1986 and 1987 and that the building and the plaza to the south have both basements and sub-basements.

As mentioned previously, the Boston Post Road formerly ran through this portion of the APE, as seen on the 1836 Colton map. However, no structures are depicted in this area, formerly located within a small lot known as Lot 32½, until the 1879 Bromley atlas, which indicates that the lot was developed but does not depict the footprint of the building that was located there. Subsequent maps identify the building as a 3-story brick dwelling with a basement and a small open rear yard. This structure stood on the lot until the "Royale" was built in the late 20th century.

Because of the significant disturbance that would have been caused during the construction of the existing structure on Lot 7501, which has both a basement and a sub-basement, there is little chance that historic period archaeological resources could have survived within the location of Ancillary Facility 2. Therefore this location is determined to have no archaeological sensitivity.

ENTRANCE 1:

Entrance 1 of the 63rd Street station will be constructed within an approximately 25- by 50-foot section of Block 1417, Lot 45, at the southeast corner of East 63rd Street and Third Avenue. This lot is currently occupied by a 6-story (with basement) commercial and residential structure.

All historic maps dating to the early and mid-19th century depict the location of Entrance 1 as vacant. Sewers were available in Third Avenue by 1865, as seen on the Viele map of that year. The 1879 Bromley atlas is the first to depict a structure on the property, although it does not depict its footprint. Subsequent maps show that a 4-story brick structure with a basement was located on the property. Early maps indicate that the structure had an open rear yard that was outside of the APE. Records on file with the New York City Department of Buildings show that the structure that currently stands on the site was built in 1929.

Because this lot was not developed until the late-19th century after water and sewer networks were available and because structures with basements were built on the property in the late-19th and early 20th century, the construction of Entrance 1 would not impact archaeological resources dating to the historic period.

THIRD AVENUE BETWEEN EAST 62ND AND EAST 64TH STREETS

No historic maps depict any structures within the streetbed of Third Avenue between East 62nd and East 64th Streets. The only structure located in the area was the aforementioned farmhouse that was located to the east of Third Avenue in the vicinity of East 64th Street. Third Avenue was constructed through the APE by 1836, as seen on the Colton map of that year. Numerous maps dating to the late-19th and early 20th centuries also depict the elevated street car line that ran along Third Avenue at that time.

The Viele map of 1865 depicts a sewer line that ran beneath Third Avenue throughout much of the Upper East Side. Additional utilities including sewer and water lines are visible within the streetbed on historic maps dating to the late 19th and early 20th century. Maps of the streetbed as it exists today show that numerous utility lines run beneath

Third Avenue between East 62nd and East 64th Streets. These utilities include sewer, water, gas, electric, and telecommunications lines. In addition, an existing staircase leading to the 63rd Street Station is located beneath the eastern sidewalk of Third Avenue near the northeast corner of East 63rd Street. This staircase would be opened to the public as part of the Second Avenue Subway project.

As mentioned in Chapter 2, numerous soil borings recorded in the late-20th century showed that the project site was underlain by a layer of fill followed by layers of sand, clay and/or silt, and finally bedrock. One soil boring (B63-7) was recorded in the area in 2009 which identified only a level of fill above bedrock with no natural sediments present. This boring is located in the vicinity of the proposed staircase.

Because of the lack of development within this portion of the APE—no structures appear to have ever been constructed within the streetbed—as well as the disturbance generated by the construction of the existing 63rd Street Station and the numerous utilities that run beneath the streetbed, Third Avenue between East 62nd and East 64th Streets is determined to have low sensitivity for archaeological resources dating to the historic period.

EAST 63RD STREET BETWEEN THIRD AND PARK AVENUES

No historic maps depict any structures within the streetbed of East 63rd Street between Third and Park Avenues. Several early maps depict historic roads in the vicinity of the street as well as many hills, all of which were no longer present by the mid-19th century. As stated above, the streetbed of East 63rd Street was heavily disturbed in the late 1970s during the construction of the existing 63rd Street Station. This construction, which involved the excavation of nearly all of the streetbed from the surface to the depth of the bedrock, would have had a substantial impact on any archaeological resources that may have at one time been located within the streetbed. Therefore, any excavation necessary within the streetbed of East 63rd Street between Third and Park Avenues as part of the Second Avenue Subway project will not impact historic period archaeological resources.

EAST 63RD STREET BETWEEN SECOND AND THIRD AVENUES

Utility lines may be installed or relocated in an area of East 63rd Street extending approximately 150 feet east of Third Avenue. According to the 2003 Phase 1A, this portion of the APE was determined to be sensitive for historic period archaeological resources based on its proximity to an 18th century farmhouse as depicted on B.F. Stevens' facsimile of the 1782 British Headquarters Map (published 1900). Stevens' facsimile map is more readily available than the original version of the British Headquarters Map, although it is considered by historians to be less accurate. Using new georeferencing technology that has advanced since the completion of the 2003 Phase 1A study, the original 1782 British Headquarters map was georeferenced for the purposes of this study so that the modern street grid could be superimposed on the historic map. This has provided a more accurate representation of the project site in the late 18th century (see Figure 4).

As seen on Figure 4, the georeferenced version of the British Headquarters Map suggests that the farmhouse to the northeast of the APE was located in the center of modern Block 1419, bounded by Second and Third Avenues and East 64th and East 65th Streets, outside the project site. However, because of the inaccuracies inherent in the original map, the location of the farmhouse cannot be identified with complete certainty. The same farmhouse (along with an adjacent structure, possibly an outbuilding) may be depicted on the 1811 Bridges map (Figure 5), which suggests that it was located within the streetbed of East 64th Street midway between Second and Third Avenues. The placement of the buildings as depicted on the Bridges map is more than 200 feet to the north of the APE. The buildings are depicted at an even greater distance on the georeferenced British Headquarters Map (Figure 4).

This farmhouse was present before the installation of municipal water and sewer networks, and therefore, its residents would have depended on shaft features such as privies, cisterns and wells for water gathering and sanitation. In general, cisterns and wells were located in the immediate vicinity of houses for convenience, while privies would have been further away from the house, although not so far as to be at an inconvenient distance for the home's residents. Because of the significant distance between the 63rd Street Station APE and the former farmhouse, it is not likely that shaft features associated with the 18th century farmhouse would have been located within the modern streetbed of East 63rd Street. No historic maps depict any structures within the streetbed of East 63rd Street between Second and Third Avenues, although it is possible that outbuildings (barns, stables, etc.) could have been located within the farm property at a greater distance from the house. However, it is not likely that

remnants from any such buildings could remain intact after the construction of East 63rd Street in the mid-19th century as well as subsequent road paving, maintenance, and the installation of utilities.

As seen in Table 1, the elevation of the intersection of East 63rd Street and Third Avenue has been relatively unchanged since the mid-19th century, though there is cartographic evidence which suggests that there was some landscape modification in this area in the early-19th century. The 1782 British Headquarters Map suggests that the project site was located near the base of a very large hill that was situated to the northwest. This is not depicted on the 1811 Bridges map, although that map does indicate that many elevated areas were located in the vicinity of this portion of the APE. The 1836 Colton map indicates that this part of the APE was located on a hill adjacent to a long, tree-lined driveway. This hill was also depicted on the 1851 Dripps map (Figure 6). Therefore, it seems that in the early-19th century, before the neighborhood was transformed into a fully-developed urban neighborhood, there was some modification of the landscape and hills were cut down and/or realigned.

In addition, as previously mentioned, soil borings show that the streetbed of East 63rd Street between Second and Third Avenues has been disturbed. Soil borings completed in the 1960s and 1970s showed that at that time a layer of fill measuring between 2 and 18 feet thick was present below the surface of the streetbed and that in several locations there were potentially natural soil levels beneath the fill. Soil borings completed in 2005 and 2009, after the construction of the existing station, show that 6 to 10 feet of fill are present below the street surface followed by layers of sand or sandy silt (see Chapter 2). The fill levels identified are likely the result of disturbance associated with the installation of the many utilities (including electric, gas, telecommunications, water, and steam lines) that run through the streetbed. The borings suggest that while there may be intact pockets of natural soils throughout the streetbed, they are highly variable and are located at depths of 6 to 10 feet. The most disturbance appears to be within East 63rd Street just east of Third Avenue, where utility work is planned, and just west of Second Avenue.

Chapter 5:

A. APE SENSITIVITY

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

PRECONTACT SENSITIVITY ASSESSMENT

The 2003 Phase 1A Archaeological Assessment identified the streetbed of East 63rd Street as sensitive for precontact archaeological resources from the ground surface to a depth of 13 feet. However, based on new soil borings that were completed or made available since the completion of that study, the precontact sensitivity determination of this portion of the APE has changed. None of the other portions of the 63rd Street Station APE were analyzed for archaeological sensitivity in the 2003 Phase 1A, including Third Avenue between East 62nd and East 64th Streets, East 63rd Street between Third and Lexington Avenues, and the locations of the new entrance and ancillary facilities.

The precontact sensitivity of project sites in New York City is generally evaluated by a site's proximity to level slopes, water courses, well-drained soils, and previously identified precontact archaeological sites. Historic maps suggest that the 63rd Street Station APE may have at one time been attractive to Native Americans as a location for habitation sites or resource exploitation. However, there is evidence of landscape modification and disturbance associated with the transformation of the Upper East Side from a hilly, undeveloped wilderness into highly developed urban neighborhood.

In general, precontact period archaeological resources are found at relatively shallow depths within five feet of the precontact ground surface. As seen in Table 1, minimal changes have been made to the elevations of the APE and vicinity since the mid-19th century. Early and mid-19th century maps show that the landscape of the APE was modified during the early to mid-19th century. While Third Avenue was cut through the area before 1836, East 63rd Street was not completed until the middle of the 19th century. Portions of the project site were later disturbed by the construction of buildings with basements, the installation of utilities within streetbeds, and the cut-and-cover construction of the existing 63rd Street Station between Third and Park Avenues. Within the streetbed of East 63rd Street between a layer of fill and the bedrock beneath the surface of the APE; however, these pockets appear to be isolated and interspersed with areas where soil borings indicate that fill levels occupy the entire area between the ground surface and bedrock. Many utility lines run through the streetbed in this area as well.

As a result of the documented disturbance and landscape modification described above, the APE for the 63rd Street Station is determined to have low sensitivity for precontact period archaeological resources.

HISTORIC SENSITIVITY ASSESSMENT

The majority of the APE was not developed for residential use until after water and sewer networks were available in the neighborhood. None of the historic lots included within the APE (Entrance and Ancillary Facilities) included open rear yards and all of them have been disturbed as a result of basement excavation. Therefore, it is not likely that any of these historic properties would have included shaft features such as privies, cisterns, or wells. In addition, no historic maps depict any structures entering any of the streetbeds within the APE. As a result of the proximity of the streetbed of East 63rd Street to an 18th century farmhouse depicted on the 1782 British Headquarters Map, HPI's 2003 Phase 1A archaeological assessment identified the streetbed of East 63rd Street between Second and Third Avenues as sensitive for historic period archaeological resources. However, the data presented above which are based on newly obtained or completed soil borings and more advanced map georeferencing suggest that the 63rd Street Station APE is at too great a distance from the historic farmhouse and has experienced too much disturbance associated with the construction and maintenance of the street as well as the installation of utilities within it, to be sensitive for archaeological resources associated with the historic farm.

Because of the lack of development in the area until the late 19th century and the substantial disturbance that has occurred on the site, it is not likely that undisturbed archaeological resources dating to the historic period remain present within the APE. Therefore, the APE is determined to have low sensitivity for archaeological resources dating to the historic period.

B. RECOMMENDATIONS

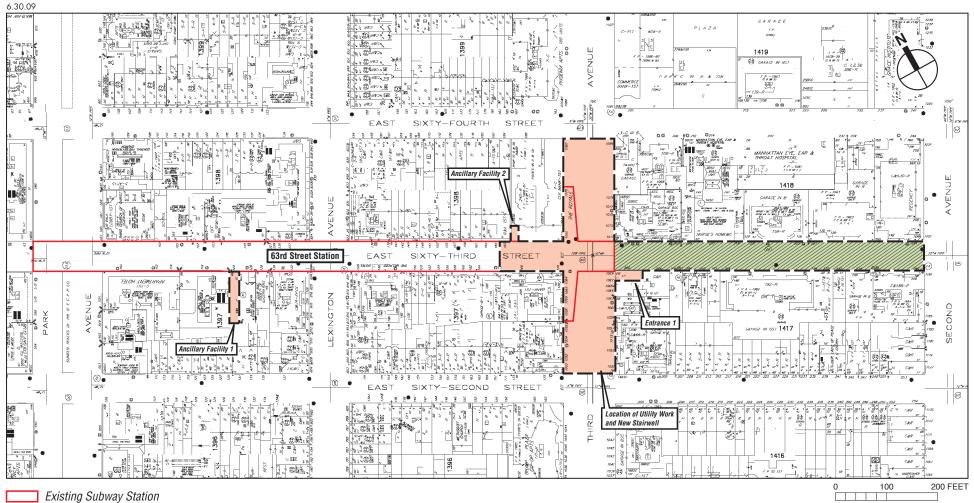
The APE has low sensitivity for both precontact and historic period archaeological resources. Therefore, no additional archaeological research or investigation is recommended. However, if project plans change so that additional areas are added to the APE, they should be reviewed by an archaeologist in accordance with the Second Avenue Subway project's PA to determine if archaeological resources could be impacted.

AKRF, Inc. 2004	Second Avenue Subway Final Environmental Impact Statement and Final Section 4(f) and 6(f) Evaluation. Prepared for MTA NYCT.
Bolton, Reginald 1922	P. "Indian Paths in the Great Metropolis." In, <i>Indian Notes and Monographs</i> , edited by F.W. Hidge. New York: Museum of the American Indian Heye Foundation.
Bridges, William 1811	Map of the city of New York and island of Manhattan, as laid out by the commissioners appointed by the legislature, April 3d, 1807. New York: unknown.
"The British Hea Ca. 1782	dquarters Map" New York: Unknown.
Bromley, G.W. a 1879 1891	nd Company Atlas of the City of New York, Complete in One Volume. New York: George W. Bromley and E. Robinson. Atlas of the City of New York, Manhattan Island, From Actual Surveys and Official Plans. Philadelphia: G.W. Bromley & Co.
Burrows, Edwin 1999	G. and Mike Wallace Gotham: A History of New York City to 1808. New York: Oxford University Press.
Colton, J.H. 1836	<i>Topographical Map of the City and County of New York and the Adjacent Country</i> . New York: J.H. Colton and Co.
Dripps, Matthew 1852 1867	Map of the City of New York Extending Northward to Fiftieth St Surveyed and Drawn by John F. Harrison. New York: M. Dripps. Plan of New York City from the Battery to Spuyten Duyvil Creek. New York: Matthew Dripps.
Hayward, George 1850	Profile of the twelve avenues in the city of New York from 24th to 161st Sts., showing the elevations at the streets. Compiled for D.T. Valentine's Manual.
Historical Perspe 2003a 2003b	ctives, Inc. Second Avenue Subway Phase 1A Archaeological Assessment. Prepared for: Allee King Rosen and Fleming, Inc. New York, New York. "Section 7.13, East 63rd Street Curve Site." Supplement to the Second Avenue Subway Phase 1A Archaeological Assessment. Prepared for: Allee King Rosen and Fleming, Inc. New York, New York.
Johnston, Henry 1 1914	Phelps Nathan Hale, 1776: Biography and Memorials. New Haven: Yale University Press and London: Humphrey Milford Oxford University Press.

Kelby, William 1893	"Site of the Execution of Captain Nathan Hale." Published in <i>The New York Historical Society Quarterly Bulletin, Index, Volume I April 1917-1918.</i> Published 1918. New York: The New York Historical Society.
New York Times 5/13/1976 5/18/1976 9/24/1976	"Work on Subway Halted by Court," p. 37. "Despite Protests, Judge Allows Work on 63d St. Subway Station," p. 30. "Coming: Light at End of the 63d Street Tunnel," p. 29.
Parker, Arthur C 1922	"The Archaeological History of New York." <i>New York State Museum Bulletin</i> Albany, New York: The University of the State of New York.
Perris, William 1862	Maps of the City of New York surveyed under Directions of Insurance Companies of said City. New York: printed by Laing & Laing.
Randel, John 1819-20	"The Randel Farm Map." Published in The Iconography of Manhattan Island. I.N.P. Stokes, 1968.
Robinson, E. and 1885	R.H. Pidgeon Robinson's Atlas of the City of New York, 1883-1888. New York: E. Robinson.
Sanborn Map Co 1892 1907 1951 2007	mpany Insurance Maps of the City of New York. New York: Sanborn-Perris Map Co. Insurance Maps of the City of New York. New York: Sanborn-Perris Map Co. Insurance Maps of the City of New York. New York: Sanborn Map Co. Insurance Maps of the City of New York. New York: Sanborn Map Co.
Solochek, Beverl 1976	y "Sacrificed for a Subway: Two Blocks' Repose." In <i>The New York Times</i> . December 19, 1976, p. R1.
Stevens, B.F. 1900	B. F. Stevens' facsimile of the unpublished British headquarters colored manuscript map of New York & environs (1782). Reproduced from the original drawing in the War Office, London. London: B.F. Stevens.
Stokes, I.N. Phel 1968 (reprint)	ps. The Iconography of Manhattan Island, 1498-1909 Volumes I-VI. New York: Robert Dodd.
United States Ge 1979	ological Survey USGS Digital Raster Graphic (DRG) Quadrangle: Central Park.
Viele, Egbert Lu 1865	dovicus Sanitary & Topographical Map of the City and Island of New York. New York: Ferd. Mayer & Co.



Project Location USGS Map: Central Park Quadrangle Figure 1



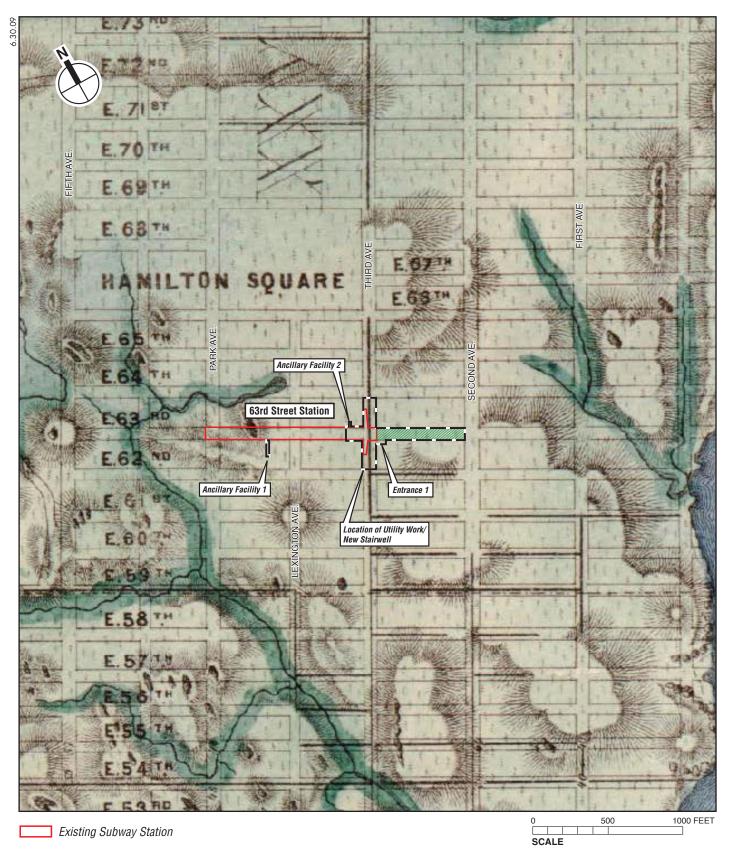
Existing Subway Station

Second Avenue Subway 63rd Street Station APE

Portion of APE Determined to be Sensitive for Precontact and Historic Archaeological Resources in the 2003 Archaeological Assessment

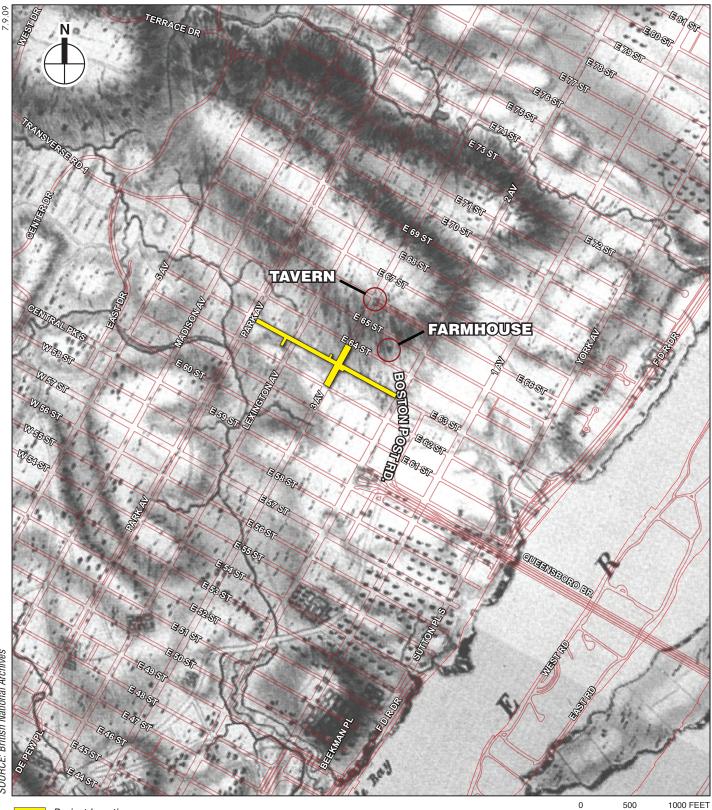
> **APE** Location Sanborn Map, 2007 Figure 2

SCALE



Portion of APE Determined to be Sensitive for Precontact and Historic Archaeological Resources in the 2003 Archaeological Assessment

> Topographical Map of the City of New York E. Viele,1865 Figure 3

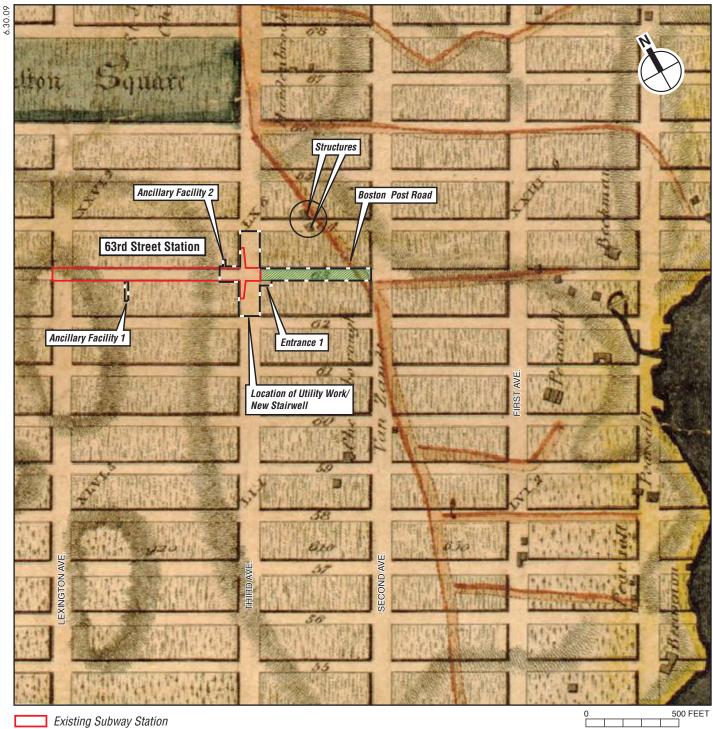




Project Location 2004 Streets

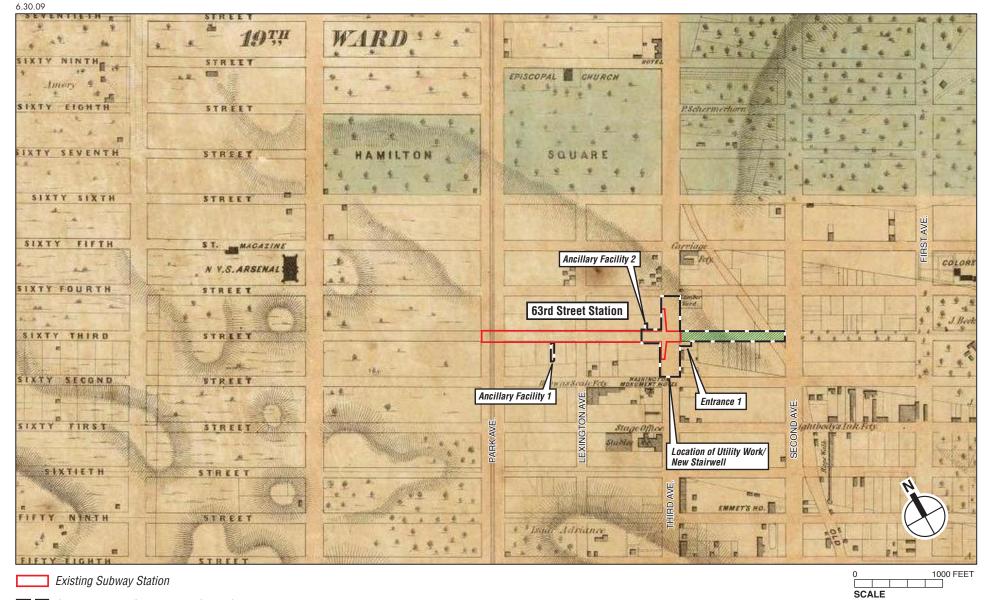
NOTE: This map has been georeferenced with ARC GIS software. Because of inaccuracies in the original map, the overlay of the 2004 street lines may not be entirely accurate.

