# HISTORICAL PERSPECTIVES INC.



# Phase IA Archaeological Documentary Study

Crotona Park Tennis Center Block 2942 Lot 1 Bronx, New York

LPC Project # 77DPR009X

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# Crotona Park Tennis Center Block 2942 Lot 1 Bronx, New York

# LPC Project # 77DPR009X

# Prepared For:

City of New York Department of Parks & Recreation 830 Fifth Avenue, Room 401 New York, NY 10065

and the

New York Junior Tennis League 58-12 Queens Blvd, Suite 1, 59th Street Woodside, NY 11377

Prepared By:

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#### **EXECUTIVE SUMMARY**

The City of New York Department of Parks and Recreation (DPR), in partnership with the New York Junior Tennis League, a concessionaire, is proposing to develop a new Tennis Center and two new tennis courts in Crotona Park to provide facilities necessary for tennis users and teaching purposes (Figures 1, 2, and 3). The new tennis amenities, to be known as the Cary Leeds Tennis Center, are located within a portion of Block 2942 Lot 1 in an area of the park that until late 2011 contained concrete handball courts, but which have since been removed. The tennis center building and two new courts will be situated in near proximity to twenty existing tennis courts, ten of which are currently under renovation. The tennis center is proposed to be 12,755 square feet, with one story situated 12 feet below grade in order to minimize the physical scale of the building within the park landscape.

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

LPC review of archaeological sensitivity models and historic maps indicates that there is potential for the recovery of remains from Native American occupation on the project site. Accordingly, the Commission recommends that an archaeological documentary study be performed for this site to clarify these initial findings and provide the threshold for the next level of review, if such review is necessary (see CEQR Technical Manual 2010) (Santucci 2011).

Results of the Phase IA Documentary Study revealed that despite the lack of previously recorded precontact archaeological sites within Crotona Park or the immediate vicinity, the site's natural conditions – only ca. 175 feet from a natural water source, well drained soils, and a relatively level landform – suggest that in its undisturbed state, the potential for the presence of precontact archaeological resources nonetheless would have been high. However, as described in the following report, the site has undergone a series of construction and demolition episodes since the 1930s that have disturbed the original landform. These have included:

- Construction of tennis courts immediately north of the site by 1924,
- Construction of horseshoe courts and shuffleboard courts on the northern and central portion of the site in 1935, which necessitated grading to create the level surface,
- Demolition of the horseshoe and shuffleboard courts and construction of the massive concrete handball courts in their place in 1939, and construction of new horseshoe courts and bocce courts at the southern end of the site at the same time, which likely required additional grading, and,
- Maintenance and demolition, 1939 2011, of the handball, horseshoe, and bocce courts.

The soil borings completed as part of the proposed project, while not overly precise, nevertheless allow several conclusions. None of the soil borings recorded what could be construed as an A horizon soil stratum at any point in the soil column, despite the USDA soil series description for the site and vicinity that suggested the possible presence of both an upper A horizon and a buried A horizon. Neither did the soil borings note soil that could be construed as a B horizon, either in color or in texture. Rather, the natural soils encountered in the soil borings appear to represent soil from the lower reaches of the soil column, well below the upper strata were precontact sites would most likely be found. Five soil borings, or one-third of the total, encountered bedrock but no soil. Even discounting the fact that the soil borings did not record the concrete surface of the handball court or any underlying soil used to prepare the concrete surface, the lack of upper soil horizons and the presence of shallow bedrock suggests that a significant amount of grading has occurred on the project site over time. It seems unlikely that the site could contain any potential precontact resources.

HPI has concluded that the Crotona Park Tennis Center project site is no longer sensitive for precontact archaeological resources. This is based on several factors, including a history of construction, demolition, and grading activities on the site; results of soil borings that indicate a lack of upper soil horizons remaining on the site; and the presence of bedrock located very close to what is now the ground surface. Based on these conclusions, HPI recommends that no additional archaeological investigations are warranted for the Crotona Park Tennis Center project site.

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- 1. Project site, view looking east.
- 2. Project site, view looking southeast.
- 3. Project site, view looking northeast.
- 4. Project site, view looking northwest.

#### I. INTRODUCTION

The City of New York City Department of Parks and Recreation (DPR), in partnership with the New York Junior Tennis League, a concessionaire, is proposing to develop a new Tennis Center and two new tennis courts in Crotona Park to provide facilities necessary for tennis users and teaching purposes (Figures 1, 2, and 3). The new tennis amenities, to be known as the Cary Leeds Tennis Center, are located within a portion of Block 2942 Lot 1 in an area of the park that until late 2011 contained concrete handball courts, but which have since been removed. The tennis center and two new courts will be situated in near proximity to twenty existing tennis courts, ten of which are currently under renovation. The tennis center building is proposed to be 12,755 square feet, with one story situated 12 feet below ground in order to minimize the physical scale of the building within the park landscape. The tennis center would contain multiuse rooms for tennis instruction purposes, locker rooms, office space, a pro-shop, and tennis viewing areas. A viewing platform would be constructed to allow for viewing of tennis activities for five of the twenty existing courts in addition to the two new courts to be constructed. Bleachers flanking the two new courts would also be incorporated into the project. One of the two new tennis courts, the stadium court will be situated 12 feet below grade. The second new court, the exhibition court, would have reduced stadium seating and would be 6 feet below grade.

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

LPC review of archaeological sensitivity models and historic maps indicates that there is potential for the recovery of remains from Native American occupation on the project site. Accordingly, the Commission recommends that an archaeological documentary study be performed for this site to clarify these initial findings and provide the threshold for the next level of review, if such review is necessary (see CEQR Technical Manual 2010) (Santucci 2011).

The present report, prepared by Historical Perspectives, Inc. (HPI) comprises the Phase IA Archaeological Documentary Study for the proposed project, which is also referred to as the Area of Potential Effect, or APE. This study complies with the guidelines of the LPC (CEQR 2010; LPC 2002). The HPI project team consisted of Julie Abell Horn, M.A., R.P.A., who conducted the project research, the site visit, and wrote this report; and Cece Saunders, M.A., R.P.A., who assisted with the project research, oversaw the project, and provided editorial and interpretive assistance.

# II. METHODOLOGY

This archaeological documentary study, in direct response to the specific concerns expressed by LPC, has concentrated on establishing the potential for Native American, or precontact period archaeological resources on and later disturbance to the APE.

The project site is located within Crotona Park, which was established as a New York City park in 1888. Prior to that time, the project site was part of a large estate. According to nineteenth century maps, several of which are included as figures, the project site was not developed prior to its acquisition by the City of New York. The first development in the vicinity was not until the 1920s, when a series of tennis courts were built adjacent to the APE. The handball courts, which until late 2011 stood on the project site, were built in 1939. As such, and because the LPC has requested information about the possibility of Native American archaeological remains and not historic period occupation, many of the standard archival resources normally consulted for an Archaeological Documentary Study were not applicable, including Department of Buildings records, tax records, city directories, and census records. Rather, research for this study has concentrated primarily on documenting the disturbance to the project site during its use as a public park. DPR provided a number of useful resources toward this goal, including maps depicting topography and construction within the park during the twentieth century, a recent geotechnical investigation including soil borings (RA Consultants 2011), and site photographs. A site visit was conducted on January 30, 2012 by Julie Abell Horn of HPI to assess any obvious or unrecorded subsurface disturbance.

### III. ENVIRONMENTAL/PHYSICAL SETTING

#### A. Current Conditions

As noted above, until late 2011, the APE was covered entirely by concrete handball courts and adjacent grassy areas that once contained horseshoe courts. The site is nearly level, with only approximately a foot of variation in elevation across the expanse (Photographs 1-4). An asphalt path is located to the west of the APE. Tennis courts are under renovation immediately to the north of the APE, and a brick tennis building is situated along the east side of Crotona Avenue. A large bank of exposed bedrock is situated immediately west of the APE, bordering Crotona Avenue.

### B. Topography, Hydrology and Soils

Prior to development with athletic facilities, the APE was vacant parkland, and before being acquired as part of Crotona Park in 1888, part of a large estate attributed to a series of landowners (e.g., Sidney and Neff 1851; Conner 1853; Beers 1868, 1872; Grant 1873; Viele 1874; Robinson and Pidgeon 1885). Original topography of the APE and vicinity can be seen on several nineteenth century historic maps, which show that the area was relatively level, but with some undulations in the topography, as is found throughout most of the park. A topographic map from 1873, made before the park was deeded to the City of New York but nonetheless identified as Crotona Park, shows the APE as more than 90 but less than 100 feet above sea level (Grant 1873; Figure 4). Another topographic map from 1894 shows nearly identical conditions (Risse 1894; Figure 5). The tennis courts to the north of the APE had been built by 1924, when an aerial photograph clearly shows their placement (Bureau of Engineering 1924; Figure 6). The APE, however, remained vacant until 1935, when horseshoe courts were created on the northern side of the APE and shuffleboard courts were built in the central section of the APE (Department of Parks 1935; Figure 7). The southern end of the APE remained vacant. Topography on the 1935 as-built map indicates the same nearly level landscape that the APE contains today,

suggesting that the APE was graded to create this nearly flat surface. In 1939, the horseshoe and shuffleboard courts were replaced with concrete handball courts, and new horseshoe courts were constructed at the southern end of the APE, along with several bocce courts (Department of Parks 1939; Figure 8). A modern topographical survey of the APE notes no change in topography since the 1930s (DPR 2011; Figure 3).

Historic maps also show that the area now covered by Crotona Park Lake to the east of the courts was originally a perennial stream, known historically as Bound Brook, a branch of which originated within Crotona Park, and then flowed south before joining Leggets Creek and emptying into Long Island Sound. The portion of Bound Brook within Crotona Park was bordered by wetlands. A small man-made pond, likely created by the nineteenth-century estate residents, was located along this drainage near the southern end of the existing lake, which was enlarged during the twentieth century to its present size. The original alignment of the drainage, prior to creation of the existing lake, was located ca. 175 feet east of the APE.

