August 2007

Prepared for:

MTA/NYC Transit

Geoarchaeological Assessment for Sunnyside, Queens Rail Complex (Queens Area 12), MTA/LIRR East Side Access Project, Construction Contract CH053

Queens, New York

Prepared by:

URS

Burlington, New Jersey

Geoarchaeological Assessment for Sunnyside, Queens Rail Complex (Queens Area 12), MTA/LIRR East Side Access Project, Construction Contract CH053

Queens, New York

Prepared for:

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Abstract

URS Corporation conducted a geoarchaeological assessment within Area 12 of the Sunnyside Yards Railroad Complex in Queens, New York. The purpose of the geoarchaeological investigation was to provide the necessary information on the nature, location, and extent of intact and original soil surfaces within Area 12 and the depth of twentieth-century fills above these surfaces. This information was also needed to determine if the depths of proposed construction activities would encounter the historic surface, which may contain archaeological resources associated with the British troops who camped in the area during the Revolutionary War. Field investigations were conducted on April 16 and May 7, 2007, and consisted of placing a series of continuously drawn 2-inch-diameter soil cores within the two archaeologically sensitive locations. A track-mounted Geoprobe 5400 unit was used to obtain these cores. A total of seven 2-inch-diameter soil cores were placed at 60-foot intervals along a single transect at the base of the northern railroad embankment. In addition, 10 cores were placed at 60-foot intervals along a single transect at the base of the southern railroad embankment. Each core extended to a maximum depth of 10 feet below the current surface (this depth equals two lengths of the Geoprobe core).

Analysis of the 17 archaeological probes indicated that some amount of disturbance in the form of filling and grading is apparent in each of the cores. Fill deposits range in depth from as little as 2 feet to over 10 feet, with the average fill thickness between 4 to 5 feet. The truncation of natural soil deposits by grading was evident throughout much of the project area, with 14 of the 17 cores exhibiting a varying degree of truncation or mixing with overlaying fill material. In several instances, grading was so severe that none of the original soil horizons were present, and fill materials rest directly atop deep unweathered substrata. However, in other cases, the effects of grading were relatively minor, and wholly or partially intact surface horizons marking the original land surface were identified at six locations. These locations are distributed over the west-central portion of the study area on both the north and south sides of the rail lines. Also within this mostly intact zone are two locations where, although surface horizons are not present, remnants of natural subsoil horizons suggest truncations of no more than 1.5 to 3 ft.

Although some amount of modern alteration has affected the entirety of Area 12, across a significant part of the study area modifications have only entailed protective burial of the original surface beneath a covering of introduced earthen fill. At these locations where original soils are mostly intact, fill thicknesses tend to be on the order of 2 to 4 feet. More variable fill thicknesses generally characterize other parts of the study area. Therefore, additional investigations (Stage 1B) are recommended in order to determine the presence/absence of cultural deposits within the two locations of Area 12 that retain intact soils.

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Introduction and Project Description

The East Side Access Project will provide new LIRR service to Grand Central Terminal by connecting the Port Washington Branch and Main Line tracks adjacent to the Sunnyside Yard in Queens to the lower level of the existing 63rd Street Tunnel beneath the East River, and continuing in a new tunnel to Grand Central Terminal in Manhattan (Figure 1.1). The potential environmental effects of the proposed project were assessed in an environmental impact statement (EIS) prepared for the project, which included an evaluation of the project's potential effects on historic and archaeological resources. As part of the EIS process, Historical Perspectives, Inc. (HPI) completed a Stage 1A archaeological assessment in 1999; this work was summarized in the EIS. The final EIS (FEIS) for the project was published in March 2001. A construction protection plan, which summarized the archaeological sensitivity of Area 12, and a subsequent memo describing the field methodology that was used for this investigation, was reviewed and approved by SHPO and NYLPC.

Along the LIRR's Main Line east of the Sunnyside rail complex, the Main Line track area will be widened to the north and south of the existing embankment. This will involve construction of retaining walls—one to the north of the embankment and one to the south of the embankment—between 43rd and 48th Streets, with filling behind those walls adjacent to the existing embankment. It will also require construction of two new bridges adjacent to and abutting the existing rail bridges that cross 43rd and 48th Streets. This work will be located in what is designated as an archaeologically sensitive area (Figure 1.2). This section of the project site is currently the active tracks of Amtrak and the LIRR Main Line, as well as the land below and adjacent to the tracks on the north and south sides of the embankment.

The project currently entails the installation of retaining walls at the base of the embankment along the north and south sides of the tracks and the introduction of fill to widen the track bed. The retaining walls will vary in height from 4 feet at the eastern end of the project area to 20 feet or more at the western end. This will allow the addition of new tracks. The retaining wall construction will penetrate to a maximum of 5 feet below the current surface, potentially affecting the sensitive soils at the base of the embankment that have been conservatively assumed to not be covered in fill.

Construction of the abutments for the new bridges will involve placement of footings and sheeting outside the existing railroad right-of-way (ROW) to support the bridges. This work could affect an area up to 30 feet below the existing grade. This may affect the potentially sensitive area currently buried beneath fill. In addition, a wing wall that supports the existing bridge at 43rd Street would also be demolished to allow for the construction of two new span bridges, but this area was previously disturbed in the construction of the original bridge, and therefore lacks potential archaeological sensitivity. No field testing or further investigations are required for this action.