500 SCALE



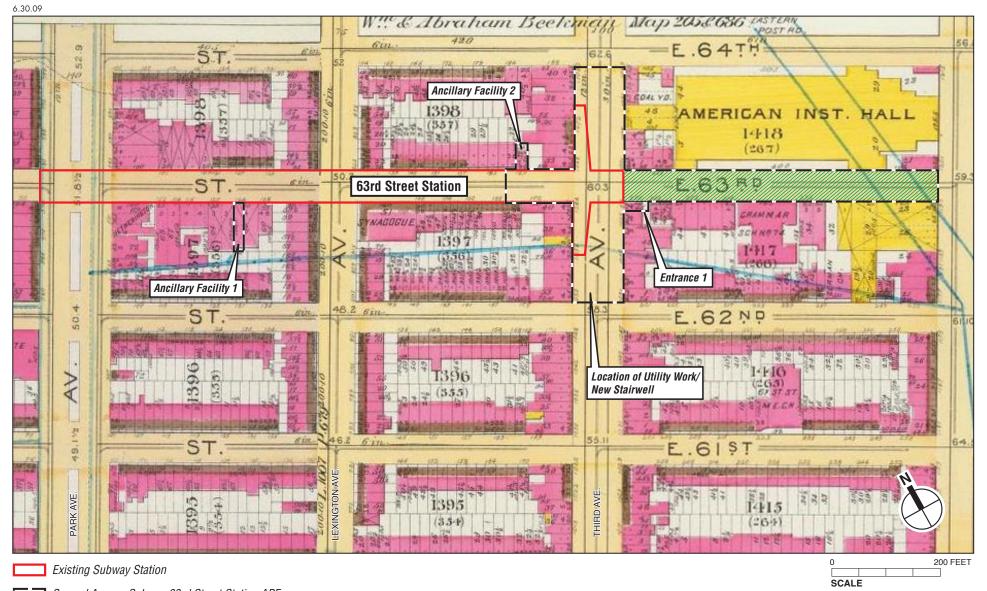
Portion of APE Determined to be Sensitive for Precontact and Historic Archaeological Resources in the 2003 Archaeological Assessment

SCALE



Portion of APE Determined to be Sensitive for Precontact and Historic Archaeological Resources in the 2003 Archaeological Assessment

Map of that Part of the City and County of New York North of 50th Street M. Dripps, 1851 Figure 6

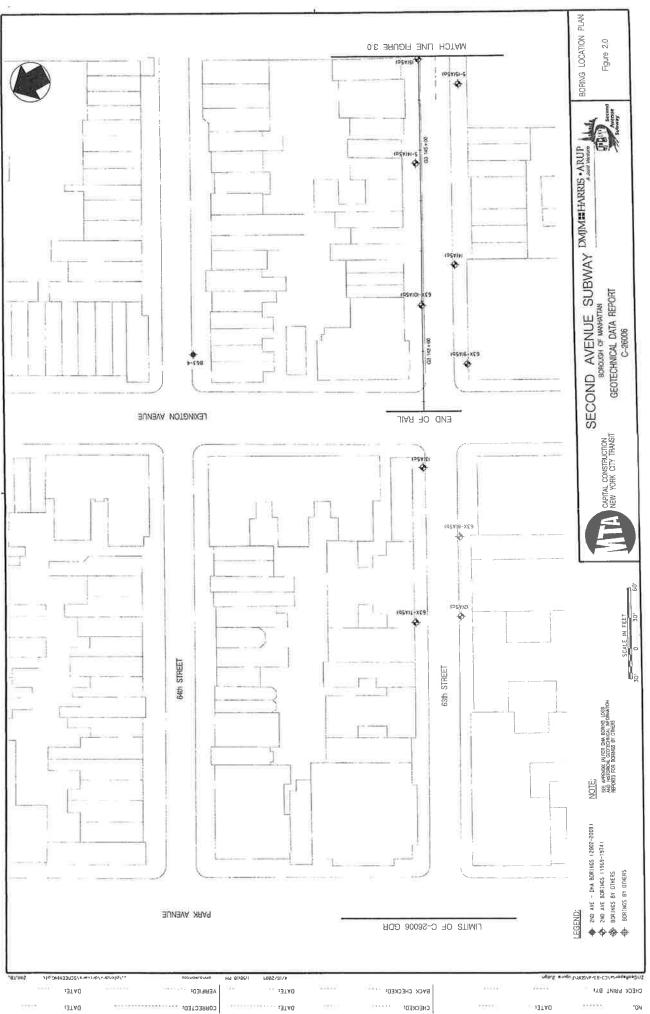


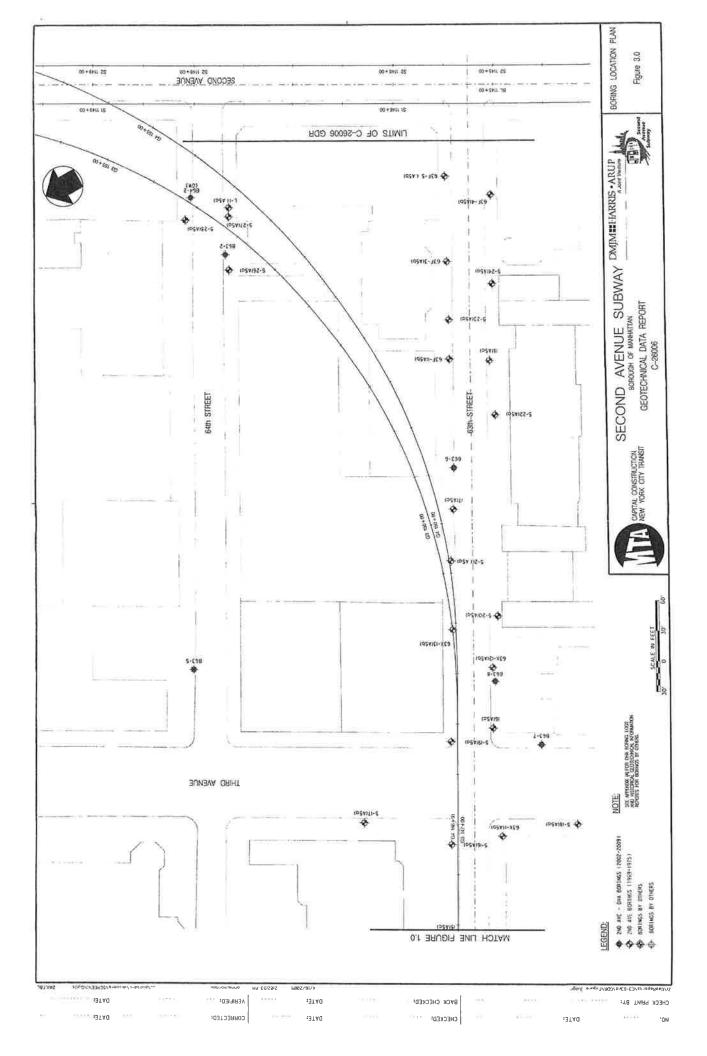
Portion of APE Determined to be Sensitive for Precontact and Historic Archaeological Resources in the 2003 Archaeological Assessment

Atlas of the City of New York G.W. Bromley, 1891 Figure 7

SECOND AVENUE SUBWAY • 63rd Street Station

Appendix A: Soil Boring Logs for the 63rd Street Station Provided by MTA NYCT





		/##[.1 AT	סומ.	ADI	Ш	_	T	-	BORING LOG	1		-	_	BO	RIN	G NO		of 5	
	DMJN	1						SE	ECOND AVENUE SUBWAY PROJECT	PROJEC G. SURI DATUM	STATION: T NO. CM1 EL 159.28 NYCT ORING DEP	3	T) 122		OFFSE COORI NORTH		3,767		
		. Split Sp		Lines			во	RING	CO: Jersey Boring and Drilling Co., Inc.	FINAL D			ND WA		READI		_		-
MPLER		R: 140 lb	Autom	atic	_				N: Peter Lynch ER: D. Persaud / S. Mendes	DATE Note 1	TIME	1	DEPTH			STA	B. TIN	ΛE	
SING H	AMMER	SPUN					DA	TE ST	ART: 08/18/04 DATE END: 08/20/04										_
	RE: NQ				-	6		VIEW	ED BY: C. Snee DATE: 9/9/04	1	rl	+			ROPER	TIES	-		_
NF) OR	ORE NO.	SAMPLE DEPTH (FT)	NCH	PF)	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	DATA	SAMPLE DESCRIPTION	MBOL	УНЧ		HARD			THERING	FR/	MBER ACTUF ER FOO	RE
CASING (BPF) OR CORING (MIN/FT)	SAMPLE / CORE NO	MPLE DE	BLOWS / 6 INCH	N VALUE (BPF)	N/REC: S DCK (FT/F	ITAL COR	CK CORI	FIELD TEST DATA	BURMISTER (USCS / NYC BLDG CODE) CLASSIFICATIONS	STRATA SYMBOL	STRATIGRAPHY	NOTES	see be valu	ues	v v	pelow for alues	for	below values	
3 22	SA	SA	В	ź	82	P	В В	Ë				2 Z	123	345	1 2	345	12	234	-
-									PAVEMENT THICKNESS: Not recorded Hand augered to a depth of 6 feet prior to start of boring.			2 3							
	S1	6-8	5 6 7 11	13	24/20				Medium dense, brown, fine to medium SAND, some Silt, Irace Gravel, Irace Mica (SM / 11-65								-		
	S2	8-10	6 10 9 14	19	24/24				Medium dense, brown, fine to coarse SAND, some Silt, trace Gravel, trace Mica (SM / 11-65			4							
	S3	10-12	21 25 18 27	43	24/0				No recovery						-		-		
	S4	15-17	3 3 5 16	8	24/8				Loose, brown, slightly micaceous, fine to coars SAND, some Sitt, trace Rock Fragments, trace Clay seams (SM / 7-65)	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	DEC ROC	K							
3.0 3.0 3.0 3.0 3.0	C1	20 0-23 7			3 7/3 7	100	90		Hard to very hard, slightly weathered, coarse grained, dark gray, quartz-mica-gamet SCHIST with very thin, sub-horizontal foliation, rough to smooth, very closely to closely spaced, horizontal to sub-horizontal, slightly iron-oxide stained foliation joints/fractures; high mica content.		ROCK	5							
3.0 3.0 3.5	C2	23.7-28.5			4.8/4.8	100	85		Similar to Schist in C1, except closely to moderately spaced, horizontal to sub-horizonta slightly weathered, slightly talcaceous, chlorilized foliation joints/fractures, 25.2'-25.4': Coarse grained feldspar vein.								な言語		
3.5 3.0 4.0	-								24.6'-25.2': Sub-vertical, healed fracture. 25.5': Cross-foliation joint/fracture, rough, undulating, moderately dipping, slightly weathered.					01000					
3PF (0-4 \ 1-10 0-30 0-50	JLAR SC DENSIT Very Loo Loose Medium Dense Very Der	se Dense se 1	BPF (<2) 2-4 ; 4-8] 8-15 ; 5-30)	SIVE S CONSIS Very So Soft Med Stiff Stiff Very Sti Hard	STENCY ft ff	1 2 3 4 5	HARI V M H	OCK DNES ery So lediun led Ha ard ard ery Ha	off 1 Complete (1) 0 n 2 Severe (2) 1-2 ard 3 Moderate (3) 3- 4 Slight (4) 11	10	<2" V 2"-1' C 1'-3' N 3'-10' V	NG/TH ery cl lose/ lod C /ide/1	HICKNES ose/Very Thin lose/Mod	3S / Thin I Thick	A	NGLE / 0-5 5-35 S 35-55 55-85 S	ATTITU Horizor iub-Ho Mod Di iub-Ve Jerlica	ntal rizonla ipping rtical	

BORING NO. B63-2

Г	M		חק	TC -	101	11)	_	T	-	BORING LOG					BO	RING NO.	eet: 2 of 5 B63-2	
	zvijn	∕/# #H <i>i</i> ∕				U(3			SE	ECOND AVENUE SUBWAY PROJECT		G SURF	NO. CM11 L. 159.28	_		OFFSET: COORDINATES NORTH: 217603 EAST: 994590.5	8.7673	
MPLER:	2" 0.[D. Split S	Spoo	n	P					CO: Jersey Boring and Drilling Co.	Inc		GR	OUN	ND WATER F		TIME	_
MPLER F		ER: 140	D Au	lloma	atic			EN	GINE	AN: Peter Lynch ER: D. Persaud / S. Mendes		DATE	TIME		DEPTH	STAL	B. TIME	
SING HA	MMER					_	_	DA'	TE ST	ART: 08/18/04 DATE END: 08/	20/04							_
CKCOR	E: NQ	1		- 1		÷.	1.0			ED BY: C. Snee DATE: 9/9/04		Li i		-		ROPERTIES		_
(BPF) OR (MIN/FT)	ORE NO.	ЕРТН (FT)		NCH	PF)	(III)	CORE REC (%)	E RQD (%)	TEST DATA	SAMPLE DESCRIPTION		MBOL	γHď		HARDNESS	WEATHERING	NUMBER FRACTUR PER FO	RĒ
CASING (BF CORING (M	SAMPLE / CORE NO	SAMPLE DEPTH (FT)		BLOWS / 6 INCH	VALUE (BPF)	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL COF	ROCK CORE I	FIELD TEST	BURMISTER (USCS / NYC BLDG CLASSIFICATIONS	CODE)	STRATA SYMBOL	STRATIGRAPHY	NOTES	see below for values	see below for values	see below for values	•
ပိပိ	SA	Sp	-	B	ź	<u>п</u> 2	P	R N	Ë			ST ST	s	N	12345	12345	1234	-
4.0	СЗ	28,5-33	3,6			5,1/5,1	100	83		27,6'-27 7': Slightly to moderately wea C3: Similar to Schist in C1, except ho moderately dipping, slightly crenulated 32,9'-33': Quarto-feldspathic vein 33'-33.4': Sub-vertical, healed cross.ft	izontal to I foliation							
4.5	C4	33.6-36	3.3			4 7/4 7	100	100		Similar to Schist in C1	μαυση							
4.5 4.5 5.5										35": Moderately dipping foliation. 37,5" Moderately dipping to vertical for Hard, fresh to slightly weathered, coar	se							
5.5 6.0 6.0 6.5	C5	38,3-43	51			4.8/4.8	100	100		grained, dark gray, quartz-mica-game with very thin, convoluted, crenulated, to vertical foliation, rough, closely to w spaced, sub-horizontal to moderately joints/fractures.	horizontal ridely							
6.0 6.0 5.5	C6	43.1-48	н			5.0/5.0	100	100		Similar to Schist in C5. 44,5'-47,6': Very hard, fresh, medium grained, gray GRANOFELS, with occc thin intercalations of coarse grained, of foliated quartz-mica Schist	asional	日日初に						
6.0 6.5 7.5			-	_	_				_	Similar to Schist in C5, except convolution horizontal to sub-vertical foliation.	uted,							
7.0 7.5 7.0 6.0	C7	48 1-52	9			4,8/4,8	100	100										
6.5 6.5 7.0	С8	52.9-57	8			4 9/4 9	100	85		Similar to Schist in C5, except horizon vertical foliation, rough to smooth, ver to closely spaced, horizontal to sub-ho slightly weathered, clay coated foliatio joints/fractures. 55.3'-55.6', 55.8'-56.0', 56.7'-57.2': Crr	y closely prizontal, n							
6.5 5.5 6.0 6.0										foliation joints/fractures, rough to smo vertical, slightly weathered, clay coate mineralization on surfaces	olh, sub-							
GRANUL	AR SC	DILS I	C	OHES	SIVE S	OILS		RC	CK C	CORE CHARACTERISTICS	5		OINT/FRAC	L TUR	E CHARACTEI	RISTICS		
PF DE 1-4 Ve -10 Lc -30 Mi -50 De	ENSIT ery Loc oose	Y ose Dense	8Pi <2 2-4 4-8 8-1 15-3 >30	F C 4 S 3 M 5 S 30 V		TENCY ft	1 2 3 4 5	HARC Vi M M H	NES ery So edium ed Ha ard ery Ha	S WEATHERING off 1 Complete and 2 Severe and 3 Moderate 4 Slight	NO PE (1) 0 (2) 1-2 (3) 3-1 (4) 11-2	R FT	SPACINO <2" Ver 2"-1' Clo 1'-3' Mo 3'-10' Wie	G/TH ry clo se/T d Clo de/T	IICKNESS ose/Very Thin hin ose/Mod Thick	ANGLE 0-5 5-35 35-55 55-85 55-85	ATTITUDE Horizonlal Sub-Horizon' Mod Dipping Sub-Vertical Verlical	3
At 98' re Packer t	moved	performe	arrel d in b	and lo	owered sk in 10	the 10' co intervals	appro	ximat	tely be perfor	tween the depths of 20' and 119.5' afte med at a future date.	r coring wa	is completer	. t					
															_			

									BORING LOG								eet: 3 of 5	
]	DMJN	/##HA R	RIS A Ja	ARI nt Vent	na]]j			SE	COND AVENUE SUBWAY PROJECT	PROJI G. SUI DATU	ECT RFE	TATION: NO CM11 L 159.28 NYCT RING DEPTI	_			RING NO. DFFSET: COORDINATES: JORTH: 217603 AST: 994590,9	.7673	
). Split Spo		Mean			BO	RING	CO: Jersey Boring and Drilling Co., Inc.			GR	JUC	ND WATE	RR	EADINGS		
AMPLER H		ER: 140 lb A	utom	atic		_			N: Peter Lynch R: D. Persaud / S. Mendes	DA	TE	TIME		DEPTH	_	STAE	B, TIME	
ASING HA	MMEF					_	DAT	TE ST	ART 08/18/04 DATE END: 08/20/04								_	
OCK COR	E NQ		<u> </u>					/IEW	D BY: C. Snee DATE: 9/9/04	1	-		-	INCIT		OPERTIES		-
R (F	KE NO.	H (FT)	Ξ		r (In/In	TOTAL CORE REC (%)	:ad (%)	DATA			j	≽		HARDNE		WEATHERING	NUMBER FRACTUR PER FOO	ES
DEPTH (FT) CASING (BPF) OR CORING (MIN/FT)	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	EC: SOI FT/FT)	CORE	CORE F	TEST D	SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE) CLASSIFICATIONS	STRATA SYMBOL		STRATIGRAPHY		see belov	v for	see below for	see below	-
CASING (BF CORING (BF	SAMPL	SAMPL	BLOWS	N VALL	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL	ROCK CORE RAD (%)	FIELD		STRAT		STRAT	NOTES	value:		values	for values	NUMBER
6.5	C9	57.8-62.6			5 2/5 2	100	77		Similar to Schist C5, except high mica content,	Ξ	Ξ		Γ	1225				0
6.5										=	Ξ					Merell 1		1
6.5	<u> </u>									Ξ	Ξ			No. Aris]	1. 200 3		2
6.5									Similar to Schist in C5, except rough, closely lo moderately closely spaced, horizontal to sub-		=			200		din print	15	C
6.5									horizontal, slightly weathered, clay coaled foliation joints/fractures, frequent very thin	Ξ	Ξ			1.0.7				1
7.0	C10	62.6-68.1			5_1/5_1	100	88		quartz-feldspathic veins	Ξ	Ξ							2
6.5										Ξ	Ξ							F
6.5										Ξ	Ξ			1.				6
6.5	1								Very hard, fresh, fine to coarse grained, gray to dark gray, guartz-mica-gamet SCHIST, with	Ξ	Ξ			HE LOT				
6.5	1								very thin, horizontal to sub-horizontal foliation,	Ξ	Ξ			E.120		. ACE 24.1	4.11	
	C11	68.1-73.0			4_9/4_9	100	51		foliation faint in places, rough, very closely to closely spaced, horizontal to sub-horizontal,	III	=			pr=			Soi	F
6.0		00.1-73.0			7 514 8	100	51		slightly weathered, slightly clay coated foliation joints/fractures; high quartz, mica content.		Ξ			1.2.1	3	10.200		
7.0										Ξ	=				18		1757	
7.5									Similar to Schist in C11	1111	Ξ				11	State Bory	a second	1
7.5									73.2'-73.7': Fracture zone, rough to smooth,		Ξ						Service	1
7.5									horizontal to vertical, slightly to moderately weathered, clay coated, chloritized	E	Ξ			meth	3			-
7.5	C12	73.0-78.2			5 2/5 2	100	56		foliation/cross-foliation joints/fractures.	Ξ	Ξ			1-15L		and the state	Sec. 1	2
7.5										\equiv	Ξ			APRIL B	10-		-2	2
7.5									Similar to Schist in C11	Ξ	Ξ			1000	3	11 11 10 10 10 10 10 10 10 10 10 10 10 1		4
7.5									78.9'-80.0': Fracture zone, rough to smooth,	1	Ξ					and space	Control 1	ŀ
7.5									sub-horizontal to vertical, slightly weathered,	Ξ	Ξ		6		8			1
7.5	C13	78.2-83.3			5,1/5,1	100	58		clay coated, chloritized foliation/cross-foliation joints/fractures	\equiv	Ξ			1.1		Service -		Ŀ
7.5										\equiv	Ξ							
7.5										Ξ	Ξ					100	8	0
7.5									Similar to Schist in C11, except rough to smooth, moderately closely to widely spaced,	Ξ				35.55			100	
7.5									sub-horizontal, slightly weathered, slightly clay	E	Ξ			1215.31			8	
7.5	C14	83.3-88.3			5 0/5 0	100	100		coated foliation joints/fractures.	HH	Ξ			S. SIL	20	Sell 12		
7.5					0,00					\equiv	Ξ			1000				
7.5										E	Ξ			- And		L'age the		
7.5	-						-			Ξ	=			02	19			
7.5										Ξ	Ξ				1		25	
GRANU	LAR S	DILS I	COHE	SIVE \$	OILS	<u> </u>	RC	CK (ORE CHARACTERISTICS			OINT/FRAC	TUR	E CHARA	CTER	RISTICS	1	1
SPF C	ENSIT	Y B	PF (STENCY	1	ARC		WEATHERING NO. F	PER FT	T	SPACING	G/TH	ICKNESS		ANGLE .	ATTITUDE Horizontal	
4-10 L 10-30 N 30-50 D	oose	Dense 4 8 nse 15	-4 \$ -8 M -15 \$ 5-30 \	Very So Soft Med Sti Stiff Very Sti Hard	ff	1 2 3 4 5	M M H	ery So ediun ed Ha ard ery Ha	rd 2 Severe (2) 1- rd 3 Moderate (3) 3 4 Slight (4) 11	2 -10		2"-1" Clo 1'-3' Mo 3'-10' Wi	d CI de/T	ose/Very T Thin lose/Mod T Thick /ide/Very T	hick	5-35 S 35-55 55-85 S	Sub-Horizonta Sub-Horizont Mod Dipping Sub-Vertical Vertical	
7) Al 98' n 3) Packer	emove testing		el and i bedro	lowere ick in 1	d the 10' co 0' intervals	appro	xima		tween the depths of 20' and 119.5' after coring v med at a future date.	vas comp	pleter	d.						
																BORING NO	. B63-2	

