

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

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A. Project Site Sensitivity
A. Project Site Sensitivity

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

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).

Table 1
Street Elevation Changes Over Time

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

Notes: The 1850 Hayward map was partially illegible and some elevation data was partially obscured; this table 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,

Table 2 (continued)
Summary of Soil Borings for East 63rd Street Between Second and Third Avenues

Davison		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:

*These are general summaries only, for detailed descriptions of soil types (including color, texture, inclusions, etc.) see soil borings logs in Appendix A. Bedrock or decomposing bedrock identified in soil borings is

referred to in this table as "rock."

Sources: See Appendix A for original boring records provided by MTA 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. 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).

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

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.

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.

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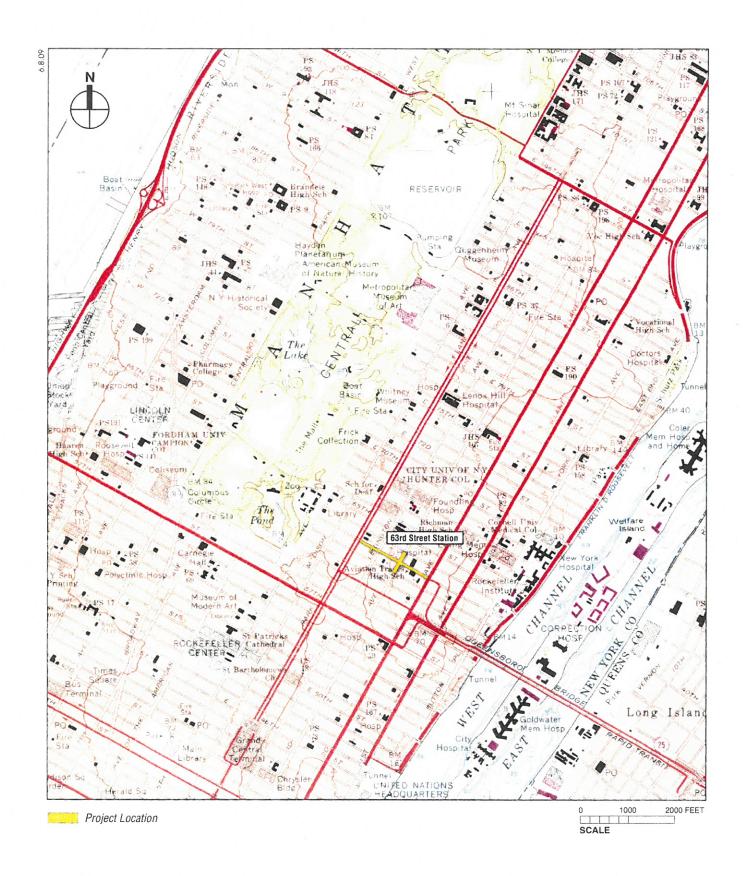
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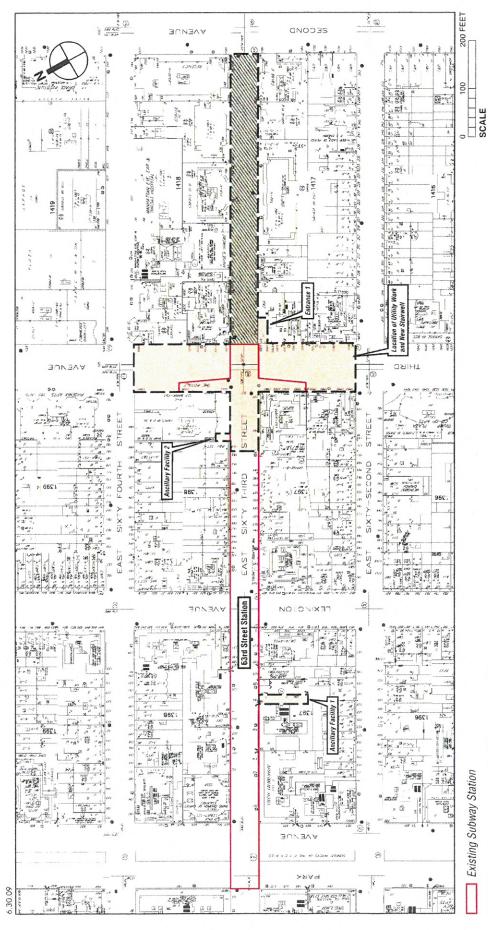
USGS Digital Raster Graphic (DRG) Quadrangle: Central Park.

Viele, Egbert Ludovicus

1865

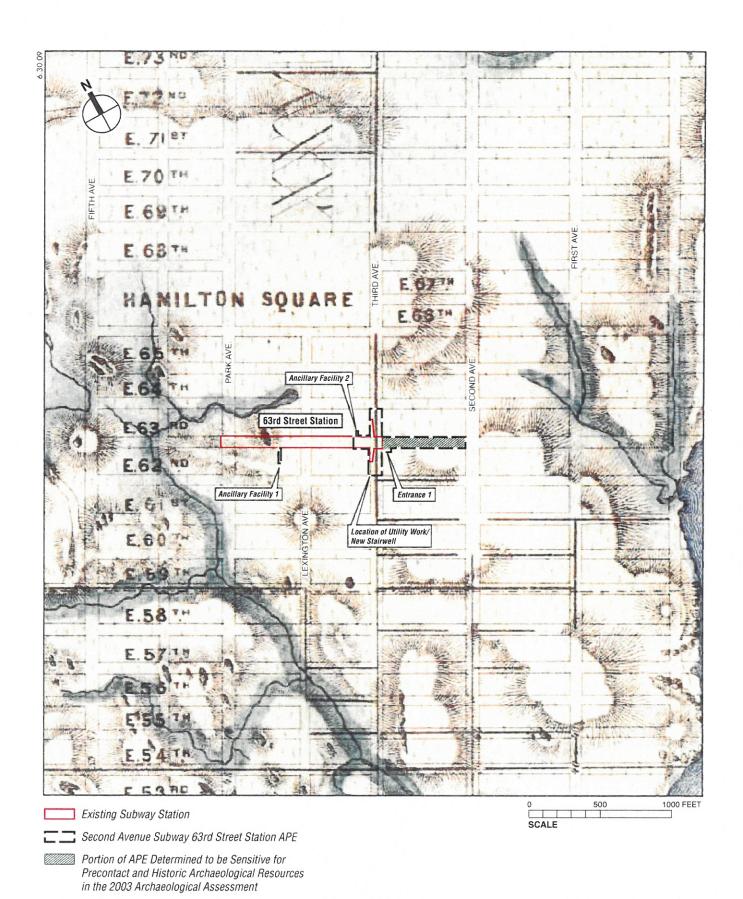
Sanitary & Topographical Map of the City and Island of New York. New York: Ferd. Mayer &

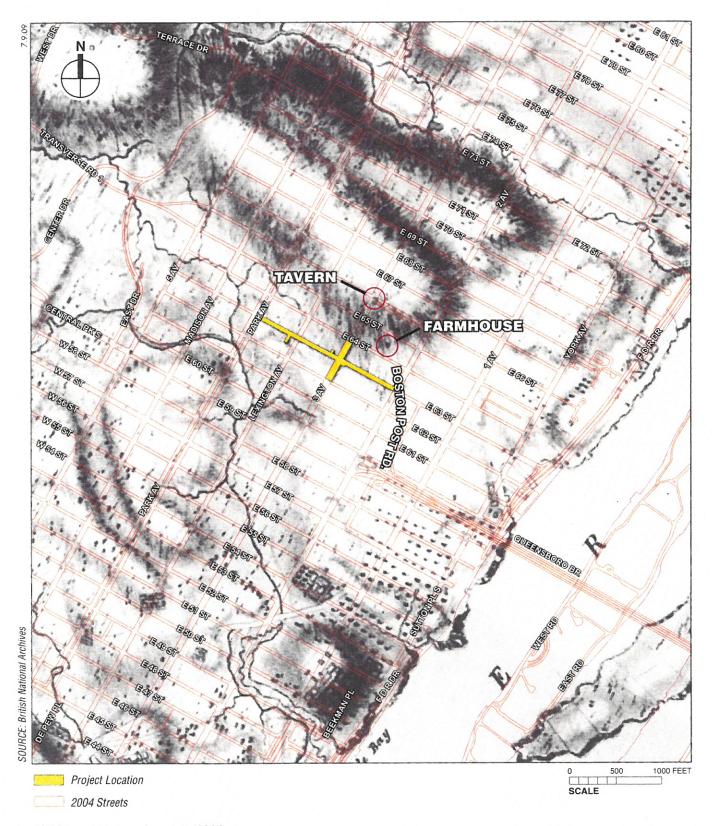




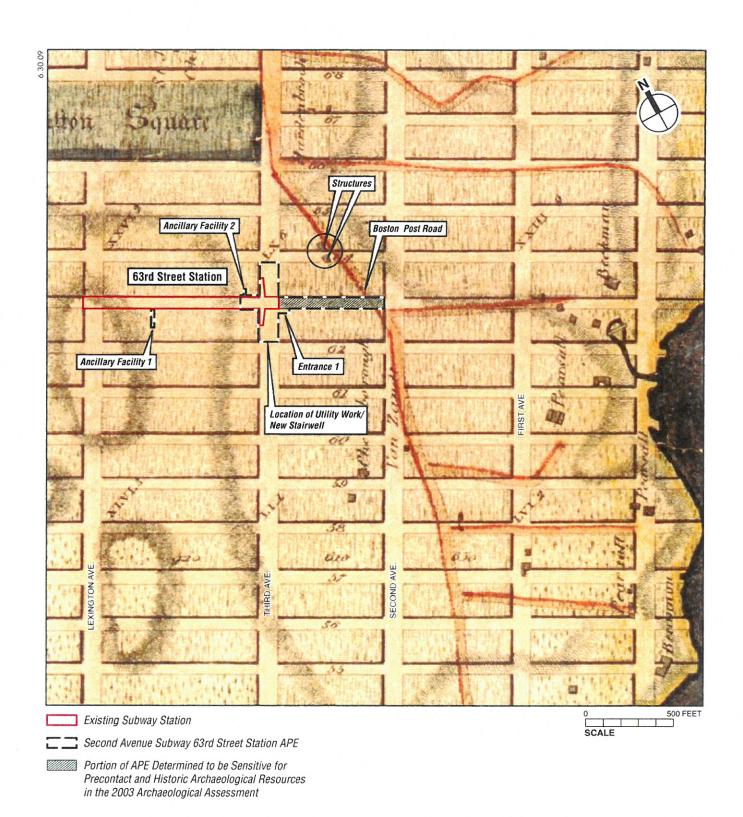
Second Avenue Subway 63rd Street Station APE

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





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.