The USDA soil survey for New York City indicates that the APE falls within an area mapped as Greenbelt-Pavement & buildings complex, 0 to 8 percent slopes. It is described as:

Nearly level to gently sloping areas of bedrock controlled hills and ridges modified by glacial action that have been partially cut and filled, mostly for parks and low density residential use; a mixture of moderately deep gneissic till soils and anthropogenic soils, with more than 15 percent impervious pavement and buildings covering the surface; located in Manhattan and the Bronx (USDA 2005:14).

The Greenbelt series is a well drained soil composed of silt loam, loam, or sandy loam. It may contain both an upper soil horizon series (A, Bw, C) as well as a buried soil horizon series (Ab, Bwb). The USDA soil survey for New York City (2005:27) notes that a typical soil profile for the Greenbelt series is:

- A 0 to 3 inches brown (7.5YR 4/4) loam; medium subangular blocky structure; very friable; 5 percent gravel, 2 percent cobbles, and 2 percent stones; very strongly acid.
- Bw 3 to 13 inches yellowish red (5YR 4/6) loam; moderate medium subangular blocky and platy structure; friable; 2 percent gravel, 1 percent cobbles, and 1 percent stones; moderately acid.
- C 13 to 57 inches reddish brown (2.5YR 4/4) gravelly loam; massive; firm; 15 percent gravel, 5 percent cobbles, and 2 percent stones; moderately acid.
- Ab 57 to 58 inches dark brown (7.5YR 3/2) loam; weak medium granular structure; very friable; 5 percent gravel and 5 percent cobbles; extremely acid.
- *Bwb* 58 to 65 inches yellowish red (5YR 4/6) loam; moderate medium subangular blocky structure; very friable; 5 percent gravel and 5 percent cobbles; very strongly acid.

In April 2011, 15 soil borings were completed within the APE, as shown in Appendix A (RA Consultants 2011). The soil borings encountered three types of profiles: a profile whose upper stratum was fill, followed by natural soils below; a profile that did not contain fill, only natural soils; and profile that had no soil of any kind but was pure bedrock. Of note, although the borings were completed prior to the demolition of the handball courts, the logs did not record the concrete surface

of the courts or any underlying bedding materials used to prepare the concrete surface. The fill, measuring 3-4 feet in thickness, was found in Borings 1, 2, and 3, which were located along the western edge of the APE. Borings 8, 9, 13, 14, and 15, which were located at various points within the central portion of the APE, contained only bedrock. The remaining borings had strata described as silt with sand or sand with silt, containing varying amounts of gravel, with bedrock encountered at ca. 4-21 feet below the existing ground surface, depending on location. Colors were noted only as brown, grey, or greenish grey. None of the more precise soil distinctions noted in the USDA soil survey for the Greenbelt series were observed during the soil boring program. The geotechnical report that included these soil borings indicated that the natural soils on the APE were glacial till. Groundwater was observed at ca. 7-10 feet below the existing ground surface.

### IV. PRECONTACT SUMMARY

The presence of Native Americans in the Bronx for the Early Archaic through Late Woodland Periods has been documented, although some periods are more abundantly represented than others (Boesch 1996). At the time of European contact, Native American groups known as the Siwanoy occupied the northern coastline of Long Island Sound from Norwalk, Connecticut to what is now known as the south Bronx. However, the Bronx River is theorized to be the dividing line between the Siwanoy and another Upper Delaware Munsee speaking cultural group, the Wiechquaesqueak (Grumet 1981:1, 59-60).

An examination of records relating to precontact habitation in the Bronx indicates that while a diverse number of precontact sites were located throughout the Bronx at various time periods, often along watercourses, neither the project site nor the extent of Crotona Park have had any sites previously recorded. The closest known precontact sites to the project site are approximately one mile away. Boesch (1996) notes these sites as:

- The Bronx River Avenue site, also known as NYSM #2830 and 2831, and ACP-BRNX-9. This site, originally recorded by Arthur C. Parker (1922), consisted of a shell midden and small camp site with pit features in the West Farms neighborhood, immediately east of the Bronx River near Westchester Avenue.
- The Bronx River II site, recorded by the Westchester County Heritage Map as shell heaps located south of Delancy's Mills, on the east bank of the Bronx River, just south of the New York Zoological Gardens.
- An unnamed camp recorded by Bolton (1922), located at the intersection of the Boston Post Road and East 166<sup>th</sup> Street near a large glacial erratic.

Grumet's map of Indian Trails indicates that the closest known trail was located approximately 0.75 mile to the east of the project site, along the approximate alignment of West Farms Road to the west of the Bronx River (Grumet 1981:69).

Based on the distance of these precontact resources from the project site, the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) GIS does not identify Crotona Park as within an area of archaeological sensitivity.

However, in addition to compiling previously recorded precontact archaeological sites, Boesch also undertook the task of creating a model of precontact land use in the Bronx based upon the knowledge of existing precontact sites and their topographic locations coupled with an understanding of the precontact environmental conditions (Boesch 1996). Boesch identified fresh water courses, such as small streams, larger rivers, and saltwater estuaries as magnets for precontact settlement and resource exploitation. His generalized sensitivity map for the borough indicated that all of Crotona Park has a high sensitivity for precontact period resources, based no doubt on the original presence of the perennial drainage and wetlands within the park, and the fact that the park has not been subjected to widespread development. However, it should be noted that Boesch's assessment was generalized, and was not intended to account for prior disturbance, which is essential to establish in order to determine if any potential archaeological resources may have retained their integrity.

#### V. DISTURBANCE RECORD AND ARCHAEOLOGICAL SENSITIVITY

There are two issues to consider in determining the archaeological sensitivity of the project site, or APE for potential precontact remains. The first is whether any potential resources would have been located within the project site at all; and the second is whether these potential resources could still be present within the project site after the development associated with use of the site for athletic facilities.

Despite the lack of previously recorded precontact archaeological sites within Crotona Park or the immediate vicinity, the site's natural conditions – only ca. 175 feet from a natural water source, well drained soils, and a relatively level landform – suggest that in its undisturbed state, the potential for the presence of precontact archaeological resources nonetheless would have been high. However, as described above, the site has undergone a series of construction and demolition episodes since the 1930s that have disturbed the original landform. These have included:

- Construction of tennis courts immediately north of the site by 1924,
- Construction of horseshoe courts and shuffleboard courts on the northern and central portion of the site in 1935, which necessitated grading to create the level surface,
- Demolition of the horseshoe and shuffleboard courts and construction of the massive concrete handball courts in their place in 1939, and construction of new horseshoe courts and bocce courts at the southern end of the site at the same time, which likely required additional grading, and
- Maintenance and demolition, 1939 2011, of the handball, horseshoe, and bocce courts.

The soil borings completed as part of the proposed project, while not overly precise, nevertheless allow several conclusions. None of the soil borings recorded what could be construed as an A horizon soil stratum at any point in the soil column, despite the USDA soil series description for the site and vicinity that suggested the possible presence of both an upper A horizon and a buried A horizon. Neither did the soil borings note soil that could be construed as a B horizon, either in color or in texture. Rather, the natural soils encountered in the soil borings appear to represent soil from the lower reaches of the soil column, well below the upper strata where precontact sites would most likely be found. Five soil borings, or one-third of the total, encountered bedrock but

no soil. Even discounting the fact that the soil borings did not record the concrete surface of the handball court or any underlying soil used to prepare the concrete surface, the lack of upper soil horizons and the presence of shallow bedrock suggests that a significant amount of grading has occurred on the project site over time. It seems unlikely that the site as it exists today could still contain any potential precontact resources.

#### VI. CONCLUSIONS AND RECOMMENDATIONS

HPI has concluded that the Crotona Park Tennis Center project site is no longer sensitive for precontact archaeological resources. This is based on several factors, including a history of construction, demolition, and grading activities on the site; results of soil borings that indicate a lack of upper soil horizons remaining on the site; and the presence of bedrock located very close to what is now the ground surface. Based on these conclusions, HPI recommends that no additional archaeological investigations are warranted for the Crotona Park Tennis Center project site.

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2011 Cary Leeds Tennis Center New Construction, One (1) Stadium Court, One (1) Exhibition Court and One (1) Viewing Deck, Located in Crotona Park, Borough of the Bronx.

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#### Sidney and Neff

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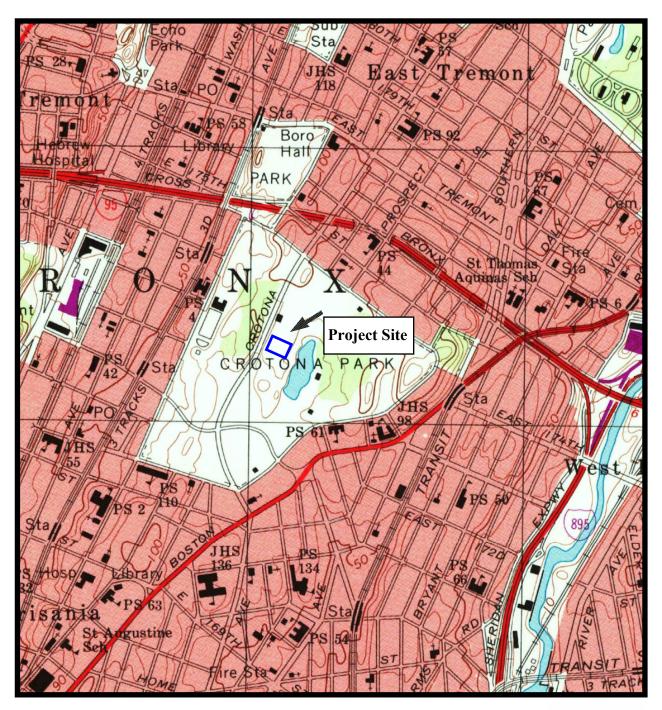
2005 New York City Reconnaissance Soil Survey. United States Department of Agriculture, Natural Resources Conservation Service, Staten Island, NY.