RRIS • ARUP A Joint Ventura Doon Automatic I Automatic BIOMS / e INCH N NTICE (BPF) N VALUE (BPF) N VALUE (BPF) SOCK (FTTF) I OTAL CORE REC (%) 3 5.0/5.0 100	BORING CO: FOREMAN: F ENGINEER I DATE START REVIEWED E (%) SOCK US SOCK SOCK SOCK SOCK SOCK SOCK SOCK SOC	D. Persaud / S. Mendes T: 08/18/04 DATE END: 08/20/04	BORING \$ PROJECT G. SURF E DATUM: N FINAL BOP DATE	NO. CM1112 L 159.28 YCT RING DEPTH GRO TIME	H (FT) 1	22.3 WATER R	RING NO. DFFSET: COORDINATES: VORTH: 217603 EAST: 994590.9 READINGS STAE STAE	3.7673
BLOWS / 6 INCH BLOWS / 6 INCH N VALUE (BPF) N VALUE (BPF) ROCK (FT/FT) ROCK (FT/FT) TOTAL CORE REC (%)	FOREMAN: F ENGINEER: I DATE START REVIEWED E (%) DATE START COCK COKE KOD (%) LE DATA LE COCK COKE KOD (%) Si Cock Cock Cock Cock Cock Cock Cock Cock	Peter Lynch D. Persaud / S. Mendes T: 08/18/04 DATE END: 08/20/04 BY: C. Snee DATE: 9/9/04 SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE)	DATE	GRO		WATER R	STAE	3. TIME
BLOWS / 6 INCH N VALUE (BPF) PEN/REC: SOIL (IN/IN) ROCK (FT/FT) TOTAL CORE REC (%)	ENGINEER DATE START REVIEWED E (%) GUE DATE ENG CVC COCK COCK COCK ENG CVC COCK COCK COCK COCK COCK COCK COCK COC	D. Persaud / S. Mendes T. 08/18/04 DATE END: 08/20/04 BY: C. Snee DATE: 9/9/04 SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE)						B. IIME
	COCK CORE ROD (%) REVIEWED E LEEN DATA FIELD TEST DATA Si Si Si	T: 08/18/04 DATE END: 08/20/04 BY: C. Snee DATE: 9/9/04 SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE)	SYMBOL	×		INSITU PF	ROPERTIES	
	Prock CORE RQD (%)	SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE)	SYMBOL		-	I INSITU PF	ROPERTIES	
	Si Si	BURMISTER (USCS / NYC BLDG CODE)	SYMBOL	¥	-	INSTIC FI	OFLITTLS	1
	Si Si		161	4 P	HA	RDNESS	WEATHERING	NUMBER OF FRACTURES PER FOOT
	Si Si		STRATA SYMBOL	STRATIGRAPHY	TES T	e below for values 2 3 4 5	see below for values	see below for values 1 2 3 4
	91	imilar to Schist in C11, 1.1': Cross-foliation joint/fracture, rough to mooth, sub-horizontal, slightly weathered, 1.0-92,7': High gamet content clusters in upda foldene lemicos						
47/47 94	94 co 50 50 50 50 50 50 50 50 50 50 50 50 50	eathered foliation joints/fractures; high mica			7			
10/10 100	joi 98 qu 100 mi 100 mi	ints/fractures; high mica content. 8.1'-103.4': Hard, fresh, coarse grained, gray, uartz-mica-garnet SCHIST, with very thin to iin, poorly segregated foliation and thin iicaceous veins and quartz feldspar veins. 00.7'-101': Cross-foliation joint/fracture, rough s smooth, sub-vertical, slightly weathered with			and the second second			
8 7.8/7.8 100	joi co	ints/fractures; high quartz-mica-garnet						
.3 6.5/6.5 100	joi	ints/fractures; high quartz-mica-garnet			8			
<2 Very Soft 1 2-4 Soft 2 4-8 Med Sliff 3 8-15 Stiff 4	HARDNESS Very Soft Medium Med Hard Hard	WEATHERING NO. PE 1 Complete (1) 0 2 Severe (2) 1-2 3 Moderate (3) 3-1	0 20	SPACINO <2" Ver 2"-1' Clos 1'-3' Mos 3'-10' Wid	y close y close se/Thin d Close/ de/Thick	NESS Very Thin Mod Thick	ANGLE 0-5 5-35 5 35-55 55-85 5	ATTITUDE Horizontal Sub-Horizontal Mod Dipping Sub-Vertical Vertical
	3 7.8/7.8 100 3 6.5/6.5 100 3 6.5/6.5 100 COHESIVE SOILS BPF CONSISTENCY 8-15 Stiff 3 8-15 Stiff 3 8-15 Stiff 3 15-30 Hard 5 ical joint/fracture. Trel and lowered the 10° core ba in bedrock in 10° intervals appro 10° intervals appro	Image: Solution of the soluti	3 7.8/7.8 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100 3 6.5/6.5 100 100	speced, horizontal to sub-horizontal is slightly weathered foliation joints/fractures; high mica content. interface interface	spaced, horzontai to sub-horzontai, sightly spaced, horzontai to sub-horzontai, sightly weathered folation joints/fractures; high mica initiar to Schist in C11, except no foliation joints/fractures; high mica initiar to Schist in C11, except no foliation joints/fractures; high mica initiar to Schist in C11, except no foliation joints/fracture; rough to smooth, sub-vertical, slightly weathered with epidote. initiar to Schist in C11, except no foliation joints/fracture; rough to smooth, sub-vertical, slightly weathered with epidote. initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/fracture; high quartz-mica-gamet initiar to Schist in C11, except no foliation joints/frac	spaced, horizontal; slightly a spaced, horizontal; slightly a subherd foliation joints/fractures; high mica content. a similar to Schist in C11, except no foliation joints/fractures; high mica content. a 98 1-103,41: Hard, fresh, coarse grained, gray, quartz-mica-garnet SCHIST, with very thin to thin, poorty segregated foliation and thin mica cous veins and quartz feldspar veins. a 10/10 100 100 3 7,8/7,8 100 3 7,8/7,8 100 3 6,5/6,5 100 3 6,5/6,5 100 2 Vary Soft NO PCR Find Structures, high quartz-mica-garnet content. 3 6,5/6,5 100 3 6,5/6,5 100 2 Vary Soft 1 2 Vary Soft 1 3 6,5/6,5 100 3 6,5/6,5 100 3 6,5/6,5 100 3 6,5/6,5 100 4 Mod Stiff 1 4 4 Slight 4 3 Mod Stiff 5 Very Soft 1 2 Very Soft 1 3 0,5/6,5 10 100	spaced, horizontal is sub-horizontal, slightly weathered foliation joints/fractures; high mica content. r similar to Schist in C11, except no foliation joints/fractures; high mica content. r 98 11-103 41: Hard, fresh, coarse grained, gray, quartz-mica-gamet SCHIST, with very thin to thin, poorly segregated foliation and thin micaeceus veins and quartz feldspar veins. r 10/10 100 100 Similar to Schist in C11, except no foliation points/fractures, nigh quartz-mica-gamet content. Image: space segregated schistors and thin micaeceus veins and quartz feldspar veins. 3 7.8/7 8 100 100 3 6.5/6.5 100 100 Similar to Schist in C11, except no foliation joints/fractures, high quartz-mica-gamet content. Image: space segregated schistors and segregated schis	spaced, horizontal to sub-horizontal, slightly spaced, horizontal to sub-horizontal, slightly weathered foliation joints/fractures; high mice millar to Schist in C11, except no foliation joints/fractures, high mice content. 98.1*103.4*. Hard, frash, coarse grained, gray, quartz feldspar veins. 100/10 100 98.1*103.4*. Hard, frash, coarse grained, gray, quartz feldspar veins. 100.7*101: Cross-foliation joints/fracture, rough to smooth, sub-vertical, slightly weathered with ejidote. Similar to Schist in C11, except no foliation joints/fractures, high quartz-mice-garnet Gotter. Similar to Schist in C11, except no foliation joints/fractures, high quartz-mice-garnet Gotter. Similar to Schist in C11, except no foliation joints/fractures, high quartz-mice-garnet Gotter. Similar to Schist in C11, except no foliation joints/fractures, high quartz-mice-garnet Gotter. 2 Yeny Soft 2 Yeny Soft 3 6.5/6.5 100 100 Similar to Schist in C11, except no foliation joints/fractures, high quartz-mice-garnet Gotter Yeny Soft 2 Yeny Soft 3 6

BORING NO. B63-2

DMJM#HARRIS • ARUP A Joint Venture SECOND AVENUE SUBWAY PROJECT PLER: 2" O.D. Split Spoon BORING CO: Jersey Boring and Drilling Co., Inc. PLER HAMMER: 140 Ib Automatic FOREMAN: Peter Lynch	PROJEC G. SURF DATUM:		_	BC	OFFSET: COORDIN	NATES:		2
	I CINAL BU	ORING DEPTI	H /ET	1 122 2	EAST: 99			
I ED UAMMED: 440 lb Automotio		GRO	OUN	D WATER	READING			
PLER HAMMER: 140 Ib Automatic FOREMAN: Peter Lynch NG SIZE: 3" ENGINEER: D. Persaud / S. Mendes	DATE	TIME	DI	EPTH		STAE	3. TIME	_
NG HAMMER: SPUN DATE START: 08/18/04 DATE END: 08/20/04 K CORE: NQ REVIEWED BY: C. Snee DATE: 9/9/04			-					_
			tπ	INSITU I	PROPERTI	IES	NUMBE	
CORING (BPF) OR CORING (MINUFT) SAMPLE / CORE NO. SAMPLE DEPTH (FT) SAMPLE DEPTH (FT) N VALUE (BPF) N VALUE (MINN) ROCK (CORE RGE (%) N VALUE (BPF) N N N N N N N N N N N N N N N N N N N	MBOL	АРНҮ		HARDNESS	S WEATH	ERING	NUMBE FRACTU PER FO	URE
CCASING (BPF) O SAMPLE DESCLIAL O BILOWS / 6 INCH PELLOTAL CORE RA CTASING (BPF) O BORNISTEK (RPF) O BORNISTEK (RPF) O CORING (MINFT) O CORING (RPF) O CORIN	STRATA SYMBOL	STRATIGRAPHY	NOTES	see below fo values	valu	Jes	see belo for value	i₩ ≥s
		ST	ž.	12345	5 1 2 3	3 4 5	123	ow ∋s 4
						86		
Bottom of borehole at 122.3 feet			9	1				
		JOINT/FRAC						
4 Very Loose <2 Very Soft 1 Very Soft 1 Complete (1) 0 Loose 2-4 Soft 2 Medium 2 Severe (2) 0 Medium Dense 4-8 Med Stiff 3 Med Hard 3 Moderate (3)		<2" Ver 2"-1' Clo 1'-3' Mo 3'-10' Wid	ry clos ose/Th od Clo ide/Th	se/Mod Thic	ж 3	0-5 5-35 5 5-55 5-85 5	ATTITUDE Horizontal Sub-Horizo Mod Dippin Sub-Vertica Vertical	ontal

										BORING LOG								Sheet	1 of	2	
CMJM#FFARRES - ARUP									S	ECOND AVENUE SUBWAY PROJECT	G. SUF	BORING STATION: 1147+46.65 PROJECT NO. CM1188 G. SURF EL. 152.66 DATUM : NYCT				OFFSET: -46.65 COORDINATES: NORTH: 218074.0341 EAST: 993743.5567					
			D. Split Spo		1 ⁻¹		-	BO	RING	CO: Jersey Boring and Drilling Corp.			OU	ND WATE						25	
SAMPLER HAMMER: 140 lb. (Automatic) CASING SIZE: 3" CASING HAMMER: N/A (Spun)								EN	GINE	AN: Peter Lynch ER: Sara Rocha	DAT 7/25/0			DEPTH	25 25				s, TIME s, 10 Min.		
		RE: NO		n)						TART: 7/22/05 DATE END: 7/25/05 ED BY: C. Snee DATE: 11/14/05			-		-					_	
	æ	ġ	E		· · ·	(N/N)	C (%)	(%) 0	4					INSITU P		ROPERTIES			NUMBER		
E	CASING (BPF) OR	SAMPLE / CORE NO	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: SOIL (IN/IN)	TOTAL CORE REC (%)	ORE ROL	ST DAT	SAMPLE DESCRIPTION		RAPHY	NOTES	HARDNESS see below for		WEATHERING see below for		IG I	PER FOC		
DEPTH (FT)		SAMPLE						ROCK CORE ROD (%)	FIELD TEST DATA			STRATIGRAPHY		values	5	V	alues	ſ	2 3	ês	
-	3* Spun		19			24/24				PAVEMENT THICKNESS: 3" Concrete Hand augered to a depth of 6 feet prior to	STRATA SYMBOL		1 2 3						ļ		
	1		e 18											++			++-	-	+		
										boring.		•					T		Ħ		
											0.0										
-		<u> </u>		6					-	Medium dense, brown, fine lo medium SAND,					4	anna fana			++	1.	
		S1	6-8	7 6 8	13				12	some Silt, trace Gravel, trace Mica (SM / 11-6	5)						1		Н		
) 				2			\vdash			Loose, brown, fine to medium SAND, some Silt, trace Gravel, trace Mica, trace Rock Fragments trace Clay (SM / 11-65)	lt,	044				14			T	Ť	
0-		\$2	8-10	3 4	6	24/8			1			0					tt		T	T	
۰.		S 3	3 10-12	4 3 3 3 3	6	24/11				Loose, brown, fine to coarse SAND, some Sill trace Mice, trace Gravel, trace Clay (SM / 11- 65)											
-										65)							4		4		
ŝ												-			-				++	÷	
1											0.0	•					11		+	T.	
5-		S 4	15-16.4	3	-4	24/13				Top: Loose, brown, fine to medium SAND, s Silt, little Gravel, trace Mica, trace Clay (SM	ne	ORGANICS	4				T		Ť	T	
		S4A	16.4-17	1 2					11-65) Bottom:Dark gray-black, fine to medium SANI some organic Silt, traceorganic Silty Clay			1									
3		S5	17-18.8	1	्त	21/14			-	pockets, trace Gravel (SM / 11-65)			5		a la				4		
3		C1	18.8	60.3"	- E	24/12		_	-	S5: Soft dark to light gray slightly organic Clayey SILT, some fine to medium SAND, trad	e v	SAND/ GRAVEL/	6	-+					4		
)=										Gravel, trace Rock Fragments, trace Mica (OL / 11-65)		SILT		+++-					-	-	
2				7					-	C1: No Recovery Medium dense, brown, fine to medium SAND,	00	0				et Annopert			ŤÎ	÷.	
		S6	21-23	84	15					some Sill, little Gravel, trace Mica (SM / 6-65)	200			T T			<		T		
-											5/20	DEC ROCK							11		
-		-		3	18	24/21		-		Top (8"): Medium dense, light gray-white,	~~	2				. 4		1.1	1		
-		S7	25-25.7	6 12					*	coarse SAND, little Silt, trace Rock Fragments trace Clay (SM / 7-65)	\sim						-		11		
		S7A	25.7-27	15						Boltom (13"): Light orange-brown, coarse to fi SAND, some Silt, trace Mica, trace Rock	1e ~~	2			÷				H		
1										Fragments (SM / 7-65)	2	-			÷						
											l_{l}	-				1.00			T	1	
G	(1) (1) (1) (2) (1)	AR SO		COHE				R	оск	CORE CHARACTERISTICS		JOINT/FRAC	TUR	E CHARAC	TER	ISTIC	Ś	1			
8P 0-	4 V	ENSIT ery Loc	ose	<2. V	fery So	STENCY	1	V	ARDNESS WEATHERING NO. PE Very Soft, 1 Complete (1) 0			<2" Very				ANGLE A 0-5 II			TTITUDE lorizontal		
4-10 Loose 2-4 Soft 2 10-30 Medium Dense 4-8 Med Stiff 3 30-50 Dense 8-15 Stiff 4 >50 Very Dense 15-30 Very Stiff 5 >30 Hard Hard 5						34	M H	Modium 2 Severe (2) 1-2 Med Hard 3 Moderate (3) 3-1 Hard 4 Slight (4) 11-3 Very Hard 5 Fresh (4) 11-3			10 1'-3' Mod Close/Mod T			ck 5-35 Sub-Horizonta 35-55 Mod Dipping 55-85 Sub-Vertical				g			
)W)Si)Fi ph) S) P	ratifica eld Te otoion ample: ossible	ition lir st Dala ization s S4A a e bould	es represen - Total orga	l appro; nic vap D) and an orga	ximate ors lev a 10.6 anic od	boundaries els are refe eV lamp R or.	s belw erence esults	een s	soil ar a ben	stated, fluctuations of ground water may occur on nd rock types, transition may be gradual. zene standard measured in the head space of s ts per million by volume (ppmv).										ade.	
				8											_			0.0	62.4	V	
							~~~						_		1	JUR	ING N	U. B	03-4	с. 	

r.

	ura.	<ol> <li><ol> <li><ol> <li><ol> <li><ol></ol></li></ol></li></ol></li></ol></li></ol>	III MARRIS			2	-	-		COND AVENUE SUBWAY PROJECT	PROJECT G. SURF DATUM :	RING DEPT	188 'H (F	+46.65 (   (   )   1   1   1	RING NO. DFFSET: -46.65 COORDINATES: NORTH: 218074 EAST: 993743.5	.0341
			D. Split Spor ER: 140 lb. (J		natic)					CO: Jersey Boring and Drilling Corp. N: Peter Lynch	DATE			DEPTH CAS		3. TIME
	NG SIZ		N/A (Spun	0						R: Sara Rocha ART: 7/22/05 DATE END: 7/25/05			1			•••••
	K COR				r ^{il}		1		/IEW	D BY: C. Snee DATE: 11/14/05			-	INCITUO	ROPERTIES	r
	F) OR	ORE NO.	PTH (FT)	HON	(je	OIL (IN/IN	CORE REC (%)	E ROD (%)	DATA	2	MBOL	үнч		HARDNESS	WEATHERING	NUMBER OF FRACTURES PER FOOT
DEPTH (FT)	CASING (BPF)	SAMPLE / CORE NO	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PENREC: SOIL (IN/N)	TOTAL COR	ROCK CORE ROD (%)	FIELD TEST DATA	SAMPLE DESCRIPTION	STRATA SYMBOL	STRATIGRAPHY	NOTES	see below for values 1 2 3 4 5	see below for values	see below for values 1 2 3 4
		S8	30-32	10 12 12 19	24	24/17			(m)	Medium dense, while-brown-light gray slightly micaeous, coarse to fine SAND, some Silt, trac Rock Fragments, trace Clay (SM / 7-65)	» {}}}					
- 35-	ļ									35.0'-36.0': Very hard, fresh, coarse grained,	$l_l l_l l_l$	ROCK				
	4.5 2 2	C2	35-42.1		8	7.1/7.1	100	88		white-light gray-pink, PEGMATITE. 36,0'-42,1': Very hard, fresh, fine to coarse grained, light to dark gray, slightly convoluted, crenulated, horizontal to moderately dipping follation, with very closely to moderately closely spaced, horizontel to moderately dipping.	= $=$		7			2 3 0 0
40	2 2 2 2	02	00-42:1				100	00		slightly weathered, slightly chloritized, slightly iron-oxide stained follation joints/fractures, occasional very thin quartz velns; occasional thin to very thin quartz o-feldspathic zones; high mica content. 35,6°: Cross-foliation joint/fracture, rough, irregular, uneven, moderately dipping to sub-						2 5 0
45	2.5 2.5 2.5 2.5 2.5 3 2.5 3 2.5 2.5	C3	42.1-51.9			9.8/9.8	100	100		<ul> <li>Megular, Unevention, Indeersely opping to solution vertical, slightly weathered, mineralized, 39.8'-40.4'; Cross-foliation joint/fracture, rough, sub-vertical to vertical, slightly weathered, serecitized, hematite coated.</li> <li>35.9', 36.0'-36.8' and 37.7'-38.1'; Healod sub-vertical to vertical joints/fractures.</li> <li>C3: Similar to Schist in C2, except with closely to moderately closely spaced, slightly weathered, slightly kaolinized foliation joints/fractures; occasional thin to very thin quartz veins; high mica content.</li> <li>48.1', 49.6'-50.8' and 50.9'; Healed, moderately</li> </ul>			8			2 0 1 1 1 1 1 0 0 1
	3 3.5 3 2.5 3 3.5 5 4 4 4 4	C4	51.9-60.4			8.5/8.5	100	100		dipping to vertical joints/fractures. C4: Similar to Schist in C2, except convoluted foilation, with closely to widely spaced, slightly weathered, slightly kaolinized foliation joints/fractures; occasional thin to very thin quartzo-fedspathic zones. 54.5'-58.5'.Very hard, fine grained, light to modium gray, quartz-mica SCHIST; occasional very thin quartz veins. Bottom of borehole at 60.4 feat			9			
G	RANU				SIVE S					ORE CHARACTERISTICS			CTUR	E CHARACTE		
4- 10- 30-	-4 V 10 L 30 M 50 D	ENSIT ery Loo bose ledium ense ery De	Dense 4 8- nse 15	2 \ -4 \ -8 \ -15 \ -30 \	Very So Soft Med Sti	iff	12345	V N N H	NES ery Si edium ed Ha ard ery Ha	ft 1 Complete (1) 0 2 Savere (2) 1- rd 3 Moderate (3) 3 4 Slight (4) 11	2 -10	"-1' Clos '-3' Moo 2-10' Wid	y clos se/Th d Clos de/Th	e/Very Thin in se/Mod Thick	0-5 5-35 35-55 55-85	ATTITUDE Horizontal Sub-Horizontal Mod Dipping Sub-Vertical Vertical
8) L	osť wa	ter retu	by sub-verliç ırn belween 4 hole al 60 4';	4'-45'	and 46	5'-60'.				epth of approximately 59.4°.	÷.,					8

					_		_	-		BORING LOG	-					et: 1 of 1
	D	MJN	1881-141		ARU	יון נוני			SI	ECOND AVENUE SUBWAY PROJECT	G_SURF DATUM:	NO. CM11 EL NYCT		) ( 1 3	RING NO. DFFSET: COORDINATES: NORTH: AST;	B63-5
MP	LER: 2	" O.D	. Split Sp	oon	-			во	RING	CO: Jersey Boring and Drilling., Inc	FINAL BC	RING DEPT		) 11.2 D WATER R	EADINGS	
MP	LER H	AMME	R: 140 lb		er		_	FO	REM/	N: P. Lynch	DATE	TIME		EPTH		. TIME
	IG SIZE		NI/A	_	_					ER R Nunez ART: 09/10/04 DATE END: 09/10/04	Note 1		-			
_	CORE		00/75							ED BY: A,A, Azmi DATE: 09/29/04						
		ö	F			(N)	(%)	(%)						INSITU F	ROPERTIES	NUMBER
	CASING (BPF) OR CORING (MIN/FT)	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	6 INCH	E (BPF)	C: SOIL (IN/IN) T/FT)	TOTAL CORE REC	ROCK CORE ROD	EST DATA	SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE) CLASSIFICATIONS	STRATA SYMBOL	SRAPHY		HARDNESS see below fo		FRACTUR
	CASING	SAMPLE	SAMPLE	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: ROCK (FT/	TOTAL C	ROCK C	FIELD TEST			STRATIGRAPHY	NOTES	values	values	for values
						n				PAVEMENT THICKNESS: Not recorded		FILL	2			
10										Hand augered to a depth of 7 feet prior to start of boring. Environmental samples taken.			3			
-																
10				2 2						Very loose, brown, silly, fine SAND and SILT, trace Gravel, trace Clay, trace Mica, trace						
5		S1	7-9	1 1 2	3	24/14				Cinders (SM / 11-65) Loose, brown, fine to coarse SAND, little Cinders, little Sill (SM / 11-65)						
-		\$2 \$3	9-11.0	3 3 2 100\3"	6 100/3"	24/5				Concrete Fragments, some Cinders, trace Brick trace coarse Sand	•:•		4			
-		33	11-11,2	10013	100/3	3/2			-							
-																
-																
-																-
-																
-														- 11		
-																
-																
-																
+		10.00			0.0.75	01.0		L				ONTER		0.000		
GF 3PI 0-4 1-1 0-3 0-5	4 Ve 0 Loo 30 Me	AR SC NSITI ry Loo ose edium ( nse	se Dense	BPF ( <2 \ 2-4 \ 4-8 I	SIVE S CONSIS Very So Soft Vied Stir Stiff	STENCY			OCK DNES ery S lediur led H lard	oft 1 Complete (1) 0 n 2 Severe (2) 1-2	ER FT	SPACING/ <2" Very 2"-1' Close 1'-3' Mod	Close close e/Thin	Wery Thin Mod Thick	ANGLE A 0-5 H 5-35 SL 35-55 M	TTITUDE orizontal Ib-Horizonta od Dipping Ib-Vertical
>5		ry Den	se '	5-30 \	Very Sti Hard	ff	į		'ery H					Very Thick		ertical

÷.