URS Corporation (URS) conducted a geoarchaeological assessment within Area 12 of the Sunnyside Yards Railroad Complex in Queens, New York. The investigation consisted of two primary tasks: 1) field investigations and 2) report preparation. All work was conducted in accordance the National Historic Preservation Act of 1966, as amended, and the Advisory Council on Historic Preservation's "Protection of Historic and Cultural Properties" (36 CFR 800). This study was conducted pursuant to the *Standards for Cultural Resources Investigations and the Curation of Archaeological Collections in New York State* (NYAC 1994) and the *State Historic Preservation Office Phase I Archaeological Report Format Requirements* prepared by the Office of Parks, Recreation, and Historic Preservation (OPRHP 2005). The cultural resource specialists who performed this work satisfy the qualifications specified in 36 CFR 61, Appendix A. Edward Morin, RPA, served as Principal Investigator for the project, and Daniel Wagner, Ph.D., Geoarchaeologist, analyzed and interpreted the soil samples.

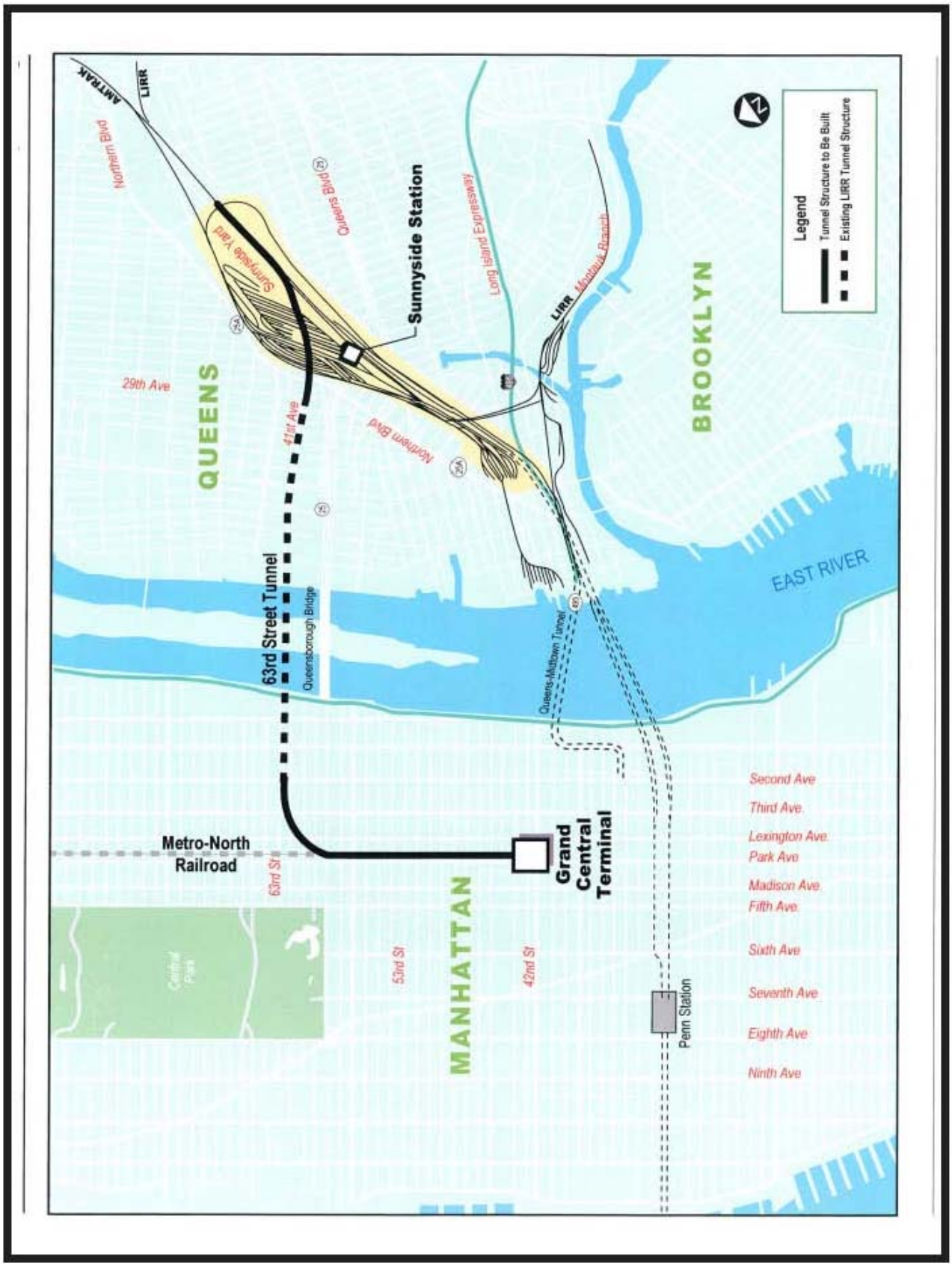

Figure 1.1 Location of project area, Sunnyside Queens Rail Complex, Queens Area 12, Queens, New York.

Figure 1.2 Area of potential effects and archaeologically sensitive areas, Sunnyside Rail Yard.