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1995 Central Park, N.Y-N.J. Quadrangle. 7.5 minute series.

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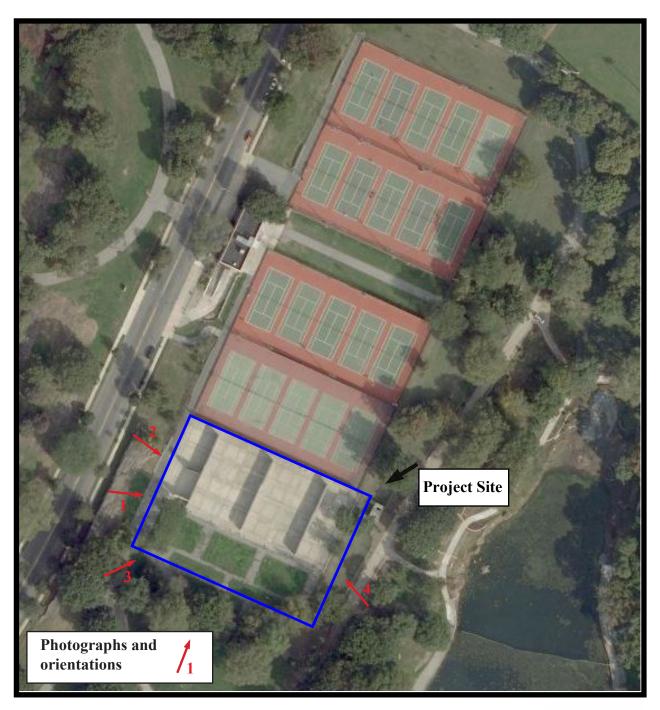
Phase IA Archaeological Documentary Study Crotona Park Tennis Center Block 2942, Lot 1 Bronx, New York





Figure 1: Project site on *Central Park*, *N.Y.* 7.5 Minute Quadrangle (U.S.G.S. 1995).

0	1000	2000	3000	4000	5000	FEET
<u> </u>			200	- 0 0 0	2000	



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Figure 2: Project site and photograph locations on modern aerial photograph (Bing 2011). Note that project site currently is vacant.

0	100	200	300	400	<b>500</b>	FEET

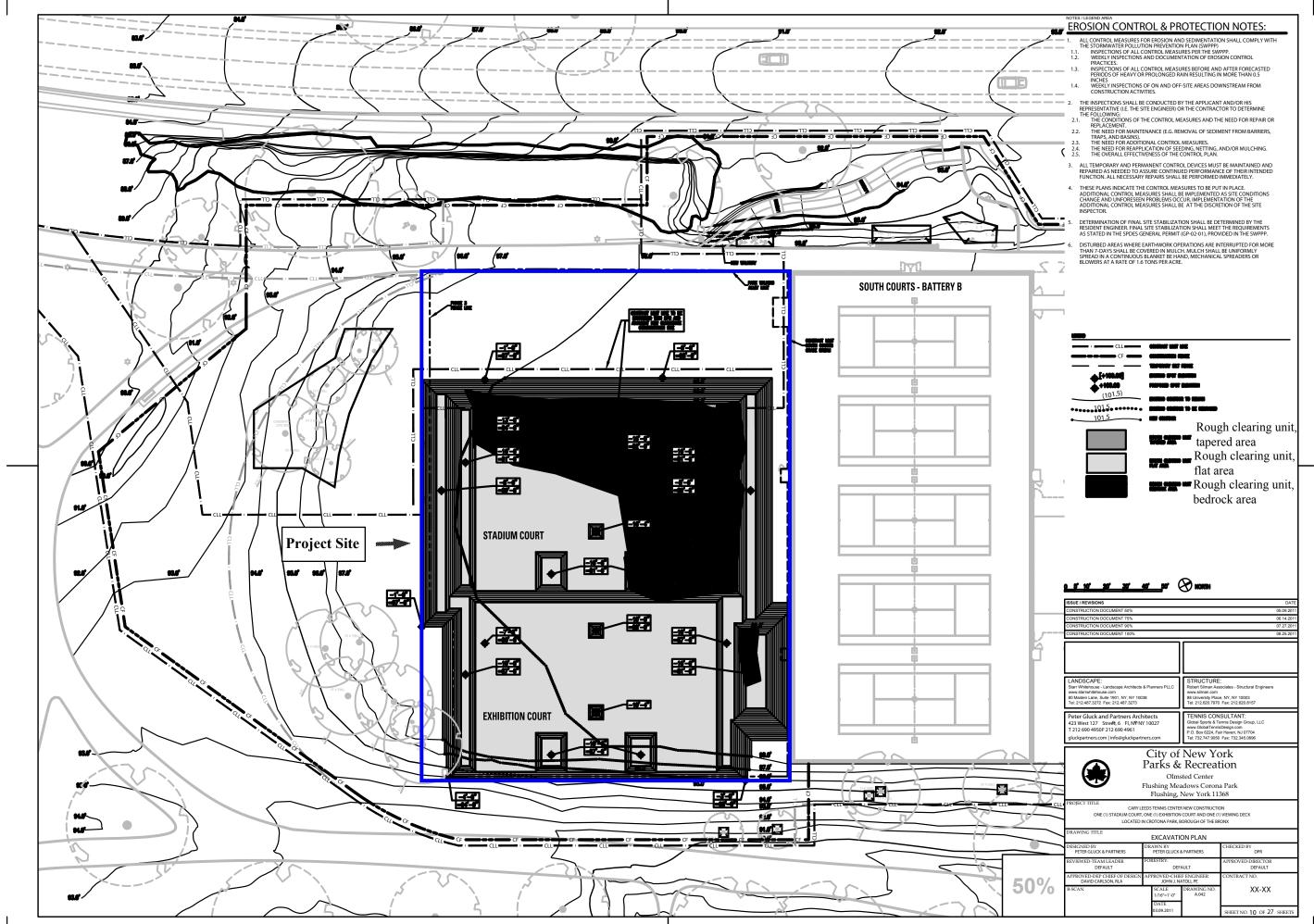
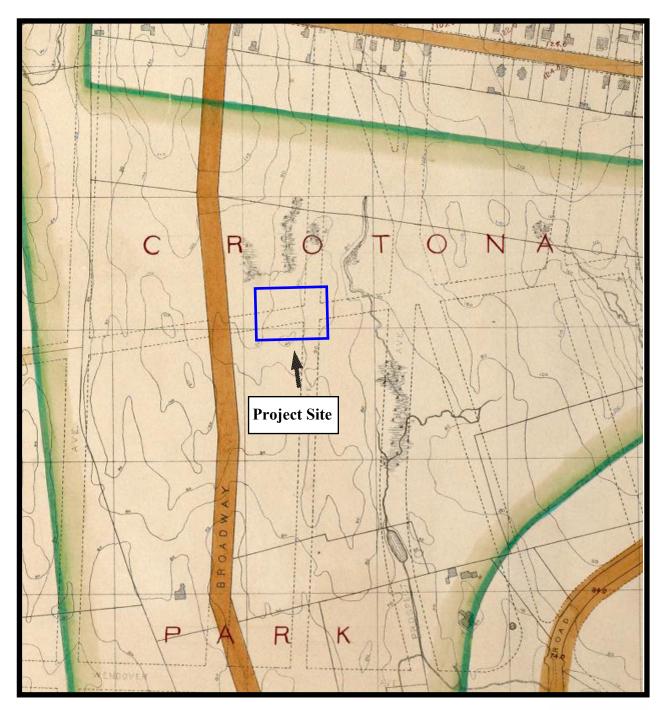


Figure 3: Project site on modern survey map (DPR 2011).



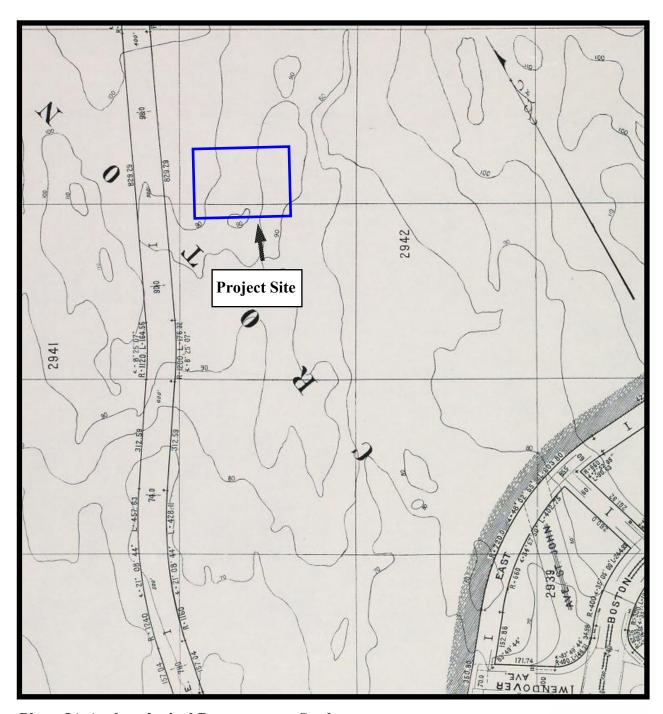
Phase IA Archaeological Documentary Study Crotona Park Tennis Center Block 2942, Lot 1 Bronx, New York





Figure 4: Project site on *Topographical map made from surveys by the commissioners of the Department of Public Parks* (Grant 1873).