						T		BORING LOG				BC	RING NO.	B63-6
MIM	HHARR	IS • AP	Ur I	*			S	ECOND AVENUE SUBWAY PROJECT	PROJEC	STATION: 1 T NO. CM1 EL. 162.67	188		OFFSET: -396.01 COORDINATES: NORTH: 217508	í
	900 - 540.	,	20	Sufering .	) II (K				DATUM	NYCT		T) 130 7	EAST: 994296.6	
										GF	ROU	ND WATER		TIME
ZE: 3"		Vincenter	mauc)			EN	GINE	ER: Sara Rocha			13		0 17 Hrs	s. 35 Min.
RE: NQ	: N/A (Sp	un)							-					
.0	£	122	-	(NIN)	C (%)	(%)						INSITU F	ROPERTIES	NUMBER
/ CORE !	DEPTH	6 INCH	(BPF)	C: SOIL (I	ORE RE	ORE ROC	EST DATA	SAMPLE DESCRIPTION	SYMBOL	SRAPHY		14/2012/04/04	ALCHONING AND A SECOND A SECOND	FRACTUR PER FOC
SAMPLE	SAMPLE	BLOWS	N VALUE	PENRE	TOTAL C	ROCKC	FIELD TI				NOTES		values	for values
1				-				PAVEMENT THICKNESS: 4* Cobblestone	0°, °0	FILL	1 2			
					r.			Hand augered to a depth of 6 feel prior to boring.		-	3			
									6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6					
S1	6-8	3 8 11 16	10	24/22		ຄ່	×	SAND, some Silt, trace Gravel (SM / 7-65)	10	GRAVEL				
S2	8-10	15 18 25	33	24/24			-	some Slit, trace Gravel, trace Mica (SM / 7-65	2 0 °G					
S3	10-12	15 22 33 42	55	24/19			5	some Silt, little Gravel, trace Mica (SM / 7-65)	0.0			-		
								- ×	52	21				
S4	15-17	41 50 46	90	24/13			-	Sill, fille Gravel, Irace Rock Fragments, trace	ne s°°					
		32			-				ې مې ۵ م					
		10								DEC ROCH	<			
S5	20-22	21 34 40	55	24/24	_			coarse SAND, little Silt, trace Rock Fragments (SM / 7-65)	~~	•				
									11/1					
S6	25-26	23 10010	100/6*	12/12	F				2 "					
	8			127				2	11/1					
	1.10	1							13	,				1111
and the second second									PERFT		an address	the second second second second second	RISTICS ANGLE A	TITUDE
ery Loo	se Dense	<2 2-4 4-8 8-15 15-30	Very So Soft	н. 	. 2	V Z Z T	ery S	ioft         1         Complete         (1) 0           m         2         Severe         (2) 1           ard         3         Moderate         (3) 2           4         Slight         (4) 1	2	<2" Ver 2"-1' Clos 1'-3' Mor 3'-10' Wid	y clos se/Th I Clos le/Th	se/Very Thin in se/Mod Thick	0-5 H 5-35 Su 35-55 M 55-85 Su	orizontal b-Horizontal od Dipping b-Vertical artical
	HAMMER ZE: 3'' MMER WINER ON BROO ( 3 HAMER S1 S2 S3 S4 S5 S5 S6 S6 S6 S6 S6 S6 S6 S6 S6 S6 S6 S6 S6	HAMMER: 140 Ib TE: 140 Ib TE: 140 Ib TE: NQ OX UE: NC OX OX OX UE: NC OX OX OX OX OX OX OX OX OX OX	ZE: 3"         HMMER: N/A (Spun)           WMMER: N/A (Spun)         HD           WMMER: N/A (Spun)         HD           WW         HJ           S1         6-8           S1         6-8           S2         8-10           S3         10-12           S3         10-12           S4         15-17           S6         25-26           S7         22           S6         25-26           S7         27           S6         25-26           S7         27	HAMMER: 140 lb. (Automatic) ZE: 3" MMMER: N/A (Spun) EV: NQ EV: NQ	HAMMER: 140 lb. (Automatic) ZE: 3" MMMER: N/A (Spun) E: NQ Q Q Q Q Q Q Q Q Q Q Q Q Q	HAMMER: 140 lb: (Automatic) ZE: 3" MMMER: N/A (Spun) EVE: NO OV BY BY CO SY BY CO SY BY CO SY BY CO SY BY CO SY SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY CO SY SY CO SY SY CO SY SY SY CO SY SY CO SY SY CO SY SY SY CO SY SY CO SY SY CO SY SY CO SY SY CO SY SY CO SY SY SY CO SY SY SY SY SY SY SY SY SY SY	HAMMER: 140 lb. (Automatic) FC E: NO VE: NO	HAMMER: 140 Ib. (Automatic) FOREM ENGINE MMAER: N/A (Spun) EFOREM ERVIEW OV V V V V V V V V V V V V V	HAMMER: 140 Ib. (Automatic)       FOREMAN: Peter Lynch.         E2: 3"       ENGINEE: Star Rocha         MMER: N/A (Spun)       OATE START. 05/25/05       OATE END: 05/26/05         IE: NO       REVIEWED BY: C. Snee       DATE: 11/14/05         IE: NO       If.       If.       If.         IE: NO       If.       If.       If.       If.         IE: NO       If.       If.       If.       If.       If.         IF.       If.       If.       If.       If.       If.       If.         IF.       If.       If.       If.       If.       If.       If.       If.         IF.       If.       If.       If.       If.       If.       If.       If.         IF.       If.       If.       If.       If.       If.       If.       If.         IF.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If.       If. <td>Z. O.D. Split Spoon         BORING CO: Jersey Boring and Drilling Corp.         DATE           HAMMER: 140 Ib. (Automatic)         FOREMARP Pater Lynch         OS/26/0           IFMARE I: 40 Ib. (Automatic)         FOREMARP Pater Lynch         OS/26/0           IE. NO         DATE STATUS         DATE STATUS           IE. NO         IDATE STATUS         DATE STATUS           IE. NO         IFMARE I: 11/14/05         IDATE STATUS           IE. NO         IE. NO         IE. NO         IDATE STATUS           IE. NO         IE. I. I.</td> <td>2". O.D. Split Spoon         BORING CO: Jersey Boring and Drilling Corp.         OTHER         THE MAMER: IVA Character Lynch         OATE         THE MAMER: IVA Character Lynch         OATE         THE MAMER: IVA Character Lynch         OATE         THE MODERS. Sara Rocha         DATE         THE MODERS. Sara Rocha         DATE         THE MODERS. Sara Rocha         DATE         DATE         THE MODERS. Sara Rocha         THE MODERS. Sara Rocha         THE MODERS. Sara Rocha         <th< td=""><td>CO.D. Solit Spoon         BORING CO: Jersey Boring and Drilling Corp.         FINAL BORING DEFY If GROUP         GROUP           HAMMER 140 Ib. (Automatic)         FOREMAR Peter Lynch.         DATE         TMME 1         DOTE         TMME 1           MAMER 140 Ib. (Automatic)         FOREMAR Peter Lynch.         DATE END: 05/26/05         DATE         TMME 1           MAMER 140 Ib. (Automatic)         DATE START 06/25/05         DATE END: 05/26/05         DATE         TMME 1           ISN         THE 10         DATE START 06/25/05         DATE END: 05/26/05         DATE         TMME 1           ISN         THE 10         DATE START 06/25/05         DATE END: 05/26/05         TMME 1         DATE START 06/25/05         TMME 1         DATE START 06/25/05         DATE START 06/25/05         TMME 1         DATE S</td><td>CD.0.5 pill Spoon         PORIS CO: Jersey Boring and Drilling Corp.         DATE         TIMU REF (17) 139.7           VAMMER 140 Ib (Automatic)         FOREMAN: Peter Lynch         DATE         TIMU EDVIS (0) 24000         TIMU EDVIS (0) 240000         TIMU EDVIS (0) 240000</td><td>2* O.O. Spill Spoon         FPIAL BORING GPTH (FT) 139.7           CAUMER 140 Ib. (Automatic)         FOREMAN Peter tyrch         OAT         CROUND WATER READINGS         SALVE           CHAMMER 140 Ib. (Automatic)         FOREMAN Peter tyrch         OAT         EAR         CAUMOR 140 (b. (Automatic))         FOREMAN Peter tyrch         OAT         EAR         CAUMOR 140 (b. (Automatic))         FOREMAN Peter tyrch         OAT         EAR         FORE         FOR</td></th<></td>	Z. O.D. Split Spoon         BORING CO: Jersey Boring and Drilling Corp.         DATE           HAMMER: 140 Ib. (Automatic)         FOREMARP Pater Lynch         OS/26/0           IFMARE I: 40 Ib. (Automatic)         FOREMARP Pater Lynch         OS/26/0           IE. NO         DATE STATUS         DATE STATUS           IE. NO         IDATE STATUS         DATE STATUS           IE. NO         IFMARE I: 11/14/05         IDATE STATUS           IE. NO         IE. NO         IE. NO         IDATE STATUS           IE. NO         IE. I.	2". O.D. Split Spoon         BORING CO: Jersey Boring and Drilling Corp.         OTHER         THE MAMER: IVA Character Lynch         OATE         THE MAMER: IVA Character Lynch         OATE         THE MAMER: IVA Character Lynch         OATE         THE MODERS. Sara Rocha         DATE         THE MODERS. Sara Rocha         DATE         THE MODERS. Sara Rocha         DATE         DATE         THE MODERS. Sara Rocha         THE MODERS. Sara Rocha         THE MODERS. Sara Rocha <th< td=""><td>CO.D. Solit Spoon         BORING CO: Jersey Boring and Drilling Corp.         FINAL BORING DEFY If GROUP         GROUP           HAMMER 140 Ib. (Automatic)         FOREMAR Peter Lynch.         DATE         TMME 1         DOTE         TMME 1           MAMER 140 Ib. (Automatic)         FOREMAR Peter Lynch.         DATE END: 05/26/05         DATE         TMME 1           MAMER 140 Ib. (Automatic)         DATE START 06/25/05         DATE END: 05/26/05         DATE         TMME 1           ISN         THE 10         DATE START 06/25/05         DATE END: 05/26/05         DATE         TMME 1           ISN         THE 10         DATE START 06/25/05         DATE END: 05/26/05         TMME 1         DATE START 06/25/05         TMME 1         DATE START 06/25/05         DATE START 06/25/05         TMME 1         DATE S</td><td>CD.0.5 pill Spoon         PORIS CO: Jersey Boring and Drilling Corp.         DATE         TIMU REF (17) 139.7           VAMMER 140 Ib (Automatic)         FOREMAN: Peter Lynch         DATE         TIMU EDVIS (0) 24000         TIMU EDVIS (0) 240000         TIMU EDVIS (0) 240000</td><td>2* O.O. Spill Spoon         FPIAL BORING GPTH (FT) 139.7           CAUMER 140 Ib. (Automatic)         FOREMAN Peter tyrch         OAT         CROUND WATER READINGS         SALVE           CHAMMER 140 Ib. (Automatic)         FOREMAN Peter tyrch         OAT         EAR         CAUMOR 140 (b. (Automatic))         FOREMAN Peter tyrch         OAT         EAR         CAUMOR 140 (b. (Automatic))         FOREMAN Peter tyrch         OAT         EAR         FORE         FOR</td></th<>	CO.D. Solit Spoon         BORING CO: Jersey Boring and Drilling Corp.         FINAL BORING DEFY If GROUP         GROUP           HAMMER 140 Ib. (Automatic)         FOREMAR Peter Lynch.         DATE         TMME 1         DOTE         TMME 1           MAMER 140 Ib. (Automatic)         FOREMAR Peter Lynch.         DATE END: 05/26/05         DATE         TMME 1           MAMER 140 Ib. (Automatic)         DATE START 06/25/05         DATE END: 05/26/05         DATE         TMME 1           ISN         THE 10         DATE START 06/25/05         DATE END: 05/26/05         DATE         TMME 1           ISN         THE 10         DATE START 06/25/05         DATE END: 05/26/05         TMME 1         DATE START 06/25/05         TMME 1         DATE START 06/25/05         DATE START 06/25/05         TMME 1         DATE S	CD.0.5 pill Spoon         PORIS CO: Jersey Boring and Drilling Corp.         DATE         TIMU REF (17) 139.7           VAMMER 140 Ib (Automatic)         FOREMAN: Peter Lynch         DATE         TIMU EDVIS (0) 24000         TIMU EDVIS (0) 240000         TIMU EDVIS (0) 240000	2* O.O. Spill Spoon         FPIAL BORING GPTH (FT) 139.7           CAUMER 140 Ib. (Automatic)         FOREMAN Peter tyrch         OAT         CROUND WATER READINGS         SALVE           CHAMMER 140 Ib. (Automatic)         FOREMAN Peter tyrch         OAT         EAR         CAUMOR 140 (b. (Automatic))         FOREMAN Peter tyrch         OAT         EAR         CAUMOR 140 (b. (Automatic))         FOREMAN Peter tyrch         OAT         EAR         FORE         FOR

ŧ

			- <b>F</b> (1997)	L-bare My		S.m.		5.		PR	VENUE SUBWAY OJECT		PROJECT G. SURF I DATUM :	RING DEPT	88 H (F	T) 139.	0 0 1 1 1 7	OFFSET	:-396.0 NATES: 217508 94296.6	538	6
			R: 140 lb. (		natic)					CO: Jersey N: Peter Ly	Boring and Drilling Corp nch	),	DATE			DEPTH				B. TIME	
sı	NG SIZ	E: 3"	1. X		auoy			ENG	GINE	R: Sara Ro	icha		Drift 2								_
	NG HA		: N/A (Spur	<u>)</u>	-					ART: 05/25					-	-					22
1			C .	1.1	- RI	ź	(%)	-								INS	SITU PR	OPERI	IES	NUMB	
	CASING (BPF) OR	/ CORE NO.	SAMPLE DEPTH (FT)	6 INCH	E (BPF)	PEN/REC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA		SAMPLE DESCRIPTION		STRATA SYMBOL	BRAPHY		HARD			HERING	FRACT PER I	URES FOOT
	CASING	SAMPLE /	SAMPLE	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC	TOTAL C	ROCK C	FIELD TE	12.			STRATA	STRATIGRAPHY	NOTES	valı 1 2 3	Jes	va	lues 345	for valu	les
	1	S7	30-30.8	54	100/3"	9/9				Very dense	e, gray-white, micaceous fin	e to	~~		F		III	1.	TH		
	3" SPUN			46				i ia		Coarse SA (SM / 7-65	ND, little Silt, trace Rock Fr.	agments,	$\sum_{j,j,j,j,j,j,j,j,j,j,j,j,j,j,j,j,j,j,j,$	15							
1 1		S8	35-36.4	88 100\5*	188/11"	17/17			•	micaceous	fine to coarse SAND, some , little Sill, trace Clay (SM /	Rock	$\sum_{j,l} \sum_{j,l} \sum_{j$		5						
	Ļ						-			11-12-6-13			122	ROCK	4						
	3 3 3 3	C1	40-44.5			4,5/4,5	100	100		grained, lig wilh very ( horizontal smooth, wi horizontal	to slightly weathered, fine pht lo dark gray, quartz-mic; nin, crenulated, slightly wea to sub-horizontal foliation, r th moderately closely space to moderately dipping, chio nts/fractures; minor garnet	a SCHIST, thered, ough to ed, sub- itized							instruction of the second		
	2.5 2.5 2.5 3 3 2.5 2.5 2.5	C2	44,5-52,5			8/8	100	98		light to dar with very th moderately with model sub-horizo mineralize 45,5': Cross smooth, ve slightly we foliation joi	ry hard, fresh, fine to coars; k gray, quartz-mica-gamet dipping foliation, rough to ately closely spaced, horiz- ntal, slightly weathered, chi d foliation joint/fracture, so s-foliation joint/fracture, ro ry widely spaced, sub-verti athered, chloritized clay co nl/fracture, (1/2" away: Hee sub-vertical joint/fracture)	SCHIST, o smooth, ontal to oritized to oritized to cal, ated									
	2 3.5 5 5 3.5	СЗ	52.5-57.2			4.7/4.7	100	100		medium gr SCHIST(P to moderat sub-horizo foliation joi	fresh, coarse grained, light ay-light green-pink, quartz- EGMATITE), with faint, sub ely dipping foliation, rough ntal, slightly weathered, chi nt/fracture, minor garnet co : Healed sub-vertical joint/fr	feldspathi -horizonta to smooth oritized ntent.								1	
	3 3 3									57 2'-58 6'	: Similar to Pegrnatite In C3			E.	5 6						
3F 0- 1-' 0-	4 V 10 L 30 M 50 D	ENSIT ery Lo bose	Y B ose Dense 8	PF ( 2 ) -4 ) -15 ) -30 )	SIVE S CONSIS Very Sc Soft Med Sti Stiff Very Sti Hard	STENCY /I	1 1 2 3 4 5	HARC V M H	DCK DNES ledium led Hi ard ery H	S oft ird	ACTERISTICS WEATHERING 1 Complete 2 Severe 3 Moderate 4 Slight 5 Fresh	NO. PI (1) 0 (2) 1-2 (3) 3- (4) 11-	ER FT	"-1' Close '-3' Mod 2-10' Wide	THIC clos e/Th Clos e/Thi	CKNESS e/Very 1 in se/Mod 1	) Thin Thick	1	NGLE 0-5 5-35 35-55 55-85	ATTITUI Horizont Sub-Horiz Mod Dip Sub-Verti Vertical	al zontal ping

9) Bottom of borehole at 139.7'; acoustic televiewer survey performed; borehole grouted upon completion.

÷

DM AMPLER: 2" AMPLER HA ASING SIZE: ASING HAMI		IF ARRIS	+ARI		11.5					С			DO	RING NO.	DCO C
AMPLER HA	0.0		11 Sa	Ţ	2			SE	COND AVENUE SUBWAY PROJECT	PROJECT G. SURF DATUM :	STATION: 11 NO. CM11 EL. 162.67 NYCT PRING DEPT	88	44.40	OFFSET: -396.( COORDINATES: NORTH: 21750/ EAST: 994296.	3.538
ASING SIZE:									CO: Jersey Boring and Drilling Corp.		GR	OUNI	D WATER		
ASING HAM		R: 140 lb. (	Autor	natic)					N: Peter Lynch R: Sara Rocha	DATE	TIME	DE	EPTH CA	SING STA	B. TIME
A DUL DADE	MER	N/A (Spur	1)		1	1	DAT	TE ST	ART: 05/25/05 DATE END: 05/26/05 ED BY: C. Snee DATE: 11/14/05						
OCK CORE:			12.1		Î	(%	· · · · · ·		DATE. 11/14/05	T		İΤ	INSITU P	ROPERTIES	Γ
0 1	E / CORE NO	SAMPLE DEPTH (FT)	BLOWS / 8 INCH	N VALUE (BPF).	PEN/REC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA	SAMPLE DESCRIPTION	STRATA SYMBOL	STRATIGRAPHY		HARDNESS		The second secon
DEPTH (FT) CASING (BF	SAMPLE /	SAMPLE	BLOWS	N VALU	PEN/RE	TOTAL (	ROCK C	FIELD T		STRAT#	STRATH	NOTES	values	values	for values
2.5 3 3 3 5	C4	57.2-66.9			9.7/9.7	100	93	141	58.6'-66.9': Very hard, fresh, fine to coarse grained, fight to dark gray, quartz-mica-garnet SCHIST, with very thin, convoluted, highly crenulated, horizontal to moderately dipping foliation, rough to smooth, with moderately closely to widely spaced, sub-horizontal to moderately dipping, slightly weathered, chloritized to clay coaled foliation joints/fractures.		t:				
2.5 2.5 3	_	2 ₁₄	E:					220	58,6'-59.2', 59.7' and 60.7': Cross-foliation joints/fractures, rough to smooth, irregular, closely spaced, moderately dipping to sub- vertical, slightly to moderately weathered, chlotitzed, silicate, clay to hematite coated,			7			
0 2.5 2.5	E,	i si Sure				(8)			mineralized. 61.3-61.7', 63.5'-63.9' and 69.5'-66.9': Soveral healed sub-vertical joints/fractures.		7	And and a second second			
3.5	C5	66.9-76.5		×.	9.6/9.6	100	87	2. R	C5: Similar to Schist In C4. 67.2'-68.0', 70.5', 71.3'-71.7' and 71.6'-72.2': Cross-foliation joints/fractures, rough, irregular, very closely to moderately closely spaced, sub- vertical to vertical, moderately weathered, chlontized, clay to hematile coated, mineralized.		i a	Contraction of the local division of the loc			
5 2.5 2.5 2.5	5	V2.		1.22 		1			C6: Similar to Schist in C4. 80,4'-80.7': Healed sub-vertical join//fracture.						
0 2.0	C6	76.5-82.4	-	9	5 9/5 9	100	100		ang a			Control Internet			
2.5				34) -					Similar to Schist in C4, except convoluted, highly crenutated foliation, occasional very thin			TED HIRVEN PARTY			
2.5 2.5 2.5		2 2 2			84 5				quartz veins; occasional very thin quartzo- feldspathic zones. 85.2'-85.5': Healed sub-vertical joint/fracture. 85.4'-85.7': Cross-foliation joint/fracture, rough, sub-vertical, slightly mineralized			Todolandu Orna			
3	C7	82.4-91.6	New York		9 2/9 2	100	100	2	94 V						
GRANULAI	R SO	ILS I	COHE	SIVE S	IN T	1	RC		CORE CHARACTERISTICS		JOINT/FRAC		CHARACTE	RISTICS	the T T T
8PF DEN 0-4 Very 4-10 Loos 10-30 Med 30-50 Den	NSIT y Loo se dium	Se 2 Dense 2 Nse 15	PF 0 <2 V -4 S -8 N -15 S		STENCY oft ff	1 2 3 4 5	IARD Vi M M H	ery So edium ed Ha ard ery Ha	S         WEATHERING         NO. PE           fit         1         Complete         (1) 0           i         2         Severe         (2) 1-2           ird         3         Moderate         (3) 3-1           4         Stight         (4) 11-2	RFT 0	SPACING/ 2" Very "-1' Close '-3' Mod '-10' Wide	THICH close, e/Thin Close e/Thicl	KNESS /Very Thin /Mod Thick	ANGLE 0-5 5-35 35-55 55-85	ATTITUDE Horizontal Sub-Horizontal Mod Dipping Sub-Vertical Vertical
<ol><li>Core barre</li></ol>	el beo cted t cted t cted t el jar	came jamme by sub-vertic by sub-vertic nmed.	al joint/ al to ve	erlical jo	oints/fractu				68', and 71'-72'. borehole grouted upon completion.		2		* K	a;	K)
						, ,							Г	BORING NO	

