
Technical Memorandum

Phase IB Archaeological Boring Survey for the New York Proton Center

East Harlem, Manhattan, NY

Prepared for:

**21st Century Oncology / Radiation Therapy Services, Inc.
1010 Northern Boulevard, Suite 314
Great Neck, NY 11021**

Prepared by:

**AECOM
20 Exchange Place
New York, NY 10005**

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Table of Contents

1	INTRODUCTION	1-1
	1.1 Background Information.....	1-1
	1.2 Description of Test Area.....	1-1
2	SUMMARY OF PHASE IA STUDY (HPI 2007).....	2-1
	2.1 Historic Context.....	2-1
	2.2 Environmental Setting	2-1
	2.3 Phase IA Study Conclusions for Block 1791, Lot 1	2-2
	2.4 Phase IA Study Recommendations for Block 1791, Lot 1	2-3
3	FIELDWORK.....	3-1
	3.1 Methodology	3-1
	3.2 Methods	3-1
4	LABORATORY ANALYSIS RESULTS	4-1
	4.1 AP 301	4-4
	4.2 AP 302	4-4
5	CONCLUSIONS AND RECOMMENDATIONS	5-1
6	REFERENCES	6-1
7	LIST OF PREPARERS.....	7-1

List of Figures

No.	Title	Page
1	The New York Proton Center Project Area, Block 1791, Lot 1	1-2
2	Block 1791: Areas of Archaeological Sensitivity in Former Rear Yard Areas of Historic Lots 11 and 12.....	1-3
3	Location of Proposed Archaeological Borings in Former Rear Yard Areas of Historic Lots 11 and 12, now part of Block 1791, Lot 1	1-5

List of Tables

No.	Title	Page
1	Results of Archaeological Boring AP-301.....	4-2
2	Results of Archaeological Boring AP-302.....	4-3

1 INTRODUCTION

1.1 Background Information

21st Century Oncology/Radiation Therapy Services, Inc. is planning to build a new medical facility, to be known as the New York Proton Center (Proton Center). The project is located in the East Harlem section of Manhattan, New York. The site consists of an approximately 51,000-square-foot-area of Block 1791, located approximately mid-block between East 126th Street and East 127th Street, between Second Avenue and Third Avenue (Figure 1). The project site currently contains a one-story industrial building and a surface parking lot.

The New York City Landmarks Preservation Commission (LPC) had previously reviewed a report titled “*Archaeological Documentary Study for East 125th Street Development Project Site Block 1790, Lot 13 and Block 1791, Lot 1, Bounded by East 125th Street, East 127th Street, Second and Third Avenues, New York, New York,*” prepared by HPI, Inc. in 2007. The 2007 report had concluded that discrete areas of archaeological sensitivity may be present. At that time, LPC requested that a scope of work for subsurface archaeological testing (Phase IB survey) be provided prior to further work on the site. The project area for the 2007 documentary study included the currently proposed Proton Center project area in its entirety (Block 1791, Lot 1). However, the project actions associated with the 2007 report were not fully realized, and Phase IB survey was not undertaken.

Accordingly, LPC requested that a scope of work for Phase IB archaeological testing be prepared and submitted to LPC for comment prior to the initiation of any construction activities on the proposed Proton Center site (LPC 2013a).

The scope of work for Phase IB archaeological work was prepared by AECOM and sent to LPC for review. The scope of work was accepted by the LPC in May 2013 (LPC 2013b). The scope of work entailed a boring survey to sample the stratigraphy present on discrete portions of the proposed Proton Center site that had been previously determined to possess archaeological sensitivity. Geotechnical and environmental boring surveys were scheduled to be undertaken on the Proton Center site, and it was in tandem with these activities that the archaeological borings were to be undertaken.

The archaeological boring survey was conducted on June 19, 2013. This technical memorandum presents the results of that boring survey.

1.2 Description of Test Area

The abovementioned 2007 HPI report concluded that the backyard areas of two historic lots on Block 1791 possessed archaeological sensitivity and should be archaeologically tested prior to any construction activities. The two areas are located at the rear of historic Lots 11 and 12, and measure approximately 20-foot-deep north-south in each lot and 34-foot-wide in Lot 11 and 39-foot-wide east-west in Lot 12 (Figure 2).