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Summary of Archaeological Sensitivity

A search of the archaeological site files indicated that no known prehistoric sites have been recorded within the immediate vicinity of the project area. However, three sites have been recorded within ¾ to 1 mile of the project area. These consist of a village site (NYSM#4538), located in Long Island City; a burial site (NYSM#4537), identified northeast of the village; and another burial site (NYSM#5472), located within St. Michael's Cemetery, Queens. Although the project area was once located within a wooded upland setting (as depicted on a U.S. Coast Survey Map of 1844), the New York City Landmarks Preservation Commission did not identify it as being sensitive for prehistoric cultural resources (NYCLPC 1982), perhaps due to the project area's distance from a freshwater source. Historic maps indicate that the closest freshwater source was the Dutch Kills, located approximately 0.9 miles (4,752 feet) to the west. Several studies have indicated that the majority of prehistoric sites are located in elevated and well-drained areas within 150 to 200 feet of a water source (Mascia et al. 1999). This tendency drops off sharply as distances increase. In addition, subsequent industrial development would have altered the landscape and impacted any potential prehistoric cultural resources. Therefore, the potential for locating intact prehistoric cultural deposits within the project area was low.

A Stage 1A investigation (Mascia et al. 1999) identified Area 12 as potentially sensitive for British and Hessian Revolutionary War troop occupation, which may lie in the lowest levels of and beneath the fill deposits. During the period in which the British army occupied New York (1776–1783), troops were garrisoned in the Sunnyside neighborhood. The area where today's Northern Boulevard, Woodside Avenue, and Newtown Avenue intersect was part of a narrow upland passage among the swampy tracts and meadowlands that covered the area in the eighteenth century. Middleburg Avenue (now 39th Avenue) was laid out in the seventeenth century and, by the time of the American Revolution, was lined with farmsteads. It served as the main transportation and communication route between east and west. British officers were billeted in the ancient Dutch farmhouses and soldiers bivouacked in the outbuildings and fields all along the road. As late as the 1890s, newspapers reported on the unearthing of artifacts from the fields of area farms in Sunnyside related to the British occupation, while the outlines of the soldiers' huts were also clearly visible in the fields (Riker 1852:209; Seyfried 1984:79).

A comparison of historical and current maps indicates fill on the embankment along the north and south sides of the track bed ranges between 10 and 20 feet in depth in the project area. There are no more than five feet of fill at the base of the embankment to the north and south, and to be conservative, the areas at the base of the embankment were assumed to contain no fill. As part of the Stage 1A, HPI examined geotechnical borings taken along the north and south embankments of the existing rail line between 43rd and 48th Streets. The information provided in the boring logs did not provide a sufficient amount of information to conclusively determine the depth of fill in the locations of the proposed retaining wall. As a result, the geoarchaeological investigation described below was conducted to further clarify subsurface conditions within the sensitive sections of Area 12.

3
Field Methodology

Initially, a Phase 1B investigation was proposed for the archaeologically sensitive Area 12 identified in the Stage 1A study described above. The testing program would consist of mechanically excavating a series of test trenches. In the event that intact buried surfaces and/or artifact deposits were encountered, hand-excavated test units would then be utilized for further investigations. The subsurface investigation plan was submitted in April 2004 as part of the advance field-testing plan (AFTP) for the MTA/LIRR East Side Access Project. The New York State Historic Preservation Office (SHPO) approved the entire plan on June 7, 2004. Since that time, discussions occurred between the MTA/LIRR and their archaeological consultant about developing an alternative testing method that would provide the same information in a more expeditious and safety-conscious approach, since the areas requiring investigation were located adjacent to active rail lines. Therefore, a geoarchaeological testing program using a Geoprobe 5400 unit was developed and subsequently approved by the SHPO and the NYCLPC on September 1, 2006.

The purpose of the geoarchaeological investigation was to provide information on the nature, location, and extent of intact and original soil surfaces within two locations of Area 12 and the depth of twentieth-century fills above these surfaces. This information is needed in order to determine if the depth of proposed construction activities for the retaining walls would encounter the historic surface that may contain archaeological resources. These two locations have a high potential for historical deposits associated with the British troops who camped in the area during the Revolutionary War. The first is located at the base of the northern embankment of the railroad line, adjacent a ROW road accessible from the parking lot of the New York Presbyterian Church, Grace Fellowship Chapel, on 37th Avenue (Photograph 3.1). The second is located within a heavily overgrown area at the southern base of the embankment, just north of a parking lot between Lot 242 and Lot 233 on Barnett Avenue (Photograph 3.2). The construction of the proposed retaining walls would extend between 4 and 8 feet below the current surface.

Field investigations consisted of placing a series of continuously drawn 2-inch-diameter soil cores within the two archaeologically sensitive locations (Figure 3.1). A track-mounted Geoprobe 5400 unit was used to obtain these cores (Photograph 3.3). A total of seven 2-inch-diameter soil cores were placed at 60-foot intervals along a single transect at the base of the northern railroad embankment. In addition, 10 cores were placed at 60-foot intervals along a single transect at the base of the southern railroad embankment. Each core extended to a maximum depth of 10 feet below the current surface (this depth equals two lengths of the Geoprobe core). The 17 cores were then delivered to Geo-Sci Consultants, Inc., located in University Park, Maryland, for Dr. Daniel Wagner's analysis. After the completion of the analysis, a geoarchaeological report was completed that details the results (Appendix A).