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

1000 FEET

SCALE

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

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

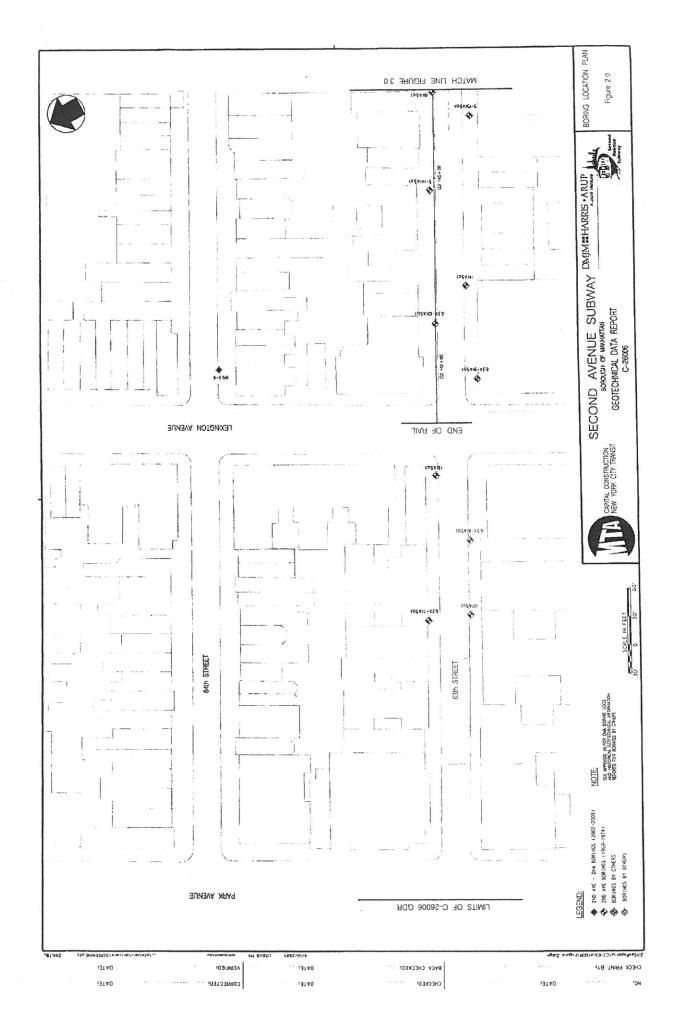
SCALE

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

Second Avenue Subway 63rd Street Station APE

SECOND AVENUE SUBWAY • 63rd Street Station

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



										BORING LOG							S	heet: 1 of 5	
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-					1	ĺ										1		1	
_															7			1	П
15 —				3						Loose, brown, slightly micaceous, fine to coan		~	DEC ROCK	1					
-		S4	15-17	5	8	24/8				SAND, some Silt, trace Rock Fragments, trace Clay seams (SM / 7-65)	,	~				1			П
-				16	+	-		-	\vdash			~							
_			l								1	~							
	1	-									1	}{}{}				1			
						İ					1^	~		5					
20 —				1			\vdash			Hard to very hard, slightly weathered, coarse	=	==	ROCK	ľ	11.6	13.00		5.05	4
-	3.0	}								grained, dark gray, quartz-mica-gamet SCHIS with very thin, sub-horizontal foliation, rough to	T. -	= =							0
-	3.0	C1	20.0-23.	7		3 7/3 7	100	90		smooth, very closely to closely spaced,	´ =	= =							-
	3.0				1					horizontal to sub-horizontal, slightly iron-oxide stained foliation joints/fractures; high mica	-					1			0
- 7	3.0			_	1		\perp			content	=	= =			3.10				0
-											=	= =			100				1
25 —	3.0				1					Similar to Schist in C1, except closely to moderately spaced, horizontal to sub-horizont	al. -	= =							1
-	3.0	C2	23 7-28.	5	1	4.8/4.8	100	85		slightly weathered, slightly talcaceous,	-	= =				1.5		100	\vdash
-	3.5		1	1				1		chloritized foliation joints/fractures. 25.2'-25.4': Coarse grained feldspar vein	-	= =							0
	3.5				1							= =				100		N. Walis	1
-	3,0			-	-		-			24.6'-25 2': Sub-vertical, healed fracture 25.5': Cross-foliation joint/fracture, rough,	=	==							2
-			1		1					undulating, moderately dipping, slightly	-					14			1
30 -	4.0				1					weathered		= =			PO DESE	1		in U.	Ŀ
		LAR SC			ESIVE S					CORE CHARACTERISTICS					E CHARACTE				
		ENSIT		BPF <2	CONSI Very Se	STENCY	1		ONES		PER FT	T			ICKNESS			ATTITUDE Horizontal	
	10 L	oose		2-4	Soft	OIL	2		lediur					y cit se/T	se/Very Thin hin	5	-35 \$	Sub-Horizonlal	
		dedium Dense	Dense	4-8	Med St	iff	3	M	led H	lard 3 Moderate (3) 3	3-10		1'-3' Mo		ose/Mod Thick		-55 -85 S	Mod Dipping Sub-Vertical	
			nse	15-30	Very St	tiff					1-20						-90	Vertical	
30-50 Dense																			
NO	TES:																		
1) (Ground	water	evel not r	ecorded															
2) S	ratific	ation lir est Data	nes repres a - Total o	sent app rganic v	roximate apors le	e boundarie vels are ref	s betv erenc	veen ed to	soil a a ber	and rock types, transition may be gradual. nzene standard measured in the head space of :	sealed s	oil san	nple jars usir	ng ar	organic vapor	meter ed	uipped	with a	
										rts per million by volume (ppmv)			,						
			e to cobt		uction in	tip of spoo	n.												

										E	BORING LOG							13000		eet 3 of 5	
	г	MAIN.	/#HA	DIC	• 101	11)		T									во	RING	NO.	B63-2	
	L	zvijiv	Alest L A		ant Ves	tura tura					AVENUE GUDIANAV		BORING S				(OFFSET.			
					1.				SI		AVENUE SUBWAY			NO CM11	88			COORDII			
				-	*					P	ROJECT			EL 159.28				NORTH:			-
				4.								· L	DATUM:	RING DEPT	u /E	T) 122		EAST: 99	94590.9	9/4	\dashv
CAN	DI EQ.	0" () [) C-E4 C-		3000			PO	DIAIC	CO: Incor	y Boring and Drilling Co.,		FINAL BO					READIN	GS		-
). Split Sp R: 140 lb		natic					N: Peter		IIIC.	DATE	TIME		EPTH				. TIME	\neg
	ING SIZ		170 10	Agion	idile						saud / S. Mendes			1							
			SPUN							ART: 08/1		20/04									
ROC	K COR	E: NQ					,	RE	VIEW	ED BY C.	Snee DATE 9/9/04				_						\dashv
		٠.	₽				(%)	%								INS	SITU PI	ROPERT	IES	NUMBER	OF
	RE.	S.	(F)	_		2	E C	RQD (%)	4 ₹					_						FRACTUR	RES
	E >	1 2 2	1	\$	E	등급	E E	R	DATA		SAMPLE DESCRIPTION		SYMBOL	Ŧ		HARD	NESS	WEATH	ERING	PER FOO	тс
F	M M	ĕ	DE	9	(a)	SE	OR.	J. S.	TEST	BURN	AISTER (USCS / NYC BLDG	CODE)	S	A.		see be	low for	see be	low for	see below	T~
I	99	щ	끡	100	当	Ö.F	Ö	ö	1		CLASSIFICATIONS		₹.	Đ.	S	val		vali		for values	18
DEPTH (FT)	CASING (BPF) OR CORING (MIN/FT)	SAMPLE / CORE	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL CORE REC (%)	ROCK CORE	FIELD.				STRATA	STRATIGRAPHY	NOTES	123	3 4 5	1 2 2	3 4 5	1234	NUMBER
ä	38				z	1	1		ii.				S	Ś	ž	14	3 4 3	11		1447	2
	6.5	C9	5 7.8-62.6	5	T	5 2/5 2	100	77		Similar to	Schist C5, except high mica	content	= =					14			0
													==							Arrest Control	1
	6.5			1		1							E								-
١.	6.5			+-	+	 	+	_	-							47.		Z			2
	6.5			1							Schist in C5, except rough, or ely closely spaced, horizontal		昌			in the	***		3.5	12	0
										horizonta	al, slightly weathered, clay coa	led	==								1
65 -	6.5		000		1					foliation	oints/fractures, frequent very	thin				7		4	8.1	1	\vdash
	7.0	C10	62.6-68.			5.1/5.1	100	88		quartz-fe	dspathic veins					Carlo.		11111	3	a the	2
	6.5				1								==		L	The works			2	49	11
													ΞΞ			100	4.		35	3	0
	6.5				-			_		Ven, bar	d, fresh, fine to coarse grained	d oray to				33	2343	E-26 -01	4.5	6.	
١.	6.5										y, quartz-mica-gamet SCHIST							1			1
	6.5									very thin	horizontal to sub-horizontal	foliation,				1-2-5	e non mi	200	PARK A	4	3
70-	0.5		* 50 - 50 - 50 - 50 - 50 - 50 - 50 - 50		1						faint in places, rough, very clo paced, horizontal to sub-horiz		三三				1100	130	0.00	1004	1
	6.0	C11	68.1-73.0	'		4.9/4.9	100	51		alightly w	eathered, slightly clay coated	foliation				17.15		100		100	\vdash
	7.0				1				1	joints/fra	ctures; high quartz, mica cont	ent	三三				0.051	2300.033	A		2
	7.5			1	1											15.6	400	1	14 to	2.5	3
	1.5	-			+					Similar to	Schist in C11					54					1
	7.5			1		1					7': Fracture zone, rough to sr	nooth.	==							\$ 1 m	\vdash
	75									horizonta	al to vertical, slightly to modera		三三					1.5			9
75 -		C12	73.0-78.2			5.2/5.2	100	56			ed, clay coated, chloritized cross-foliation joints/fractures		==								2
	7.5	CIZ	73.0-76.			5.2/5.2	100	36	-	Totalioni	cross-rollation joints/ractares		==					100			2
١.	7.5]			1							==					133		Y 13	
	7.5																			3.00	4
1		-		+	+	-	-	-		Similar t	Schist in C11		E						E State		1
	7.5									78 9'-80	0': Fracture zone, rough to sr	nooth.								1200	10
80 -	7.5									sub-hori:	zontal to vertical, slightly weat	nered.	$\equiv \equiv$		6	12.00					\vdash
100	7.5	C13	78 2-83			5,1/5,1	100	58		clay coa joints/fra	led, chloritized foliation/cross-	foliation	==			The state of					1
		0,0	702-05			3.175.1	100	30		jonnama	cidios		==			100		14. 4.			1
	75			1												No.		1,658	Sales .	57	
	7.5												===			1		1400			0
	7.5			+					\vdash		Schist in C11, except rough							12.3			1
	T	1									moderately closely to widely st zontal, slightly weathered, slig		==			1		4-4-C			0
85 -	7,5										oliation joints/fractures	,,				1		316			0
	7.5	C14	83.3-88,	3		5.0/5 0	100	100					==			- The		2.05	73.		0
	7.5												==		1			1000	71		1
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	7.5						1						= =			1		9		1	0
	7.5												==					412.5	46.1	¥mu .	H
	7.5												= =		1		38	377		HA	2
90-						<u> </u>				0000	OLOTEO OTICS		1	ONTER	T) 10	E C	DACTE	DISTICO			
	SRANU			BPF	ESIVE :						RACTERISTICS WEATHERING	NO. PE		OINT/FRAC					NGIF	ATTITUDE	
		ENSIT		<2	Very S	oft	1	HARL V	ONES ery S	oft .	1 Complete	(1) 0	21			se/Ven			0-5	Horizontal	
	-10 L	oose		2-4	Soft	- 1	2	. N	lediu	n	2 Severe 3 Moderate	(2) 1-2	,	2"-1' Clo	se/I				5-35 35-55	Sub-Horizon Mod Dipping	nai
		leaium Jense	Dense	4-8 8-15	Med St	tin	3		ted H tard	ard	4 Slight	(3) 3-10 (4) 11-2			ide/T		a Trick		55-85	Sub-Vertical	
		ery De	nse	15-30	Very S	tiff	5		ery H	ard	5 Fresh					ide/Ver	y Thick	'	B5-90	Vertical	
				>30	Hard	1															
7)	Al 98' r Packer	emove testing	performed	inel and	d lowere	ed the 10' co	appro	oxima			depths of 20' and 119 5' after uture date	r coring wa	s complete	ed,							
																		BORII	NG NC	D. B63-2	

