

6473m

Boesch
2005

Boesch
copy 2

**PHASE IA HISTORIC RESOURCES ASSESSMENT OF THE PROPOSED CITY
TUNNEL NUMBER 3, STAGE 2 MANHATTAN LEG, SHAFT 33B PROJECT AREA,
BOROUGH OF MANHATTAN, NEW YORK CITY, NEW YORK**

RECEIVED
ENVIRONMENTAL REVIEW

OCT 25 2005

LANDMARKS PRESERVATION
COMMISSION

Prepared by:

**Eugene J. Boesch Ph.D., R.P.A.
Principal Investigator
Malcolm Pirnie, Inc.
White Plains, New York**

Prepared for:

**New York City Department of Environmental Protection
Office of Environmental Planning and Assessment**

October 14, 2005

896

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	i
1.0 INTRODUCTION.....	1
1.1 Project Area Description and Areas of Potential Effect.....	3
1.2 Previously Conducted Archaeological Investigations Within the Project Area Vicinity ..	4
1.3 Methodology	5
2.0 ENVIRONMENTAL SETTING OF THE PROPOSED CITY TUNNEL NUMBER 3, STAGE 2 MANHATTAN LEG, SHAFT 33B PROJECT AREA AND VICINITY	7
2.1 Geology	7
2.2 Surface Geology.....	7
2.3 Flora and Fauna.....	8
3.0 DOCUMENTARY RESEARCH - NATIVE AMERICAN PERIOD	10
3.1 Background Culture History	10
3.1.1 Paleo-Indian Period	10
3.1.2 Archaic Period.....	12
3.1.3 Woodland Period.....	15
3.2 Native American - European Contact Period.....	16
3.3 Previously Recorded Native American Sites in the Project Area Vicinity	19
3.4 Other Evidence of Native American Activity in the Project Area Vicinity.....	20
4.0 DOCUMENTARY RESEARCH – THE HISTORIC PERIOD	21
4.1 Seventeenth Through Mid-Eighteenth Centuries.....	21
4.2 The Revolutionary War Years	23
4.3 The Nineteenth Century	25
4.4 Queensboro Bridge	25
4.5 Occupational History of the Preferred Shaft 33B Site and the Three Alternative Sites ..	25
4.5.1 Eighteenth to Early Nineteenth Centuries.....	26
4.5.2 Early Nineteenth to Twentieth Centuries.....	27
5.0 HISTORIC PERIOD ARCHITECTURAL RESOURCES	31
5.1 Historic Structures Located Within the Study Areas for the Preferred Shaft 33B Site and the Alternative Sites	32
5.2 New York State/National Registers of Historic Places and New York City	

Landmark Structures	32
5.3 Structures Eligible for Listing on the New York State/National Registers of Historic Places and Designated a New York City Landmark	34
5.4 Structures Eligible for Listing on the New York State/National Registers of Historic Places.....	34
6.0 ASSESSMENT OF HISTORIC RESOURCES SENSITIVITY AND RECOMMENDATIONS.....	37
6.1 Assessment of Archaeological Sensitivity.....	37
6.2 Assessment of Impacts to Historic Period Architectural Resources	42
6.3 Conclusions and Recommendations	44
6.3.1 Archaeological Resources	44
6.3.2 Historic Period Architectural Resources	45
7.0 REFERENCES CITED	46

FIGURES:

- Figure 1 – Preferred Shaft 33B Site and Alternative Sites – Project Area Region
- Figure 2 – Locations of the Preferred Shaft 33B Site and Alternative Sites
- Figure 3 – Preferred Shaft 33B Site – View is to the Northeast
- Figure 4 – E. 54th Street / Second Avenue Shaft Site: E. 54th Street Portion – View is to the Northwest
- Figure 5 – E. 54th Street / Second Avenue Shaft Site: Second Avenue Portion - View is to the South
- Figure 6 – E. 61st Street Shaft Site – View is to the Northeast
- Figure 7 – E. 59th Street / Second Avenue Shaft Site – View is to the Northeast
- Figure 8 – c. 1782 British Headquarters Map
- Figure 9 – 1821 Randel Map
- Figure 10 – Portion of the 1836 Colton Map that Includes the Preferred Shaft 33B Site, the E. 59th Street / Second Avenue Shaft Site, and the E. 61st Street Shaft Site
- Figure 11 – Portion of the 1836 Colton Map that Includes the E. 54th Street / Second Avenue Shaft Site
- Figure 12 - 1865 Viele Map
- Figure 13 - Portion of the New York City Landmarks Preservation Commission Prehistoric Sites Sensitivity Map that Includes the Proposed Project Location
- Figure 14 - Portion of the 1851 Dripps Map that Includes the E. 54th Street / Second Avenue Shaft Site
- Figure 15 – Undated Print of Cato's House and Tavern Built in 1712
- Figure 16 – 1901 - 1908 Construction of the Queensboro Bridge – Vicinity of Manhattan

Approach

- Figure 17 – 1901 – 1908 Construction of the Queensboro Bridge – Extent of Construction Excavations Manhattan Side
- Figure 18 – 1901 – 1908 Construction of the Queensboro Bridge – Construction Excavation, Near Manhattan Approach
- Figure 19 - 1866 United States Coast Survey Map
- Figure 20 - Portion of the 1851 Dripps Map that Includes the Preferred Shaft 33B Site, the E. 59th Street / Second Avenue Shaft Site, and the E. 61st Street Shaft Site
- Figure 21 - 1892 Sanborn Insurance Map – Preferred Shaft 33B Site and the E. 59th Street / Second Avenue Shaft Site
- Figure 22 – Portion of the 1911 Bromley and Bromley Map that Includes the Preferred Shaft 33B Site, the E.59th Street / Second Avenue Shaft Site, and the E. 61st Street Shaft Site
- Figure 23 – Portion of the 1911 Bromley and Bromley Map that Includes the E. 54th Street / Second Avenue Shaft Site
- Figure 24 - 1892 Sanborn Insurance Map – E. 54th Street / Second Avenue Shaft Site
- Figure 25 - 1892 Sanborn Insurance Map – E. 61st Street Shaft Site
- Figure 26 – Locations of Identified Historic Period Architectural Resources Within the 400-Foot Study Areas for the Preferred Shaft 33B Site and Three Alternative Sites

TABLE:

- Table 1 – Historic Period Architectural Resources Located Within A 400-Foot Radius of the Preferred Shaft 33B Site and the Alternative Sites

APPENDIX:

Appendix A: Locations of Project Area Photographs Included as Figures 3 through 7 of this Report

EXECUTIVE SUMMARY

This report presents the results of a Phase IA archaeological and historic resources assessment (Phase 1A Assessment) of the proposed City Tunnel Number 3, Stage 2 Manhattan Leg, Shaft 33B project area located in the Borough of Manhattan, New York City, New York. Four parcels that consist of potential sites for Shaft 33B comprise the project area. The preferred Shaft 33B Site is located at the northwest corner of E. 59th Street and First Avenue (Block 1434) while the three alternative sites are located at: 1) E. 54th Street and Second Avenue (1024-1036 Second Avenue, 301, 307, and 309 E. 54th Street; Block 1347, Lots 1-5, 7, 52, and 102), 2) E. 61st Street between First and Second Avenues (323 E. 61st Street; Block 1436, Lot 3B), and 3) the northeast corner of E. 59th Street and Second Avenue (Block 1434).

The Phase IA Assessment was undertaken and this report was prepared for the New York City Department of Environmental Protection (NYCDEP). The objectives of the study are to assess the likelihood that possibly significant archaeological resources are present within the four parcels and their vicinities and to recommend any necessary further investigations. In addition to evaluating for the possible presence of archaeological sites, the Phase IA Assessment identifies existing Historic period architectural resources currently recognized in the immediate vicinity (within 400 feet) of the four sites.

Construction of the Queensboro Bridge (or Bridge) between 1901 and 1908 and the new Bridge approach in 1930 extensively impacted the preferred Shaft 33B Site. This construction would likely have destroyed or disturbed any archaeological sites that formerly may have been present, particularly resources associated with the occupation of an apparent residence built sometime between 1836 and 1851 that formerly was located at the northwestern corner of the preferred Shaft 33B Site. It also is unlikely that Native American or other potentially significant Historic period archaeological deposits were present within the site. Accordingly, project construction at the preferred Shaft 33B Site would not impact archaeological resources, therefore; further archaeological investigations of the site are not warranted.

Implementation of construction activities within the E. 54th Street and Second Avenue Site likely would not impact potentially significant archaeological deposits. A dwelling and tavern known as "Cato's House", apparently was located east of the Area of Potential Effect (APE) for the site during the eighteenth to mid-nineteenth century period. The former backyard for this structure, however, extended into the E. 54th Street/Second Avenue Shaft Site's APE. Any archaeological features associated with that occupation likely would have been adversely impacted by construction of E. 54th Street, including improvements to it undertaken in 1855

and the subsequent installation of utilities. There is a limited possibility, however, that truncated portions of such features remain in the E. 54th Street portion of the APE.

As of 1851 two other apparent residences fronted onto the north side of E. 54th Street immediately east of Second Avenue, according to the Dripps map of that year. It is unlikely that archaeological resources associated with these residences are located within the E. 54th Street / Second Avenue Shaft Site's APE. The former backyards of the dwellings, the most likely location for associated archaeological features, are situated north and east of that site's APE and are now covered by existing structures. It also is unlikely that Native American or other potentially significant Historic period archaeological deposits were present within the site.

An elevated train (the EI) was constructed along Second Avenue by 1880. The base of support pillars associated with the train may be present within the Second Avenue portion of the E. 54th Street / Second Avenue Site and may have historic value.

Monitoring of the initial construction activities should be undertaken if sub-surface disturbance occurs at the E. 54th Street / Second Avenue Site, especially along E. 54th Street. Any domestic type of archaeological features encountered should be investigated following consultation with the New York City Landmarks Preservation Commission (NYCLPC). In addition, any support pillars associated with the 1880 EI that are identified along the Second Avenue portion of this site's APE also should be appropriately recorded.

The E. 61st Street Shaft Site currently consists of a graded vacant lot with apparent fill layers visible at modern grade; the fill is associated with the demolition of a Roman Catholic Church in the year 2000. It is considered possible that structural remains associated with Lightbody's Ink Factory that was constructed sometime before 1836, particularly shaft type features that may have been truncated by later construction, may be present beneath the fill and buried remains of the church. Accordingly, the site is considered to be sensitive for Historic period archaeological resources associated with the mid-nineteenth century Lightbody's Ink Factory.

Implementation of construction activities within the E. 61st Street Shaft Site may impact archaeological deposits associated with the ink factory building. Therefore, a sub-surface archaeological testing plan (Phase IB-level) should be prepared for submittal to the NYCLPC for their approval prior to proceeding with project construction on this parcel; the objective of the testing would be to determine whether potentially significant archaeological resources are in fact present at this site. Once the plan is approved by the NYCLPC, it should be implemented well before the start of project construction. It is unlikely that Native American or other potentially significant Historic period archaeological deposits are present within the site.

Archaeological deposits and structural remains associated with the occupation of the structures identified on the 1851 Dripps map as well as stratigraphic indications for the Eastern Post Road, likely were formerly located within the E. 59th Street / Second Avenue Shaft Site. However, construction of subsequent tenement buildings during the late nineteenth century, the Queensboro Bridge between 1901 and 1908, and the new Bridge approach in 1930 extensively impacted the site by destroying or extensively disturbing any archaeological resources that formerly may have been present. Accordingly, the E. 59th Street / Second Avenue Site is not considered to be sensitive for Historic period archaeological resources and further archaeological testing at this location is not warranted.

Eleven Historic period architectural resources are located within one or more of the four (4) 400-foot Study Areas established for the preferred Shaft 33B Site and the three alternative sites. These resources are the Queensboro Bridge; the Day and Meyer, Murray and Young Warehouse (1166 Second Avenue); and nine residences (located at 229-235, 237, 241, 312, and 314 E. 53rd Street, and 311 and 313 E. 58th Street). Potential visual, aesthetic or vibration impacts to the identified architectural resources would not occur as a result of the proposed project. NYCDEP would implement several vibration protection measures as part of the construction protection program for historic resources and specify a vibration limit of 0.5 inches per second (ips) for the protection of historic structures. Therefore, further evaluations of the four sites or the development of plans to avoid such impacts are not required for this project.

1.0 INTRODUCTION

This report presents the results of a Phase IA Assessment of the proposed City Tunnel Number 3, Stage 2 Manhattan Leg, Shaft 33B project area located in the Borough of Manhattan, New York City, New York (Figures 1 and 2). Four parcels that consist of the preferred Shaft 33B Site and three alternative sites comprise the project area (Figures 3 through 7). The preferred Shaft 33B Site is located at the northwest corner of E. 59th Street and First Avenue (Block 1434) while the three alternative sites are located at: 1) E. 54th Street and Second Avenue (1024-1036 Second Avenue, 301, 307, and 309 E. 54th Street; Block 1347, Lots 1-5, 7, 52, and 102), 2) E. 61st Street between First and Second Avenues (323 E. 61st Street; Block 1436, Lot 3B), and 3) the northeast corner of E. 59th Street and Second Avenue (Block 1434 {these are the same block #?}).

The Phase IA Assessment was undertaken by and this report prepared for the NYCDEP. The objectives of the study are to assess the likelihood that possibly significant archaeological resources are present within the four parcels and their vicinities and to recommend any necessary further investigations. Archaeological resources consist of the physical remains, usually buried, of past human activities. In the New York City area these resources could include remains associated with Native American and Historic period activities. In addition to evaluating for the possible presence of archaeological sites, the Phase IA Assessment identifies existing Historic period architectural resources currently recognized in the immediate vicinity (within 400 feet) of the four sites.

Archaeological sites and Historic period architectural properties are classified in the *New York City Environmental Quality Review (CEQR) Technical Manual (CEQR Technical Manual)* as historic resources. The *CEQR Technical Manual* identifies historic resources as districts, buildings, structures, sites, and objects of historical, aesthetic, cultural, and archaeological importance. These resources include designated New York City Landmarks; properties calendared for consideration as landmarks by the NYCLPC; properties listed on the New York State and National Registers of Historic Places or contained within a district listed on or formally determined eligible for listing on these registers; properties determined to be eligible for listing on the New York State and National Registers of Historic Places by the New York State Office of Parks, Recreation and Historic Preservation (NYS OPRHP); National Historic Landmarks; and properties not included in these categories but which nonetheless meet eligibility requirements for New York State and National Historic Registers of Historic Places listing.

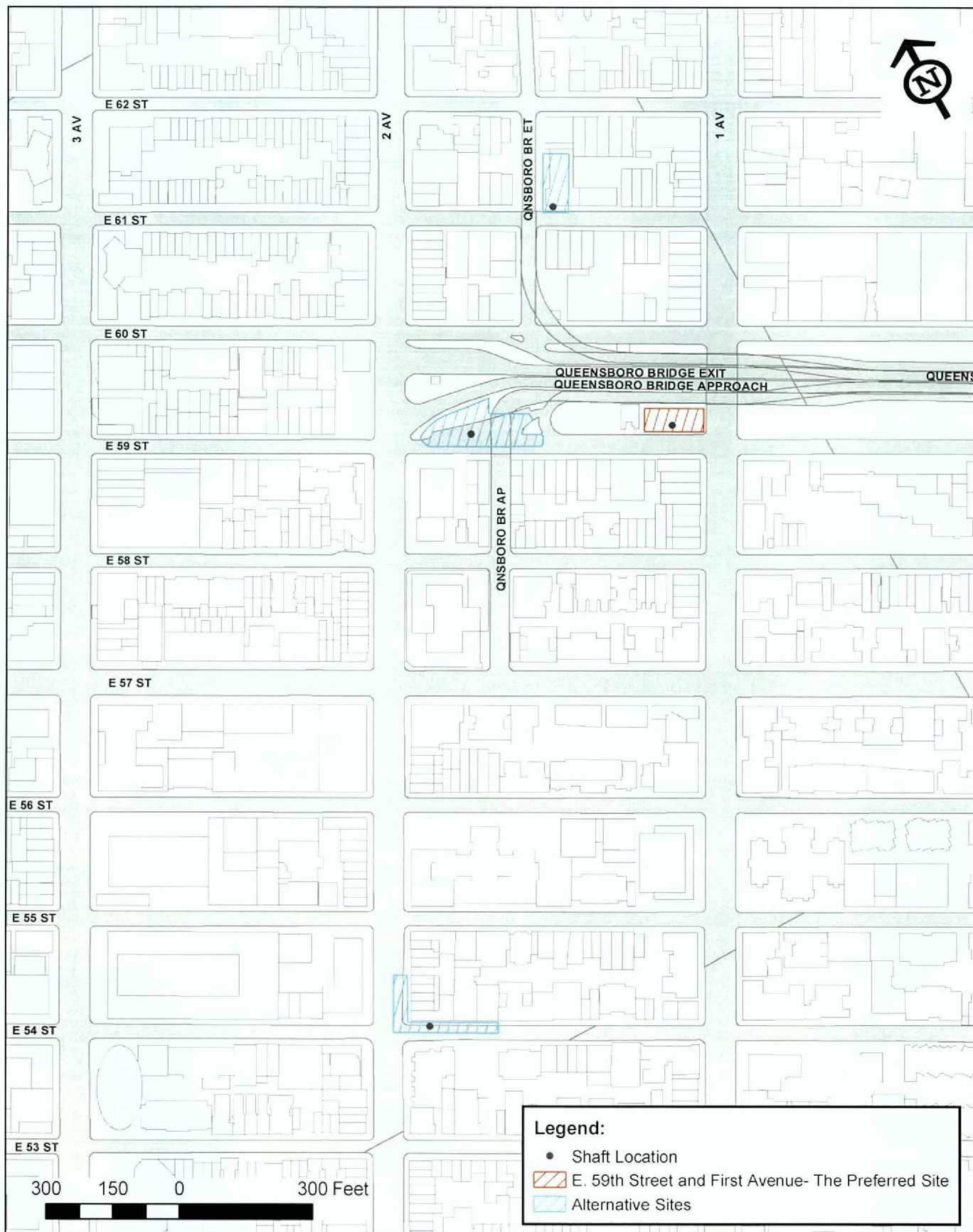
According to the *CEQR Technical Manual* guidelines, impacts to historic resources need to be considered on those parcels potentially affected by the proposed project and in the area surrounding the four possible sites. For archaeological resources the Phase IA Assessment evaluates the preferred Shaft 33B Site and three alternative sites where the proposed project could require ground disturbance, for the possible presence of Native American and Historic period sites. For Historic period architectural resources this study identifies all existing previously recognized historic structures present within 400 feet of the preferred Shaft 33B Site and alternative sites; this distance is considered adequate by the NYCLPC for the



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CITY WATER TUNNEL NO. 3, STAGE 2
 SHAFT 33B
 PREFERRED SHAFT 33B SITE AND ALTERNATIVE SITES- PROJECT AREA REGION
 BASE MAP SOURCE: UNITED STATES GEOLOGICAL SURVEY 1966
 SCALE OF ORIGINAL: 1:24,000
 CONTOUR INTERVAL: 10 FEET

JUNE 2005

FIGURE 1



Legend:

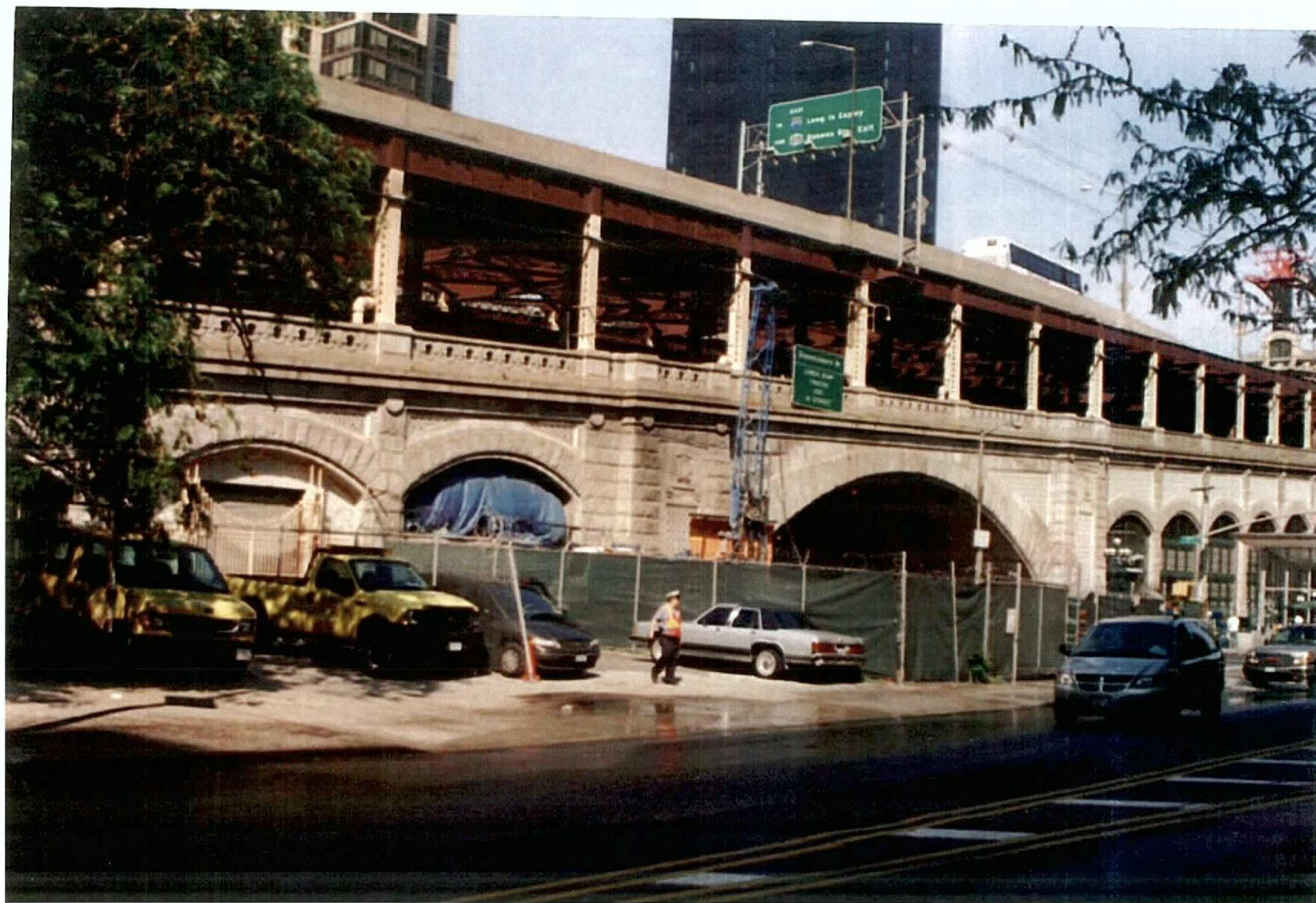
- Shaft Location
- E. 59th Street and First Avenue- The Preferred Site
- Alternative Sites



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
LOCATIONS OF THE PREFERRED SHAFT 33B SITE AND ALTERNATIVE SITES
SOURCE: MALCOLM PIRNIE, INC. 2005a

JUNE 2005

FIGURE 2



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B

PREFERRED SHAFT 33B SITE- VIEW IS TO THE NORTHEAST

JUNE 2005

FIGURE 3

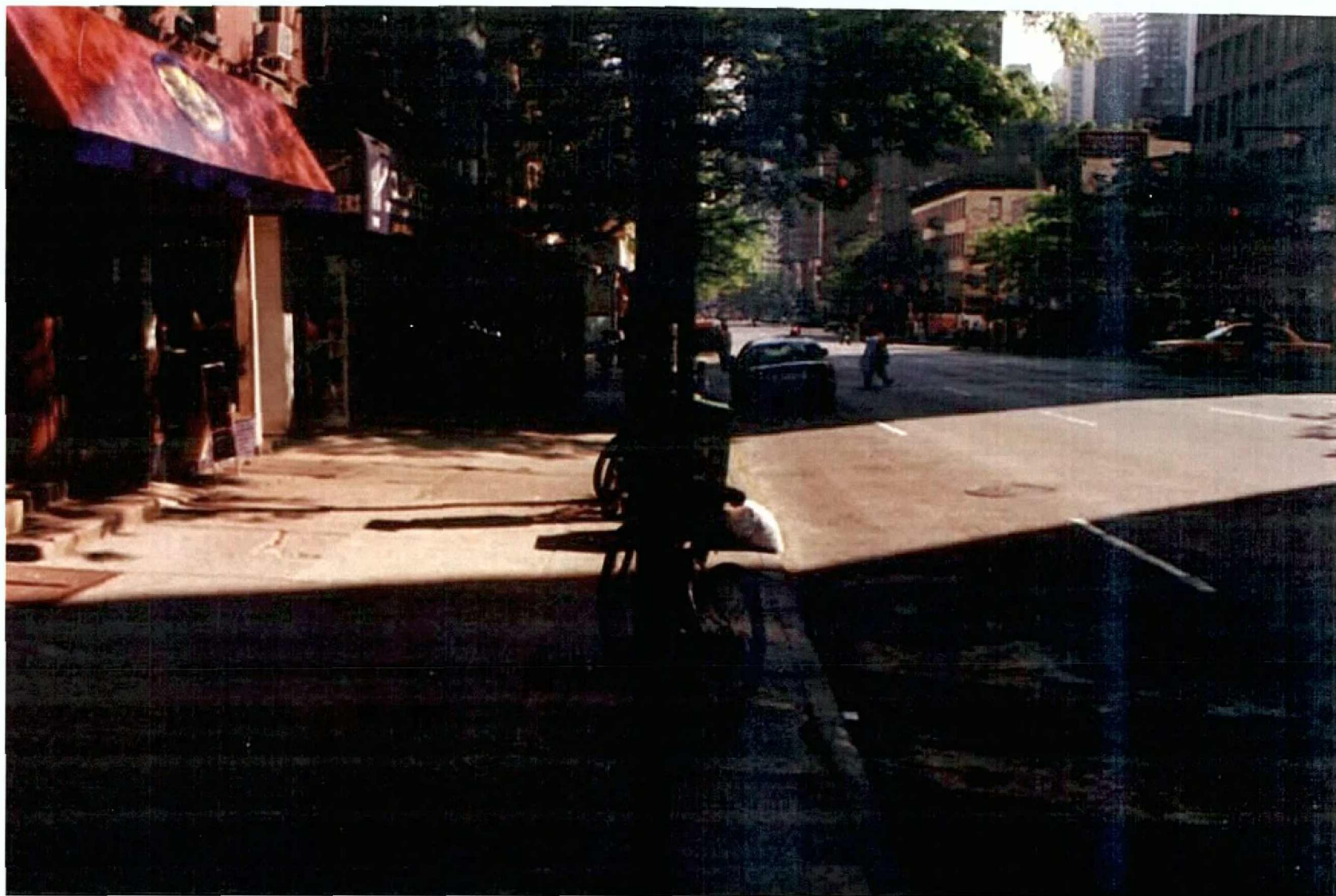


NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B

**E. 54TH STREET AND SECOND AVENUE SHAFT SITE:
E. 54TH STREET PORTION- VIEW IS TO THE NORTHWEST**

JUNE 2005

FIGURE 4



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2

SHAFT 33B

E. 54TH STREET AND SECOND AVENUE SHAFT SITE:
SECOND AVENUE PORTION- VIEW IS TO THE SOUTH

JUNE 2005

FIGURE 5



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
E. 61ST STREET SHAFT SITE:
VIEW IS TO THE NORTHEAST

JUNE 2005

FIGURE 6



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
E. 59TH STREET AND SECOND AVENUE SHAFT SITE:
VIEW IS TO THE NORTHEAST

JUNE 2005

FIGURE 7

assessment of Historic period architectural resources in terms of physical, visual, and historical relationships.

The Phase IA Assessment was undertaken as part of the environmental review for construction of Shaft 33B pursuant to the CEQR process and the New York State Environmental Quality Review Act (SEQRA) (Section 8-0113, Article 8 of the Environmental Conservation Law). This study complies with Section 106 of the National Historic Preservation Act and the New York State Historic Preservation Act. All work for the Phase IA Assessment was performed according to the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation, Federal Register, Volume 48, Number 190 and the guidelines and standards for cultural resource investigations currently adopted by the NYS OPRHP (2005; New York Archaeological Council 1994, 2000) and the NYCLPC.