Photograph 3.1 Area 12, north side of railroad tracks, western end, view looking south.

Photograph 3.2 Area 12, south side of railroad tracks, view looking east.

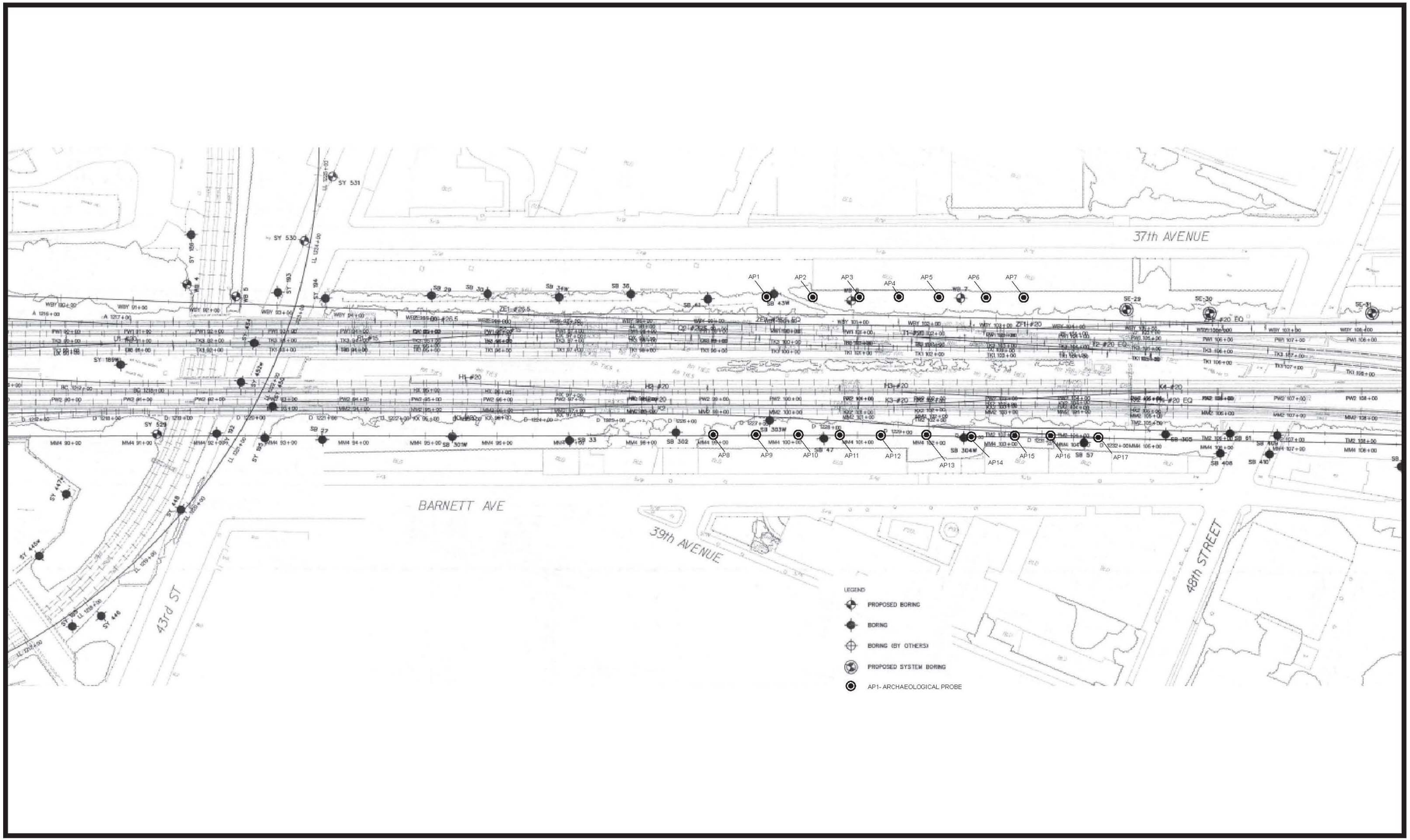

Figure 3.1 Locations of archaeological soil probes.

Photograph 3.3 Geoprobe 5400 unit excavating AP15, view looking west.

4
Conclusions and Recommendations

Analysis of the 17 archaeological probes (AP) indicated that some amount of disturbance in the form of filling and grading is apparent in each of the cores (for detailed analysis, see Appendix A). Fill deposits range in depth from as little as 2 feet to over 10 feet, with the average fill thickness between 4 to 5 feet. The truncation of natural soil deposits by grading was evident throughout much of the project area, with 14 of the 17 cores exhibiting a varying degree of truncation or mixing with overlaying fill material. In several instances, (AP5, AP6, AP7, AP8, and AP9) grading was so severe that none of the original soil horizons were present, and fill materials rest directly atop deep unweathered substrata. However, in other cases, the effects of grading were relatively minor, and wholly or partially intact surface horizons marking the original land surface were identified at six locations (AP1, AP2, AP3, AP11, AP12, and AP14). These locations are distributed over the west-central portion of the study area on both the north and south sides of the rail lines (Figure 4.1). Also within this mostly intact zone are two locations (AP4 and AP13) where, although surface horizons are not present, remnants of natural subsoil horizons suggest truncations of no more than 1.5 to 3 feet.