										1	BORING LOG							S	heet: 5 of 5	
	Г	NAIN.	ASSLIAT	DIĆ.	ADI	(11)		T								Е	3OF	RING NO	. B63-2	
	L	varliv	A HAII	יכטוו	"/ \\\\ wit Veni	UT.							BORING S	STATION:				FFSET:		
	~		minutes and this and control of	774	I VEAN	-			SE		AVENUE SUBWAY		PROJECT	NO CM11	88		C	OORDINATES		
					hinda					P	ROJECT		G SURF	EL 159.28			N	ORTH: 21760	3,7673	
				P									DATUM:				E	AST: 994590.	9974	
				-11		=							FINAL BO	RING DEPT						
). Split Sp								ey Boring and Drilling Co	o., Inc.					R RE	EADINGS		
			R: 140 lb	Autom	atic					N: Peter			DATE	TIME	D	EPTH		STA	B. TIME	_
	NG SIZ		001111					EN	GINE	ER: D. Pe	rsaud / S. Mendes	2/22/24			-					-
	K COR		SPUN							TART: 08/1 ED BY: C.					-					\dashv
KOC	COR	E. 14G		_			Ta		VIEVV	CUBI. C.	Shee DATE 9/9/04		1		\vdash	INICITI	I PD	OPERTIES	T	\neg
		Ō,	Æ			Z	%)	%							1 1	1145114	1	OI EITHEO	NUMBER	
	&F	m V	E	I		5	12	RQD (%)	DATA				칭	≥	11	HARDNE	90	WEATHERING	FRACTUR PER FOC	ES
	ΕŽ	og	T4:	S	PF	ğF	l iii	E E	0	01101	SAMPLE DESCRIPTION		ΣΨ	d.	11	HARONE	55	WEATHERWA	PERFOC	"
E.	S (B	0	ä	9/	(E)	i ii	5	O.	ESI	BURI	MISTER (USCS / NYC BLD CLASSIFICATIONS	G CODE)	8	58	1 1	see below	for	see below for	see below	Tα
E	88	PLE	PLE	\$	3	X X	ابرا	N X	F				I A	Ĕ	8	values	- 1	values	for values	
БЕРТН (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	FIELD TEST				STRATA SYMBOL	STRATIGRAPHY	NOTES	1 2 3 4	5	1 2 3 4 5	1 2 3 4	NUMBER
0	00	S	(r)	m	z	۵.۵	F	α	ū.				S	S	Z		-			Z
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-	1																- 1			0
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										Bottom	of borehole at 122 3 feet						1			11
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_	RANUL	AR SC	DILS T	COHE	SIVE S	SOILS I		RC	ж.	CORE CH	ARACTERISTICS	T		JOINT/FRAC	TURE	E CHARAC	TER	RISTICS		
	PF D	ENSIT	Y			STENCY	1	HARD	DNES	S	WEATHERING	NO P				ICKNESS	Т	ANGLE	ATTITUDE	
0	4 V	ery Loc		<2	Very So		1	V	ery S	oft	1 Complete	(1) 0		<2" Ve	ry clo	se/Very Th	nin	0-5 5-35	Horizontal Sub-Horizont	a
		ose edium	Dense		Soft Med Sti	liff	2		fediun		2 Severe 3 Moderate	(2) 1-2			se/Th	hin se/Mod Ti	hick	5-35 35-55	Mod Dipping	
30	-50 D	ense		8-15	Stiff		4	t H	lard		4 Slight	(4) 11-		3'-10' Wi	de/T∤	nick		55-85	Sub-Vertical	
		ery Der	nse	15-30	Very St	üff	5		ery H	ard	5 Fresh					ide∕Very TI	hick	85-90	Vertical	
				>30	Hard															
01.	200 - 2	in at = 2 ·	bu aut :::	and the feet	Men -1							-								
			by sub-vert			re ed the 10' co	ore ba	ırrel												- 1
8) 9	acker	testing	performed	in bedro	ack in 1	10' intervals	аррго	oxima	tely b	etween the	depths of 20' and 119 5' at	ter coring w	ras complete	ed						
9) 6	ottom	of bore	nole at 122	3'; bon	enole le	eft open for	ATV I	to be	perfo	med at a f	uture date									
																		BORING N	O B63-2	
																	1 1	DUKING N	U. D03-2	

										Е	ORING LOG							Si	hest: 1 of	2
-	-							T	-							BC	RIN	NG NO.	B63-4	4
	U	MIN	HARRE	*******	UP L	1.4							BORING	STATION: 11	474			SET: -46.65		
	.,	STREET,			100	-			SI		AVENUE SUBWAY		PROJECT	NO. CM11	88		COO	RDINATES:		
					ALR.	-				P	ROJECT		G. SURF	EL. 152.66				TH: 218074		
					111	Dr. Carrie							DATUM:				EAST	: 993743.	5567	
													FINAL BO	RING DEPT						
SAMP	LER:	2" O.D	. Split Spo	ort							y Boring and Drilling Corp					ID WATER				
SAMP	LER I	AMME	R: 140 lb. (Auldn	natic)					AN: Peter L			DATE	TIME		DEPTH CA			B. TIME	. 1
		E: 3"								ER: Sara F			7/25/05	10:10	-	16.2' 2	25'	68 H	rs, 10 Min	ì
			N/A (Spur	1)						TART: 7/22					⊢					
ROCK	COR	E: NO						$\overline{}$	VIEW	ED BY: C.	Snee DATE: 11/14/05		-		\vdash	INSITU F	2000	COTICO	1	-
- [اما	E			ĝ.	(9:	8								INSTIUE	ROP	ERTIES	NUMBE	ROF
	CASING (BPF) OR	SAMPLE / CORE NO	SAMPLE DEPTH (FT)	NCH	BPF)	PEN/REC: SOIL (IN/IN)	CORE REC (%)	ROCK CORE ROD (%)	TEST DATA	20 20 20	SAMPLE DESCRIPTION		STRATA SYMBOL	МРН∀		HARDNESS		ATHERING		ООТ
DEPTH (FT)	SING (B	APLE /	APLE D	BLOWS / 6 INCH	N VALUE (BPF)	SZEC:	TOTAL CO	CXCO	LD, TES				RATAS	STRATIGRAPHY	NOTES	see below for values		e below for values	sée belo	es B
ä	3	SAR	SA	BLC	ž	g.	5	ğ	FIELD.							12345	1:	2 3 4 5	1 2 3	4 3
	3"						-			DAVIENE	NET THICKNESS. OF C.			FILL	1		11	111		
4	Spun		*			1				PAVEME	NT THICKNESS: 3" C	oncrete			2		TI			
4	•				'								200		3	1	++	+++	1-1-1-	+
- }	1			1							gered to a depth of 6 feet price	r to			1		11			-1
- 1										boring.			000					1111		1
4														V.	1	+	11	1111		T
													200					1.11		
5				1																
4		-		-	-		-	-	-	Medium	dense, brown, fine to medium	SAND,				1111	1	9 44 4	1111	
- 1			100 mm 10	0 7			1			some Sill	t, Irace Gravel, trace Mica (SI	A / 11-65)	300		1.		1		1 1 1	
1		S1	6-8	7	13	24/24							1				1	1 1 .	1 1	:
4				8			-	\vdash	+-	Loose, b	rown, fine to medium SAND,	ome Sift,	400		1	1	1	1:11	111	
				3				1		trace Gra	evel, trace Mica, trace Rock F	ragments,			1	1 1 1	1	111	1.1	1-
7		\$2	8-10	3	8.	24/8		1	-	trace Cla	y (SM / 11-65)		200				1 ,	1 1 1	11.1	
10-		-		4	-	-	+-	-	-	Loose, b	rown, fine to coarse SAND, s	ome Siit,					1:	1 11	11:1	
.				3						trace Mid	a, trace Gravel, Irace Clay (S	M/11-	000				11	1111		-1-
1		S3	10-12	3	0	24/11		1		65)			200			11.1.1	11	1:11		!
4	-			3	-		-	-	-						1			1111		11
				1			1	1					-		1			1-1-1-	- 1	
٦			1,7	1				l					1		1					
-							1	1					25.0				-	1111	111	i
ا			÷					L	_	Ton: Loo	se, brown, fine to medium SA	ND. some	22		١.				1	+-
15		S4	15-16.4	3	4	24/13				Silt, little	Gravel, trace Mica, trace Cla	y (SM /	5	ORGANICS	1 4		1			1
-				1		2.11.0		1	1	11-65)			2.2	ONGANICS	1	1		111	17	
		SAA	16.4-17	2						Bottom: C	Park gray-black, fine to mediu ganic Silt, traceorganic Silty (m SAND,	8 8 8		1			1441		
		S5.	17-18.8	1!	1	21/14				pockets.	trace Gravel (SM / 11-65)	day	777		1	11:1, 1				il
\dashv				3			1					ala.	22.22		5			7 1 1 1		
_		C1.	18.8	600		-			-	S5: Soft	dark to light gray slightly orga iLT, some fine to medium SA	ND trace	0.0	SAND/		111111	1	+ +-+-+		
				1	1		1	1			race Rock Fragments, trace i		9 9	GRAVEL/ SILT	6				11 : 1	
20 -			1 2	1				1		11-65)		-,,-	(Or: U	SILI		1111			1	
_	1			-		-	-		-	C1: No F	Recovery		0.0			1.1	1			
1				7			1				dense, brown, fine to medium		30.00	1			1		1	
7		\$6	21-23	8	15	24/12	1			some Sil	I, little Gravel, trace Mica (SM	(6-65)	0.8				1			
4				4	-		-	-	-				0000							
	1						1	1					~~	DEC ROCK	1					
1					1		1	1					~~	1	1				1	
25				1	-		-	-	-	Top (8"):	Medium dense, light gray-wh	ite,	~~				1.	+ + '		
		S7	25-25.7	8	18	24/21			-		AND, little Silt, trace Rock Fr		~					1	11	
1		S7A	25.7-27	12			1	1	1	trace Cla	ıy (SM / 7-65) 13"): Light orange-brown, coa	rea la fina	· ~~				-	1 1	2	- 1
4	1	SIM	23.1-21	15	-		-	-	-	SAND e	13"): Light orange-brown, coa ome Silt, trace Mica, trace Ro	ick ick	· ~~			11:1	1			1
				1			1	1	1		its (SM / 7-65)		~~			1 1 3				
1	1								1	~ ~	900 50		~					1. 1	1, '	
- 4							1		1				7/1/2		1		1.	1		-1
20-	1							_					.5	1		Land Land			- 1 - 1	
30-			20.5	0.00	00.45		1	_	100		ADACTORICTICS			MINTERAC	TIT	RE CHARACTI	EDICE	ics		
		LAR SO			SIVE				DNE		ARACTERISTICS WEATHERING	NO. PE		SPACING			1		ATTITUDE	
BP O-		ENSIT			Very S	STENCY	1		ery S		1 Complete	(1) 0		<2" Very	clos	se/Very Thin		0-5	Horizontal	
		oose	.	2-4	Soft	- 1	2	2 N	Aodlu	m	2 Severe	(2) 1-2		2"-1' Clos	e/Th	nin			Sub-Horizo	
10-	A OE	Nedium	Dense	4-8	Med St	liff	3	3 h	ted I	lard	3 Moderate	(3).3-1	10			se/Mod Thick			Mod Dippi Sub-Verlica	
30-		ense			Stiff	1	4		lard	land	4 Slight 5 Fresh	(4) 11-	20	3'-10' Wid >10' Very		de/Very Thick			Sub-venical Vertical	Car.
>5	60 V	ery De		5-30 \ >30 I	very Si	titt.	,	, ,	ery h	10[0	Q FIRST			10 401)	,					

NOTES:

1)Water level readings have been made at times and under conditions stated, fluctuations of ground water may occur due to other factors than those present at the time measurements were made.

2)Stratification lines represent approximate boundaries between solf and rock types, transition may be gradual.

3)Field Test Data - Total organic vapors levels are referenced to a benzone standard measured in the head space of sealed solf sample jers using an organic vapor meter equipped with a photoionization detector (PID) and a 10.6eV lamp. Results are in parts per million by volume (ppmv)

4) Samples S4A and S5 have an organic odor.
5) Possible boulder at 18'-19'.
6) Placed core barrel between 18.5'- 21.5' - No recovery.

