## A. INTRODUCTION AND METHODOLOGY

This chapter assesses the potential impacts of the project on archaeological resources. It assesses each area where a project alternative would require ground disturbance—for example, by excavation or grading. For each of those areas, the analysis considers the likelihood that archaeological resources may be buried there. The chapter then considers the alternatives' effects on those potential resources, should they be present. Because any archaeological resources present would be affected by construction rather than operation of the project alternatives, this chapter includes a detailed evaluation of construction impacts.

As described in more detail in Chapter 7, "Historic Resources," Section 106 of the National Preservation Act of 1966 requires federal agencies to consider the effects of their actions on any properties listed on or determined eligible for the National Register of Historic Places and afford the federal Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. Properties listed on or determined eligible for the National and State Registers can include both historic resources (described in Chapter 7), and also archaeological resources.

Federal agency preservation officers, in consultation with the State Historic Preservation Office (SHPO), must determine whether a proposed action would have any effects on the characteristics of a site that qualify it for the National Register. If the analysis indicates that the proposed project will have an adverse effect, SHPO is consulted to seek agreement on ways to avoid or reduce the effects. This mitigation is typically implemented through either a Memorandum of Agreement (MOA) or Programmatic Agreement. The Advisory Council must be invited to participate when the federal agency sponsoring the project *requests* the Council's involvement, when the project would have an adverse effect on a National Historic Landmark, or when a Programmatic Agreement will be prepared.

The New York State Historic Preservation Act of 1980 similarly requires state agencies to consider the effects of their actions on any properties listed on or determined eligible for the State and National Registers of Historic Places (S/NR). The National Environmental Policy Act (NEPA) also requires such consideration. The review under Section 106 can be conducted in coordination with analyses conducted for NEPA.

In addition, historic properties (including archaeological resources) are also protected from adverse effects by Section 4(f) of the Department of Transportation Act of 1966. Section 4(f) prohibits actions by the Secretary of Transportation that require "use" of a historic property that is listed in or eligible for inclusion in the National Register, unless a determination is made that there is no feasible and prudent alternative to the use of such land, and all possible planning has been undertaken to minimize harm to the 4(f) property.

Consistent with these regulations, the analysis of the MTA/LIRR East Side Access Project's effects on archaeological resources is being conducted in coordination with SHPO. *To this end,*

*a meeting was held with representatives of SHPO and MTA/LIRR on April 26, 2000.* Copies of correspondence from SHPO are included *in Appendix B of* this EIS.

## TYPES OF ARCHAEOLOGICAL RESOURCES

Archaeological resources are physical remains, usually buried, of past activities on a site. They can include remains from prehistoric (Native American) people who used or occupied a site—including tools, refuse from tool-making activities, habitation sites, etc. They can also include remains from activities that occurred during the historic period (beginning with European colonization of the New York area), such as battle sites, foundations, wells, and privies.

### *PREHISTORIC RESOURCES*

Before Europeans arrived in New York and continuing into the 18th century, Native Americans (American Indians) lived throughout the region. Upland well-drained land in proximity to fresh water was used by Native Americans for long- and short-term habitation, hunting, and planting. Native American sites that have been identified in the New York City region are typically located on high ground near freshwater ponds, streams, and tidal inlets and coves. Throughout the New York metropolitan region, the limited number of prehistoric archaeological resources that have been found have typically been shallowly buried, usually within 3 or 4 feet of the predevelopment surface. As a result, these sites are vulnerable to disturbance by later activities on the site, and few such sites have survived. Because Native American archaeological sites in the New York City area are extremely rare, any surviving site would be considered extremely valuable and therefore would most likely be eligible for the State and National Registers of Historic Places.

### *HISTORIC-PERIOD RESOURCES*

Buried remains from the historic period can also be important, because of the new, undocumented information they can provide about the daily lives of previous inhabitants or about important historical events. In the New York City area, historic-period archaeological resources can range from early Dutch colonial artifacts (17th century), to Revolutionary War-period remains, to 19th century residential remains. Industrial remains can also be important. Types of historic archaeological resources that may be present in the New York City region include artifacts relating to dwellings, workplaces, and schools, which are often preserved in old privies, cisterns, or wells. Privies, cisterns, and wells, in use before municipal sewer and water services were available, were located in backyards. They were typically shafts of up to 8 feet deep, and were sometimes used for refuse disposal. These deep shafts therefore can serve as a time capsule, filled with artifacts from the time of their use. They can remain preserved beneath later construction on a site, often protected by fill levels or later buildings. Other commonly occurring, but more shallowly buried, historic remains include foundations and builder's trenches, as well as more fragile backyard features such as fence lines, paths, and traces of landscaping. Historic-period archaeological resources may be considered significant, and therefore eligible for the State and National Registers, if they have the potential to provide valuable new information about the past. Consequently, historic-period archaeological resources are typically most valuable when they are older and, usually, when they predate installation of municipal sewer and water services.

*FACTORS AFFECTING SURVIVAL OF RESOURCES*

As noted above, archaeological sites containing buried features, artifacts, and architectural remains can remain in locations that were once used for prehistoric or historic-period activities. However, on sites where later development occurred, archaeological resources at many of these locations have since been disturbed or destroyed by later grading, excavation, installation of utilities, construction of subway lines, and other development activities.

## EVALUATION METHODOLOGY

Documentary research was undertaken by professional archaeologists to determine the project's potential to affect archaeological resources. The research was conducted as part of the *MTA/ Long Island Rail Road East Side Access Project, Stage 1A Archaeological Assessment*, prepared by Historical Perspectives, Inc., October 1999, supplemented by follow-up memoranda, *addenda, and a topic-intensive study (Archaeological Resource Evaluation Topic Intensive Study of Highbridge Yard, prepared by Historical Perspectives, Inc., August 2000)*. The evaluation is summarized in this chapter. As detailed below, the archaeological study conducted to date encompassed five steps:

- Definition of the Area of Potential Effect (APE). This is the area where project activities could disturb the ground enough so that if any archaeological resources are present, they could be affected. The APE is the study area for archaeological resources.
- Preliminary identification of the possibility of archaeological resources being present within the APEs. Documentary research was conducted to identify areas where important prehistoric or historic-period activities may have occurred that could have resulted in archaeological resources.
- Documentation of disturbance and identification of potential undisturbed resources. For each area where research indicated that prehistoric or historic-period activities may have left archaeological resources, the site history was studied to identify construction activities and other ground disturbances that occurred later on the site. The objective of this assessment was to identify locations where any archaeological resources, if originally present, may have survived. This assessment resulted in an inventory of potential archaeological resources that may remain in the APE.
- Assessment of impact. The project alternatives' effects on the potential archaeological resources identified were then assessed. Any archaeological resources present would be affected by construction rather than operation of the project alternatives.
- Identification of mitigation. For all potential significant adverse impacts identified, mitigation measures were identified.

Each of these steps is described in more detail below.

*DEFINITION OF THE AREA OF POTENTIAL EFFECT (APE)*

The first step in the assessment was to identify the study areas to be evaluated for archaeological resources. These study areas are the areas where project activities have the potential to disturb soils. They are referred to as the project's Areas of Potential Effect, or APEs. The APEs were identified in consultation with the SHPO at the New York State Office of Parks, Recreation and

Historic Preservation (OPRHP), and approved in correspondence dated June 21, 1999. The APEs for the analysis are described below.

*Area of Potential Effect for the No Action Alternative*

The No Action Alternative involves measures that are available to the Long Island Rail Road (LIRR) as routine management and do not require a major new construction effort. Therefore, it would not result in any significant adverse impacts to archaeological resources, and would not require analysis of archaeological resources. *(However, as noted in Chapter 2, "Project Alternatives," under the No Action Alternative a new storage yard would be required on the LIRR's Port Jefferson Branch. MTA/LIRR will undertake an evaluation process to identify potential sites for new storage yards and consider the environmental impacts associated with development of those sites in the future. That evaluation will include an assessment of archaeological resources. This FEIS considers the potential effects of developing a new storage yard at the Cerro Wire site on the Port Jefferson Branch in the No Action Alternative.)*

*Area of Potential Effect for the TSM Alternative*

As described in Chapter 2, the TSM Alternative includes several components that would require new construction. *In addition to a new yard on the Port Jefferson Branch*, these include a new pedestrian connection between the LIRR station and subway station at Hunters Point Avenue, a new covered walkway between the Long Island City station and East River ferry terminal in Long Island City, enlargement of an existing slip at the ferry terminal, and a new flyover ramp and on-ramp along the Long Island Expressway (LIE) right-of-way. Of these components, only the new connection at Hunters Point Avenue has the potential to affect archaeological resources, and therefore that is the only APE for the TSM Alternative, as described below.

*Area for Which No Analysis was Required.* The walkway at the Long Island City station and the changes to the ferry slip do not have the potential to affect archaeological resources. Both areas were previously analyzed as part of a separate and unrelated project. Archaeological assessments prepared by Historical Perspectives, Inc., *Hunters Point Phase 1A Archaeological Assessment Report* (June 1988) and *Archaeological Assessment of the Hunters Point Project Secondary Study Area* (January 1990), concluded that those areas do not have the potential to contain archaeological resources from either the prehistoric or historic period.

Similarly, the TSM Alternative's work on the LIE does not have the potential to result in adverse impacts on archaeological resources. Construction of the LIE flyover ramp would take place on an existing elevated portion of the highway, and therefore would have no subsurface impacts. Construction of the new on-ramp would occur on the existing roadways of the LIE and its service road, and on a narrow, previously disturbed portion of the elevated embankment between the LIE and the service road.

*Area for Which Analysis was Performed.* Construction of the TSM Alternative's pedestrian bridge between the LIRR station and subway at Hunters Point Avenue would have the potential to disturb archaeological resources, if any are located there. Therefore, this area is considered an APE for the TSM Alternative. This area was evaluated in the Stage 1A Archaeological Assessment prepared by Historical Perspectives, Inc. The location of this bridge is in an area that could also be affected by the Preferred Alternative (described below).

*Area of Potential Effect for the Preferred Alternative*

The Preferred Alternative includes a number of elements that would disturb soils, all of which are detailed in Chapter 2. The APEs for the Preferred Alternative are described below.