Several sets of boring data were reviewed during the 2007 HPI study, and the results were very consistent. Seven borings were located on Block 1791, Lot 1, however; they were not placed in the yard areas of historic Lots 11 or 12. The upper layer was described as urban fill, which ranged from 10- to 15-



Figure 1 The New York Proton Center Project Area, Block 1791, Lot 1

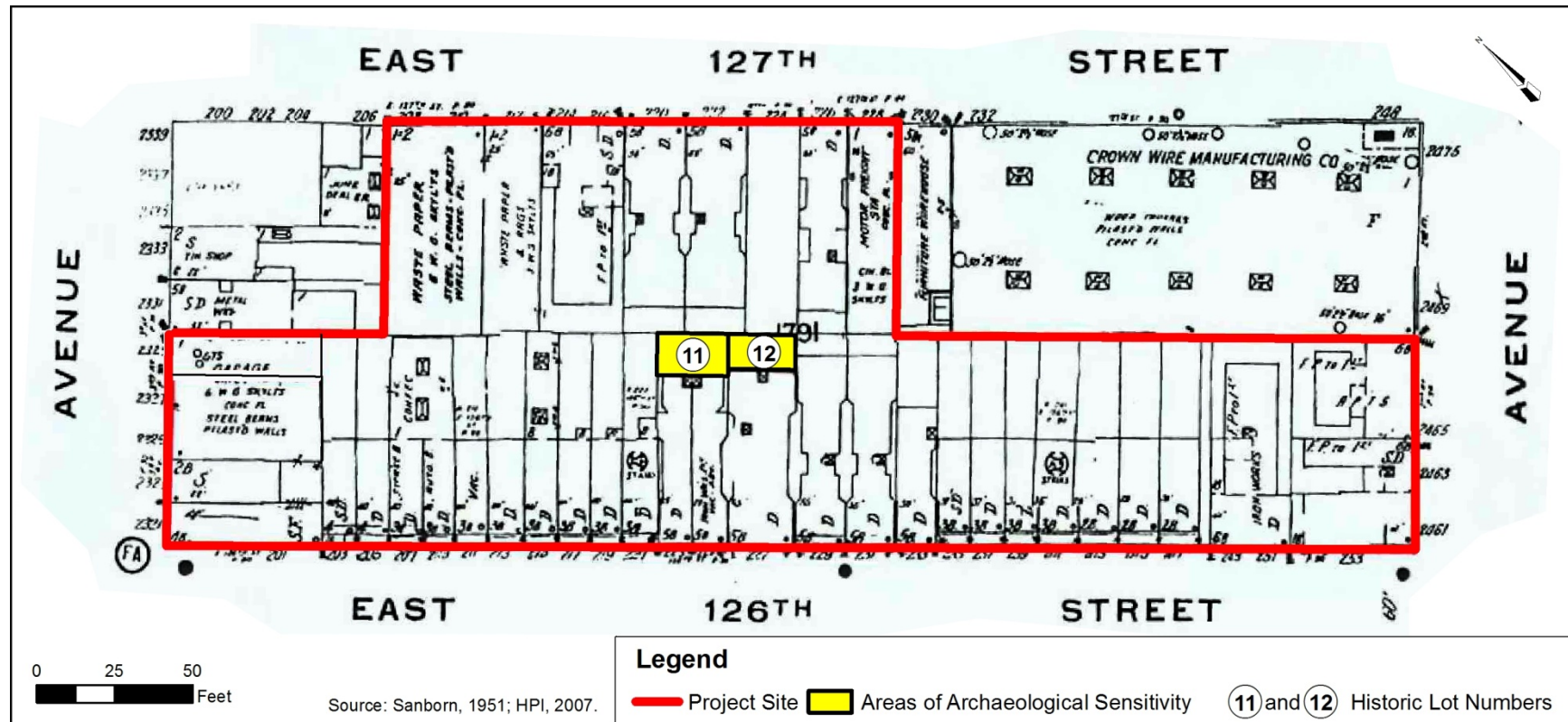


Figure 2 Block 1791: Areas of Archaeological Sensitivity in Former Rear Yard Areas of Historic Lots 11 and 12

feet-deep, and was overlying the lower levels of the naturally occurring soil column. None of the borings encountered an upper, organic layer that could represent an original ground surface. Again, it must be noted that these borings were placed within footprints of demolished buildings that had once had basements, and had covered the entire lot.

Two borings, to be conducted using a geoprobe, were proposed for the current archaeological survey (AP-301 and AP-302). The purpose of these borings was to sample subsurface conditions in the former backyard areas of historic Lot 11 (AP-301) and historic Lot 12 (AP-302) (Figure 3), in order to assess whether or not archaeological resources were potentially present, and whether or not additional archaeological survey work was warranted prior to construction.

