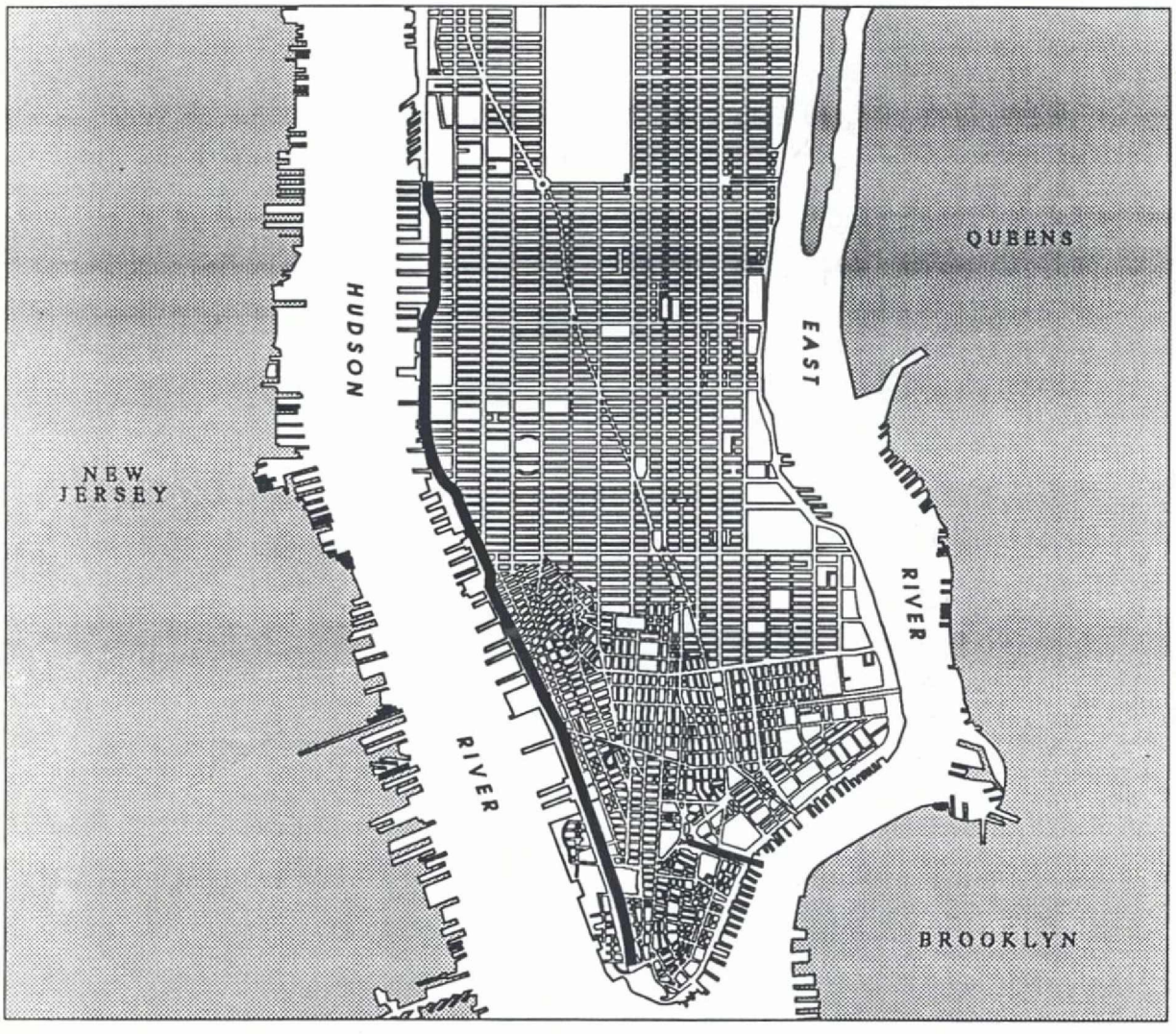
ROUTE 9A

RECONSTRUCTION PROJECT



DRAFT
ARCHEOLOGICAL ASSESSMENT REPORT

WEST 30TH STREET TO WEST 44TH STREET

March 1990

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Prepared By:
Hartgen Archeological Associates, Inc.
in association with
Historical Perspectives, Inc.

Prepared For:
New York State Department of Transportation
in cooperation with
Federal Highway Administration & The City of New York

VOLLMER ASSOCIATES *with*
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EXECUTIVE SUMMARY

The Route 9A Reconstruction Project from Battery Place to West 59th Street has undertaken in a collaborative effort between the New York State Department of Transportation (NYSDOT), the City of New York and the Federal Highway Administration (FHWA). The planning and engineering process of the proposed reconstruction entails preparing an Environmental Impact Statement (EIS). As part of this EIS, potentially sensitive archeological resources within the archeological study area are being identified, and the effects of prior disturbance (demolition, excavation, or change in historic context) on these cultural resources are being determined. The object of this study is to compile a list of sites which may meet the criteria for nomination to the National Register of Historic Places and an assessment of the impacts of the various alternatives on each of these resources. Hartgen Archeological Associates, Inc. (HAA), in association with Historical Perspectives, Inc. (HPI), has undertaken preparation of an inventory of potential archeological resources in the archeological study area, an investigation of prior disturbance, and the final assessment of the impact of the proposed project alternatives.

The sites preliminarily identified as potentially sensitive archeological resources for this study area of the Route 9A project area will be re-evaluated after completion of research on the entire project area.

ARCHEOLOGICAL STUDY AREA

The proposed Route 9A Reconstruction spans from Battery Place to West 59th Street. This section of the report is concerned with the section between West 30th and West 44th Streets (Figure 1-1). The project area bounds are generally as follows: The southern boundary is West 30th Street and the northern boundary is West 44th Street. On the west the area is bounded by the U.S. Bulkhead line. On the east it is bounded by the west ends of numbered city blocks, and includes sidewalks along the block ends. At cross roads the project area extends an additional 50 feet east to include the first 50 feet of the crossroad and sidewalks on the north and south borders of the road (Figure 1-2).