Section 106 of the National Preservation Act of 1966 and the New York State Historic Preservation Act of 1980 require federal and state agencies to assess the impacts of certain projects on cultural resources that meet the eligibility criteria for inclusion on the State and National Registers of Historic Places. Properties listed on or determined eligible for inclusion on the State and National Registers of Historic Places can include archaeological sites as well as Historic period architectural resources. According to the criteria of eligibility for listing of properties on the National Register of Historic Places (United States Department of the Interior 1985:5-6):

The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. That are associated with the lives of persons significant in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded, or may be likely to yield, information important in prehistory or history.

In order for a property to be designated a New York City Landmark, it must be at least 30 years old and must possess a special character, historical or aesthetic interest or value as part of the development, heritage or cultural characteristics of the city, state or nation. Four types of landmarks are recognized:

- Individual Landmarks - that consist of individual structures and range from rowhouses to bathhouses to mansions to skyscrapers to bridges;
- Interior Landmarks - that are building interiors that are customarily open or accessible to the public;
- Scenic Landmarks - that are New York City-owned parks or other landscape features; and,
- Historic Districts - that are areas of New York City that possess architectural and historical significance and a distinct sense of place.

An Environmental Review for the proposed project, prepared by the NYCLPC on April 19, 2005, indicates that the preferred Shaft 33B Site and the alternative sites might be archaeologically significant. The review further indicates that the NYCLPC would request additional materials (i.e., this Phase IA Assessment) in order to complete its evaluation (Sutphin 2005).

1.1 Project Area Description and Areas of Potential Effect

There are four areas of potential effect (APE) identified in the current project area. As indicated previously, these APEs are the preferred Shaft 33B Site, which is located at the base of the Queensboro Bridge at the northwest corner of E. 59th Street and First Avenue, and the three alternative sites that are located at: E. 54th Street and Second Avenue; E. 61st Street between First and Second Avenues; and the northeast corner of E. 59th Street and Second Avenue (Figures 2 through 7).

The APE includes locations which directly and indirectly may be impacted by the proposed project. Areas directly impacted by the proposed project are located where construction activities would disturb the ground to such an extent that any significant historic resources present would be destroyed or disturbed to the extent that they would lose integrity to the degree that they would no longer be eligible for inclusion on the New York State and National Registers of Historic Places. Such construction related activities associated with the shaft construction include excavations, grading, filling, demolition, blasting, placement of geotechnical borings, installation of utilities, or paving, among others, that would constitute direct impacts. Such activities, including blasting, would occur at the preferred Shaft 33B site or at one of the alternative sites as a result of the proposed project, resulting in direct impacts to that location. Indirect impacts to a location, which also may destroy or disturb historic resources, could include utilization of areas for construction equipment staging and storage or increased or improved access to a site. Project staging and storage areas for the proposed project, however, would be located within streets, other paved or disturbed areas near the sites. Accordingly, indirect impacts to archaeological resources are unlikely to occur as a result of the implementation of the proposed project.

The preferred Shaft 33B Site is located on Block 1434 at the base of the Queensboro Bridge at E. 59th Street and First Avenue (Figures 2 and 3). This site is approximately 9,200 square feet

in size and is adjacent to the New York City Department of Transportation (NYCDOT) Queensboro Bridge Engineer's office, and a multi-use area that is commonly referred to as "Honey Locusts Park" but is also used for Bridge maintenance and staging activities (the multi-use or planted area). This area is also used by the New York City Department of Sanitation (DSNY) as a staging area for their activities. Structural components of the Queensboro Bridge are located immediately north of the site.

The project's three alternative sites are identified as follows:

E. 54th Street and Second Avenue (Block 1347, Lots 1-5, 7, 52, and 102): the site is approximately 8,500 square feet in size and is located in a portion of the street and sidewalk along (Figures 2, 4, and 5): 1) the north side of E. 54th Street just east of Second Avenue (Figure 4) and 2) the east side of Second Avenue just north of E. 54th Street (Figure 5). The site is located completely within New York City property but the project would require the removal of an existing structure that encroaches onto New York City-owned sidewalk on the northeast corner of the E. 54th Street and Second Avenue intersection. Utilities extend through the site.

E. 61st Street between First and Second Avenues (Block 1436, Lots 3B): the site is approximately 9,000 square feet in size and is located on the northern side of E. 61st Street between First and Second Avenues (Figures 2 and 6). The site currently is a vacant parcel owned by the Archdiocese of New York.

E. 59th Street and Second Avenue (Block 1434): the site is approximately 15,000 square feet in size and is located on the northern side of E. 59th Street, encroaching onto a plaza area of the Queensboro Bridge (Figures 2 and 7). Utilities extend through the road bed portion of the site. Structural components of the Queensboro Bridge are located immediately north of the site.

1.2 Previously Conducted Archaeological Investigations Within the Project Area Vicinity

The Phase IA archaeological assessment that was prepared for the proposed Second Avenue Subway route (Historical Perspectives, Inc. (HPI) 2003) includes the section of Second Avenue that contains the E. 54th Street / Second Avenue Shaft Site and the portion of Second Avenue just west of the E. 59th Street / Second Shaft Avenue Site. The study determined that the portion of Second Avenue between E. 59th and E. 62nd Streets prior to development consisted of raised ground in proximity to fresh water sources, locations that traditionally were attractive to Native Americans for subsistence related and other purposes. Accordingly, the report concluded that pre-development ground surfaces could be present at this location beneath fill layers that extend between zero and 19 feet below grade. Therefore, the report determined that such former ground surfaces may contain evidence of Native American activity and that the area is archaeologically sensitive for Native American sites (HPI 2003:4.4-3). The section of Second Avenue in proximity to the current E. 54th Street / Second Avenue Shaft Site was not considered by the HPI report to be sensitive for Native American

archaeological sites. The locations that now include the preferred Shaft 33B Site and the E. 61st Street Shaft Site were not evaluated by that study.

The Second Avenue Subway Phase IA archaeological assessment also indicates that the section of Second Avenue between E. 59th and E. 61st Streets is sensitive for Historic period archaeological resources dating to the early to mid-nineteenth century. During that period, four structures and surrounding land, which may have been the location of shaft type archaeological features (wells, privies, and cisterns), extended into what is now Second Avenue (HPI 2003: 4.4-4). Based upon analyses conducted for that study, the report concluded that buried foundation remains and shaft type features (possibly truncated) potentially may be present within portions of the Second Avenue road bed between E. 59th and E. 61st Streets. Other sections of Second Avenue in proximity to the current E. 54th Street / Second Avenue Shaft Site were not considered by the HPI report to be sensitive for Historic Period archaeological resources. The locations of the current preferred Shaft 33B Site and the E. 61st Street Shaft Site were not evaluated in the this study.

The research conducted for this study did not identify any other previously conducted archaeological investigations within the immediate vicinity of the Shaft 33B project area.

1.3 Methodology

Documentary research on the Euro-American history of the four sites and their vicinities, as well as on regional and local Native American culture history, adaptations, and site locations was conducted for this Phase IA Assessment. The research involved a review of information contained in the NYS OPRHP, New York State Museum (NYSM), and NYCLPC archaeological site files; Historic period maps; and other primary and secondary sources. Cartographic research included a comparison of Historic period topographic maps with current site conditions to provide information on changes in local topography as a result of grading or filling. Also, pedestrian reconnaissance of the proposed sites was undertaken and discussions were conducted with people knowledgeable of the history and archaeology of the project area vicinity. In accordance with the NYCLPC procedure, a request was made to staff of that agency to research their databases to identify any previously recorded archaeological resources which may be located within the Study Areas for the preferred Shaft 33B Site and three alternative sites. A determination also was made on the extent of past disturbance within the preferred Shaft 33B Site and the three alternative sites and the effects such activities may have had on any archaeological resources potentially present at these locations.

In order to identify the Historic period architectural resources previously recognized within the 400-foot Study Areas of the four sites, NYS OPRHP and NYCLPC files were reviewed. In addition and in accordance with NYCLPC procedures a request was made to that agency to research its databases to identify any such architectural resources that may be located within the 400-foot Study Areas for the preferred Shaft 33B Site and the three alternative sites. Other knowledgeable people also were contacted for information on these resources within the project's study area (please see the list below). The location of each Historic period architectural resource identified in the vicinity of each of the sites was field verified to ascertain its location in relation to the four sites (Figures 3 through 7).

Research for the Phase IA Assessment was conducted at the following repositories:

- New York City Public Library, Local History, Map, and General Research Divisions;
- NYCLPC;
- New York City Municipal Archives;
- City Hall Library;
- New York City Department of Buildings;
- New York State Archives; and,
- NYS OPRHP.

Knowledgeable people spoken to as part of the research conducted for this study include:

Mr. Arnold Pickman, Professional Archaeologist;
Mr. Daniel Pagano, NYCLPC;
Ms. Amanda Sutphin, NYCLPC;
Ms. Gina Santucci, NYCLPC;
Ms. Kathy Howe, NYS OPRHP;
Ms. Cynthia Blakemore, NYS OPRHP;
Mr. Richard Rosen, Project Advocate, New York City Department of Buildings
Ms. Leonora Gidlund, Director, New York Municipal Archives; and,
Mr. Paul C. Perkus, Director, City Hall Library.

A field reconnaissance was conducted at the four sites and study areas on January 12 and 31, February 15, and May 31, 2005. Based on the documentary research and the field reconnaissance, the archaeological sensitivity of the four sites was assessed. Assessment of Native American period sensitivity was based on the location of known archaeological sites reported in the literature as well as a consideration of the current and pre-development topographic and physiographic characteristics of the four sites and their vicinities. This assessment allowed an evaluation to be made as to whether the pre-development environmental settings of the project area locations were similar to that of previously recovered Native American sites. If so, such environments may have been attractive locations for Native American occupation and the use and evidence of such activities could be present if subsequent development did not impact those locations. Assessment of Historic period sensitivity was based on an analysis of late eighteenth to twentieth century maps as well as a review of other primary and secondary sources. Locations were considered sensitive if they formerly contained possibly significant Historic period occupations and were not impacted by subsequent development.

2.0 ENVIRONMENTAL SETTING OF THE PROPOSED CITY TUNNEL NUMBER 3, STAGE 2 MANHATTAN LEG, SHAFT 33B PROJECT AREA AND VICINITY

Prior to development, the Shaft 33B project area vicinity was part of the gently undulating landscape of the south central portion of eastern Manhattan. The East River is located approximately one quarter mile east of the preferred Shaft 33B Site. A tributary of the River formerly flowed just north and east of the E. 61st Street Shaft Site, before turning southeast and joining the East River near what is now E. 61st Street. Another tributary passed to the south and west of the E. 54th Street / Second Avenue Shaft Site, emptying into the East River at Turtle Bay near what is now E. 47th Street. The former courses of both waterways have been filled. Their former locations are shown on Figures 8 through 11.

2.1 Geology

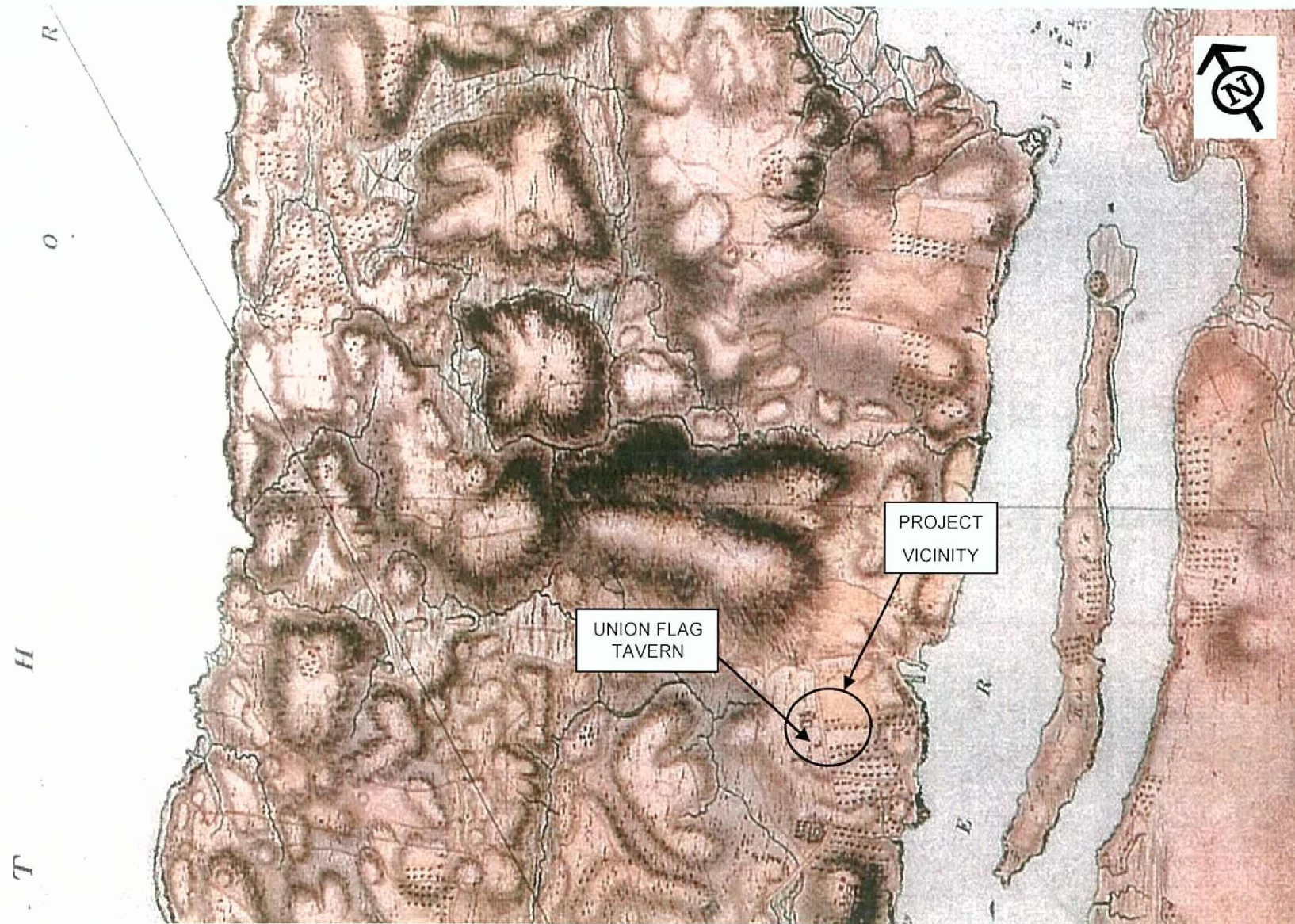
All of Manhattan, including the area where each potential Shaft 33B Site is located, is part of the Piedmont Lowlands geomorphic/physiographic province. The southern boundary of that province extends through western Brooklyn, Queens, and Staten Island and thence across the narrow waist of New Jersey. The portions of New York City and New Jersey south of this line are part of the emergent lowland of the Coastal Plain geomorphic/physiographic province.

The Piedmont Lowlands consist of gently rolling terrain, generally less than 120 feet in elevation, which gradually slopes to the southeast (Wolfe 1977:207). The elevation of the Piedmont Lowlands is generally less than 120 feet above mean sea level (United States Geological Survey 1966).

The bedrock in the project area vicinity consists of Manhattan Formation amphibolite and schist of Cambrian aged (505-540 hundred million years ago; Gratacap 1904; Fenneman 1938; Schuberth 1968; Rogers, Isachsen, Mock, and Nyahay 1990; Isachsen, Landing, Lauber, Rickard, and Rogers 1991).

2.2 Surface Geology

In Manhattan, the current and former undulating surface of the Piedmont Lowlands is immediately underlain by post-Pleistocene aged, unconsolidated, lacustrine and fluvial sediments associated with Proglacial Lake Flushing (Lake) and its drainages (Schuberth 1968). The Lake covered much of what is today Manhattan, the Bronx, Upper New York Bay (where it joined Glacial Lake Hudson), the East River, and the western portion of Long Island Sound (Wolfe 1977:160). Glacial Lake Flushing (and Glacial Lake Hudson) drained around 12,500 years ago when the moraine crossing the Verrazano Narrows from Brooklyn to Staten Island, which acted as a dam or dike impounding glacial meltwaters and forming the lakes, was breached. For a long period after the lakes drained, much of the former lake bed, including the eastern part of Manhattan, likely would have been a marshy, pond filled plain overlooking a narrower East River; the plain would have contained small hills and rises overlooking the marshes.



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
c. 1782 BRITISH HEADQUARTERS MAP
SCALE OF ORIGINAL: 3.25 INCHES = 0.5 MILE

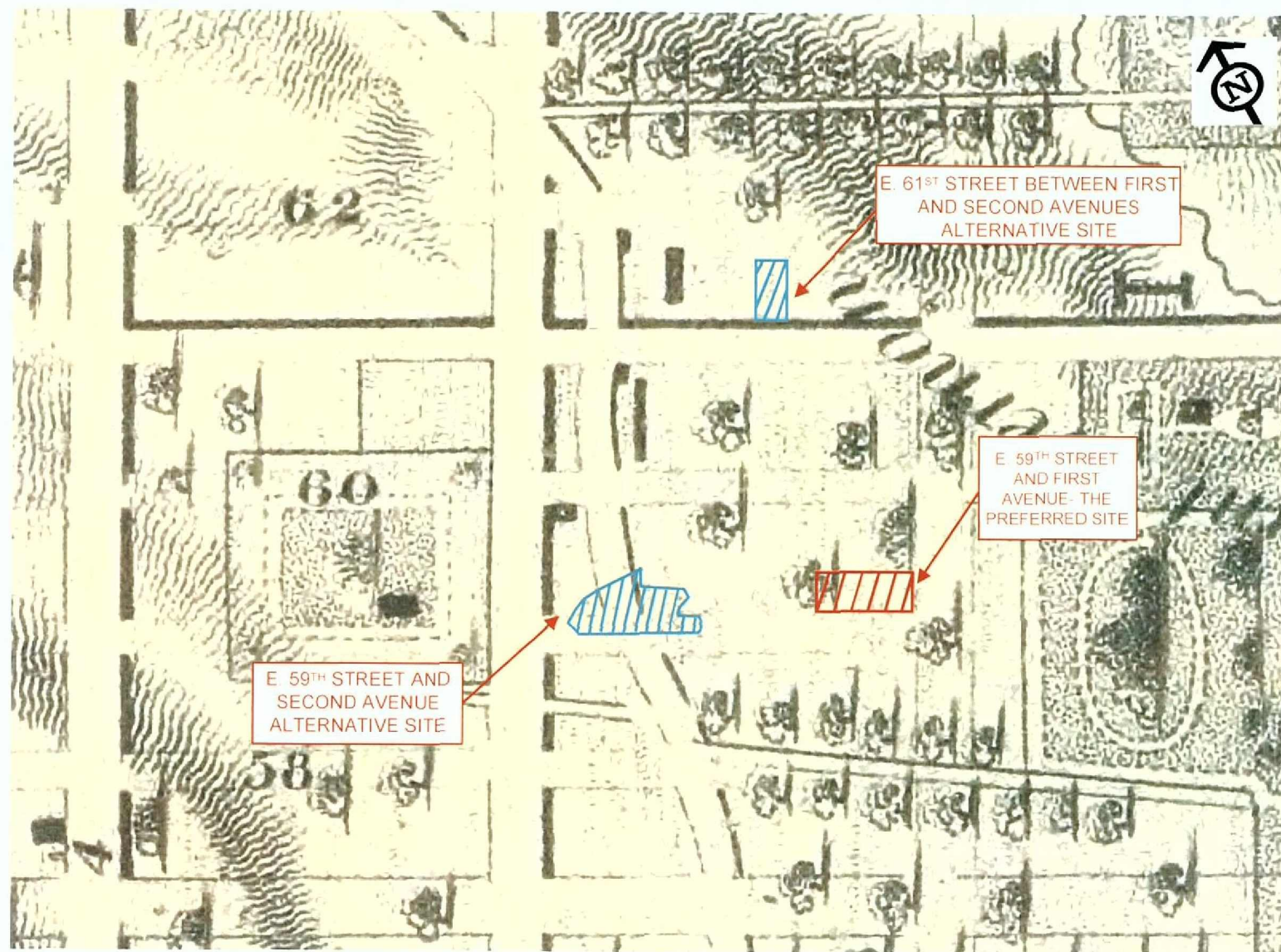
JUNE 2005

FIGURE 8



1821 RANDEL MAP
SCALE OF ORIGINAL: 0.5 INCH = APPROXIMATELY ONE MILE

FIGURE 9



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CITY WATER TUNNEL NO. 3, STAGE 2
 SHAFT 33B

PORTION OF THE 1836 COLTON MAP THAT INCLUDES THE PREFERRED SHAFT 33B SITE,
 THE E. 59TH STREET AND SECOND AVENUE SHAFT SITE,
 AND THE E. 61ST STREET SHAFT SITE
 SCALE OF ORIGINAL: 1 INCH = 6,500 FEET

JUNE 2005

FIGURE 10

Manhattan also was greatly affected by the Wisconsin Glaciation with glaciofluvial events creating kames, kame terraces, eskers, and kettles, most of which have been destroyed by development. Glacial drift is present below post-Pleistocene deposits over most of the island.

2.3 Flora and Fauna

The predominant pre-contact period habitats present within the Piedmont Lowlands were saltwater/brackish water marshes and tidal flats, freshwater marshes, and upland climax forest (Robichaud and Buell 1973:106). In many areas, brackish and fresh water marshes transition between the open shore to the upland forest.

Saltwater and brackish water marshes were formerly common along the entire shoreline of Manhattan, also occurring inland for a short distance along the banks of tidal creeks. Chrysler (1910) provides a list of 38 plants found in the Piedmont Lowlands in salt and brackish water marshes and meadows in the order of their occurrence in soils with decreasing salt content; all of these plants were formerly present in Manhattan. Those plants listed which thrive in a heavily saline environment are glasswort, sea lavender, salt reed grass, and salt water cord grass. Those composites which are less salt tolerant are marsh elder, groundsel, and cat-tail. The least salt tolerating plants mentioned by Chrysler are swamp-rose, arrowhead, lizard's tail, and bur-marigold.

Freshwater marshes were present along the edges of lakes, ponds, rivers, and wherever depressions of land were kept flooded on a regular basis by high water tables (Robichaud and Buell 1973:105). In pre-Contact period freshwater marsh environments, the plant community was typically dominated by reed grass, cat-tail, and/or wild rice. All of these would have been important economic plants for indigenous groups. Other plants that would have been common in pre-Contact period freshwater marshes were low-growing grass-like sedges, bulrushes, arrow-arum, blue flag, spike rush, bur reed, water dock, marsh fern, orange touch-me-not, and swamp milkweed (Robichaud and Buell 1973:125-127).

Many of the remaining areas are characterized as upland forest because the most abundant or dominant type of vegetation present were tall growing, deciduous, broadleaf trees (Robichaud and Buell 1973:106). The forests are specifically described as oak-chestnut forests composed primarily of mixed oak trees (white, red, and black) with some chestnut trees also present on drier slopes (Robichaud and Buell 1973:106). Beech trees and several varieties of hickory, sugar maple, white ash, and black cherry trees also would have been numerous (Shelford 1974).

A description of the plentiful oak-chestnut forest in the area around Hempstead in 1670, but also applicable to the current project area vicinity, is provided by Daniel Denton (1670):

The greatest part of the island is very full of timber, as Oaks, white and red, Walnut trees, Chestnut trees, which yield store of mast for Swine, and are often therewith sufficiently fatted with oat-corn as also Maples, Cedars, Saxifrage, Beech, Birch, Holly, Hazel, with many sorts more.

Prior to development, such forest habitats likely were present within the preferred Shaft 33B Site and Alternative Shaft Sites. Currently, marsh and forest habitats are found in less developed areas within the Piedmont Lowlands in Queens, Central Park, and Inwood Park.

Shellfish were one of the most important prehistoric subsistence resources found along the shoreline in the Piedmont Lowlands. The species commonly utilized by Native Americans were oysters, soft shell clams, hard shell clams, scallops, and various marine snails.

Pre-Contact period faunal species usually present within the Piedmont Lowland's marshes included various invertebrates, migratory water fowl and other birds, muskrat and small rodents, rabbit, raccoon, otter, skunk, opossum, and white-tailed deer (Shelford 1974; Gosner 1978; Roberts 1979). In the province's freshwater streams, marshes, and lakes mussels, fish, certain amphibians and reptiles, migratory fowl, and semi-aquatic mammals were present. (Shelford 1974). Pre-Contact period faunal species present within the forests of the Piedmont Lowlands included game birds, small mammals, white-tailed deer, bear, and during at least a portion of the prehistoric period, elk (Shelford 1974). Anadromous fish species would have been present seasonally within Manhattan via streams emptying into the estuary system (the Narrows, Upper New York Bay, Hudson River, East River, and western Long Island Sound). All of these economically useful fauna would have been present in the project area vicinity during the Native American and early Historic periods.

3.0 DOCUMENTARY RESEARCH - NATIVE AMERICAN PERIOD

The Native American and Native American - European Contact period cultural history of the Shaft 33B project area region is provided in Sections 3.1 and 3.2. This is followed by descriptions of Native American sites and other evidence of Native American activity previously identified in the project area vicinity (Sections 3.3 and 3.4). Analysis of the Native American archaeological sensitivity of the project area is provided in Section 6.1.

3.1 Background Culture History

The prehistory of the New York County region, which includes the project area, encompasses the Paleo-Indian, Archaic, Transitional, and Woodland periods. The Paleo-Indian period (11,000-10,000 B.P.¹) represents the earliest occupation of the southeastern New York region. The Archaic (10,000-3,700 B.P.) refers to a time prior to the introduction of horticulture and pottery manufacture and is divided into Early, Middle, and Late periods. The Transitional period (3,700-2,700 B.P.) witnessed a gradual change in Archaic lifestyles with the development of "Woodland" period traits. The Woodland period (2,700-400 B.P.), which is characterized by the use of pottery and reliance on horticulture, also is divided into Early, Middle, and Late periods.

3.1.1 Paleo-Indian Period

The Paleo-Indian period corresponds with the end of the Wisconsin glaciation (80,000 - 11,000 B.P.). The last advance of the ice sheet associated with this stage reached its maximum approximately 18,000 years B.P., covering Manhattan with glacial ice. After approximately 18,000 B.P., worldwide temperatures started to rise and the northward retreat of the ice sheet began. A continuous morainal feature consisting of mixed sands, silts, clays, and boulders, marks the southernmost advance of the ice sheet (see Section 2.2).

Sea levels were lower during the Paleo-Indian period and the subsequent Early to Middle Archaic period due to sea water being trapped in the remaining glacial ice. During most of this era, Manhattan was located well inland from the Atlantic coast, being a tract of raised ground containing glacial lakes traversed by meltwater streams and rivers.

A tundra environment characterized the landscape of Manhattan during the late glacial and immediate post-glacial periods. As the glaciers retreated northward, water drained from the melting ice sheet creating large inland lakes, bogs, and marshes. Two of the lakes (Proglacial Lakes Flushing and Hudson) covered most of Manhattan Island (see Section 2.2).

The tundra landscape was succeeded by woodland with local forests consisting primarily of spruce and fir trees with some oak trees and other deciduous species (Snow 1980). Many faunal species that are now extinct or no longer native to the area were present in the forests that included mammoth, mastodont, caribou, giant beaver, sloth, elk, moose, and peccary (Drumm 1963; Snow 1980). Remains of extinct fauna found in the project area region

¹ B.P. means years Before Present, with the archaeological present by convention being 1950.
Shaft 33B Phase 1A Historic Resources Assessment

include mastodont remains recovered from peat deposits located beneath the Harlem River approximately seven and a half miles north of the preferred Shaft 33B site, near where the Harlem River ship canal was excavated in 1885 (Calver 1948). Portions of another mastodont also were recovered nearby, from a peat deposit formerly located below what is now the corner of Seaman Avenue and Dyckman Street in the Inwood section of northern Manhattan (Calver 1948). Remains of other extinct fauna have been found in Queens and Staten Island.