										В	ORING LOG						DMIMELIARDIS • ADLID BORING NO. B63-5												
	-	· m	4001 1AT	nić	ADI	111		T									BOR	ING NO.	363-5										
	D	MJN		CKIS 9	AIC	11,						1	BORING S	STATION:				FSET:		\neg									
	_			AJO	nt Vent	, nuis		1	SE	CONDA	AVENUE SUBWAY	1	PROJECT	NO CM118	38		CC	ORDINATES:											
					LL.					PF	ROJECT	1	G SURF				NC	ORTH:											
					110			1				1	DATUM:				EA	ST:											
				3		-						1		RING DEPTH	I (FT	11.2													
SAME	PLER: 2	" O D	Split Sp	oon				ВО	RING	CO: Jerse	y Boring and Drilling., Inc			GRO	DUNI	TAW C	ER RE	ADINGS											
			R: 140 lb		er					N: P. Lynd			DATE	TIME	DE	PTH		STAB.	TIME										
	NG SIZI									R. R. Nur			Note 1																
CASI	VG HA	MER:	N/A							ART: 09/1		0/04																	
ROCH	CORE	: N/A					,	RE	VIEW	ED BY: A.A	Azmi DATE: 09/29/04									-									
		<i>-</i> :	_	[<u> 2</u>	8	(%)								IN:	SITUPR	OPERTIES	NUMBER	OF									
	α.	8	Ĺ.			Ž.	0	RQD (4					_				_	FRACTUR	RES									
	(F)	B.	Ŧ	P P	Œ	30	2	8	A		SAMPLE DESCRIPTION		NB(Ŧ		HARC	NESS	WEATHERING	PER FOO) TC									
F	MIN	S	Ä	2 2	(8)	S	18	RE	ST	BURN	HISTER (USCS / NYC BLDG CC	ODE)	SY	A.		see he	low for	see below for	see below										
1	00	ш	щ	18	J.	3.6	0	8	밑		CLASSIFICATIONS		Ĭ ¥	Ę	S		ues	values	for values										
ОЕРТН (FT)	CASING (BPF) OR CORING (MIN/FT)	SAMPLE / CORE	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: SOIL (IN/IN) ROCK (FT/FT)	TOTAL CORE REC (%)	ROCK CORE	FIELD TEST DATA				STRATA SYMBOL	STRATIGRAPHY	NOTES	4.0		4 2 2 4 5	1 2 2 4	12									
B	800	SAI	SA	BL(z	m 5	임	8	쁀					ST	ž	12	3 4 5	1 2 3 4 5	1 2 3 4	_ ž									
													3.2	FILL						П									
-										PAVEME	NT THICKNESS: Not recor	rded			2														
													430																
1															3														
-										of horiog	gered to a depth of 7 feet prior to Environmental samples taken	to start																	
										or boning	Environmental samples total							1											
																		İ		11									
5-																			V 1										
-																		ai											
										Very lone	e, brown, silty, fine SAND and S	SILT				1000 May		-											
				2						trace Gra	ivel, trace Clay, trace Mica, trac	ce .			1														
1		S1	7-9	2	3	24/14				Cinders (SM / 11-65)							l		11									
-				1			-		-	Loose, b	rown, fine to coarse SAND, little	Э																	
				3						Cinders,	little Silt (SM / 11-65)							1		11									
10 -		S2	9-11,0	3 2	6	24/5									1					11									
-				1	-		1-				Fragments, some Cinders, trac	ce Brick,	4.0		4			1											
_		S3	11-11.2	100\3"	100/3"	3/2				trace coa	irse Sand					1				11									
_																													
_				1														1											
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	RANUL	AR S	DILS I	COHE	SIVE	SOILS	1	-	ROCK	CORE CH	ARACTERISTICS]			JOINT/FRAC	TURE	CHAR	ACTER												
	PF D	ENSIT	Y	BPF	CONSI	STENCY	1	HAF	DNE	SS	WEATHERING	NO. PE	RFT	SPACING/				ANGLE A											
0	4 V	ery Loc		<2	Very S			١ ١	ery S	oft	1 Complete 2 Severe	(1) 0 (2) 1-2		<2" Very 2"-1" Close		Nery T	nin		orizontal b-Horizonta	, 1									
		ose	Dense		Soft Med St	riff			Mediu Med H		2 Severe 3 Moderate	(3) 3-1	10			Mod T	hick	35-55 M	od Dipping	.									
	-50 D		Democ		Stiff		1 4	4 1	lard		4 Slight	(4) 11-	20	3'-10' Wide					b-Vertical										
>	50 V	ery De	nse	15-30		tiff	'	5 \	/ery l-	lard	5 Fresh			>10' Very	wide	Very T	HICK	85-90 V	ertical										
				>30	Hard	,																							
1) (Ground	water	evel not er	counter	red	. h 4			0.51	and roots to -	on transition may be gradual																		
3) (Stratifica Field Te	st Dat	ies represi i - Total or	ant appr ganic va	oximati ipors le	e boundari vels are re	es pel	weer ced to	a be	niu rock typ nzene stano	es, transition may be gradual dard measured in the head spac	ce of sea	aled soil sar	nple jars usin	g an	organic	vapor m	neter											
equ	ipped v	with a p	hotoioniza	tion det	ector (F	PID) and a	10.6e	V Ian	p R	esults are in	parts per million by volume (pp	pmv)																	
4) (Concret	e obst	uction end	ountere	at 11'	; bottom o	r bore	note a	111																				
1																													
											-																		

											2001110	100											T	CL.			_
											BORING	LUG										***			1 1 0		
	CJ/	W.	HARRE	S+AR	UP i									200010	07170	011.4	1.45			RC			-396		363	-6	_
		and the second	water of the same and the	A JOSE SE	TOTAL ST				SI	ECOND	AVENUE	SUBWAY		PROJECT				44.	40	_			NATE				-
						J				P	ROJEC	Г		G. SURF			00			+			2175		38		-
					0	DENNY							1	DATUM:			-			1			14296				_
														FINAL BO	RING												
			. Split Spc									and Drilling Cor	ρ.	5175								DIN		40	TIL 10		
CASING			R 140 lb.	(Autor	natic)					AN: Peter				DATE 05/26/05		IME		15.8		CA	40	G			TIME 35 M		
			N/A (Spu	n)				DA	TE S	ER: Sara I	3000a 25/05	DATE END: 05	26/05	03/20/03	1	-	1	10.0	_		-	T	.,,,,	110.	00 11	74.1.	-
ROCK C			13111000				,			ED BY: C.		DATE: 11/14/0															
			_	1:		Î	30	3									П		INS	ITU F	PROF	PERT	IES			BER C	~-
3	2	ON BRO	тн (FT)	Ę	Ę.	PEN/REC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	DATA					18OL	1	À.		НА	RON	NESS	w	EATH	ERIN		FRAC	FOO	ES
DEPTH (FT)	CASING (BFF)	SAMPLE / CORE	SAMPLE DEPTH	BLOWS / 6 INCH	N VALUE (BPF)	EC: SC	LCOR	CORE	FIELD TEST		SAMPL	EDESCRIPTION		STRATA SYMBOL		STRATIGRAPHY	S		belo valu	ow fo	rs		low fo		see b		Q Q
DEPT	3	SAMP	SAMP	BLOW	NVAL	PENÆ	TOTA	SOC.	FIELD							2	NOTES	1	2 3	4 5	1	2 :	3 4 5	5	1 2	3 4	ANI IIA
- 3										PAVEM	ENT THICK	NESS: 4" Cobble	estone		FILL		1 2		1	1					1	1	
SP	un l																			- 1 ,	-		Li_	í		1 :	
		114									gered to a	depth of 6 feet price	or to				3		1	. 1							
71										boring.								1	1						1	1	
11																		1	1	1			1				
5-		- 1																i		1		,					
4	H			+,	-		-	-	\vdash	Medium	dense, oraș	ge-brown, fine to	coarse	-	SAND	1	1		++	. 1	-	-		+	++	-	1
- 1	S1 6-8 11 19 24/2					24/22						ce Gravel (SM /		0.8	GRA	AVEL			100	4.				1	1.		
] [~ °	SIL	_Т			11								
				12						Dense, g	gray-brown,	fine to medium Sa vel, trace Mica (S	AND.	0 B					11					,	1		1
11		S2	8-10	18	33	24/24				Some Si	i, trace Gra	ver, pace mica (S	M11-93)	, o . c				1							. !		1
10-	+	-		15			-		-	Dense, o	range-brov	m, fine to medium	SAND,	3°°6			П	-	11	1	-	1			-	-	
+1	-	53	10-12	33	55	24/19				some Sil	t, little Grav	el, Irace Mica (Sh	17-65)	h . 0 . 1				-	1.		-		-	-	1!	-	1
41	-	_		42					Ш					3 8					1	11				1	1	1 ;	
														3.0.8						11			1		1		1
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11				1										0°0				1	11	11							1
15-	+			41			1-	_	\vdash	Very der	ise, brown,	fine to medium SA	ND, some	9.00					1-1-	-	+	-	-i-		1-1-	1	ı
+1		54	15-17	50 46	90	24/13				Sitt, little	Gravel, tra	ce Rock Fragmen		o°g					1		-	1	1	1	+ -		1
41	1			32			_			Mica (Sh	N1 0-05)			\$ 20						1. :		. !		11			1
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11				1										~~	DEC 1	TOUR			- 1	1						1	1
20-	-			10	\vdash		-		Н	Very der	se, gray-bi	ack-white, micace	ous fine to	~				Ì	: 4	i .				1	++	1	
41		\$5	20-22	34	55	24/24			.	coarse S	AND, little	Sill, trace Rock Fr	agments	~~				1		: 1				.		. !	1
41	-			40			-			(SM / 7-6	,,,			~~						- ;	-		,			1 1	1
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25-	-	50	26.00	23	10000	1077.0	\vdash		-	Very der	se, gray-bi	ack-white, micace	ous fine to	~~					1 1				1				
-	S6 25-26 23 100/6" 12/1					12/12	-		-	(SM / 7-6		Silt, Irace Rock F	ragments	~~.				-	. [1 :		. !		1		1	
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GRAN BPF		NSITY			SIVE S	OILS			OCK		ARACTERI	STICS	NO. PEI			FRAC	-			ACTE	RIST		GLE	AT	TITUD	E	_
0-4	Ve	ry Loo	se	<2 \	ery So		. 2	V	ery S	oft	1 0	omplete	(1) 0		<2"	Very	close	We		nin		0	-5	Hor	izonta	3.	
4-10 10-30								M	ediun	n		evere foderate	(2) 1-2 (3) 3-10		2"-1" 1'-3"	Close			od Ti	hick			-35 -55		Horiz d Dipp	ontal	
30-50	De	กรอ	8	-15 5	Stiff	- 1	3 4 5	H	ard		4 5	light	(4) 11-2	0	3'-10"	Wide	/Thk	k .				55	-85	Sub	-Verti		
>50	0-50 Dense 8-15 Stiff 2-50 Very Dense 15-30 Very Stiff 2-30 Hard							V	ery H	ard	5 F	resh			>10'	Very	WICE	6/V.6	ry (I	HCK		85	-90	Ver	ticel		

NOTES.

1)Waler level readings have been made at times and under conditions stated, fluctuations of ground water may occur due to other factors than those present at the time measurements were made.

2)Strafification lines represent approximate boundaries between soil and rock types, transition may be gradual

3)Field Test Data - Total organic vapors levels are referenced to a benzene standard measured in the head space of sealed soil sample jars using an organic vapor moter equipped with a photoionization detector (PID) and a 10.8eV tamp. Results are in parts per mittion by volume (ppmv).