0	200	400	600	800	1000	FEET



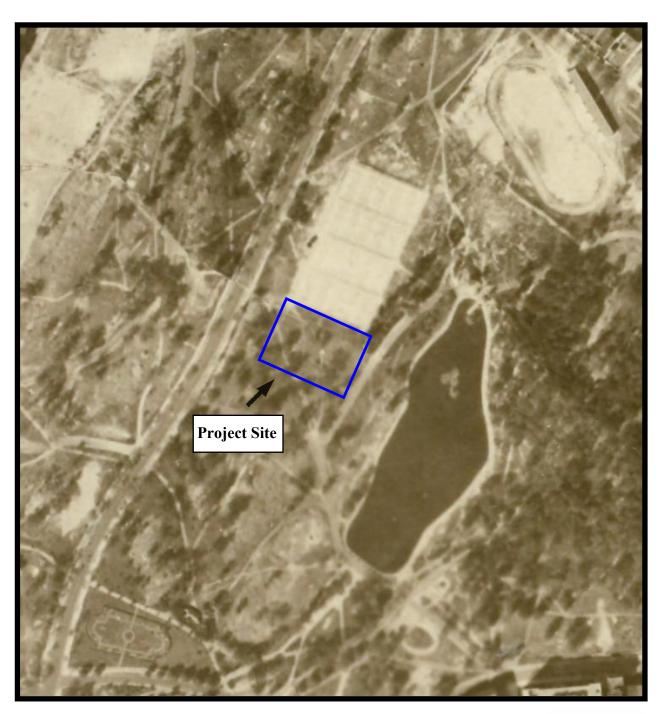
Phase IA Archaeological Documentary Study Crotona Park Tennis Center Block 2942, Lot 1 Bronx, New York





Figure 5: Project site on *Maps or plans and profiles, with field notes and explanatory remarks...* (Risse 1894).

0	250	<b>500</b>	<b>750</b>	1000	1250	FEET



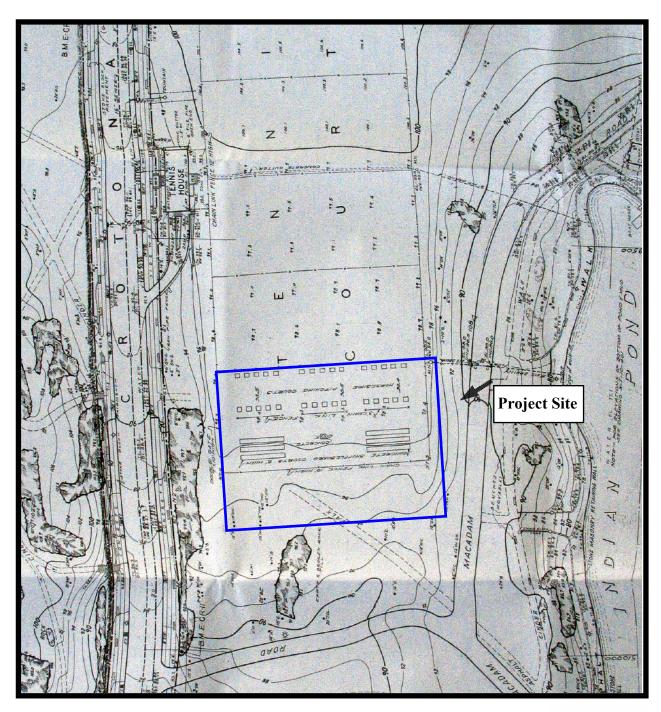
Phase IA Archaeological Documentary Study Crotona Park Tennis Center Block 2942, Lot 1 Bronx, New York





Figure 6: Project site on Sectional Aerial Maps of the City of New York (N.Y. Bureau of Engineering 1924).

0	125	250	375	500	625	FEET



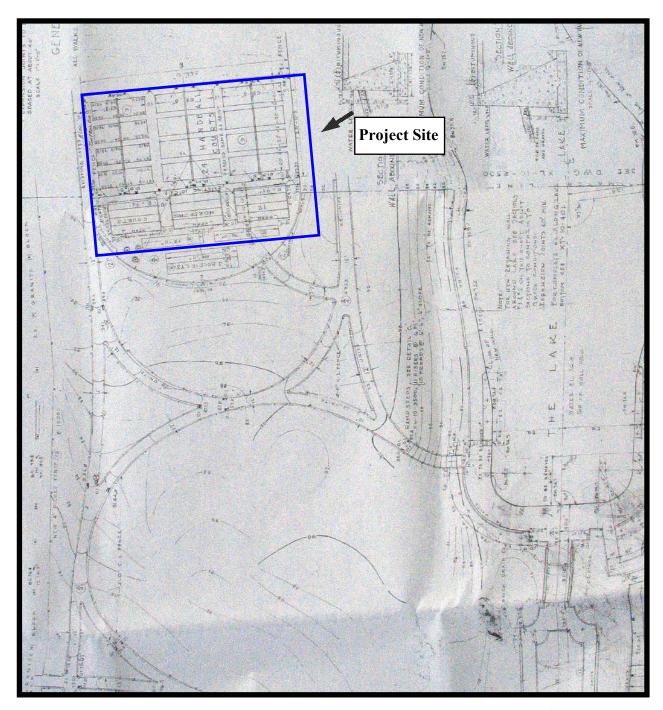
Phase IA Archaeological Documentary Study Crotona Park Tennis Center Block 2942, Lot 1 Bronx, New York





Figure 7: Project site on Map of Portion of Crotona Park (Department of Parks 1935).

0	125	5 2:	50 3'	75 5	00 62	25 FEET



Phase IA Archaeological Documentary Study Crotona Park Tennis Center Block 2942, Lot 1 Bronx, New York





Figure 8: Project site on Landscape, Construction & Grading Plan (Department of Parks 1939).

0	125	250	375	500	<b>625 FEET</b>

# **PHOTOGRAPHS**



Photograph 1: Project site, view looking east.



Photograph 2: Project site, view looking southeast.





Photograph 4: Project site, view looking northwest.

APPENDIX A

**Boring Logs** 





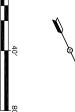
BORING LOCATION

BORING LOCATION WITH OBSERVATION WELL

(+XX) TOP OF ROCK CLASS 1C OR BETTER

NOTES:

- 1. BORNIGS DRILLED BY WARREN GEDRGE INC. AND OBSERVED BY RA CONSULTANTS LLC.. APRIL 6TH THROUGH APRIL 14TH 2011.
- 2. ELEVATIONS CORRESPOND TO BRONX HIGHWAY DATUM
- 3. REFER TO FIGURE 2 FOR SECTION A-A





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	DRAWN BY:	PS

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1 OF 1

DRAWING: CHECKED BY:

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FIGURE 1

	Geote	chnic	a/	Eng	ineer	ing					•				
						•					S	Sheet	1	of	2
PROJECT	Carey Leeds Tennis	Center						PROJEC	CT NUM	BER	11C10	016			
LOCATION	Crotona Park, Bronx,							ELEVA1	TION & D	DATUM	Bronx	Highway	/s +98	3 annrox	
DRILLING AGENCY	Crotona : and Drony							DATE S	TARTE	)	2.0	DATE CO			
	Warren George Inc										6/2011				/6/2011
DRILLING EQUIPMENT	Soil Max XLS							COMPL	ETION D	EPTH (F	ғт) 23.0	ROCK DE	PTH (F	·T)	18.0
SIZE AND TYPE OF BIT	3-15/16"	SIZE AN	D TY	PE COR	REBARR	EL		NO.SAN	<b>IPLES</b>	DIST.	4	UNDIST.	0	CORE (FT)	
CASING SIZE AND TYPE	4"	NX						WATER				COMPL.	-	24HR	-
CASING HAMMER WEIGHT	300 lb 2 in S.S	DROP		30" 30"		SAMPLIN		FOREM			urgess				
SAMPLER HAMMER WEIGHT	140 lb	DROP	Safe		_ на ≀Donut	MMER T		HELPER			Burges ck Sorr				
	1.10.10				Sample			Results							
DESCR	IPTION	DEP <sup>-</sup>	ΤН	Туре	Recov.		water			ATA		RI	ΕΜΑ	RKS	
					FT/	BL/6"	cont.	-200							
		(ft)		No.	/ %	RQD%	(%)	(%)							
1		F	4								Starte	ed drilling	at 11	:00	
Elli Bassas " . "		- 1	_		-	<u> </u>			_	::11					
Fill: Brown medium to fin	ne sand with silt,	-	-	00		5			F	ill					
asphalt (7)		- 2	-	SS 1	1	6 5									
_		-	-	'		10				3'					
<u> </u>		<del>-</del> 3									1				
<del>-</del>		Ι,	- 1												
1		4													
]		- 5													
Brown silt with fine sand	(ML)(5b)					7	31	82.6	9	ilt					
		- 6		SS	1	7				,,,,					
		L .	_	2		3									
<u> </u>		- 7	_			2									
<u> </u>		-	-												
+		- 8	_						8	.5'					
		F	-						0	.5	1				
1		- 9	-												
<u> </u>		<b>-</b>	-												
Brown medium to fine sa	and with silt, fine	<del>-</del> 10				13									
gravel (SP)(3a)		T 44		SS	1.5	15									
		<u> </u>		3	1.5	19									
		_ 12				21									
			_												
-		<b>—</b> 13	_						Sa	and					
<u> </u>		F	-												
<u> </u>		<del>-</del> 14	_												
+		F	-												
Brown silty sand (SM)(3l	h)	<del>-</del> 15	-			3	17.9	23.8							
Drown only dana (Onl)(of	~)	<u>ا</u>	-	SS	_	5	11.0	20.0							
<del>-</del>		<del>-</del> 16	T	4	2	10									
		_ 17	٦			13									
		_ 17													
1		_ 18							1	8'	1				
Gray intermediate mica	schist (1b)	'S	4												
1		_ 19	4	C-1	88	41			Ro	ock			& R0	QD conside	ered
4		- 20	4								for roo	ck class			