Little is known about cultural activities during the Paleo-Indian period, although it is generally accepted that humans first inhabited the region at approximately 10,000 B.P. (Funk 1976; Ritchie 1980). Small nomadic bands of hunters and gatherers subsisted probably on the faunal species mentioned previously as well as small game animals, certain riverine resources, and a variety of plants. Population density, however, was very sparse. A variety of functionally diverse site types have been identified based upon intersite variability of artifact assemblages and environmental setting and include base camps, quarry workshops, rockshelter habitations, open air hunting camps, kill and butchering sites, and other temporary camps (Funk 1972; Gardner 1974; Moeller 1980; Gramley 1982).

A small number of Paleo-Indian sites have been recorded in the New York metropolitan area on Staten Island (Port Socony north a.k.a. Port Mobil north/North Beach and Cutting Site, Kreischerville; Charleston Beach; see Ritchie 1980), and in Westchester County (Piping Rock Site) and Orange County (Dutchess Quarry Cave, Kings Road, West Athens Hill sites; see Funk 1976).

Most of the evidence of Paleo-Indian activity, however, comes from scattered surface finds of Clovis Fluted points, a diagnostic Paleo-Indian artifact (Funk 1976:205). Almost all of the fluted points found in New York City were recovered from Staten Island as surface finds. At least two fluted points, however, have been recovered from Queens; one was found in the Bayswater section (Platt 1994, 1995; Stone 1996). The exact location of the find is not indicated in the literature but it likely was recovered from the high, well-drained ground west of Little Neck Bay, overlooking the former lake bed of Proglacial Lake Flushing. As previously noted, once the lake drained and prior to sea level rise, the area would have contained numerous marshes, ponds, and a narrower East River Channel.

Information from known Paleo-Indian sites in the New York - New Jersey - Pennsylvania-Connecticut region suggests that raised well-drained areas near rivers, streams or wetlands were the areas preferred for occupation. The project area vicinity during the late glacial and early Holocene periods would probably have fit such a topographic and physiographic description with the area consisting of raised ground overlooking the former lakebed of Proglacial Lake Flushing and a narrower East River to the east. Rock shelters, areas near lithic sources, and lower river terraces also were subject to Paleo-Indian occupation and use (Werner 1964; Funk 1976; Moeller 1980; Ritchie 1980; Marshall 1982).

The lack of data from Paleo-Indian sites especially stratified sites in Manhattan (and the remainder of New York City and Long Island) is the primary reason for the current lack of understanding of Paleo-Indian adaptations in southeastern New York. Many PaleoIndian sites in the vicinity were probably located off the Atlantic and Long Island Sound shores and were

inundated by post-glacial rising sea levels (Edwards and Emery 1966, 1977; Salwen 1962, 1965, 1975). It is also probable that many sites were submerged beneath the rising waters of New York Bay and the other bays and inlets along the coasts of Manhattan and Long Island; meltwater rivers formerly were associated with most of these areas. Prior to submergence, the areas would have contained productive environments (i.e., marshes, lakes, and streams) that could have been exploited for subsistence purposes by Paleo-Indian populations.

3.1.2 Archaic Period

During the Archaic period (10,000-3,700 B.P.), the environment changed from a pine dominated forest to an increasingly deciduous one that achieved an essentially modern character by 2,000 B.P. (Salwen 1975). While Archaic cultures have been traditionally thought of as reflecting a forest-based adaptation, more recent research has produced a picture of an increasingly varied subsistence pattern based on the seasonal exploitation of various faunal and floral resources (Ritchie and Funk 1973; Funk 1976; Kraft 1986; Starbuck and Bolian 1980). In the lower Hudson Valley and Long Island Sound area oysters became a major source of subsistence, at least seasonally during this period (Brennan 1977). At this time, the project area probably was a forested tract.

Archaic hunters and gatherers were still nomadic and organized into small bands that occupied localities along New York City's shorelines, especially its protected coves, inlets, and bays probably during the warmer months and interior regions during the colder months (Wyatt 1977; Ritchie 1980; Kraft 1986). Population growth throughout the period resulted in an increase in both site density and the number of functional site types represented in the archaeological record. Site types recognized for this period include spring fishing camps along major streams, fall open air hunting camps, rockshelter habitations, shellfish collecting and processing stations, mortuary sites, quarry and workshop sites, and semi-permanent villages (Harrington 1909; Brennan 1974; Dincause 1976; Barber 1980; Ritchie 1980; Snow 1980). Ritchie states that most Archaic sites were small and multi-component, lacking traces of substantial dwellings, fortifications, storage pits, and graves (Ritchie 1980:32 and 35). Evidence of housing patterns attributable to the Late Archaic period, however, has been reported from the Howard Site located in Old Lyme, Connecticut near Long Island Sound (Pfieffer 1983).

The Early Archaic period was the time of settlement of the southeastern New York area by hunting and gathering cultures that developed the skills and practices to exploit the region's emerging deciduous forest environment and its associated micro-environments with their increasingly rich subsistence potential. The time frame for the period in the northeastern United States has been defined as extending from approximately 10,000 to 8,000 years B.P. Kraft (1986), however, suggests that on the basis of collected radiocarbon dates from a number of northeast sites, including Rocklein and Harry's Farm in New Jersey, that the Early Archaic period should more accurately be viewed as extending until approximately 7,000 years B.P.

Hardaway, Palmer, Kirk, Kanawha, Stanly, and LeCroy projectile points characterize early Archaic contexts in the northeast. Similar projectile point types also are associated

stratigraphically with Early Archaic contexts in the Mid-Atlantic States Piedmont region (Justice 1987).

During the Early Archaic period, the northeast was inhabited by people employing primarily a freshwater and saltwater-based fishing economy. The riverine, coastal marine, and lacustrine oriented economies of the Early Archaic can be seen as a continuation of the adaptation process begun during the Paleo-Indian period, which produced Late Paleo-Indian cultures. Those cultures, characterized by non-Clovis fluted and unfluted point forms including Plano and Cumberland styles and archaeologically present in the region at Turkey Swamp (Cavallo 1981; Marshall 1982) and Plenge (Kraft 1973, 1977) sites in New Jersey and possibly at the Port Mobil and Cutting sites on Staten Island (Boesch 1994), probably developed as a response to biological stress resulting from the failure of prior subsistence systems to adequately exploit the regionally deteriorating spruce/fir environments of the early Holocene. Those environments underwent a reduction in the number and variety of associated and previously exploited game animals including probably such animals as mastodont, ground sloth, giant moose, caribou, musk ox, tapir, snowshoe hare, weasel, martin, peccary, porcupine, mice, voles, non-arctic lemmings, squirrels, woodchucks, bats, birds, fish, and snakes. When this subsistence shift from a strongly forest-based hunting economy to one based strongly on exploiting riverine, coastal marine, and lacustrine species is detected in the archaeological record, the Early Archaic had begun.

In the New York region, a limited number of Early Archaic components have been identified along the lower reaches of the Hudson River (Piping Rock, Montrose/Dogan Point, and Croton Point) and from the southern and western portions of Staten Island (Richmond Hill, Hollowell-Tottenville, Wards Point, and Old Place). An unknown number of coastal and estuarine lowland Early Archaic sites probably were destroyed by post-glacial sea level rise either directly by inundation or indirectly by affecting river gradients near their coastal outlets (see Salwen 1965; Kraft 1975). This change would slow river flow, increase river meandering and bank erosion, and increase flooding and alluvial sedimentation, deeply burying some Paleo-Indian and Early Archaic sites. The latter is illustrated at the Harry's Farm Site located on the Delaware River where, according to Kraft (1975), 93 inches of alluvial silt overlaid the Early Archaic levels.

In addition to the noted sites, isolated surface occurrences of Early Archaic points have been found in the Hudson, Delaware, and Walkill Valleys (Dumont 1981:28). All of the Early Archaic sites mentioned occupy places in the traditional system of Early Archaic settlement noted previously and are estuarine/riverine sites oriented towards the exploitation of marine/riverine subsistence resources. In addition to Early Archaic type points, their lithic assemblage frequently included net sinkers, gravers, scrapers, and knives, groundstone, utilized flakes, and ochre.

Few Early Archaic campsites, however, have been identified from the forested interior portions of southeastern New York. Excavations at one such interior site, identified as the IBM-Armonk Site, a small Early Archaic campsite located in Armonk, New York, also indicate a riverine/ lacustrine oriented subsistence role for the site (Boesch 1995a, 1995b, 1997). The site produced a LeCroy Bifurcated projectile point as well as cutting and scraping

tools, and from flotation samples, fish scales from fresh water white perch. The site was located on a small ridge in proximity to what is currently a large wetland, but which may have been an open water lake during the Early Archaic period. The precise role that the IBM-Armonk Site and other interior sites had in Early Archaic settlement systems is at best the subject of general speculation and perhaps more accurately are unknown.

Generally the low site density recorded for the Early Archaic period, particularly for sites in the interior portion of southeastern New York, has been attributed to environmental factors. While deciduous forests are thought to have appeared along the Atlantic seaboard and Hudson River estuary with the termination of the Valdres readvance that occurred approximately 9,000 years B.P., coniferous pine forests are traditionally thought to have covered most of the interior at this time and for much of the Early Archaic period although speculation exists that the environment was characterized by a more mosaic vegetation pattern. Oak/hardwood deciduous forests apparently predominated throughout the region beginning at c. 7,000 years B.P., post-dating the Early Archaic.

In the vicinity of the project area, the range of reported site types associated with the Archaic period is limited to shell fishing stations and rockshelters along the Long Island Sound shore and possibly small temporary camps in the interior (Skinner 1919a, 1919b, 1920, 1932; Funk 1976; Levine 1978; Ritchie 1980; Dincauze 1976; Truex 1982).

Population density, as reflected in the limited number of Early Archaic sites known and the limited number of artifacts recovered from each, must have been low but individual groups must have been highly mobile. The number of individuals and groups was probably no larger than that which existed during the preceding Paleo-Indian period. The low population density probably reflects the low subsistence potential due to the low faunal carrying capacity of coniferous forests for humans. With the advent of coniferous forests and the disappearance of spruce and fir forest associated species, fish and other aquatic animals may have been the only dependable major food resource during much of the Early Archaic, particularly its early portion (c. 10,000-8,000 years B.P.). Deer and associated forms were not present in large numbers over much of the region at that time due to their preference for deciduous forests. The lack of identifiable plant processing tools such as grinding tools, commonly known as manos and metates, may also suggest a lack of edible floral resources within the coniferous pine forest, although tools used to process what was available could have been of a perishable form. Early Archaic subsistence practices during this period, therefore, may not be reflective of traditional hunter-gatherer economies. Evidence for Early Archaic exploitation of fish at an interior campsite in southern Westchester County has been mentioned previously (Boesch 1995a, 1995b, 1997).

It must be noted, however, that although near the beginning of the Early Archaic period coniferous pine forests dominated the landscape, recent work has suggested that a more coniferous pine/ deciduous forest mosaic pattern with spruce and fir stands surviving in moister lowlands and landscape depressions may have existed in the region during the period's latter portions. Such a pattern, with its more extensive ground cover, could have attracted a larger variety of game species than traditionally associated strictly with a coniferous pine forest. This calls into question the role that subsistence potential may have

played in site and/or population density.

Most information concerning the Archaic period comes from Late Archaic sites, since evidence for Early and Middle Archaic sites in the region is almost as scarce as for Paleo-Indian sites.

Evidence of Early Archaic occupation, however, has been recovered along high ground bordering Little Neck Bay in Queens and the Arthur Kill in Staten Island (Jacobson 1980; Platt 1994, 1995, 1996, Stone 1996a). It is probable that other Early Archaic sites were located in similar environmental settings near other inlets and bays along New York waterways. Early Archaic life styles and adaptations are generally considered to be similar to Paleo-Indian lifestyles and adaptations (Gardner 1974).

During the Middle Archaic (7,000-4,500 B.P.), the region's coniferous forests receded and were replaced by deciduous forests that provided humans with more exploitable resources. Sites dating to this period tend to be located on floodplains and low terraces of major rivers and streams in association with marsh, swamp, and estuarine environments (Ritchie and Funk 1973; Funk 1972, 1976; Ritchie 1980). As with Early Archaic components, Middle Archaic sites were probably located along high, well-drained ground bordering bays and inlets throughout southeastern New York.

Human population, site density, and site size seem to have increased in the New York region during the Late Archaic period. Some sites appear to have been occupied on a semi-permanent basis. Sites containing Late Archaic components have been found on high ground bordering area bays and inlets, in low-lying locales in close proximity to estuaries, and along major interior streams.

Sites dating to the Transitional period (or Terminal Archaic; 1,500 - 1,000 B.P.) are most frequently found along the coast and major waterways (Lopez 1955; Kaeser 1963; Funk 1976; Ritchie 1980; Vargo and Vargo 1983), although smaller sites are known from the interior (Funk 1976; Vargo and Vargo 1983). New and radically different broadbladed projectile point types appeared during this period as did the use, during the latter half, of steatite (soapstone) vessels. In southeastern New York, Transitional period components have been found on high ground bordering the bays and inlets of the north shore.

3.1.3 Woodland Period

During the Early Woodland period (1,000 B.P. - A.D. 1), the use of fired clay ceramic vessels gradually replaced the reliance on steatite vessels. Subsistence practices included a continuation of the hunting, gathering, and fishing of the Archaic but were supplemented by an increase in shellfish collecting. It has been suggested that this indicates a trend towards more sedentary lifestyles (see Funk 1976; Snow 1980).

Human populations during the Middle Woodland period (A.D. 1 - 800) continued gradually to adopt a more sedentary lifestyle. Although it is generally felt that subsistence was essentially based on hunting and gathering supplemented by fishing and shellfish collecting (Williams

and Thomas 1982), there has been speculation that domestication of various plants occurred during this period (Ritchie and Funk 1973; Snow 1980). Most Middle Woodland sites in coastal New York are located near estuaries, although smaller inland sites also are known (Funk 1976; Ritchie 1980).

By Late Woodland times (A.D. 900 - 1,600), agriculture/horticulture was a major component of the subsistence base. Some consider it to be the primary component (Ritchie 1980; Snow 1980), while others (Ceci 1979) see it playing a subsidiary role to hunting, fishing, and gathering (including shell fishing). It has been suggested that extensive reliance on agriculture did not occur until late in the Late Woodland period (Ceci 1979).

Late Woodland sites are relatively numerous in the New York City area. Most Late Woodland sites are located along the Long Island Sound shore, Hudson River, and East River and their major tributaries, although smaller inland campsites and shellfish processing sites have been recognized (Skinner 1919a, 1919b; Bolton 1922; Parker 1922; Funk 1976; Levine 1978; Ritchie 1980; Truex 1982; Boesch 1997). Large base camps and habitation sites apparently existed during this period but whether they were permanently occupied or occupied only on a temporary perhaps seasonal basis, is a matter of debate. Such sites are usually located adjacent to tidal inlets and major rivers. Use was still made, however, of smaller, temporary, and special purpose inland campsites usually located near a water source that were probably occupied on a seasonal basis (Ritchie 1980; Snow 1980). Extensive shell middens associated with Late Woodland occupations also have been discovered in the New York City area.

It is possible that numerous Late Woodland bands related through kinship, totemic affiliation or other associated device came together occasionally for particular purposes, perhaps related to seasonal, ritual, and/or subsistence activities. During other periods, the dispersed groups would have occupied smaller, temporary camps.

Smith (1950), basing his conjectures on ceramic typologies, sees an initial "Windsor Tradition" Late Woodland culture occupying all of Manhattan and Long Island. Groups associated with the succeeding "East River" culture eventually forced "Windsor Tradition" people from Manhattan and the western part of Long Island. Smith sees East River culture groups as expanding eastward from New Jersey and/or southeastern New York; the East River culture is divided into an earlier Bowman's Brook phase and a later Clason's Point phase.

3.2 Native American - European Contact Period

The documentary history of the Borough of Manhattan, which includes the current project area, begins with the information recorded by early settlers concerning the Native American groups who occupied the area when Europeans first arrived in the early seventeenth century. The Contact period (A.D. 1600 - ca. 1750) is the time of the first large scale contacts between Native Americans and European colonists. By the latter part of the Late Woodland period, Native American cultures began to resemble those of groups that were encountered by seventeenth century Europeans. At this time, Manhattan's Native Americans were part of the widespread Algonquian cultural and linguistic stock; specifically, they were a group of

Munsee (Minsi) speakers who migrated into the area during Late Woodland times (Goddard 1978a, 1978b; Salwen 1978; Grumet 1995) and their descendants were known collectively as the Wappinger (also Waranoans or Warban). This group included the Manhattan Native Americans encountered by European settlers (Cook 1976:73-74). The Wappinger also occupied much of present day Westchester, Putnam, Dutchess, the Bronx, and southwestern Connecticut. The origin of the term Wappinger is unclear. Pelletreau states that the name translates roughly as "east of the river", although Salomon (1982:85) feels that it may be derived from the Algonquian word "wapinkw" or "woapink" meaning opossum.

The total population of the Wappinger Confederacy has been estimated at about 13,200 individuals at the beginning of European contact (Cook 1976:74). Their settlements included camps along the major rivers and larger villages located at the river mouths (MacCracken 1956:266). Despite references to villages and other site types by early European explorers and settlers, few Contact period sites have been identified in southeastern New York (Funk 1976).

Robert Juet, an officer on the "Half Moon", provides an account in his journal of some of the lower Hudson Valley Native Americans (see Cunningham 1959). In his entries for September 4 and 5, 1609 he states (Juet 1859:28):

This day the people of the country came aboard of us, seeming very glad of our comming, and brought greene tobacco, and gave us of it for knives and beads. They goe in deere skins loose, well dressed. They have yellow copper. They desire cloathes, and are very civill. They have great store of maize or Indian wheate whereof they make good bread. The country is full of great and tall oakes.

This day [September 5th, 1609] many of the people came aboard, some in mantles of feathers, and some in skinnes of divers sorts of good fures. Some woman also came to us with hempe. They had red copper tabacco pipes, and other things of copper they did wear about their necks. At night they went on land againe, so wee rode very quite, but durst not trust them.

The crew of the Half Moon distrusted the aboriginals since the previous day (September 4) because one of their members, John Coleman, was killed and two others were wounded by Native Americans while exploring the Hudson River in a small boat (Ruttenber 1872:9; Juet 1859). The exact circumstances of this violent confrontation are not fully recorded; the confrontation supposedly occurred off shore in the vicinity of the area now referred to as Coleman's Point, New Jersey.

David Pieterz DeVries (Murphy 1853:154-155) recorded another description of Native Americans who resided around Fort Amsterdam:

The Indians about here are tolerably stout, have black hair with a long lock which they let hang on one side of the head. Their hair

is shorn on the top of the head like a cock's-comb. Their clothing is a coat of beaver skins over the body, with the fur inside in winter and outside in summer; they have, also sometimes a bear's hide, or a coat of the skins of the skins of wild cats, or hefsanen [probably raccoon], which is an animal most as hairy as a wild cat, and is also very good to eat. They also wear coats of turkey feathers, which they know how to put together.

Their pride is to paint their faces strangely with red or black lead, so that they look like fiends. Some of the women are very well featured, having long countenances. Their hair hangs loose from their head; they are very foul and dirty; they sometimes paint their faces, and draw a black ring around their eyes.

In political terms, the Wappinger were divided into seven (Bolton 1975:4) or nine (Ruttenber 1872) main groups or chieftaincies and numerous sub-groups and bands. To the Dutch and English, the majority of the groups were known collectively as the River Indians. Little is known about these divisions. Regionally, the Wappinger Confederacy was loosely allied with the Mahikan Confederacy found to the north (Bolton 1975:4; see also Swanton 1952).

The political, linguistic, and social relationships that existed among the Wappinger probably will never be fully understood for a number of reasons. The Native groups themselves had no fixed boundaries and "ownership" of particular areas may have overlapped with use rights shared. Euro-American colonists also frequently misunderstood and misrecorded Native American associations with particular areas. Finally, early pressure on some Native groups by colonial expansion probably resulted in frequent shifts of villages and territories. Such confusion over relationships was particularly true for the bands inhabiting the relatively unexplored and unknown interior areas (Goddard 1978b).

Scholars have associated the Reckgawawancs with the area that includes the present project area; traditionally, they occupied most of the island of Manhattan and the area adjoining the east bank of the Hudson River as far north as Yonkers (Ruttenber 1872:77-78; Cook 1976:73-74; Bolton 1975:18-22). Their name reportedly derived from the name of the sachem, Reckgawac who was involved in a series of land transactions with the Dutch and English (Bolton 1975:18). The group also was referred to as the Mannattans or Manhatesen, which reportedly roughly translates as "south" possibly referring to their geographic location within the Wappinger Confederacy (Cook 1976). These names apparently derive from the 1610 Velasco map, which assigns the name Manahata to the Native inhabitants on both banks of the lower Hudson River (Grumet 1981:25-26). Isaak de Rasieres reported around 1628 that the island of Manhattan was "inhabited by the old Manhatesen; they are about 200 to 300 strong, woman and men, under different chiefs." In addition, the Janssonius-Visscher Map of Nova Belgica and/or Nieu Nederlandt first published in 1650 identifies Dutch North American land claims from Cape Malabare (Cape Cod) to the Delaware Capes (Gekle 1982: 27; Jameson 1909:294) and shows the Mannattans (original spelling from the 1650 map) to the south of the present vicinity of the City of Yonkers. Grumet (1981:26) states, however, that the Reckgawawancs actually were the Haverstraw, a Munsee Delaware speaking group

that lived on the west side of the Hudson in the vicinity of Haverstraw Bay, and that the Manhattan (or Mannattans) were a separate group inhabiting the island that bears their name. In any case, the names Reckgawawancs and Mannattans (and other variants of the name) disappear from the historic record by the mid-seventeenth century.

The main village of the Reckgawawancs and/or Manhattan was named "Nappachamak" and was located in present day Yonkers (Cook 1976:73), near the mouth of the Nepperhan or Saw Mill River. Another village and fort or castle referred to as "Nipinichsen", was located on the north shore of Spuyten Duyvel Creek on Berrien's Neck (Ruttenber 1872:77). Other temporary campsites were located on Manhattan Island, particularly along the shoreline of the Hudson River and East River.

Problems and conflicts during the seventeenth century between the Indians of the lower Hudson Valley area and the Dutch resulted in the deaths of large numbers of Native Americans (Hodge 1910; Washburn 1978; Ruttenber 1872; van der Zee and van der Zee 1978). During the late pre-European Contact period, the Reckgawawancs probably numbered approximately 900 individuals (Cook 1976:73). As mentioned above, by the year 1628 the population of the group has been estimated to have been reduced to 200 to 300 individuals (Cook 1976:73).

In two tragic incidents occurring in February, 1643, Dutch troops at the command of the Dutch Governor Wilhelm Kieft slaughtered about 80 Native Americans taking shelter at Pavonia (Jersey City) and another 40 camped at Corlear's Hook in Manhattan. The Natives were among a group of Westchester County Natives who had taken refuge near New Amsterdam to escape from Mahican or Mohawk attacks on their villages. Kieft saw the congregation of the refugees as a way of solving his perceived problem with local Native Americans in general hindering the expansion of the New Netherlands colony. The murder of the Native Americans sparked a two year period of hostilities known to historians as Kieft's War (1643-1645). During the war, more than 1,600 Natives and an almost equal number of settlers were killed. Most of New Netherlands' colonial settlements were destroyed during the war with remaining colonists seeking safety in the Dutch fort at New Amsterdam. A treaty of peace signed on August 30, 1645 at a site on Croton Point in Westchester County, brought the conflict to an end (Cantwell and Wall 2001:125).

By the early eighteenth century, the population of the entire Wappinger Confederacy has been estimated to have been reduced to approximately 1,000 individuals (MacCracken 1956:266). These included a few survivors of the Reckgawawancs who were reportedly living in the vicinity of Inwood in northern Manhattan (Bolton 1975:20-21). In 1774, the entire Native American population located on both sides of the Hudson River was estimated at 300 individuals with only a small number of these people inhabiting the New York City area (Cook 1976).

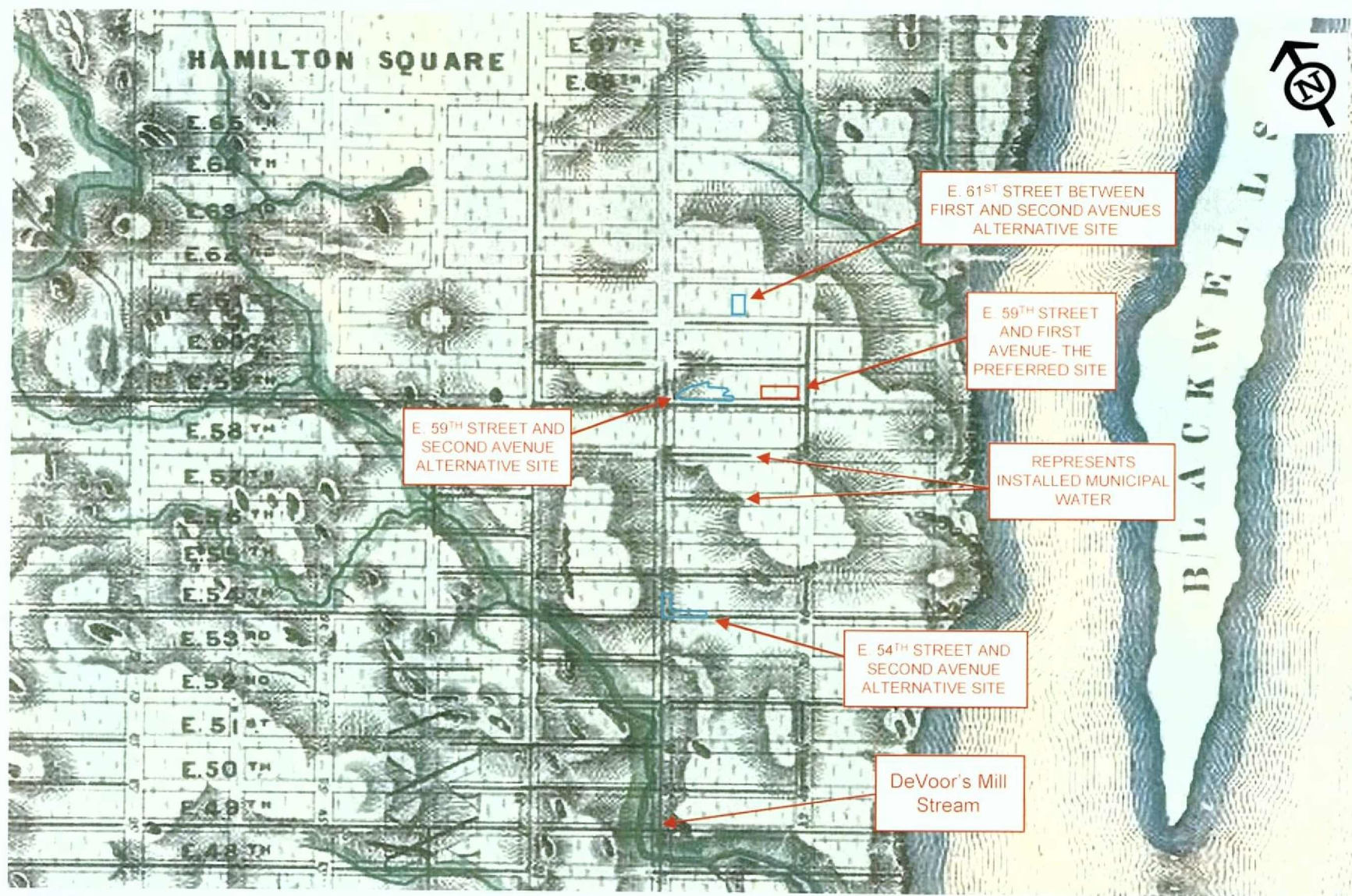
3.3 Previously Recorded Native American Sites in the Project Area Vicinity

Research indicates that, for the most part, the prehistory of Manhattan is little known. That prehistoric activity did occur in the area is seen from identified sites, artifact scatters, and

anecdotal information. Although Native American sites have not been recorded specifically at the preferred Shaft 33B Site or the three Alternative Shaft Sites, evidence of such activities previously has been recorded in their vicinities. The nearest known evidence of activity is recorded in the archaeological site files of the New York State Museum (NYSM) as generally located in the area extending between 45th and 70th Streets from the East River shoreline to Second Avenue, which includes the current preferred Shaft 33B Site and the alternative sites. The information included on the NYSM archaeological site map and in its files describes the area as containing "traces of [Native American] occupation" and is derived from the work of the noted avocational archaeologist Arthur C. Parker in the early twentieth century. No further information is recorded in the NYSM files on the occupations, which may have dated to any of the Native American culture historic periods mentioned previously. NYSM has assigned the archaeological site number 4061 to the area containing the finds. Parker's description of traces of occupation in the area suggests that a scatter of small campsites was located within the area identified. This is not surprising since the cartographic research (see Viele 1865; Figure 12) undertaken for this investigation has indicated that two freshwater streams extended through the area that were bordered by knolls, hills, and other areas of high ground. The larger of two streams (known as DeVoor's Mill Stream) emptied into the East River in the vicinity of 49th Street at Turtle Bay, while the second joined the river between E. 61st and E. 62nd Streets. Areas of raised ground in proximity to these water courses would have been attractive for Native Americans engaged in subsistence pursuits, serving as the locations of campsites. Archaeologists have traditionally considered such areas of high ground in proximity to water sources as sensitive for the presence of Native American sites. A prehistoric site sensitivity model developed by the NYCLPC in 1980 (NYCLPC 1980, 1982) also has identified the former routes of these two freshwater streams and their immediately adjoining areas as generally sensitive locations for Native American sites (Figure 13). However, the archaeological sensitivity of specific lots within the area is predicated on the extent of sub-surface disturbance that has occurred there as a result of nineteenth and twentieth century development.