Although some amount of modern alteration has affected the entirety of Area 12, across a significant part of the study area modifications have only entailed protective burial of the original surface beneath a covering of introduced earthen fill. At these locations where original soils are mostly intact, fill thicknesses tend to be on the order of 2 to 4 feet. More variable fill thicknesses generally characterize other parts of the study area. Therefore, additional investigations (Stage 1B) are recommended in order to determine the presence/absence of cultural deposits within the two locations of Area 12 that maintain intact soils.

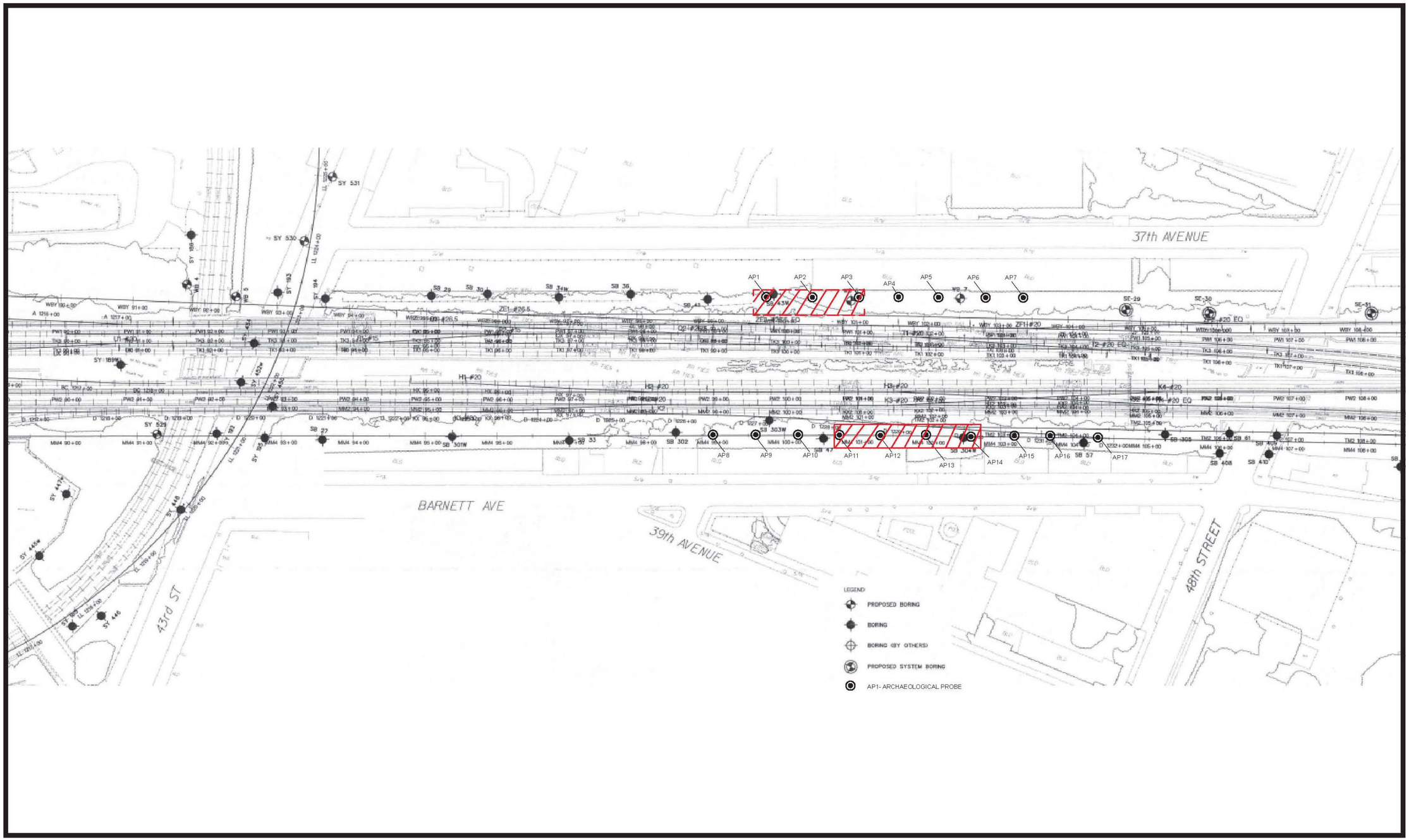

Figure 4.1 Areas proposed for testing.

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Appendix A
Geomorphological Assessment of the Sunnyside Queens Rail Complex

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GEOMORPHOLOGICAL ASSESSMENT

OF THE SUNNYSIDE QUEENS RAIL COMPLEX

IN NEW YORK

By
Daniel P. Wagner, Ph.D.
Pedologist

Submitted to
URS Corporation

June 25, 2007

Introduction and Methods

This report summarizes pedological and geoarchaeological investigations along a portion of the Queens Rail Complex adjacent to Sunnyside Yard in the Queens borough of New York City. The principal objective of the study was to ascertain whether any original, formerly inhabitable land surfaces still persist within the artificially sculpted topography of the site. Since it is known that previous landscape modifications at least in part entailed a considerable amount of filling, the possibility exists that original surfaces might be preserved beneath the fill at some locations. This in turn offers the prospect that buried cultural resources might also be present. Investigations were therefore directed toward examinations of soil features for indications of deposit types and intact natural land surfaces that may once have been available to former occupants of the area.