*Areas for Which No Analysis was Required.* In several project locations, the Preferred Alternative does not have the potential to affect archaeological resources, and no analysis was performed. These are as follows:

- Work within the existing, already constructed, 63rd Street Tunnel (extending from Second Avenue at 63rd Street in Manhattan to close to Northern Boulevard in Queens).
- Deep tunneling and mining through bedrock in Manhattan. The bedrock beneath New York City is metamorphic rock with some lenses of igneous rock. The only type of fossils that occur in this type of rock are of shell from glacial deposits. There is no potential to find archaeological resources from human habitation within the bedrock. In the Preferred Alternative's Option 1 and Option 2, all the work in Manhattan for tunnels, trainsheds, and tracks would be in rock.
- In Manhattan, the area already excavated for the Grand Central Terminal (GCT) complex. As described in Chapter 7, "Historic Resources," GCT was constructed by excavating a large area roughly between 42nd and 50th Streets from Madison to Lexington Avenue. After the complex was constructed, buildings and streets were built above the new terminal. Therefore, no original soils or archaeological resources remain above the existing GCT complex. The excavated area is depicted in Figure 8-1.
- In Blissville and Maspeth Yards, which have been (or are) used as rail yards before, and the only work proposed would be installation of new tracks. This type of construction would not be deep enough to disturb soils that have not already been disturbed by previous yard activities (including installation of previous tracks) and therefore does not have the potential to affect archaeological resources.

*Area for Which Analysis was Performed.* At other project locations, excavation or other project activities would disturb soils, and therefore could disturb any archaeological resources, should they be present there. These APEs include the following:

- In Manhattan, the limited areas where excavation of soils would occur. These are the areas of cut-and-cover activity outside of the already built GCT trainshed. For Option 1, they consist of the location of the new tunnel just west of Park Avenue between 52nd and 55th Streets, ventilation facilities beneath 53rd and 54th Streets between Park and Madison Avenues, a ventilation facility beneath 54th Street between Park and Lexington Avenues, a ventilation structure on the north side of East 44th Street, and one of the project's new potential pedestrian entrance, since it falls outside the existing GCT area (see Figure 8-2). For Option 2, they consist of a ventilation facility beneath 55th Street between Park and Madison Avenues, the new ventilation structure on the north side of East 44th Street, and one of the new potential pedestrian entrances, since it falls outside the existing GCT area (see Figure 8-3).
- In Queens, where disturbance of soils would occur. This would be where excavation and soft ground tunneling techniques would be used for construction of project elements at the rail yard complex in Sunnyside and at Harold Interlocking (see Figure 8-4).

- On Roosevelt Island, where construction of a new substation would require excavation of soils (see Figure 8-5).
- At the replacement yards (Fresh Pond and Highbridge). At the yards, the only project activities likely to be deep enough to disturb soils that have not already been disturbed by construction of the existing yards are installation of utilities and foundation work for structures. However, since the precise locations of the proposed utility lines and of project elements in Highbridge Yard have not yet been designed, the APEs were conservatively defined as all of Fresh Pond and Highbridge Yards (see Figures 8-6 and 8-7).
- *In addition, the potential for effects was considered at the sites being assessed in this FEIS as* the potential nighttime storage yard sites on Long Island. The APEs were conservatively defined as the entire yard sites.

*PRELIMINARY IDENTIFICATION OF THE POSSIBILITY OF ARCHAEOLOGICAL RESOURCES BEING PRESENT WITHIN THE APEs*

After defining the study areas for archaeological resources, the next step in the analysis was to identify locations that may have been used during the prehistoric period or during the historic period and that might, therefore, have left archaeological evidence behind in the soils. This involved documentary research to identify already known archaeological sites and areas that have the potential to contain archaeological resources, based on original topography (for prehistoric resources) or site development history (for historic-period resources).

Research was conducted at the New York Public Library; the Westchester County, Bronx, and Queens Historical Societies; and at the Westchester County Archives. Site file searches were performed at OPRHP and the New York State Museum (NYSM) in Albany. Pertinent archaeological reports were also reviewed at the New York City Landmarks Preservation Commission (LPC), which keeps records on archaeological sites in New York City and prepares sensitivity maps based on pre-development topography. Existing, documented archaeological resources were identified, including sites on the State and National Registers and other known sites. Cartographic information, in the form of historic maps and atlases, was gathered to determine whether land forms within each APE were conducive for prehistoric habitation or use and to ascertain the historical development of each APE. Where available, soil borings were analyzed to determine subsurface conditions.

As noted earlier, prehistoric sites tend to be located near bodies of water and atop hills. The documentary research conducted was used to determine the likelihood that prehistoric (Native American) archaeological resources were deposited within each APE. To help ensure that no possible sites are missed, any project locations that had appropriate topographical features before development and any locations noted in historic sources as former sites of native American camps, villages, middens (refuse piles, such as shell heaps), etc., were considered potential prehistoric sites unless later activities have disturbed them.

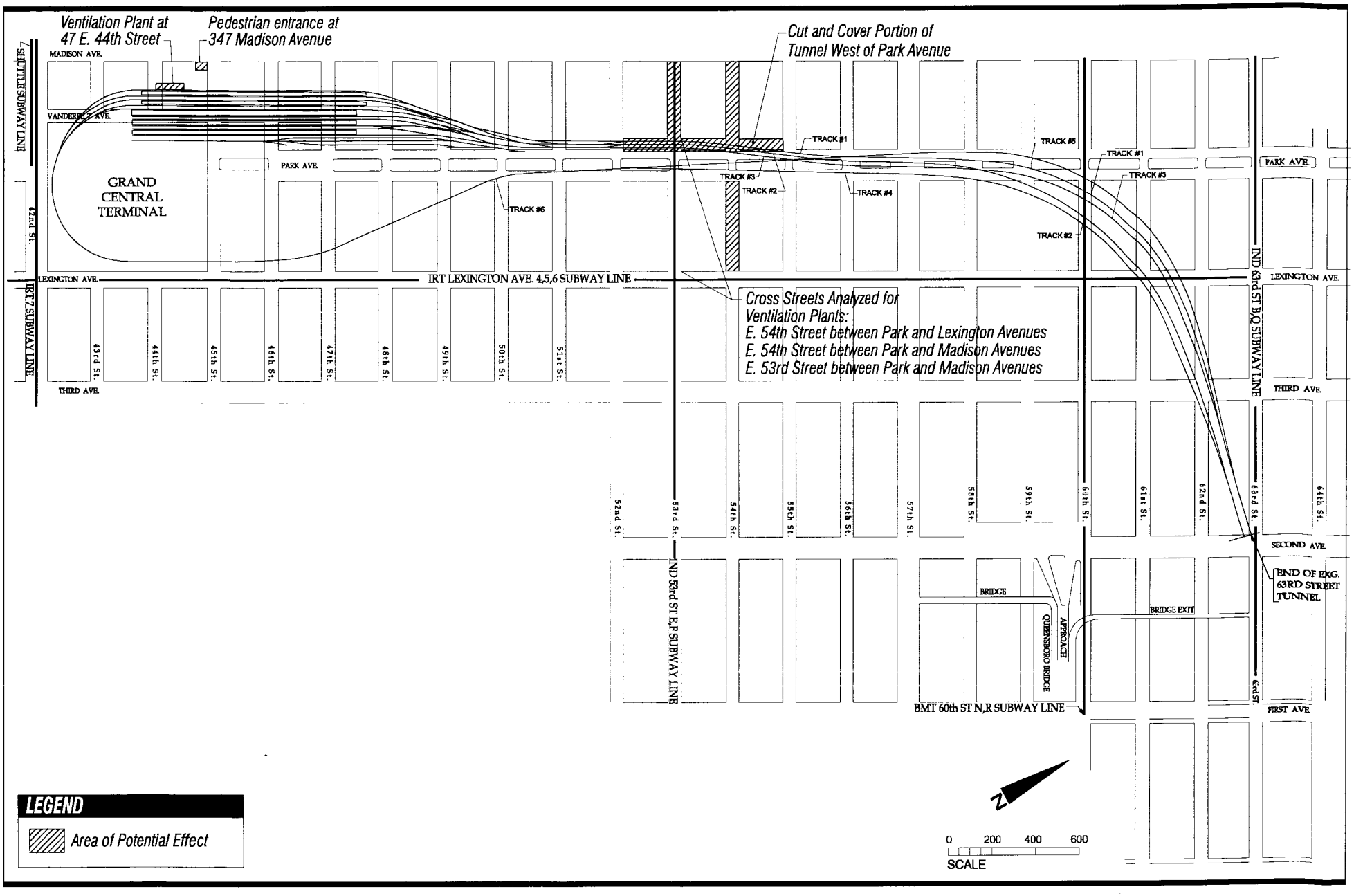
The cartographic and documentary research was also used to reconstruct the historic development of each APE. In each area, a development history was compiled, and historic structures and landforms were noted. This information was used to determine the likelihood that archaeological resources from historic-period uses could have been deposited within each APE. Following completion of the background research, field visits were undertaken at each APE. At this time, obvious signs of disturbance were recorded and historical features were noted.