At the time of the boring survey, the archaeological areas were covered by a fairly level, paved parking surface, which probably required the deposition of substantial amounts of fill across the backyards to bring them up to grade with the rest of the paved parking area on Block 1791 (Photo 1). The boring locations within the former backyards had been marked out on the surface of the pavement prior to the actual drilling. The parking lot was still in use during the boring survey, requiring careful placement of the drilling rig.



Photo 1 View north across the paved parking lot where historic Lots 11 and 12 were located; the east-west running chain link fence visible in the center of the photo marks the rear lot lines. The locations of borings AP-301 and AP-302, situated within the rear yard areas of the historic lots, are noted on the photo.

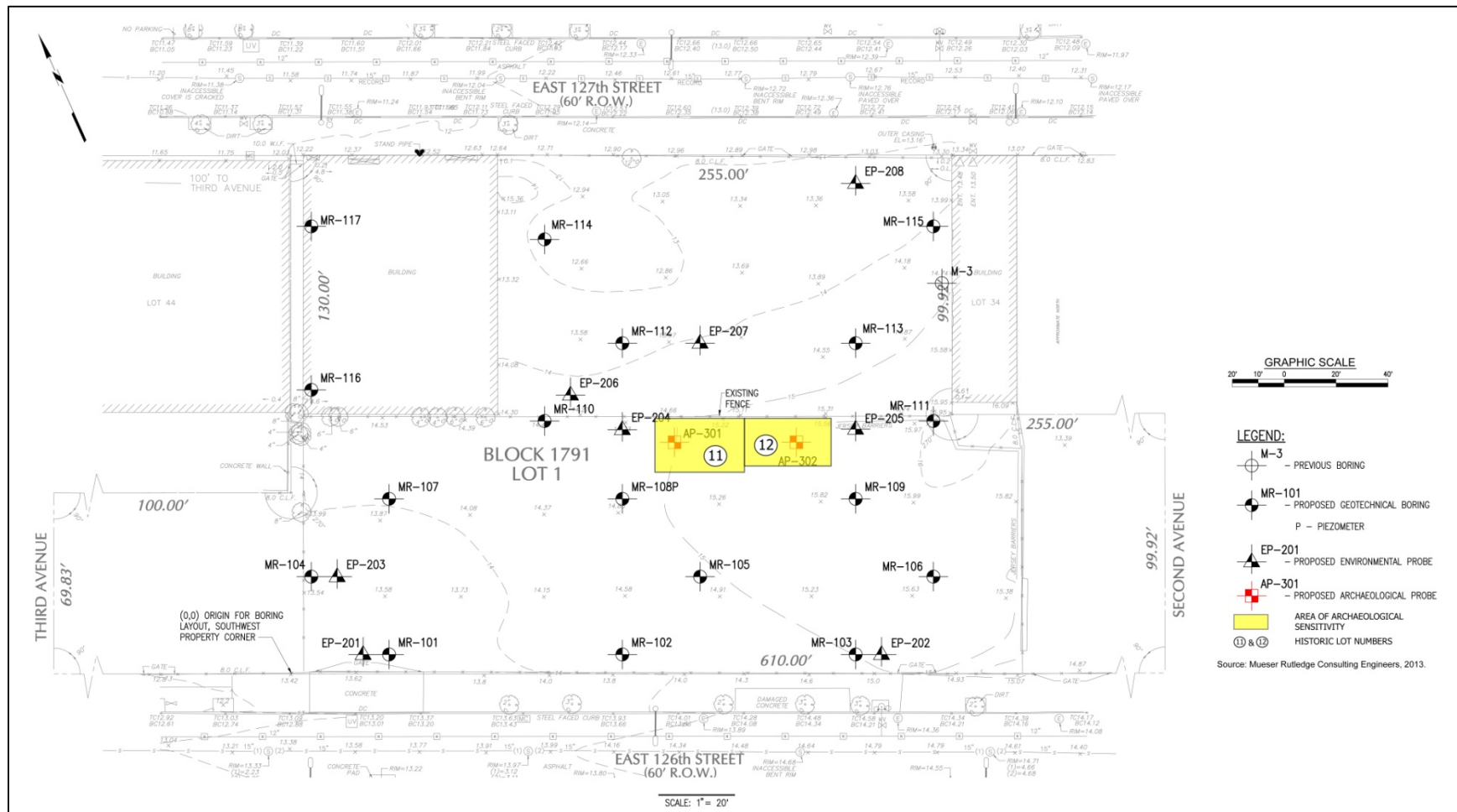


Figure 3 Location of Proposed Archaeological Borings in Former Rear Yard Areas of Historic Lots 11 and 12, now part of Block 1791, Lot 1

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2 SUMMARY OF PHASE IA STUDY (HPI 2007)

As noted in the Introduction, HPI's 2007 Phase IA study included the entirety of the Proton Center project area within its research effort. The 2007 report evaluated the lot histories for Block 1790 and Block 1791; the current Proton Center project area is limited to Block 1791, Lot 1.