		-								BORING LOG						S	heet: 3 of 5
	LX	MM	FIARRE	•AR	UP 4			T	-		T					RING NO	
				John St		del			S	OND AVENUE SUBWAY			STATION: 1 TNO. CM11		+44.40	OFFSET: -396,(
			.=		0.3	Servera		1		PROJECT			EL. 162.67	QU.		NORTH: 21750	8.538
						Danny						DATUM :	NYCT PRING DEPT	LI /6	D 120 7	EAST: 994296.	6477
SAM	PLER:	10"5). Split Spo	on				ВО	RING	Jersey Boring and Drilling Corp.	+	FINAL BU			ND WATER	READINGS	
SAM	PLER H	LAMME	R: 140 lb. (Autor	natic)			FÓ	REMA	Peter Lynch	1	DATE	TIME	1	EPTH CA	SING STA	B. TIME
CAS	NG SIZ	E: 3" MMER	N/A (Spur	2)						Sara Rocha 1: 05/25/05 DATE END: 05/26/05	+			+			
	K COR		тыкторы							BY: C. Snee DATE: 11/14/05	士						
		0	E.			<u> </u>	(%)	(%)							INSITU F	ROPERTIES	NUMBER OF
	o R	SAMPLE / CORE NO	SAMPLE DEPTH (FT)	E	6	PEN/REC: SOIL (IN/IN)	CORE REC (%)	ROCK CORE ROD (%)	DATA			BOL	눞		HARDNESS	WEATHERING	FRACTURES PER FOOT
E	3PF)	8	Ë	N	198	SO	J. S.	E.	ST D	SAMPLE DESCRIPTION		J. V.	₹ A			1	
H F	90	LE/	J. F.	1/8/	3	Ë	10	. 03	TEST			I A	ID.	S	see below fo values	r see below for values	for values
DEPTH (FT)	CASING (BPF) OR	AMP	AME	BLOWS / B INCH	N VALUE (BPF).	EN	TOTAL	ò	FIELD			STRATA SYMBOL	STRATIGRAPHY	NOTES	12345	1 2 3 4 5	for values BWON
<u>a</u>	0	S	S	0	Z	, <u>a</u>	1	22	11				0)	-	- 131	25	0
١.	2.5									3.6'-66.9': Very hard, fresh, fine to coarse ained, fight to dark gray, quartz-mica-garne	t	==			11 11		30
	3	C4	57.2-66.9			9.7/9.7	100	93		CHIST, with very thin, convoluted, highly enulated, horizontal to moderately dipping		==			祖生。	E STATE OF	0
	3									liation, rough to smooth, with moderately osely to widely spaced, sub-horizontal to		==					0
	3									oderately dipping, slightly weathered,		==			4	1	0
65-	3									nlorifized to clay coated foliation ints/fractures.		==					
	2.5		١,							8,6'-59.2', 59.7' and 60.7'; Cross-foliation		= =				是如此	0
١.	2.5			-	_		-		-	ints/fractures, rough to smooth, irregular,		ΙΞΞ					0
١.	3									osely spaced, moderately dipping to sub- crtical, slightly to moderately weathered,				7			7
Ι.	3									nloitized, silicate, clay to hematile coaled, ineralized.		==					0
70-	2.5									1.3'-61.7', 63.5'-63.9' and 69.5'-66.9': Sovera ealed sub-vertical joints/fractures.	al	==			1		0
70 -	2.5			1						,		==	İ				
	2.5	C5	66.9-76.5			9.6/9.6	100	87	.	5; Similar to Schist in C4.		E					5
	3.5									7.2'-68.0', 70.5', 71.3'-71.7' and 71.6'-72.2': ross-foliation joints/fractures, rough, irregula	ır,	==			数1/23		4
1	3					,				ery closely to moderately closely spaced, su erlical to vertical, moderately weathered,		==				177	0
-	2.5									niontized, clay to hemalite coated, mineralize	ed.	==				1 214	0
75 -	2.5			1								==					0
-	25	100		-	-		-			6: Similar to Schist in C4.		==					0
	25				1					0.4'-80.7' Healed sub-vertical joint/fracture		==				1	0
	25	٠.										==				X4-14	0
1	2.5	C6	76.5-82.4			5.9/5.9	100	100	_			= =				14	0
80 -	2.5																0
	2.5											==					0
	4.5			-			-			imilar to Schist in C4, except convoluted,		==					1
	12									ghly crenulated foliation, occasional very this partz veins; occasional very thin quartzo-	in	==					0
-	2.5			1						Idspathic zones.		==			11		0
85,-	2.5					-				5.2'-85.5': Healed sub-vertical joint/fracture. 5.4'-85.7': Cross-foliation joint/fracture, roug		-			16		1 2
	2.5									ub-vertical, slightly mineralized		= =			1	10	1
-	3.	C7 [']	82.4-91.6	1		9,2/9,2	100	100				= =					
-	3			1								==				Like	0
	3															THE STATE	
90 -	3.	::												L	TAR FISS	本學者認知	10
	RANUL PF D	AR SO			SIVE S	SOILS			OCK	RE CHARACTERISTICS NO.	PER		JOINT/FRAC		E CHARACTE	RISTICS ANGLE	ATTITUDE
0	1-4 V	ery Lo	ose	<2	Very So		1	٧	ery S	1 Complete (1)	0			clos	e/Very Thin	0-5 5-35	Horizontal Sub-Horizontal
		oose edium			Soft Med St	iff	3	N	lediur led H		3-10		'-3' Mod	Clo	se/Mod Thick	35-55	Mod Dipping
		ense ery De			Stiff Very St	iff	5		lard 'ery H	4 Slight (4) 1 5 Fresh	11-20)	'-10' Wide		ick de∕Very Thick	55-85 85-90	Sub-Vertical Vertical
					Hard					5 Fresh							
41	New cor	e barr	el placed.														
5)	Core ba	rrel be	came jamme by sub-vertice		Ufcacto	ro											
7)	RQD aff	fected	by sub-vertice	al to v	erlical	oints/fractu	ires be	elwee	en 67'	and 71'-72'.							9
	Core ba Bollom			7'; aco	ustic le	leviewer su	ırvey (perfo	rmed;	ehole grouted upon comptetion.							
										see.							
															٦		0.0000
l															1	BORING N	U. D03-D

										BORING LOG						Si	neet: 5 of 5
	D	MIM	BI JARRE	2 + A1	RIJP 4			T								RING NO.	
		******	##HARKE	d lens	VICTO !	يلطر			SI	ECOND AVENUE SUBWAY			TION: 11			OFFSET: -396.0 COORDINATES:	
					918	aniara		-		PROJECT		RF EL.		00		NORTH: 217508	
					10	factory						M: NY		11.00	71. 400.7	EAST: 994296.6	5477
SAM	PI FR:	2.01). Split Spo	oon				BO	RING	CO: Jersey Boring and Drilling Corp.	FINAL	BORIN			T) 139.7 ND WATER I	READINGS	
			ER: 140 lb.		matic)			FO	REM	AN: Peter Lynch	DA	TE	TIME		EPTH CA		B. TIME
	NG SIZ		N/A (Spu	<u>-1</u>						ER: Sara Rocha TART: 05/25/05 DATE END: 05/26/05	+	-		\vdash	+-	_	
	K COR			111			_			ED BY: C. Snee DATE: 11/14/05	1	一					
		o.	E.			2	(%)	8							INSITU P	ROPERTIES	NUMBER OF
	e e	Z U	H (F	I	-	S S	SE S	g.	ATA		5	1	≿		HARDNESS	WEATHERING	FRACTURES PER FOOT
-	PF)	ပ္ပြဲ	EPT	2	8	SOI	A.	R. A.	TD	SAMPLE DESCRIPTION	3		ž				
H.	9,0	1 37	ij	18	. H	EC.	18	8	Ţ.		1	ś	TIGI	S	see below for values	see below for values	for values
ОЕРТН (FT)	CASING (BPF) OR	SAMPLE / CORE NO	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC: SOIL (ININ)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA		CENTA SYMBO		STRATIGRAPHY	NOTES	12345	12345	for values 1 2 3 4 N
0		· s	0	-	Z	. <u>a</u> .	-	12	u			-	0)	-			5
-	3					9/9	100	58		C11: Similar to Schist in C9, except very close to moderately closely spaced foliation	" <u>=</u>	\exists			7		3
-	2.5	C11	116.9-125.	9		9/9	100	38		joints/fractures, 119.8'-121.8': Foliation joints/fractures,	Ξ	=				21 ****	5
-	_3_		1							moderately dippling, high mica content with mytonite.						a oc	0
-	2.5									118.2': Cross foliation joint/fracture, weakly healed to open, rough, moderately dipping,	Ξ	=				130	The state of the s
125-	3		,							slightly weathered. 122.2'-122.7': Cross-foliation joint/fracture,	E						5
	3			+	+		+-	├-	-	rough, sub-vertical, slightly to moderately	=	=		8		拉拉	0
-	2.5									weathered with pyrite.	Ξ	\exists			100	- SI	Distant -
C12: Similar to Schist in C9.															蟾。		2
-	2.5	C12	125.9-132.	,		6.2/6.2	100	76	-	weakly healed, sub-vertical, slightly weathered	=	=			二九時		0
130 -	2.5									130.8'-131.7':Cross-foliation joints/fractures, rough to smooth, vertical, moderately	=	\equiv				437	2
-	2.5									weathered, hemalite chlorite coated.	Ξ	_					7
-	2.5			_	1_			_			=	\exists		8		1	2
-	2.5					1				C13: Similar to Schist In C9. 132.1'-134.6':Healed, very closely spaced,	Ξ	=				30%	0
-	2.5									vertical, hematite, chlorite coated, quartz filled. 139.0'-139.4" Healed sub-vertical joint/fracture		=			0.00	到侵交	0
135-	2.5				1					105.0 105.4 1705.00 dos-rentalin jenivinstina	· =	=					3
-	2.5	C13	132.1-139.	7		7.6/7.6	100	86			=	\exists					2
-	2.5									2	=	=				11:1	0
-	2.5	:									ΙΞ	\equiv					0 0
-	2.5	:									=			9			0 0
140	2.5		-	+	+-	-	\vdash	-		Boltom of borehole at 139 7 feet	-	+		1	1-1-1-1-1		
-										10.000						+1-++-	
-															1 1 1 1	1: :-!	
-					-										1 1 1 1		
-					.										-		
145-			1		1												111.
-										9							
-																	
-				1	-	1											
			'												1		
150																	
G	RANUI				ESIVE					CORE CHARACTERISTICS					E CHARACTE		ATTITUDE
0	-4 V	ENSIT ery Lo	ose	SPF <2	Very S	ISTENCY oft	1	l V	ONES ery S	oft 1 Complete (1) 0		2"	Very	clos	e/Very Thin	0-5	Horizontal
		oose ledium		2-4 4-8	Soft Med S	tiff	3		lediu			"-1" '-3"	Mod	Clos	se/Mad Thick	35-55	Sub-Horizontal Mod Dipping
	-50 D	ense ery De		3-15 5-30	Stiff Very S	tiff	5		ard ery H	4 Slight (4) 11	1-20	10			lck le/Very Thick	55-85 85-90	Sub-Vertical Vertical
		,		>30	Hard												A FIRM MANAGEMENT AND ADDRESS OF THE PARTY O
4) 1	Vew co	re barr	el placed.							,							
5) (Core ba	rrel be	ecame jamm by sub-verti		nt/fractu	ıre											
7)1	RQD af	fected					res b	elwee	en 67'	-68', and 71'-72'.							
9) 1	Bollam	of bore	ehole at 139	7'; ac	oustic te	eleviewer so	ırvey	perfo	rmed;	borehole grouted upon completion.							
															Γ	BORING NO	D R63-6
1																POKING M	J. D03-0