Interpretations are based on examinations of 17 soil borings from which soil was sampled as nearly continuous columns by GeoProbe coring to a maximum depth of 10 feet. These soil columns were described in accordance with standard pedological techniques and nomenclature, and evaluated for indications of deposit types, soil disturbance, and buried surface levels. Descriptions of the soil columns are attached at the end of the report.

Geomorphic Setting

The project area is located on the western end of Long Island, where basal geology consists of various unconsolidated Coastal Plain deposits ranging in age from Cretaceous to Quaternary. Owing to the glacial history of the area, however, these deposits would not be reflected in the original native soils. Rather, all surficial deposits across Long Island can be attributed to the Wisconsin glaciation, the terminal advance of which in fact corresponds to the island. Glacial moraines marking former ice margins are aligned along both the northern shore and central spine of the island; extensive deposits of glacial outwash are evident to the south of the central moraine. Since the study location is near the moraine to outwash transition, several types of glacial material are possible. In close vicinity to the moraine, glacial drift of varying compositions—ranging from loamy sediments to cobbles—would be present. Where outwash is the predominant material, glaciofluvial deposits of sand and gravel would be expected. Additionally, surficial deposits of loess also occur in the Long Island area, particularly near Long Island Sound. These wind-blown deposits are a common byproduct in the aftermath of glacial retreat, and when present form a mostly silty mantle atop the usually coarser textures of drift and outwash.

Results

As would be expected for any location as highly urbanized as that of the project area, some amount of disturbance in the form of filling and often grading is apparent in each of the examined borings. Surficial deposits of earthen fill have a ubiquitous presence throughout the study area, and range in thickness from as little as perhaps 2 feet (Borings AP2 and AP12) to over 10 feet (Borings AP10 and AP17). Due to incomplete sample retrieval within the upper fill portions of the columns, precise determinations of fill thicknesses are difficult to make, but the average appears to be on the order of about 4 to 5 feet.

Truncation of natural soil layers by artificial grading has also occurred throughout much of the project area, with 14 of the 17 cores exhibiting evidence of varying amounts of truncation or mixing with overlaying fill material. In several instances (Borings AP5, AP6, AP7, AP8, and AP9), grading has been so severe that none of the original pedogenic soil horizons are present, and fill materials rest directly atop deep unweathered substrata. It is particularly noteworthy, however, that in other cases the effects of grading were relatively minor, and wholly or partially intact surface horizons (A horizons) marking the

original land surface were identified at six locations (Borings AP1, AP2, AP3, AP11, AP12, and AP14). These locations are distributed over the west-central portion of the study area on both the north and south sides of the rail lines. Also within this mostly intact zone are two locations (AP4 and AP13) where, although surface horizons are not present, remnants of natural subsoil horizons (Bt horizons) suggest truncations of no more than 1.5 to 3 feet.

As depicted in the representative profile in Figure A.1, two natural strata are present beneath the variable mantle of artificial fill. These consist of an upper stratum of loam to silt loam texture, as well as underlying substrata of sandy and gravelly composition. These are interpreted to represent deposits of loess and glacial outwash, respectively. More mixed deposits consistent with glacial drift were not identified in any of the borings. Pedogenic subsoil development has achieved that of relatively advanced argillic (Bt) horizon formation, but is mainly confined to the upper layer of brownish (7.5YR 4/6) loess. Based on the several mostly intact soil profiles, the loess is about 2.5 to 3 feet in thickness. In most cases, soil development also extends into the top of the glacial outwash in the form of lower transitional subsoil horizons (BC), but by and large soil weathering of the outwash has typically affected only the top foot or so.

The recognized natural soils of the site are consistent with the Long Island area, and based both on the deposit types—as well as the advanced degree of argillic subsoil horizon development—evince an upland landscape that prior to modern disturbances existed in more or less the same form since the late Pleistocene. Accordingly, all chrono-cultural groups of the Holocene together with subsequent European settlers would have utilized the same land surface, thus limiting any potential cultural materials to near-surface levels of the now variably preserved landscape. Additionally, no indications of drainage restrictions were observed, and the well-drained upland landscape should be considered to have been well suited for human occupation or other activities. Indeed, based on the 0.5-to-0.9-foot thickness of the three most intact surface horizons (Boring AP1, AP3, and AP 11), as well as the absence of underlying eluvial horizons (E) typical of forested settings but nearly always destroyed by plowing, it is quite likely that the landscape was formerly cultivated.

Summary

Although some amount of modern alteration has affected the entirety of the examined portion of the Queens Rail Complex, across a significant part of the study area modifications have only entailed protective burial of the original surface beneath a covering of introduced earthen fill. At these locations where original soils are mostly intact, fill thickness tends to be on the order of 2 to 4 feet. More variable fill thickness generally characterizes other parts of the study area. At these locations, truncation of the original soils is also usually the case, with fill material typically resting directly on unweathered substrata that would have been well below the original surface level.