METHODOLOGY

Background research was conducted to establish a prehistoric and historic framework for the interpretation of potential resources. As part of this context, general categories were defined for these resources. The following categories were utilized for classifying potentially sensitive archeological remains:

A) prehistoric remains
B) historic remains
    1) dwellings and associated outbuildings
    2) industrial buildings/complexes
    3) piers and wharves

4) landfill
5) other

Archeologically sensitive areas were identified through archival and cartographic research. Several phases of research have been performed including documentary research, cartographic analysis, and site files review at numerous repositories in Manhattan and Albany, New York. Reports from previous archeological projects and the New York City Landmarks Preservation Commission's predictive model for archeological site formation in New York City were consulted for data pertinent to the Route 9A project area.

A block by block summary of development in the project area was compiled based on this research. The disturbance record, which includes road construction and reconstruction, utility line installation, and general demolition activities, has been established based on utility maps and the documented historical development of the area.

Cartographic reconstruction of the prehistoric shoreline is necessary in order to assess the potential for deeply buried prehistoric archeological sites to exist beneath landfill. Data from the cultural resource report prepared for the Westway project in 1983 by Historic Conservation and Interpretation, Inc. (HCI) was applicable to this section of the project area since it addressed the area south of West 44th Street. Specific areas categorized as potentially sensitive for prehistoric habitation were identified based on topography and characteristics known to be conducive to prehistoric habitation, now deeply buried beneath nineteenth century fill and river silts.

PREHISTORIC SENSITIVITY

Professional and amateur archeologists have been excavating prehistoric sites on Manhattan since the late nineteenth century. However, until after the 1930s, their field techniques and recording procedures were not comparable to the more scientific procedures that are used today. The data from these earlier excavations are generally ambiguous so that findings cannot be assigned to a particular period and properly assessed. Thus it is necessary to continue trying to gather additional information on prehistoric lifeways in the metropolitan New York area.

Although numerous areas were identified by HCI as having potential to possess prehistoric archeological remains, no areas were sensitive north of Gansevoort Street. The research conducted by HCI indicated that the shoreline within the project area north of Gansevoort Street, including this section, was inundated by 13,000 years ago, prior to the introduction of Native Americans into the area. Therefore, there is no sensitivity for prehistoric resources to have once existed beneath Twelfth Avenue landfill in this section of the project area.

HISTORIC SENSITIVITY

Archeologists have become increasingly concerned with research issues focusing on the development of urban landscape and the development and change in waterfront construction, two issues important for understanding the process of urbanization. Resources that can potentially address these issues include: 1) early dwellings or 2) industrial buildings and complexes located along the shorefront, 3) piers and wharves, 4) possible sunken ships, and 5) landfill, including architectural features such as retaining devices. The significance of potential cultural resources located within the project area must be examined in this light.

Historical development has altered many of the natural topographic features that once characterized Manhattan. Between West 30th and West 44th Streets, the land now supporting Twelfth Avenue and Marginal Street was submerged through at least the middle of the nineteenth century. Prior to that time the Hudson River shoreline meandered between what are now Greenwich and Washington Streets, and Tenth and Eleventh Avenues. The shoreline was characterized by bluffs with beaches below. Shorefront development has contributed to the disturbance of these natural topographic features.

The extensive documentary and cartographic research to date for the project area between West 30th and West 44th Streets has revealed the location of several areas potentially sensitive for cultural remains. Prior impacts were assessed and a final list of areas deemed to be potentially sensitive was created. A preliminary evaluation of the resources in each of five categories as applicable is presented here. These include dwellings and outbuildings; industrial complexes; piers and wharves; landfill; and other. The conclusions presented in this chapter may be altered when research on the entire project area is completed and a final list of all potentially sensitive areas along the entire length of the project corridor is compiled.

Numerous piers dating to the nineteenth century were located in the current route of Twelfth Avenue and Marginal Street and may have become part of the landfill. It would be impractical to attempt either excavation or avoidance of all of these features. However, the importance of such resources cannot be denied. The sample chosen and presented here for further consideration is preliminary and was based on age of construction and the potential for answering specific questions regarding shoreline development. It includes:

- Old West 30th to West 31st Street Pier was existing between 1852 and 1859. The pier became part of West Street landfill between 1897-1902. [Clarification of the building sequence for the wharves and piers is available in the block history section of this report.]

- Old West 32nd to West 33rd Street Pier, existing between 1874 and 1902, became part of West Street landfill between 1897-1902.

- Old West 37th Street Pier, existing between 1874 and 1902, became part of West Street landfill between 1897-1902.

- Old West 41st Street Pier, existing between 1879 and 1913, became part of West Street landfill between 1902-1913.

- Old West 41st to West 42nd Street Pier, existing between 1874 to 1913, became part of West Street landfill between 1902-1913.

Industrial buildings and complexes which may warrant archeological investigations are the buildings and their associated commercial yards once present on Block 1091, all probably associated with the Higgins Carpet Company that was in operation between at least 1859 and 1902. Each of these lots is listed below:

- Lots 58 and 59 hosted a brick building between c.1879 and 1925.

- Lots 1, 2, and 5 hosted a brick building (Pickers etc.) between c.1859 and 1925.

- Lots 4, 60, and 62-64 hosted a storehouse between c.1859 and 1925.

It is highly probable that undocumented piers, wharves, quays, and fill retaining devices were incorporated into the fill during the land reclamation process. Since a diverse number of methods of shoreline expansion were used in Manhattan, varying with age of construction and individualistic techniques, these resources are considered an important research issue toward documenting the development of the city.

As stated above, this is a preliminary evaluation and the conclusions presented may be altered when research on the entire project area is completed.

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A. INTRODUCTION

The Route 9A Reconstruction Project from Battery Place to West 59th Street has been undertaken in a collaborative effort between the New York State Department of Transportation (NYSDOT), the City of New York, and the Federal Highway Administration (FHWA). The planning and engineering process of the proposed reconstruction entails preparing an Environmental Impact Statement (EIS). Part of this EIS entails identification of potentially sensitive archeological resources within the project area, and then determination of the effects of prior demolition, excavation, or a change in historic context on these cultural resources. The result of this study is a preparation of an inventory of probable archeological sites, and recommendations of which sites are potentially significant and may meet the criteria for nomination to the National Register of Historic Places. This introductory chapter provided for each individual report will eventually be replaced by a final overall introductory section.