MTA / LIRR

East Side Access

Figure 8-1

**Area Excavated for Grand Central Terminal and Tracks**



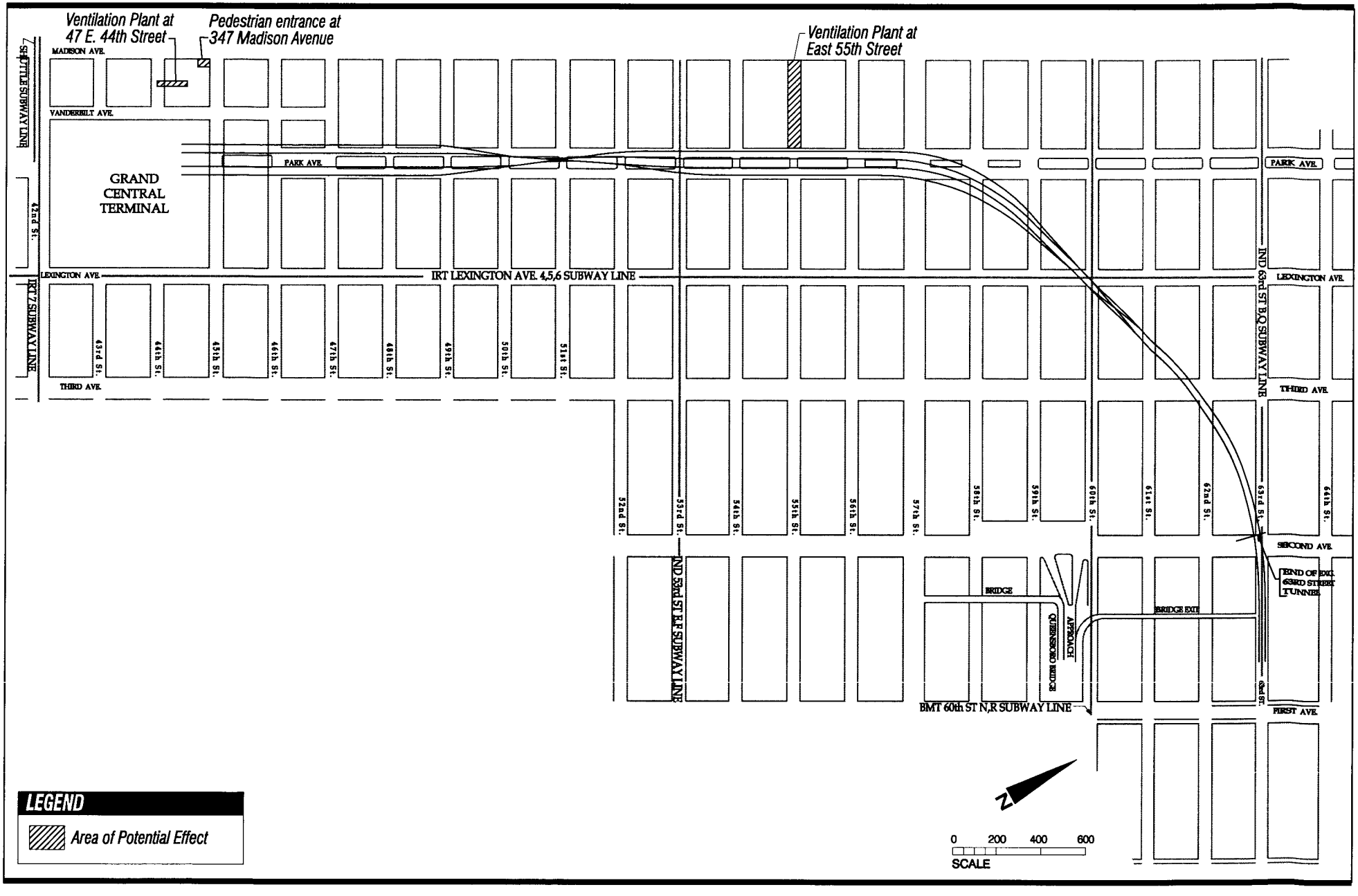

M T A / L I R R

East Side Access

Figure 8-2

**Manhattan Alignment Option 1**

**Areas of Potential Effect - Archaeological Resources**

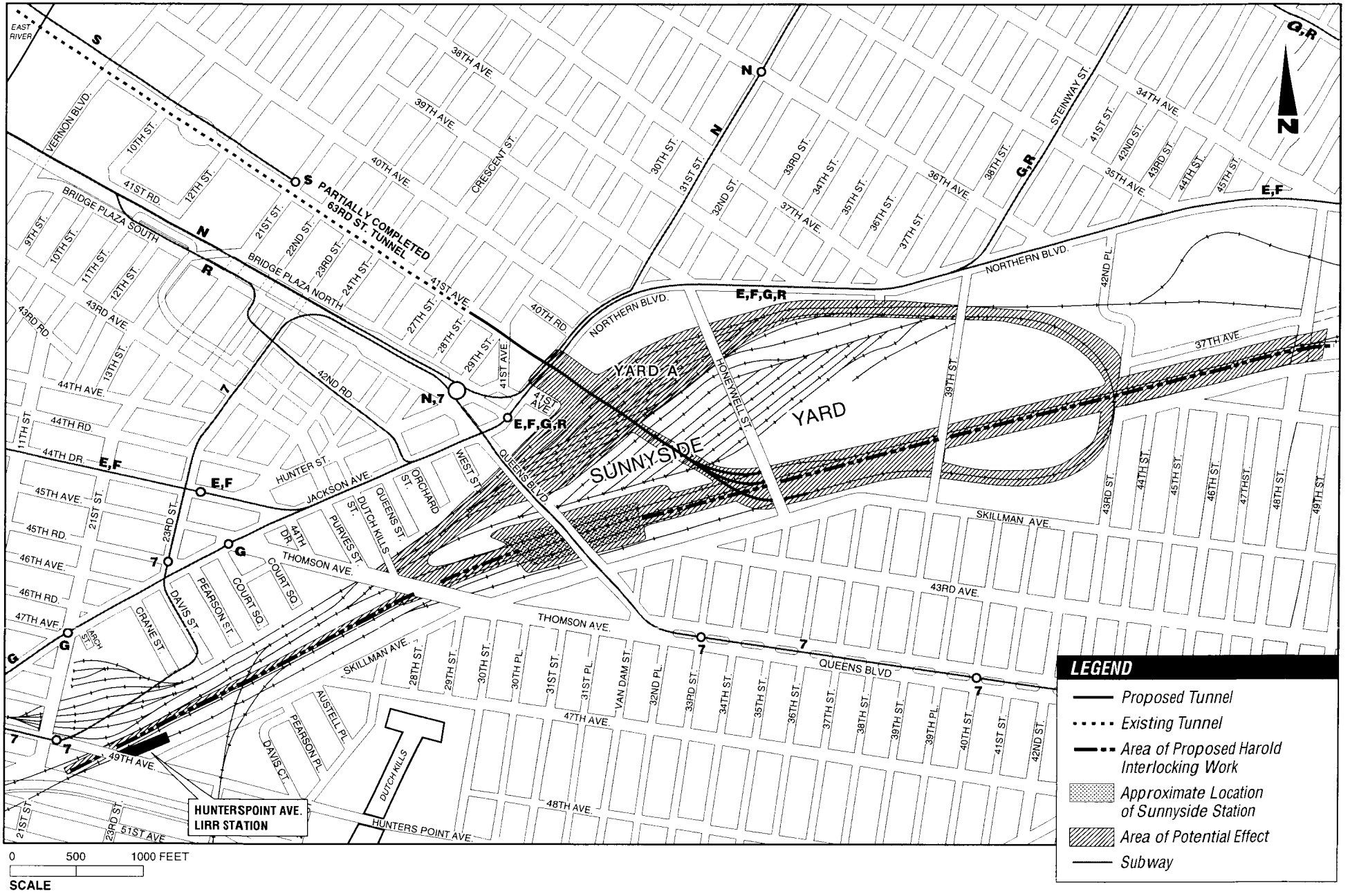



M T A / L I R R

East Side Access

*Figure 8-3*

## *Manhattan Alignment Option 2*
## *Areas of Potential Effect - Archaeological Resources*

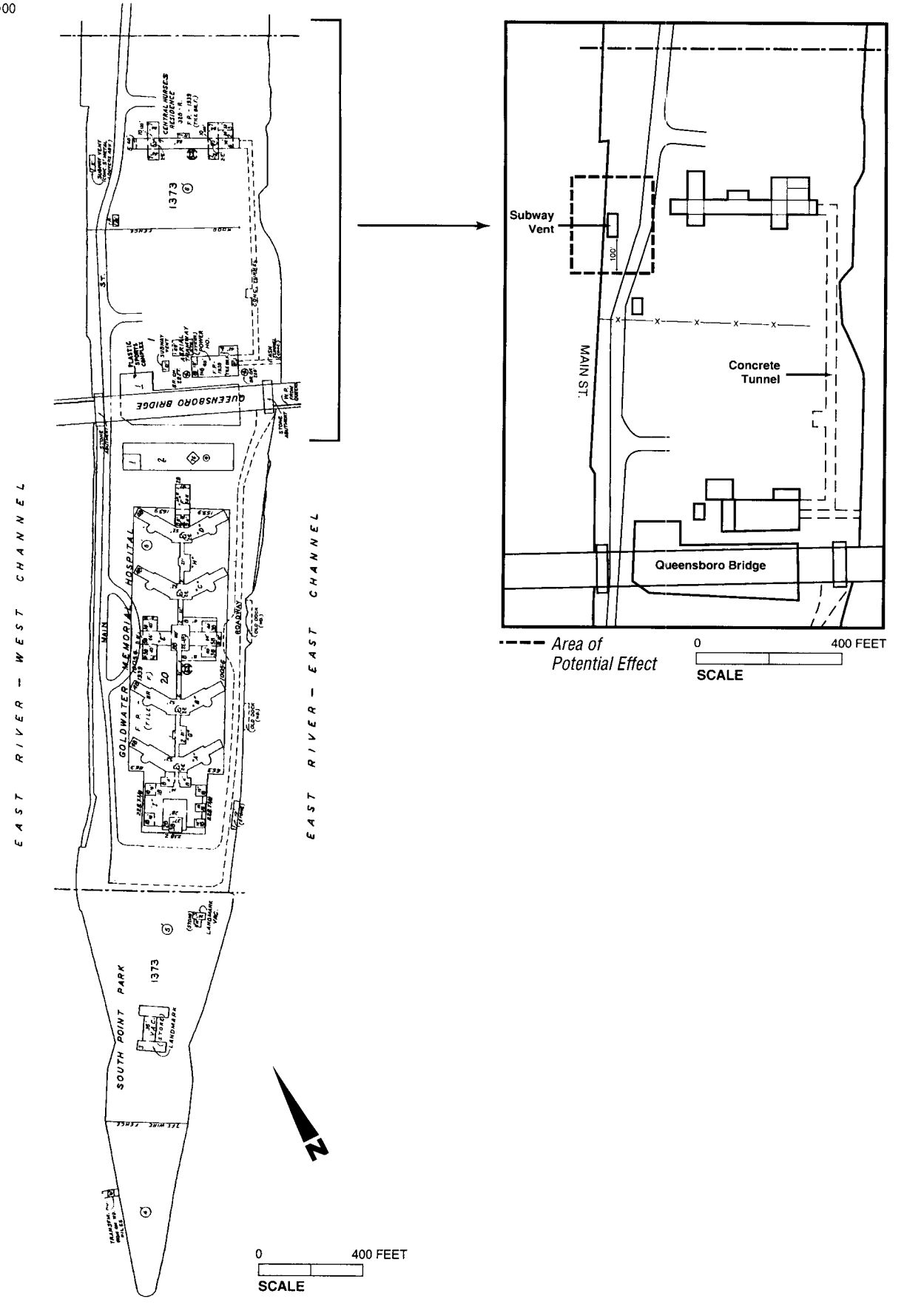



MTA / LIRR

East Side Access

Figure 8-4

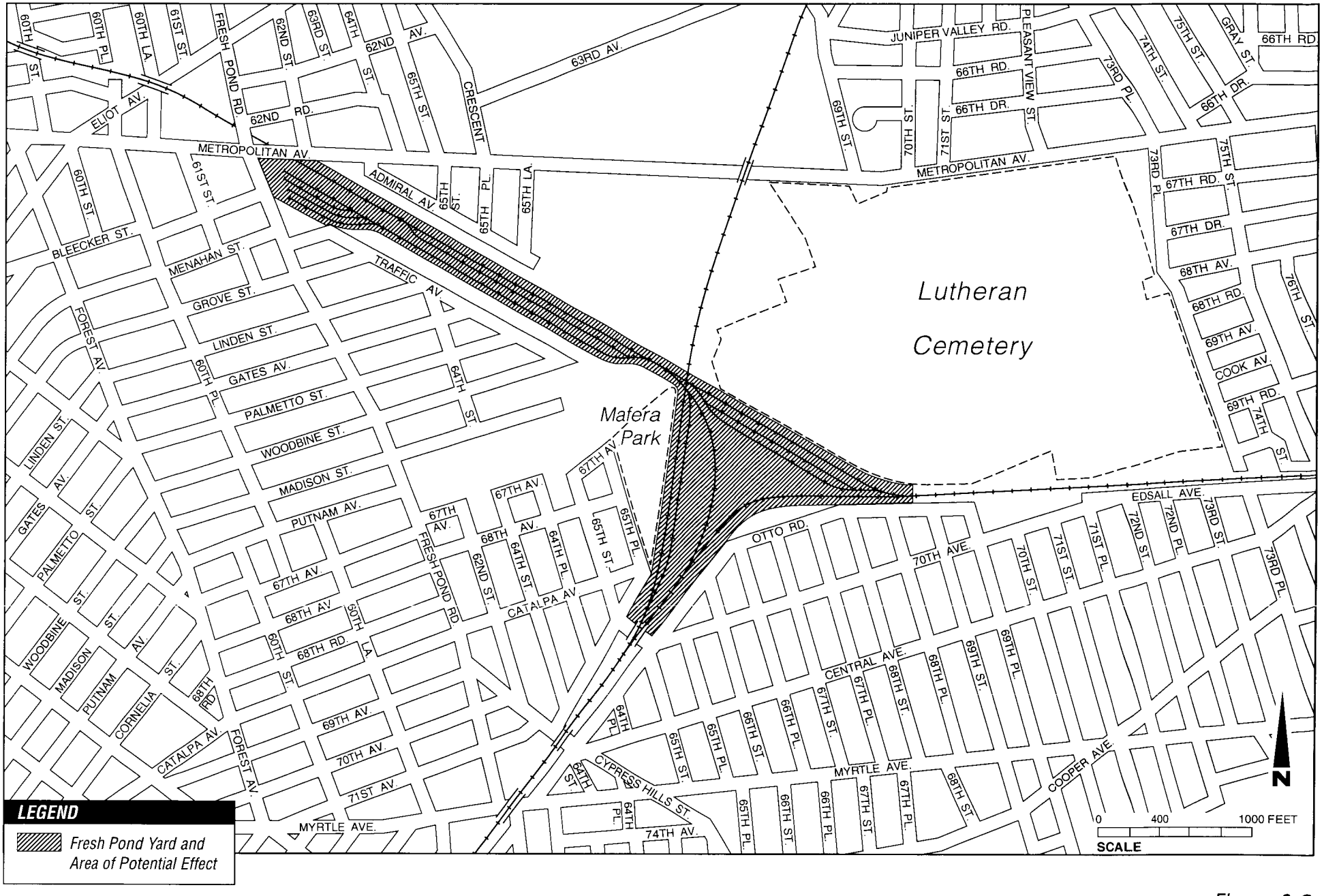
## Queens Alignment and Area of Potential Effect – Archaeological Resources




MTA / LIRR
East Side Access

Figure 8-5

**Roosevelt Island Area of Potential Effect – Archaeological Resources**

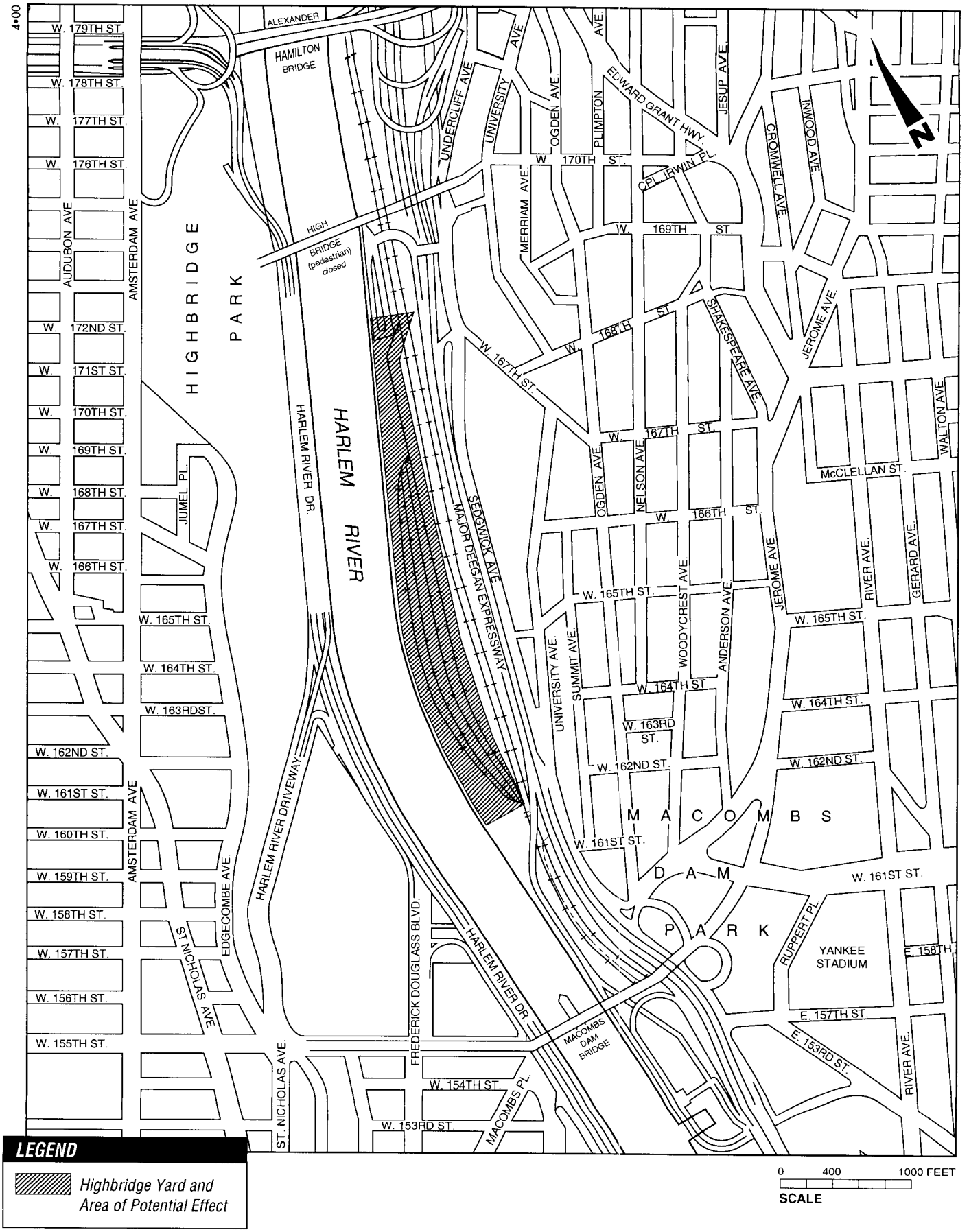



MTA / LIRR

East Side Access

Figure 8-6

## Fresh Pond Yard and Area of Potential Effect – Archaeological Resources




MTA / LIRR
East Side Access

Figure 8-7

## Highbridge Yard and Area of Potential Effect – Archaeological Resources

For both prehistoric and historic studies, contextual overviews were created based on the background research. These provide a framework in which to interpret potential prehistoric and historic resources and to understand the development history of each APE.

Based on information gathered from documentary and cartographic research and site visits, a preliminary evaluation of the likelihood of encountering archaeological resources was rated as low, moderate, or high for each APE. The results of this research are summarized below under "Existing Conditions."

*DOCUMENTATION OF DISTURBANCE AND IDENTIFICATION OF POTENTIAL UNDISTURBED RESOURCES*

In conjunction with identifying areas where known archaeological sites are located or where archaeological resources may have been deposited, documentary and cartographic research was used to identify areas where late 19th century and 20th century development activities appear to have disturbed the soils and therefore any archaeological resources that may once have been present. Activities such as grading, landscaping, utility installation, and other similar activities that could have disturbed buried resources were documented. Where available, existing boring logs were reviewed to understand grading and filling activities that may have occurred, and topographic maps were compared to current elevations to determine what changes to the landscape have occurred through grading and/or filling. This information about disturbance was used to adjust the rating of each APE's potential to contain