								Sheet			2
DESCRIPTION	DEDTH	DEPTH Type Recov.				Results	STRATA	D	ΕMΔ	RKS	
DESCRIPTION	DEFIII	Туре	FT/	Resist. BL/6"	water cont.	-200	SINAIA	K	LIVIA	INNO	
	(ft)	No.	/%	RQD%	(%)	(%)					
Gray intermediate mica schist (1c)											
	_ 21 _						Rock				
		C-1	88	41			rtoon				
	_ 22 _										
End of boring	23						23'	Fiinished drilling	ng at 1	12:30	
End of boning											
	_ 24 _										
	_ 25 _										
	_ 26 _										
	_ 27 _										
	-										
	_ 28 _										
	_ 29 _										
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	_ 30 _										
	_ 31 _										
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	42										
	<del>- 43 -</del>										
	<del>- 44 -</del>										
	45										

KA C	Geote					ing				_0	, 0.	<b>D</b> 0	·9·		
DD 0 1507								Inn - :-	OT 1		S	heet	1	of	2
PROJECT	Carey Leeds Tennis C	:enter						PROJE	CT NUM	BER	11C10	16			
LOCATION								ELEVA	TION & D	DATUM					
	Crotona Park, Bronx, I	NY									Bronx			8, approx	
DRILLING AGENCY								DATES	TARTE			DATE CO	MPLE1		
	Warren George Inc										1/2011				12/2011
DRILLING EQUIPMENT	0 " • • • • • •							COMPL	ETION D	EPTH (I		ROCK DE	PTH (F	FT)	
	Soil Max XLS	1									26.0			1	21.0
SIZE AND TYPE OF BIT	3-15/16"								MPLES	DIST.	5	UNDIST.	0	CORE (FT	) 5
CASING SIZE AND TYPE	4"	NX		00"	1				LEVEL		-	COMPL.	-	24HR	
CASING HAMMER WEIGHT	300 lb	DROP	_	30"	4	SAMPLIN		FOREM			urgess				
SAMPLER	2 in S.S	DROP	0-1	30"			HELPER			Burges					
SAMPLER HAMMER WEIGHT	140 lb	X	Saf			: 🗆 A		INSPEC	TOR	Patri	ck Sorre	entino			
					Sample	S	Lab. F	Results							
DESCRI	PTION	DEP.	TΗ	Type	Recov.	Resist.	water		STR	ATA		RE	EMA	RKS	
					FT/	BL/6"	cont.	-200							
		(ft)		No.	/%	RQD%	(%)	(%)							
		1 17		, , , ,			(70)	(73)			Starto	d drilling	at 11	.30	
}		F	-								J. Cal I.C.	a anning	at 11	.50	
Cille Diestrande 19 - 92 - 5	valsan vast: (7)	<u> </u>	_		-	4.0									
Fill: Black asphalt with b	roken rock (7)	L	_			10			_						
		- 2	_	SS	1	20			F	ill					
		L -	_	1	·	35									
		Γ,				50/3"									
		<del>-</del> 3									Boulde	er from 3	'-5'		
		F	-						_	4'			-		
		- 4	_								+				
		L	_												
		- 5	_												
Brown silty sand (SM)(6)															
		_		SS	4.0	5									
		<del>-</del> 6		2	1.2	3									
		F	-	_		2									
		<del>-</del> 7	_												
		F	_												
		- 8	_												
		L	_												
		<b>–</b> 9													
		_ 9													
		Γ.,	_												
Brown medium to fine sa	and with silt mica	<u> </u>	) —			9	14.8	18							
l l	and with siit, iiilda	H	-	00			14.0	10							
(SM)(3a)		<del>-</del> 11	_	SS	1	24									
		_	_	3		20			_						
		_ 12	,			22			Sa	and					
		12	•												
		Γ.,													
		<u> </u>	· —												
		-	-												
		<del>-</del> 14	ļ —												
<u> </u>		F	_												
		_ 15	; _		ļ										
Brown coarse to fine san	d with coarse to	L '`	_			9									
fine gravel, silt, mica (SF	P)(3a)	10	, –	SS	4	24									
,		<del>-</del> 16	, —	4	1	20									
†		<u> </u>	-			22									
<del> </del>		<u> </u>	<i>_</i>				1								
+		F	_												
		_ 18	3 —												
		L	_												
		_ 19	_ د												
		'8	,												



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Ī				Sample		Lab. R	Results				
	DESCRIPTION	DEPTH	Туре	Recov.	Resist.	water		STRATA	R	EMARKS	
				FT/	BL/6"	cont.	-200				
1		(ft)	No.	/ %	RQD%	(%)	(%)				
4	Gray broken rock (1d)		SS	0.2	50/3"			Soft Rock			
4		— 21 —	5					21'			
4	Hard gray mica schist (1a)										
4		— 22 —									
+											
4		— 23 —						Rock			
+		-	C-1	99	98			NOCK			
+		<b>–</b> 24 <b>–</b>									
+											
$\forall$		— 25 —									
+		-						26'	Finished hole	at 10:00	
+	End of boring	— 26 —						20	i illisiled flole	at 10.00	
t	End of borning	-									
†		— 27 —									
1											
7		— 28 —									
1											
Ħ		— 29 —									
1											
1		— 30 —									
1											
1		— 31 —									
1											
1		— 32 —									
1		22									
1		— 33 —									
1		_ _ 34 _									
1		34									
╛		<b>–</b> 35 <b>–</b>									
1		_ 55									
1		— 36 —									
1											
4		— 37 —									
4	,	ļ									
4		— 38 —									
4		<u> </u>									
4		— 39 —									
4											
+		<del>-</del> 40 -									
+		_									
+		— 41 —									
+											
+		— 42 —									
+											
+	,	— 43 —									
†		-									
7		— 44 —									
1		45									
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							Inn - :=	OT 1		S	heet	1	of	2
PROJECT	Carey Leeds Tennis	Center					PROJE	CT NUMI	BER	11C10	016			
LOCATION	Crotona Park, Bronx						ELEVA1	FION & D	ATUM		Highwa	ays,+	-99 apı	orox
DRILLING AGENCY	Warren George Inc						DATE S	TARTE		1/2011	4/11/2011			
DRILLING EQUIPMENT	Soil Max XLS						COMPL	ETION D	EPTH (I	FT) 22.0	ROCK D	EPTH (	(FT)	17.0
SIZE AND TYPE OF BIT	3-15/16"	CIZE AND	TYPE COF	DE DADE	) E I		NO.SAN	ADI ES	DIST.	4	UNDIST	. 0	CORI	
CASING SIZE AND TYPE	4"	NX NX	71112001	(L DAI(I				LEVEL	FIRST		COMPL.		24HR	
CASING HAMMER WEIGHT	300 lb	DROP	30"	т ,	SAMPLIN	ıc	FOREM			urgess			24HK	
SAMPLER	2 in S.S	DROP	30"	_	MMER T		HELPER			Burges				
SAMPLER HAMMER WEIGHT			Safety 🗆	-			INSPEC			ck Sorr				
SAMPLER HAMMER WEIGHT	140 10	^ .							гаш	T SUIT	CHUITO			
DESCR	RIPTION	DEPT (ft)		Recov. FT/%	Resist. BL/6" RQD%	water cont.	-200 (%)		ATA		R	REMA	ARKS	
		-	_							D	ate	Ti	me	Water Level El.
Fill: Brown silty sand w	ith concrete (7)	<u> </u>	+	1	7	1				1/12	/2011	Q	:00	89.5
Fill. DIOWIT SIILY SAITU W	itii concrete (7)	F	-					_	:11					
,		- 2	SS	1.5	4			-	ill		/2011		:00	90.8
		L -	_ 1		4					4/14	/2011	8	:00	90.9
		<del>-</del> 3	4		4									
		_	4					l .	.,					
		L 4	_						ļ'	+	ed Well			
		L								(10' of	screen	, 7' of	riser)	
Gray silty fine sand with	n medium to fine	<del>-</del> 5			3									
gravel (SM)(3b)	· · · · · · · · · · · · · · · · · · ·	-	ss		4									
graver (Sivi)(Sb)		<del>-</del> 6	_	1.5				Sa	ınd					
		L	_ 2		8									
		- 7			8									
		,												
		Γ	1											
		<del>-</del> 8						8.	5'					
		<b>-</b>	4							†				
		- 9	_											
		L	_											
		<del>-</del> 10												
Greenish gray silt with t	fine sand (ML)(5b)	10			2									
		Γ.,	SS	١.	3									
		<u> </u>	3	1	15			S	ilt					
		<b>-</b>	- T											
		<del>-</del> 12	+		16	1								
		-	4											
		<del>-</del> 13	_											
		14						1	4'					
		<del>-</del> 14	7							Ī				
			1											
Decomposed rock with	medium to fine	<del>-</del> 15	1		8	1		ח	R					
	medium to line	-						٦	11					
sand, silt (1d)		<del>-</del> 16	SS	1	8									
		L.	4		20									
		_ 17			53			1	7'	]				
Gray medium hard mic	a schist (1b)													
	. ,		1											
		<del>-</del> 18												
		F	- C-1	70	58			Ro	ck					
		<del>-</del> 19	_											
		L												
		20			ĺ	1	1	ĺ		ĺ				