	132	475.4	NET TATETOR					E									
	1.44 	vij <i>v</i> a	IIHARRIŞ	e A RU		Decora			SE	COND AVENUE SUBWAY PROJECT	PROJEC G. SUR DATUM	STATION: 1 CT NO. CM11 F EL. 162.67 : NYCT SORING DEPT	88 H (F	-44.40 T) 139.7		RING NO. OFFSET: -396.0 OORDINATES: ORTH: 217508 AST: 994296.0	1
			D. Split Spoo		alla)					CO: Jersey Boring and Drilling Corp.	DAT			D WAT		EADINGS	B. TIME
	NG SIZ		ER: 140 lb. (/	Auton	nauc)					N: Peter Lynch R: Sara Rocha	DAT		-	/EF111	UNS	110 0171	D. TIML
			R: N/A (Spun	)			_			ART: 05/25/05 DATE END: 05/26/05 ED BY: C. Snee DATE: 11/14/05							
100	COR	-	10 J. M.	-	÷.	9	2	- C. 25.	VIEV	E0 61: C, Shee DATE: 11/14/05	- T	- Philippine - Phi	t 1	INSI	TU PR	OPERTIES	
	PF) OR	CORE NO	SPTH (FT	INCH	SPF)	INI) TIOS	RE REC (	E ROD (9	T DATA	SAMPLE DESCRIPTION	MBOL	APHY		HARDN	IESS	WEATHERING	FRACTUR PER FOO
DEPTH (FT)	CASING (BPF) OR	SAMPLE / C	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA		STRATA SYMBOL	STRATIGRAPHY	NOTES	see belo value	85	see below for values	see below for values 1 2 3 4
۵	1	<i>co</i>	0	ŝ	2	0.	H	CL.	u.	8 2 1		0	z	1111 1937 1		<b>展示:</b> (動物)	翻頭
-	3			1	-		1				= 2	=		· · · ·			
ē.÷	3.5	3			3. S					Similar to Schist in C4, except occasional very thin quartz veins; occasional quartzo-feldspathic	Ξ	3			調・	P 1 1 1 1 -	
i.	4.5	6.8	je je			1.10				zones.	=					12	
2 1 2 1	3.5	1	di si ji		2		1			95 4'-95.8': Healed sub-vertical joint/fracture.	Ξ	3				1417	
5-	3	8		$\sim$	-					۰. ۱۰,	= =	=			in the second se		1
-	3	CB	91.6-101.1	•		9.5/9.5	100	96		(1)	Ξ				- 1	「「「「「「」」	
1	2.5	00	01.0-101.1		съ <u>с</u>	5.018.0	100	20	1	241 0.00 0 -	=	=				展台湾	
-	2.5		1.1.1.	5						0 00 ° 00 0 ° 10	Ξ:	-		41			
-	.3				V.					2 2 1 2 2	$\equiv$			and a	30		
0-	2.5		1		8					Taran Aran ang San	$\equiv$	Ξ					
ļ	2:5			-2	•				-	Very hard, fresh, fine to coarse grained, light to	Ξ.	-			間.	3-1-5-5-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	
	- 4		8 M - 14		ř.	1.2				dark gray, quartz-mica-garnet SCHIST, with	Ξ	3					
-	3		е°,	15		1 ⁶⁴				very thin, convoluted, highly crenulated, horizontal to moderately dipping foliation, rough	= :	=		AS -	-	1.7我的	
-	3		1 d		The second	5	2	-		to smooth, with moderately closely to widely spaced, sub-horizontal to moderately dipping,	Ξ:	-					
5-	3.5					-				slightly weathered, chloritized foliation joints/fractures; occasional very closely to	Ξ÷				1	1134	
	2,5	C9	101,1-110.7	k e i	×	9.6/9.6	100	77	m	moderately closely spaced, very thin quartz velns.		3				主義強調	-
	2.5	1250	al a di conserenti L'an di conserenti	1						106,2": Cross-foliation joint/fracture, rough to smooth, planar, moderately dipping, slightly	=	=			11		
1	2.5		1. S. S.	) +						weathered.	Ξ	1					100
	2.5	6	- e e							106.7": Cross-foliation joint/fracture, rough, uneven, sub-vertical, slightly weathered,	= -	-			E.		
0-	2.5	Š.,	s							serecite, hemalite, chlorilized, 107.6'-115.3': Cross-foliation joints/fractures,	Ξ	-					1000
	2.5							_		heated to weakly heated to open, sub-parallel, rough, very closely spaced, sub-vertical to	=	-		P.S.	A.	Sec. 1	
	3	÷.	1,5 h							vertical, slightly to moderately weathered, kaolinized	$\equiv$ :	-		一批制		A REAL R	2.2
	4	1	8								Ξ	-		28.5	No.		
	3	C10	110.7-116.9	- 2		6.2/6.2	100	76	-	C10;Similar to Schist in C9.	=	-			1		
ŝ-	2.5		2			×., •				113.5'-114.7': Feldspar concentration, 112.4': Cross-foliation joint/fracture, rough,	= :	-		+ na		1.00	
	2.5			- 24		~				moderately dipping, severely weathered hemalite coaled.	=				i.	R ISH	12
_	2.5									114.5': Cross-foliation joint/fracture, rough to	Ξ				-		7724
	2.5		* 820 T	2					- 1	smooth, moderately dipping, chloritized, mineralized,	Ξ	-	8				
1	2.5		-		c s	1.15				116.3":Cross-foliation joint/fracture, rough, sub- vertical, slightly to moderately weathered.	Ξ	-		1	1	A A A	Contraction of the second
0-	3	141								¥-	=	-		1		1 18	的被用
G	RANUL				SIVE S			ALC: NO DECIDENT	and the second s	CORE CHARACTERISTICS		JOINT/FRAC			ACTER		
BF 0		ENSIT ery Lo			CONSI /ery Sc	STENCY	1	IARC V	NES ery S	oft 1 Complete (1) 0		SPACING/ 2" Very	clos	e/Very Tł	hin	0-5	ATTITUDE Horizontal
4- 10- 30-	10 Lo 30 M 50 D	oose edium	Dense 2- Dense 4- 8- 15- 15-	-4 -8 M 15 S -30 N	Soft ded St Stiff /ery St Hard	iff _	2 3 4 5	M M H	lediur led H ard ery H	n 2 Severe (2) 1-2 ard 3 Moderate (3) 3-1 4 Slight (4) 11-2	0	"-1' Clos '-3' Mod '-10' Wide	e/Thi Clos e/Thi	in se/Mod TI	hick	35-55 55-85	Sub-Horizont Mod Dipping Sub-Vertical Vertical
5) ( 6) F	Core ba RQD aff	rrel be 'ecled	el placed ecame jammec by sub-vertica	i al joint	/fractu		res bi	slwee	n 67'	68', and 71'-72'							ŀ
8) 0	Core ba	rrel ja	mmed.							borehole grouted upon completion.	8: III (1		ŝ				
			12														D. B63-6

													B	ORIN	IG NO.	B63-6
	MJM	HARRE	S • AR		5	-		SE	PROJECT	BORING S PROJECT I G. SURF E DATUM : N FINAL BOR	NO. CM11 L 162.67	88	14.40	OFFS COO NOR	ET: -396.0 RDINATES: TH: 217508 994296.6	1 .538
		. Split Spo			1.	_			CO: Jersey Boring and Drilling Corp.	DATE	GR		D WATER			3. TIME
SING SIZ		R: 140 lb.	(Autor	natic)			EN	GINE	N: Peter Lynch R: Sara Rocha	DATE	TIME			101140	51/1	2. THAIL
SING HA		N/A (Spu	n)			-			ART: 05/25/05 DATE END: 05/26/05 D BY: C. Snee DATE: 11/14/05			-				
		É			Î	(%)				T			INSITU	PROP	ERTIES	NUMBER
PF) OR	CORE NO.	ЕРТН (F	INCH	BPF)	SOIL (IN	RE REC	RE ROD (	T DATA	SAMPLE DESCRIPTION	YMBOL	ИНА		HARDNES		ATHERING	FRACTUR PER FOO
CASING (BPF) OR	SAMPLE /	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA	inal data reas in transformation	STRATA SYMBOL	STRATIGRAPHY	NOTES	values		e below for values 2 3 4 5	see below for values
3						-		-	C11: Similar to Schist in C9, except very closely				1		Hele-	
2.5 .	C11	116.9-125.			9/9	100	58	-	to moderately closely spaced foliation joints/fractures,				得 書		重要特	
3							5		119.8'-121.8': Foliation joints/fractures, moderately dipping, high mica content with	ΞΞ				1933		
2.5									mytonite. 118.2": Cross-foliation joint/fracture, weakly	ΞΞ				1	See.	
3		• 201 df - 1							heated to open, rough, moderately dipping, slightly weathered.						AN A N	15-
3	1					_			122.2 122.7' Cross-foliation joint/fracture, rough, sub-vertical, slightly to moderately	ΞΞ		8				
2,5	10 U	÷							weathered with pyrite.	$\equiv \equiv$			821			
2.5	1								C12: Similar to Schist in C9.	= =					1.12	
2.5	C12	125.9-132.			6.2/6.2	100	76		129.8'-130.3':Cross-foliation joints/fractures, weakly healed, sub-vertical, slightly weathered.	ΞΞ			1.11		M	
2.5	GIE	120.9-102.			0.2/0.2	100	10		130.8'-131.7':Cross-foliation joints/fractures,	= $=$			の新生い	1		
2.5			÷ .	1.11					rough to smooth, vertical, moderately weathered, hemalite chlorite coated.	$\equiv \equiv$					法遗.	
2.5	й 1 в 1	Sec. 4	-		-					$\Xi \Xi$		8			福利	
2.5					14				C13: Similar to Schist In C9. 132.1'-134.6':Healed, very closely spaced.	$\equiv \equiv$			1		素語(下)	
2.5									vertical, hematite, chlorite coated, quartz filled.	$\equiv \equiv$			S STA		個公	in the second se
2.5				1.3	1 A				139.0'-139.4' Healed sub-vertical joint/fracture.	ΞΞ						The second
2.5	C13	132.1-139.	1.0	÷.,	7.6/7.6	100	86			= $=$						
2.5		1000 100							A 38 00 00 00	ΞΞ				al a		100
2.5	10		2							ΞΞ						陸
2.5	5	25.11								==		9		1-63		1000
2.5						1		$\left  \right $	Bottom of borehole at 139 7 feet			5		9 228		20
	1.11						2							11		
		400 militari 1							3					1		
-	2.11		- 8			÷.,						1.8				
-	1940.				÷ •											
1	5			e -		1				1 1			-+++			1
		12.15					18		9	1 -			++++	+	411	
1	<	100		88	73	+			*							
	10		1	20.										ΗH		
	Baug			š.)-										1H	HH	
	- 50	CH K											111	1	1111	
PF D	AR SO			SIVE S	STENCY			OCK ONES	CORE CHARACTERISTICS		SPACING		E CHARAC	TERIST		ATTITUDE
0-4 V	ery Loo oose	ose	<2	Very So Soft		1	V	ery Solediun	ft 1 Complete (1) 0		2" Very		Very Thin		0-5	Horizontal Sub-Horizon
0-30- M		Dense	4-8	Med Sti Stiff	ff	3	N	led Ha lard		3	'-3' Mod	Clos e/Thio	e/Mod Thic	ĸ	35-55	Mod Dipping Sub-Vertical
	ery De	nse 1	5-30	Very St Hard	iff	5		ery H		<b>7</b> 9			e/Very Thic	k		Vertical
			-30													
		el placed. came jamm	he													90
RQD af	fected	by sub-verti	cal join			ree h	atwor	n 67'	68', and 71'-72'							
Core ba	nrrel ja	mmed.							ber, and 71-72							
Date:																

	D	мім	#HAR)	<u>رانج</u>	ARL	JP .	1.4					BORING	STATION:				RING NO.	B63-7	_
				×		(1) 	5			SE	COND AVENUE SUBWAY PROJECT	PROJEC G. SURF DATUM ;	T NO. CM11 EL. 160.23	_	12	1	OPPSET: COORDINATES: NORTH: 217567 EAST: 994013.6		
MP	LER:	2" 0.[	D. Split S	poon					BO	RING	CO: Warren George		GR	OUN	ND W	ATER F	READINGS		
		E: 4"	ER: 140 I	b. (Ma	anua	al)					N: Mike McCarthy R: Melad Girgis	DATE	TIME	10	DEPT	H CAS	ING STA	B. TIME	
		MMER	₹ 300 lb	_				_			ART: 2/19/09 DATE END: 2/27/09 ED BY: C. Snee DATE:				_				_
							ź	(%)	10		ED DI. C. Silee Divic.				1	INSITU PR	ROPERTIES	or Warne mark	
	PF) OR	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	10000	INCH	SPF)	PEN/REC: SOIL (IMIN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	T DATA	SAMPLE DESCRIPTION	MBOL	ΥНЧ		HAF	RDNESS	WEATHERING	FRACTURI PER FOO	E
חבר זה (רו	CASING (BPF) OR	WPLE /	WPLE D	- 11. TE 110	BLOWS / 6 INCH	N VALUE (BPF)	NREC	TAL COI	OCK COF	FIELD TEST DATA	Usin LE DESCRIPTION	STRATA SYMBOL	STRATIGRAPHY	NOTES	Y	below for alues	see below for values	see below for values	
Š	3	SA	SA	1	<u>ಹ</u>	ź	Pe	5	å	H		ST	FILL	N N	12	345	12345	1234	1
2	3" SP										PAVEMENT THICKNESS: 4" Cobblestone		FILL .	2	-				
4											6" plain concrete slab (sidewalk) 8" concrete slab base			3			and a	<u></u>	
											Hand augered to a depth of 6 feet prior to boring.								
1		_		-	56	_		-											
-		S1	6-8		18 7 6	25	24/14			*	S-1: Medium dense Brown c-f SAND, little Silt, trace Gravel, occasionally brick fragments				-		· · · · ·		
1		<b>S</b> 2	8-10		4 4 6 12	10	24/2			2	S-2: Medium dense Brown m-f SAND, little Silt, trace Gravel, occasional brick fragments.		]						
- 0		\$3	10-12		12 8 14	22	24/14				S-3: Medium dense Gray SAND, some Silt and								
					18	-					Clay brown motted romoxid, occasional coal fragments								
										-	S-4: Medium dense Gray brown m-f SAND,			4	T				
5-		S4	15-17		26 12 12	54	24/24				Irace Silt, occasional mica fragments.		DEC						
-				1	12								SCHIST						
-																	and a lab		
		<b>S</b> 5	20-20.5		38		11/11			2	S-5: Very dense Gray brown m-f SAND, trace Silt, occasional mica fragments				ī i		-		
]					100,00						Siit, occasional mica nagments.								
_																			
-																		지금 말	
-					15			$\vdash$			S-6: Very dense Green/ gray m-f SAND, mica				-				
		S6	25-27	3	3	54	24/22			5	fragments.								
-																	: P	<u>, c</u> .	L
																	et e te	1	
-	ANI	ARSC			HEC	IVE S					CORE CHARACTERISTICS		IOINT/FRAC		E CU	PACTEC	ISTICS		
BPI 0-4	D	ENSIT ery Loc	Y	BPF <2	C		TENCY	1	HAR	DNES ery Sc	S WEATHERING NO. PEI	RFT	SPACING/	THIC	KNES		ANGLE A	TTITUDE	-
4-1 10-3 30-5 >50	0 Lo 0 M	oose	Dense	2-4 4-8 8-15 15-30 >30	Sc M St Ve	oft ed Stit	ff	2345	M M H	edium ed Ha ard ery Ha	rd 2 Severe (2) 1-2 rd 3 Moderate (3) 3-10 4 Slight (4) 11-2	0	2"-1' Close 1'-3' Mod 3'-10' Wide	a/Thi Clos /Thi	n e/Moo ck	s Thick y Thick	5-35 S 35-55 M 55-85 S	ub-Horizontal fod Dipping ub-Vertical fertical	
2)Str 3)Fie	ater le atifica Id Tes	ition lin sl Data	es represe - Total org	ent apj ganic v	proxi /apoi	imate rs leve	boundaries els are refe	s betw rence	ieen s d to a	soil ar benz	stated, fluctuations of ground water may occur due d rock types, transition may be gradual ene standard measured in the head space of seal s per million by volume (ppmv).								Je
																ī	BORING NO	112272 12	_

									BORING LOG					Sh	eet: 2 of 5	
	DMJM	HARRIS	• AR		5			SE	COND AVENUE SUBWAY PROJECT	G. SURF E	NO. CM11 L. 160.23 NYCT			RING NO. DFFSET: COORDINATES: NORTH: 217567 EAST: 994013.6	.2364	_
SAMPLER	2" O	D. Split Spo	оп				во	RING	CO: Warren George	FINAL BOP	RING DEPTI		) 129.40 ID WATER F	READINGS		_
AMPLER	R HAMM	ER: 140 lb. (		al)			FO	REMA	N: Mike McCarthy	DATE	TIME		EPTH CAS		B. TIME	_
ASING S ASING H		R: 300 lb							R: Melad Girgis ART: 2/19/09 DATE END: 2/27/09			-				-
OCKCO	RE: NC	ų		r i		ľ -	RE		ED BY: C. Snee DATE:			-	1			_
) OR	CORE NO.	TH (FT)	CH	Ē	SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE RAD (%)	DATA		BOL	수		HARDNESS	WEATHERING	NUMBER FRACTUR PER FOO	ES
CASING (BPF) OR	SAMPLE / CO	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: SC	IL CORE	< CORE	FIELD TEST DATA	SAMPLE DESCRIPTION	STRATA SYMBOL	STRATIGRAPHY	ŝ	see below for values	see below for values	see below for values	
CASI	SAME	SAM	BLOV	N VA	PEN/	TOTA	ROCH	FIELD				NOTES	12345	12345	1234	NIMBER
- 3° - 5 - 5 - 5	- C1	30-35			5.0/5.0	100	45	-	C-1: Medium soft to medium hard, moderately weathered, f-m grain, green-gray SCHIST, close fracture spacing, sub horizontal to sub vertical foliation, cross foliation 31' - 31.1'		ROCK					
4.5 4.5 4.5 4.5 4.5	C2	35-39.8			4.8/4.8	100	72		C-2: Medium hard, moderately weathered, f-m grain, dark gray SCHIST, close to moderately fracture spaces, sub horizontal - sub vertical foliated, cross foliated 36.4° - 37.0°.							
4.5 3.5 3.5 3.5 3.5 3.5	- C3	39_8-44_5			4.7/4.7	100	66		C-3: Hard slightly weathered f-m grain, dark gray SCHIST, close to moderately fractured, sub horizontal - sub vertical angle.						-	
$-\frac{3}{3}$	C4	44,5-49,5			5,0/5,0	100	75		C-4: Soft to moderately soft, weathered, f-m grain, dark gray SCHIST, clost to moderately fractured, sub horizontal-sub vertical angles.				-		-	
- <u>4</u> - <u>4</u> - <u>4</u> - <u>4</u>	C5	49,5-54,5			5.0/5.0	100	87		C-5: Hard, slightly weathered f-m grain, dark gray SCHIST, clost to moderately fractured, sub horizontal angles, mod dipping 53'-54,5',							
	C6	54,5-58,7			4.2/4.2	100	88	•	C-6: Hard, slightly weathered f-m grain, dark gray SCHIST, clost to moderately fractured, sub horizontal angles, mod dipping 53*54.5*.						1111	
													1.4			
GRANI BPF 0-4 4-10 10-30 30-50	DENSI Very Lo Loose	Y         B           ose         2           Dense         4           8-         8-           inse         15	PF ( -2 \ -4 \$ -8 M -15 \$ -30 \	SIVE S CONSIS Consis Soft Med Stiff Med Stiff /ery Stiff lard	TENCY ft ff	1 1 2 3 4 5	HARE V M H	OCK ( DNES ery So ledium led Ha ard ery Ha	ft         1         Complete         (1)         0           0         2         Severe         (2)         1-2           rd         3         Moderate         (3)         3-1           4         Slight         (4)         11-7	ER FT	SPACING/ 2" Very "-1' Close '-3' Mod '-10' Wide	THIC close /Thir Close /Thic	e/Very Thin 1 e/Mod Thick	ANGLE 0-5 5-35 35-55 55-85	ATTITUDE Horizontal Sub-Horizonta Mod Dipping Sub-Vertical Vertical	31
5) Core b 6) Chang	parrel be ged Core	4' depth, 3" ( came jamme e barrel after ( mechanical b	d. C-20		then pushe	ed to 3	14' the	en pus	hed to 37,0',							
													Γ	BORING NO	. B63-7	

										BORING LOG								eet: 3 of 5	
	Dî	мјм	HARRIS	• AR		Autorea Autorea Internet			SI	COND AVENUE SUBWAY PROJECT	PRC G, S DAT	OJECT I SURF E	TATION: NO. CM11 L. 160.23 YCT ING DEPTI		1 1 2 0 /		RING NO. DFFSET: COORDINATES: IORTH: 217567 AST: 994013.6	2364	
			). Split Spo							CO: Warren George			GR	QUN	ND WA	TER R	EADINGS		
ASIN	G SIZI	E: 4"	ER: 140 lb. (	(Manı	ial)			FO	REM/	N: Mike McCarthy ER: Melad Girgis	D.	ATE	TIME		DEPTH	CAS	ING STAE	B. TIME	
	G HAN		: 300 lb	_	_	_	_	DA	TE ST	ART: 2/19/09 DATE END: 2/27/09 ED BY: C. Snee DATE:	-			-		-	_	_	
T			F			(Ž	(%)	100 Y (1)				T.			INS	SITU PR	OPERTIES	NUMBER	
-	BPF) OR	SAMPLE / CORE NO	SAMPLE DEPTH (FT)	6 INCH	(BPF)	PEN/REC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	ST DATA	SAMPLE DESCRIPTION		SYMBOL	RAPHY		HARDI		WEATHERING	FRACTUR PER FOO	RES OT
	CASING (BPF)	SAMPLE	SAMPLE	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC	TOTAL C(	ROCK CC	FIELD TEST			STRATA SYMBOL	STRATIGRAPHY	NOTES	see bel valu 1 2 3	ies	see below for values	see below for values	
	4	C7	58.7-63.7			5.0/5.0	100	92	*	C-7: Hard, slightly weathered, f-m grain, dark gray SCHIST, clost to wide spacing, sub horizontal angles.						1000			
	4 4 4 4 4	C8	63.7-68.7			5.0/5.0	100	100	*	C-8: Hard, slightly weathered, f-m grain, dark gray SCHIST, clost to wide spacing, sub horizontal angles, sub vertical at 65.9'.									
	4	C9	68.7-73.9			5:2/5.2	100	76		C-9: Hard, slightly weathered, f-m grain, dark gray SCHIST, close to moderate spacing, sub horizontal angles.									
		C10	73.9-78.1			4.2/3.7	88	24		C-10: Medium hard, moderately weathered, f-n grain, dark gray SCHIST, very close- close spacing, sub horizontal angles, cross foliation 76.3'-78.0'.	n					- 11			
		C11	78.1-80.6			2.5/2.1	83	50		C-11: Medium hard, moderately weathered, f-n grain, dark gray SCHIST, very close- close spacing, sub horizontal angles.	n								
1		C12	80.6-84.7			4_2/3.1	74	34		C-12: Medium hard, moderately weathered, f-n grain, dark gray SCHIST, occasionally mixed GRANIT, very close to close spacing, sub horizontal to sub vertical 81,5'-84,7' (tost recovery at this zone).	n					- 1			
		C13	84.7-89.7			5.0/5.0	100	50		C-13: Moderately hard, moderate-slightly weathered, close -moderate spacing, f-m grain dark gray SCHIST, GRANIT, very close 84,7'- 85.2' sub horizontal foliation, sub vertical at 86.3',	1,							-	
BPF 0-4 4-10 10-30	Ve Lo 0 Me 0 De	ENSIT ary Loc ose	Y B ose 2 Dense 4 8-	PF ( 2 \ -4 \ -8   -15 \stacksorp	/ery Sc Soft Med Sti Stiff	STENCY oft ff	1 2 3 4 5	HARD V M H		off         1         Complete         (1) 0           n         2         Severe         (2) 1-7           ard         3         Moderate         (3) 3-7           4         Slight         (4) 11	2 -10		'-1' Close -3' Mod -10' Wide	THIC close e/Thi Close e/Thi	KNESS e/Very T n se/Mod T	hin hick	ANGLE 2 0-5 5-35 \$ 35-55 55-85 \$	ATTITUDE Horizontal Sub-Horizont Mod Dipping Sub-Vertical	lal
BPF 0-4 4-10 30-50 >50 4) 4" 5) Co 6) Ch	DE Ve D Lo D Me D De Ve Casing ore bar	g to 14 rel ben g to 24	Y B sse < Dense 4 se se 15 >	PF ( 2 N -4 S -8 I -15 S -30 N 30 I Casing d C-20.	CONSIS /ery Sc Soft Med Sti Stiff /ery Sti Hard to 29'	STENCY ft ff	1 2 3 4 5	HARE M M H V	ONES ery S lediur led H ard ery H	S         WEATHERING         NO. F           oft         1         Complete         (1) 0           n         2         Severe         (2) 1-7           ard         3         Moderate         (3) 3-7           4         Slight         (4) 11	2 -10		SPACING/ 2" Very '-1' Close -3' Mod -10' Wide	THIC close e/Thi Close e/Thi	KNESS e/Very T n se/Mod T ck	hin hick	ANGLE 2 0-5 5-35 \$ 35-55 55-85 \$	Horizontal Sub-Horizont Mod Dipping Sub-Vertical	9
																	BORING NO	. B63-7	_