The LPC had previously communicated to HPI that there were no precontact (prehistoric) period concerns for the project area studied during the 2007 Phase IA survey. Therefore, the 2007 study concentrated solely on the review of specific historic period occupation and disturbance to the selected lots on Blocks 1790 and 1791 (HPI 2007:2). The following summaries of the historic context, environmental setting, conclusions, and recommendations of the HPI Phase IA study of Block 1791, Lot 1 are paraphrased and borrowed directly from the HPI 2007 report.

2.1 Historic Context

European settlement of this area, known as the village of New Harlem (of New Haerlem), occurred during the mid- to late-1630s. At this time Governor Kieft granted two, 200-acre tracts of land roughly between what is now East 109th and East 124th Streets, and between East 125th and East 150th Streets. North-south and east-west oriented streets and avenues were soon laid out. Development of the 1811 Commissioners' Plan, which established the modern-day street grid, created a network of roads set at a 45 degree angle to the colonial street system (HPI 2007:5).

Cartographic resources depict a portion of the project area during the mid-17th century show no evidence of development during this period. The project area remained undeveloped through the 1830s. Development within the area of archaeological sensitivity is first noted in the early 1850s, when land is sold by Daniel P. Ingraham to two separate individuals. Henry Ryer purchased historic Lot 11 in 1850 and by 1851 had constructed a house. James Colwell purchased historic Lot 12, to the east, in 1853 and by 1854 had constructed a house (HPI 2007:5, 13). These houses were demolished by the 1890s and replaced by 5-story brick apartment buildings (HPI 2007:9).

In 1968, the project area was included in the Harlem-East Harlem Urban Renewal Plan, which incorporated about 150 blocks in Harlem and East Harlem slated for redevelopment and rehabilitation by the City of New York. Nearly all the buildings on modern Lot 1 were demolished beginning in the late 1960s and continuing through 1981, including those in the area of archaeological sensitivity. Since the 1970s, portions of modern Lot 1 have been used for surface parking for automobiles and for city buses; the remainder of the lot is vacant and unused (HPI 2007:10).

2.2 Environmental Setting

Early maps of the vicinity of the project record the topography and environment of the area at the beginning of historic development. Two nineteenth-century maps of the area, the 1836 Colton map and the 1851 Dripps map show that in its natural state the project area blocks fell within a generally level area. The Viele maps from 1865 and 1874 suggest that there may have been a slight rise in the center of Block 1790 (located one block south of the current Proton Center project on Block 1791), and that there was a small pond overlapping the East 125th Street side of that block. The shore of the Harlem River was

located less than one block away. Topographical maps made in the late nineteenth and early twentieth centuries show that the project site fell within the 0-20 feet above sea level contour lines but was reasonably level (Bien and Vermeule 1891). Modern topographical maps, which are more precise, show that the project blocks lie between the 0-10 feet above sea level contour lines (HPI 2007:3).

The USDA soil survey for New York City indicates that the project site falls within a large area mapped as "Pavement & buildings, outwash substratum, 0 to 5 percent slopes." It is described as:

Nearly level to gently sloping, highly urbanized areas with more than 80 percent of the surface covered by impervious pavement and buildings, over glacial outwash; generally located in urban centers (USDA 2005:14) (HPI 2007:3).

A 2007 soil boring program conducted within Blocks 1790 and 1791 provided data on subsurface conditions (STV 2007a, 2007b). In every boring the upper layer was described as urban fill, consisting of mixed soils generally used to infill former building basement cavities. The depth of the fill was dependent on localized conditions and varied from 10-15 feet in thickness. Beneath the fill stratum were the lower levels of the naturally occurring soil column. In no instances did the soil borings record an upper organic layer that could correspond to an original ground surface, or A horizon. However, because all the soil borings were located within former building footprints, this is not surprising (HPI 2007:4).