Vollmer Associates is coordinating the preparation of the EIS, while Allee King Rosen and Fleming, Inc. (AKRF) is directing the cultural resources portion of the EIS. Hartgen Archeological Associates, Inc. (HAA), in affiliation with Historical Perspectives, Inc. (HPI), has undertaken preparation of an inventory of potential archeological resources in the project area, an investigation of prior disturbance, and an assessment of the impact of the proposed project alternatives.

The proposed Route 9A Reconstruction spans from Battery Place to West 59th Street. This section of the report is concerned with the section between West 30th and West 44th Streets (Figure 1-1). The archeological study area bounds are as follows: The southern boundary is West 30th Street and the northern boundary is West 44th Street. On the west the area is bounded by the U.S. Bulkhead line. On the east it is bounded by the west ends of numbered city blocks, and includes sidewalks along the block ends. At cross roads, the project area extends an additional 50 feet east to include the first 50 feet of the crossroad and sidewalks on the north and south borders of the road (Figure 1-2). The Miller Elevated highway is locally referred to as the West Side Highway (hereafter referred to as the Highway). Marginal Street lies between the 70 foot span of West Street and the U.S. Bulkhead line to the west.

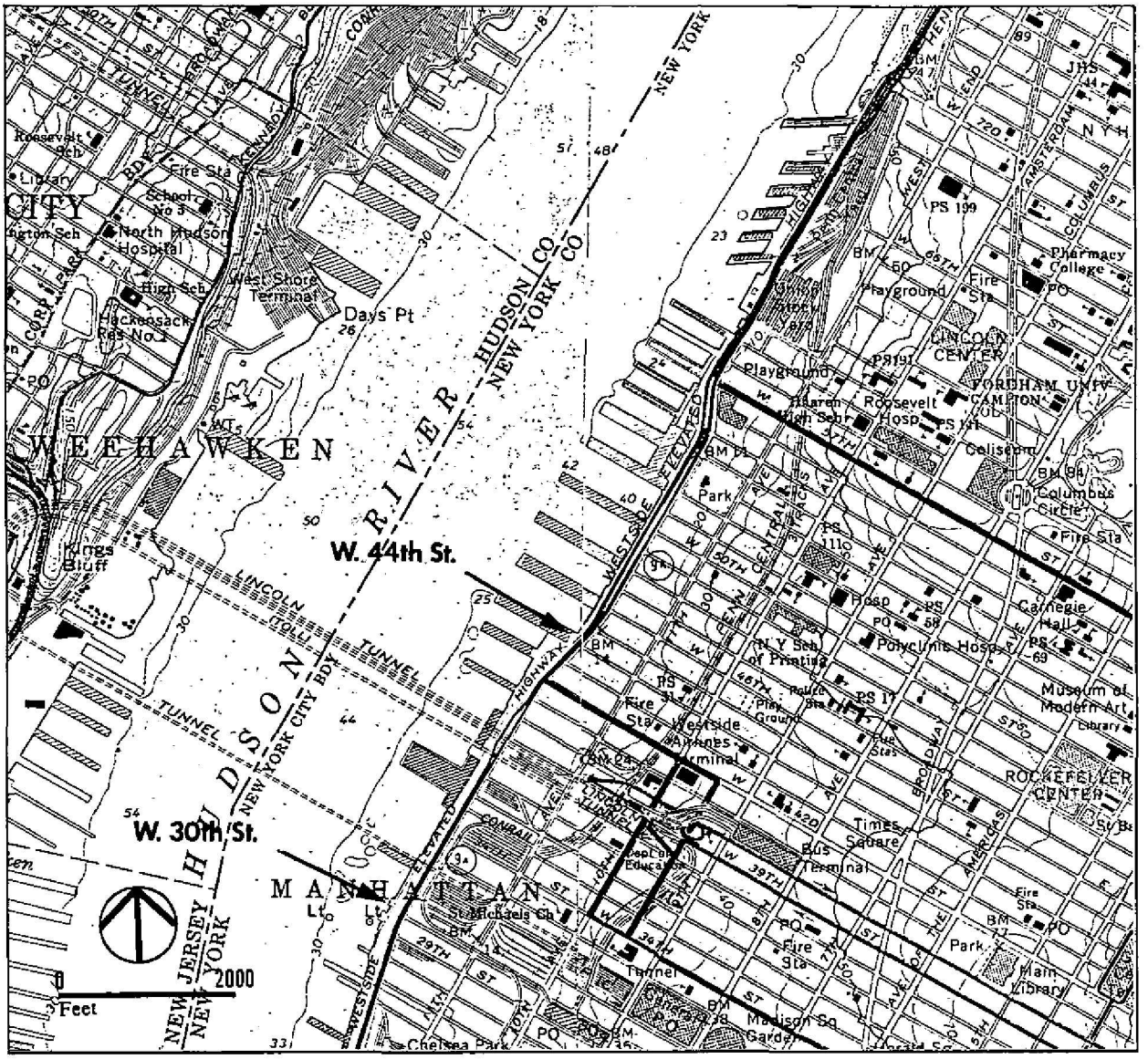
Prehistorically, the lands now occupied by Twelfth Avenue and Marginal Street were beneath water. At various points in time, following deglaciation about 15,000 years ago, water levels were lowered exposing land along the shore. The width of the Hudson River was reduced and areas submerged at the time of European settlement were exposed for habitation by various flora and fauna.

These drowned shorelines were probably once utilized by Native Americans for resource procurement and processing, as well as habitation. The estuarial environment and nearby uplands would have provided necessary resources to sustain prehistoric populations.

The shoreline reconstruction compiled by Historic Conservation and Interpretation, Inc. (HCI) in 1983 for the Westway project has been utilized to determine the degree of prehistoric sensitivity for those areas submerged at the time of European settlement. The cartographic reconstruction of the drowned shoreline, which identified areas having the potential to possess Native American remains, was based on topographic and environmental features. No potentially sensitive areas were identified by HCI between West 30th and West 44th Streets due to the steep slope of the original land along the shoreline and the early date of inundation.

Historically, development and landfilling were slower along the Hudson's shoreline than on the East River since the Hudson was deep and difficult to fill, and the East River accommodated the needs of early shippers. As new technologies were introduced, the use of the Hudson River increased and filling moved the shoreline from its original route between Tenth and Eleventh Avenues west to permit the construction of Twelfth Avenue and Marginal Street. The process of landfilling was slow, and often garbage, sunken ships, and shoreline features associated with shipping became part of the fill. The remnants of these activities have been encountered in a few places in lower Manhattan and undoubtedly exist in the project area.