archaeological resources. After reviewing the disturbance record, sites were considered to have a low, moderate, or high probability of having buried archaeological resources. Sites with a high probability were those that once had topography that would have been conducive to prehistoric use, or those that once had historic-period uses that could have resulted in significant archaeological resources, at which later development activities may not have disturbed those resources. These sites therefore have the potential to contain intact archaeological resources. Such sites are referred to as potentially archaeologically "sensitive." The results of this research and the potentially archaeologically sensitive areas in the study areas are described below in "Existing Conditions."

*For areas that were determined to be archaeologically sensitive in the Stage 1A archaeological resources assessment, ongoing analysis in consultation with SHPO has been conducted since publication of the Draft Environmental Impact Statement (DEIS). In some locations, this analysis has resulted in changes to the conclusions made in the DEIS. This ongoing work is described in this chapter.*

*ASSESSMENT OF PROJECT IMPACTS AND IDENTIFICATION OF MITIGATION*

For each area that was identified as archaeologically sensitive, the project alternatives' potential for significant adverse impacts to those possible archaeological resources was assessed. The future steps required to avoid significant adverse impacts were then outlined. These consist of additional investigation to identify whether any archaeological resources are actually present on the sites and whether any resources that are present are eligible for the State and National Registers of Historic Place. Then, for any such resources, a range of possible mitigation measures was identified. The results of these steps are described later in the chapter in section D, "Probable Impacts of the Project Alternatives," and section E, "Mitigation Measures."

## B. EXISTING CONDITIONS

There are no archaeological sites listed on the S/NR located within the APEs. Possible archaeological sites, inventoried by the New York State Museum or otherwise identified by archaeologists, have been identified as potentially within or in close proximity to the Queens alignment, described below. The New York State Museum's identification of these sites and their locations is based on a variety of old documents, which themselves may be unclear or contain conflicting information, and, therefore merely serve as indicators as to the potential archaeological sensitivity of the APEs.