All of the soil borings also recorded the water table depth. Within the project site, the water table ranged from 11 to 15 feet below the ground surface. In most cases the water table was recorded 1 to 5 feet below the level of the fill, although in a few borings the water table was recorded up to one foot above the bottom of the fill layer. Two of the deeper soil borings had ground water monitoring wells installed; in these locations where the water level had stabilized over several days, the depth ranged from 11 to 12.5 feet below the ground surface (HI 2007:4).

2.3 Phase IA Study Conclusions for Block 1791, Lot 1

The research conducted for HPI's 2007 Phase IA Documentary Study revealed that the majority of the historic lots that comprise Block 1791, Lot 1 appear to be quite disturbed from twentieth-century construction and demolition, including infilling of former basements, which ranged in depth approximately 10 to 15 feet below the current grade. However, the research identified discrete areas within the project site where basements or other twentieth-century buildings were never constructed, and where the archaeological remains, such as privies, cesspools, or cisterns could be preserved.

Within Block 1791, Lot 1, these areas of archaeological sensitivity were identified in the rear of historic Lots 11 and 12, located along East 126th Street, about halfway between Second and Third Avenues (Figure 2). On both of these historic lots, houses were constructed in the early 1850s, and residents could be documented for a number of years. Although there were apartment buildings with basements constructed on these lots after the smaller houses were razed, in each case there was enough open yard area at the rear of the lots (about 20 feet) that may not have been affected by construction of the apartment buildings, therefore, archaeological resources, such as privies, cesspools, or cisterns, could still be present (Figure 2).

2.4 Phase IA Study Recommendations for Block 1791, Lot 1

Based on the results of the Phase IA research, HPI recommended that archaeological testing be conducted with the backyard areas of historic Lots 11 and 12, if they would be impacted by proposed development actions.

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3 FIELDWORK

3.1 Methodology

Archaeological boring surveys are sometimes conducted in order to assess subsurface conditions and determine archaeological sensitivity in locations that cannot be easily examined through more traditional archaeological methods (i.e. manual shovel testing, machine-assisted clearing, etc.). The use of archaeological borings may be prompted by several factors, such as the assumption that archaeologically sensitive layers may be deeply buried, either below land or water, or if surface conditions do not allow for clear access for testing (i.e. paved surfaces, mounds of debris, etc.).

An archaeological boring survey conducted in the Bronx during the 1980s (Boesch and Pickman 1986) cited similar circumstances. The investigators anticipated that the survey would allow them to “detect the presence of any midden accumulations associated with prehistoric occupations, as well as any historic period midden accumulations.” They further noted that while the small size of the sample would not necessarily detect surface scatters associated with short term prehistoric camp sites, the recovered data “would enable us to detect the presence of ground surfaces on which such sites could be present” (Boesch and Pickman 1986:2).

The LPC had previously communicated to HPI that there were no precontact (prehistoric) period concerns for the project area studied during the 2007 Phase IA survey (HPI 2007:2). Nevertheless, as stated in the AECOM scope of work for the Proton Center project, it was anticipated that the borings located in the former backyard areas of historic Lots 11 and 12 would reveal the presence of any prehistoric or historic midden deposits that may be preserved in the yards. It was also anticipated that the examination of the strata present in the borings would reveal any former ground surfaces that may have survived undisturbed beneath historic and modern fill deposits. Heavily organic strata, which can be indicative of deposits within historic shaft features such as privies, cesspools, or cisterns, would also be easily identified.

3.2 Methods

The locations for the borings in the former rear yards of historic Lots 11 and 12 were chosen by the principal investigator prior to the initiation of fieldwork. The historic lot lines, documented on several 20th century Sanborn fire insurance maps, were scaled and superimposed on the modern Block 1791, Lot 1 project map. The proposed boring locations were placed ten feet from the historic lot lines indicated on the Sanborn maps, to ensure that the yards would be sampled, not the foundation walls. The chosen locations were marked out on the pavement of the parking lot in tandem with the mark-outs for the environmental and geotechnical boring locations (Figure 3).

The location in historic Lot 11 was ten feet south of the rear lot line and ten feet east of its western lot line. The location in historic Lot 12 was ten feet south of the rear lot line and ten feet west of its eastern lot line. As mentioned above, the locations were chosen in these quadrants of the rear yards in order to maximize the possibility of locating shaft features that may have survived, even if truncated, the demolition of the buildings and the infilling of the yards.