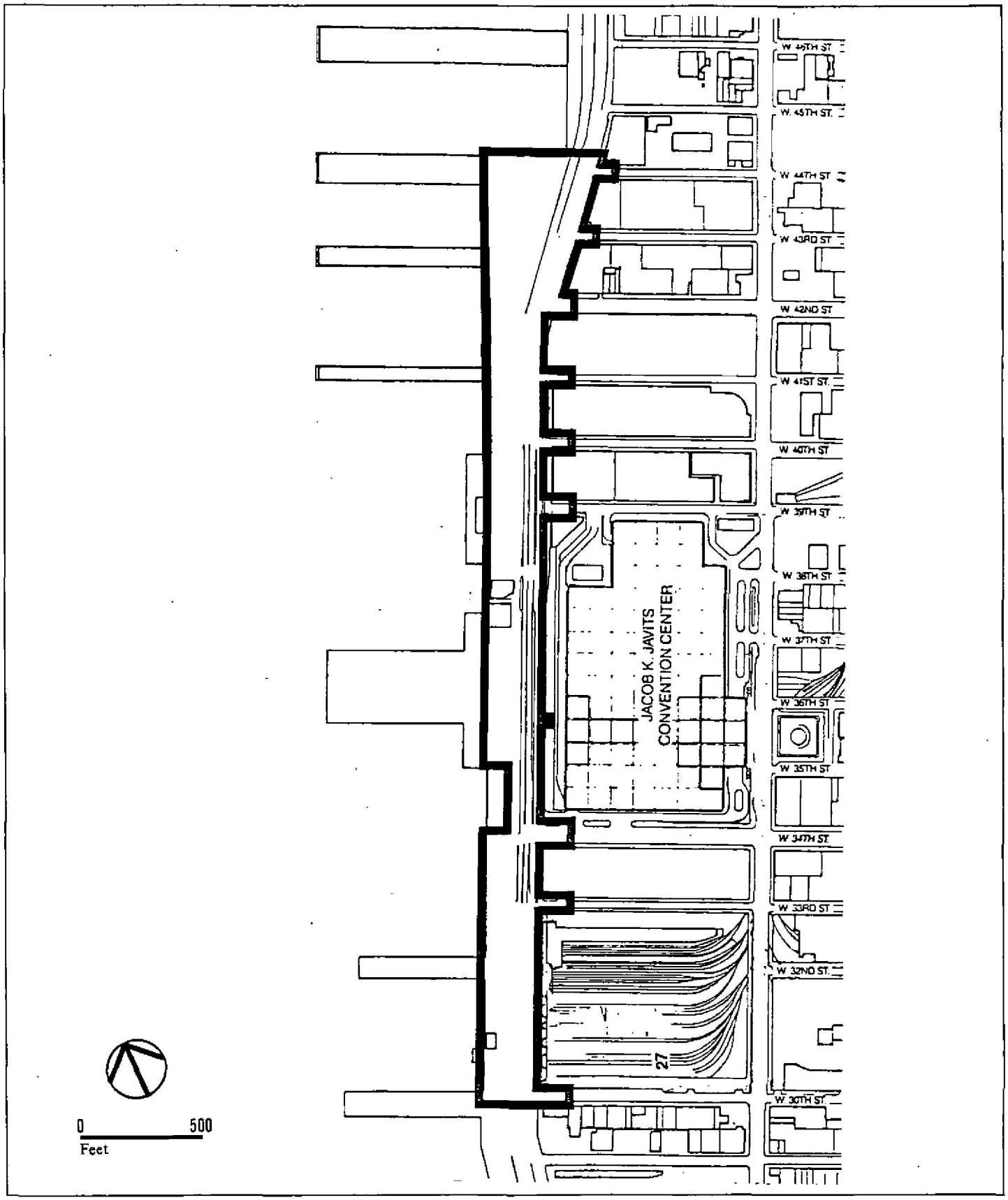
The following archeological study addresses the potential prehistoric and historic archeological sensitivity of the project area between West 30th and West 44th Streets. The analysis has provided a synopsis of these potentially sensitive areas, together with a record of the subsequent disturbance to these areas. A final list was compiled to present those features considered to be archeologically sensitive and previously undisturbed.



ROUTE 9A RECONSTRUCTION PROJECT

U.S.G.S. Topographic Map of the Archeological Study Area
Weehawken Quadrangle 1981/Central Park Quadrangle 1979

Figure 1-1



ROUTE 9A RECONSTRUCTION PROJECT

Legend

Archeological Study Area

I-4

Archeological Study Area Boundaries
West 30th Street to West 44th Street

Figure 1-2

A. METHODOLOGY

Background research was conducted to establish a prehistoric and historic framework for the interpretation of potential resources. Areas of prehistoric and historic sensitivity were identified through archival and cartographic research. The previously compiled Cultural Resource report prepared for the Westway project in 1983 by Historic Conservation and Interpretation, Inc., was applicable to this section since it addressed potential sensitivity between Battery Place and West 44th Street.

The focus of the prehistoric sensitivity section of the 1983 Cultural Resource report for Westway differed from the focus of this report. The previous project area encompassed a large area outboard of the current shoreline together with several inboard interchanges, and only extended as far north as West 44th Street. The research conducted in 1983 entailed reconstructing the prehistoric shoreline beneath the West Side Highway landfill and the outboard area. Sensitivity was assessed based on prehistoric topography and the degree of likelihood that Native Americans once found such topographic features attractive for subsistence and settlement. The final analysis sufficiently assessed archeological sensitivity for the current project area south of West 44th Street based on current theoretical and methodological issues. It was not necessary to conduct any additional research for that area.

The historical research conducted for the Westway project also differed from that conducted in this report due to the differences in project area boundaries as well as changes in methodological and theoretical concerns. Research concerns have changed through time as new techniques became available and topics of investigation became more refined. The research conducted for this report is guided by such projects. The previous report provided details of historical development at interchange areas, outside of the current project area. Because of current boundary differences, a more complete cartographic reconstruction of historical development in the corridor has been compiled, and landowner lists and building histories have been acquired for areas where the Highway traversed previously lotted city blocks. Episodes of filling, construction, and disturbance have also been traced for the entire length of the corridor.