The APEs have been assessed for their potential to contain prehistoric and historic-period archaeological resources, and the archaeological sensitivity of each APE has been rated low, moderate, or high. Areas with moderate and high ratings are considered to have the potential for archaeological sensitivity; in those locations, disturbance by project-related work could result in significant impacts. Areas with no or low sensitivity are not considered to have the potential for significant impacts. APEs rated as having moderate or high potential for containing archaeological resources are described below. *As part of the ongoing consultation with SHPO, this assessment has been reviewed and approved by SHPO.*

### MANHATTAN ALIGNMENT

*OVERVIEW*

As shown in Figures 8-1 and 8-2, the Manhattan alignment APE *(for Options 1 and 2, combined)* includes an area between East 52nd and East 55th Streets. This includes the streetbeds of East 52nd, 53rd, and 54th Streets between Park and Madison Avenues, the streetbed of East 54th Street between Park and Lexington Avenues, and a 100-foot-wide area of the three blocks between East 52nd and 55th Streets west of Park Avenue. The Manhattan APE also includes a small area at East 44th and 45th Streets.

In Manhattan, the project alignment falls within bedrock of the Hartland Formation. The bedrock is approximately 20 to 50 feet deep along the alignment. Above the bedrock, where overlying material has not been removed for building construction, the rock is overlain by a layer of weathered rock, above which are glacial soils and fill. However, the project area has been fully developed. Other than the streets themselves, the area above the project route has been developed with buildings resting on below-grade foundations. In the Manhattan APE, these foundations are close to or resting upon bedrock, with little or no soil between.

*EAST 52ND TO 55TH STREET APE*

*Preliminary Identification of the Possibility of Archaeological Resources Being Present Within the APEs*

*Prehistoric Period.* Early historic maps indicate that a stream once flowed north-south roughly parallel to and west of Park Avenue, in the area approximately between 52nd through 55th Streets. However, the exact location of this stream differs on the several different maps available. As noted above, prehistoric sites tend to be found on what was once well-drained land with fresh water nearby. Depending on the exact location of the stream, the area west of Park Avenue between 52nd and 55th Streets may have been such land, or it may have been marshy, and therefore not conducive to habitation. Because of the possibility that the land was not marshy, LPC has identified this APE as potentially sensitive for prehistoric resources.

Considering that it may or may not have been marshy, before taking into account any disturbance activities, this area is considered to have a low to moderate potential for containing prehistoric resources. Later development activities that could have affected these conditions are described below.

In addition, a second stream is depicted on historic maps east of Park Avenue, at roughly Third Avenue. The land sloped down from Park Avenue toward this stream. Consequently, LPC identified this APE as potentially sensitive for prehistoric resources. Before taking into account any disturbance activities, East 54th Street between Park and Lexington Avenues is also considered to have a low to moderate potential for containing prehistoric resources.

*Following publication of the DEIS, borings were taken in the East 55th Street APE. Logs of these borings were analyzed by Historical Perspectives, Inc. The logs depicted fill levels beneath the roadbed extending 5 to 7 feet below grade and, in most cases, lying directly above bedrock. The lack of deeper fill levels suggests that the East 55th Street APE was formerly elevated upland rather than a stream location that might have been used by Native Americans. In the single boring that contained soils that were not fill material, those soils lacked organic material. Organic material is indicative of surface soils, which would be the soils most likely to contain any archaeological evidence of prehistoric use. Overall, therefore, the borings indicated that the pre-development stream that flowed through this portion of Manhattan did not flow through the East 55th Street APE, reducing the likelihood that the area was used by prehistoric people. Further, even if the location were used prehistorically, it no longer retains any evidence of buried soil layers that might contain archaeological resources. Consequently, the East 55th Street APE is not sensitive for prehistoric resources. The SHPO concurred with this conclusion in a letter dated February 16, 2001 (included in Appendix B).*

*Historic Period.* Documentary and cartographic research indicates that no historic structures or features were present on the East 52nd, 53rd, 54th, and 55th Street roadbeds. Therefore, no historic archaeological resources are anticipated in the streetbeds. Between the streets, the blocks between East 52nd and 55th Streets on the west side of Park Avenue were extensively developed in the late 19th through 20th century. These buildings were constructed after water and sewer lines were already available, and therefore they would not be early enough to result in significant archaeological resources (see the discussion above of the types of historic resources of interest in the New York area).

*Documentation of Disturbance/Identification of Potential Undisturbed Resources*

The discussion below focuses first on the roadbeds of 52nd, 53rd, 54th, and 55th Streets. Following that evaluation, the non-street portion of the APE is considered. This consists of a roughly 100-foot-wide area on each of the three blocks adjacent to the west side of Park Avenue between 52nd and 55th Street.

*Roadbeds.* To construct East 52nd, 53rd, 54th, and 55th Streets, the land was graded and/or filled to make it level and suitable for streets. In addition, sewer, water, gas, and electrical utilities were also buried beneath these roadbeds. These utilities may be in original soils, or they may be in fill, depending on the specific grading activities that were required.

In addition to these changes, East 52nd Street was part of the large area excavated in the early 20th century to create GCT's two-level track network. All the soil beneath this large area was

excavated, down to rock. Once the new train terminal was created, buildings and streets were gradually constructed above the terminal.

On East 53rd Street, a small ventilation facility for the E/F subway was constructed below grade, connecting to street level. However, the subway tunnel itself was built through bedrock and would not have disturbed areas above it. Consequently, some areas of original soil may have remained undisturbed above the subway and around the ventilation facility.

On East 54th Street, borings completed within the streetbed directly west of Park Avenue indicate fill levels extending between 12 to 20 feet below grade, consisting of sandy silt, with no evidence of organic materials. The lack of organic material and depth and content of fill suggest, respectively, that the area was, in fact, low-lying and does not contain the topographic features associated with Native American occupation. Based on this information, there is little chance that Native Americans inhabited the immediate area. Consequently, the East 54th Street roadbed west of Park Avenue has no prehistoric sensitivity.

*The East Side Access DEIS, summarizing the conclusions of the Stage 1A archaeological resources assessment, indicated that* on 54th Street east of Park Avenue and 55th Street west of Park Avenue, the disturbance associated with grading, filling, and installation of utilities may have left some original soils undisturbed. As described earlier, there is some chance that a stream once flowed through the area and that it may therefore have been used by Native Americans. The extent of filling or grading that occurred after that time is unknown, and therefore some prehistoric surfaces may remain protected beneath the street. Prehistoric resources are rare throughout the city, and particularly in Manhattan. Therefore, these two streetbeds and East 53rd Street (discussed above) *were* assumed *in the DEIS* to retain a low to moderate sensitivity for prehistoric resources. *Since publication of the DEIS, however, a review of boring logs indicated that the East 55th Street APE is not sensitive for archaeological resources from the prehistoric period.*

*Blocks between 52nd and 55th Streets.* The blocks between East 52nd and 55th Streets west of Park Avenue have undergone several periods of construction. All three blocks are now occupied by large buildings with basements. Beneath those basements, the buildings have massive foundations due to their size. Those foundations rest on the bedrock below. The depths of excavations required for the basements and foundations would certainly have impacted any undisturbed soils that were originally at the surface during prehistoric times. Consequently, there is no sensitivity for significant prehistoric resources in those three blocks.

*EAST 44TH AND 45TH STREET APE*

*Preliminary Identification of the Possibility of Archaeological Resources Being Present Within the APEs*

*Prehistoric Period.* Historic maps indicate that this APE was well-drained land about one block west of a stream, and, therefore, may have been attractive to Native Americans. Consequently, before taking into account any disturbance activities, this APE has a moderate potential for prehistoric resources.

*Historic Period.* Before late 19th century development, no historic structures or features were identified in this APE, with the exception of a small wooden structure that stood on the site at 47 East 44th Street. This structure, built before 1879, was replaced in 1887 by a 5-story brick

dwelling with a basement. The brick structure was enlarged with an addition to the rear of the lot in the early 20th century and is still extant.

*Documentation of Disturbance/Identification of Potential Undisturbed Resources*

The non-street portion of this APE has been developed with two structures with basements: the late 19th century brick structure that still stands at 47 East 44th Street, and the 20-story office building at 347 Madison Avenue. The construction work associated with these two structures would have disturbed any original prehistoric surfaces on their sites. The East 44th Street roadbed has been disturbed by the installation of utilities twice—first prior to the construction of the GCT tracks and subsequently after their construction. A retaining wall for the below-grade rail complex was also constructed in this portion of the street. The late 19th century building at 47 East 44th Street would have disturbed any potential prehistoric or historic resources on that site. Therefore, this APE is overall not sensitive for either prehistoric or historic-period resources.

## QUEENS ALIGNMENT

*OVERVIEW*

The Queens alignment APE includes all areas that would be disturbed by construction of the new tunnels, tracks, and other features of the Preferred Alternative. It also includes the area that could be affected by a new connection between the Hunterspoint Avenue LIRR station and the nearby subway under the TSM Alternative.

In Queens, most of the project alignment consists of a surficial layer of fill, ranging in thickness from approximately 5 to 35 feet. An organic deposit of peat and organic silt was encountered in the area north of Sunnyside Yard, from 3 to 10 feet thick. The entire Queens alignment is underlain by glacial deposits that vary between 10 and more than 60 feet thick. These glacial deposits are of variable type, distribution, and thickness that is representative of the complex conditions typically found at the rear of terminal moraines. Decomposed rock and bedrock underlie the glacial deposits at depths ranging from 40 to more than 100 feet. The depth to rock generally increases from west to east.

*PRELIMINARY IDENTIFICATION OF THE POSSIBILITY OF ARCHAEOLOGICAL RESOURCES BEING PRESENT WITHIN THE APEs*

*Prehistoric Period*

Evidence of Native American utilization within the Queens alignment project area and its vicinity is well documented—OPRHP and NYSM have identified six prehistoric sites in the area. Four of the sites fall outside the boundaries of the project area. Of the two closest sites, one may fall within the boundaries of the yards and one directly adjacent, as follows:

- New York State Museum #4538 (ACP* Queens #—no number assigned): This refers to a village site in Long Island City. The location provided by NYSM includes the entire yard complex and surrounding area—from the rail yard complex on the southeast to 12th Street

* Archaeologist Arthur C. Parker's research into the known prehistoric sites of New York State identified a number of sites within New York City in his 1920 publication, *The Archaeological History of New York*. These are given numbered designations (ACP #). The New York State Museum locates these sites based on Parker's maps.

on the northwest. Therefore, this village site may potentially be within the project area or immediately adjacent to it.

- New York State Museum #4537 (ACP Queens #14): This refers to a burial site in Long Island City. Archaeologists differ on the placement of the site, placing it either on or northeast of Broadway, or on or near Crescent Street. Though not precisely located by NYSM, the site may either be 6,500 feet from the project area, or overlap at the northwestern edge of the rail yard complex and extend to 11th Street on the northwest.