The several mostly intact soils preserved beneath the fill are formed in deposits of probable wind-blown silts (loess) overlaying sandy and gravelly glacial outwash. These late Pleistocene parent materials and the advanced subsoil development are consistent with an upland landscape that has existed largely unchanged through the course of the Holocene. This old, well-drained upland would have been well suited for human use, and a range of cultural materials dating from the earliest human presence in the region to the time of burial beneath the modern fill could be present where its surface horizon still exists.

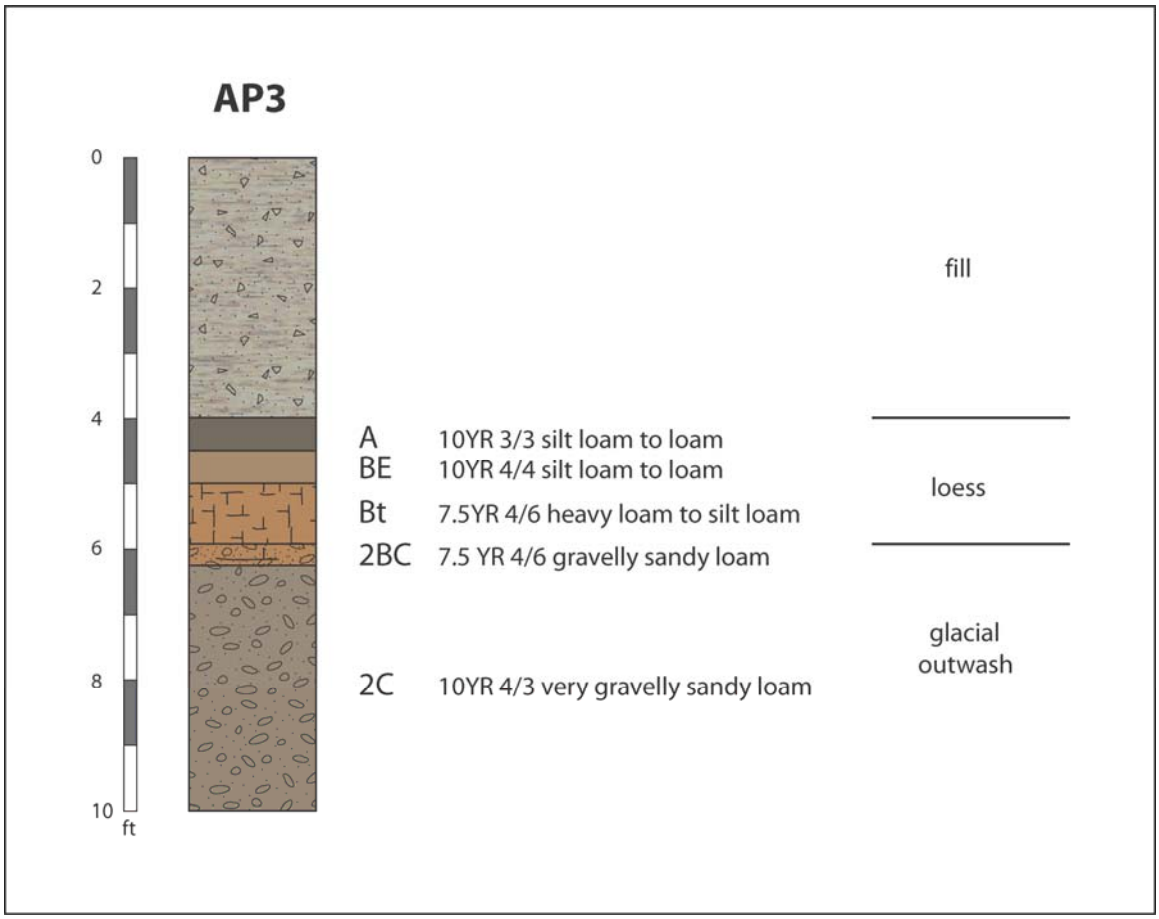

Figure A.1. Profile diagram of Boring AP3 showing the representative stratigraphy of a largely intact soil preserved beneath the mantle of mixed earthen fill.