Currently, several phases of research have been performed including documentary research, cartographic analysis, and site files review. The scope of each of these tasks is presented below. The disturbance record has been established based on utility maps and the documented historical development.

DOCUMENTARY RESEARCH

A literature search was conducted of available ethnographic and historic accounts, and reports and data pertinent to the historic and prehistoric archeological record. Archeological reports for the surrounding area were reviewed. In addition, permit applications from various state, city and federal agencies were examined. Where

available, photographic, print and clipping files were also reviewed. The following libraries and agencies were contacted and researched in New York City and Albany.

American Museum of Natural History
Holland Society Library
Municipal Art Society Library
Museum of the City of New York-Reference Collection
New York City Landmarks Preservation Commission
New York City Municipal Reference Library
New York City Municipal Archives
New York City Society of Mechanics and Tradesmen Library
New York Historical Society Library
New York Public Library
New York State Library-Manuscripts and Special Collections
New York State Museum
New York State Office of Parks, Recreation and Historic Preservation (SHPO)
Port Authority of New York and New Jersey
Regional Plan Association Library
Society of Engineers Library
South Street Seaport Library
U.S. Army Corps of Engineers

CARTOGRAPHIC ANALYSIS

Historical maps and atlases were obtained and examined to establish the presence of standing structures and features within the project parcel throughout documented history, and to establish the prehistoric topographic and environmental conditions. Numerous maps and atlases were reviewed. It was sufficient to review maps and atlases at five-to-ten year intervals, since buildings of shorter duration would probably not greatly contribute to the archeological record. In addition, short-term temporary structures which would have stood for less than five-to-ten years, usually lack permanent subterranean foundations and therefore do not cause substantial disturbance.

In addition to the above libraries researched, the Olmstead Center in Flushing, Queens was contacted for maps of early parks existing within the project area. Certain maps at the United States Army Corps of Engineers were also reviewed for shoreline disturbance. At the Borough President's Office, the Topographic Bureau provided historical and geological maps.

PROPERTY RESEARCH

In order to determine the previous owners of land currently within the bounds of the project parcel, and the development and subsurface disturbance of these parcels, land transaction records were reviewed at the New York City Department of Finance, Index Division. Individual lot development was followed by obtaining Block and Lot files and microfiche from the New York City Building Department. This

level of research was limited to reviewing ownership records, and did not include deed research. If appropriate, this documentation will be reviewed during the Stage 2 investigations.

SITE FILES REVIEW

The New York City Landmarks Preservation Commission (NYCLPC) was contacted for information on culturally significant areas previously identified in the project area and vicinity. In addition, the NYCLPC provided a predictive model of prehistoric site location for the project area. Site files were also reviewed at the New York State Museum and the State Office of Parks, Recreation and Historic Preservation.

FIELD VISIT

A walkover survey was conducted of the entire project area between West 30th and West 44th Streets and photographs were taken at each intersection of a cross road. Phototographs were also taken of several piers and the bulkhead from the Hudson river.

A. PROJECT AREA CONDITIONS

ENVIRONMENTAL CONDITIONS

During the Pleistocene period, ice advanced in North America four times. In the last 50,000 years, the Wisconsonian period, ice was 1,000 feet thick over Manhattan. Gravel and boulders deposited at the ice sheet's melting margin formed Long Island about 15,000 years ago (Kieran 1982:26). During the last 10,000 years, glacial till and outwash were covered by the fluvial deposits of the Hudson River. Sea levels have gradually risen as glaciers retreated, and the velocity of the Hudson River has decreased (Vollmer Associates 1989:6). Estuary formation in the Hudson began between 11,000 to 12,000 years ago. Between 8,000 and 10,000 thousand years ago, the river experienced a reduction in salinity, which then increased between 7,000 and 8,000 years ago when the estuary obtained its maximum extent (Rutsch et al. 1983:25). The Hudson River is known for freezing in the winter, with ice floating down river during spring thaws (Luke 1953:10).

The project area between West 30th and West 44th Streets along the Hudson River is part of the embayed section of the Coastal Plain which extends along the Atlantic Coast and ranges from 100 to 200 miles wide (Figure 4-1). The Manhattan prong, which includes southwestern Connecticut, Westchester County, and New York City, is a small eastern projection of the New England uplands, characterized by 360 million year old highly metamorphosed bedrock (Schuberth 1968:11). The Manhattan ridge generally rises in elevation towards the north, and sinks towards the south. Between West 31st and West 110th Streets the underlying rocks are mica schist and hornblende gneiss, known as the Manhattan Formation (Vollmer Associates 1989:6).

The prevalent gneissoid formation is known as Hudson River metamorphosed rock. The city is characterized by a group of gneissoid islands, separated from each other by depressions which are slightly elevated above tide and filled with drift and alluvium. The area consists of drift with underlying crystalline rocks including stratified gneiss, mica schist, hornblendic gneiss and hornblende schist with some feldspar and quartz (Gratacap 1909:27). The principal gneissoid island is between west 32nd and West 125th Streets (Lewis 1929:8).

Soil within Manhattan is mostly glacial till, clay, sand, gravel, mud, and assorted debris (Kieran 1982:24). Within the project area, the soils include landfill, silty clay, clayey silt and fine sand, silty coarse to fine sand, and glacial till (Vollmer Associates 1989:7). The groundwater level fluctuates with tidal variations in the river (Ibid.:9).

Historical development has altered many of the natural topographic features that once characterized Manhattan (Gratacap 1909:5). Between West 30th and West 44th Streets, the land now supporting Twelfth Avenue and Marginal Street was submerged through at least the middle of the nineteenth century. Prior to that time

the Hudson River shoreline meandered between what are now Tenth and Eleventh Avenues.