As described above, because of the lack of clarity and the age of the sources that identify these sites, the identified sites only serve as indicators of potential sensitivity.

Prehistoric topographical conditions in the Queens alignment area would have been conducive to use by Native Americans. The project area consisted of marsh, salt meadow, and elevated knolls, interspersed with ridges and wooded areas on and surrounding the project area. However, while the marshes that once existed east and west of Hunters Point Avenue and extending east to Queens Street would have been attractive hunting and gathering locations for native peoples, it is unlikely that any campsite, settlement, or processing area would have been located within the marsh. Instead, these would have been established on nearby dry, elevated land. Therefore, although the project area may have been utilized by Native Americans, types of occupation would have varied depending on the topographical conditions. Consequently, before taking into account any disturbance activities, the APE has varying levels of sensitivity throughout the project area.

*Historic Period*

The earliest recorded European residents in the vicinity of the project area were in the Dutch Kills area, to the west of the project site. There were few roads in the vicinity of the project area, which was isolated from the rest of Long Island. Crops were transported to New York City markets on boats on the East River, or from a wharf on the current Court Street, down Dutch Kills and Newtown Creek to the East River. By the time of the Revolution, there were a few isolated farmsteads, clustered along a road that ran between the current Skillman Avenue and Northern Boulevard. British forces occupied northwestern Queens from 1776 until 1783. Middleburg Road, which formerly ran diagonally through the center of the rail yards to the east of the current Honeywell Street viaduct and continued southeasterly past the current boundaries of the yard, was the chief communication and transportation route between east and west, and the eastern section of the yards and areas farther east were heavily manned with British troops, with soldiers bivouacked in huts and tents and on farms and fields along the road. Even until the 1880's and 1890's, some of the huts were still visible, and there were regular reports of farmers plowing up Revolutionary War relics.

During the 1880's and 1890's, many of the farms on the site of the future rail yards were subdivided. By 1891, more than 100 small frame and brick houses had been built on the site of the future rail yard complex, including a small hamlet, Sunnyside, built between Northern and Queens Boulevards. By 1903, many houses filled the future yards site, though this neighborhood was short lived. From 1903 to 1905, all the houses were razed and the land was leveled by the Pennsylvania Railroad for construction of the rail yards. In 1909, the viaduct bridges were constructed over the yards and the rail yard complex opened in 1910. Since then, the yard complex, which also contains the LIRR Main Line and Port Washington Branches, has been utilized for railroad operations to the present day.

Due to the large number of farmhouses and other residential properties that once occupied the project area, before taking into account any disturbance activities the project area is considered potentially sensitive for a range of shallowly and deeply buried archaeological resources along the former Middleburg Road, and in the areas of the dwellings erected in the late 19th and early 20th centuries (in the form of wells, privies, cisterns, and foundations) prior to construction of the yard complex. In addition, there is also the potential for resources relating to the British occupation of the area during the Revolution along Middleburg Road.

*DOCUMENTATION OF DISTURBANCE/IDENTIFICATION OF POTENTIAL UNDISTURBED RESOURCES*

During residential and commercial development of the area beginning in the 1860's and 1870's, meadows were filled in and old roads raised to a higher grade, often using local hills as fill sources. As described above, in the first decade of the 20th century, the Pennsylvania Railroad leveled the area of the future rail yards, filling in low-lying meadow and swamp land, and removing hills within the yard boundaries. An estimated 2.5 million cubic yards of earth were deposited at the meadow at the Dutch Kills headwaters, now the westernmost third of the rail yards, roughly west of the current Van Dam Street.

As described above, prehistoric archaeological resources are typically shallowly buried, usually within 3 to 4 feet of the prehistoric surface, and therefore vulnerable to later construction activities. Therefore, early grading and residential development would have compromised the prehistoric potential of the project area, including the above-described NYSM sites, while subsequent rail yard construction would have affected later historic-period resources. The analysis of the project area—the Queens alignment and area of the TSM Alternative tunnel at Hunters Point Avenue—identified a number of potentially sensitive locations, which have been rated low, moderate, or high based on the potential for containing prehistoric and historic-period resources and depending on levels of disturbance. However, conclusions concerning both sensitivity and impact are based primarily on a comparison of topographic maps that detail land contours along the Queens alignment before and after the Sunnyside Yard and LIRR track construction. Although earlier topographic maps were reviewed, they provided only crude descriptions of topography due to lack of elevation numbers. In addition, disturbance and filling episodes prior to the construction of Sunnyside Yard can only be generally documented.

Taking into account the likelihood of prehistoric and historic-period occupation and subsequent disturbance activity, the following areas were identified as having moderate and high sensitivity for archaeological resources (see Figure 8-8):

- Area of proposed demolition of the warehouse buildings between Northern Boulevard and Yard A. This area is potentially sensitive for prehistoric resources. Soil borings indicate that this area has 10 feet of fill or less.
- Three areas between the Thomson Avenue and Queens Boulevard bridges as follows: 1) the area that extends along the northern edge of Yard A between the Thomson Avenue and Queens Boulevard bridges is potentially sensitive for prehistoric resources; 2) the small triangular area of tracks bounded by the northern edge of Yard A, Dutch Kills Street, and the Thomson Avenue bridge is sensitive for historic-period resources relating to 18th and 19th century residential lots (including shaft features such as privies, cisterns, and wells); and 3) an area adjacent to and east of Dutch Kills Street and the Thomson Avenue bridge is potentially sensitive for 18th and 19th century historic-period resources relating to residential uses as described above.

- Three areas between the Queens Boulevard and Honeywell Street bridges as follows: 1) the area that extends along the northern edge of Yard A between the Queens Boulevard and Honeywell Street bridges is potentially sensitive in different locations for prehistoric resources and historic-period resources relating to a ca. 1650 grist mill; soil borings indicate that a portion of this area has 10 feet of fill or less; 2) a small area along the proposed tunnel alignment is potentially sensitive for prehistoric resources and has 10 feet or less of fill; and 3) an area along the north side of the proposed Harold Interlocking work and in the area of the proposed new Sunnyside station near the Queens Boulevard bridge is potentially sensitive for prehistoric resources and historic-period resources relating to 18th and 19th century residential lots (including shaft features such as privies, cisterns, and wells).
- Two areas between the 39th Street viaduct and 43rd Street (Laurel Hill Avenue), as follows: 1) a portion of the area proposed for the Harold Interlocking work is potentially sensitive for historic-period resources relating to 18th and 19th century residential lots; and 2) an area adjacent to the western edge of the loop track at 43rd Street is potentially sensitive for historic-period archaeological resources relating to British and Hessian troop occupation during the Revolutionary War.
- The area between 43rd Street (Laurel Hill Avenue) and 48th Street (Gosman Avenue), bounded by 37th Avenue to the north and Barnett Avenue to the south, is potentially sensitive for historic-period resources relating to British troop occupation during the Revolutionary War.

**ROOSEVELT ISLAND**

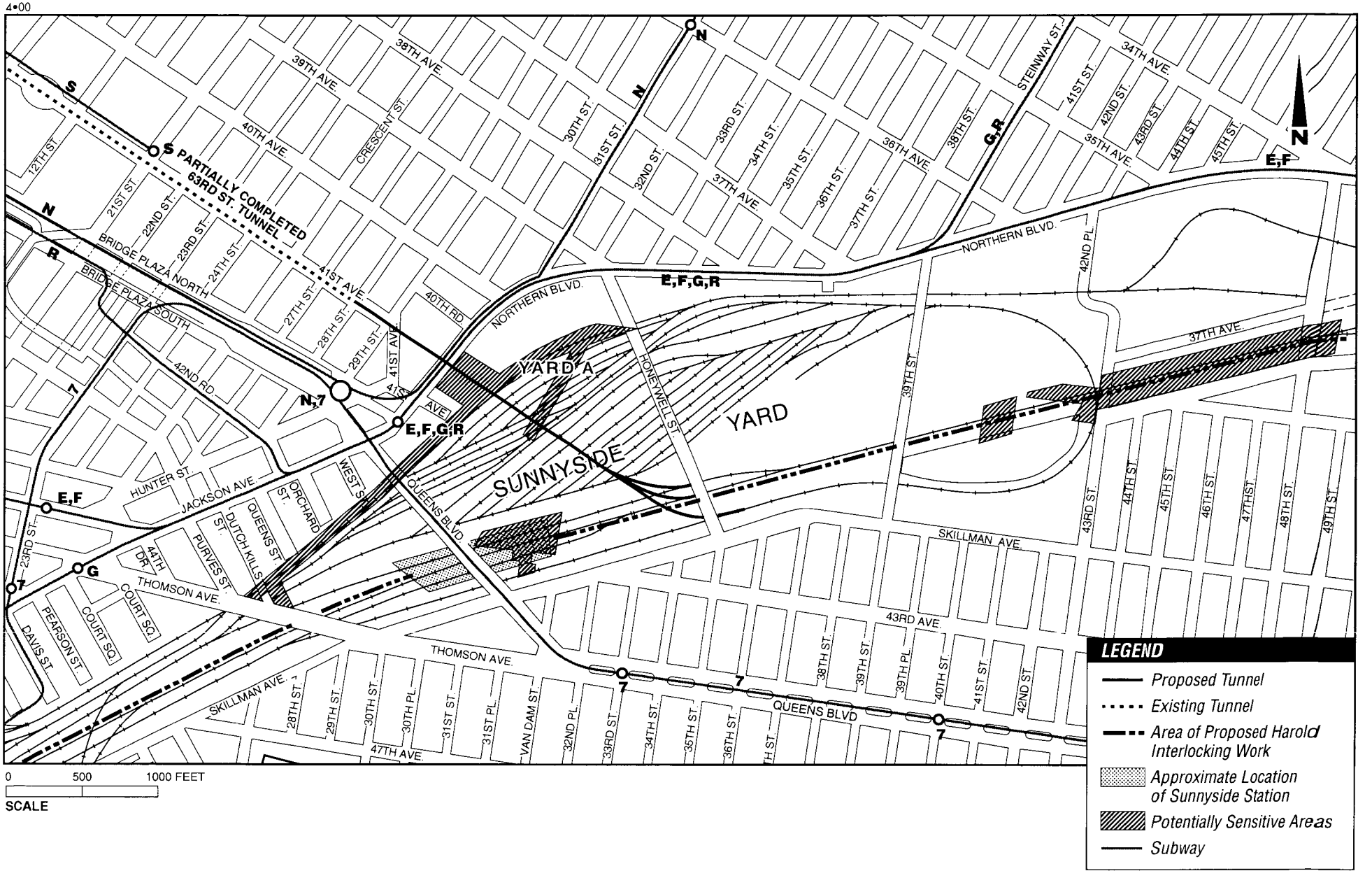
*PRELIMINARY IDENTIFICATION OF THE POSSIBILITY OF ARCHAEOLOGICAL RESOURCES BEING PRESENT WITHIN THE APE*