		A 47 L 2	BALLACIN	1C - 1 F				Т		BORING LOG	T			ВО	RING NO.	B63-7	\dashv
	L.	AVIJ AV	III I ARR	4 (54)		del			S	ECOND AVENUE SUBWAY	BORING S	NO. CM11	88	(OFFSET: COORDINATES:		\exists
					48	- Lange				PROJECT	G SURF	EL 160.23	00		NORTH: 217567		
						Eastway					DATUM:	NYCT RING DEPTI	H(F		EAST: 994013.6	733	\dashv
SAM	PLER:	2" O.E). Split S	ooon						CO: Warren George		GR	٩Ų٥	ND WATER F			
CASI	PLER I	HAMMI	ER: 140 It	. (Man	ual)					AN: Mike McCarthy ER: Melad Girgis	DATE	TIME	1 0	EPTH CAS	SING STAI	3. TIME	\dashv
CASI	NG HA	MMER	: 300 lb					DA	TE S	FART: 2/19/09 DATE END: 2/27/09							=
ROC	KCOR	E: NO		1	1	9	13		VIEW	ED BY: C. Snee DATE:	1	J	-	INSITU P	ROPERTIES		\dashv
	OR	RE NO.	SAMPLE DEPTH (FT)	15	6	PEN/REC: SOIL (IN/IN)	CORE REC (%)	RQD (%)	DATA		BOL	È		HARDNESS	WEATHERING	FRACTURE PER FOO	ES
(FT)	CASING (BPF) OR	SAMPLE / CORE NO.	LE DEP	BLOWS / 6 INCH	N VALUE (BPF)	EC: SO	CORE	ROCK CORE	TEST	SAMPLE DESCRIPTION	STRATA SYMBOL	STRATIGRAPHY	S	see below for values	see below for values	see below for values	E E
DEPTH (FT)	CASIN	SAMP	SAMP	BLOW	N VAL	PEN/R	TOTAL	ROCK	FIELD		STRA	STRA	NOTES	12345	1 2 3 4 5	1234	NUMBER
-	. 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.							0
-										nonzonial angles.					2.25	# 	0
-	4									B						5.379	0
-	4						Γ							- Salar		1500	1
65 -	4															-	0
-	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				A CONTRACTOR			0
-	4									horizontal angles, sub vertical at 65.9'.						_	7
-	4						_									-	0
	4													د در پردو در در در در در در در در در در در در در			0
70										C-9: Hard, slightly weathered, f-m grain, dark gray SCHIST, close to moderate spacing, sub							1
-		C9	68.7-73.	9		5.2/5.2	100	76		horizontal angles.					197834 11	Pro-	5
														_		- C	4
														2 <u>2-0 - 1</u>	4		0
7.5																_	0
75 -										C-10: Medium hard, moderately weathered, f-m grain, dark gray SCHIST, very close-close							0
		C10	73.9-78.	1		4.2/3.7	88	24		spacing, sub horizontal angles, cross foliation 76.3'-78.0'					15.00	Addi.	0
																	0
		-		\top													0
		C11	78.1-80.	6		2.5/2.1	83	50		C-11: Medium hard, moderately weathered, f-m grain, dark gray SCHIST, very close- close							0
80 —					-		-	_		spacing, sub horizontal anglés.						_	0
										0.40-44-4						-	0
		C12	80.6-84.	7		4.2/3.1	74	34		C-12: Medium hard, moderately weathered, f-m grain, dark gray SCHIST, occasionally mixed							1
										GRANIT, very close to close spacing, sub horizontal to sub vertical 81.5'-84.7' (lost							0
0F -		-		-	-		_			recovery at this zone).				<u>-</u>	1100	Lance Control	0
85 -															12	-	2
									,	C-13: Moderately hard, moderate-slightly weathered, close -moderate spacing, f-m grain,						-	1
		C13	84,7-89,	7		5,0/5.0	100	50		dark gray SCHIST, GRANIT, very close 84.7'- 85.2' sub horizontal foliation, sub vertical at							1
										86,3*.						-	0
00-		,		4_	_		_										0
90 ~	RANLI	AR SC	DILS T	COH	ESIVE 8	SOILS I	1	R	CK	CORE CHARACTERISTICS		OINT/FRAC	TURI	E CHARACTER	RISTICS		믝
BF	PF D	ENSIT	Y	BPF	CONSI	STENCY		HAR	NES	S WEATHERING NO. PE		SPACING/	THIC	KNESS	ANGLE	ATTITUDE Horizontal	\neg
4-	10 L	ery Loc oose		2-4	Very Soft		1	. N	ery S lediur	n 2 Severe (2) 1-2		"-1' Close	e/Thi		5-35	Sub-Horizonta	
30-	-50 D	ense	Dense	8-15	Med St Stiff		3	Н	ed H ard	4 Slight (4) 11-2		/-10' Wide	-/Thi		55-85	Mod Dipping Sub-Vertical	
>:	50 V	ery De	nse		Very SI Hard	liff	5	V	ery H	ard 5 Fresh		10' Very	Wid	e/Very Thick	85-90	Vertical	
																	-
5) (Core ba	rrel be	came jami	ned.	g to 29'	then pushe	ed to 3	34" the	en pu	shed to 37.0'.							
6) (Change	d Core	barrel afte mechanica	r C-20.	rock												
										-							
																	- 1

	BORING LOG Sheet: 5 of 5																			
	C	MJM	###ARRE	• A.R	UP	4.6		SECOND AVENUE SUBWAY PROJECT					BORING S			•	BORING NO. B63-7 OFFSET:			
					4									NO. CM11 EL. 160.23	88		COORDINATES: NORTH: 217567.2364			
					1	America James y							DATUM:	NYCT			EAST: 994013.6733			
SAME	I FR	2" () [D. Split Spo	On.				BORING CO: Warren George				FINAL BO	RING DEPTI		() 129.40 ND WATER F	READINGS		\dashv		
SAME	LERI	MMA	ER: 140 lb.		ial)			FOREMAN: Mike McCarthy					DATE	TIME		EPTH CAS		B, TIME		
CASI	VG SE	E: 4"	: 300 lb					EN	GINE TE S	ER: Melac	Girgis DATE END: 2/2	7/09			-				\dashv	
ROCK						,				ED BY: C		.7703	İ.,							
		ō.	E			Q ∑	(%)	(%)								INSITU PI	ROPERTIES	NUMBER C		
E	3PF) OR	CORE	DEPTH (NCH	(BPF)	SOIL (IN/IN)	RE REC (%)	RE ROD	ST DATA		SAMPLE DESCRIPTION		SYMBOL	ЗАРНУ		HARDNESS	WEATHERING	PER FOO	Т	
БЕРТН (FT)	CASING (BPF) OR	SAMPLE / CORE NO.	SAMPLE DEPTH (FT)	BLOWS / 6 INCH	N VALUE (BPF)	PEN/REC	TOTAL CORE	ROCK CORE RQD (%)	FIELD TEST DATA				STRATA	STRATA SYMBOL		see below for values 1 2 3 4 5	see below for values	see below for values 1 2 3 4	NUMBER	
-				ш.	2	-	١.		LL.			- 0		NOTES				5		
-		C21	119.4-124.4				100	92			Same as C-19 except sub hori	zontal -					10.00	_	3	
-										Undulat	ical foliation. ing to irregular, rough to smo	oth, fresh							5	
										Some c	to slightly weathered, Some calcite cross foliation fractures at 115.4,							_	5	
125										118.2' a fractures	ind 118.9'. No apparent foliat	on					3.2	_	-	
																			3	
		C22	124.4-129.6				100	50		C-21: Ve	ery hard fresh fine to coarse of	rained				excelled of the set of				
										convolut	dark gray gm SCHIST with thi ted foliations; sub horizontal t	0	1 1						2	
										moderal	te foliation, rough, irregular, o tely close, fresh to slightly we						1965	2		
30											20,8' Very Hard fresh coarse d white Quartz - feldspar vein	grained							7	
																			2	
																		9	0	
																			0	
			- 1							C-22: Ve	ery hard, fresh, f-c grained, lig HIST, sub horizontal to mode	ht to dark							3	
135	35—					foliation	; rough to smooth with close!	spaced,												
										foliation	weathered to fresh foliated joinal 124.8", 125.0" and 125.9".	nts. Cross	,						0	
-																			0	
-						1													0	
																			0	
140																				
-																				
														-						
145										Bol	Itom of borehole at 129,4									
-										*										
-																				
-																				
-																				
150						<u> </u>										~4¥	L	<u></u>	旦	
GF BP		AR SO			SIVE S	STENCY	1		ONES		ARACTERISTICS WEATHERING	NO. PE		OINT/FRACT		CHARACTER KNESS		ATTITUDE	\dashv	
0-	4 V	ery Lo	ose	<2 '	Very Sc		1	V	ery S lediur	oft	1 Complete 2 Severe	(1) 0 (2) 1-2	- 1		clos	e/Very Thin	0-5	Horizontal Sub-Horizonta	, 1	
						3	M	led H		3 Moderate	(3) 3-1	0	'-3' Mod	Clos	e/Mod Thick	35-55	Mod Dipping Sub-Vertical			
30-5 >5		ense ery De	nse 15	-30	Stiff Very St	liff	5		ard ery H	ard	4 Slight 5 Fresh	(4) 11-2				e/Very Thick		Vertical		
				30 1	Hard															
			4' depth. 3"		to 29'	then pushe	ed to 3	4' the	en pu	shed to 37.	,0',									
6) C	hange	d Core	came jamme barrel after	C-20.																
7) 1	19,4'-1	19.5':	mechanical t	roken	rock															
											**									
																Γ	BORING NO	. B63-7		

BORING LOG														Sheet: 1 of 3								
	ï	Serven	TI SECTO	70.	ý.1:"	יו כורי											BORING NO. B63-8					
A SCHEEN STREET AND A STREET										6	COND	AVENUE CUDWAY			STATION:				OFFSET:			
	_					li :	1.1.7			S		AVENUE SUBWAY		PROJECT NO. CM1188					COORDINATES:			
											P	ROJECT			EL. 160.96				NORTH: 217576.7756			
1. Street														DATUM ;				E	AST: 994091	.0634		
C 4 1 4 5	1 50	0 0 0	0 1/4 5						FINAL BORING DEPTH (FT) 68.3 BORING CO: Warren George GROUND WAT								TEDD	FARINGS				
			D. Split S ER: 140 I			natiol					AN: Mike N		DATE			DEPTH			AB. TIME			
		ZE: 4"	CR. 140 I	ib. (A	uton	natic					ER: Melad			DATE	1 HAIC	-	CFIR	CAS	1113	NO. THVIC		
			2: 300 lb								TART: 2/16		7/09		+	-						
		RE: NQ									ED BY: C.											
		Ι.	_				Î	3									INS	SITU PR	OPERTIES			
E	CASING (BPF) OR	SAMPLE / CORE NO	SAMPLE DEPTH (FT)		BLOWS / 6 INCH	N VALUE (BPF)	PENREC: SOIL (ININ)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA		SAMPLE DESCRIPTION		STRATA SYMBOL	STRATIGRAPHY		HARD		WEATHERIN		RES	
рертн (FT)	9	3	삨		2	当	SE SE	S	S	쁜				1	5	S	see bel		values	for value:		
4	S	₩ .	M M		8	₹	2	IA	ž	12				2	\$	NOTES					18	
8	S	S	S S		ם	z	8	15	2	12				ST	S	ž	1 2 3	4 5	1 2 3 4 5	1234	١ź	
-	3° SP										PAVEM	ENT THICKNESS: 4" Cobble	estone		FILL	1 2						
-	1										6" plain 8" concr	concrete slab (sidewalk) ete slab base				3						
5-											Hand an boring.	guered to a depth of 6 feet pr	ior to									
-		S1	6-8	1	28 12 4	16	24/16					dium dense Yellow brown fine ayey sill, brick fragments.	SAND,		-		F. V., . P.,					
		\$2	8-10	1	6 7	13	24/6					dium dense Brown c-f SAND rick gragments.	, filtle									
10-	+	32	8-10	+	6 15 24		24/0	-			S-3: Ver	y dense Brown c-f SAND and race silt, occosional mica frag		-	SAND							
-		S3	10-12	- 1	26 45 26	74	24/18				Graver, t	race sit, occosional filica iraș	inents									
				1	42																	
15-		S4	15-17		32 27 36	59	24/16				S-4: Ver Gravel, t	y dense Brown c-f SAND, litt race Silt, occasional mica fra	le fine gments.									
-																	-					
20-					21 24							y dense Green c-f SAND, tra nix mica fragments.	ce fine		DEC ROCK							
-		S5	20-22		46 80		24/15	-	_	·												
															-							
25		S6	25-26		75 75 00\3*		15/15			·		y dense Green c-f SAND, mi posed SCHIST).	ca mix									
-																						
4																						
30-	1	\vdash		\top													7.7				0	
	AAH!	LAR SO	W C		OUS	SIVE S	OILS T			001	CORE CI	ARACTERISTICS		1	MINITEDAM	L	CHAR	ACTED	STICS			
BP	F C	DENSIT	Y	BPF	C	ONSIS	TENCY		HARI	DNES	5\$	WEATHERING	NO, PER	RFT	SPACING	THIC	JRE CHARACTERISTICS HICKNESS ANGLE ATTITUDE					
BPF DENSITY BPF CONSISTENCY 1 1 1 1 1 1 1 1 1					M M H	ARDNESS WEATHERING NO. PE				<2" Very close/Very Thi 2"-1' Close/Thin 0 1'-3' Mod Close/Mod Thi					0-5 5-35 35-55 55-85	Horizontal Sub-Horizont Mod Dipping Sub-Vertical Vertical	al					

NOTES:

1)Water level readings have been made at times and under conditions stated, fluctuations of ground water may occur due to other factors than those present at the time measurements were made.