_				_				1									205		eet: 4 of 5	_
	D	MJM	#HARRIS	•AR					SI		AVENUE SUBWAY ROJECT	1000	G. SURF E	NO. CM11			OF CC NC	RING NO. FFSET: DORDINATES: DRTH: 217567 AST: 994013.6	2364	
			D. Split Spo		_						en George				NUO	ND WAT	ER RE	ADINGS		_
			ER: 140 lb. (	Manu	ial)		_			AN: Mike N			DATE	TIME	C	EPTH	CASI	NG STAE	B. TIME	_
	NG SI2		2 300 lb							ER: Melad TART: 2/19		19			-					-
		E: NQ								ED BY: C.										_
		Ň	F			(NIV)	(%)	(%)								INSIT	UPRO	OPERTIES	NUMBER	0
	CASING (BPF) OR	SAMPLE / CORE N	SAMPLE DEPTH (FT)	6 INCH	(BPF)	PENREC SOIL (IN/IN)	CORE REC (%)	ROCK CORE ROD (%)	TEST DATA		SAMPLE DESCRIPTION		STRATA SYMBOL	RAPHY		HARDNE		WEATHERING	FRACTUR PER FOC	OT
חברוה (רו)	ASING (	AMPLE	AMPLE	BLOWS / 6 INCH	N VALUE (BPF)	ENREC	TOTAL CO	OCK CO	FIELD TE				TRATA (	STRATIGRAPHY	NOTES	see below values	5	see below for values	see below for values 1 2 3 4	
5	Ű	0	ŵ	0	z	ũ.	Ĕ	æ	E			-	io I	Ś	Ż	14.9	· ·	14979	1497	Ŀ
14 14 Math		C14	89.7-94.1			4.4/3.8	85	8		weathere	derate hard, moderate-slightly Id, close fracture spacing, f-m g SCHIST, sub horizontal angles	rain					-			
5 1 1 1		C15	94.1-99.1			5.0/5.0	100	33		weathere	iderate hard, moderate-slightly id, close fracture spacing, f-m g i SCHIST, sub horizontal angles	rain								
		C16	99.1-103.6			54/60	100	55		weathere	me as C-13 except Hard slightly Id, f-m grained close spacing, d IIST, sub horizontal foliation,	/ ark						Ţ		
e ne ne îl ac a		C17	103.6-108.6			59/60	98	73		sub horiz 107.7'-10 fracture 103.8', 10 107.2', 11 Cross fol undulatin	rd, F-c light- dark gray SCHIST, ontal 105.7'-106.1' and modera 8.6' foliations No apparent foli 94.1', 104.5', 104.8', 105.7', 106 77.7', and 108.1' iation, rough to smooth, irregula g sub horizontal moderately fre eathered.	te ated 1', ar to								
		C18	108_6-113_1			54/60	100	100		foliation 110.9', 1 Rough to fresh to s	ame as C-17 except moderate l08.6'-110.2', Cross-foliation jo 11.8', 112.5' smooth sub vertical to sub hori lightly weathered. 'Quartz-feldspar vein	inls								
Ī		C19	113 1-114 4			16/60	100	100									ā			t
1 1 1			114.4-119.4			58/60	98	97		SCHIST, smooth v horizonta	ry Hard, f-c grained, light to dar sub horizontal foliation, rough t vith closely spaced, horizontal t I slightly weathered foliated joir 2" Quartz-feldspar vein.	o o sub			5 6				Ξ	
-															7					
	7F D -4 V 10 L 30 M 50 D	AR S( ENSIT ery Loc oose ledium ense ery De	Y B ose 2 Dense 4 8- nse 15	PF ( 2 \ -4 \$ -8 M -15 \$ -30 \	SIVE S CONSIS Very So Soft Med Stir Stiff Very Sti Hard	TENCY ft ff	1 1 2 3 4 5	HARD V M H	DCK DNES ery S lediur led H ard ery H	S oft m ard	RACTERISTICS WEATHERING 1 Complete 2 Severe 3 Moderate 4 Slight 5 Fresh	NO. PER (1) 0 (2) 1-2 (3) 3-10 (4) 11-20	FT	"-1' Close "-3' Mod "-10' Wide	THIC clos e/Thi Clos e/Thi	KNESS e/Very Thi n se/Mod Thi	n ck	ANGLE 0-5 5-35 35-55 55-85	ATTITUDE Horizontal Sub-Horizont Mod Dipping Sub-Vertical Vertical	

										BORING LOG					Sh	eet: 5 of 5
	C	MJM	<b>SI SARR</b>	5 • A9	UP A	Annual State			SI	ECOND AVENUE SUBWAY PROJECT		NO. CM11	88		OFFSET: COORDINATES: NORTH: 217567 EAST: 994013.6	.2364
SAM	PLER	HAMM 2E: 4"	D. Split Sp ER: 140 lb.		ual)			FO	REM/	CO: Warren George N: Mike McCarthy ER: Melad Girgis	FINAL BO	RING DEPTI	100	) 129.40	READINGS	B. TIME
		E: NQ	: 300 lb							ART: 2/19/09 DATE END: 2/27/09 ED BY: C, Snee DATE:						
	OR	RE NO.	TH (FT)	H		r (IN/IN)	REC (%)	(%)	DATA		30L	¥	1	INSITU F		NUMBER OF FRACTURES PER FOOT
DEPTH (FT)	CASING (BPF)	SAMPLE / CORE	SAMPLE DEPTH	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST D	SAMPLE DESCRIPTION	STRATA SYMBOL	STRATIGRAPHY	NOTES	see below fo values	r see below for values	see below for values 1 2 3 4
-		C21	119.4-124	4			100	92		C-20: Same as C-19 except sub horizontal -						5 3 - 5
- 125									_	sub vertical foliation, Undulating to irregular, rough to smooth, fresh to slightly weathered. Some calcite cross foliation fractures at 115.4', 118.2' and 118.9'. No apparent foliation fractures.	8					
-		C22	124_4-129	6			100	50		fractures, C-21: Very hard fresh fine to coarse grained light to dark gray gm SCHIST with thin convoluted foliations; sub horizontal to						- <u>3</u> 0 2
- 130 — -										moderate foliation, rough, irregular, close to moderately close, fresh to slightly weathered. 120.6 ¹⁻¹ 20.8 ⁰ Vory Hard fresh coarse grained pink and white Quartz - feldspar vein.						0 2 7
										C-22: Very hard, fresh, f-c grained, light to dark gray SCHIST, sub horizontal to moderate						2 0 0 3
135										foliation, rough to smooth with closely spaced, slightly weathered to fresh foliated joints. Cross foliation at 124.8', 125.0' and 125.9'	5			-		2 0 0
140																0
1.1.1														1		
145										Boltom of borehole at 129,4						
-																
G		LAR SO			SIVE S	SOILS				CORE CHARACTERISTICS		OINT/FRAC SPACING/		E CHARACTE		ATTITUDE
0- 4- 10- 30- >{	4 V 10 L 30 M 50 D	ery Lo oose	Dense	<2 2-4 4-8 3-15 5-30	Very Soft Soft Med SI Stiff Very Si Hard	oft Jff	1 2 3 4 5		Very S Mediur Med H Iard Very H	oft 1 Complete (1) 0 n 2 Severe (2) 1-2 ard 3 Moderate (3) 3- 4 Slight (4) 11-	10 -20	2" Very "-1' Close '-3' Mod '-10' Wide	clos e/Thi Clos e/Thi	e/Very Thin n :e/Mod Thick	0-5 5-35 35-55 55-85	ATTITODE Horizontal Sub-Horizontal Mod Dipping Sub-Vertical Vertical
5) C	ore ba	arrel be d Core	4' depth, 3" came jamm barrel after mechanical	ed. C-20.		then push	ed to 3	34' lhe	en pu	shed to 37.0'.					1	
														Г	BORING NO	. B63-7

12	ea tea	HEADE	1.25	P F	wo		Γ					_	В		IG NO	. B6	3-8	
-	anty that		A BOARD	10 10 10 10 10 10 10 10 10 10 10 10 10 1				SI	COND AVENUE SUBWAY PROJECT	PROJEC G. SURF DATUM ;	STATION: T NO. CM11 EL. 160.96 NYCT DRING DEPT		D. 69.2	NORT	ET: DINATES H: 217576 994091.0	6.7756	3	
MPLER:	2" 0.0	). Split Spo	non				BO	RING	CO: Warren George	FINAL DA			ND WATER	READ	INGS			_
MPLER I		ER: 140 lb.	(Auton	natic)					N: Mike Mcerlean ER: Melad Girgis	DATE	TIME	1	EPTH C	ASING	STA	B. TIN	ЛЕ	_
SING HA	MMER	: 300 lb					DA	TE ST	ART: 2/16/09 DATE END: 2/17/09							_		-
CKCOR	COMP.		1	- 1	9	()	1	VIEW	ED BY: C, Snee DATE:	J	r ¹	+	INSITU	PROPE	RTIES	1		-
F) OR	ORE NO.	PTH (FT)	NCH	PF)	OIF (INI)	E REC (%	ROD (%	DATA		MBOL	ЪНЧ		HARDNES		THERING	FR/	MBER ACTUR ER FOC	E
CASING (BPF) OR	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PENIREC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA	SAMPLE DESCRIPTION	STRATA SYMBOL	STRATIGRAPHY	NOTES	see below f values		below for values		below values	1
S	SA	SA	BLC	z	Be	10	ß	FIE		STI	FILL	Q 1	1234	5 1 3	2345	13	2 3 4	
- 3" SP									PAVEMENT THICKNESS: 4" Cobblestone		FILL	2	ni-e	l an				
									6" plain concrete slab (sidewalk) 8" concrete slab base			3						
									Hand anguered to a depth of 6 feet prior to boring,				14-1	ij.,				
-	S1	6-8	28 12 4	16	24/16			2	S-1: Medium dense Yellow brown fine SAND, some clayey silt, brick fragments,				-					
-	S2	8-10	18	24/6				S-2: Medium dense Brown c-f SAND, little gravel, brick gragments.										
	\$3	10-12	24 26 48	74	24/18	1			S-3: Very dense Brown c-f SAND and c-f Gravel, trace silt, occosional mica fragments.		SAND							
			26					E					1					
	<b>S</b> 4	15-17	42 32 27	59	24/16				S-4: Very dense Brown c-f SAND, little fine				Ĩ.	E.				
-	_	, make a Co	30						Gravel, trace Silt, occasional mica fragments.					8		+		
			21						S-5: Very dense Green c-f SAND, trace fine	_	DEC ROCK			4				
	S5	20-22	24 46 80		24/15			×	Gravel mix mica fragments.									
									S-6: Very dense Green c-f SAND, mica mix				6 I.					
-	S6	25-26	75 75 100\3*		15/15			÷	(Decomposed SCHIST).				1					
													TURES			-	l	
0-4 Ve -10 Le 0-30 M 0-50 De	AR SC ENSIT ery Loo bose edium ense ery Der	Dense 8	<2 V 2-4 S 4-8 M -15 S 5-30 V		STENCY ft ff	1 2 3 4 5	HAR V N H	ROCK DNES lediur led H lard lard lery H	oft         1         Complete         (1)         0           n         2         Severe         (2)         1.2           ard         3         Moderate         (3)         3.4           4         Slight         (4)         11	ER FT	2"-1' Close 1'-3' Mod 3'-10' Wide	THIC clos e/Thi Clos e/Thi	KNESS e/Very Thin n e/Mod Thick	ľ	ANGLE / 0-5   5-35 S 35-55   55-85 S	ATTITU Horizor ub-Ho Mod Di ub-Ver Vertica	ntal rizontal pping rtical	

	_	_				_		1			BORING LOG	1						eet: 2 of 3	
	12	ei, fiert	HFRE	- 21 1997 - 199 1997 - 199					SI		AVENUE SUBWAY ROJECT	G. SURF	STATION: T NO. CM11 EL 160.96 NYCT DRING DEPT	-	D 68 3	0	RING NO. DFFSET: COORDINATES: NORTH: 217576 AST: 994091.0	7756	
M	PLER:	2" 0.0	). Split Spor	n				BO	RING	CO: Warr	ren George	1.0012.03				TER R	EADINGS		
			ER: 140 lb. (		natic)		_			AN: Mike M		DATE			EPTH			. TIME	_
	NG SIZ									ER: Melad									
			2 300 lb				_			ART: 2/16				-					_
201	K COR	NQ	· · · · · ·		<u> </u>	-		1	VIEW	ED BY: C.	Snee DATE:	L	T I	-					_
	PF) OR	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	NCH	PF)	PEN/REC: SOIL (IN/IN)	CORE REC (%)	E ROD (%)	DATA			MBOL	УН4		HARD		WEATHERING	NUMBER FRACTUR PER FOO	RES
(וב) בו בסה	CASING (BPF) OR	WPLE / C	MPLE DE	BLOWS / 6 INCH	N VALUE (BPF)	VIREC: S	TOTAL COR	CK CORE	ROCK CORE ROD (%) FIELD TEST DATA SYRATA SYMBOL		STRATIGRAPHY	NOTES	see bel valu		see below for values	see below for values			
	CAS	SAA	SAM	BLC	>z	ű.	101	0°	E			STR	STR	NON	123	4 5	12345	1234	1
	3" 5 5 5	C1	29.5-34.5			5.0/5.0	100	95		grained, SCHIST foliation	d, slightly weathered fine to coarse light to dark gray quartz mica garnet , very thin crenulated, sub horizontal , rough, irregular moderately close to b horizontal foliation joints/fractures.		ROCK						~ ~ ~ ~
	4.5 4.5 4.5 4.5	C2	34.5-39.5			5.0/5.0	100	87		34 5'-34	nular SCHIST in C-1 .6': Cross foliation joints/ fractures, weathered moderately dipping,						С 1	-	
The second second	4.5 3.5 3.5 3.5 3.5	С3	39.5-44.5			5.0/5.0	100	83	. X	weather 42,7'-43	hular to SCHIST in C-1except severely ed from 44,1' to 44,5' .2': Cross foliation joints fractures spaced vertical to sub vertical.								
	3.5 3 3 3	C4	44.5-49.5			5.0/5.0	100	63	<u>16</u>	hard.	ular to SCHIST in C-1 except medium ached sheet)							I   I	
	3 3 4 4 4 4	C5	49.5-54.5			5.0/5.0	100	100		C-5: Sin	nular to SCHIST in C-1							1.1.1	
	4 4 4 4 4	C6	54.5-59.5			5.0/4.8	97	75	•	moderat horizonta	nular to SCHIST in C-1 except ely weathered from 53.0°-59.5°, Sub al foliation (cross foliation 58.0°-59.5°) ical joints/ fractures.							-	
3P 0- 4-1 0-:	4 RANUL 7F Di 4 Ve 10 Lo 30 M	ENSIT ery Loc	Y Brose < Dense 4	PF C 2 V 4 S	SIVE SI CONSIS Very Soft Med Stiff	TENCY ft	1 1 2 3 4	HARE V M	DCK DNES ery So lediur led Ha ard	S oft n	ARACTERISTICS WEATHERING NO. P 1 Complete (1) 0 2 Severe (2) 1-2 3 Moderate (3) 3- 4 Slight (4) 11-	ER FT	"-1' Close	Clos clos e/Thi Clos	e/Very Tr n se/Mod Ti	nin	ANGLE / 0-5   5-35 S 35-55	ATTITUDE Horizontal Sub-Horizont Mod Dipping Sub-Vertical	3

							-	T		BORING LOG	1		-		RO	RING NO.	eet: 3 of 3
	13	4,064	HTIN		記				SI	ECOND AVENUE SUBWAY PROJECT	G. SURF	NO. CM11 EL. 160.96		11 69 2	O C N	FFSET: OORDINATES: ORTH: 217576 AST: 994091.0	.7756
AMF	LER	2" 0.0	). Split Spo	oon				BO	RING	CO: Warren George	Firent DO				TER R	EADINGS	
MF		AMM	ER: 140 lb.		matic)			FO	REM	N: Mike Mcerlean	DATE	TIME		DEPTH	CASI	NG STAE	B. TIME
			: 300 lb							ER: Melad Girgis TART: 2/16/09 DATE END: 2/17/09				-			
CH	COR	E: NQ		1	-	-			VIEW	ED BY: C. Snee DATE:	1		-			0000000	
	PF) OR	ORE NO.	EPTH (FT)	NCH	6F)	PEN/REC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	DATA		MBOL	YH4,		HARD		OPERTIES WEATHERING	NUMBER FRACTUR PER FOO
	CASING (BPF) OR	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	ENREC: S	DTAL COR	OCK CORI	FIELD TEST DATA	SAMPLE DESCRIPTION	STRATA SYMBOL	STRATIGRAPHY	NOTES	see bel valu		see below for values	see below for values
	_	S/	St.	ä	z	R.	T	A.	E	C-7: Simular to SCHIST in C-1 except sub horizontal foliation, Hard slightly weathered	ST	IS	ž	144	4 9	12349	1234
	4 4	C7	59.5-64.5			5.0/4.7	96	83	*	SCHIST (occosional GRANITE), clost to moderate fractured spacing, sub horizontal foliation,							
	4 4 4 4	C8	64.5-69.5			5.0/3.8	100	33	3	C-8: (64,5-68.3') Moderate to Hard, slightly weathered SCHIST, close fractured spacing (66'-67,8' fractured), sub horizontal to moderately dipping foliation, 64,5'-65,5' and 68,0-68,3'; Fine to medium			4				
(I) I I I										grained, light gray quartz mica SCHIST with sub horizontal to moderatley dipping foliation, 65,5-68,0°: Simular to above SCHIST except severely weathered,							
														1			
-										Bottom of borehole at 68.3'							
		10.0									_	0		-	10777	07:00	
P)-1/2	4 Ve 10 Lo 30 M 50 De	ENSIT ery Loc oose	Y E ose Dense Tse 1	3PF ( <2 ) 2-4 ; 4-8   3-15 ; 5-30 )	SIVE S CONSIS Very So Soft Med Sti Stiff Very Sti Hard	STENCY oft ff	1 2 3 4 5	HARC V N	DCK PNES lediur led H lard lard	oft         1         Complete         (1)         0           n         2         Severe         (2)         1-2           ard         3         Moderate         (3)         3-1           4         Slight         (4)         11-	ER FT	"-1' Clos '-3' Mod -10' Wid	clos e/Thi Clos Clos	CKNESS e/Very T in se/Mod T	hin hick	ANGLE / 0-5 5 5-35 5 35-55 5 55-85 5	ATTITUDE Horizontal Sub-Horizont Mod Dipping Sub-Vertical Vertical

		XMJN	/IIIH/		•AR oint Ven	U P itura			S	ECOND	AVENUE SUBWAY		BORING S	TATION: NO. CM 1	189			0	FFSE	T:S		86	4-2	
				9	5	57					ROJECT		G. SURF E DATUM: N	L 158.08	_		40	N	ORTH	: 217	606		3	
M	PLER:	2" O.E	), Split S	poon	- sam		_	во	RING	CO: Jers	ey Boring and Drilling Co	Inc.	FINAL BOI				40 VATE	RR	EADI	NGS	-	_		-
Mi	PLERH	AMME	ER: 140 I	b. Auto	matic			FO	REM/	AN: A. Fel	iciano		DATE	TIME		DEP	TH			S	TAE	3. TIN	1E	_
			and 5"	_			_			ER: N. Sc TART: 6/1		00/02	7/2/02 8/23/02	12:40 15:45	-	14.3		OV			Day 5 Da			_
		E: NQ	14010.								A. Ponti, JDATE 9/3/02	20/02	8/27/02	16:05	+-	14.6		OV			Da			-
		<u>,</u>	C			ź	(%)	(%									INSIT	U PR	OPER	TIES				
	PF) OR IIN/FT)	CORE NO	ЕРТН (F	INCH	BPF)	(IN) (IN)	REC (	LOTAL CORE REC (%) ROCK CORE REC (%) BORWISTER (RSCS / NYC BIDG CODE) BORWISTER (RSCS / NYC BIDG CODE) CLASSIFICATIONS CLASSIFICATIONS					ХНЧ		НА	RDNE	ss	WEAT	THER	ING	FRA	MBER ACTUI R FO	R	
( ב ב ב ב ב ב ב ב ב ב ב ב ב ב ב ב ב ב ב	CASING (BPF) OR CORING (MIN/FT)	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL COI	ROCK COF	CLASSIFICATIONS		RATA S'	STRATIGRAPHY	NOTES		below values			alues		for v	below	s		
2	δŏ	1S	s/		z	22	ΙΎ	1 M	Ē					FILL	Z 1		234	5	12	3 4	5	12	234	4
-										PAVEM	ENT THICKNESS: 4" Conc	ele			2									
											igered to a depth of 6 ft. prior nental samples taken.	to boring,			3	T.								
-										environi	nental samples taken,				4									
-																÷		-						
1-1-1		S1	6-8	4 5 9	14	24/17			0		dense, brown, fine to mediur T, trace Gravel (SM / 11-65)	n SAND										Ē		
1		S2	8-10	12 13 11 18	29	24/14			0	medium	dense, light brown to red-bro SAND and SILT, trace Grave													
-		S3	10-12	20 9 18 19	37	24/15	t		0		ight brown to red-brown, fine some Silt, trace Gravel (SM /										I			
		S4	12-14	23 15 16 34	50	24/17			0		ight brown, fine to medium S. It, trace Gravel, trace Clay (S													
-		S5	14-15 3	26 18 22	40	24/19			0	Top 16"									T	Т				
-		S5A	15,3-16	18 18					-	Bottom to media	avel (SM / 11-65) 3": Gray-brown, slightly micad Im SAND, some Sill, trace Ro	$\sim$	DEC ROCK		-									
-										Fragme	nts (SM / 7-65)		122			-		-						
]													~~~			L.F								
_													$\sim$ 1											
	1			13 18						Dense,	ight gray to red-brown (variat	le color),	~~~											
1		S6	20-22	30 51	48	24/20			0		us, fine to coarse SAND, little agments (SM / 7-65)	Silt, Irace	~~			T								
1		-			-		+	-	-		- <u>j</u>		$\sim$			-ir		-11-						
-													$\sim$											
-													$\sim$			-8-		-11						
4	-			_									~~			4					4			
		S7	25 27	20 26	69	24/24					nse, gray, micaceous, fine to		$\sim$											
		31	25-27	43 64	69	24/24			0	SAND, I 65)	ittle Silt, trace Rock Fragmen	s (SM / 7-	~~											
1	1												$\sim$											
ſ													~~									H		
ł													$\sim$									E		
ļ				-									~~~			Į.		1				العرا		
SF	RANUL	AR SC	DILS	COHE	SIVE S	SOILS		R	OCK	CORE CH	ARACTERISTICS		JC	DINT/FRAC	TUR	ECH	ARAC	TERI	STICS	3	_			-
		ENSIT ery Loo				STENCY			DNES		WEATHERING	NO. PE	RFT	SPACINO					A	NGLE		FTITU		
	0 Lc	ose		2-4	Very So Soft		1	M	ery So ediun	1	1 Complete 2 Severe	(1) 0 (2) 1-2		2"-1' Clo	seЛ	Thin	ery Th	- 1		0-5 5-35	Su		rizonla	
	50 De	edium I ense ery Der		8-15 15-30	Med Sti Stiff Very St Hard		3 4 5	н	ed Ha ard ery Ha		3 Moderate 4 Slight 5 Fresh	(3) 3-1 (4) 11-2	20	3'-10' Wi	de/T	hick	/lod Th /ery Th		5	35-55 55-85 35-90	Su	od Dig Ib-Ver erlical		
<u>с</u> т	ES:																							_
N S	/ater le tratifica	ition lin	ies repres	enl appr	oximate	boundarie	s betv	veen	soil a	nd rock typ	ctuations of ground water ma es, transition may be gradual												re ma	d
Fi	eld Te	st Data	<ul> <li>Total or</li> </ul>	rganic va	pors lev	els are refe	erence	ed to	a ben	zene stand	lard measured in the head sp on by volume (ppmv)		aled soil sam	ple jars usir	ng a	n org	anic va	apor n	neter e	equip	ped v	/ith a		
4	~~~			ا اله رحب ا	. u iv 0'	evianip K	ວວບແຮ	- ui O	n pail															