The archaeological borings were conducted using a truck mounted rig (Geoprobe GH42 by Geoprobe Systems 5410). The rig was operated by Jersey Boring and Drilling Co., Inc. (JBD) of Newark, New Jersey. Samples were taken with a two-inch-diameter split-spoon, in four-foot-long sections (Photos 2 and 3). The scope of work for this Phase IB archaeological boring survey called for continuous sampling to a depth of 20 feet below pavement, if possible. Each four-foot-long section was encased in clear plastic, and capped at both ends upon removal and labeled with all relevant provenience information. The sections were transported to AECOM's archaeology lab for processing, as the still-active parking lot made in-field analysis too difficult to accomplish.

Two archaeological borings were conducted for the Phase IB survey: AP-301 in Lot 11 and AP-302 in Lot 12 (Figure 3). In addition to these two archaeological borings, archaeologists in the field took advantage of additional borings conducted for environmental purposes, by observing the excavation and recovery of samples at two additional locations situated approximately 25 feet east of AP-302 (EP-205) and approximately 90 feet north of AP-302 (EP-208) (Figure 3). While not part of the archaeological scope of work, the observation of subsurface conditions encountered in these additional borings was helpful for comparative purposes.



Photo 2 View of geoprobe rig in operation at AP-301, the former rear yard of historic Lot 11.



Photo 3 View of four-foot-long geoprobe soil sample encased in clear plastic being capped.



Photo 4 View of eight four-foot-long geoprobe soil samples from AP-301 and AP-302, before transport to AECOM archaeology lab for processing and analysis.

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4 LABORATORY ANALYSIS RESULTS

As the four-foot-long sections were removed and capped during the boring survey, it was noted that not all of the sections contained a full four feet of soil. Several of the sections exhibited voids, which due to the mechanics of the testing appeared at the top of the section upon removal. Boesch and Pickman encountered this same situation during their archaeological boring survey for Hostos College in 1986, and attributed the voids to compaction during coring. Compaction of the soil during drilling of the sections for the Proton Center project could explain the voids noted in several four-foot-long sections. It is also possible that there were voids in the fill deposits through which the sections were drilled.

Regardless of whether the voids are due to compaction or voids in the fill material on the site, it is not possible to precisely determine the thickness of the strata present, nor their exact depth below ground surface for either of the two borings. It is possible, however, to describe the color, texture, inclusions, and cultural material noted in the identified strata, and to record the thickness of each stratum as it was recovered from the four foot sections for comparative purposes and relative depths.

The capped four-foot-long geoprobe soil samples were taken to AECOM's archaeology lab for processing and analysis. Each four foot section was opened lengthwise to reveal the soil layers, using an approved geoprobe cutting tool. Opening of the soil sample lengthwise enabled examination of the soil layers as they were recovered in each four foot sample; they were examined as to color, texture, and visible inclusions. It was then possible to discern strata distinctions within each sample tube as the first step toward an interpretation of their nature, i.e., whether they represented fill episodes, cultural deposits, or natural subsoil.

Each preliminarily identified stratum was measured as to relative thickness, and Munsell colors were noted for each, often consisting of more than one Munsell reading per stratum due to their mottled nature. The soil types and textures were defined, and any inclusions were noted. Some of the identified soil layers contained obvious cultural material, as red brick fragments were immediately noticeable in the sample.

Once a stratum was recorded as to its attributes, it was removed from the sample tube and screened through 1/4-inch mesh hardware cloth to recover any artifacts present. All cultural material was noted by stratum, and all recovered material identified represented historic and modern construction/demolition debris such as small red brick fragments, wood chips, mortar fragments, glass fragments, iron wire nail fragments, porcelain tile fragments, fabric, and plastic. A few tiny fragments of shell were identified, but it is not possible to determine if these fragments were culturally derived, or naturally occurring.

Tables 1 and 2 below detail the attributes and cultural material identified from the soil layers recovered in the four-foot-long sections for each of the two borings. Table 1 describes geoprobe AP-301, which was sampled to a depth of 20 feet below pavement in the rear yard of historic Lot 11. Table 2 describes geoprobe AP-302, which was sampled to a depth of 12 feet below pavement in the rear yard of historic Lot 12. AP-302 was intended to be sampled to 20 feet below pavement, but refusal was encountered at 12 feet.