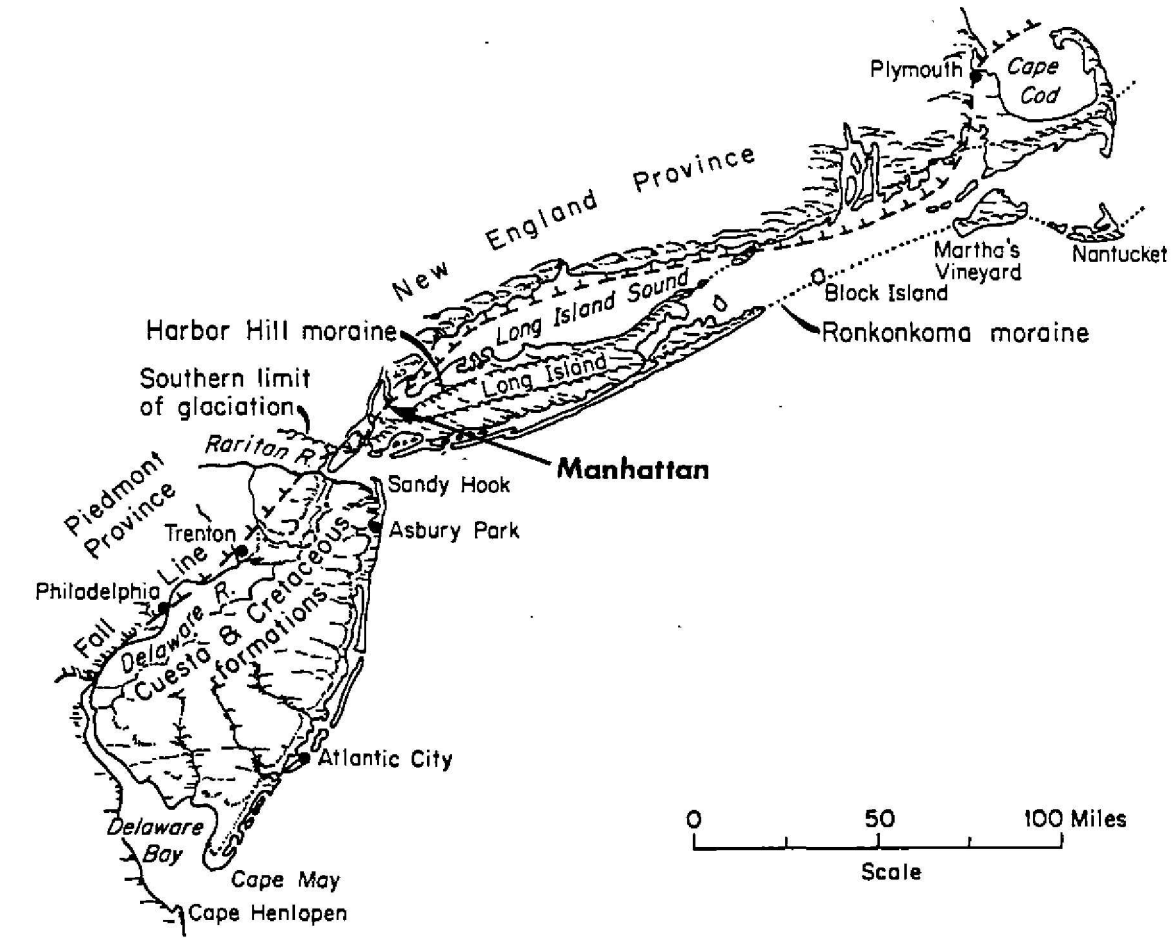
The shoreline was characterized by bluffs with beaches below (Stokes Vol.3 1919:157). Shorefront development has contributed to the obliteration of these natural topographic features (Gratacap 1909:5).

CURRENT CONDITIONS

The original elevated West Side Highway has been removed from this section of the project, and an at-grade roadway exists where Twelfth Avenue was prior to the Highway's construction. Project area photographs show the current area conditions along the shoreline between West 30th and West 44th Streets (Figure 4-2). The area is generally non-residential, characterized by shipping related facilities, and small shops and businesses. The usage of piers within this section, active through the nineteenth and twentieth centuries, has declined.

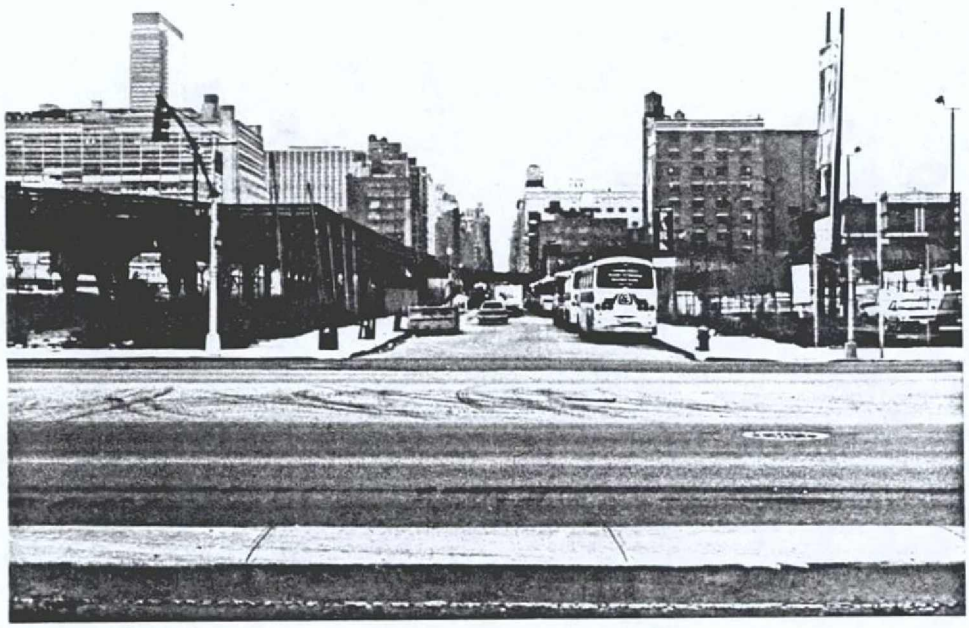
The condition of the bulkhead varies along the project parcel. Between West 30th and West 34th Streets the bulkhead is made of timber piles supporting concrete and granite blocks visible along the shoreline (Mueser Rutledge 1989:9). Between West 34th and West 35th Streets the bulkhead no longer exists. Here "the embankment...is set inshore approximately 30 feet and is flanked on the north and south side with embankments perpendicular to the shore, forming a small cove. The rubble embankment consists of broken concrete, stones and timber logs from the remains of an old timber crib...at the north end of the cove lies the remains of an old mooring platform which is severely damaged and deteriorated" (Ibid.:10). North to West 38th Street the bulkhead is not accessible, and between West 38th and West 44th Streets the construction is similar to that between West 30th and West 34th Streets (Ibid.:11).