*Prehistoric Period*

Although there does not appear to be any documentary evidence of prehistoric sites on Roosevelt Island, since prehistoric sites are documented in Manhattan and Queens not far from the site, it is likely that Native Americans did at some point visit Roosevelt Island. At the time of European contact, the proposed site of the substation was land under water. *The East Side Access DEIS noted that because* sea levels gradually rose during the prehistoric period as the glaciers of the last ice age retreated, it is possible that during some prehistoric period the site may have contained habitable land that may have been occupied by Native Americans. *The DEIS therefore concluded that* before taking into account any disturbance activities, this APE (conservatively defined as the area within 100 feet of the existing subway ventilation shaft) is considered to have a low to moderate sensitivity for prehistoric resources. *Since publication of the DEIS, however, borings have been taken on Roosevelt Island and reviewed by Historical Perspectives, Inc. The boring logs indicate that the site on Roosevelt Island is not sensitive for prehistoric resources. No evidence of a prehistoric living surface exists at the site; rather, Roosevelt Island was enlarged in the 20th century by placing fill directly above the sand and gravel river bottom. SHPO concurred with this conclusion in a letter dated February 16, 2001 (included in Appendix B).*

*Historic Period*

As described above, prior to development activities, the Roosevelt Island APE was under water. By 1866, a bulkhead and pier line had been established around Roosevelt Island and the island had been filled to this line. Following the filling of the shoreline along the East River, the site




MTA / LIRR

East Side Access

*Figure 8-8*

## *Queens Alignment – Potential Archaeologically Sensitive Areas*

remained undeveloped with the exception of a short-term unidentifiable structure there from approximately 1885 through 1890. Because of the short duration of the structure, it has little research value, and the APE does not have any potential for significant historic-period archaeological resources.

*DOCUMENTATION OF DISTURBANCE/IDENTIFICATION OF POTENTIAL UNDISTURBED RESOURCES*

As described above, the shoreline edges of Roosevelt Island were filled in to create regular, bulkheaded riverfronts. In the 1970's, a subway ventilation shaft for the 63rd Street Tunnel was constructed south of and contiguous with the proposed substation site. *Although the DEIS indicated the possibility of buried prehistoric resources at the site, a review of boring logs after publication of the DEIS indicated that the site is not sensitive for archaeological resources from the prehistoric or historic period.*

**FRESH POND YARD, QUEENS**

*PRELIMINARY IDENTIFICATION OF THE POSSIBILITY OF ARCHAEOLOGICAL RESOURCES BEING PRESENT WITHIN THE APE*

*Prehistoric Period*

Until the 20th century, prior to historic development on the site, the area of Fresh Pond Yard appears to have been relatively level and wooded. Historic maps indicate that the area was once swampy and dotted with fresh water ponds, but the yard site itself was dry and included a knoll that could have been attractive to Native Americans. In 1930, elevations at the yard site varied between 85 and 100 feet above sea level, cresting at the northeastern section of the yard. Therefore, the yard's prehistoric topographical features and its proximity to a fresh water source could have made it possible that the site was utilized by Native Americans in some capacity. In addition, Fresh Pond, a fresh water source, was located within approximately 2,000 feet of the western portion of the yard, and about 3,000 feet from the east portion of the yard, making water easily accessible to Native Americans. Consequently, prior to taking into account any disturbance activities, Fresh Pond Yard has a high sensitivity for prehistoric resources.

*Historic Period*

Through the 19th century, the yard encompassed the back acreage of large farms that bordered Fresh Pond Road, one of the early transportation routes in this part of Queens. The farm structures, which typically included the farmhouse, barn, privy, and other outbuildings, fronted onto Fresh Pond Road, far from the yard. Mid-19th century maps show that the area of the yard was undeveloped woodland. Since it is unlikely that any significant features relating to the agricultural/domestic history of the site would have been located so far from the active farm compounds, the yard has no potential resources relating to these homesteads.

Starting in the late 19th century, the area of the yard was used exclusively by the railroad. Railroad-related resources indicated on historic maps, including tracks, switching and signaling boxes, and towers, are not considered to have archaeological importance since they would have been upgraded and their mechanisms removed as technology advanced. Therefore, the yard is not sensitive for railroad-related historic-period archaeological resources.

*DOCUMENTATION OF DISTURBANCE/IDENTIFICATION OF POTENTIAL UNDISTURBED RESOURCES*

*The DEIS for the East Side Access Project concluded that, if Fresh Pond Yard had been filled to raise the land for tracks and other railroad uses, the fill materials may have preserved and protected some prehistoric archaeological resources below, and therefore Fresh Pond Yard might possess undisturbed areas that are sensitive for prehistoric resources. Following publication of the DEIS, borings were taken at Fresh Pond Yard. Logs of these borings were examined by Historical Perspectives, Inc. The boring logs indicate that fill extends to at least 12 feet below the surface in the location of the proposed building at Fresh Pond, and elsewhere in the yard, the fill extends at least 4 feet below the surface. Within those fill materials, no evidence of potentially habitable prehistoric living surfaces was identified in boring logs. Beneath this fill level, Fresh Pond Yard retains a high sensitivity for prehistoric resources. The SHPO concurred with this conclusion in a letter dated November 17, 2000 (included in Appendix B.)*

## HIGHBRIDGE YARD, THE BRONX

*PRELIMINARY IDENTIFICATION OF THE POSSIBILITY OF ARCHAEOLOGICAL RESOURCES BEING PRESENT WITHIN THE APE*

*Prehistoric Period*

There are a number of documented prehistoric sites in the area surrounding Highbridge Yard, although there are no sites reported within or in direct proximity to the yard. Prior to historic development and filling, Highbridge Yard was predominantly either inundated by the Harlem River or marsh along its shore. It is possible that the area of the yard experienced a short period when it was drained and dry, when sea levels were lower. At that time, the site could have been utilized by Native Americans for fishing and other food procurement. Extensive borings conducted across the site over the last decade do not indicate the presence of extensive shell deposits on the site, which would have been indicative of a Native American presence there. Given the lack of extensive shell deposits and the short span of time prehistorically that the site would have been dry and inhabitable, it is highly unlikely that the site was used for prehistoric activities. Furthermore, even if prehistoric resource were once present below fill layers, they would have been subject to currents and tidal actions for more than 4,000 years, as well as more recent dredging activities, and therefore would be disturbed. Consequently, even without considering disturbance from later development of rail uses at the site, Highbridge Yard is not considered to have potential to contain significant prehistoric archaeological resources.

*Historic Period*

Until the 1860's, Highbridge Yard was either marsh or under water. The yard area was filled to its current western boundary in stages starting in the late 1860's, and concluding in the early- to mid-20th century. Due to the late period of the fill, the fill itself is not considered to have archaeological potential. Commencing in the 1860's, the area of the yard was utilized exclusively by the railroad, and numerous tracks and buildings were built and later demolished in the yard. As described above, the sites of railroad tracks, switching mechanisms, and towers, would not be considered to have archaeological potential as they have been upgraded and removed through time. *The DEIS concluded that* the sites of structures that existed in Highbridge Yard for longer periods of time, such as the carpenter shop and blacksmith shop, among others, and

a shorter lived 30-stall roundhouse built to service New York Central's engines, could provide information on railroad technology and its adaptation at Highbridge Yard. *The DEIS therefore indicated that* the locations of these structures, which are expected to be shallowly buried within the fill, *were* potentially sensitive for historic archaeological resources.

*Following publication of the DEIS, additional research was conducted to determine the potential significance of the railroad structures that once stood at Highbridge Yard (this research effort is documented in the Archaeological Resource Evaluation Topic Intensive Study of Highbridge Yard prepared by Historical Perspectives, Inc. in August 2000). This report concludes that the railroad structures built at Highbridge Yard were intended as temporary, marginal structures and their sites would lack the integrity to produce valuable archaeological information. Furthermore, more pertinent examples of those types of structures existed elsewhere and have been well documented and studied. Therefore, there is a very low potential that National Register-eligible remains that would make a substantive contribution to the archaeological record are located at Highbridge Yard. The SHPO agreed with the conclusions of this report in a letter dated October 5, 2000 (included in Appendix B of this FEIS).*

*DOCUMENTATION OF DISTURBANCE/IDENTIFICATION OF POTENTIAL UNDISTURBED RESOURCES*

*As described above, Highbridge Yard has no potential to possess significant buried archaeological resources from the prehistoric or historic periods.*

## LONG ISLAND STORAGE YARDS

With the exception of the Cerro Wire site, the locations *being assessed as potential* nighttime storage yard sites—Babylon, Yaphank East, Yaphank West, Ronkonkoma, Pilgrim Hospital, and Riverhead—have the potential to contain archaeological resources. The southern portion of the proposed Cerro Wire site was previously analyzed as part of a separate and unrelated project, The Mall at Oyster Bay (*Final* Environmental Impact Statement for the Mall at Oyster Bay, *May 2000*). The report concluded that the site had little potential for either prehistoric or historic-period archaeological resources based on original topography and previous subsurface disturbance. In its review of that project, SHPO concurred with that assessment and concluded that the project would have no impact on cultural resources (SHPO correspondence, March 8, 1999). The remaining northern portion of the site, located on the Syosset Landfill, would not be anticipated to have archaeological potential due to extensive subsurface disturbance.

Of the remaining yard sites *being assessed*, the Yaphank East, Yaphank West, and Riverhead sites may be archaeologically sensitive for prehistoric archaeological resources due to their proximity to fresh water sources and local water bodies. The Yaphank East and West sites are close to the Carmans River. In addition, the Yaphank East site is located next to a small cemetery, and, therefore, may also be sensitive for historic-period archaeological resources. The Riverhead site is located close to several bodies of water, including Saw Mill Creek, the Peconic River, and Flanders Bay.

The Babylon and Ronkonkoma sites are situated within a more built-up environment. The archaeological potential of each depends on the proximity and type of reported prehistoric sites in the region, their historic use, and the degree of subsurface disturbance each site has experienced. Based on a map of Archaeologically Sensitive Areas provided by the Suffolk

County Archaeological Society for the Heartland Business Center Project (Generic Draft Environmental Impact Statement for the Heartland Business Center, March 1983), the Pilgrim Hospital site may fall within or substantially contiguous with areas that have been identified as having generalized prehistoric activity.