Table 1
Results of Archaeological Boring AP-301

Core Sample	Thickness	Soil Matrix	Munsell	Inclusions	Cultural Material	Interpretation
0-4 ft	3 inches	asphalt pavement	n/a	n/a	n/a	Parking lot pavement
	3 inches	gravel bedding in silty sand matrix	5 YR 3/1 very dark gray	gravel	None	Pavement bedding
	30 inches	construction/demolition debris in silty sand matrix	5 YR 3/2 dark reddish brown 5 YR 3/1 very dark gray		Fragments of: red brick, mortar, bottle/container glass, porcelain tile, wood chips, coal, cinder, plastic	20 th century fill material from demolition of former buildings on Block 1791
	5 inches	Silt with some sand	7.5 YR 3/1 very dark gray		None	Fill
	7 inches	Silt with some sand	10 YR 6/6 brownish yellow		None	Fill
4-8 ft	8 inches	Void in sample	n/a	n/a	n/a	n/a
	6 inches	Fine silty sand	7.5 YR 3/1 very dark gray 2.5 YR 4/6 red	Red clay lumps	1 bottle/container glass fragment; 1 cinder	Fill
	7 inches	Fine silty sand	10 5/6 yellowish brown	Crushed stone	None	Fill
	6 inches	Fine sand	5 YR 4/6 yellowish brown	Crushed stone	None	Fill
	21 inches	Gritty coarse sand	2.5 YR 6/3 light reddish brown 5 YR 6/3 light reddish brown	Pebbles	None	Fill
8-12 ft	11 inches	Void in sample	n/a	n/a	n/a	n/a
	3 inches	Gritty coarse sand	2.5 YR 6/3 light reddish brown 5 YR 6/3 light reddish brown	Pebbles, pockets coarse sand	None	Fill
	8 inches	Silty sand	5 YR 3/3 dark reddish brown 5 YR 4/4 reddish brown		3 bottle/container glass fragments	Fill
	26 inches	Silty sand	5 YR 4/4 reddish brown 7.5 YR 4/4 brown		None	Probable fill
12-16 ft	11 inches	Void in sample	n/a	n/a	n/a	n/a
	27 inches	Gritty coarse sand with some silt	2.5 YR 5/3 reddish brown 5 YR 5/3 reddish brown	Angular gravel, crushed stone	2 tiny red brick fragments	Probable subsoil; red brick fragments probably from overlying fill
	10 inches	Gritty coarse sand with some silt	5 YR 3/3 dark reddish brown 5 YR 4/3 reddish brown 5 YR 2.5/1 black	Pocket of crushed, friable dark rock	None	Subsoil
16-20 ft	30 inches	Coarse sandy silt	5 YR 3/3 dark reddish brown		None	Subsoil
	14 inches	Finer sand with some silt	7.5 YR 3/4 dark brown 5 YR 3/3 dark reddish brown		None	Subsoil
	4 inches	Fine silt	7.5 YR 4/3 brown		None	Subsoil

Table 2
Results of Archaeological Boring AP-302

Core Sample	Thickness	Soil Matrix	Munsell	Inclusions	Cultural Material	Interpretation
0-4 ft	5 inches	Void in sample	n/a	n/a	n/a	n/a
	3 inches	asphalt pavement	n/a	n/a	n/a	Parking lot pavement
	7 inches	gravel bedding in silty sand matrix	7.5 YR 3/2 dark brown	Gravel	None	Pavement bedding
	19 inches	construction/demolition debris in silty sand matrix	5 YR 3/3 dark reddish brown		Fragments of: red brick, metal, leather, fabric, porcelain tile	20 th century fill material from demolition of former buildings on Block 1791
	14 inches	Compact sandy silt, homogeneous	5 YR 4/4 reddish brown		1 shell fragment	Fill
4-8 ft	3 inches	Void in sample	n/a	n/a	n/a	n/a
	7 inches	construction/demolition debris in gritty sand matrix	5 YR 4/2 dark reddish gray		Fragments of: red brick, mortar, wood, glass, shell	20 th century fill material from demolition of former buildings on Block 1791
	13 inches	Sandy silt, compact, clean	7.5 YR 5/4 brown		None	Fill
	6 inches	Fine sandy silt, compact	10 YR 4/4 yellowish brown	Few pebbles	None	Fill
	19 inches	Sandy silt, compact	5 YR 4/6 yellowish red 7.5 YR 4/4 brown 7.5 YR 3/2 dark brown	Pockets of fine and coarse sand	None	Fill
8-12 ft	7 inches	Void in sample	n/a	n/a	n/a	n/a
	7 inches	Sandy silt	7.5 YR 4/4 brown 7.5 YR 3/2 dark brown	Pockets of darker silt	Few tiny shell fragments	Fill
	5 inches	construction/demolition debris in gritty silty sand matrix	7.5 YR 3/2 dark brown		Fragments of: red brick, mortar, wood, iron wire nail, copper	20 th century fill material from demolition of former buildings on Block 1791
	29 inches	Silty sand	5 YR 4/4 reddish brown	Pockets coarse and fine sand, rounded pebbles, shattered quartz	None	Subsoil
Refusal at 12 ft						

4.1 AP 301

Table 1 indicates that approximately six inches of the core sample from 0-4 feet below ground surface was composed of the asphalt pavement and bedding. Directly below the pavement and bedding, 20th century fill was encountered, which is likely the result of the demolition of the last building to be standing on historic Lot 11, and the in-filling of the rear yard area during the latter half of the 20th century. Several fragments of construction related material such as red brick, mortar and wood, bottle/container glass, coal, cinder and plastic were recovered.