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DESCRIPTION	DEPTH		Recov.	Resist.		Results	STRATA	REMARKS					
BEGORII HOW		Турс	FT/	BL/6"	cont.	-200	01101171						
O	(ft)	No.	/ %	RQD%	(%)	(%)							
Gray medium hard mica schist (1b)							Rock						
	_ 21 _	C-1	70	58									
End of boring	22 -						22'						
End of boiling	 - 23 -												
	- 23 -												
	<b>–</b> 24 <b>–</b>												
	- 25 -												
	-												
	<del>- 26 -</del>												
	_ 27 _												
	- 28 <del>-</del>												
	<b>–</b> 29 <b>–</b>												
	- 30 -												
	- 30 -												
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	- 32 <del>-</del>												
	<del>- 33 -</del>												
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	— 35 —												
	<b>–</b> 36 <b>–</b>												
	<del>- 37 -</del>												
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	- 39 <del>-</del>												
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	<del>- 40 -</del>												
	- 41 -												
	-												
	<del>-</del> 42 <del>-</del>												
	<b>–</b> 43 <b>–</b>												
	-												
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PROJECT	Carey Leeds Tenni	is Center					PROJE	CT NUME	BER	11C10	016					
LOCATION	Crotona Park, Bror						ELEVA	FION & D	ATUM	Brony	Highway	/c ±0	8 approv			
DRILLING AGENCY	Cioloria Park, Bior	IX, IN I					DATE S	TARTED	)	Bronx Highways +98, approx DATE COMPLETED						
	Warren George Ind	С					4/6/2011 4/6/									
DRILLING EQUIPMENT	0 11.1. \( \tau \)						COMPL	ETION D	EPTH (F		ROCK DE	PTH (	FT)			
OIZE AND TYPE OF DIT	Soil Max XLS 3-15/16"	CIZE AND T		NO.SAN	ADI EC	DIST.	10.5	UNDIST.	0	CODE (ET)	5					
SIZE AND TYPE OF BIT CASING SIZE AND TYPE	4"	NX	SIZE AND TYPE CORE BARREL					LEVEL	FIRST	-	COMPL.	-	CORE (FT) 24HR			
CASING HAMMER WEIGHT	300 lb	DROP					FOREM			urgess						
SAMPLER	2 in S.S	DROP 30" HAMMER TYPE					HELPER	₹	Alen	Burges	SS					
SAMPLER HAMMER WEIGHT	140 lb	x Sa		Donut			INSPEC		Patrio	k Sorr	entino					
				Sample	s	Lab. F	Results									
DESCR	RIPTION	DEPTH	Type	Recov.	Resist. BL/6"	water		STR	ATA		RI	=MA	ARKS			
						cont.	-200									
		(ft)	No.	/ %	RQD%	(%)	(%)									
			4													
Brown medium to fine s	and with all	<u> </u>		1												
	and with siit	-			6			Sa	nd							
(SP)(3b)		- 2 -	SS 1		6 6			Sa	iiu							
		-	┨ '		6											
		- 3 -			U											
		-	1					4	!							
		<del>-</del> 4 -	1							l						
		-	1					S	ilt							
Brown silt with fine sand	d (SM)(5a)	<del>-</del> 5 -	SS-2	0.2	50/2"			5.	5'							
Gray medium hard mica								-		Ì						
		- 6 -	1													
		_ T	1													
		<b>⊢</b> 7 <b>−</b>	1													
		ļ , ·		00	-4			Ro	ck							
		- 8 -	C-1	63	51											
			1													
		_ 9 -														
		<del>-</del> 10 -														
		10						10	.5'							
End of boring		_ 11 _	]				1									
		ļ	1													
		<b>–</b> 12 <b>–</b>	1													
		<del>- 13 -</del>	4													
		<del>- 14 -</del>	1													
			4													
		<del>-</del> 15 -	4													
		-	1													
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		<del>-</del> 17 -	1													
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		<del>- 18 -</del>	ł													
		-	1													
		<del>-</del> 19 -	1													
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PROJECT	Ones I and Tami	D1					PROJE	CT NUMI	BER			•		-	
LOCATION	Carey Leeds Tennis (	Senter					ELEVA1	TION & D	ATUM	11C10	)16				
	Crotona Park, Bronx,	NY					ELEVATION & DATUM Bronx Highways +98, approx								
DRILLING AGENCY							DATE S	TARTE			DATE CO	MPLET		_,	
	Warren George Inc									6/2011	+			7/201	
DRILLING EQUIPMENT	Soil Max XLS						COMPL	ETION D	EPTH (F	-т) 12.0	ROCK DE	PTH (F	FT)	7.	
SIZE AND TYPE OF BIT	3-15/16"	SIZE AND T	YPE COE	RE BARR	FI		NO.SAN	MPI FS	DIST.	2	UNDIST.	0	CORE (FT)		
CASING SIZE AND TYPE	4"	SIZE AND TYPE CORE BARREL NX						LEVEL	_	-	COMPL.	-	24HR		
CASING HAMMER WEIGHT	300 lb	DROP 30" SAMPLING FO				FOREM			urgess						
SAMPLER	2 in S.S					HELPER	R	Alen	Burges	ss					
SAMPLER HAMMER WEIGHT	140 lb	x Sa	afety 🗆	Donut	□ AT	Ή	INSPEC	TOR	Patrio	ck Sorr	entino				
				Sample	es	Lab. F	Results								
DESCR	IPTION	DEPTH	Туре	Recov.		water		STR	ATA		RE	EMA	RKS		
İ				FT/	BL/6"	cont.	-200								
<u> </u>		(ft)	No.	/ %	RQD%	(%)	(%)								
Brown medium to fine sa	and with fine				4										
gravel (SP)(3b)		_ 1 -	SS	1	7										
		_ ' -	1	'	7										
		_ 2 -	1	<u>l</u>	6			Sa	and						
,															
		<del>-</del> 3 -													
•		Ī.,						4	4'						
•		<del>-</del> 4 -													
i.		Ι _	1												
Brown silt with fine sand	d. mica	<del>-</del> 5 -			2			S	ilt						
(ML)(5b)	.,	_	SS		2										
(=)(02)		<del>-</del> 6 -	2	1	50/2"										
			1					l -	7'						
Gray medium hard mica	schist (1h)	<del>-</del> 7 -													
Cray modium nara milo	(15)	-	-												
		<del>-</del> 8 -													
			_												
		<b>9</b> -	-					R.	ock						
		-	- C-1	97	75			1	JUK						
		<del>-</del> 10 -													
		-	4												
		<u> </u>													
•		-	-						2'						
End of haring		<del> </del> 12 -		+	-		+	1	2'						
End of boring		-	4												
		<del>-</del> 13 -													
,		F	4												
		<del>- 14 -</del>													
		-	4												
		<b>—</b> 15 <b>-</b>													
		<u> </u>	4												
		_ 16 -													
		L	_												
		_ 17 -													
		L ''	_												
		_ 18 -													
		10													
		<del>-</del> 19 -													
		_	-1	1	i	ı	1	i		i					

PROJECT	Carey Leeds Tennis	s Center					PROJE	CT NUMI	BER	11C10				
LOCATION	-						ELEVA	FION & D	ATUM					
	Crotona Park, Bron	x, NY								Bronx				
DRILLING AGENCY	Marron Coorgo Inc						DATES	TARTE		7/2011		MPLET		/7/204
DRILLING EQUIPMENT	Warren George Inc						COMPI	ETION D		7/2011		DTU /E		/7/20
DRILLING EQUIPMENT	Soil Max XLS						COMPL	ETION D	EFIN (F	15.0		F I II (F	1)	10
SIZE AND TYPE OF BIT	3-15/16"	SIZE AND T	YPE COF	REBARR	EL		NO.SAN	/PLES	DIST.	2	UNDIST.	0	CORE (FT)	
CASING SIZE AND TYPE	4"	NX					WATER		FIRST	-	COMPL.	-	24HR	
CASING HAMMER WEIGHT	300 lb	DROP	30"	8	AMPLIN	G	FOREM		Gil B	urgess			l.	
SAMPLER	2 in S.S	DROP	30"	НА	MMER T	YPE	HELPER	₹	Alen	Burges	s			
SAMPLER HAMMER WEIGHT	140 lb	x Sa	fety 🗆	Donut	□ AT	Ή	INSPEC	TOR	Patrio	k Sorre	entino			
			,	Sample	s	Lab. F	Results							
DESCR	IPTION	DEPTH			Resist.	water		STR	ATA		RE	ΞMΑ	RKS	
1			1	FT/	BL/6"	cont.	-200							
1		(ft)	No.	/%	RQD%	(%)	(%)							
		(11)	INU.	70	וועט%	( /0)	( /0)							
I		-	-											
		<u></u> 1 −												
Brown medium to fine s	and with silt, fine	ļ .	4		10									
gravel (SP)(3b)		- 2 -	SS	1	7									
		L -	1	'	4									
					4									
·		- 3 -												
			1											
		<b>⊢</b> 4 −	1											
		-	1					80	and					
		<del>-</del> 5 -			_			30	iliu					
Brown silty medium to f	ine sand with	<u> </u>			4									
fine gravel (SM)(6)		<del>-</del> 6 -	SS	1	2									
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Gray hard mica schist (	(1a)	L 'Ŭ .	1											
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End of boring		T 15 -												
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PROJECT							PROJEC	CT NUMB	BER		heet	1	UI	1
LOCATION	Carey Leeds Tennis	Center						TION & D		11C10	016			
LOCATION	Crotona Park, Bron	x, NY					ELEVAI	ION & DA	AIUM	Bronx	Highway	's +99	), approx	
DRILLING AGENCY							DATE S	TARTED			DATE CO		ED	
	Warren George Inc									7/2011				7/20
DRILLING EQUIPMENT	Soil Max XLS						COMPL	ETION DE	EPTH (F		ROCK DE	PTH (F	T)	
SIZE AND TYPE OF BIT	3-15/16"	SIZE AND T	VDE COE	FRADD	FI		NO.SAN	IDI ES	DIST.	19.0 2	UNDIST.	0	CORE (FT)	ç
CASING SIZE AND TYPE	4"	NX NX	11 2 001	(L DAI(I)			WATER		FIRST	-	COMPL.	-	24HR	
CASING HAMMER WEIGHT	300 lb	DROP	30"	8	SAMPLIN	G	FOREM			ırgess				
SAMPLER	2 in S.S	DROP	30"	НА	MMER T	YPE	HELPER	₹	Alen I	Burges	ss			
SAMPLER HAMMER WEIGHT	140 lb	x Sa	ıfety □	Donut	□ AT		INSPEC		Patric	k Sorr	entino			
				Sample	s	Lab. F	Results							
DESCR	IPTION	DEPTH	Туре	Recov.		water		STR	ATA		RE	ΞMΑ	RKS	
				FT/	BL/6"	cont.	-200							
		(ft)	No.	/%	RQD%	(%)	(%)							
			1											
Greenish brown silty sar	nd with fine	1 -	1		6	1								
gravel (SM)(3b)			SS	_	4			Sar	nd					
S - (/(/		- 2 -	1	2										
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0 111 26 26		- 5 -			-									
Greenish brown silt with	i fine sand, fine	-	-											
gravel (ML)(5b)		<del>-</del> 6 -	-	1						d				
		L .	2					Si	lt					
		- 7 -	- 1 6 10 4' 4' - SS 8											
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		- 8 -												
								9	'					
Gray intermediate mica	schist (1c)	<del>-</del> 9 -												
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		<del>-</del> 10 -												
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Gray hard mica schist (	1a)	'¬ .	1											
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		- - 18 -												
		-							21					
End of boring		-						19	9'					