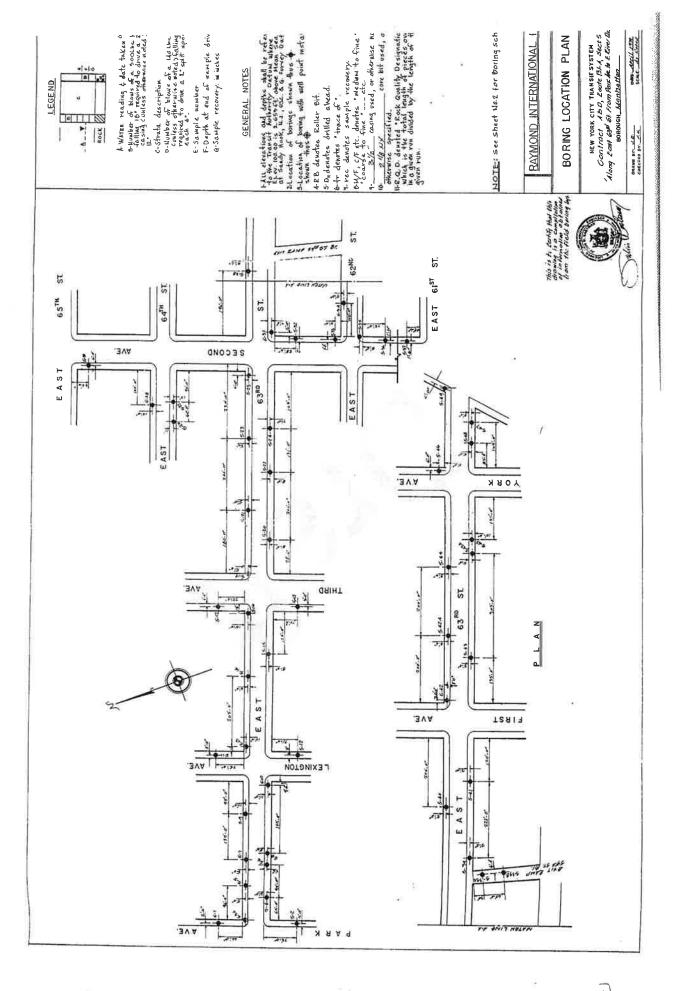
1	CN III	ABELIAD	DIC -	ADT	1D		1							BO	RING NO.	B64-2
2	DMJN	/##HAR	KIS • A Joi	MRU ht Venti	/P ure			SE	COND AVENUE SUBWAY PROJECT	G SURF	NO. CM 1 EL. 158,08	188	1		OFFSET COORDINATES: IORTH: 217606	
				9_	-					DATUM:		11.15	-	8	AST: 994657.5	5258
	2" 0 [	). Split Spo		-			BO	RING	CO: Jersey Boring and Drilling Co., Inc.	FINAL BC	RING DEPT				EADINGS	
		R: 140 lb		natic		_			N: A. Feliciano	DATE	TIME		DEPTH			B. TIME
SING SI	ZE: 3"	and 5"					EN	GINE	ER: N. Sokol	9/6/02	13:00		14.8'	0		
		: 140 lb.							ART: 6/17/02 DATE END: 6/28/02	9/13/02	12:15 11:30		15.3'	0		
T	RENQ	ř – –		r r	~				ED BY: M. A. Ponti, JĐATE: 9/3/02	9/20/02	11.50	-	15,1		OPERTIES	ays
PF) OR AIN/FT)	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	INCH	BPF)	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL CORE REC (%)	CORE RQD (%)	T DATA	SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE)	YMBOL	АРНҮ		HARDI	1	WEATHERING	NUMBER FRACTUR PER FOR
CASING (BPF) OR CORING (MIN/FT)	SAMPLE /	SAMPLE D	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: ROCK (FT/	OTAL CO	ROCK COF	FIELD TEST DATA	CLASSIFICATIONS	STRATA SYMBOL	STRATIGRAPHY	NOTES	see bel valu	ies	see below for values	see below for values
100	S8	30-30.3	100\4	100/4	4/4			0	Very dense, gray, slightly micaceous fine to	$\sim$	03	4				
-	58	30-30,3	10014	100/4	4/4	-		0	medium SAND, little Silt, trace Clay pockets, trace Rock Fragments (SM / 8-65)	$\sim$	ROCK		a la	elet 1	and the second sec	205
3 3.5 4									C1: Hard to very hard, slightly weathered to fresh, fine to coarse grained, gray to dark gray, quartzose-mica-garnet SCHIST, with very thin, convoluted, sub-horizontal to vertical foliation, smooth to rough, very close to widely spaced,		NOCK					
5	-								slightly clay coated, iron-oxide stained to moderately weathered foliation joints/fractures;	$\equiv \equiv$				dia a	0.00000	
5.5	- C1	31-41			10/10	100	94		high quartz, mica, gamet content, occasional,							
4		51-41			10/10		54		very hard, 0.1' to 0.3' thick quartzo-feldspathic zones, with green-yellow to pale green	$\equiv \equiv$				12	1. S.	
4									chlorile/plagioclase	= =			32	21	S.C.W.D.S.	
	1								31.3' to 32': Fracture zone, rough to smooth, clay coated, very closely spaced, sub-horizontal	$\equiv \equiv$			+	1.5	17	
3	4					clay coated, very closely spaced, sub-horizontal to sub-vertical foliation joints/fractures.								2.4	125 656	6
3	-									$\equiv \equiv$				5.1°	the cash	
3													L, 47		1-1-2-2-2-2	
									Similar to Schist in C1, except, 0.1' to 0.5' thick	= =			1.0	2.1	1 land	
						quartzo-feldspathic zones, high quartz, mica, garnet content.				= =			11	201	AS LONG TO A	1.1
3	4									= $=$			15116	2	The states	Sec. 1
4									43 5': Sub-vertical joint/fracture 43 5'-44 4': Vertical healed joint, pitted, filled						S. Same	Sec. 1
4									with medium yellow mineralization	ΞΞ			10.00	11.11	2. 5. 91. 3	100
4										= =			12.14			
	C2	41-51			10/10	100	100			ΞΞ			1112	(114)		8
4.5								11					1-35	291-		22 - · · ·
5										$\equiv \equiv$			1 12	881	China a	
5.5															110-120	
4.5										ΞΞ			Carles .	12	Line and	1
										= =			in the		The second second	
4.5	-			-				$\vdash$		$\equiv \equiv$			42.3	1	in section	10-
4.5									Similar to Schist in C2	$\equiv$ $\equiv$			5-6	1A .	200	· · · · · · · · · · · · · · · · · · ·
5										$\equiv$ $\equiv$			Real F			8
5	СЗ	51-56			5/5	100	100		55.5": Minor pitting along sub-vertical, healed joint with yellow mineralization.	$\equiv$ $\equiv$			Calls			S
5									- 25	$\equiv =$			124	301	ELSE S	
	1									ΞΞ			1.20		NUES-YE	8111
5					-		-	-		ΞΞ						
3										$\equiv$ $\equiv$					AND THE	
3										= =			1.24			
3	1									ΞΞ			1,-1,3	100	11232112	
	1									<u> </u>			1.	915-	. finds	Sex 1
3	1									= $=$			Station of the			
	LAR SC			SIVE SO	DILS TENCY			NES	CORE CHARACTERISTICS		OINT/FRAC					ATTITUDE
4 ∖	/ery Loc	se .	2 V	/ery Sof		1	Ve	ery So	oft 1 Complete (1) 0	SCE U		ry clo	se/Very		0-5	Horizontal
	.oose Aedium			Soft /led Stiff	f	2 3		edium ed Ha				se/T	'hin ose/Mod	Thick		Sub-Horizoni Mod Dipping
-50 E	Dense /ery Der	8	-15 S	liff /ery Stif		4 5	Ha	ard	4 Slight (4) 11-2		3'-10' Wi	de/T	hick		55-85 \$	Sub-Vertical Vertical
50 V	ory Del			ard	'	5	V	ery Ha	ard 5 Fresh		>10' Ve	ny VV	/ide/Very	ITICK	00-90	venucal
												_				
TES:	1.4-10 C			101	440											
ertica		n occurs beb														
acker	testing	performed in	the be	drock ir	10' increi	ments	betw	een a	pproximately 36' and 136' after coring was complet	ted						

						BORING LOG					s	heet: 3 of 5
DMJM#H	ARRIS • ARI A Joint Ven	()])) ()]))			SE	COND AVENUE SUBWAY PROJECT	G. SURF DATUM:	NO. CM 11 EL 158.08 NYCT			RING NO DFFSET COORDINATES NORTH: 21760 AST: 994657	: 6.1916
AMPLER: 2" O.D. Split AMPLER HAMMER: 140 ASING SIZE: 3" and 5" ASING HAMMER: 140 II OCK CORE: NQ	Ib. Automatic			FOF ENC DA1	REMA GINEE TE ST	CO: Jersey Boring and Drilling Co., Inc. N: A. Feliciano R: N. Sokol ART: 6/17/02 DATE END: 6/28/02 ED BY: M. A. Ponti, JPATE: 9/3/02	FINAL BC DATE 9/6/02 9/13/02 9/20/02			D WATER R EPTH 4.8' 0 5.3' 0		ays
DEPTH (FT) CASING (BPF) OR CORING (MIN/FT) SAMPLE / CORE NO. SAMPLE DEPTH (FT)	BLOWS / 6 INCH N VALUE (BPF)	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL CORE REC (%)	ROCK CORE RAD (%)	LD TEST DATA	SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE) CLASSIFICATIONS	STRATA SYMBOL	STRATIGRAPHY		INSITU PF HARDNESS see below for values	ROPERTIES WEATHERING see below for values	
3 C4 56-6 3 2.5 2.5 2.5		ũ Ô 10/10		100	FIELD	Similar to Schist in C1		STR	ON _	12345	1 2 3 4 5	1234
2.5 2.5 3 3 3 C5 66-7	1	5/5	100	100		Very hard, fresh, fine to coarse grained, light to dark gray quartz-mica-garnet SCHIST, thin to very thin, convoluted, sub-horizontal to sub- vertical foliation, smooth to rough, moderately close to widely spaced, sub-horizontal to moderately dipping, yellow slightly weathered mineralized joints/fractures; high quartz, mica, garnet content.						
4 4 4.5 5 5 5 5 NA NA	1	10/10	100	100		Similar to Schist in C5. 79.6'-80.2'' Cross-foliation joint/fracture, rough, irregular, widely to moderately closely spaced, sub-vertical, slightly weathered with grayish- green mineralization. 71.3'-71.9'' Sub-vertical healed joint with 0.01' thick, white mineralization, several 0.2' to 0.1' thick gray, fine grained zones.						
4.5 4.5 4.5 4.5 3 3 3 3 3		10/10	100	91		<ul> <li>Similar to Schist in C5</li> <li>81.3': Moderately dipping, gray-yellow clay coated foliation joint/fracture.</li> <li>83.1'-84.0': Cross-foliation joint/fracture, sub-vertical, with red-brown and gray-green mineralization (0.01' thick).</li> <li>85.2'-85.4' and 86.9': Cross-foliation joints/fractures, sub-vertical, gray-yellow to yellow-green clay coated/mineralized.</li> </ul>						
GRANULAR SOILS BPF DENSITY 0-4 Very Loose 4-10 Loose 10-30 Medium Dense 30-50 Dense >50 Very Dense	COHESIVE S BPF CONSI: <2 Very Sc 2-4 Soft 4-8 Med Sti 8-15 Stiff 15-30 Very St >30 Hard	STENCY ofl	F 1 2 3 4 5	HARD Ve Me Me Ha	DCK C INESS ery So edium ed Ha ard ard ery Ha	ft 1 Complete (1) 0 2 Severe (2) 1-2 rd 3 Moderate (3) 3-1 4 Slight (4) 11-2	R FT	SPACINO <2" Ver 2"-1' Clo 1'-3' Mo 3'-10' Wid	G/THI y clos se/Th d Clos de/Thi	se/Very Thin in se/Mod Thick	ANGLE 0-5 5-35 35-55	ATTITUDE Horizontal Sub-Horizontal Mod Dipping Sub-Vertical Vertical

r	WID.	/0011A	DDIC	A 13 1	10		1							B	ORIN	IG NO.	B64	-2
L	7MJV		KKIS A Jo	•AKU at Vent	UP UP			e F	COND AVENUE SUBWAY			TATION:			OFFS	ET	204	_
-				la.c.				35	PROJECT			NO. CM 1	188			RDINATES	1016	_
											ATUM N					994657		
			2		٣					Fit	NAL BOI	RING DEPT						
		) Split Sp				_			CO: Jersey Boring and Drilling Co., Inc.	_	DATE	GR TIME		DEPTH	READ			
SING SIZ		R: 140 lb	. Autor	natic		_			N: A. Feliciano		6/02	13:00		14.8	ow	70 Da		_
SING HA	MMER	140 lb.		_	_				ART: 6/17/02 DATE END: 6/28/02	9/	13/02	12:15		15.3'	OW	77 Da		
CK COR	ENQ		1				· · · · ·	VIEW	D BY: M. A. Ponti, JDATE: 9/3/02	9/1	20/02	11:30		15.1'	OW	84 Da	ays	
	g	Ē			(NI/)	(%)	(%)							INSITU	PROPE	RTIES	NUME	
RE BE	SAMPLE / CORE NO	SAMPLE DEPTH (FT)	L E	6	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA			ы В	≿		HARDNES	s WE	ATHERING	FRAC PER	
CASING (BPF) OR CORING (MIN/FT)	Ö	EP,	BLOWS / 6 INCH	N VALUE (BPF)	SO FI	RE			SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE)		STRATA SYMBOL	STRATIGRAPHY						
CASING (BF CORING (M	Ē	Ë I	S/6	3	Щ.	۱ ^۲	8	Ľ۳	CLASSIFICATIONS		IAS	191	l o	see below f values	or see	e below for values	see be for va	
ASIN	MP	MP	Š	AL	NUN	DTAI	Ŋ				. KA	IRA.	NOTES	1 2 2 4		2 2 4 5	1.2	2 1
20	St	Ś	ā	ż	22	P	Ř	Ē			LS I	5	ž	1234		2345	12	34
			_			_				ΞΞ			1100.217		2.2.0			
2.5									Hard to very hard, fresh, fine to coarse graine gray to dark gray guartzose-mica-garnet	ed,				1.12	100			
loozed.	1								SCHIST, with thin to very thin, convoluted, su	ıb-	= =			1 3% e ()	1.03		1	
2.5									horizontal to sub-vertical foliation, smooth to moderately smooth, moderately close to very					0.0.1351	10		13	
2.5				1 1					closely spaced, moderately dipping, slightly cl	lay	ΞΞ			1971-15	125		II	
2.5				1 1					coated to slightly iron-oxide stained foliation					신성 문환			1.5	
	1								joints/fractures occasionally, talcified slickensides with chlorite/epidote mineralized		ΞΞ			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		8101 BR		
2.5	C8	91-101		1 1	10/10	100	97		surface; high garnet, mica, quartz content.					NT TOP	100		Cer.	
2.5											ΞΞ				18	CHARLE I		
2.5																		
2.5	1										= $=$							
2.5											= $=$				- 335		5.00	11
2.5											$\equiv \equiv$		Ľ	TVPS	1.11	SUN ST	100	
2.5														i stradi	100		31	
NA									Similar to Schist in C8 except, close to		= =				1.1		10.01	
									moderately close joints/fractures, several 0.1 0.8' thick, very hard, fine grained, quartzo-	10	= $=$		L.				100	11
3									feldspathic zones, foliaiton joints/fractures at		= =			8 m - 2 A	12		10	
3				1 1					101.5' and 101.7', wilh smooth, gray- yellow green to moderate yellow-green slickensided.		= =				. 12		B	
3											$\equiv \equiv$			1.46.5				
	f										= =			al-tool	100		10.0	
3	C9	101-111			10/10	100	100	11			= =		10	1-2-24	1		Albert -	
2.5											ΞΞ			16. XV			200	
2.5											$\equiv \equiv$			12,114-1				L
3											= =						10.1	
																	12 -	
3											ΞΞ				- 211			
3														CHOICE N				
2.5									Hard to very hard, fresh to slightly weathered fine to coarse grained, light to dark gray, dark		ΞΞ			W. LITS		2011	10	
									fine to coarse grained, light to dark gray, dark green-gray quartzose-mica-gamet SCHIST, v					-R. (1 1 1 1			15	
2.5									thin to very thin, convoluted, horizontal to		$\Xi \Xi$				1.52	15 Days		
2.5									vertical foliation, smooth to rough, shallow to vertical, very close to widely spaced, gray-				5		1P			
3									green to dusky green clay coated, occasional		ΞΞ				1			
									white mineralized foliation joints/fractures.		==			1.20	120		10	
3	C10	111-121			10/10	100	100		117.2' - 120.4' Pitting with green					No. 200	100	1.22	28	
3									alteration/chloritization.		<u>= =</u>			1.6	-	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		11
3									116.3' - 116.7': PEGMATITE, very hard, very		ΞΞ			154-18	1			
3									coarse grained quartzo-feldspathic zone.					12 200	01		12,3	
											ΞΞ			1.013	1		100	
3															1	1100	1	1 L
RANUL				SIVE S					ORE CHARACTERISTICS	-		and a second sec	-	E CHARACI	ERISTI			DE
	ENSIT ery Loc			CONSIS Very So	STENCY ft	1		ONES: ery So		PER F	· C ]			ICKNESS		ANGLE 0-5	ATTITU Horizon	
-10 Lo	oose		2-4	Soft	~ I	2	M	lediun	2 Severe (2) 1	1-2		2"-1' Clo	sеГ	hin		5-35	Sub-Hori	izonla
	ledium ense	Dense		Med Sti Stiff	п	3 4		led Ha ard		3-10 11-20				ose/Mod Thi hick	*		Mod Dip Sub-Ver	
	ery De	nse	15-30	Very Sti	ff	5		ery Ha						/ide/Very Thi	ck		Vertical	
			>30	Hard														
DTES:																		
Vertical		n occurs b				nont	hat		pprovimately 26' and 120' offer action was	minted								
гаскег:	lesting								pproximately 36' and 136' after coring was com	pieted								
	of bore	ehole at 14	); obsei	vation v	vell installe	f to a	depti	n of a	proximately 28									

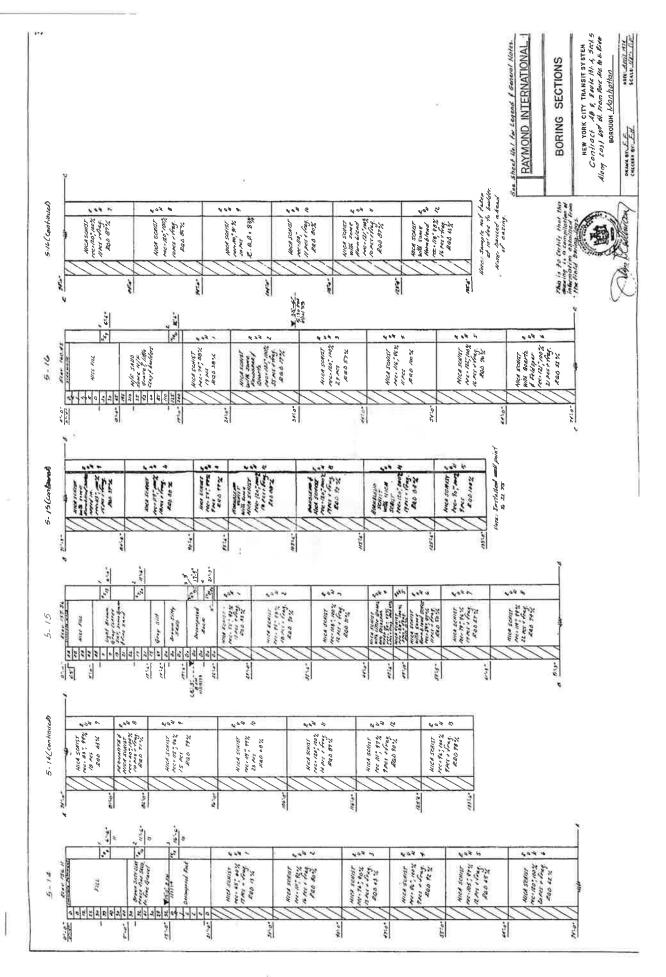
									BORING LOG							eel: 5 of 5	
I	DMJM	<b>111 HA</b> RI		ARU nt Ventu	ן) ייז			SE	COND AVENUE SUBWAY PROJECT	PROJEC G SURF DATUM				OFFSET: COORDINA NORTH: 21 EAST: 9946	TES: 7606	1916	
AMPLER ASING SI ASING HA	HAMME ZE 3" a AMMER			atic			FOF ENC	REMA GINEI FE ST	CO: Jersey Boring and Drilling Co., Inc. N: A. Feliciano FR: N. Sokol ART: 6/17/02 DATE END: 6/28/02	DATE 9/6/02 9/13/02	TIME 13:00 12:15		ND WATER DEPTH 14.8' 15.3'	ow 7 ow 7	STAE 0 Da 7 Da	iys	
	RE: NQ		<u> </u>		~			/IEW	ED BY: M. A. Ponti, JPATE: 9/3/02	9/20/02	11:30			OW 8	4 Da	iys	
T) BPF) OR MIN/FT)	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	6 INCH	(BPF)	PEWREC: SOIL (INUN) ROCK (FT/FT) TOTAL CORE REC (%) ROCK CORE ROD	RAPHY		HARDNESS see below fo	WEATHER	RING	NUMBER FRACTUR PER FOO	RES DT					
DEPTH (FT) CASING (BPF) OR CORING (MIN/FT)	SAMPLE	SAMPLE	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC ROCK (F1	TOTAL C(	ROCK CC	FIELD TE	CLASSIFICATIONS	STRATA:	STRATIGRAPHY	NOTES	values	values	5	for values	NU IMOCI
3 3 3.5 5 4 4 4 5 0 5 4	C11	121-131			10/10	100	100		Very hard, fresh, fine to coarse grained, light to dark gray quartzose-mica-gamet SCHIST, with very thin to thin, convoluted, sub-horizontal to sub-vertical foliation, smooth to moderately rough, very close to widely spaced, moderately dipping to sub-vertical, slightly weathered foliation joints/fractures; high quartz, mica, garnet content.								
	C12	131-140			9/9	100	100		Boltom of borehole at 140 feel			67					
5																	
BPF L 0-4 \ 4-10 L 10-30 M 30-50 L	JLAR SC DENSIT Very Loc Loose Medium Dense Very De	Y E ose 2 Dense 4 nse 1	PF ( <2 ) 2-4 ; 1-8   -15 ; 5-30 )	SIVE SC CONSIS Very Soft Soft Med Stiff Stiff Very Stiff Hard	TENCY ft	1 1 2 3 4 5		DCK DNES Very S Vediur Ved H Very H	oft 1 Complete (1) 0 n 2 Severe (2) 1-2 ard 3 Moderate (3) 3- 4 Slight (4) 11-	ER FT 2 10	SPACIN <2" Ve 2"-1' CH 1'-3' M 3'-10' W	IG/TI ery cl ose/ od C ide/	RE CHARACT HICKNESS ose/Very Thin Thin lose/Mod Thic Fhick Vide/Very Thic	ANC 0 5- * 35- 55-	-5 35 5 -55 -85 5	ATTITUDE Horizontal Sub-Horizon Mod Dipping Sub-Vertical Vertical	g



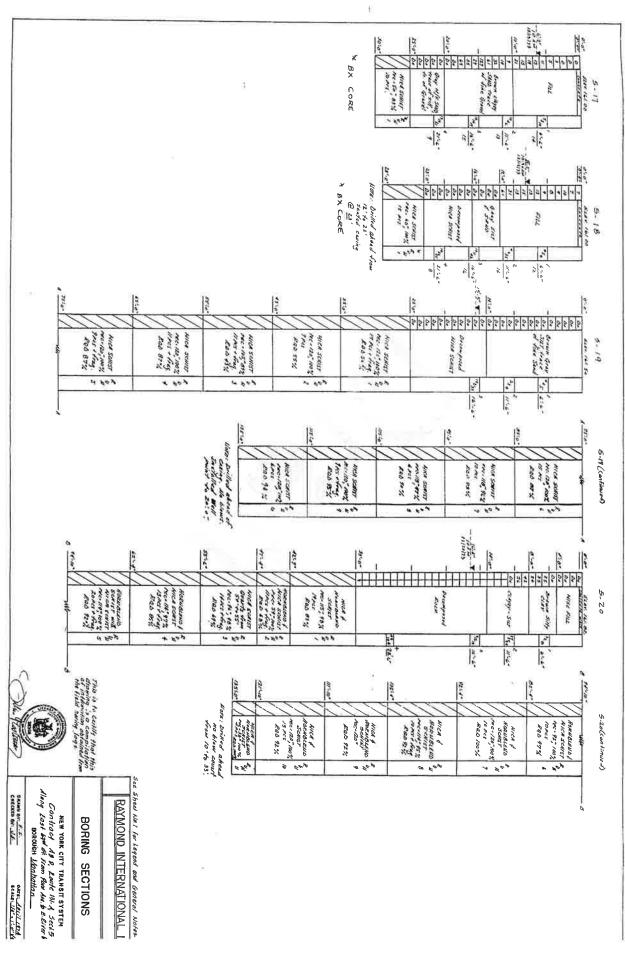


10 3-

~

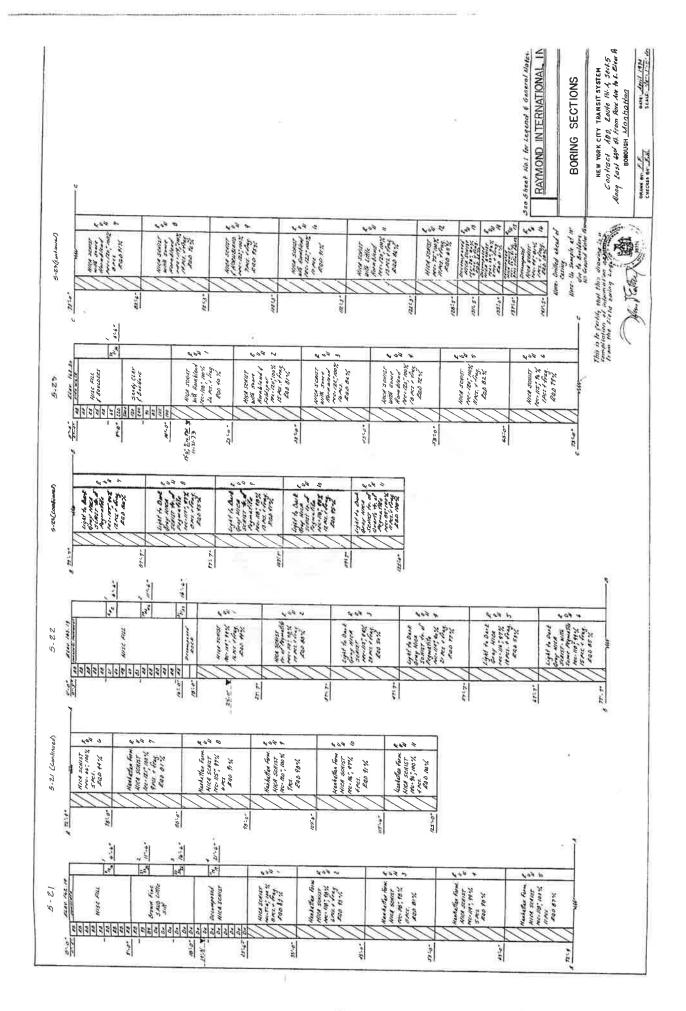


ě.