Several additional fill layers were identified below the concentration of 20th century debris in the first core sample as well as in the core samples 4-8 feet and 8-12 feet, many of which did not yield any cultural material. However, the distinctions made to separate the layers were largely based on Munsell color and texture; and it is more than likely that the fill episode or episodes extend to a depth of at least 10 feet, if not 12 feet below the pavement. Cultural material was recovered intermittently from some of the identified fill levels, as shown in Table 1.

The subsoil was reached in the 12-16 feet below pavement core sample, but its exact depth is not known due to multiple voids encountered in the core samples. The subsoil consists of reddish brown sands and silts, which in AP-301, appear to grade from gritty coarse sand to finer sand and silt to fine silt with depth.

4.2 AP 302

Table 2 indicates that approximately 10 inches of the core sample from 0-4 feet below ground surface was composed of the asphalt pavement and bedding. As was seen in AP-301, the 20th century construction/demolition related fill was first encountered directly below the pavement bedding. Several small fragments of construction related material, metal fragments, and scraps of leather and fabric were identified.

Several additional fill layers were identified throughout the core samples. A few of the layers did not yield any cultural material, however, deposits of 20th century construction/demolition related fill were clearly identified in the 4-8 feet and 8-12 feet core samples. Although the layers were separated during analysis in order to determine if there were any temporal or functional differences in the fill content between layers across the core samples, none were found. The 20th century debris was present to a depth of at least 10 feet below pavement.

The exact depths below pavement for the contact with subsoil cannot be determined due to the multiple voids in the core samples. The subsoil encountered in AP-302 between 10 and 12 feet below pavement consists of reddish brown silty sand with pockets of coarse and fine sand, rounded pebbles and crushed quartz. Refusal was encountered at 12 feet.

5 CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis of the two borings do not indicate the presence of any significant archaeological deposits. No undisturbed former ground surfaces were detected in the boring samples. No organic layers that would be indicative of deposits at the base of historic shaft features were encountered. No temporally diagnostic cultural material dating prior to the mid-20th century was recovered from any sample in either boring.

The results of the archaeological borings conducted in the former rear yard areas of historic Lots 11 and 12 have shown that there is construction/demolition related fill deposits to depths of 10 to 12 feet below pavement, which are overlying the natural soil column, or subsoil.

No further archaeological work is recommended for the New York Proton Center project site, Block 1791, Lot 1. The project actions will have no effect on archaeological resources.

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7 LIST OF PREPARERS

AECOM Technical Services, Inc

20 Exchange Place, 13th Floor
New York, NY 10005

Nancy A. Stehling, RPA, Project Manager, Principal Investigator: Over 30 years of experience in cultural resource management, including archival research, field survey, laboratory work, artifact analysis, report preparation, consultation with federal and state agencies, and public outreach. State University of New York, Potsdam, 1977, BA, Anthropology, BA, Geology; Rensselaer Polytechnic Institute, 1980, MS, Public Archaeology.

Michele Besson, Archaeologist: Over 12 years of experience in cultural resource management in the Northeast and Mid-Atlantic regions. Experience includes archival research, supervisory field work, analysis of prehistoric and historic artifacts, report preparation, and public outreach. Brooklyn College, City University of New York, 1999, BA, Anthropology and Archaeology.

Xiaojing Wei, GISP, GIS Analyst: Over 12 years of experience in Geographic Information System (GIS) and spatial analysis, including developing numerous efficient impact analysis models using Model Builder and database design to implement extensive Impact Analyses of Habitat, Wetlands, Cultural Resources, Parklands, Air, Noise, Acquisition and Displacement, map production, and software maintenance. Experienced in using Autodesk Land Desktop 2007 and MicroStation V8; experienced in using Thales GPS Unit, Trimble GeoExplorer, and Trimble PathFinder Office. University of Connecticut, Storrs, 2001, MA, Geography.

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