#### Log of Boring: RA CONSULTANTS LLC **B-8** Geotechnical Engineering Sheet 1 of 1 PROJECT PROJECT NUMBER Carey Leeds Tennis Center 11C1016 LOCATION ELEVATION & DATUM Crotona Park, Bronx, NY Bronx Highways +99, approx DRILLING AGENCY DATE STARTED DATE COMPLETED Warren George Inc 4/7/2011 4/7/2011 DRILLING EQUIPMENT COMPLETION DEPTH (FT) ROCK DEPTH (FT) Soil Max XLS 4.0 3-15/16" SIZE AND TYPE OF BIT SIZE AND TYPE CORE BARREL NO.SAMPLES DIST. 0 UNDIST. 0 CORE (FT) 5 NX COMPL. 24HR WATER LEVEL FIRST CASING SIZE AND TYPE CASING HAMMER WEIGHT 300 lb DROP SAMPLING FOREMAN Gil Burgess Alen Burgess SAMPLER 2 in S.S DROP 30" HAMMER TYPE HELPER Patrick Sorrentino SAMPLER HAMMER WEIGHT 140 lb x Safety □ Donut □ ATH INSPECTOR Samples Lab. Results **DESCRIPTION DEPTH STRATA REMARKS** Resist. BL/6" -200 (ft) RQD% (%) (%) 1 2 3 4 Gray intermediate mica schist (1c) 5 6 Rock C-1 70 40 8 9' 9 End of boring 10 11 12 13

14

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16

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19 20

# RA CONSULTANTS LLC

PROJECT							PROJE	CT NUM	BER		heet	-	Oi	ı
	Carey Leeds Tennis C	enter								11C10	16			
LOCATION	Crotona Park, Bronx,	NY					ELEVA	FION & D	DATUM	Bronx	Highway	s +98	B, approx	_
DRILLING AGENCY							DATE S	TARTE	)		DATE COI			
	Warren George Inc								4/1	3/2011			4/1	3/201
DRILLING EQUIPMENT	-						COMPL	ETION D	EPTH (F	·T)	ROCK DE	PTH (F	T)	
	Soil Max XLS									15.0				10.
SIZE AND TYPE OF BIT	3-15/16"	SIZE AND TY	PE COR	E BARR	EL		NO.SAN	<b>IPLES</b>	DIST.	0	UNDIST.	0	CORE (FT)	
CASING SIZE AND TYPE	4"	NX					WATER	LEVEL	FIRST	-	COMPL.	-	24HR	
CASING HAMMER WEIGHT	300 lb	DROP	30"	S	AMPLIN	G	FOREM	AN		urgess				
SAMPLER	2 in S.S	DROP	30"		MMER T		HELPER			Burges				
SAMPLER HAMMER WEIGHT	140 lb	x Sat	ety 🗆			H	INSPEC	TOR	Patrio	k Sorre	entino			
			5	Sample	S	Lab. F	Results							
DESCR	IPTION	DEPTH	Туре	Recov.	Resist.	water		STR	ATA		RE	MΑ	RKS	
				FT/	BL/6"	cont.	-200							
		(ft)	No.	/%	RQD%	(%)	(%)							
		1.7	140.			( /0)	(70)							
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Hard gray mica schist (1	la)	L ' -												
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End of boring		15 –												
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ļ													4/13. TH (FT)  CORE (FT)	