## C. FUTURE CONDITIONS COMMON TO ALL ALTERNATIVES

Without the proposed project, any archaeological resources buried in the APEs will most likely remain in place, though disturbance could occur in some APEs. In streetbed locations, work on utilities and other in-street work could have some additional effect on those resources, as could routine maintenance and repair work in the rail yards. Possible redevelopment unrelated to the proposed project on the Pilgrim Hospital *and Riverhead sites* may also lead to the disturbance of potential archaeological resources, if they exist. Otherwise, there is no reason to expect them to be disturbed.

## D. PROBABLE IMPACTS OF THE PROJECT ALTERNATIVES

As project plans proceed with commencement of preliminary engineering, ongoing consultation will be undertaken with SHPO at OPRHP and with the federal Advisory Council on Historic Preservation, if they wish to be involved. This ongoing consultation is mandated by Section 106 of the National Historic Preservation Act of 1966. As part of the consultation process, additional work will be performed where the potential for significant impacts to archeological resources has been identified, described below. As discussed below, this work will involve the undertaking of appropriate mitigation measures to avoid significant impacts to the extent practicable. The potential impacts associated with project alternatives are described below.

*Throughout the preparation of the EIS, SHPO was consulted regarding the various elements of the analysis. In addition, representatives of SHPO met with representatives of East Side Access on April 26, 2000. Copies of the correspondence are included in Appendix B.* SHPO concurred with the information and findings contained in the Stage 1A archaeological resources assessment, *addenda, and topic-intensive study* and with the summary in this chapter in correspondence dated January 12, 2000; *July 7, 2000; August 4, 2000; August 8, 2000; October 5, 2000; November 17, 2000; and February 16, 2001.*

### NO ACTION ALTERNATIVE

As described earlier, the No Action Alternative would involve measures available to the LIRR as routine management that would not require major new construction. Therefore, this alternative does not have the potential to affect archaeological resources.

### TSM ALTERNATIVE

No areas of potential prehistoric or historic-period sensitivity have been identified in the location of the proposed pedestrian bridge between the LIRR station and subway at Hunters Point Avenue. Therefore, this alternative would have no significant adverse effects on archaeological resources.

### PREFERRED ALTERNATIVE

As described above under "Existing Conditions," because of the long history of activity in parts of the study areas, archaeological sites containing artifacts, features, and architectural remains

may be buried in the project areas. Many of these locations that once contained archaeological resources have since been disturbed or destroyed by later grading, excavation, installation of utilities, construction of subway lines, and other development activities. In some locations, however, archaeological resources may remain. If present, these could provide information about the early history of Manhattan, Queens, and the Bronx, and therefore may be eligible for listing on the State and National Registers of Historic Places.

The archaeological assessment completed for the project identified areas that would be affected by the Preferred Alternative that may contain archaeological resources. As described above, many of the project APEs—*a portion of* the Manhattan alignment, the Queens alignment, and most of the Long Island yard sites—have the potential to contain buried archaeological resources from the prehistoric period. In addition, portions of the Queens alignment APE have the potential to contain buried archaeological resources from the historic period. In many of these locations, the specific depth of fill materials that may have covered and protected earlier archaeological resources is unknown. In addition, in some locations, the specific depth and extent of project disturbance is not yet known. In all such areas, the analysis conservatively assumes that the project could result in significant adverse impacts to archaeological resources, as described below. Additional analysis of subsurface conditions in the potentially affected areas will be conducted to determine fill levels as the project proceeds into preliminary engineering. With such information, appropriate mitigation measures will be developed (as described in section E, below) to protect or recover archaeological resources that would be disturbed by construction.

*MANHATTAN ALIGNMENT*

Within the Manhattan alignment APE *for Option 1*, small areas of potentially prehistoric sensitive areas may be located beneath East 53rd Street between Park and Madison Avenues, *and* East 54th Street between Lexington and Park Avenues.

Proposed construction required for Option 1 on East 53rd Street west of Park Avenue and on East 54th Street east of Park Avenue could adversely affect prehistoric resources, if any are buried beneath those streets. In addition, the cut and cover work required to create a new train tunnel *for Option 1* in the area just west of Park Avenue between 52nd and 55th Streets could adversely affect prehistoric resources beneath 52nd *and* 53rd Streets, if any are located there. *However, as described in Chapter 2 ("Project Alternatives"), Option 2 has been selected as the preferred engineering option for the Manhattan alignment.* Option 2 would avoid affecting potentially sensitive areas of 52nd, 53rd, and 54th Streets.

*QUEENS ALIGNMENT*

Proposed work along the Queens alignment would cause varying levels of disturbance to areas that may contain prehistoric archaeological resources, including in the locations of NYSM sites #4538 and 4537, and historic-period archaeological resources. The deepest and most extensive areas of impact would be related to tunnel construction through an area that may contain buried prehistoric resources, located between Northern Boulevard and Yard A, and in two areas between the Queens Boulevard and Honeywell Street bridges that may contain prehistoric and historic-period resources. As described above, these locations have 10 feet or less of fill, so that the original land beneath would be disturbed by the proposed excavation.

In addition, proposed construction within Yard A would affect an area that may contain archaeological resources at the Thomson Avenue bridge. The installation of utility lines within Yard A

may also affect areas that may contain prehistoric archaeological resources, including along the northern edge of Yard A between the Thomson Avenue and Honeywell Street bridges, and an area in Yard A between the Queens Boulevard and Honeywell Street bridges. Even if trenches are dug only to a depth of 5 feet, they may affect shallowly buried prehistoric resources, if any are located there, since as described above, these are typically located within 3 to 4 feet of the pre-development surface.

Proposed construction of the new Sunnyside station, including the headhouse and platforms, would affect an area between the Queens Boulevard and Honeywell Street bridges where archaeological resources may be present. Proposed Harold Interlocking work would also affect an area that may contain archaeological resources located between the Queens Boulevard and Honeywell Street bridges, as well as two other such areas between the 39th Street bridge and 43rd Street. Proposed loop track work could also affect an area where archaeological resources may be present along the west side of 43rd Street.

In the area between 43rd and 48th Streets, from 37th Avenue to Barnett Avenue, proposed Harold Interlocking work, including embankment modifications and construction of a new viaduct bridge(s) would affect an area where archaeological resources from the historic-period may be present.

As described below under "Mitigation Measures," as project plans proceed, additional work will be performed in coordination with SHPO to further delineate the archaeologically sensitive areas that could be affected by the Preferred Alternative.

*ROOSEVELT ISLAND, FRESH POND YARD, AND HIGHBRIDGE YARD*

At Roosevelt Island, *the site is not sensitive for prehistoric or historic-period archaeological resources. Therefore, the East Side Access Project would not result in significant adverse impacts to archaeological resources on Roosevelt Island.*

At Fresh Pond Yard, the construction of a new maintenance facility *is* anticipated to affect soils approximately 6 to 10 feet below grade in the east part of the yard, *and* proposed utility excavations *would affect areas* up to 5 feet deep. *The proposed work would not extend beneath the existing fill materials at Fresh Pond Yard. Therefore, potential resources that may be present at Fresh Pond Yard are outside of the project's APE, and, if present, would not be adversely affected by the East Side Access Project.*

*No potential significant prehistoric or historic-period archaeological resources were identified at Highbridge Yard. Therefore, the East Side Access Project would not result in any significant adverse impacts to archaeological resources at Highbridge Yard.*

*LONG ISLAND STORAGE YARDS*

*As described in Chapter 2, with the Preferred Alternative, additional space would be required for nighttime storage of rail cars. All of the illustrative yard sites analyzed in this FEIS* other than the Cerro Wire site appear to have to the potential to contain archaeological resources from the prehistoric and historic periods. Documentary and cartographic research, as described below, would be undertaken at the selected yard sites, to determine the prehistoric and historic-period archaeological potential.

## E. MITIGATION MEASURES

The investigation of archaeological resources identified numerous locations where the Preferred Alternative would disturb areas that may contain archaeological resources. If resources are present there, and if they are significant resources that are eligible for the State and National Registers, the Preferred Alternative would result in a significant adverse impact.

As described earlier, as project plans proceed, ongoing consultation will be undertaken with SHPO and with the federal Advisory Council on Historic Preservation. As part of the consultation process, additional work will be performed where the potential for significant impacts to archaeological resources has been identified for the project components. This ongoing consultation is mandated by Section 106 of the National Historic Preservation Act of 1966. The future steps to be taken and any mitigation measures to be developed in consultation with SHPO *are* included in a Programmatic Agreement *executed by SHPO, FTA, and MTA. A copy of the Programmatic Agreement is included in Appendix B.*

The continuing work consists first of investigative measures using borings to further understand the filling and grading that have occurred at project areas in Queens. Once preliminary engineering is under way and the locations of the proposed construction activities have been fully determined, soil borings would be performed in those locations where they have not already been completed and analyzed for this section of the EIS. The results of the proposed borings would be used *by professional archaeologists* to determine depths of fill, and, where possible, the sensitivity of the areas to be affected by the proposed project. For the Queens alignment, soil borings *would* be performed in all areas of sensitivity where they have not already been completed. Upon completion of the soil borings, impacts would be reevaluated *by professional archaeologists* based on indication of potential sensitivity.

At any locations where borings or additional research confirm the potential for significant archaeological resources to exist, appropriate mitigation measures would be developed through ongoing consultation with SHPO. This may include Stage 1B subsurface archaeological testing in the form of trenching/shovel test pits to investigate the sensitive sections that would be impacted by proposed construction. The testing would be done to locate and identify any potential prehistoric or historic cultural features or deposits, so that the presence or absence of resources, and their extent if they are in fact present, could be determined. For resources that are identified as present, mitigation may also include Stage 2 subsurface investigation, as well as further research, to determine whether or not the resources identified are eligible for the State and National Registers. If resources are determined to meet National Register eligibility criteria, Stage 3 data recovery in the form of a full-scale excavation or avoidance of the resources would be undertaken. *The* Programmatic Agreement executed by FTA, MTA, and SHPO outlines the process and measures to be undertaken to avoid any significant adverse impacts to archaeological resources.

*As described earlier, prior to selecting sites for development of new nighttime railcar storage yards, MTA/LIRR will undertake an evaluation process to identify potential sites and consider the environmental impacts, including effects on archaeological resources, at those sites. At any sites other than those that are clearly disturbed and therefore that cannot possess archaeological resources,* Stage 1A archaeological reports would be prepared to assess the potential archaeological sensitivity of the sties. This would include a site file search at OPRHP, NYSM, and any local repositories *as well as* cartographic research. ❖