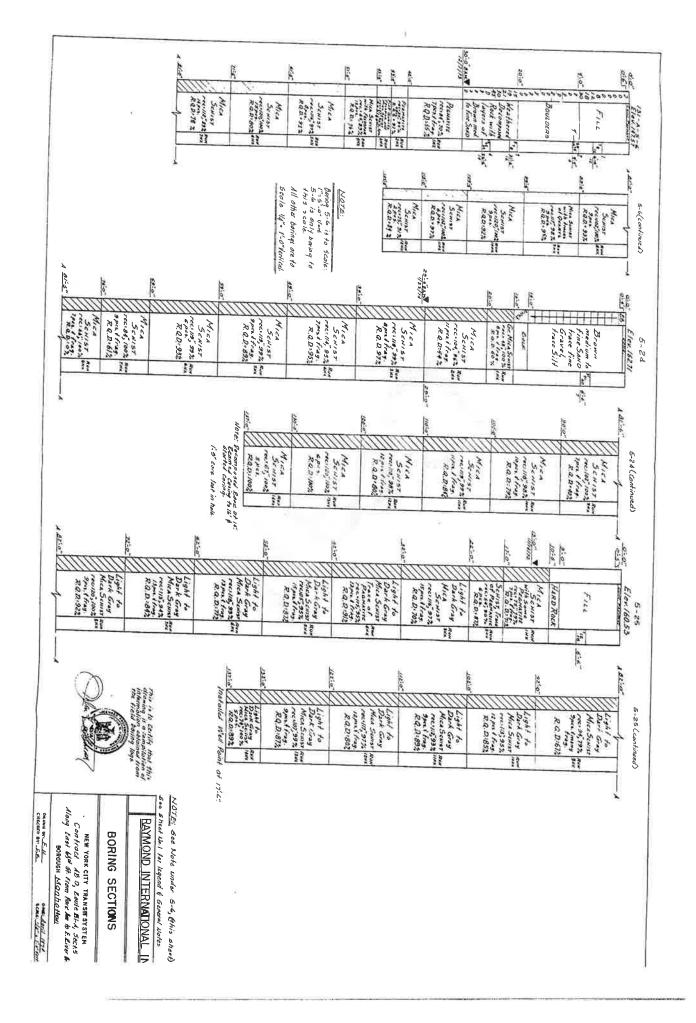
•

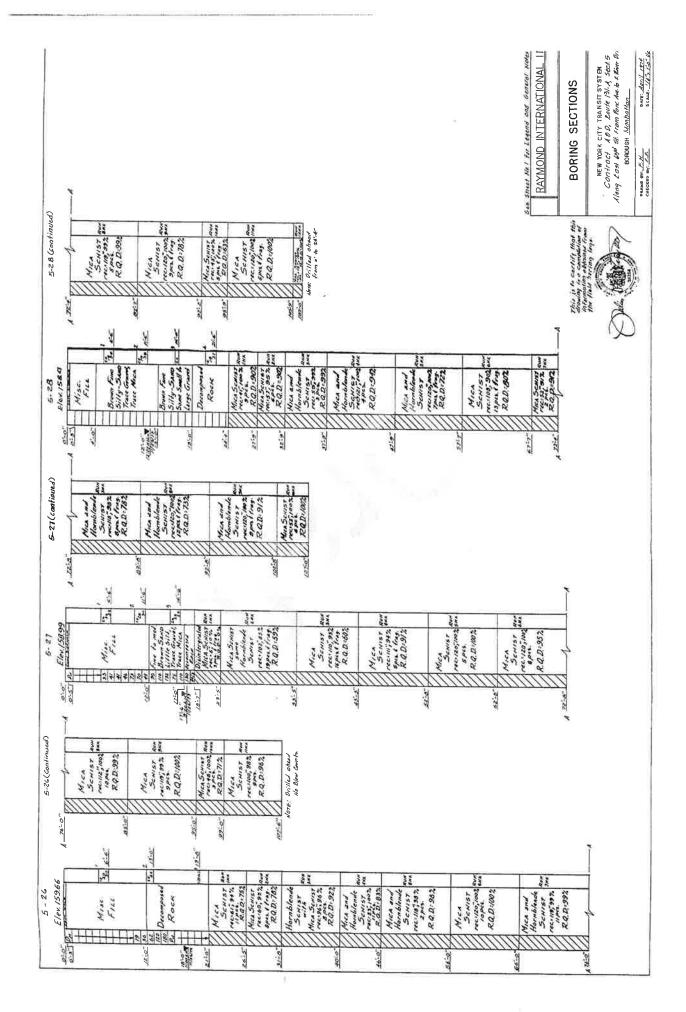
į

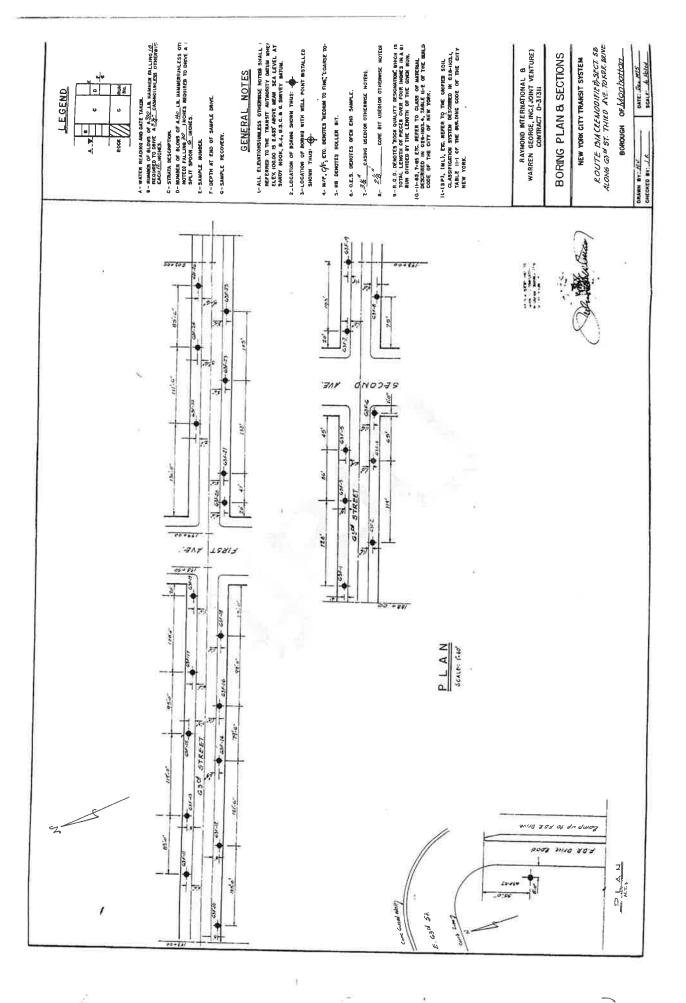


i.



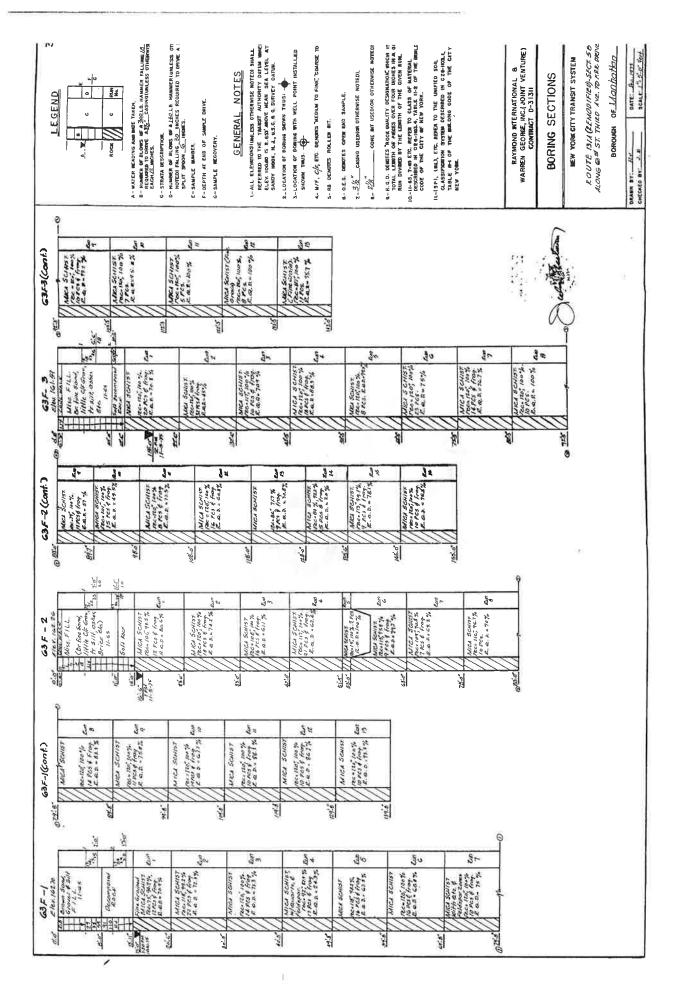


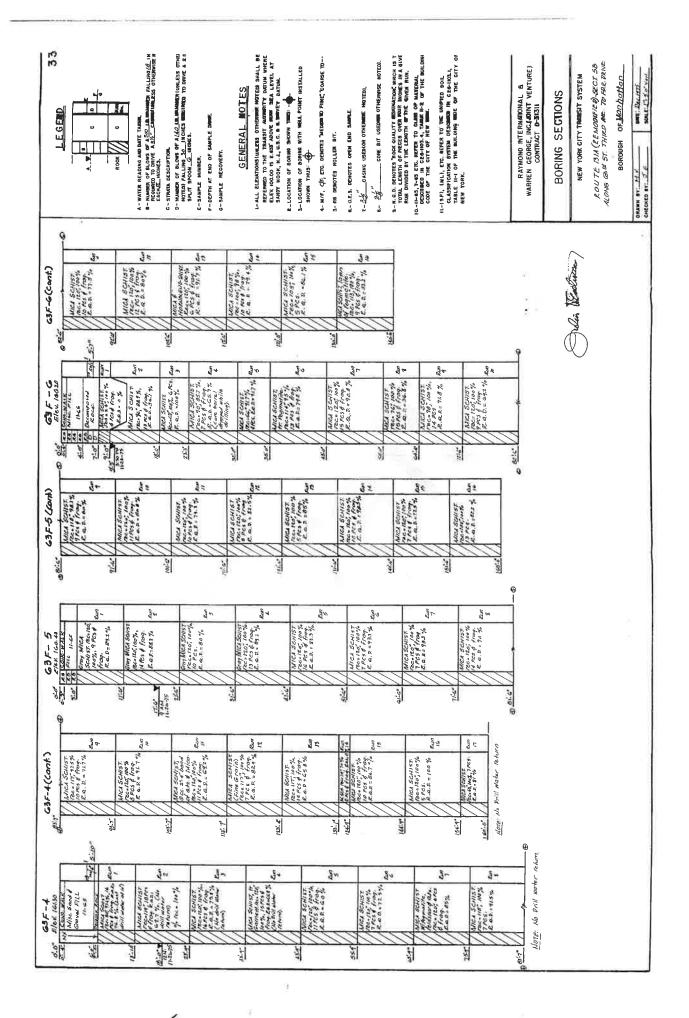




ê.

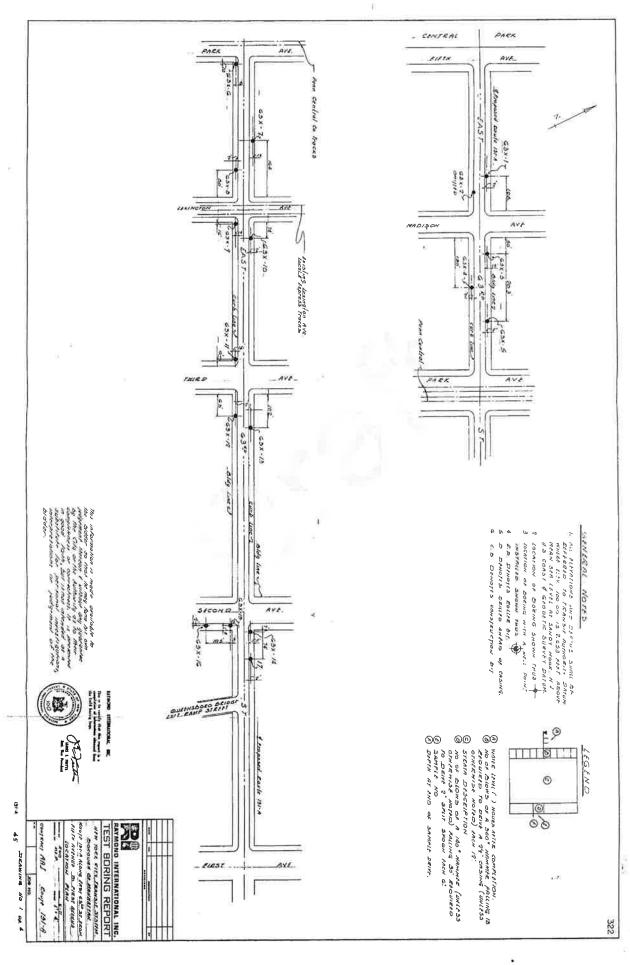
\$

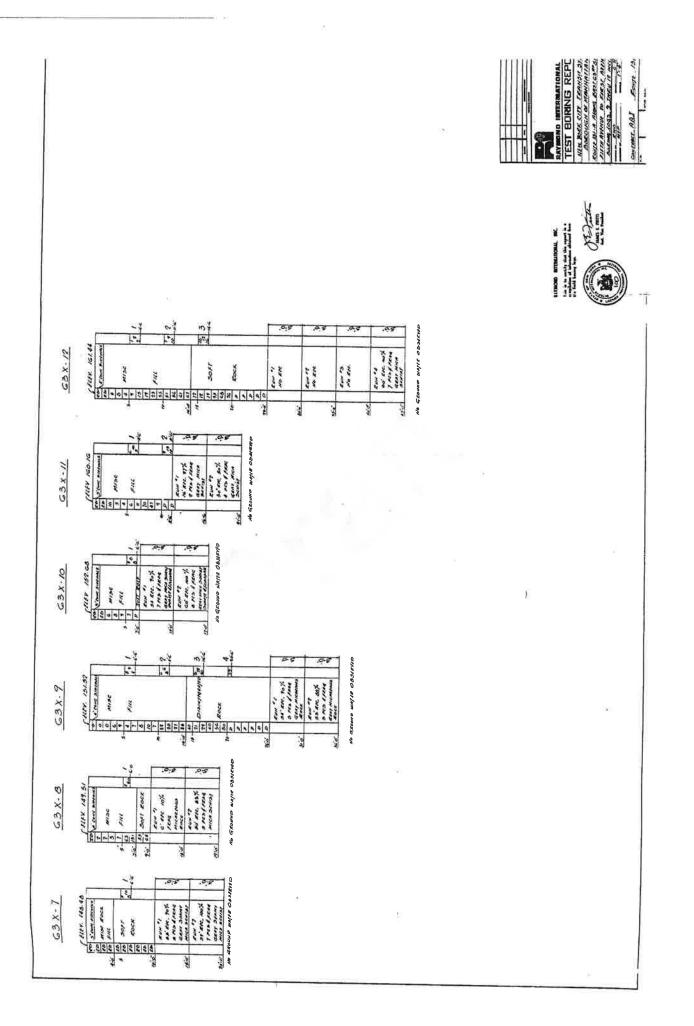


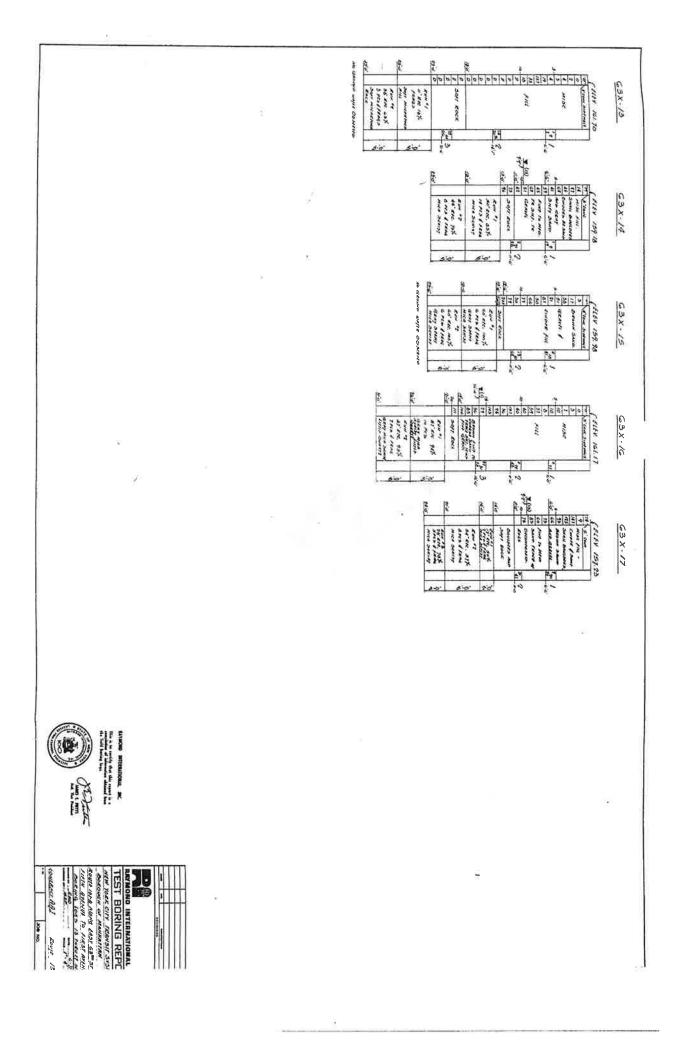


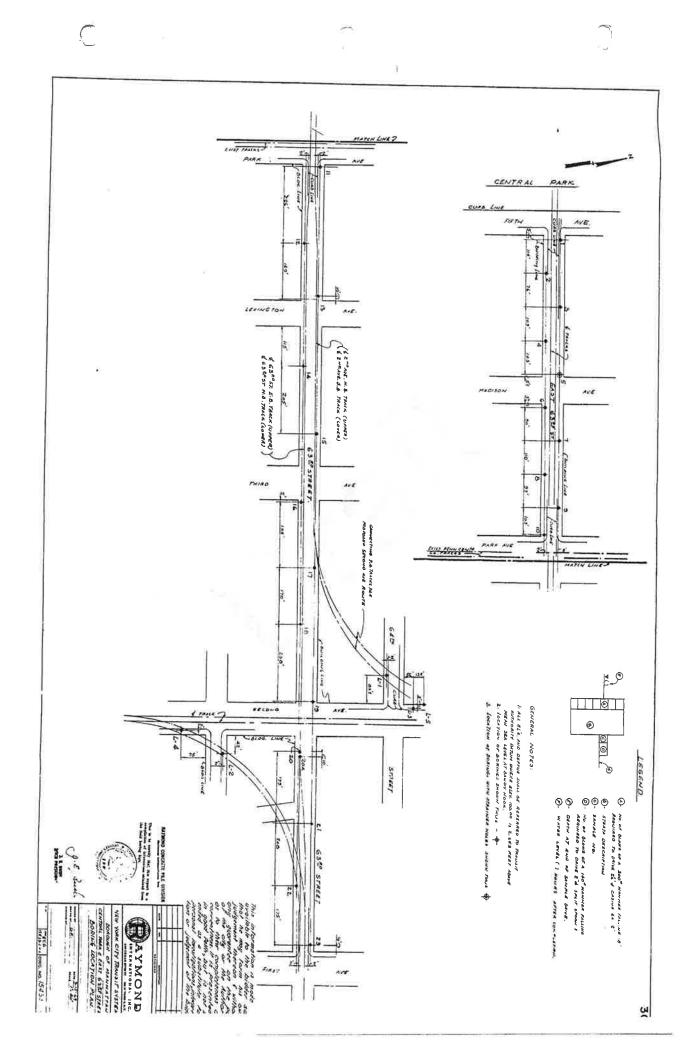
ž.

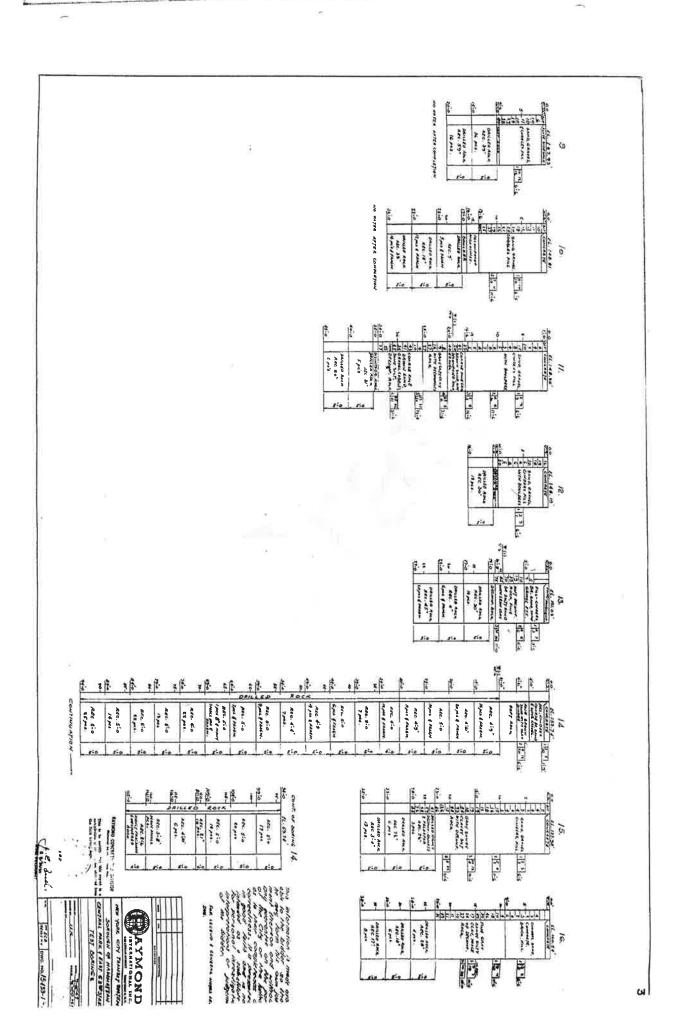
 $\widehat{\phantom{a}}$ 

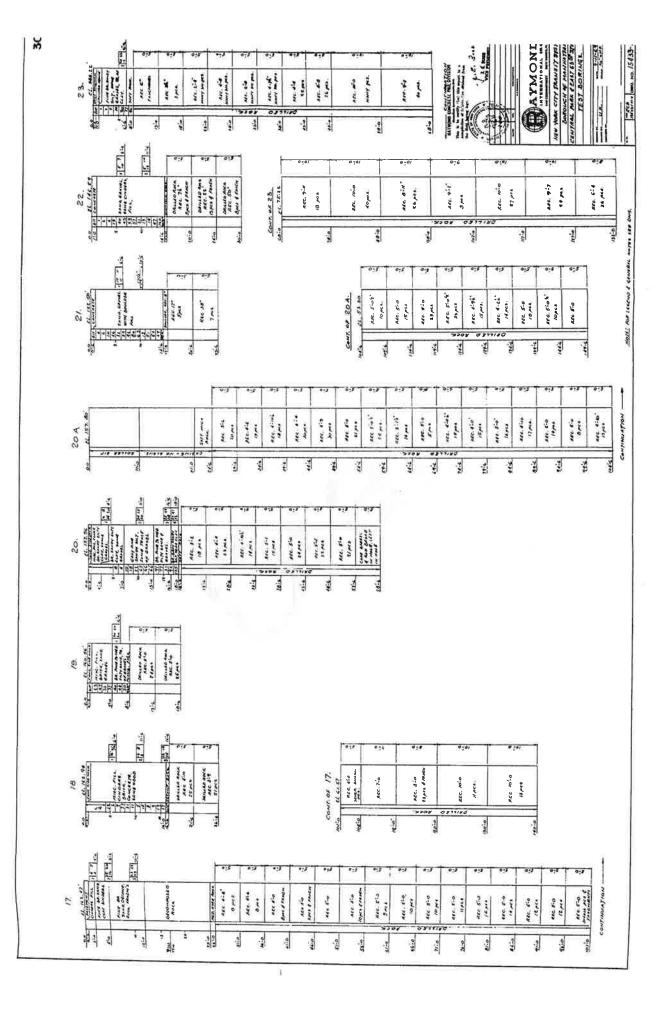












 $\widehat{}$ 