3.4 Other Evidence of Native American Activity in the Project Area Vicinity

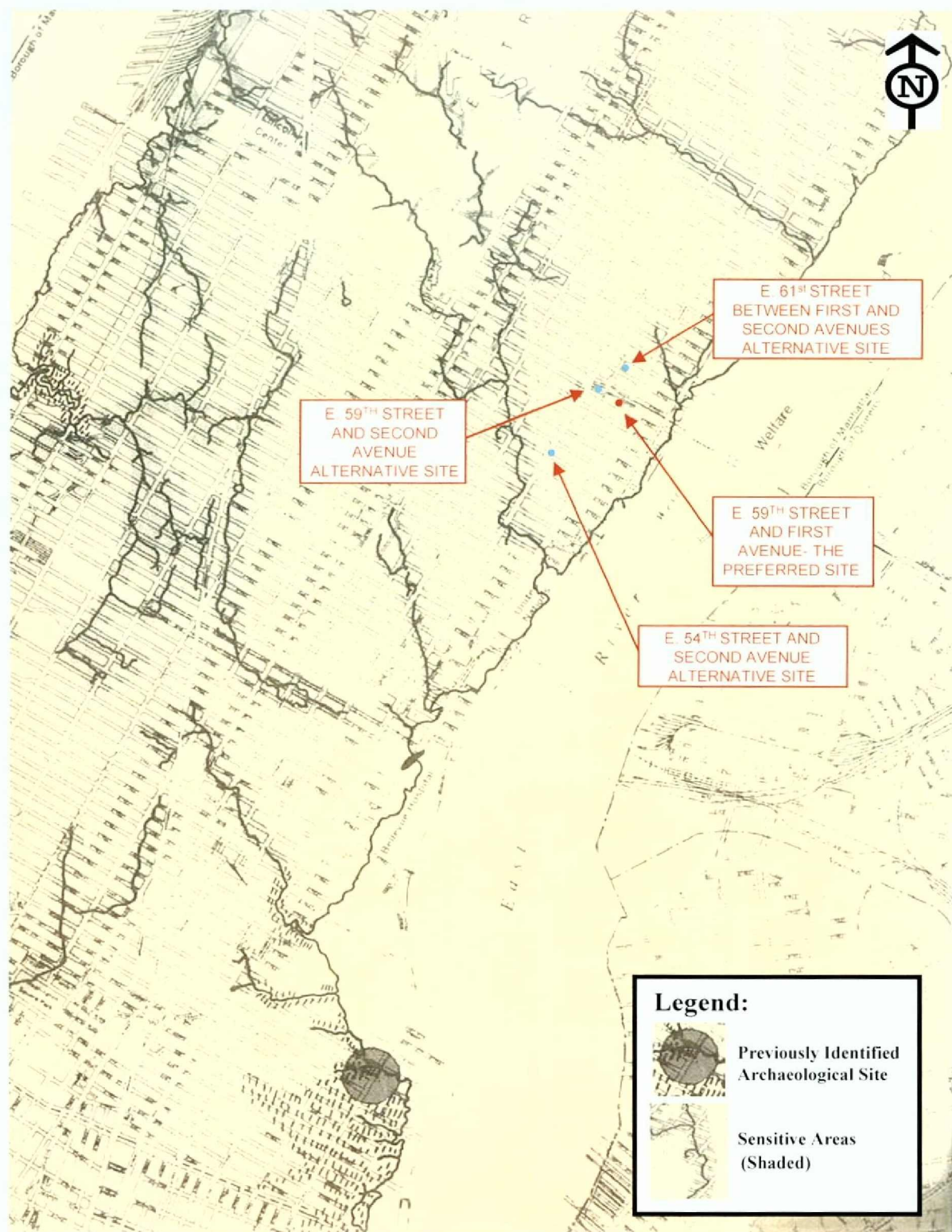
Other indications of Native American activity in the project area vicinity are suggested by references to a Contact period aboriginal trail in the area. The trail was referred to during the seventeenth century as the Wechquasgeck Road and named after a Native American group found in lower Westchester. It extended from the southern tip to the northern tip of Manhattan. Contact period Native Americans reportedly used the trail during their travels to and from Fort Amsterdam. In the current midtown area, the trail followed the route of what is now Broadway (the Old Albany Post Road), that this is located west of the project area (Grumet 1981:59; Bolton 1922:55). The trail would have been an important regional and local travel corridor and by-way, communications artery, and trade route for Contact period Native Americans. Its importance probably also extended for some period back in time. Branching trails would have extended from it leading eastward to the East River. Game trails used by Native Americans likely also extended along the banks of the streams formerly located in the project area vicinity. All these trails would have brought seventeenth century Native Americans into the immediate vicinity of the project area.



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CITY WATER TUNNEL NO. 3, STAGE 2
 SHAFT 33B
 1865 VIELE MAP
 SCALE OF ORIGINAL: ONE INCH = 1,000 FEET

JUNE 2005

FIGURE 12



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
PORTION OF THE NEW YORK CITY LANDMARKS PRESERVATION COMMISSION
PREHISTORIC SITES SENSITIVITY MAP THAT INCLUDES
THE PROPOSED PROJECT LOCATION
SCALE OF ORIGINAL: 1:24,000

JUNE 2005

FIGURE 13

4.0 DOCUMENTARY RESEARCH – THE HISTORIC PERIOD

4.1 Seventeenth Through Mid-Eighteenth Centuries

Although Dutch and other explorers and traders had been visiting the Hudson River for decades, it was not until 1624 that individuals employed by the Dutch West India Company founded the Colony of New Netherlands along its shores. The majority of the first colonists who came to settle in the area sailed north to what is now Albany and established Fort Orange. Eight other colonists, however, were left to construct a fort on what is now Governor's Island located south of Manhattan Island to protect the mouth of the Hudson River. By 1625 the importance of Manhattan to the development of New Netherlands was recognized and the Dutch West India Company established a settlement there naming it New Amsterdam, with the objective of building a fort and establishing nine company farms. In 1664, forty years after New Netherlands' founding, the colony was taken over by the English. Throughout the seventeenth and eighteenth centuries, development of New York City was restricted to the lowermost portion of Manhattan. Expansion flourished especially along the waterfront where numerous growing commercial and industrial endeavors were located. The development fueled population growth and expansion in the lower Manhattan area, including the creation of new land along the island's southernmost shoreline throughout the period.

During the seventeenth and eighteenth centuries, what is now midtown Manhattan (where the project sites are located) consisted primarily of an undulating landscape covered by woodlands, freshwater streams, and wetlands. A few farms and the country estates of wealthy individuals were widely scattered throughout the area beginning in the late seventeenth century. The establishment of Boston Post Road through the current project area vicinity was the first major development allowing relative ease of access between the farmsteads and the settlement at lower Manhattan; this section of the road was constructed between 1669 and 1671 and was referred to as Eastern Post Road. The road roughly followed the current route of Lexington Avenue until about what is now 41st Street, where it made a bend to the northeast before rejoining what is now Third Avenue around 66th Street (Stokes 1928). The road formerly extended through the E. 59th Street / Second Avenue Shaft Site and passed to the west of the preferred Shaft 33B Site, to the east of the E. 54th Street / Second Avenue Shaft Site, and west of the E. 61st Street Shaft Site.

The English Governor Edmund Andros awarded a 20-acre land grant that included the preferred Shaft 33B Site and the E. 59th Street / Second Avenue Shaft Site (Block 1434) to John Danielson on March 15, 1676 (Stokes 1928:126). Around the same date, the Governor awarded another land grant to Jacobus Fabricius (Stokes 1928:78 and 156) that contained the area presently known as Block 1436. This grant also included the Alternative Shaft Site at E. 61st Street between First and Second Avenues. It is possible, however, that the current block may be part of a parcel that was designated as common land by New York City in the Charter issued by the English Governor Dongan on April 27, 1686 (Stokes 1928: 156). By 1748 the E. 61st Street Shaft Site was included in the farm of Johannes Van Zandt (Stokes 1928: 156). Governor Andros awarded what is now the current E. 54th Street / Second Avenue Shaft Site (Block 1347) to David Duffore (or Du Four; later Devore) on October 9, 1677 (Stokes 1928: 81 and 149).

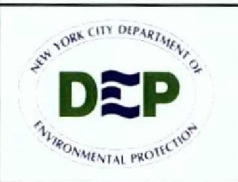
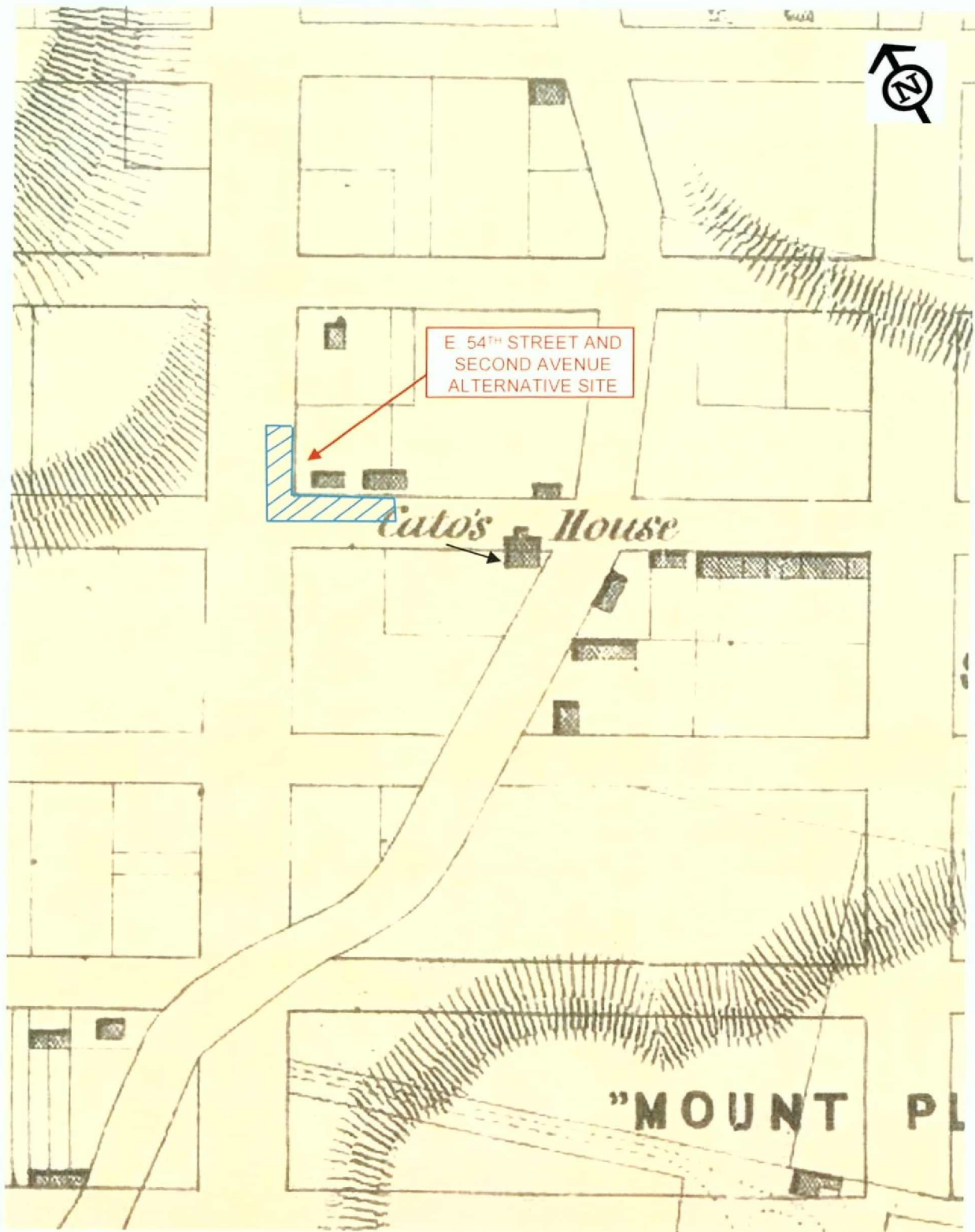
In addition to being part of the farm of David Duffore (later Devore), during the late seventeenth and eighteenth century period what is now the E. 54th Street / Second Avenue Shaft Site subsequently became part of the Brevoort and Odell Farms and the Spring Valley Farm. For part of this period the former was located east of the Eastern Post Road and north of E. 53rd Street, while the latter was located in the East 50's north of 52nd Street around First Avenue (Stokes 1928:82). Most of the farm buildings in the project area vicinity during the late seventeenth to early nineteenth centuries were located along Eastern Post Road or closer to the East River shoreline.

According to Stokes (1928:82), a structure was located west of the Eastern Post Road within what is now, at least in part, the road bed of E. 54th Street east of Second Avenue; the structure reportedly was constructed in 1712. Originally or soon after construction it was owned and operated as a tavern by an individual named "Cato" who lived there until around 1760. After that date, the structure was associated with the Duffore/Devore, Brevoort, and Odell farms (the farm and house actually stayed in the Devore family since a daughter, Ann, married successively to Abraham Brevoort in 1788 and John Odell in 1795). However, the house remained known locally as Cato's house until the mid-nineteenth century (Stokes 1928:82). This is illustrated by the fact that both the 1836 Colton and 1851 Dripps maps (Figures 11 and 14) indicate a house situated in the same location (E. 54th Street east of Second Avenue and west of the Eastern Post Road) as associated with an individual named "Cato" or as "Cato's House." The house likely was demolished in 1855 when E. 54th Street was improved (Stokes 1928:603). An undated print of the house is reproduced in this report as Figure 15.

According to Earle (1900:25):

Cato was a Negro slave who had so mastered various specialties in cooking that he was able to earn enough money to buy his freedom from his South Carolina master. He kept this inn for forty-eight years. Those who tasted his okra soup, his terrapin, fried chicken, curried oysters, roast duck, or drank his New York brandy-punch, his Virginia egg-nogg, or South Carolina milk-punch, wondered how any one who owned him could ever sell him even to himself. Alongside his road house he built a ballroom, which would let thirty couples swing widely in energetic reels and quadrilles. When Christmas sleighing set in, the Knickerbocker braves and belles drove out there to dance; and there was always sleighing at Christmas in Old New York – all octogenarians will tell you so. Cato's egg-nogg was mixed in single relays by the barrellful. He knew precisely the mystic time when the separated white and yolk was beaten enough, he knew the exact modicum of sugar, he could count with precision the grains of nutmeg that should flect the compound, he could top to exactness the white egg foam.

The former location of Cato's house and tavern, based upon Stokes' depiction of early land grants between 23rd and 59th Streets, was just east of the Alternative Shaft Site located at E.

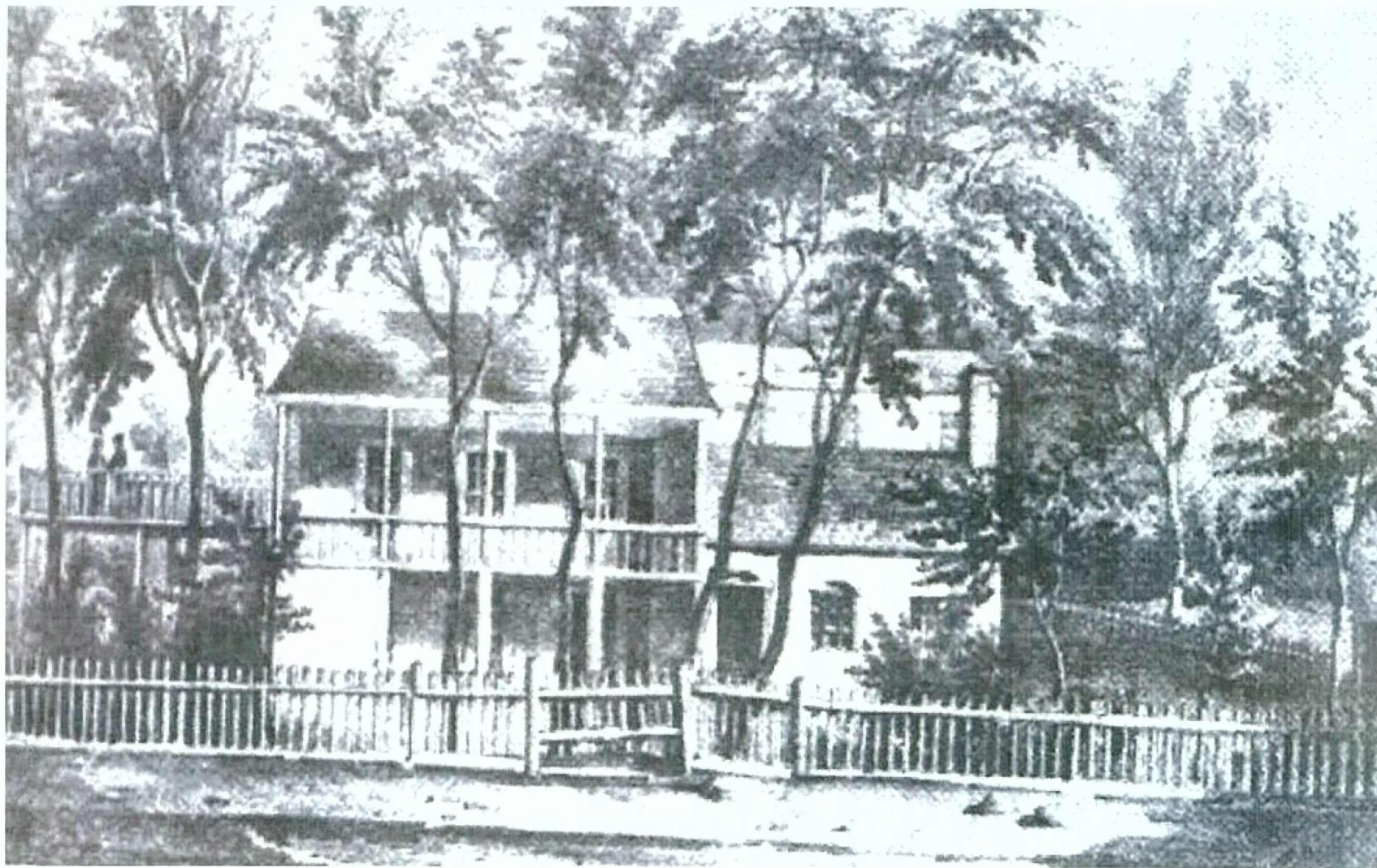


NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CITY WATER TUNNEL NO. 3, STAGE 2
 SHAFT 33B

PORTION OF THE 1851 DRIPPS MAP THAT INCLUDES
 THE E. 54TH STREET AND SECOND AVENUE SHAFT SITE
 SCALE OF ORIGINAL: 1 INCH = 3,520 FEET

JUNE 2005

FIGURE 14



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B

UNDATED PRINT OF CATO'S HOUSE AND TAVERN BUILT IN 1712
SOURCE: EARLE 1900

JUNE 2005

FIGURE 15

54th Street and Second Avenue with the former backyard area possibly extending into that site. The 1851 Dripps map also places the tavern within E. 54th Street just east of the APE for the E. 54th Street / Second Avenue Shaft Site (see Section 4.5.2), although Earle (1900:25) indicates its former location as at the junction of the Eastern Post Road and E. 51st and E. 52nd Streets.

During the late seventeenth and early eighteenth century period, in addition to being included in the farm of Jacobus Fabricius the E. 59th Street / Second Avenue Shaft Site apparently was included in the Philip Brasher farm and later in a farm owned by William Stephens Smith (Stokes 1928:78-79) named "Mount Vernon" (Stokes 1928:79). The farm was located in the area just east and northeast of E. 59th Street between First and Second Avenues. During the late seventeenth and early eighteenth century period, in addition to being included in the farm of Jacobus Fabricius the E. 61st Street Shaft Site apparently was included in a farm owned by A. and W.K. Beerman (Stokes 1928).

In addition to Cato's house and tavern (see above), there were two other taverns located in the area that served the needs of the local population during the eighteenth century. Sometime before 1738, one saloon called the Union Flag reportedly was located along the west side of Eastern Post Road on the farm of Thomas Addis Emmet in the vicinity of what is now the approach road to the Queensboro Bridge and the E. 59th Street / Second Avenue Shaft Site. Stokes (1928:101) indicates that the tavern was located on what is now Block 1351 (between E. 58th and E. 59th Streets just east of Second Avenue); this location is just south of the E. 59th Street / Second Avenue Shaft Site. The last reference to the tavern is dated January, 1757 after which the house may have served only as a residence. What is likely the Union Flag tavern apparently is shown on the 1785 Map of Common Lands² by the surveyor Casimer Goerck. On the latter map the house is shown along with an outhouse at a bend in Eastern Post Road (between what are now E. 58th and E. 59th Streets) and is indicated as the residence of an individual named "Harmon" (see also Stokes 1916 and Stokes 1928:101). The second tavern that served the Shaft 33B project area during part of the eighteenth century period was located along Eastern Post Road at what is now E. 67th Street and Third Avenue.

4.2 The Revolutionary War Years

Following their defeat at the Battle of Long Island on August 27, 1776, the American Army retreated to Manhattan and established a number of fortifications and outposts along the East River shoreline from the island's southern tip to at least Turtle Bay (47th Street) along the East River. On September 12, 1776, the American Army decided to begin its evacuation of New York City. Over the next three days troops streamed northward along Eastern Post Road/Boston Post Road and Bloomingdale Road, located further to the west, as well as through adjoining fields and farm roads. The Americans acted just in time because on September 15, 1776 British and Hessian troops landed at Kips Bay in the East River (between what are now 23rd and 34th Streets) in an attempt to trap the Americans in lower Manhattan. Fortunately for the Americans, the British were delayed after their landing at Kips Bay, which

² The copy of the 1785 map reviewed for this investigation was too faint to indicate the structure when it was reproduced so it is not included in this report.
Shaft 33B Phase 1A Historic Resources Assessment

allowed the bulk of the remaining American forces to escape to northern Manhattan. British forces remained in possession of Manhattan Island for the duration of the war. The occupation of the island caused much hardship for the local inhabitants and devastated much of the area north of New York City, including the current project area vicinity; foraging troops cut down most of the area's forests and orchards and pillaged local farms.

Following the Revolutionary War, the New York City Common Council voted to survey the midtown area and divide portions of it into lots for sale. Local residents started to move northward out of lower Manhattan and establish small to medium sized farmsteads in what is presently the midtown area. These farmsteads were developed in addition to and near the large estates that had existed in the area during the eighteenth century. The growth in this vicinity of the midtown area resulted in the establishment of a small hamlet known as Yorkville, located north of 60th Street to 96th Street and east of Third Avenue.

4.3 The Nineteenth Century

By the early nineteenth century the midtown area was emerging as a diverse, but still primarily rural landscape with small farms and a few estates located east of Second Avenue that extended to the East River shoreline. Limited commercial and residential dwellings were scattered along or near Eastern Post Road, and the hamlet of Yorkville was located to the north. By 1815, the New York Common Council authorized construction of Third Avenue, which was improved by 1820 thereby permitting easier travel along it. This improvement also served to increase development of the midtown area.

By the second third of the nineteenth century the midtown area was quickly transforming from a rural to a suburban community and then into an urban area. Rapid growth resulted in the establishment of commercial and industrial ventures and class-segregated neighborhoods in some locations while large estates remained in other areas. At the same time, increased immigration into New York City and the rise of the industrial working class resulted in the movement uptown of wealthy and upper middle class citizens. Although the boundary of New York City extended only to around 14th Street as of 1825, within 30 years of that date the City's reach had extended almost to 70th Street with a number of village communities thriving further to the north.

Numerous blocks in the midtown area were divided into building lots by the late 1830's, although construction on many did not occur for years afterward. By mid-century, all of New York City's streets to at least 42nd Street were regulated and paved and most of the streams and wetlands formerly located in the area had been filled primarily for health reasons. The closing of the Eastern Post Road by the City of New York in 1852 occurred as a result of increased development and increased value of local real estate in the vicinity. Essentially, Eastern Post Road was closed because the development of Third Avenue left it redundant and unnecessary. Growth of the midtown area, however, was not all for the good and resulted in deplorable living conditions in many locations. According to one account, the portion of Manhattan north of 42nd Street during the 1850's and 1860's consisted of garbage dumps, shantytowns, and decrepit taverns interspersed by outcroppings of rock (Lamb 1880:123).

The advent of the Civil War slowed growth in the midtown region as well as in New York City generally. One of the most notorious events associated with the war in New York City occurred in the midtown area in 1863 when the opening of the first conscription office at E. 46th Street and Third Avenue was the spark that started the infamous Draft Riots as thousands of poor residents protested their induction into the United States Army.