	Geote	chnic	al En	ginee	ring			·	-				
PROJECT							IDDO IE	CT NUMBER	S	heet	1	of	2
	Carey Leeds Tennis	Center							11C10	016			
LOCATION	Crotona Park, Bronx	, NY					ELEVAT	TION & DATUM	Bronx	Highway	/s +98	3, approx	
DRILLING AGENCY							DATE S	TARTED		DATE CO		ΓED	
DRILLING EQUIPMENT	Warren George Inc						COMPL	4, ETION DEPTH (	/8/2011 ET)		DTU /		8/201
DRILLING EQUIPMENT	Soil Max XLS						COMPL	ETION DEPTH (	22.0		:PIH (I	-1)	17.
SIZE AND TYPE OF BIT	3-15/16"		D TYPE C	ORE BAR	REL		NO.SAN	MPLES DIST.	4	UNDIST.	0	CORE (FT)	
CASING SIZE AND TYPE	4"	NX		011				LEVEL FIRST		COMPL.	-	24HR	
CASING HAMMER WEIGHT SAMPLER	300 lb 2 in S.S	DROP			SAMPLIN AMMER T		FOREM.		urgess Burges				
SAMPLER HAMMER WEIGHT				□ Donu			INSPEC		ck Sorr				
	1			Sampl	es	Lab. F	Results						
DESCR	RIPTION	DEP	ТН ту			water		STRATA		RI	EMA	RKS	
				FT	BL/6"	cont.	-200						
		(ft)	N	o. / %		(%)	(%)						
Brown medium to fine s	sand with silt	-	4_		6								
(SP)(3b)		- 1	_ s	1 1.5	8								
		F	_		8								
		- 2	+		0								
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		<del>-</del> 3											
		Ι,	1										
		- 4											
		_ 5											
Brown medium to fine s	sand with fine				4								
gravel, silt (SP)(3b)		- 6	_ s	1 1	13								
		L ĭ	_ 2	:	15								
		- 7	_		11								
		F	4					Sand					
•		- 8	-					Sanu					
		F	-										
		- 9	-										
		<u>ا</u>	1										
Gray brown silty sand w	vith gravel (SM)(3a)	<del>-</del> 10			6	12.2	18.1						
		T 44	s	s 1	21								
		_ 11	3	'	21								
		_ 12			18								
		'-											
•		<del>-</del> 13											
		ļ	4										
		<del>-</del> 14	_										
		H	4										
No Recovery		<del>-</del> 15	+		50/4"	1							
THO RECOVERY		-	s	s	30/4			16'					
		<del>-</del> 16							Difficu	ılt drilling	ST. 0 CORE (FT) PL 24HR		
			7							.9			
Gray hard mica schist (	1a)	_ 17	J			1							
		_ _ 18			1			Rock					
		'0	- c.	1 100	100			NOON					
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								Sheet	2	of	2
DESCRIPTION	DEDTU	- 5	Sample			Results	CTDATA	В		DIVE	
DESCRIPTION	DEPTH	Type	Recov.	Resist. BL/6"	water cont.	-200	STRATA	K	⊏IVIA	RKS	
	(ft)	No.	/%	RQD%	(%)	(%)					
Gray hard mica schist (1a)											
	- 21 <b>-</b>	C-1	100	100			Rock				
	-						22'				
	22 _						22				
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	Geote	chnic	al	Eng	ineer	ing					c	hoot	1	of	1
PROJECT								IPROJE	CT NUMI	BER	<u> </u>	neet	ļ.	OI	ı
	Carey Leeds Tennis	Center									11C10	016			
LOCATION	Crotona Park, Bronx,	NY						ELEVA	TION & D	OATUM	Brony	Highwa	avs +00	approv	
DRILLING AGENCY	CIOCOTA I AIR, DIOIR,							DATES	TARTE	)	אווטוע		•		•
	Warren George Inc							-/::			2/2011		· · · · · · · · · · · · · · · · · · ·		/12/201
DRILLING EQUIPMENT	Trainen Geerge me							COMPL	ETION D			_	DEPTH (F		
	Soil Max XLS									(.			(.	-,	14.
SIZE AND TYPE OF BIT		SIZE AN	ID TY	PE COR	E BARR	EL		NO.SAN	/IPLES	DIST.			. 0	CORE (F	
CASING SIZE AND TYPE	4"	NX								FIRST		COMPL		24HR	·
CASING HAMMER WEIGHT	300 lb	DROP		30"	5	SAMPLIN	G	FOREM	AN	Gil B	urgess				
SAMPLER	2 in S.S	DROP		30"	НА	MMER T	YPE	HELPER	₹						
SAMPLER HAMMER WEIGHT	140 lb	X	Saf	ety 🗆	Donut	□ AT	Ή	INSPEC	TOR	Patrio	ck Sorr	entino			
				5	Sample	es	Lab. I	Results							
DESCE	RIPTION	DEP	ТН							ATA		F	REMA	RKS	
2200.			•••	Турс	FT /	BL/6"			• · · ·	., , .			\		
		110	Sheet 1 of												
		PROJECT NUMBER   11C1016													
		L	_												
		_ 1													
Brown medium to fine s	sand with silt	L'				4									
(SP-SM)(6)		Γ		SS		3									
, , , ,		F 2		1		2									
		-	-												
		- 3	-												
		F	_												
		_ 4							Sa	and					
		L .					WATER LEVEL FIRST - COMPL 24HR  NG FOREMAN GII Burgess THH INSPECTOR Patrick Sorrentino  Lab. Results t. water cont200 (6 (%) (%) (%)  Sand  Sand  Silt  Silt								
Brown medium to fine s	sand with silt	_ 5				2									
(SP-SM)(3b)		-	-	SS											
(01 -0101)(00)		<del>-</del> 6	19.0   19.0												
		SIZE AND TYPE CORE BARREL   NX   NX   DROP   30"   HAMMER TYPE   X Safety   Donut   ATH   Type   Recov.   Resist.   Water   FT   BL/6   Cont.   (%)   Recov.   Resist.   Water   Cont.   (%)   Recov.   Recov.   Resist.   Water   Cont.   (%)   Recov.   Recov.   Resist.   Water   Cont.   (%)   Recov.													
i		L 7	_			6									
		L '	A/12/2011   A/12/2011   A/12/2011   A/12/2011   A/12/2011   B/12/2011   B/12												
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Brown clayey silt with fi	ine sand (ML)(6)	_	_			1									
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		Γ.,	_			6									
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		_ 1/	ı						1	4'	]				
Gray hard mica schist (	(1a)	L '													
		Γ.,		1											
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		F	-	1		Bronx Highways +99, approx   DATE STARTED									
		− 16	; —												
	Soil Max XLS   Size AND TYPE CORE BARREL   NO. SAMPLES   DIST.														
		_ 17	<i>_</i> _												
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		4.0	, –												
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End of boring		L	_												
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	Geot	echnical	Eng	ineer	ing					c	hoot	1	o f	2
PROJECT							IPRO.IF(	CT NUMI	BFR	<u> </u>	neet	<u> </u>	OI	
	Carey Leeds Tennis	Center								11C10	016			
LOCATION	Crotona Park, Bron						ELEVAT	FION & D	ATUM	Brony	Highwa	avs ±0	8 ann	rox
DRILLING AGENCY	Ciolona Park, Bion	X, INT					DATES	TARTE	`	DIUIX		•		IUX
DRILLING AGENCT	Warren George Inc						DATES	IANIEL		/8/2011		OWIFEE	ILD	4/8/201
DRILLING EQUIPMENT	Walter George Inc						COMPL	ETION D				FPTH (	FT\	7/0/201
DIVILLATO EQUI MENT	Soil Max XLS						00	LIIOND	(.	25.0			٠.,	15.
SIZE AND TYPE OF BIT	3-15/16"	SIZE AND TY	PE COF	REBARR	EL		NO.SAN	/PLES	DIST.	2	UNDIST	. 0	CORE	
CASING SIZE AND TYPE	4"	NX						LEVEL	FIRST		COMPL.			` '
CASING HAMMER WEIGHT	300 lb	DROP	30"		SAMPLIN	G	FOREM			urgess				
SAMPLER	2 in S.S	DROP	30"	4	MMER T		HELPER			Burges				
SAMPLER HAMMER WEIGHT				Donut			INSPEC			ck Sorr				
				Sample			Results							
DESCE	RIPTION	DEPTH					Toodito	STR	ΛΤΛ		P	EN12	DKC	
DEGGN	di HON		Type	Recov.	BL/6"	water		3110			11	LIVIA	NI NI NO	
Ì						cont.	-200							
<u> </u>		(ft)	No.	/ %	RQD%	(%)	(%)			<u> </u>				
Brown medium to fine s	sand with silt	L _			5					ח	ate	Ti	me	Water
(SM)(3b)		[ 1 -	SS		5					L		L '''		Level El.
			1		8					4/11	/2011	8:	00	88.
1			1		7						/2011			88.
		- 2 -		<u> </u>	•						/2011			89.
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,														
		- 4 -												
		_ L _ ' _								Install	ed Well	at 12	:00	
		Γ						Sa	and	(10' of	screen	, 7' of	riser)	
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,		─ 6 ─												
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		<b>⊢</b> 7 −												
		_ L _								Bould	er from	4' - 6'		
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,		F -												
		→ 9 →												
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		─ 10 ─						-	U	<u> </u>				
Decomposed rock		<u> </u>	4		30									
1		<u> </u>	SS	0.5	25									
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		40			50/3"									
		<del>-</del> 12 -						D	R	Touah	n drillina	from	12' - 1	5'
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		-	1											
,		<del>-</del> 14 -												
		<u> </u>	4											
		<del>-</del> 15 -						1	5'	1				
Gray intermediate mica	schist (1c)	L 13												
		40												
		<del>-</del> 16 -	1											
		-	1											
		<del>- 17 -</del>	1											
		-  -	C-1	67	32			Ro	ock					
}		<del>- 18 -</del>	4											
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		<del>-</del> 19 -	]											
		19											MARKS  Time	
		20	1											



								Sheet	2	of	2
DESCRIPTION	DEPTH		Recov.	Resist.		Results	STRATA	R	EMA	RKS	
			FT/	BL/6"	cont.	-200					
Gray intermediate mica schist (1c)	(ft)	No.	/ %	RQD%	(%)	(%)					
	_ 21 _										
†	-										
1	_ 22 _	C-2	70	48			Rock				
	_ 23 _										
	_ 24 _										
	25 -						25'				
End of boring	-										
]	_ 26 _										
+	_ 27 _										
1	_ 28 _										
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1	_ 30 _										
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+	-										
1	- 44 -										
	45										

	Geote	chnical	Eng	ineer	ing					9	heet	- 1 of	1	1
PROJECT	Carey Leeds Tennic Crotona Park, Bron CY Warren George Inc MENT Soil Max XLS DE BIT 3-15/16" D TYPE 4" R WEIGHT 300 lb 2 in S.S HER WEIGHT 140 lb  DESCRIPTION	0 1					PROJE	CT NUME	BER			. 01		
LOCATION	Carey Leeds Tennis	Center					ELEVA1	TION & D	ATUM	11C10	)16			
	Crotona Park, Bronx,	NY					LLLVA	non a b	A10	Bronx	Highways		orox	
DRILLING AGENCY							DATE S	TARTED		0/0044	DATE COMP	PLETED	4/40	<b>100</b>
DDII I ING FOUIDMENT	Warren George Inc						001101	ETION D		3/2011			4/13/	/201
DRILLING EQUIPMENT	Soil Max XI S						COMPL	ETION D	EPTH (F	-1) 10.0	ROCK DEPT	H (FT)		5
SIZE AND TYPE OF BIT		SIZE AND TY	YPE COR	REBARR	EL		NO.SAN	/PLES	DIST.	0		0 cor	E (FT)	
CASING SIZE AND TYPE		NX					WATER		FIRST	-	1	- 24HF		
CASING HAMMER WEIGHT	300 lb	DROP	30"		SAMPLIN	G	FOREM	AN	Gil B	urgess	l	- U		
SAMPLER		DROP	30"	НА	MMER T	YPE	HELPER	₹	Alen	Burges	s			
SAMPLER HAMMER WEIGHT	140 lb	x Sa	fety 🗆	Donut	□ AT	H	INSPEC	TOR	Patrio	ck Sorr	entino			
				Sample	s	Lab. F	Results							
DESCR	RIPTION	DEPTH	Туре	Recov.		water		STR	ATA		REN	<b>MARKS</b>	3	
				FT/	BL/6"	cont.	-200							
	Carey Leeds Tenni Crotona Park, Bron Warren George Inc IIPMENT Soil Max XLS E OF BIT 3-15/16" AND TYPE 4" MER WEIGHT 300 lb 2 in S.S MMER WEIGHT 140 lb  DESCRIPTION	(ft)	No.	/ %	RQD%	(%)	(%)							
	Carey Leeds Tenni Crotona Park, Bronency Warren George Inc JIPMENT Soil Max XLS E OF BIT 3-15/16" AND TYPE 4" MER WEIGHT 300 lb 2 in S.S MMER WEIGHT 140 lb  DESCRIPTION													
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PROJECT	Carey Leeds Tennis C	:enter					PROJE	CT NUMI	BER	11C10				
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	Warren George Inc									4/2011				4/201
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SIZE AND TYPE OF BIT CASING SIZE AND TYPE	4"	NX	TPE COR	EBAKK	EL			LEVEL	_		COMPL.	-	CORE (FT) 24HR	3
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SAMPLER HAMMER WEIGHT	140 lb	x Sa		Donut			INSPEC		Patrio	ck Sorr	entino			
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PROJECT	Carey Leeds Tennis	^enter					PROJE	CT NUMI	BER	11C10				
LOCATION							ELEVA	TION & D	ATUM			0	0	
DRILLING AGENCY	Crotona Park, Bronx,	NY					DATES	STARTE	<u> </u>	Bronx				
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SIZE AND TYPE OF BIT CASING SIZE AND TYPE	4"	SIZE AND TY	YPE COR	KE BAKK	EL		NO.SAM WATER	RLEVEL	_		COMPL.	-		
CASING HAMMER WEIGHT	300 lb	DROP	30"	8	AMPLIN	G	FOREM			urgess			ı	
SAMPLER	2 in S.S	DROP	30"		MMER T		HELPE		Alen	Burges	ss			
SAMPLER HAMMER WEIGHT	140 lb	x Sa		Donut			INSPEC		Patrio	ck Sorr	entino			
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