Descriptions for Core Borings

Depth (ft)	Soil Horizon (If Present)	Properties
Boring AP1		
0 - 3.0		Mixed earthen fill
3.0 - 3.9	A	Dark brown (10YR 3/3) silt loam to loam
3.9 - 5.5	Bt	Strong brown (7.5YR 4/6) heavy loam to silt loam
5.5 - 10.0	2C	Brown (10YR 4/3) very gravelly sand
Notes: Filled upland; upper 2.5 ft of buried soil possibly loess; glacial deposits below		
Boring AP2		
0 - 2.0		Mixed earthen fill
2.0 - 2.2	A	Dark brown (10YR 3/3) silt loam to loam
2.2 - 3.2	Bt	Strong brown (7.5YR 4/6) heavy loam to silt loam
3.2 - 4.0	2BC	Strong brown (7.5YR 4/6) gravelly sandy loam
4.0 - 10.0	2C	Brown (10YR 4/3) very gravelly sand
Notes: Filled upland; poor retrieval in both tubes; original surface partially truncated; upper 2.2 ft of buried soil possibly loess; glacial deposits below		
Boring AP3		
0 - 4.0		Mixed earthen fill
4.0 - 4.5	A	Dark brown (10YR 3/3) silt loam to loam
4.5 - 6.9	Bt	Strong brown (7.5YR 4/6) heavy loam to silt loam
6.9 - 7.3	2BC	Strong brown (7.5YR 4/6) gravelly sandy loam
7.3 - 10.0	2C	Brown (10YR 4/3) very gravelly sand
Notes: Filled upland; upper 2.9 ft of buried soil possibly loess; glacial deposits below		
Boring AP4		
0 - 3.7		Mixed earthen fill
3.7 - 4.7	Bt	Strong brown (7.5YR 4/6) loam to fine sandy loam
4.7 - 6.0	2BC	Brown (7.5YR 4/3) gravelly sandy loam
6.0 - 10.0	2C	Brown (10YR 4/3) very gravelly sand
Notes: Graded and filled upland; original surface and subsoil truncated 2 to 3 ft; Bt horizon possibly mixed loess; glacial deposits below		
Boring AP5		
0 - 5.0		Mixed earthen fill
5.0 - 10.0		Brown (10YR 4/3) very gravelly sand

Notes: Graded and filled upland; original surface and subsoil destroyed; fill over unweathered glacial deposits

Boring AP6

0 - 4.5	Mixed earthen fill
4.5 - 10.0	Brown (10YR 4/3) very gravelly sand

Notes: Graded and filled upland; original surface and subsoil destroyed; fill over unweathered glacial deposits

Boring AP7

0 - 3.5	Mixed earthen fill
3.5 - 9.0	Brown (7.5YR 4/3) sand with minor gravel
9.0 - 10.0	Brown (10YR 4/3) sand with minor gravel

Notes: Graded and filled upland; original surface and subsoil destroyed; fill over unweathered glacial deposits

Boring AP8

0 - 4.0	Mixed earthen fill
4.0 - 10.0	Strong brown (7.5YR 4/6) stratified sand, sandy loam, and loamy sand

Notes: Graded and filled upland; original surface and subsoil destroyed; fill over unweathered glacial deposits

Boring AP9

0 - 8.5	Mixed earthen fill
8.5 - 10.0	Strong brown (7.5YR 4/6) sand and loamy sand

Notes: Graded and filled upland; original surface and subsoil destroyed; fill over unweathered glacial deposits

Boring AP10

0 - 10.0	Mixed earthen fill

Notes: Filled upland; original surface and subsoil probably destroyed

Boring AP11

0 - 8.1		Mixed earthen fill
8.1 - 8.7	A	Dark brown (10YR 3/3) silt loam
8.7 - 9.1	BE	Dark yellowish brown (10YR 4/4) heavy loam to silt loam
9.1 - 10.0	Bt	Dark yellowish brown (10YR 4/6) heavy loam

Notes: Filled upland; upper 2+ ft of buried soil possibly loess

Boring AP12

0 - 2.1	Mixed earthen fill

2.1 - 2.2	A	Very dark grayish brown (10YR 3/2) loam
2.2 - 2.6	BE	Dark yellowish brown (10YR 4/4) loam
2.6 - 3.8	Bt	Strong brown (7.5YR 4/6) heavy loam
3.8 - 5.0	2BC	Dark brown (7.5YR 3/4) gravelly sandy loam
5.0 - 10.0	2C	Very dark grayish brown (10YR 3/2) very gravelly sand

Notes: Partially graded and filled upland; most of original surface truncated, and is overlain by charcoal and decomposing plant remains; upper 2.7 ft of buried soil possibly loess; glacial deposits below

Boring AP13

0 - 4.4		Mixed earthen fill
4.4 - 6.0	Bt	Dark yellowish brown (10YR 4/6) heavy loam
6.0 - 7.1	2BC	Dark yellowish brown (10YR 4/4) gravelly sandy loam
7.1 - 10.0	2C	Brown (10YR 4/3) gravelly sand

Notes: Partially graded and filled upland; soil truncated 1 to 1.5 ft; upper 1.6 ft of buried soil possibly loess; glacial deposits below

Boring AP14

0 - 3.2		Mixed earthen fill
3.2 - 3.7	A	Dark brown (10YR 3/3) loam
3.7 - 4.6	Bt	Strong brown (7.5YR 4/6) heavy loam
4.6 - 6.0	2BC	Dark yellowish brown (10YR 4/4) sandy loam
5.0 - 10.0	2C	Brown (10YR 4/3) gravelly sand

Notes: Filled upland; original surface somewhat disturbed and partly mixed with fill; upper 2.4 ft of buried soil possibly loess; glacial deposits below

Boring AP15

0 - 4.3	Mixed earthen fill
4.3 - 10.0	Brown (7.5YR 4/3) sand

Notes: Graded and filled upland; original surface and subsoil destroyed; fill over unweathered glacial deposits

Boring AP16

0 - 4.5	Mixed earthen fill
4.5 - 10.0	Brown (10YR 4/3) gravelly sand

Notes: Graded and filled upland; original surface and subsoil destroyed; fill over unweathered glacial deposits

Boring AP17

0 - 10.0	Mixed earthen fill

Notes: Filled upland; original surface and subsoil probably destroyed