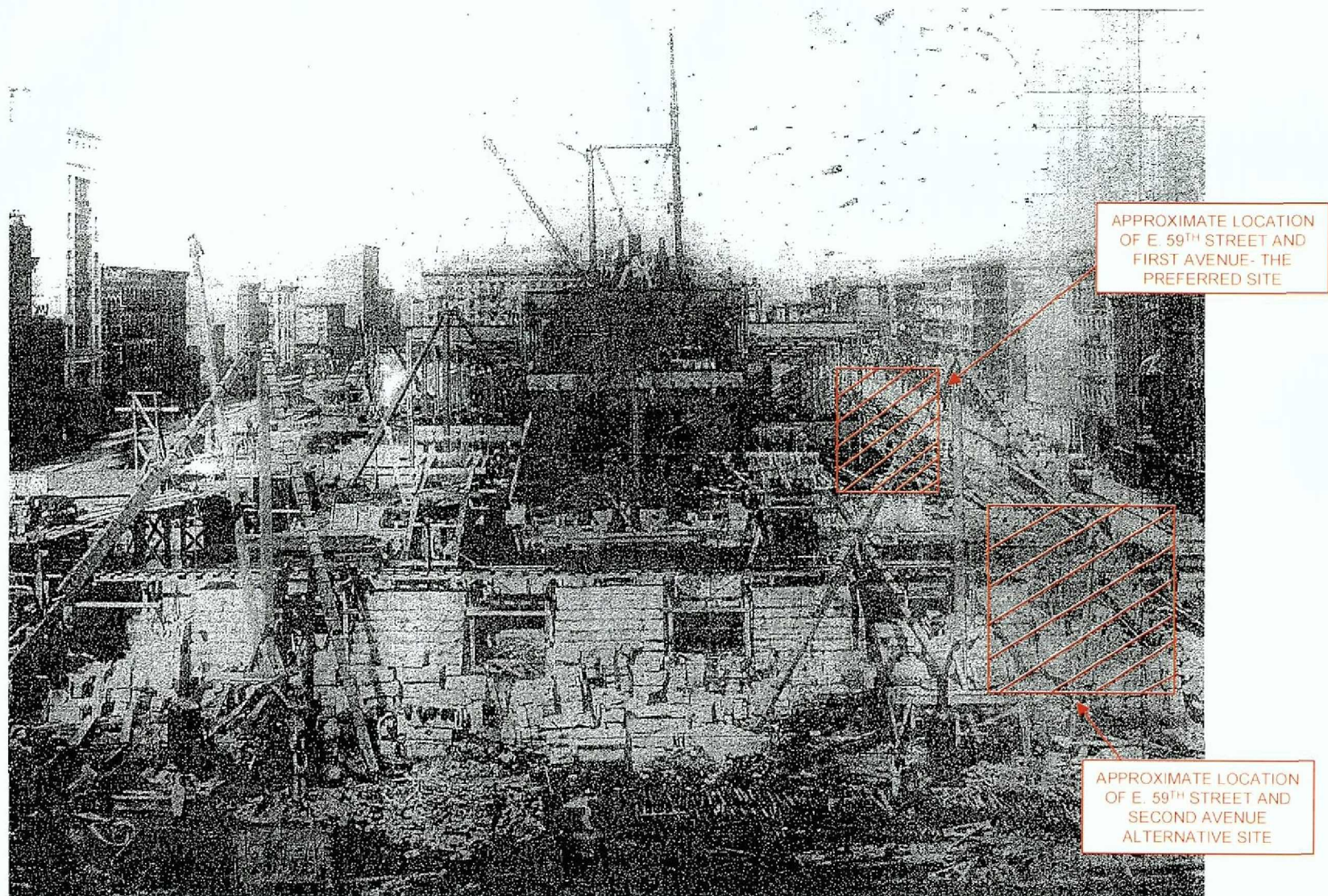
By the post-Civil War period, the midtown area had become fully urban consisting of a mix of residential, commercial, and industrial buildings. Among the businesses located in the area were slaughter houses, gas and coal yards, breweries, glass manufacturers, an ink factory, a rope walk, and piano manufacturers, to list a few. By 1880, the elevated train (the El) had been constructed along Second Avenue as well as along Third, Sixth, and Ninth Avenues, contributing to the growth of midtown. The mix of commercial, industrial, and residential buildings and development within midtown continued through the late nineteenth and twentieth century period.

4.4 Queensboro Bridge

Soon after the end of the Civil War, a movement arose to construct a number of bridges across the East River to better connect Manhattan with the City of Brooklyn and the farms of Queens and Long Island. The Brooklyn Bridge was the first of these spans to be built, opening in 1883. Six years earlier in 1877 plans had been proposed to construct another bridge at Blackwell's (now Roosevelt) Island, spanning the East River between New York and Queens. Twenty-four years later in 1901, construction of a bridge at that location finally commenced. Construction of the bridge referred to as the Queensboro Bridge (Bridge), ended seven years later in 1908 with the span opened to train traffic; it was opened to pedestrian and vehicle traffic during the following year (New York City NYCLPC 1973). The Bridge is listed on the New York State and National Registers of Historic Places and also has been designated a New York City Landmark (Santucci 2005; see Section 5.1). According to Stokes (1918:844), as part of the Bridge's construction a "proper approach" to the Bridge was built by "widening 60th Street and by providing a diagonal approach to the Bridge from Second Avenue to 57th Street so as to relieve Fifth Avenue congestion." Construction of this approach likely disturbed both the preferred Shaft 33B Site and the E. 59th Street / Second Avenue Shaft Site (see Figures 16 through 18). A new approach to the Bridge on the Manhattan side east of Second Avenue was constructed in 1930 (New York City NYCLPC 1973).

4.5 Occupational History of the Preferred Shaft 33B Site and the Three Alternative Sites

In order to investigate the history of Historic land use within the preferred Shaft 33B Site and the three alternative sites, maps showing the pertinent sections of Manhattan were consulted. Many of the post-1811 maps reviewed showed the gridiron pattern of Manhattan's street network, allowing for the identification of the preferred Shaft 33B Site and the three alternative sites. Some early nineteenth-century maps show the location of the alternative sites as being west of Blackwell's Island and located approximately one-third of that island's length north of its southernmost tip.

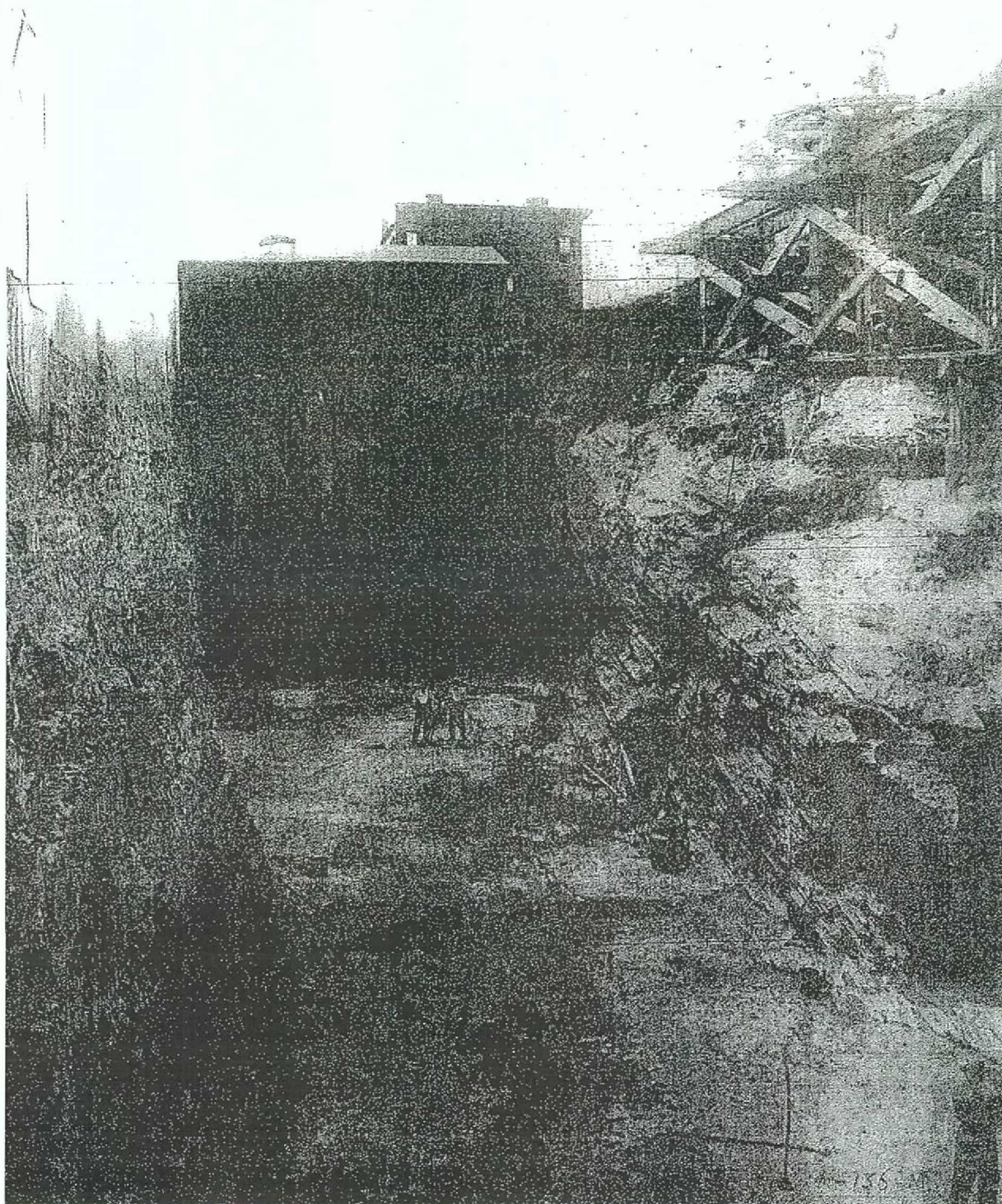


NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B

1901-1908 CONSTRUCTION OF THE QUEENSBORO BRIDGE-
VICINITY OF MANHATTAN APPROACH
SOURCE: NEW YORK CITY MUNICIPAL ARCHIVES n.d.

JUNE 2005

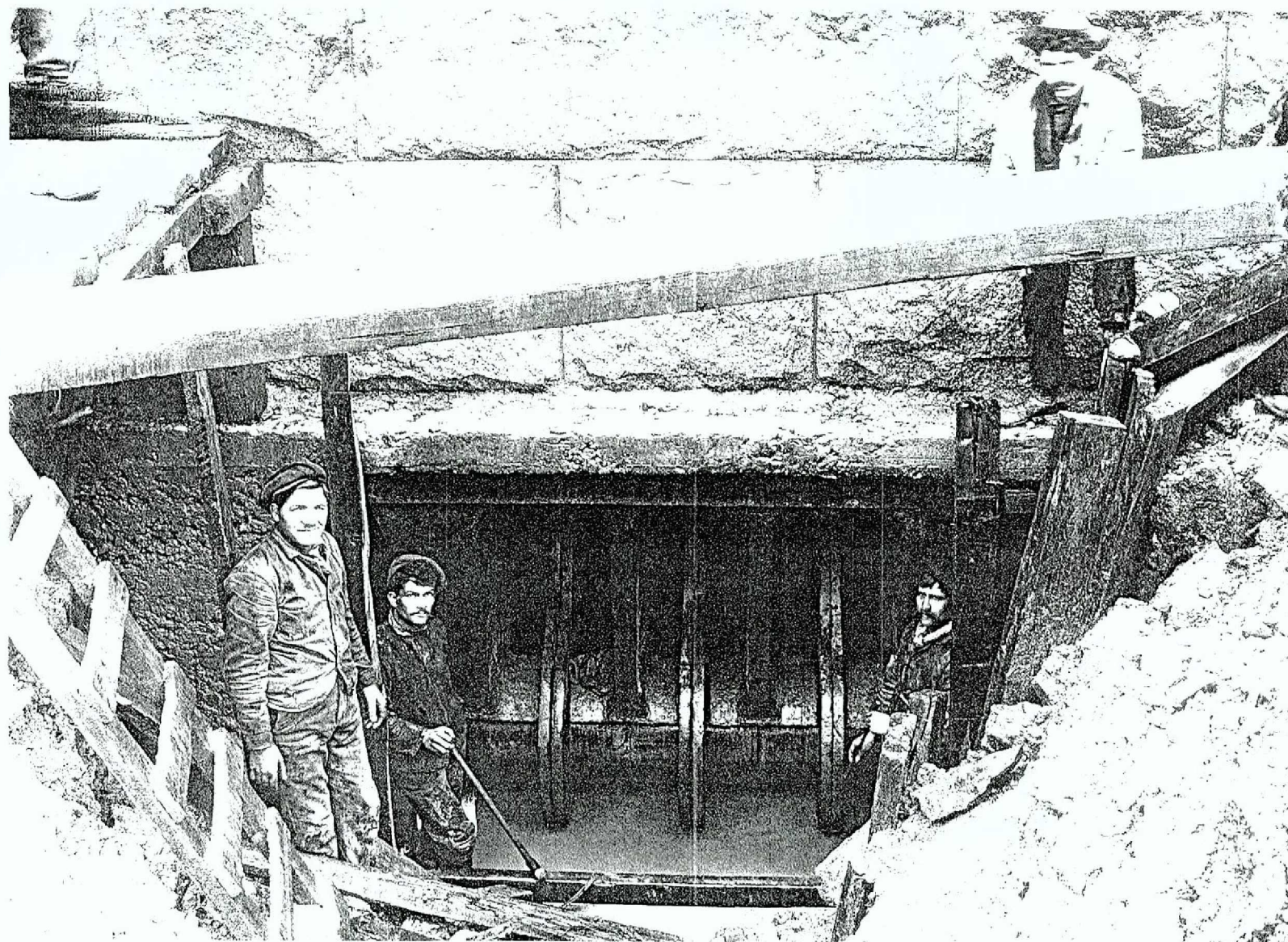
FIGURE 16



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
1901-1908 CONSTRUCTION OF THE QUEENSBORO BRIDGE-
EXTENT OF CONSTRUCTION EXCAVATIONS MANHATTAN SIDE
SOURCE: NEW YORK CITY MUNICIPAL ARCHIVES n.d.

JUNE 2005

FIGURE 17



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B

1901-1908 CONSTRUCTION OF THE QUEENSBORO BRIDGE-
CONSTRUCTION EXCAVATION NEAR MANHATTAN APPROACH
SOURCE: NEW YORK CITY MUNICIPAL ARCHIVES n.d.

JUNE 2005

FIGURE 18

4.5.1 Eighteenth to Early Nineteenth Centuries

Preferred Shaft 33B Site and the E. 59th Street / Second Avenue Shaft Site

No structures were located within what are now the preferred Shaft 33B Site and the E. 59th Street / Second Avenue Shaft Site during the late eighteenth century and early nineteenth century period, according to the c. 1782 British Headquarters Map, 1811 Randel map (Commissioners' Plan), 1821 Randel map (Final Commissioners Plan), and 1836 J.H. Colton map (Figures 8 through 10). All of the maps indicate that the vicinity of the two sites consisted of wooded and/or open land, some of which likely was cultivated during this period. Development of the sites did not begin until sometime after 1836.

During the eighteenth century, the Union Flag Tavern/Harmon dwelling (see Section 4.1) reportedly was located on Eastern Post Road in the vicinity of what is now the Second Avenue approach road to the Queensboro Bridge. Figure 8 identifies the location of the Union Flag Tavern. According to Stokes (1928), the tavern was located south of the E. 59th Street / Second Avenue Site within what is now Block 1351. This block is located between E. 58th and E. 59th Streets east of Second Avenue and west of First Avenue.

East 54th Street / Second Avenue Site

No structures were located within what is the E. 54th Street / Second Avenue Site during the eighteenth century through early nineteenth century period, according to the c. 1782 British Headquarters Map, 1811 and 1821 Randel maps, and 1836 Colton map (Figures 8, 9, and 11). The maps indicate that the vicinity of this site comprised generally, but not completely of wooded areas and/or open land. Some of this land was likely cultivated, during this period. .

A structure is shown just west of Eastern Post Road (east of what is now Second Avenue) on the c. 1782 British Headquarters map (Figure 8). This may be the structure depicted by Stokes (1928) on his map of early land grants between E. 23rd Street and E. 59th Street. As mentioned earlier, Stokes (1928) depicts the presence of a structure within what is now E. 54th Street east of Second Avenue. Its former location according to Stoke's depiction was just east of the E. 54th Street / Second Avenue Shaft Site; the former backyard of the structure would have extended into the site. The house is shown on the 1836 Colton and 1851 Dripps maps (Figures 11 and 14) and is located west of Eastern Post Road where it is identified as being owned by an individual named Cato. As mentioned previously, for at least a part of its existence the house reportedly was a tavern constructed in 1712 that was owned and operated by a freed slave named Cato. After c. 1760, the tavern likely served as a residence associated with the eighteenth century Devore and/or Brevoort and Odell farms. It remained known as Cato's House, however, well into the early nineteenth century. The building likely was demolished in 1855 when E. 54th Street was improved (Stokes 1928:603).

The 1836 map also identifies a lane extending to the north of Cato's house, running between Third Avenue and a landing and Shot Tower for Spring Valley Farm at the East River. The

lane is a precursor to E. 54th Street in this area but it extends at a slight tangent to the gridiron pattern established for New York City's Streets; the lane formerly extended through Second Avenue within the E. 54th Street / Second Avenue Shaft Site. Cato's House is still shown on the 1851 Dripps map (Figure 14), but replacing the lane shown on the 1836 map is a regulated and established E. 54th Street laid out to the New York City's gridiron street network. The 1851 map depicts Cato's house as partially situated within E. 54th Street, possibly suggesting that the house had been or was soon to be demolished as a result of construction of E. 54th Street. By 1866 according to the United State Coast Survey map (Figure 19) of that year, the house apparently was no longer standing with the entire block having been developed. The house may have been demolished in 1855 when E. 54th Street was improved (Stokes 1928: 603) likely to meet the standards of the New York City's established street network. In any case as stated above, the house formerly was located east of the E. 54th Street / Second Avenue Shaft Site but its former backyard area may have extended into the site.

No structures are shown in the vicinity of the E. 54th Street / Second Avenue Site on the 1811 or 1821 Randel maps (Figure 9), although Cato's house apparently was present as shown by the 1836 Colton map (Figure 11). Further development of the E. 54th Street / Second Avenue Shaft Site's vicinity did not begin until sometime after 1836 and is discussed in Section 4.5.2.

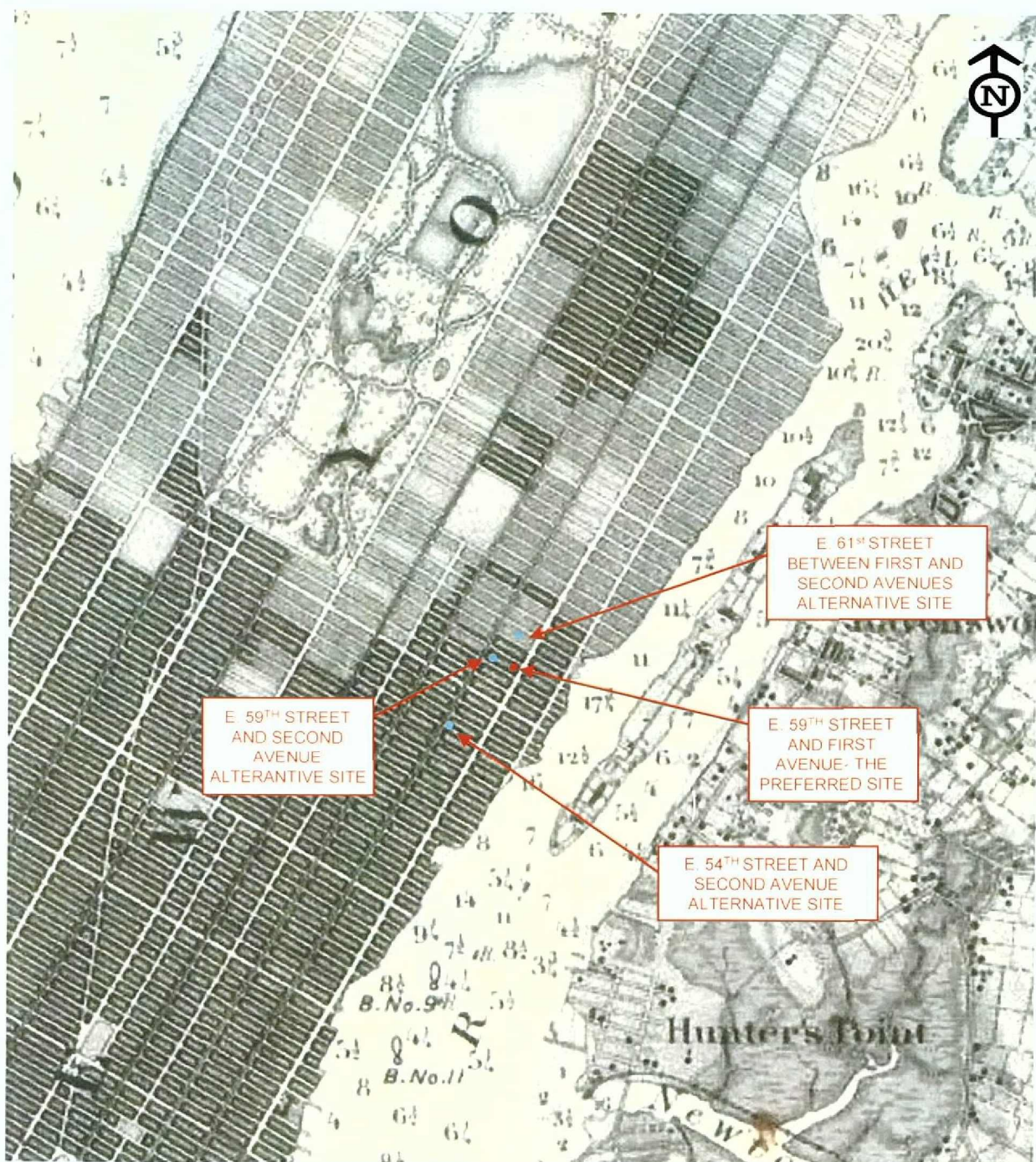
East 61st Street Shaft Site

A review of the c. 1782, 1821, and 1836 maps (Figures 8 through 10) mentioned above indicates that development of the E. 61st Street Shaft Site occurred sometime between 1821 and 1836 (see 1821 Randel and 1836 Colton maps – Figures 9 and 10). Prior to its development as indicated by the three maps mentioned, the current E. 61st Street Shaft Site consisted of wooded and/or open possibly cultivated land during this period. A dwelling house and some outbuildings, however, were located on the northwest corner of E. 60th Street and Second Avenue by 1821 according to the Randel map of that year (see also Stokes 1928:156). The former locations of the structures and the associated rear yards are located well to the southwest of the APE for the E. 61st Street Shaft Site. The post-1821 development of the site is discussed in Section 4.5.2.

4.5.2 Early Nineteenth to Twentieth Centuries

E. 59th Street and First Avenue – The Preferred Shaft 33B Site

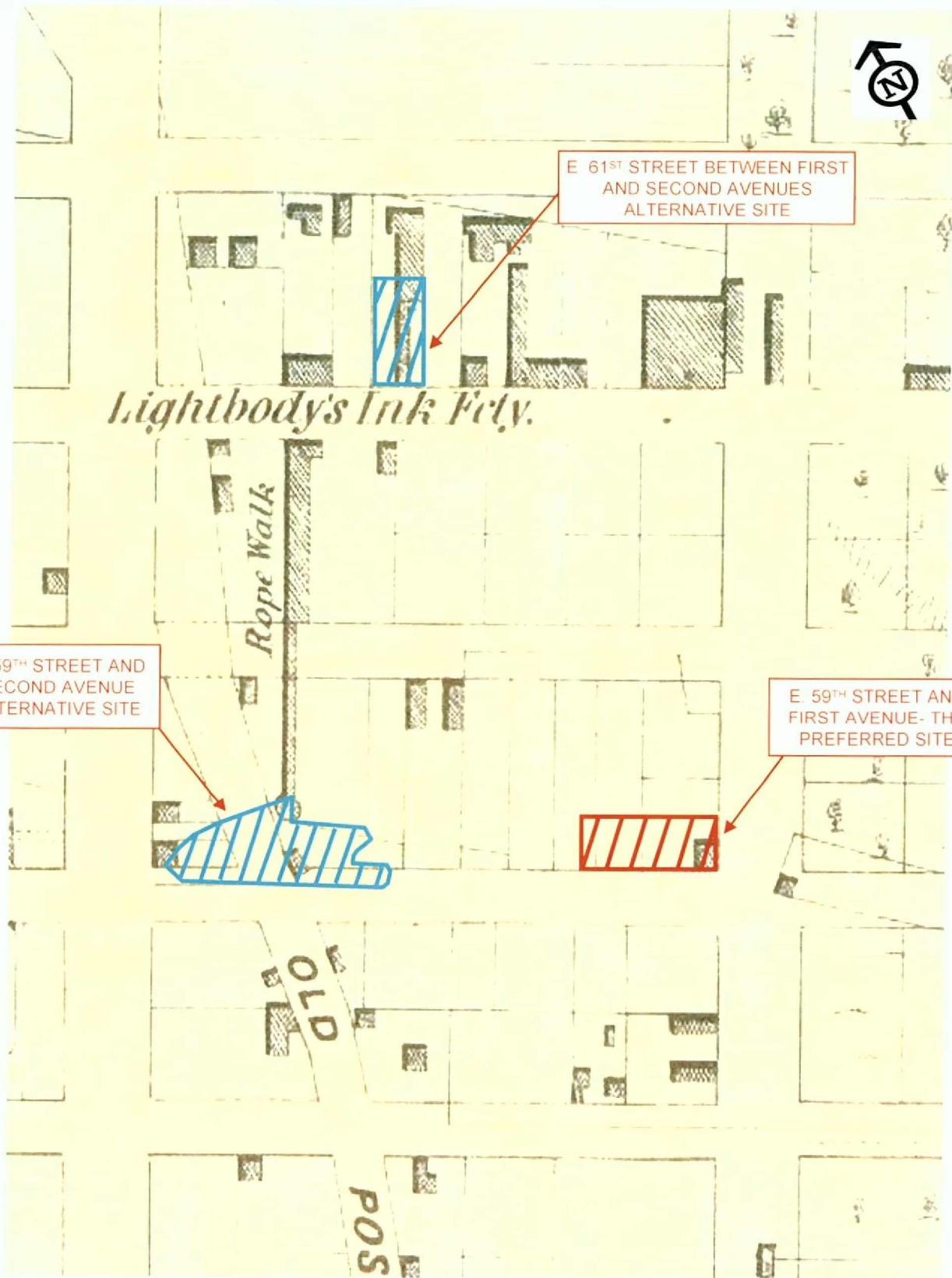
A structure was built sometime between 1836 and 1851 at the northwestern corner of E. 59th Street and First Avenue, within what is now the APE for the preferred Shaft 33B Site. The structure appears to be a residence and is not depicted on the 1836 Colton map, however, it is shown on the 1851 Dripps map (Figures 10 and 20). Municipal water lines are not indicated within local streets on the 1851 Dripps map (Figure 20), demonstrating that such services were not available as of that year. This suggests that cisterns, wells, and privies associated with the dwelling most likely were located within its former backyard. Figure 12 shows the location of installed municipal water lines as they were developed by 1865. The eastern portion of the preferred Shaft 33B Site would have included a portion of the former backyard of the structure. According to the Sanborn map of 1892 (Figure 21), tenements and what



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
1866 UNITED STATES COAST SURVEY MAP
SCALE OF ORIGINAL: 1:80,000

JUNE 2005

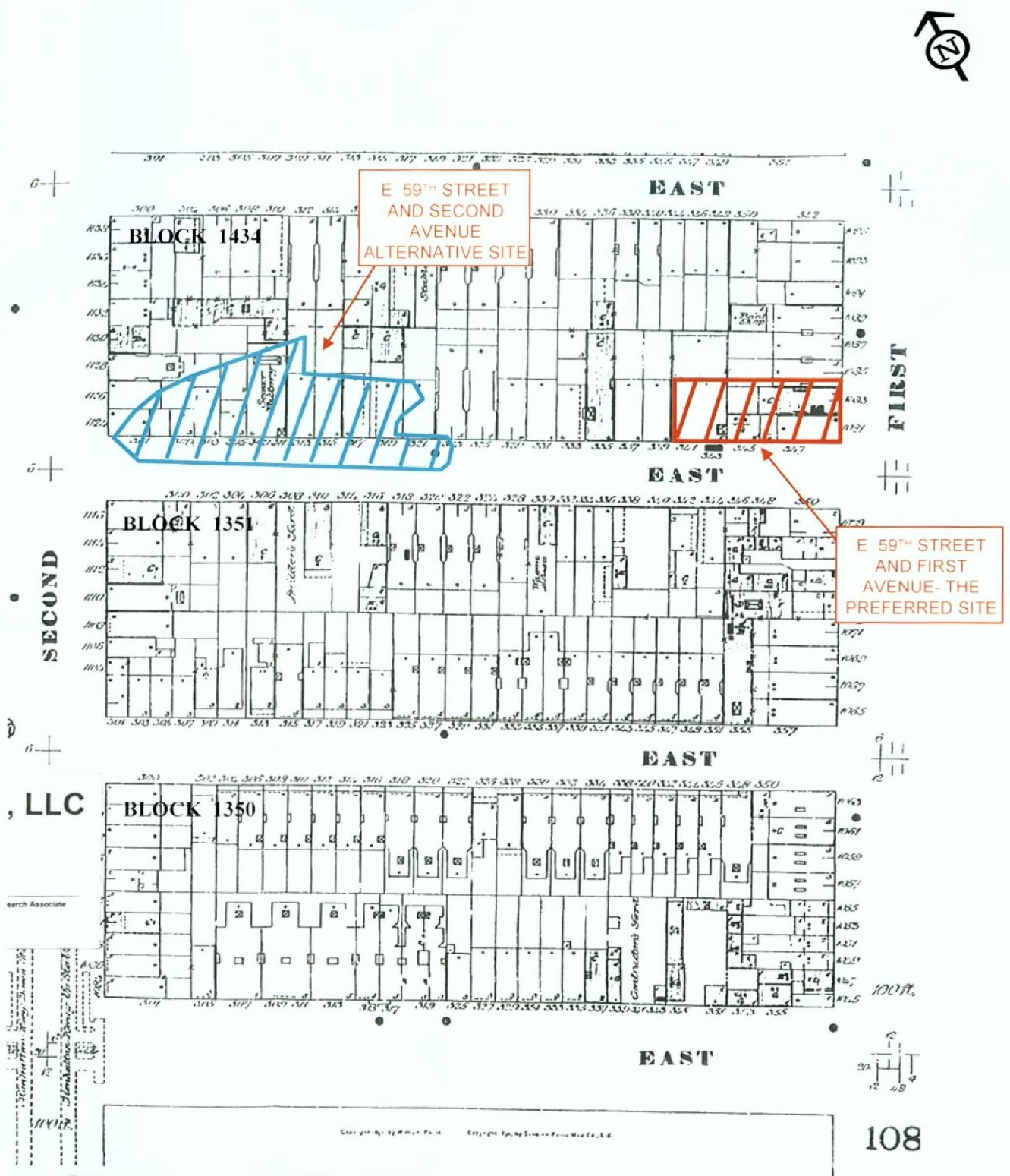
FIGURE 19



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CITY WATER TUNNEL NO. 3, STAGE 2
 SHAFT 33B
 PORTION OF THE 1851 DRIPPS MAP THAT INCLUDES
 THE PREFERRED SHAFT 33B SITE, THE E. 59TH STREET
 AND SECOND AVENUE SHAFT SITE, AND THE E. 61ST STREET SHAFT SITE
 SCALE OF ORIGINAL: 1 INCH = 3,520 FEET

JUNE 2005

FIGURE 20



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CITY WATER TUNNEL NO. 3, STAGE 2
 SHAFT 33B
 1892 SANBORN INSURANCE MAP-
 PREFERRED SHAFT 33B SITE AND THE E. 59TH STREET
 AND SECOND AVENUE SHAFT SITE
 SCALE OF ORIGINAL: 1/2 INCHES = 100 FEET

JUNE 2005

FIGURE 21

likely was a commercial building had been constructed within the preferred Shaft 33B Site. These structures were demolished by 1901 when construction of the Queensboro Bridge commenced. In 1902 as part of the bridge construction project, E. 59th Street was widened (Stokes 1928:603). The presence of the newly constructed Queensboro Bridge relative to the preferred Shaft 33B Site is identified on the 1911 Bromley and Bromley map (Figure 22).