The development of the shoreline has progressed sporadically and the condition of subsurface remains reflects this development. In general, subsurface resources along Twelfth Avenue and Marginal Street undoubtedly "contain cribs, old bulkheads, sections of old piers, abandoned utility lines and other remnants of abandoned previous construction" (Vollmer Associates 1989:11). More recent utility lines are also present and there are two tunnels within this section of the project area. At West 32nd Street the Pennsylvania-Central Railroad tunnel runs east-west beneath Twelfth Avenue, and at West 38th and West 39th Streets the Lincoln Tunnel runs beneath the project area.



Physiographic Map of the North End of the Embayed Section of the Coastal Plain
Source: Eisenberg 1976:10

Figure 4-1

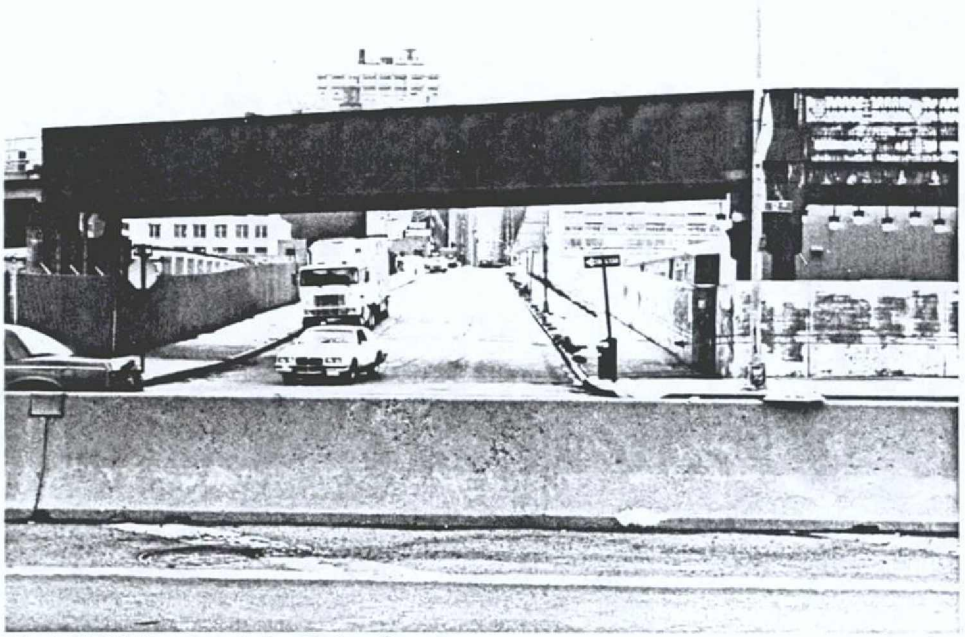


West 30th Street
Facing east from Marginal Street in front of Port Authority Heliport facility 9/13/ 89

Heliport facilities visible from Twelfth Avenue
The eastern portion of the Heliport is within the study area boundaries
Facing northwest from West 30th Street 9/13/89

This section contains photographs of present site conditions. Included are photographs showing the east and west extensions of the archeological study area into the streets intersecting Twelfth Avenue.

West 30th Street to West 33rd Street
Elevated railroad superstructure, Long Island Railroad storage yard (Caemmerrer Yard) extends west from beneath it
Facing northeast from Marginal Street 9/13/89



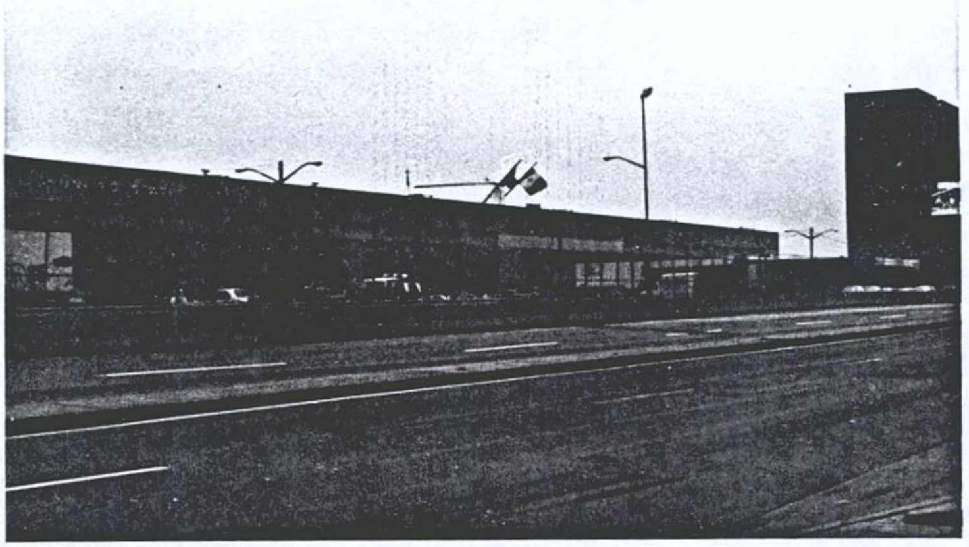
West 33rd Street and elevated railroad
Facing east from Marginal Street in front of N.Y.C. Tow-Away Parking Lot 9/13/89

Figure 4-2 (cont'd)