2)Stratification lines represent approximate boundaries between soil and rock types, transition may be gradual.

3)Field Test Data - Total organic vapors levels are referenced to a benzene standard measured in the head space of sealed soil sample jars using an organic vapor meter equipped with a photoionization detector (PID) and a 10.6eV lamp. Results are in parts per million by volume (ppmv)

	BORING LOG Sheet: 3 of 3																			
TWO STANDARD AND A																В	ORING NO. B63-8			
DECEMPED OF SHOP									SECOND AVENUE SUBWAY					TATION:			OFFSET:			
					1)	A D			3		ROJECT			NO. CM11	88			RDINATES:		_
1					150	CON.					.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		G. SURF E					TH: 217576 T: 994091.		
													RING DEPT	H (F	r) 68.3					
SAMI	SAMPLER: 2° O.D. Split Spoon SAMPLER HAMMER: 140 lb. (Automatic)									CO: War	2175			ND WATER			D. TILLE			
	NG SI		ER: 140 lb.	(Auto	matic)					ER: Meta	Mcerlean 1 Girois		DATE	TIME	-	EPTH C	ASING	SIA	B. TIME	\dashv
CASI	NG HA	MMER	: 300 lb					DA	TES	TART: 2/1	6/09 DATE END: 2/1	7/09								
ROCI	K COR	E: NO		_			T -	RE	VIEW	ED BY: C	Snee DATE:				-				т	_
		ğ	E			25	3	(%)								INSITU	PROP	ERTIES	NUMBER	OF
	8	8	Ŧ	E	6	=======================================	REC	8	A A				l g	≠		HARDNES	s w	ATHERING	FRACTURI PER FOO	ES
16	3P.F	8	9. P	Z Z	86	Sol	E E	SE F	15		SAMPLE DESCRIPTION		× WE	r P						
H (F	ပ္ခ	19	<u> </u>	8/6	当	Si Si	18	8	Ĭ,				2	5	, s	see below values	for se	e below for values	sea below for values	ER
DEPTH (FT)	CASING (BPF) OR	SAMPLE / CORE NO	SAMPLE DEPTH	BLOWS / 6 INCH	N VALUE (BPF)	PENREC: SOIL (IN/IN)	TOTAL CORE REC (%)	ROCK CORE ROD (%)	FIELD TEST DATA				STRATA SYMBOL	STRATIGRAPHY	NOTES				1234	NUMBER
ā	3	ò	ŷ	ã	z	ă.	F	×	-				l.S	20	ž	1234	7 1	2 3 4 5	1234	ž
											nular to SCHIST in C-1 exceptal foliation. Hard slightly weat									1
	4	C7	59.5-64.5			5.0/4.7	96	83		SCHIST	(occosional GRANITE), clost	lo				1			-	\vdash
	-					ļ				modera foliation	te fractured spacing, sub hori	zontal							-	3
1	4	-		-	-		-		\vdash							7.			-	1
1	4			_	_		_			ļ										1
65-	4																		1	2
-	4										.5-68.3') Moderate to Hard, st									5
-	4	C8	64.5-69.5			5.0/3.8	100	33		weather (66'-67.	ed SCHIST, close fractured s 8 fractured), sub horizontal to	pacing				Carte Company Commerce				10
	4									modera	tely dipping foliation. i.5' and 68,0-68,3'; Fine to me				4					5
-				1						grained	light gray quartz mica SCHIS	T with sub								
70 -										65.5'-68	al to moderatley dipping folial .0': Simular to above SCHIST	ion. except								
["]										severely	weathered.									
1 1																				
1 1																				
Ιđ																			l	
75																				
-																				
		-																		
80																				
1 1																	1			
1 1																				
											•									
85-																				
1																				
										Bo	ttom of borehole at 68,3°									
90									Ш						Щ	A.P.			1	旦
GF BP		AR SC			SIVE S	STENCY		HARD			ARACTERISTICS WEATHERING	NO. PE		SPACING/		CHARACT KNESS	ERISTI		ATTITUDE	\dashv
0-	4 V	ery Loc	se	<2 \	Very So		1	V	ery S	oft	1 Complete	(1) 0		2" Very	close	Very Thin		0-5	Horizontal Sub-Horizonta	,
							2		lediur led Ha		2 Severe 3 Moderate	(2) 1-2 (3) 3-1	0	-3' Mod	Clos	e/Mod Thick		35-55	Mod Dipping	
30-5		ense ery Der			Stiff Very St	iff	4 5		ard ery H	ard	4 Slight 5 Fresh	(4) 11-7	20	-10' Wide 10' Very		:k e∕Very Thick		55-85 85-90	Sub-Vertical Vertical	
		,			Hard				,				1	,		,				
41.5	lar- L	ala 4			-11.			h	е-											\dashv
4) E	oreho	ole ten	minated to	preve	ent inte	rterence v	with t	ne F	line	tunnels.										
											-									
																	BO	RING NO	B63-9	\neg

BORING LOG Sheel: 1 of 5 **BORING NO. B64-2** DMJM#HARRIS • ARUP BORING STATION: OFFSET A Joint Ventura SECOND AVENUE SUBWAY PROJECT NO. CM 1188 COORDINATES: **PROJECT** G SURF EL. 158.08 NORTH: 217606.1916 PP DATUM: NYCT EAST: 994657,5258 FINAL BORING DEPTH (FT) 140 SAMPLER: 2" O.D. Split Spoon GROUND WATER READINGS TIME | DEPTH | STAB. TIME BORING CO: Jersey Boring and Drilling Co., Inc. SAMPLER HAMMER: 140 lb. Automatic DATE FOREMAN: A. Feliciano CASING SIZE: 3" and 5" CASING HAMMER: 140 lb. ENGINEER: N. Sokol OW 7/2/02 12:40 14.3' 4 Days 8/23/02 DATE START: 6/17/02 15:45 14.5 OW 56 Davs DATE END: 6/28/02 ROCK CORE: NO B/27/02 16:05 14.6 ÓW 60 Days REVIEWED BY M. A. Ponti, JDATE: 9/3/02 (NVIN) (%) INSITU PROPERTIES % NUMBER OF FRACTURES PER FOOT E CORE REC DATA (BPF) OR (MIN/FT) å CORE DEPTH STRATA SYMBOL PEN/REC: SOIL (ROCK (FT/FT) HARDNESS WEATHERING SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE) CLASSIFICATIONS STRATIGRAPHY (BPF) ROCK CORE TEST BLOWS / 6 see below for see below see below to CASING (SAMPLE / N VALUE SAMPLE DEPTH (values TOTAL NO 1 2 3 4 5 1 2 3 4 1 2 3 4 5 FILL PAVEMENT THICKNESS: 4" Concrete 2 3 Hand augered to a depth of 6 ft. prior to boring, environmental samples taken. 4 Medium dense, brown, fine to medium SAND and SILT, trace Gravel (SM / 11-65) 6-8 **S**1 5 9 12 14 24/17 0 13 11 18 20 Medium dense, light brown to red-brown, fine to medium SAND and SILT, trace Gravel (SM / 11-29 0 S2 8-10 24/14 10 Dense, light brown to red-brown, fine to medium SAND, some Silt, trace Gravel (SM / 11-65) S3 10-12 37 0 15 16 Dense, light brown, fine to medium SAND S4 50 0 12-14 24/17 some Silt, trace Gravel, trace Clay (SM / 11-65) 15 22 Top 16": Brown, fine to medium SAND, little Silt, trace Gravel (SM / 11-65) **S5** 14-15.3 40 24/19 0 15 S5A Bottom 3": Gray-brown, slightly micaceous, fine to medium SAND, some Sill, trace Rock Fragments (SM / 7-65) DEC ROCK 20 -13 18 30 51 Dense, light gray to red-brown (variable color). S6 48 micaceous, fine to coarse SAND, little Silt, trace Rock Fragments (SM / 7-65) 20-22 24/20 0 Very dense, gray, micaceous, fine to coarse SAND, little Silt, trace Rock Fragments (SM / 7-24/24 **S7** 25-27 69 0 GRANULAR SOILS COHESIVE SOILS ROCK CORE CHARACTERISTICS JOINT/FRACTURE CHARACTERISTICS BPF DENSITY RPF CONSISTENC ARDNESS WEATHERING NO. PER FT ANGLE ATTITUDE SPACING/THICKNESS (1) 0 (2) 1-2 (3) 3-10 (4) 11-20 0-5 5-35 35-55 55-85 Very close/Very Thin Close/Thin Very Loose <2 Very Soft Very Soft Medium Complete Horizontal 4-10 Loose Severe Moderate 2"-1' 1'-3' Sub-Horizontal Mod Dipping 2-4 Soft 10-30 Medium Dense 4-8 8-15 15-30 Med Stiff Stiff Med Hard Mod Close/Mod Thick Dense Very Dense 30-50 Hard 4 5 Slight 3'-10' Wide/Thick Sub-Vertical Very Stiff Very Hard Fresh Very Wide/Very Thick 85-90 Vertical >30 Hard

NOTES:

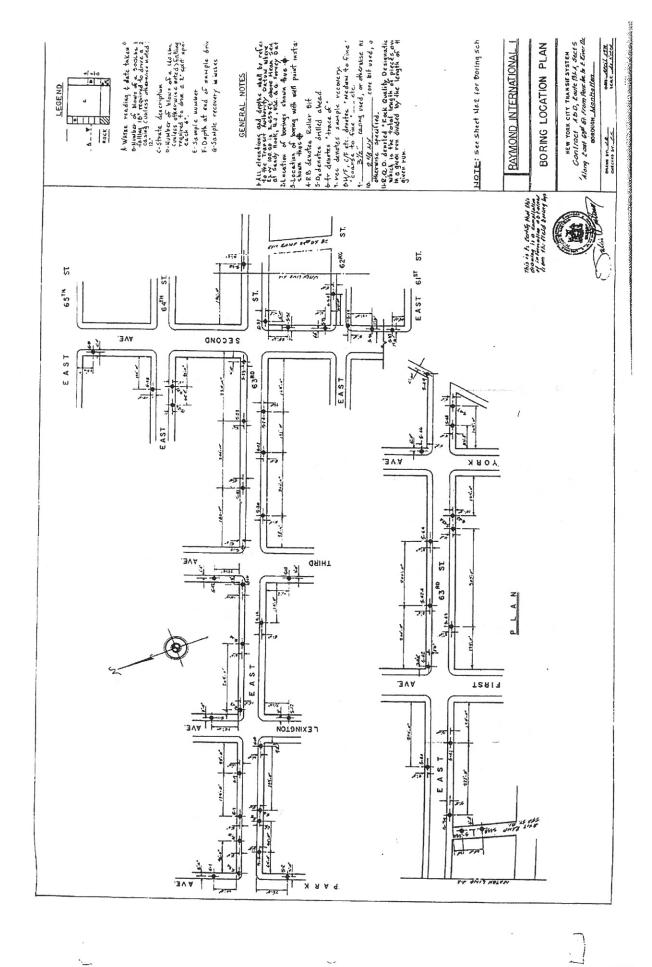
1) Water level readings have been made at times and under conditions stated, fluctuations of ground water may occur due to other factors than those present at the time measurements were made 2) Stratification lines represent approximate boundaries between soil and rock types, transition may be gradual