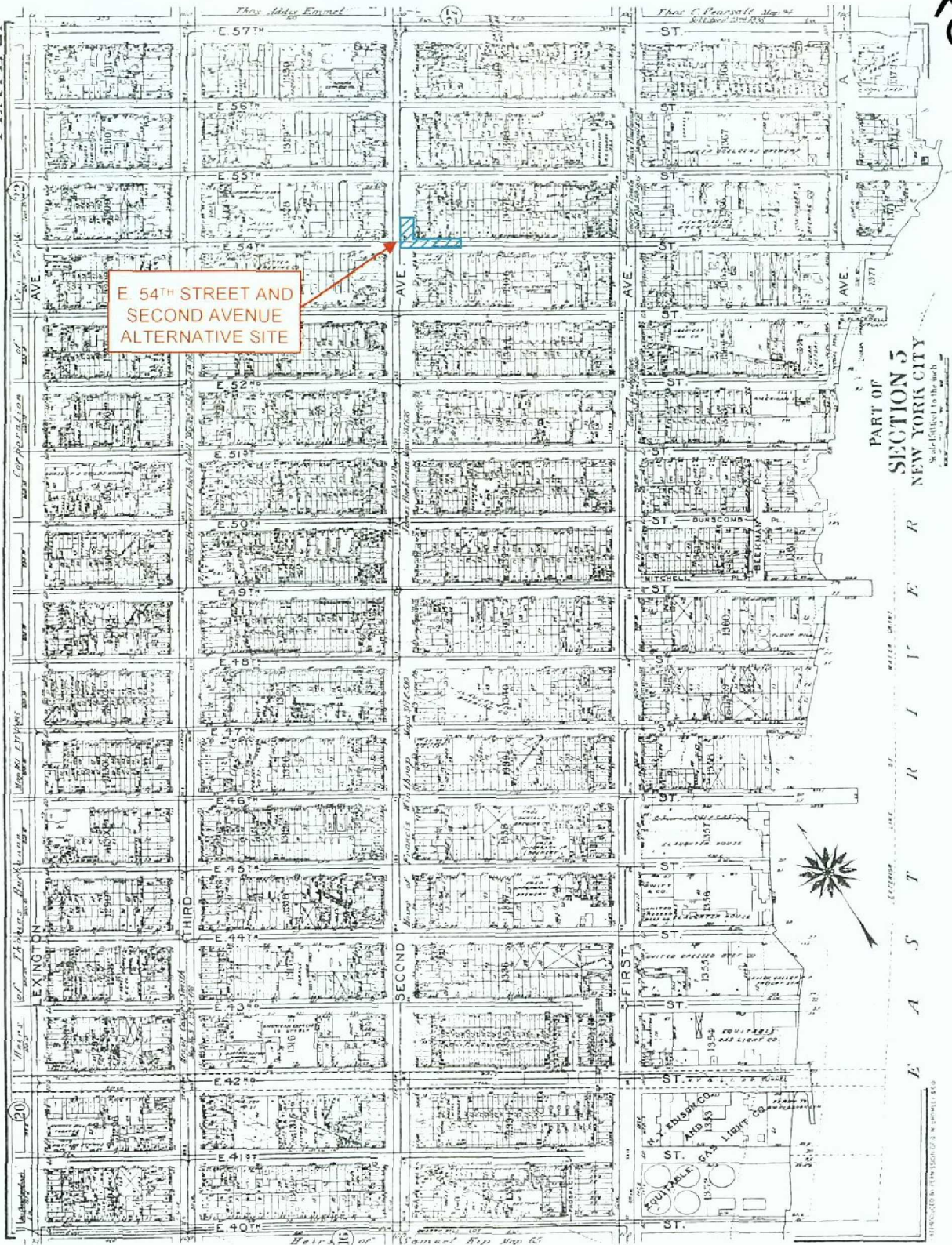
E. 54th Street / Second Avenue Shaft Site

No Historic period structures were situated within the existing road bed and sidewalks that constitute the APE for the E. 54th Street / Second Avenue Shaft Site during the nineteenth and twentieth centuries. As mentioned previously, however, Stokes (1928) indicates that a structure was located west of Eastern Post Road along what is now E. 54th Street east of Second Avenue during the eighteenth to mid-nineteenth centuries. The former location of the building apparently was east of the APE for the E. 54th Street / Second Avenue Shaft Site but its backyard may have extended into it. As discussed above, the building may be indicated on the 1782 British Headquarters Map (Figure 8) as well as on the 1821 Randel, 1836 Colton map, and 1851 Dripps map (Figures 9, 11, and 14) where it is identified as Cato's house (See Section 4.5.1). The 1851 map indicates that the house was partially situated within E. 54th Street east of Second Avenue. The house likely was demolished in 1855 when E. 54th Street was improved (Stokes 1928:603).

Two structures, one or both of which likely were residences, fronted onto the north side of E. 54th Street immediately east of Second Avenue as of 1851 according to the Matthew Dripps map (Figure 14) of that year. The former locations of the buildings are not situated within the E. 54th Street and Second Avenue Site's APE. The buildings had not been constructed as of 1836, according to the J.H. Colton map published that year. Municipal water was not installed below local streets as of 1851 suggesting that cisterns, wells, and privies were associated with the dwellings. Those sanitary and water retention features most likely were located in the two dwellings' former backyard areas. The former backyards of the dwellings, the most likely location for associated archaeological features and deposits, like the buildings themselves, are situated north and east of the E. 54th Street / Second Avenue Shaft Site's APE. The former backyards are now covered by existing structures (buildings located at 1024 and 1030 Second Avenue).

By 1866 according to the United States Coast Survey Map (Figure 19) of that year, development had occurred within the entire block along the north side of E. 54th Street between First and Second Avenues. According to New York City Department of Building (DOB) records, these buildings had been constructed by 1865 (Rosen 2005). Municipal water had been installed along E. 54th Street by 1865 according to the Viele map of the year (Figure 12), so it is likely that the buildings were constructed with connections to that system precluding the need to employ sanitary and water retention features. These buildings and some of the utilities extending along Second Avenue and E. 54th Street through the current APE of the site, are shown on the 1911 Bromley and Bromley map and the 1892 Sanborn map (Figures 23 and 24).

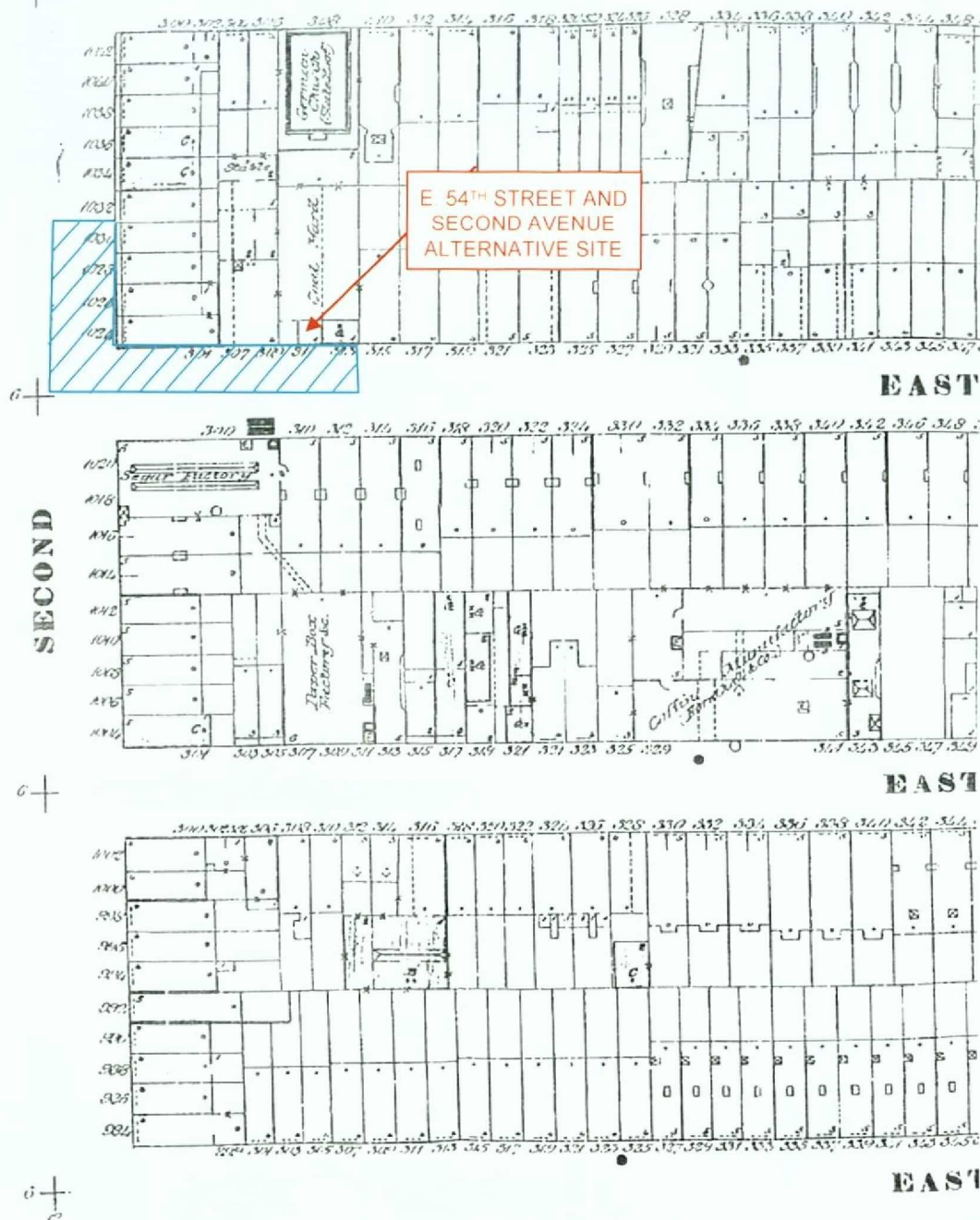
PLATE 21



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CITY WATER TUNNEL NO. 3, STAGE 2
 SHAFT 33B
 PORTION OF THE 1911 BROMLEY AND BROMLEY MAP THAT INCLUDES THE
 E. 54TH STREET AND SECOND AVENUE SHAFT SITE
 SCALE OF ORIGINAL: 150 FEET = ONE INCH

JUNE 2005

FIGURE 23



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 CITY WATER TUNNEL NO. 3, STAGE 2
 SHAFT 33B
 1892 SANBORN INSURANCE MAP-
 E. 54TH STREET AND SECOND AVENUE SHAFT SITE AND SECOND AVENUE SHAFT SITE
 SCALE OF ORIGINAL: 1/2 INCHES = 100 FEET

JUNE 2005

FIGURE 24

The El was constructed along Second Avenue in 1880 (See Section 4.3). Structural remains associated with the base of supporting pillars for the elevated train may be located within the Second Avenue portion of the E. 54th Street / Second Avenue Site.

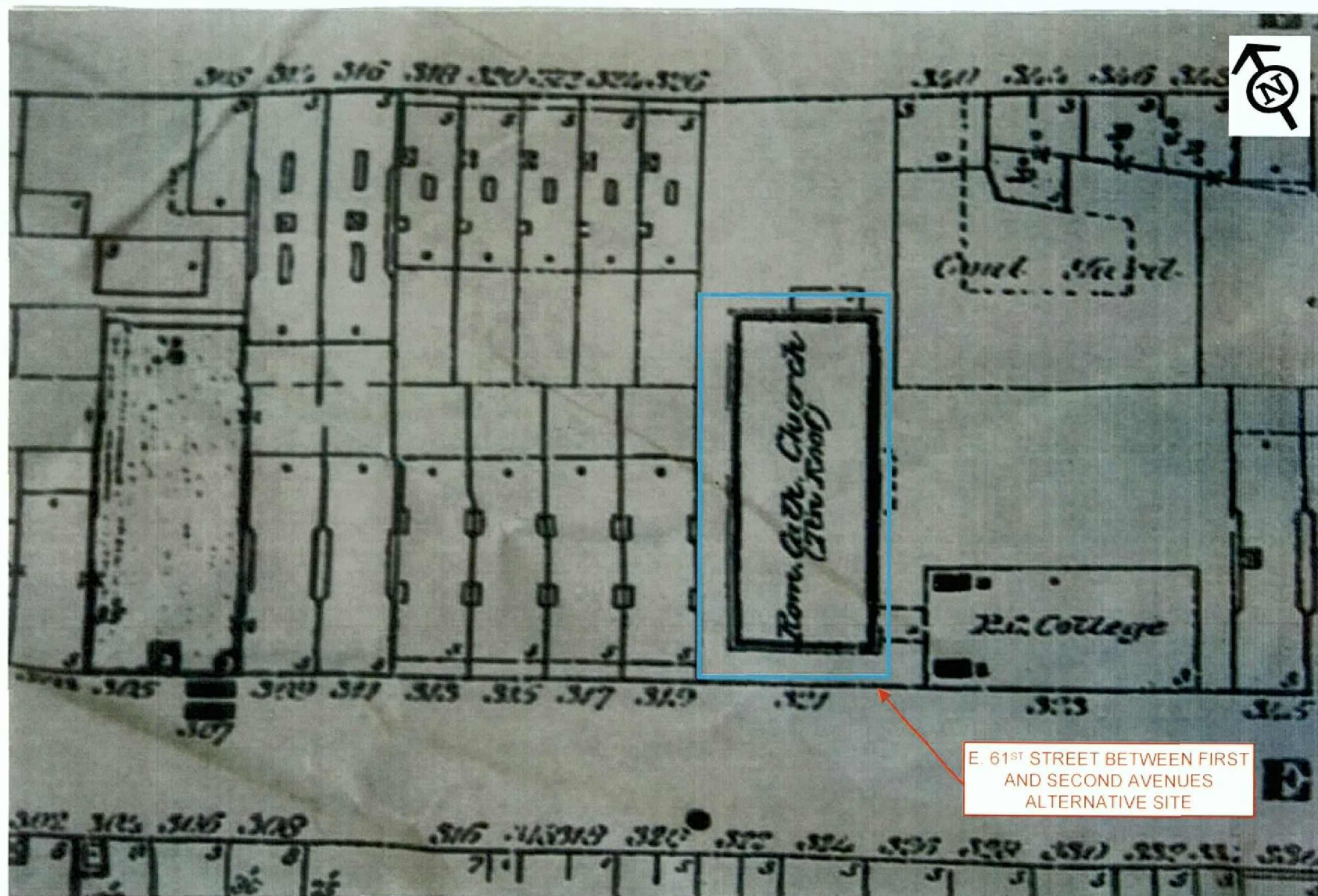
E. 61st Street Shaft Site

According to Stokes (1928:603), E. 61st Street was improved, paved, and regulated (standardized in size to other New York City Streets) in 1833. By 1836 according to the J.H. Colton map of that year (Figure 10), an elongated north to south oriented structure had been constructed along the street within what is now the shaft alternative site at E. 61st Street. The building apparently was constructed sometime after 1821 since it is not depicted on the Randel map of that year (Figure 9). The building still existed 15 years after it was depicted on the 1836 map (Figure 10) as shown by the 1851 Dripps map (Figure 20), which shows the structure and its surroundings in more detail than the Colton map. The Dripps map depicts the building as an elongated commercial type structure, likely a production facility associated with Lightbody's Ink Factory. Other factory buildings are shown on the map as located on surrounding parcels not included within the E. 61st Street Shaft Site's APE. The 1851 map indicates that municipal water pipes had not been installed beneath the local roadways as of that year suggesting that shaft type sanitary and water retention features (wells, privies or cisterns), possibly truncated, may have been associated with the ink factory buildings. Municipal water apparently had been installed below the local streets by 1865 according to the Egbert Viele map of that year (Figure 12), suggesting that the use of cisterns, wells, and possibly privies may have ceased around that time. The dark lines shown in the streets of Figure 12 represent the location of underground municipal water lines within streets in the midtown area by 1865.

By 1892 according to the Sanborn Insurance map of that year (Figure 25), a Roman Catholic Church had been constructed on a portion of the current E. 61st Street Shaft Site. By 1911 according to the Bromley and Bromley map of that year (Figure 22), the church referred to as "Our Lady of Perpetual Help" had been expanded in size and likely was constructed with a basement. It is located on the north side of E. 61st Street, midway between First and Second Avenues. The documentary research undertaken for this study did not indicate that a cemetery was associated with the church. According to a "Certificate of Occupancy" issued by the New York City DOB, the expansion of the church may have occurred in 1905 or 1906 (Rosen 2005). The building reportedly was demolished sometime in 2000 (Rosen 2005).

E. 59th Street / Second Avenue Shaft Site - Base of the Queensboro Bridge

Two apparent dwellings fronted onto Second Avenue north of 59th Street as of 1851, according to the Matthew Dripps map (Figure 20) of that year. The western portion of the E. 59th Street / Second Avenue Shaft Site would have included the former backyards of those structures. The 1851 Dripps map also indicates that another dwelling fronted onto E. 59th Street east of Eastern Post Road. The former location of this structure is now included in the preferred Shaft 33B Site but its former backyard extended into the E. 59th Street / Second Avenue Shaft Site. The former route of Eastern Post Road passed just to the west of the house, extending though this site. Municipal water was not installed below local streets as of



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
1892 SANBORN INSURANCE MAP-
E. 61ST STREET SHAFT SITE
SCALE OF ORIGINAL: 1.2 INCHES = 100 FEET

JUNE 2005

FIGURE 25

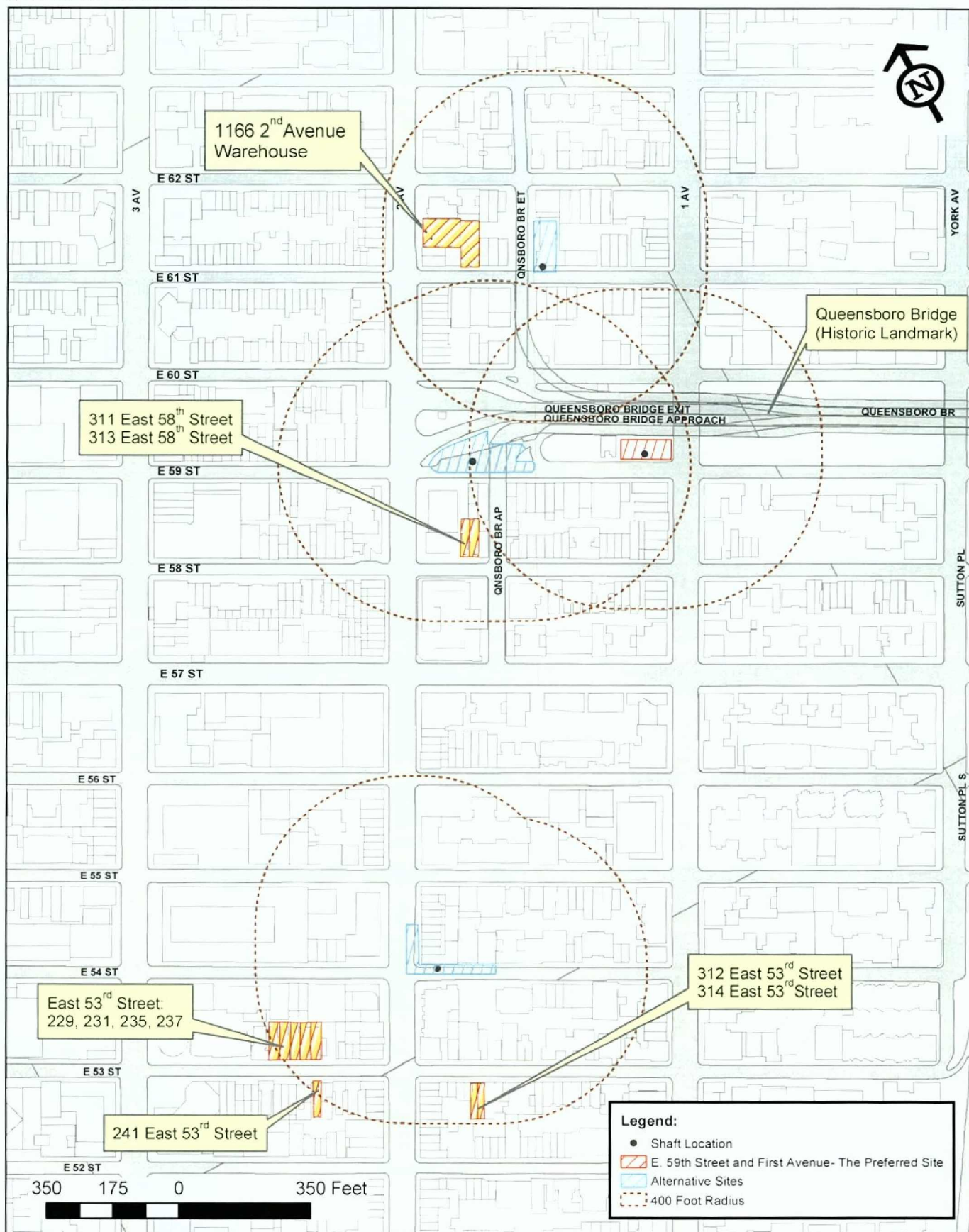
1851 suggesting that cisterns, wells, and privies were associated with the dwellings most likely located in their former backyard areas. By 1892 according to the Sanborn map of that year (Figure 21), tenements and commercial establishments had been built within the current E. 59th Street and Second Avenue Site that were demolished by 1901 when construction of the Queensboro Bridge commenced. The presence of the newly erected Queensboro Bridge relative to the E. 59th Street / Second Avenue Shaft Site is seen on the 1911 Bromley and Bromley map (Figure 22).

5.0 HISTORIC PERIOD ARCHITECTURAL RESOURCES

The research undertaken for this Phase IA Assessment identified 11 previously recognized Historic period architectural resources that are located within 400 feet of the preferred Shaft 33B Site and the three alternative sites (i.e., the Study Areas). These properties have been either: 1) listed on the New York State and National Registers of Historic Places; 2) recognized as being eligible for inclusion on these two registers; and/or 3) designated as New York City Landmarks by the NYCLPC. Table 1 lists all of the designated resources in the study areas and their current status. Each of the designated resources is briefly described below and their locations relative to the preferred Shaft 33B Site and the three alternative sites are shown on Figure 26.

TABLE 1
HISTORIC PERIOD ARCHITECTURAL RESOURCES
LOCATED WITHIN A 400-FOOT RADIUS OF THE PREFERRED SHAFT 33B SITE
AND THE ALTERNATIVE SITES

Site Study Areas	Historic Property ³	S/NR Listed	S/NR Eligible	NYCNYCLPC Designated
Preferred Shaft 33B Site	Queensboro Bridge	Yes	-	Yes
Preferred Shaft 33B Site	311 and 313 East 58 th St.– dwellings ¹	Yes	-	Yes
E. 61 st Street Shaft Site	1166 Second Avenue – warehouse	No	Yes	No
E. 61 st Street Shaft Site	Queensboro Bridge ¹	Yes	-	Yes
E. 59 th Street / Second Avenue Shaft Site	311 and 313 East 58 th Street – dwellings	Yes	-	Yes
E. 59 th Street/ Second Avenue Shaft Site	Queensboro Bridge	Yes	-	Yes
E. 54 th Street / Second Avenue Shaft Site	229-235 East 53 rd Street – dwellings	No	Yes	No
E. 54 th Street / Second Avenue Shaft Site	237-241 East 53 rd Street– dwellings	No	Yes	No
E. 54 th Street / Second Avenue Shaft Site	312 and 314 East 53 rd St.	No	Yes	Yes
Notes: 1. On the west side of the Queensboro Bridge approach, north of E. 58 th Street. 2. Refers to an exit ramp off the upper level of the Bridge.				



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
LOCATIONS OF IDENTIFIED HISTORIC PERIOD ARCHITECTURAL RESOURCES
WITHIN THE 400-FOOT STUDY AREAS FOR THE PREFERRED SHAFT 33B SITE
AND THREE ALTERNATIVE SITES
BASE MAP SOURCE: MALCOLM PIRNIE, INC. 2005b

JUNE 2005

FIGURE 26

5.1 Historic Structures Located Within the Study Areas for the Preferred Shaft 33B Site and the Alternative Sites

E. 59th Street and First Avenue – The Preferred Shaft 33B Site

The Queensboro Bridge and the dwellings located at 311 and 313 E. 58th Street are located within the 400-foot Study Area for the preferred Shaft 33B Site, at E. 59th Street and First Avenue (see Table 1). The dwellings located at 311 and 313 E. 58th Street are on the northwest corner of the intersection of E. 58th Street and the Queensboro Bridge approach, just east of Second Avenue (see Figure 26).

E. 54th Street / Second Avenue Shaft Site

The dwellings located at 229-235 E. 53rd Street, 237 - 241 E. 53rd Street, and 312 and 314 E. 53rd Street are located within the 400-foot Study Area for the E. 54th Street and Second Avenue Site (see Table 1). The dwellings at 229-235 E. 53rd Street, and 237-241 E. 53rd Street are located on the north side of E. 53rd Street between Second and Third Avenues. The dwellings at 312-314 E. 53rd Street are on the south side of E. 53rd Street between First and Second Avenues (see Figure 26).

E. 61st Street Shaft Site

The Day and Meyer, Murray and Young Warehouse located at 1166 Second Avenue and the Queensboro Bridge are located within the 400-foot study area for the E. 61st Street Shaft Site (see Table 1). The Day and Meyer, Murray and Young Warehouse building is located on the east side of Second Avenue between E. 61st and E. 62nd Streets. The building also has frontage on the north side of E. 61st Street, just east of Second Avenue (see Figure 26).

E. 59th Street / Second Avenue Shaft Site

The dwellings located at 311 and 313 E. 58th Street and the Queensboro Bridge are located within the 400-foot Study Area for the E. 59th Street and Second Avenue Site (see Table 1). These dwellings are located on the northwest corner of the intersection of E. 58th Street and the Queensboro Bridge approach, just east of Second Avenue (see Figure 26).

5.2 New York State/National Registers of Historic Places and New York City Landmark Structures

Three of the identified structures are listed on the New York State and National Registers of Historic Places and have also been designated as New York City Landmarks. These structures are the Queensboro Bridge and the residences located at 311 and 313 E. 58th Street.

Queensboro Bridge

The Queensboro Bridge, excluding the service building and elevator on Roosevelt Island, was designated a New York City Landmark on April 16, 1974 and was listed on the National Register of Historic Places on December 20, 1978. The Bridge spans the East River between E. 59th and E. 60th Streets and Second Avenue in Manhattan and 11th Street and Bridge Plaza North and Bridge Plaza South in the Borough of Queens. The Bridge is a 4,168 foot long double-span, through cantilever truss bridge of steel frame on masonry piers with Beau-Arts stone approaches that was constructed between 1901 and 1908. The Bridge was opened to vehicle and pedestrian traffic in the spring of 1909. A new approach to the Bridge on the Manhattan side was constructed along 59th Street east of Second Avenue in 1930. The Bridge was designed by the engineer Gustav Lindenthal and the architect Henry Hornbostel. The 47,000 square-foot vaulted space beneath the Manhattan approaches to the bridge, which originally was used as public markets, was designed by Raphael Guastavino the famed engineer and contractor. When the Bridge first opened, four railroad tracks for the Second Avenue elevated train extended across the upper level while four trolley tracks and a roadway ran on the lower level (New York City Landmarks Preservation Commission 1973; Shaver 1993). The Bridge has been determined to be "significant as an urban artifact, as an important engineering achievement and as a civic symbol" of the unification of the City of New York (Gill 1978). The NYCLPC designation states that the bridge possesses "a special character, special historic and aesthetic interest and value as part of the development, heritage and cultural characteristics of New York City" and it further states that the Bridge is a "notable engineering achievement, that it was an essential factor in the development of the Borough of Queens, that it is a Landmark known to countless New Yorkers and that it is a magnificent element in the skyline of the City" (NYCLPC 1973).

311 and 313 E. 58th Street

Two modest vernacular brick residences containing Italianate details were designated New York City Landmarks on May 25, 1967 (number 311) and July 14, 1970 (number 313). Both structures were listed on the National Register of Historic Places on December 20, 1978. The structures, built by Hiram G. Disbrow in 1856-1857, are excellent examples of the modest semi-suburban houses that formerly lined uptown side streets during the mid-nineteenth century (Covell 1982; Shaver 1993). Number 311 is three bays wide and exhibits double-hung windows with muntined sash and plain lintels. The main entrance to this residence is characterized by double glass paneled doors with an over door transom and a lintel and cornice top the doorway above a wooden stoop. A second entrance to the residence exists at basement level and a molded cornice supported by four scroll brackets crowns the building (Covell 1982). Number 313 is similar in appearance to its neighbor (311) but is slightly more elaborate featuring a full-length wooden porch with dentilled cornice. French doors, which open onto the porch, appear at the first floor level of the residence. Square, simply paneled pilasters frame the entrance where the original door has been replaced by a new door in Italianate style with cut glass arched panels. A stained glass transom tops the entrance to the residence. Double hung windows with muntined sash and plain lintels are present on the second floor and small double brackets support the house's projecting cornice (Covell 1982). The NYCLPC designation reports for the two buildings state that they possess a "special

character, special historical and aesthetic interest and value as part of the development, heritage and cultural characteristics of New York City" (NYCLPC 1969, 1970). The reports further state that the dwellings are carefully preserved, dignified examples and charming reminders of the residential architecture of a bygone day, having withstood the changes occurring in the surrounding neighborhood (NYCLPC 1969, 1970).

These buildings are located within the APE of the E. 59th Street / Second Avenue Site. They are located on the northwest corner of the intersection of E. 58th Street and the Queensboro Bridge Approach.

5.3 Structures Eligible for Listing on the New York State/National Registers of Historic Places and Designated a New York City Landmark

The research undertaken for this assessment identified two structures, located at 312 and 314 E. 53rd Street, within the 400-foot Study Area for the E. 54th Street / Second Avenue Site that have been designated as New York City Landmarks and determined to be eligible for listing on the New York State and National Registers of Historic Places. Number 312 was designated a New York City Landmark on June 12, 1968, while number 314 was designated a New York City Landmark on June 20, 2000 (NYCLPC 1968, 2000). Robert and James Cunningham, local builders and carpenters, constructed both dwellings in vernacular style with Second Empire and Italianate details in 1866. The buildings are two bays wide, two stories high above a brick basement, and are covered in clapboard. The structures are characterized by mansard roofs, dormers, bracketed wooden cornices and door hood, and molded window enframements on double hung sash windows (NYCLPC 2000). The buildings are among the last of the pre-1866 wooden buildings constructed north of E. 23rd Street. In that year, New York City fire codes prohibited the construction of such buildings in this neighborhood and many existing wooden buildings were soon demolished and replaced by masonry structures (NYCLPC 2000). According to the NYCLPC Landmark designation report for the two structures, the buildings retain "a special character and a special historical and aesthetic interest and value as part of the development, heritage, and cultural characteristics of New York City" (NYCLPC 2000).

5.4 Structures Eligible for Listing on the New York State/National Registers of Historic Places

The research undertaken for this assessment identified six (6) structures located within the 400-foot Study Area for the preferred Shaft 33B Site and three alternative sites that have been determined to be eligible for listing on the New York State and National Registers of Historic Places. These structures are: 1) the Day and Meyer, Murray and Young warehouse located at 1166 Second Avenue; 2) three dwellings located at 229-235 E. 53rd Street; and 3) two dwellings located at 237 and 241 E. 53rd Street.

Day and Meyer, Murray and Young Warehouse - 1166 Second Avenue

The Day and Meyer, Murray and Young Warehouse located at 1166 Second Avenue between E. 61st Street and E. 62nd St. was constructed in 1927 in Art Deco/Neo-Gothic style and is

considered to be an architecturally distinguished example of storage warehouse design. This structure was a state of the art facility at the time of its construction employing an advanced storage technology known as a "protovault" service, which consisted of steel storage vaults that were moveable within the warehouse on a system of tracks (Historical Perspectives Inc. 2003). It is located within the Study Area of the E. 61st Street Shaft Site.

229-235 E. 53rd Street

Located on the north side of E. 53rd Street between Third and Second Avenues, these three identical five-story brick apartment buildings are intact examples of early 20th century residential buildings. These apartment buildings, which were constructed in 1900, were designed by the noted architect Charles Rentz in 1899 in a Renaissance Revival style. Rentz designed numerous buildings throughout Manhattan, some of which are included in the Greenwich Village Historic District and the Lower East Side Historic District.

Describing the 229-235 E. 53rd Street buildings in 2002 Cooney and Riddle (2002a) state that:

The ground floor of each has an entrance porch flanked by double-height storefront windows; set on low stoops, the porches have brownstone half columns supporting arched entablatures ornamented with floral keystones and scalloped pendentives, and the windows have thick brownstone enframements with floral keystones. On the upper floors, variations in the window surrounds provide a vertical rhythm to the facades and created a unified composition of the three structures. The second floor windows have thick, banded brownstone enframements capped with cornices. The brownstone lintels of the windows on the third and fourth floors are composed of voussoirs and keystones, but they are slightly different on each floor. The windows of the fifth floor are arched with brownstone keystones. A projecting cornice with brackets and an entablature of alternating relief panels and swags cap each building. Brownstone bands, decorative brick courses, and cornices tie the three buildings together. Ornamental iron fire escapes are attached to each façade. There are ground-floor and basement stores in each building. In front of 233 East 53rd Street, there are decorated, iron streetlights that appear to date to the early 20th century.

237-241 E. 53rd Street

George F. Pelham designed these two (2) identical six-story brick apartment buildings that are located on the north side of E. 53rd Street between Third and Second Avenues. These apartment buildings have stone trim and were constructed in 1900 in a Renaissance Revival style. Pelham and his architectural firm were noted designers of apartment buildings during the late nineteenth and early twentieth century period. The buildings are intact examples of early twentieth century residential buildings. According to Cooney and Riddle (2002b) the structures are:

...tied together with cornices, stone string courses, and courses of decorative brickwork. Different window treatments create a

vertical rhythm to the facades. Moving upward from the ground-floor storefront windows with stone architraves, the windows are surmounted with segmental pediments, triangular pediments, stone arches with keystones adorned with human heads, and stone entablatures, which are duplicated on the sixth floor. On the upper two floors, the wall surface consists of single and grouped pilasters with Corinthian capitals. On the fifth floor, brackets with bearded faces support the pilasters. Another ornamental feature are relief panels below the sixth-floor windows. Each building is capped with a cornice supported with heavy brackets. Pilasters supporting projecting stone entablatures form the entrance porch to each building. There are basement stores, and in front of each building at the basement entrances are iron streetlights that appear to date to the early 20th-century.

6.0 ASSESSMENT OF HISTORIC RESOURCES SENSITIVITY AND RECOMMENDATIONS

This section assesses the potential archaeological sensitivity of the preferred Shaft 33B Site and the three alternative sites. Two locations (E. 61st Street and E. 54th Street / Second Avenue Shaft Sites) have been identified as potentially sensitive for archaeological resources. For these locations, recommendations are provided for additional archaeological investigations that would need to be implemented to properly address the potential presence of archaeological resources if project related construction activities would occur at these sites. The chapter also presents an assessment of potential project related impacts to identified Historic period architectural resources that are located within one or more of the 400-foot Study Areas established for the preferred Shaft 33B Site and the three alternative sites.

6.1 Assessment of Archaeological Sensitivity

E. 59th Street and First Avenue – The Preferred Shaft 33B Site

Native American Resources

Although the preferred Shaft 33B Site at E. 59th Street and First Avenue is located within the general area identified as containing traces of Native American occupation in the archaeological site files of the NYSM (Site Number 4061), a freshwater source apparently was not located in its immediate proximity. In addition, according to the 1865 Viele map (Figure 12) the area formerly was part of the margin, likely sloping, of a hill. Accordingly, the area did not formerly possess environmental characteristics that would indicate that it could have been attractive for Native American use. In addition, any Native American sites that were present would have been destroyed by construction of the Queensboro Bridge between 1901 and 1908 and the new bridge approach in 1930, as well as earlier nineteenth century development (see below). The extent of the ground disturbance around the western approach, which includes the preferred Shaft 33B Site, was caused by construction of the bridge. The level and depth of disturbance as a result of the Bridge construction and foundations are shown on Figures 16 through 18. Extensive excavations associated with construction of the footings and foundation for the western approach extended to depths below which Native American archaeological sites would be present. Accordingly, the preferred Shaft 33B Site is not considered to be sensitive for Native American archaeological resources.

Historic Period Resources

What apparently was a residence located at the northwestern corner of E. 59th Street and First Avenue within what is now the APE for the preferred Shaft 33B Site, was built sometime between 1836 and 1851 according to the J.H. Colton and Matthew Dripps maps (Figures 10 and 20) of those respective years. Municipal water was not installed below local streets as of 1851 suggesting that cisterns, wells, and privies were associated with the dwelling most likely located within its former backyard. The western portion of the preferred E. 59th Street and First Avenue Site would have included a portion of the former backyard of the structure. By

1892, according to the Sanborn map of that year (Figure 21) tenements and what likely was a commercial building had been constructed within the preferred Shaft 33B Site.

Archaeological deposits and structural remains associated with the occupation of the structure that was located at First Avenue and E. 59th Street as indicated on the 1851 Dripps map, likely were formerly located within the preferred Shaft 33B Site. Construction of the late nineteenth century buildings and the subsequent construction of the Queensboro Bridge between 1901 and 1908 (Figures 16 through 18); however, extensively impacted the APE for this site by destroying or extensively disturbing any archaeological resources that formerly may have been present. Accordingly, the preferred Shaft 33B Site located at E. 59th Street and First Avenue is not considered to be sensitive for Historic period archaeological resources.

No other historic period activities or events occurred within the preferred Shaft 33B Site that may have resulted in the deposition of potentially significance archaeological deposits or structural remains at this location.

Conclusions

According to the research conducted for this study, the preferred Shaft 33B Site at E. 59th Street and First Avenue is not considered to be sensitive for Native American or Historic period archaeological resources. Therefore, further archaeological investigation of the site is not warranted as part of the proposed construction project (see Section 6.3).

E. 54th Street / Second Avenue Site

Native American Resources

Although the E. 54th Street / Second Avenue Shaft Site is located within the general area identified as containing traces of Native American occupation in the archaeological site files of the NYSMm (Site Number 4061), a freshwater source apparently was not located in its immediate proximity. In addition, according to the 1865 Viele map (Figure 12), the area formerly was part of the margin, likely sloping, of a hill. Accordingly, the area did not formerly possess environmental characteristics that would suggest that it could have been attractive for Native American use. In addition, any Native American sites that were present would have been destroyed by construction of the Second Avenue and E. 54th Street road beds, including the latter street's 1855 improvement (Stokes 1928: 603), and installation of utilities there. Accordingly, the E. 54th Street / Second Avenue Shaft Site is not considered to be sensitive for Native American archaeological resources.

Historic Period Resources

No Historic period structures were situated within the existing road bed and sidewalks that constitute the APE for the E. 54th Street / Second Avenue Shaft Site. Cato's house, a dwelling and tavern built in 1712 (Figure 15), was located at least partially within East 54th Street east of what is now the APE for the E. 54th Street / Second Avenue Shaft Site during the eighteenth to mid-nineteenth century period. While the structure was located east of the APE,

its former backyard may have extended into the E. 54th Street right-of-way portion of the APE. Since municipal water was not installed along E. 54th Street until the 1860's, it is likely that sanitary and water retention features (privies, wells, and/or cisterns) likely were associated with the house's occupation. The most likely location for such features is within former backyard areas, which includes at least the E. 54th Street portion of the APE.

Two later structures, one or both of which likely were residences, were fronting onto the north side of E. 54th Street immediately east of Second Avenue as of 1851, according to the Matthew Dripps map of that year (Figure 14). The buildings had not been constructed as of 1836 according to the J.H. Colton map published that year (Figure 11). Municipal water was not installed below local streets as of 1851 suggesting that cisterns, wells, and privies were associated with the dwellings that most likely were located in the two former backyard areas. The former backyards of the dwellings, the most likely location for associated archaeological features and deposits like the buildings themselves, are situated primarily north and east of the E. 54th Street / Second Avenue Shaft Site's APE. However, although the former backyards of the dwellings are now covered by existing structures (buildings located at 1024 - 1030 Second Avenue), small portions may have extended into the proposed E. 54th Street / Second Avenue Shaft Site. By 1866 according to the United States Coast Survey map of that year, development had occurred within the entire block along the north side of E. 54th Street between First and Second Avenues.

Structural remains associated with the base of supporting pillars for the c. 1880 elevated railroad may be present within the Second Avenue portion of the E. 54th Street / Second Avenue Shaft Site. No other Historic period activities or events occurred within the construction site, which may have resulted in the deposition of potentially significant historical archaeological deposits or structural remains, at this location.

Construction of the road bed, including improvements made in 1855 and the prior installation of utilities within the E. 54th Street / Second Avenue Shaft Site APE, have resulted in some disturbance to the E. 54th Street / Second Avenue Shaft Site. Accordingly, this site is considered to have limited sensitivity for the presence of Historic period archaeological deposits. Specifically, there is limited sensitivity for the presence of truncated features associated with Cato's house within the E. 54th Street portion of the APE for the E. 54th Street / Second Avenue Shaft Site. In addition, the possible presence of structural remains associated with the supporting pillars for the c. 1880 elevated train may be present within the APE along the Second Avenue portion of the E. 54th Street / Second Avenue Shaft Site and may have historic value.

Conclusions

According to the research conducted for this study, the proposed E. 54th Street / Second Avenue Shaft Site is sensitive for Historic period archaeological resources. The site is not considered to be sensitive for Native American sites. If the E. 54th Street / Second Avenue Shaft Site were selected as the site for Shaft 33B, it is recommended that further historical archaeological investigation be conducted prior to the initiation of construction activities at this location (see Section 6.3).

E. 61st Street Shaft Site

Native American Resources

The E. 61st Street Shaft Site is located on raised ground situated a few hundred feet southwest and west of a former freshwater stream that emptied into the East River between 61st and 62nd Streets. The site is located within the general area identified as containing traces of Native American occupation in the archaeological site files of the NYSM (Site Number 4061). The former stream and location of high ground immediately adjacent to the site have been identified as an area archaeologically sensitive for the presence of Native American sites (Figure 13). Nineteenth century construction of Lightbody's Ink Factory (see below) and the subsequent building of a Roman Catholic Church, referred to as "Our Lady of Perpetual Help", on the site likely destroyed or disturbed any pre-development ground surfaces which may have formerly existed on the property. No evidence was found by the research conducted for this assessment that filling of the property prior to construction of the ink factory occurred which could have preserved such contexts. Any pre-development ground surfaces present would have been the stratigraphic contexts where evidence of Native American activity would have been situated. Accordingly, the E. 61st Street Shaft Site is not considered to be sensitive for the presence of Native American archaeological resources.

Historic Period Resources

By 1836 according to the J.H. Colton map of that year (Figure 10), an elongated north to south oriented structure had been constructed within what would later become the E. 61st Shaft Site. The building was still in existence 15 years later as shown by the 1851 map of New York by Matthew Dripps (Figure 20) that shows the structure and its surroundings in more detail than is shown on the Colton map; the Dripps map depicts the building as an elongated, commercial type structure likely a production facility associated with Lightbody's Ink Factory. The street just south of this structure is E. 61st Street. The figure identifies the location of the E. 61st Street between First and Second Avenues Alternative Site. Other factory buildings that are shown on the map as located on surrounding parcels are not included within the current site. The 1851 map does not indicate that municipal water had been installed beneath the local roadways as of that year suggesting that shaft type sanitary and water retention features (wells, privies or cisterns), possibly truncated, may have been associated with the ink factory buildings. Municipal water apparently had been installed below the local streets by 1865, according to the Egbert Viele map of that year (Figure 12), suggesting that the use of cisterns and wells, and possibly privies may have ceased by that time.

By 1892 according to the Sanborn Insurance map of that year, a Roman Catholic Church had been constructed on a portion of the E. 61st Street Shaft Site. The church had been expanded in size by 1911 (Figure 22) and likely was constructed with a basement that was at least eight feet deep (Rosen 2005). The church was demolished sometime in 2000 and the site now consists of a graded vacant lot with apparent fill layers visible at modern grade (Figure 6). It

is considered possible that structural remains associated with the ink factory, particularly shaft type features that may have been truncated by later construction, may be present beneath now buried remains of the church. Accordingly, the site is considered to be sensitive for Historic period archaeological resources associated with the mid-nineteenth century Lightbody's Ink Factory.

No other historic period activities or events occurred within the E. 61st Street Shaft Site, which may have resulted in the deposition of potentially significant historical archaeological deposits or structural remains at this location.

Conclusions

According to the research conducted for this study, the E. 61st Street Shaft Site is sensitive for Historic period archaeological resources. The site is not considered to be sensitive for Native American sites. If the E. 61st Street Shaft Site were selected as the site for Shaft 33B, it is recommended that further historic archaeological investigation be conducted prior to the initiation of construction activities at this location (see Section 6.3).

E. 59th Street / Second Avenue Site

Native American Resources

Although the site located at the base of the Queensboro Bridge at E. 59th Street and Second Avenue is located within the general area identified as containing traces of Native American occupation in the archaeological site files of the NYSM (Site Number 4061), a freshwater source apparently was not located in its immediate proximity. In addition, according to the 1865 Viele map (Figure 12) the area formerly was part of the margin, likely sloping, of a hill. Accordingly, the area did not formerly possess environmental characteristics that would suggest that it could have been attractive for Native American use. In addition, any Native American sites that were present would have likely been destroyed by construction of the Queensboro Bridge between 1901 and 1908 and the new bridge approach in 1930. The extensive excavations associated with construction of the footings and foundation for the bridge and approach extended to depths below which Native American archaeological sites would be present. Figures 16 through 18 indicate the extent of the disturbance with the depicted areas including the current APE for the E. 59th Street / Second Avenue Shaft Site. Accordingly, the E. 59th Street / Second Avenue Shaft Site is not considered to be sensitive for Native American archaeological resources.

Historic Period Resources

As of 1851, two apparent dwellings were fronting onto Second Avenue north of E. 59th Street, according to the Matthew Dripps map of that year. The western portion of the E. 59th Street / Second Avenue Shaft Site would have contained the former backyards of these structures. The 1851 Dripps map also indicates that another dwelling fronted onto E. 59th Street, just east of Eastern Post Road; the former location of this structure is now included in the eastern portion of the E. 59th Street / Second Avenue Shaft Site. The former route of Eastern Post

Road passed just to the west of the house extending though this site. Municipal water was not installed below local streets as of 1851 suggesting that cisterns, wells, and privies were associated with the dwellings that were most likely located in their former backyard areas. By 1892 according to the Sanborn map of that year, tenements had been built within the E. 59th Street / Second Avenue Shaft Site.

Archaeological deposits and structural remains associated with the occupations of the structures indicated on the 1851 Dripps map as well as stratigraphic indications for Eastern Post Road, likely were formerly located within the E. 59th Street / Second Avenue Shaft Site. However, construction of the late nineteenth century buildings and subsequent construction of the Queensboro Bridge, between 1901 and 1908 (Figures 16 through 18), and the new bridge approach in 1930, extensively impacted the site, destroying or extensively disturbing any archaeological resources that formerly may have been present. The extensive excavations associated with construction of the footings and foundation for the Bridge and approach extended to depths below which historical archaeological sites would be present. Figures 16 through 18 demonstrate the extent of the disturbance with the depicted areas including the current APE for the E. 59th Street / Second Avenue Shaft Site. Accordingly, the E. 59th Street / Second Avenue Shaft Site is not considered to be sensitive for Historic period archaeological resources.

No other historic period activities or events occurred within the E. 59th Street / Second Avenue Shaft Site that may have resulted in the deposition of potentially significant historical archaeological deposits or structural remains.

Conclusions

According to the research conducted for this study, the E. 59th Street / Second Avenue Shaft Site is not considered to be sensitive for Native American or Historic period archaeological resources. Therefore, if the E. 59th Street / Second Avenue Shaft Site were selected as the site for Shaft 33B, further archaeological investigation of this site would not be recommended. (see Section 6.3).

6.2 Assessment of Impacts to Historic Period Architectural Resources

As described in Chapter 5, eleven (11) Historic period architectural resources are located within one or more of the four (4) 400-foot Study Areas established for the preferred Shaft 33B Site and/or the three Alternative Shaft Sites (see Table 1 and Figure 26). These resources are identified in Table 1. Potential visual or aesthetic impacts to the identified architectural resources would not occur as a result of the proposed project at the potential Shaft 33B Shaft Sites. Construction activities would be enclosed within a 20-foot tall enclosure which would be visible from the street and the on-ramp to the Bridge. At the E. 54th Street / Second Avenue Shaft Site, the enclosure would be 10 feet tall. The wall would likely be present for the entire period of construction (four years and four months at the preferred Shaft 33B Site, between 52 and 65 months at the 59th Street / Second Avenue Shaft Site, between 61 and 70 months at the E. 54th Street / Second Avenue Shaft Site, and between 52 and 65 months at E. 61st Street Shaft Site). Once construction is completed, there would be no significant new above ground

or permanent structures associated with Shaft 33B. Following construction activities, the Shaft 33B Site would be returned to a condition equivalent to its original condition except for two relatively small flush-mounted hatchways providing entrance to the shaft and a small air vent located on the sidewalk at curbside. In addition, up to two standard (three-foot high by 6-inch diameter) hydrants could be provided in the sidewalk for blow-off (air relief) from the piping. These features would be of the same character, appearance and scale at any of the four potential sites.

Vibration related impacts are not expected to occur to the identified Historic period structures as a result of the proposed project. NYCDEP specifies a vibration limit of 0.5 ips for the protection of surrounding historic structures that are susceptible to cosmetic cracks in fragile plaster. This limit is 10 times more restrictive than the 2.0 ips (on a logarithmic scale) established by the United States Bureau of Mines frequently used as a vibration threshold. This limit could be lowered to protect fragile and/or historic structures based on a detailed vibration assessment to be conducted by the construction contractor prior to commencement of construction, monitoring during structural conditions in the vicinity of the preferred Shaft 33B Site, and as modified by NYCLPC.

A construction protection program for historic resources would also be developed, where warranted, which would include the following:

- Inspect and report on current foundation and structural conditions of any historic resources;
- Set up a vibration monitoring program to measure vertical and lateral movement and vibration to the historic structures within the zone of impact identified as part of the fragile buildings assessment process detailed above. Details as to the frequency and duration of the vibration monitoring program would be determined in consultation with NYCNYCLPC;
- Establish and monitor construction methods to limit vibrations to levels that would not cause structural damage to the historic structures, as determined by the condition survey; and,
- Issue "Stop Work" orders to the construction contractor, as required, to prevent damage to the structures, based on any vibration levels that exceed the design criteria in lateral or vertical direction. Work will not begin again until the steps proposed to stabilize and/or prevent further damage to the designated buildings were approved and put in place.

If the preferred Shaft 33B Site at E. 59th and First Avenue is selected, special attention will be paid to construction vibration impacts on the Queensboro Bridge due to its importance as a critical transportation infrastructure as well as its status as a State and National Register site. NYCDEP will work closely with NYCDOT and NYCLPC to determine an appropriate protective level to ensure that the Bridge will not experience vibration levels exceeding acceptable limits.

The remaining 10 Historic period properties area located too far (more than 100 feet) from the four sites to be impacted by the anticipated level of vibration caused by implementation of the project.

6.3 Conclusions and Recommendations

6.3.1 Archaeological Resources

E. 59th Street and First Avenue – The Preferred Shaft 33B Site

Construction of the Queensboro Bridge between 1901 and 1908 (Figures 16 through 18) and the new Bridge approach in 1930 extensively impacted the preferred Shaft 33B Site, most likely destroying or extensively disturbing any archaeological sites that may have been present, particularly resources associated with the occupation of an apparent residence built sometime between 1836 and 1851 that formerly was located at the northwestern corner of the site. Accordingly, construction at the preferred Shaft 33B Site would not impact archaeological resources. Therefore, further archaeological investigations of this parcel are not warranted.

E. 54th Street / Second Avenue Site

A dwelling and tavern known as “Cato’s House” apparently was located east of the APE for the E. 54th Street / Second Avenue Shaft Site during the eighteenth to mid-nineteenth century period. The former backyard for the structure, however, extended into the Site’s APE. Any archaeological features associated with that occupation likely would have been adversely impacted by construction of E. 54th Street, including improvements to it in 1855 and the subsequent installation of utilities. There is a limited possibility, however, that truncated portions of such features remain in the E. 54th Street portion of the APE.

Although two other apparent residences fronted onto the north side of 54th Street immediately east of Second Avenue as of 1851 according to the Dripps map of that year, it is unlikely that archaeological resources associated with these structures are located within the Site’s APE. The former backyards of the dwellings, the most likely location for associated archaeological features, are situated north and east of the Site’s APE and are now covered by existing structures (numbers 1024 - 1030 Second Avenue). It also is unlikely that Native American or other potentially significant Historic period archaeological deposits were present within the construction site.

The base of pillars associated with the elevated train that was constructed along Second Avenue by 1880 may be present in the E. 54th Street / Second Avenue Shaft Site and may have historic value.