3) Field Test Data - Total organic vapors levels are referenced to a benzene standard measured in the head space of sealed soil sample jars using an organic vapor meter equipped with a philotoionization detector (PiD) and a 10 6eV lamp Results are in parts per million by volume (ppmv)

⁴⁾ On 6/18/02, water level was at top of casing, about 1.5' above existing ground surface

											BORING LOG							St	neet: 3 of 5	
	I	MC	MIIHA	RRIS	•AR	UP		T					BORING NO. B64							
DMJM#HARRIS • ARUP A Joint Venture										ECOND	AVENUE SUBWAY	Ī		STATION:			OFFS			
					14.4				3		PROJECT			T NO. CM 1	188			DINATES:		
				Œ	110								DATUM:	EL 158.08 NYCT	_			H: 217606		\dashv
				1		7							FINAL BORING DEPTH (FT) 140						2200	\dashv
SAM	PLER:	2" O.	D. Solit S	poon				BC	RING	CO: Jers	ey Boring and Drilling Co	., Inc.	GROUND WATER READINGS							
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ROC	K COR	E: NC)				_	RE	VIEW	ED BY: N	. A. Ponti, JDATE: 9/3/02		9/20/02	11:30		15.1	ow	84 Da	ays	
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NO 5) V	FES: ertical f	oliatio	n occurs be	etween 1	10' and	3 113'														
6) P	acker to	esling	performed	in the be	drock i	in 10' increi	ments	betw	een a	pproximat	ely 36' and 136' after coring w	as complete	ed.							
/) B	опот с	o Dore	note at 140	observ	ation v	vell installe	a to a	depth	of ap	proximate	ly 28'									- 1
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BORING LOG Sheet: 5 of 5												
DMJM#HARRIS • ARUP A Jean Venture	SECOND AVENUE SUBWAY	BORING STATION: PROJECT NO CM 1188	OFFSET: COORDINATES NORTH: 217606,1916									
1	l Ti	DATUM: NYCT	EAST: 994657.5258									
SAMPLER. 2" O.D. Split Spoon	BORING CO: Jersey Boring and Drilling Co., Inc.	FINAL BORING DEPTH (FT) 140 GROUND WATER READINGS										
SAMPLER HAMMER: 140 lb. Automatic	FOREMAN: A. Feliciano	DATE TIME DEPTH	STAB TIME OW 70 Days									
CASING SIZE: 3" and 5" CASING HAMMER: 140 lb.		9/13/02 12:15 15.3'	DW 77 Days									
ROCK CORE: NQ	The state of the s		DW 84 Days ROPERTIES									
DEPTH (FT) COSING (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 (%)	SAMPLE DESCRIPTION		NUMBER OF FRACTURES									
DEPTH (FT) COSING (BINFT) SAMPLE / CORE NO. SAMPLE DEPTH (FT) BLOWS / 6 INCH N VALUE (BPF) PENIREC: SOIL (INJI) TOTAL CORE REC (**)	SAMPLE DESCRIPTION BURMISTER (USCS / NYC BLDG CODE) CLASSIFICATIONS CLASSIFICATIONS	TRATA SYMBOL STRATA A SHEET STRATA S	values for values									
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3 3 3 3 3.5 4 C11 121-131 10/10 100 4 4 5 5	Very hard, fresh, fine to coarse grained, light to dark gray quartzose-mica-garnet 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		0 0 0 1 0 0 0 1 0 1 0									
135 4 C12 131-140 9/9 100	Similar to Schist in C11 except, disseminated pyrite		0 0 0 0 0 0 0									
	Boltom of borehole at 140 feet											
145 —												
GRANULAR SOILS COHESIVE SOILS	ROCK CORE CHARACTERISTICS	JOINT/FRACTURE CHARACTE										
0-4 Very Loose	Med Hard 3 Moderate (3) 3-10 Hard 4 Slight (4) 11-20	<2" Very close/Very Thin 2"-1' Close/Thin 1'-3' Mod Close/Mod Thick	5-35 Sub-Horizontal k 35-55 Mod Dipping 55-85 Sub-Vertical									
NOTES: 5) Vertical foliation occurs between 110' and 113' 6) Packer testing performed in the bedrock in 10' increments 7) Bottom of borehole at 140'; observation well installed to a 6	between approximately 36' and 136' after coring was complete depth of approximately 28'	ed.	BORING NO. B64-2									



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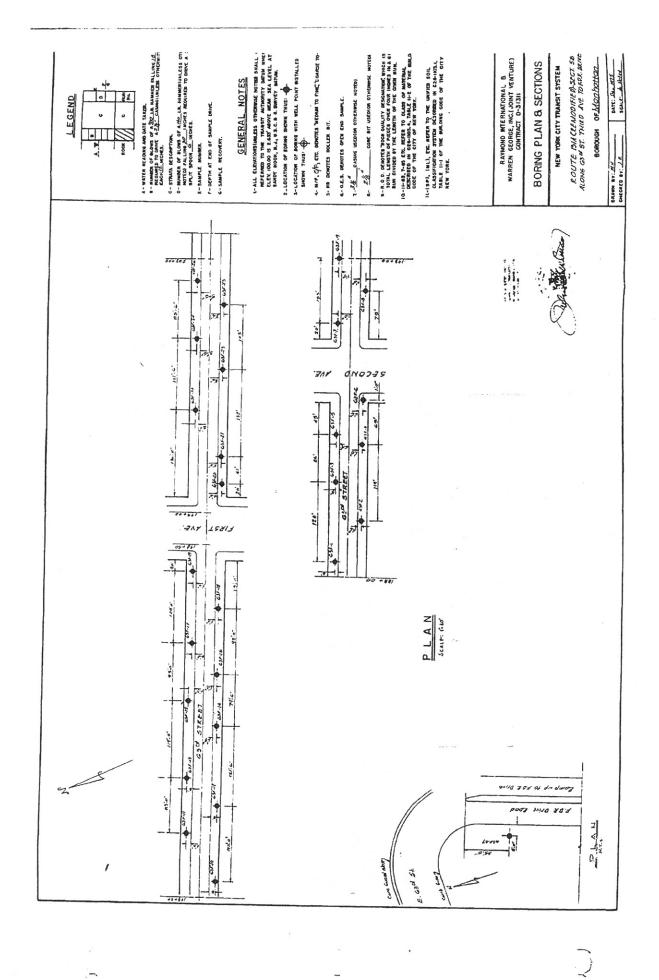
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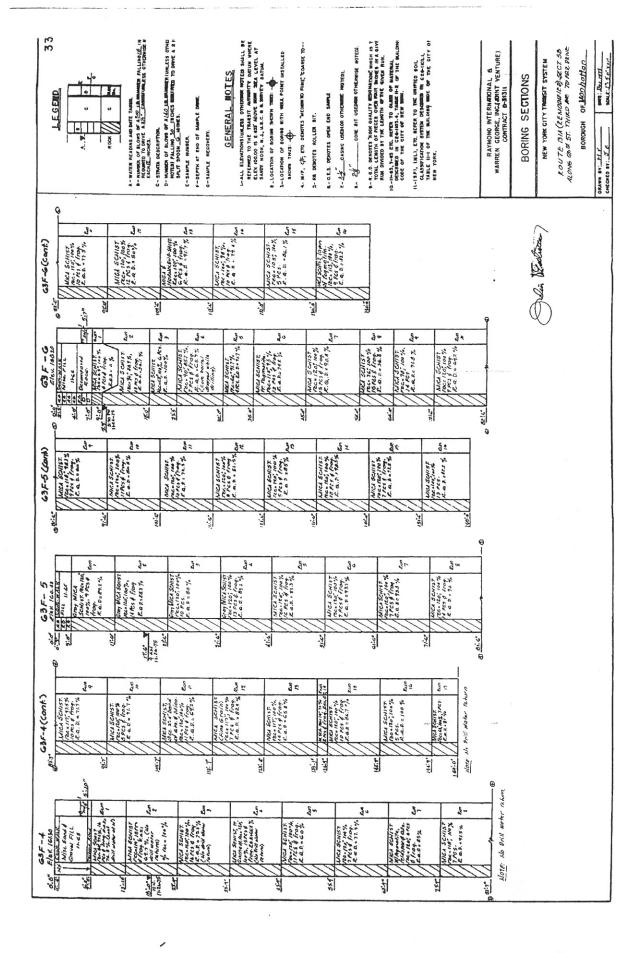
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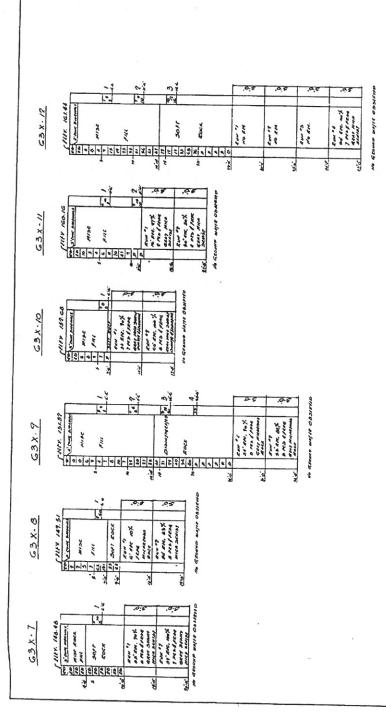
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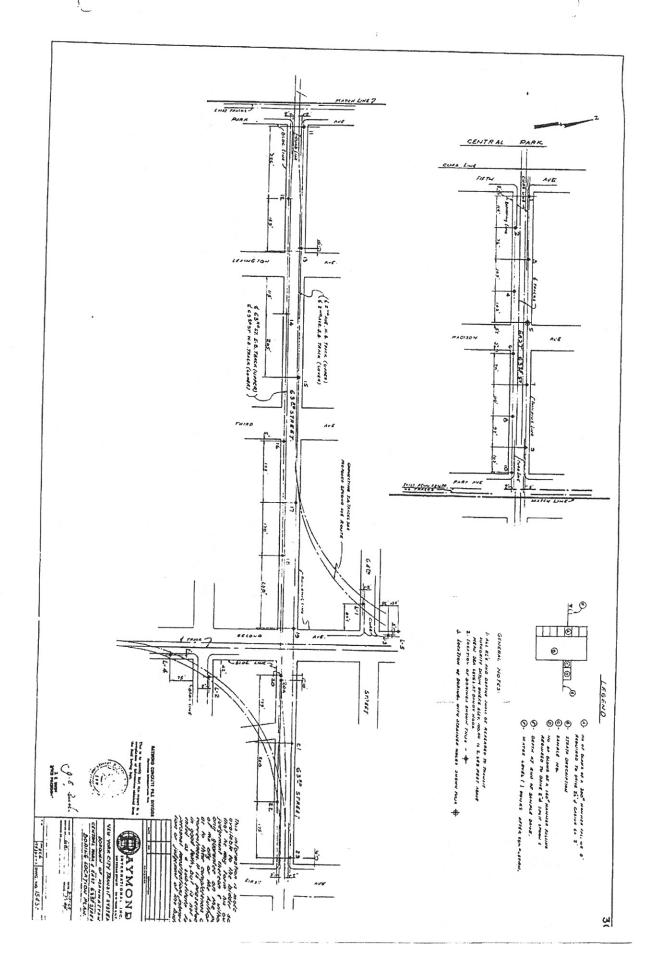
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