Archaeological monitoring of the initial construction activities should be undertaken if sub-surface disturbance occurs at this alternative site, especially along the E. 54th Street portion. Any domestic-type archaeological features encountered should be investigated following consultation with the NYCLPC. In addition, any supporting pillar associated with the c. 1880

El that are identified along the Second Avenue portion of this Site's APE also should be appropriately recorded.

E. 61st Street Shaft Site

The E. 61st Street Shaft Site now consists of a graded vacant lot with apparent fill layers visible at modern grade. It is considered possible that structural remains associated with Lightbody's Ink Factory, particularly shaft type features that may have been truncated by later construction, may be present beneath now buried remains of Our Lady of Perpetual Help Roman Catholic Church. The factory was located on the parcel by at least 1851 and possibly earlier than 1836. Accordingly, the site is considered to be sensitive for commercial/industrial type Historic period archaeological resources associated with the mid-nineteenth century ink factory.

Prior to project construction proceeding on this parcel, a sub-surface archaeological testing plan (Phase IB-level) should be prepared for submittal to the NYCLPC for approval. Once the plan is approved by the NYCLPC, it should be implemented well prior to the start of project construction. The objective of the testing would be to determine whether potentially significant archaeological resources are in fact present there. It is unlikely that Native American or other potentially significant Historic period archaeological deposits are present within the site.

E. 59th Street / Second Avenue Site

Archaeological deposits and structural remains associated with the occupations of the structures indicated on the 1851 Dripps map as well as stratigraphic indications for Eastern Post Road, likely were formerly located within the E. 59th Street / Second Avenue Site. However, construction of the late nineteenth century buildings and subsequent construction of the Queensboro Bridge, between 1901 and 1908 (Figures 16 through 18), and the new bridge approach in 1930 extensively impacted the construction site, destroying or extensively disturbing any archaeological resources that formerly may have been present. Accordingly, the E. 59th Street / Second Avenue Site is not considered to be sensitive for Native American or Historic period archaeological resources and no further archaeological evaluations are warranted for this location.

6.3.2 Historic Period Architectural Resources

Adverse impacts are not anticipated to occur to any of the 11 identified Historic period architectural resources located within the four (4) 400-foot Study Areas established for the preferred Shaft 33B Site and the three Alternative Shaft Sites as a result of the proposed project. Therefore, further evaluations of these four sites or the development of plans to avoid such impacts on these sites are not warranted as part of the proposed project.

7.0 REFERENCES CITED

- Barber, Russell J.
1980 "Post - Pleistocene Anadromous Fish Exploitation at the Boswell Site, Northeastern Massachusetts." Man in the Northeast Occasional Publications in Northeastern Anthropology 7:97-113.
- Boesch, Eugene J.
1994 Archaeological Evaluation and Sensitivity Assessment of Staten Island, New York. Prepared for the New York City Landmarks Preservation Commission.
- 1995a Stage Ib Archaeological Investigation of the IBM Headquarters Office Building Project Area, Town of North Castle Westchester County, New York. Submitted to Ronald A. Freeman Associates, P.C., Mount Kisco, New York.
- 1995b Stage II Archaeological Investigation of Zone 3, Area A - IBM Headquarters Office Building Project Area, Town of North Castle Westchester County, New York. Submitted to Ronald A. Freeman Associates, P.C., Mount Kisco, New York.
- 1997 "The IBM-Armonk Site: An Early Archaic Occupation in Interior Westchester County." Paper presented at the New York State Archaeological Association Annual Meeting. Port Jervis, New York.
- Bolton, Reginald Pelham
1922 Indian Paths in the Great Metropolis. Indian Notes and Monographs. Museum of the American Indian, Heye Foundation, New York, New York.
- 1975 New York City In Indian Possession, 2nd Edition. Museum of the American Indian, Heye Foundation, New York, New York.
- Brennan, Louis A.
1974 "The Lower Hudson: A Decade of Shell Middens." Archaeology of Eastern North America 2:81-93.
- 1977 "The Lower Hudson: The Archaic." In Amerinds and their Paleoenvironments in Northeastern North America, Walter S. Newman and Bert Salwen, editors. Annals of the New York Academy of Sciences, No. 288.
- British Headquarters Map
c.1782 British Headquarters Map. Public Records Office, London.

- Bromley, George W. and Walter S.
1911 Atlas of the City of New York. G.W. Bromley and Company,
Philadelphia, Pa.
- Calver, William L.
1948 "Recollections of Northern Manhattan." The New York Historical Society Quarterly 32:1:20-31.
- Cantwell, Anne-Marie and Diana diZerega Wall
2001 Unearthing Gotham: The Archaeology of New York City. Yale
University Press, New Haven.
- Cavallo, John A.
"Turkey Swamp: A Late Paleo-Indian Site in New Jersey's Coastal Plain."
AENA 9:1-17.
- Ceci, Lynn
1979 "The First Fiscal Crisis in New York." In Economic Development and Cultural Change, Vol. 28, No. 4. The University of Chicago Press,
Chicago, Illinois.
- Chrysler, M.
1910 "The Ecological Plant Geography of Maryland – Coastal Zone West
Shore District." Maryland Weather Service:3:149-197.
- Colton, Joseph H.
**Topographic Map of the City and County of New York and the Adjacent
Country**. Published by J.H. Colton and Company, New York. Copy in
the Collections of the New York City Public Library.
- Cook, S.F.
1976 "The Indian Population of New England in the Seventeenth Century."
University of California, Publications in Anthropology, Vol. 12. University
of California Press, Los Angeles, Ca.
- Cooney, Claudia and Nathan Riddle
2002a Historic Resources Inventory Form: 229-235 East 53rd Street, New
York, New York. Copy on file at the New York State Office of Parks,
Recreation and Historic Preservation.
- 2002b Historic Resources Inventory Form: 237 and 241 East 53rd Street, New
York, New York. Copy on file at the New York State Office of Parks,
Recreation and Historic Preservation.

Covell, Anne B.

National Register of Historic Places Inventory – Nomination Form: Houses at 311 and 313 East 58th Street. Copy on file at the New York State Office of Parks, Recreation and Historic Preservation.

Cunningham, John T.

1959 "Introduction". In The Voyage of 'Half Moon' from 4 April to 7 November, 1609. The New Jersey Historical Society, New Jersey Historical Society, Newark, New Jersey.

Denton, Daniel

1670 A Brief Description of New-York: Formerly Called New Netherlands, with the Places thereunto Adjoyning. London. Reprinted 1966, Readex Microprint Corporation, Cleveland, Ohio.

Dincauze, Dena F.

1976 "The Nelville Site: 8,000 Years at Amoskeag." Peabody Museum Monographs No. 4, Harvard University, Cambridge, Ma.

Dripps, Mathew

1851 Map of the City of New York North of 50th Street. Surveyed and drawn by John F. Harrison, New York. Copy in the collections of the New York City Public Library.

Drumm, Judith

1963 Mastodons and Mammoths Ice Age Elephants of New York. Educational Leaflet No. 13. The University of the State of New York, the State Education Department, State Museum and Science Service, Albany, New York.

Dumont, John

1981 "The PaleoIndian-Early Archaic Continuum: An Environmental Approach." Archaeology of Eastern North American 9:18-42.

Earle, Alice Morse

1900 Stage Coach and Tavern Days. The MacMillan Company, New York, New York.

Edwards, Robert L. and K.O. Emery

1966 "Archaeological Potential of the Atlantic Continental Shelf." American Antiquity 31:5.

1977 "Man on the Continental Shelf." Annals of the New York Academy of Sciences 288:245-256.

Fenneman, Nevin M.

1938 Physiography of Eastern United States. McGraw-Hill Book Company, New York, New York.

Funk, Robert E.

1972 "Early Man in the Northeast and the Late Glacial Environment". Man in the Northeast 4:7-39.

1976 "Recent Contributions to Hudson Valley Prehistory." New York State Museum and Science Service Memoir No. 22, Albany, New York.

Gardner, W. M.

1974 "The Flint Run Paleo-Indian Complex: A Preliminary Report, 1971-1973 Seasons." The Catholic University of America, Archaeology Laboratory, Occasional Publication 1.

Gekle, William F.

1982 The Lower Reaches of the Hudson River. Wyvern House, Poughkeepsie, New York.

Gill, Huntley

1978 National Register of Historic Places Inventory – Nomination Form: Queensboro (59th Street) Bridge. Copy on file at the New York State Office of Parks, Recreation and Historic Preservation.

Goddard, Ives

1978a "Eastern Algonquian Languages." Handbook of North American Indians. Vol. 15:70-77. Smithsonian Institution, Washington, D.C.

1978b "Delaware." Handbook of North American Indians Vol.15:213-239. Smithsonian Institution, Washington, D.C.

Goerck, Casimer

1785 Map of Common Lands. Copy in the collections of the New York Public Library.

Gosner, Kenneth L.

1978 A Field Guide to the Atlantic Shore. Houghton, Mifflin Company, Boston, Ma.

Gramley, Richard M.

1982 "The Vail Site: A Paleo-Indian Encampment in Main." Bulletin of the Buffalo Society of Natural Sciences No. 30.

Gratacap, L.P.

1904 Geology of the City of New York, Greater New York. Brentano's, New

York, New York.

Grumet, Robert S.

Native American Place Names in New York City. Museum of the City of New York, New York, New York.

1995 Historic Contact. Indian People and Colonists in Today's Northeastern United States in the Sixteenth Through Eighteenth Centuries. University of Oklahoma Press, Norman, Oklahoma.

Harrington, Mark Raymond

1909 "The Rock-shelters of Armonk, New York." Anthropological Papers of the American Museum of Natural History 3:125-140.

Historical Perspectives, Inc.

2003 Second Avenue Subway Phase 1A Archaeological Assessment. Prepared by Historical Perspectives, Inc., Westport, Connecticut. Prepared for Allee, King, Rosen and Fleming, Inc., New York, New York.

Hodge, Frederick W. (editor)

1910 "Handbook of American Indians North of Mexico." Bureau of American Ethnology, Bulletin No. 30, Part II, Smithsonian Press, Washington, D.C. Isachsen, Y.W., E. Landing, J.M. Lauber, L.V. Rickard, and W.B. Rogers (editors)

Jacobson, Jerome

1980 Burial Ridge, Tottenville, Staten Island, New York: Archaeology at New York City's Largest Prehistoric Cemetery. Staten Island Institute of Arts and Sciences, Staten Island, New York.

Jameson, J. Franklin (editor)

1909 Narratives of New Netherland, 1609-1664. Charles Scribner's Sons New York, New York.

Juet, Robert

1859 The Voyage of the 'Half Moon' from 4 April to 7 November, 1609. The New Jersey Historical Society, Newark, New Jersey.

Justice, Noel D.

1987 Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States. Indiana University Press, Indianapolis, Indiana.

Kaeser, Edward J.

1963 "The Morris Estate Club Site." New York State Archaeological Association Bulletin No. 27.

Kraft, Herbert C.

1973 The Plenge Site: A Paleo-Indian Occupation Site in New Jersey. Archaeological Research Center, Seaton Hall University Museum, South Orange, New Jersey.

1977 "The PaleoIndian Sites at Port Mobil, Staten Island." Current Perspectives in Northeastern Archaeology: Essays in Honor of William A. Ritchie. Robert E. Funk and Charles F. Hayes III (editors). New York State Archaeological Association.

1975 The Archaeology of the Tocks Island Area. Archaeological Research Center, Seaton Hall University Museum, South Orange, New Jersey.

1986 The Lenape: Archaeology, History, and Ethnography. New Jersey Historical Society, Newark, New Jersey.

Lamb, Martha

1880 History of the City of New York. New York, New York.

Levine, Gaynell

1978 "The Coastal Archaeology Reader: Selections from the New York State Archaeological Association 1954-1977." Readings in Long Island Archaeology and Ethnohistory Vol. III. Suffolk County Archaeological Association.

Lopez, Julius

1955 "Preliminary Report on the Schurz Site (Throgs Neck, Bronx County, New York)." Nassau Archeological Society Bulletin No. 1:6-16.

MacCracken, Henry Noble

1956 Old Dutchess Forever. Hastings House Publishers, New York, New York.

Malcolm Pirnie, Inc.

2005a New York City Department of Environmental Protection City Water Tunnel No. 3, Stage 2 Shaft 33B and Alternative Site Locations. Prepared by Malcolm Pirnie, Inc., White Plains, New York for the New York City Department of Environmental Protection.

2005b New York City Department of Environmental Protection City Water Tunnel No. 3, Stage 2 Shaft 33B Historic Properties. Prepared by Malcolm Pirnie, Inc., White Plains, New York for the New York City Department of Environmental Protection.

Marshall, Sydne

- 1982 "Aboriginal Settlement in New Jersey During the Paleo-Indian Cultural Period: ca. 10,000 B.C. - 6,000 B.C." A Review of Research Problems and Survey Priorities, the Paleo-Indian Period to the Present. Office of New Jersey Heritage, New Jersey Department of Environmental Protection, Trenton, New Jersey.

Moeller, Roger

- 1980 "6LF21: A Paleo-Indian Site in Western Connecticut." American Indian Archaeological Institute Occasional Paper No. 2.

Murphy, Henry C. (Translator)

- 1853 Voyages From Holland to America, A.D. 1632 to 1644. Written by David Peterson DeVries. Reprinted by Kraus Reprint Company, New York, New York, 1971.

New York Archaeological Council

- 1994 Standards for Cultural Resource Investigations and the Curation of Archaeological Collections. The New York Archaeological Council. Standards adopted by the New York State Office of Parks, Recreation and Historic Preservation.

- 2000 Cultural Resource Standards Handbook. Guidance for Understanding and Applying the New York State Standards to Cultural Resource Investigations. The New York Archaeological Council. Standards adopted by the New York State Office of Parks, Recreation and Historic Preservation.

New York City Landmarks Preservation Commission

- 1968 "311 East 58th Street House, Borough of Manhattan. Landmarks Preservation Commission May 25, 1967, Number 2, LP-0583." Copy on file at the New York City Landmarks, Preservation Commission, New York, New York.

- 1969 "312 East 53rd Street House, Borough of Manhattan. Landmarks Preservation Commission June 12, 1968, Number 2, LP-0582." Copy on file at the New York City Landmarks, Preservation Commission, New York, New York.

- 1970 "313 East 53rd Street House, Borough of Manhattan. Landmarks Preservation Commission July 14, 1970, Number 2, LP-0584." Copy on file at the New York City Landmarks, Preservation Commission, New York, New York.

- 1973 Queensboro Bridge, Borough of Manhattan. Landmarks Preservation Commission April 16, 1974, Number 2, LP-0828." Copy on file

at the New York City Landmarks, Preservation Commission, New York, New York.

2000 "314 East 53rd Street House, Borough of Manhattan. Landmarks Preservation Commission June 20, 2000, Designation List 315, LP-2071." Copy on file at the New York City Landmarks, Preservation Commission, New York, New York.

1980 "Prehistoric Sites, New York City; Excavated Sites, Unexcavated Sites, Potential Sites." Copy in the collections of the New York City Landmarks Preservation Commission, New York, New York.

1982 Towards an Archaeological Predictive Model for Manhattan: A Pilot Study. Copy on file at the New York City Landmarks Preservation Commission, New York, New York.

New York Municipal Archives

n.d. "Bridges and Structures: Number IV (Queensboro Bridge) Construction Photographs." New York City Municipal Archives, New York, New York.

New York State Office of Parks, Recreation and Historic Preservation

2005 New York State Historic Preservation Office (SHPO) Archaeological Report Format Requirements. Prepared by the New York State Office of Parks, Recreation and Historic Preservation. New York State Historic Preservation Office.

Parker, Arthur C.

1922 "The Archaeological History of New York, Part Two." New York State Museum Bulletin, Nos. 237, 238, Albany, New York.

Pfeiffer, John

1983 "The Howard Site: A Late Archaic Laurentian Village in the Lower Connecticut Valley." Paper presented to the Archaeological Society of Connecticut, October 15, 1983.

Platt, Edward J.

1994 "Only Known Early Archaic Stage Settlement (ca. 7,500-5,000 B.C.) on Long Island, New York." New York Institute of Anthropology Arts and Sciences Journal 15:1.

1995 "Paleo-American Stage Explorers (ca. 10,000 B.C.) in Bayside, New York." New York Institute of Anthropology Arts and Sciences Journal: 15:1.

1996 "The Bayside Site on Long Island, New York. A Chronological

Continuum of Sociological Occupations from Early Archaic into the Woodland Stages (ca. 7,500 B.C. – A.D. 1600.” New York Institute of Anthropology and Sciences Journal: 17:1.

Randel, John Jr.

1811 A Map of the City of New York by the Commissioners appointed by an act of legislation passed April 3rd, 1807. In Manhattan in Maps by Paul E. Cohen and Robert T. Augustyn, Rizzoli, New York.

1821 A Map of the City of New York as laid out by the Commissioners with the surrounding country. Manhattan in Maps by Paul E. Cohen and Robert T. Augustyn, Rizzoli, New York.

Ritchie, William A.

1980 The Archaeology of New York State. Harbor Hill Books, Harrison, New York.

Ritchie, William A. and Robert E. Funk

1973 "Aboriginal Settlement Patterns in the Northeast." New York State Museum and Science Service Memoir No. 20. Albany, New York.

Roberts, Melvin F.

1979 The Tidemarch Guide. E.P. Dutton, New York, New York.

Robichaud, Beryl and Murray F. Buell

1973 Vegetation of New Jersey. Rutgers University Press, New Brunswick, New Jersey.

Rogers, William B., Yngvar W. Isachsen, Timothy D. Mock, and Richard E. Nyahay

1990 New York State Geological Highway Map. Educational Leaflet of the University of the State of New York, Albany, New York.

Rosen, Richard

2004 Personal Communication. Mr. Rosen is a Project Advocate with the New York City Department of Buildings.

Ruttenber, E.M.

1872 History of the Indian Tribes of Hudson's River. Kennikat Press, Port Washington, New York.

Rutsch, Edward

1970 "An Analysis of the Lithic Materials Used in the Manufacture of Projectile Points in Coastal New York." New York State Archaeological Association Bulletin 49.

Salomon, Julian Harris

- 1982 Indians of the Lower Hudson Region, The Munsee. Historical Society of Rockland County, New City, New York.

Salwen, Bert

- 1962 "Sea Levels and Archaeology in the Long Island Sound Area." American Antiquity 28:1:46-55.

- 1965 Sea Levels and the Archaic Archaeology of the Northeast Coast of the United States. Ph.D. Dissertation, Columbia University, New York.

- 1975 "Post-Glacial Environments and Cultural Change in the Hudson River Basin." Man in the Northeast 10:43-70.

- 1978 "Indians of Southern New England and Long Island: Early Period." Handbook of North American Indians Vol. 15:160-176. Smithsonian Institution, Washington, D.C.

Sanborn Map Company

- 1892 Insurance Map of New York. Sanborn Map Company, Pelham, New York.

Santucci, Gina

- 2005 Environmental Review - Shaft 33B, New Site 2005. March 9th, Prepared by the New York City Landmarks Preservation Commission, New York, New York.

Saxon, Walter

- 1973 "The Paleo-Indian on Long Island." Bulletin of the New York State Archaeological Association 2:2:117-130.

Schuberth, C.J.

- 1968 The Geology of New York City. The Natural History Press, New York, New York.

Sutphin, Amanda

- 2006 Environmental Review - Shaft 33B and Alternative Sites. April 19th, Prepared by the New York City Landmarks Preservation Commission, New York, New York.

Shaver, Peter D.

- 1993 The National Register of Historic Places in New York State. Rizzoli Press, New York, New York.

Shelford, Victor E.

- 1974 The Ecology of North America. University of Illinois Press, Chicago, Illinois.

Skinner, Alanson

- 1919a "Exploration of Aboriginal Site at Throgs Neck and Clason's Point, New York City; Part I: The Throgs Neck or Schley Avenue Shellheap." Contributions from the Museum of the American Indian, Heye Foundation, Volume V, No. 4, Part II. New York, New York.
- 1919b "Exploration of Aboriginal Site at Throgs Neck and Clason's Point, New York City; Part II: Snakapins, a Siwanoy Site at Clason's Point." Contributions from the Museum of the American Indian, Heye Foundation, Volume V, No. 4, Part II. New York, New York.
- 1920 Archaeological Investigations on Manhattan Island, New York City. Indian Notes and Monographs 2:6:125-218. Museum of the American Indian, Heye Foundation, New York, New York.
- 1932 The Indians of Manhattan Island and Vicinity. The American Museum of Natural History, Guide Leaflet Series No. 11.

Smith, Carlyle Shreeve

- 1950 "The Archaeology of Coastal New York." Anthropological Papers of the American Museum of Natural History, Vol. 43, Part 2, New York, New York.

Snow, Dean

- 1980 The Archaeology of New England. Academic Press, New York, New York.

Starbuck, David R. and Charles E. Bolian (editors)

- 1980 "Early and Middle Archaic Cultures in the Northeast." Occasional Publications in Northeastern Anthropology, No. 7. Published by the Department of Anthropology, Franklin Pierce College, Rindge, New Hampshire.

Stokes, Isaac Nathan Phelps

- 1916 The Iconography of Manhattan Island 1498-1909. Volume 2. Robert Dodd, New York.
- 1918 The Iconography of Manhattan Island 1498-1909. Volume 3. Robert Dodd, New York.
- 1928 The Iconography of Manhattan Island 1498-1909. Volume 6. Robert Dodd, New York.

Stone, Linda

- 1997 Report on Phase IA Archaeological Documentary Research in Advance of the Reconstruction of the Martins Field Playground Flushing, Queens, New York. Copy on file at the New York City Landmarks Preservation Commission, New York, New York.

Swanton, John R.

- 1952 "The Indian Tribes of North America." Bureau of American Ethnology Bulletin No. 145, Smithsonian Institution, Washington, D.C.

Truex, James (editor)

- 1982 "The Second Coastal Archaeology Reader: 1900 to the Present." Readings in Long Island Archaeology and Ethnohistory Vol. V. The Suffolk County Archaeological Association.

United States Coast Survey

- 1866 Harbor Chart Number 20; New York Bay and Harbor. Survey of the Coast of the United States. United States Coast Survey. Washington, D.C. Copy in the collections of the New York City Public Library.

United States Department of the Interior

- National Register Bulletin Number 24. Technical Information on Comprehensive Planning, Survey of Cultural Resources, and Registration in the National Register of Historic Places. United States Department of the Interior, National Park Service, Interagency Resource Division, Washington, D.C.

United States Geological Survey

- 1966 Central Park, New York - Connecticut, 7.5 Minute Series (Topographic). United States Department of the Interior, Geological Survey, Washington, D.C. Photo revised 1979.

Van der Zee, Henri, and Barbara Van der Zee

- 1978 A Sweet and Alien Land; The Story of Dutch New York. The Viking Press, New York.

Vargo, Jack and Donna Vargo

- 1983 "The Rabuilt Cave Site - PKE 4-4 Site Report." Bulletin and Journal of Archaeology of New York State:87:13-39.

Viele, Egbert Ludovicus

- 1865 Sanitary and Topographical Map of the City and Island of New York.

Egbert L. Viele, New York.

Washburn, Wilcomb E.

1978 "Seventeenth-Century Indian Wars." Handbook of North American Indians:15:89-100. Smithsonian Institution Press, Washington D.C.

Werner, D.

1964 "Vestiges of Paleo-Indian Occupation Near Port Jervis, New York".
New World Antiquity 11:30-52.

Williams, Lorraine and Ronald Thomas

1982 "The Early/Middle Woodland Periods in New Jersey. In New Jersey's Archaeological Resources: A Survey of Research Problems and Survey Priorities." Olga Chesler, editor, New Jersey Office of Heritage, Trenton, New Jersey

Wolfe, Peter

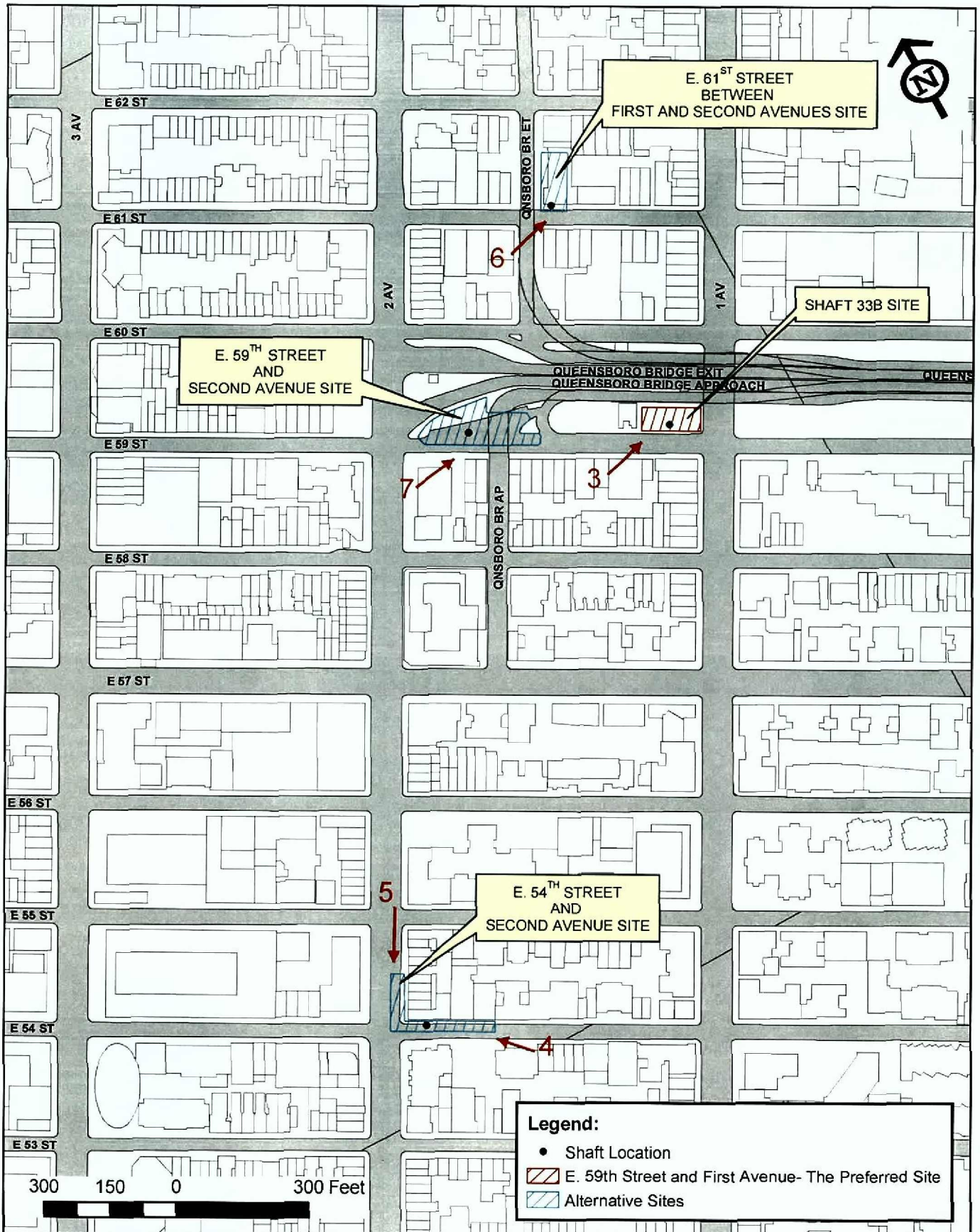
1977 The Geology and Landscapes of New Jersey. Crane, Russak, and Company, New York.

Wyatt, Ronald J.

1977 "The Archaic on Long Island." Annals of the New York Academy of Sciences 288:400-410.

APPENDIX A

**LOCATIONS OF PROJECT AREA PHOTOGRAPHS INCLUDED AS FIGURES 3-7
IN THIS REPORT**



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CITY WATER TUNNEL NO. 3, STAGE 2
SHAFT 33B
LOCATIONS OF PROJECT AREA PHOTOGRAPHS INCLUDED AS
FIGURES 3-7 OF THIS REPORT

JUNE 2005