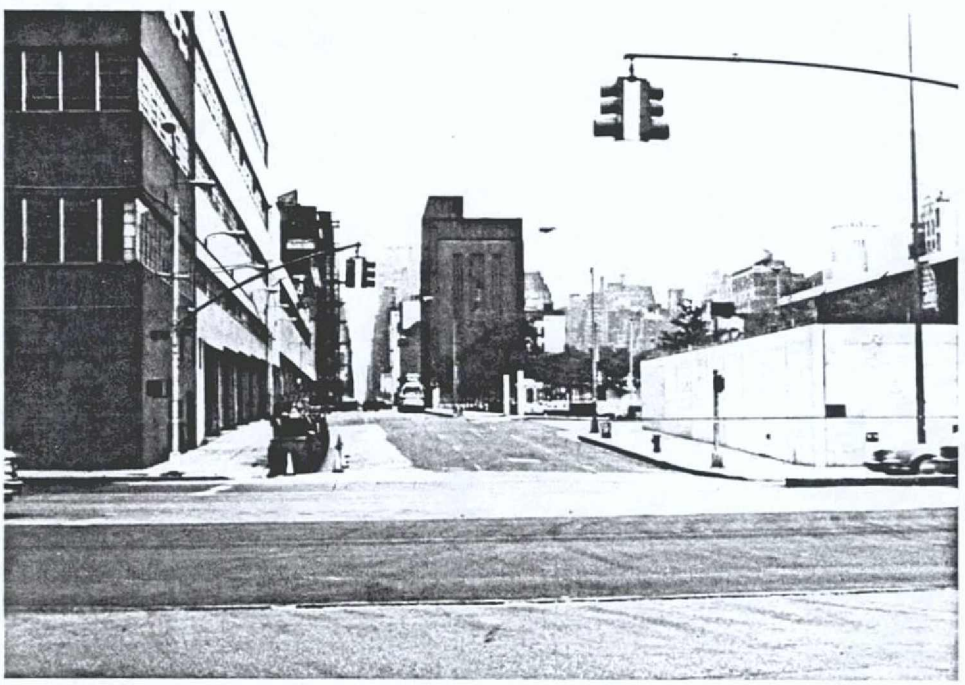
West 34th Street, Jacob Javitz Convention Center at left
Facing east from Marginal Street 9/13/89

West 34th Street to West 38th Street, Jacob Javitz Convention Center
Facing northeast from Marginal Street at West 34th Street 9/13/89

Figure 4-2 (cont'd)

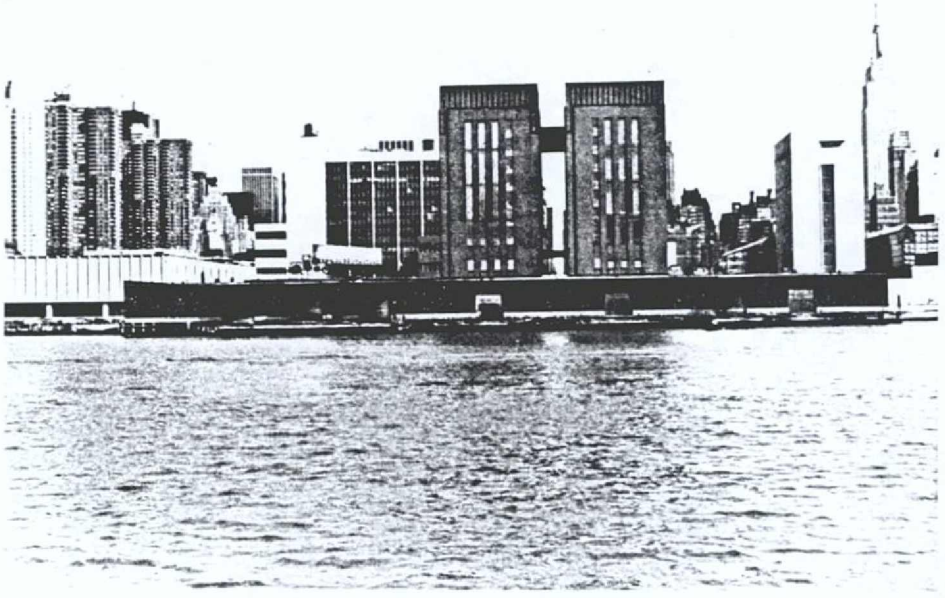


West 34th Street to West 39th Street, N.Y.C. Tow-Away Impoundment facility
The front buildings or piersheds are within the study area boundaries, Lincoln Tunnel ventilator building at right 9/13/89



West 39th Street, Jacob Javitz Convention Center at right, inland Lincoln Tunnel ventilator building center
Facing east from Marginal Street at foot of waterfront ventilator building 9/13/89

Figure 4-2 (cont'd)



Lincoln Tunnel ventilator building
View from the Hudson River facing east 4/27/89

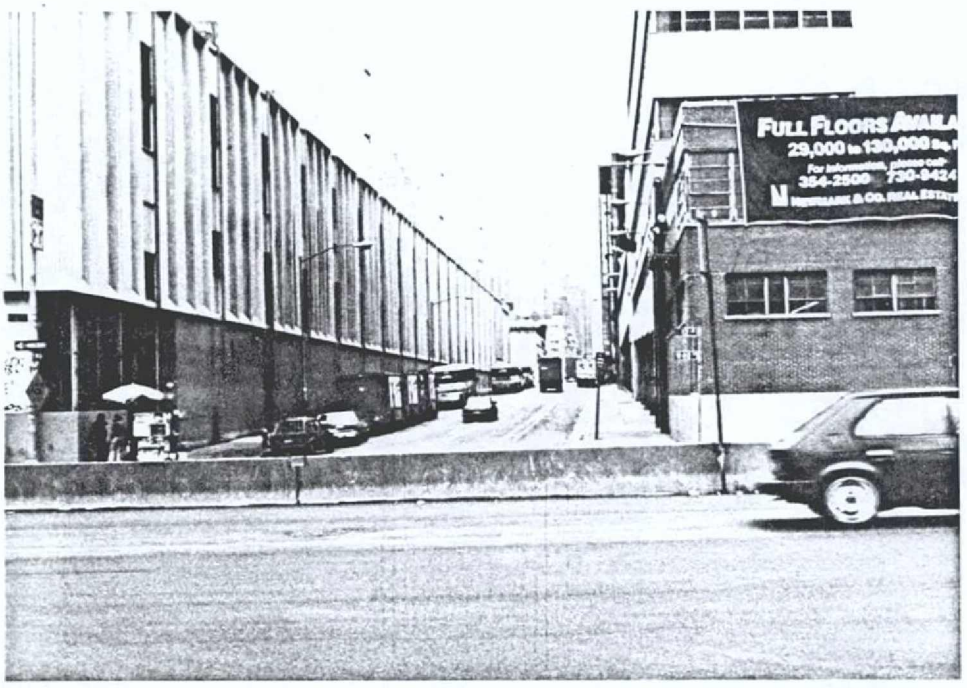
Lincoln Tunnel ventilator building
The bulkhead line and study area boundaries extend along its base
Facing west from West 39th Street 9/13/89

Figure 4-2 (cont'd)

West 38th Street to West 34th Street, Twelfth Avenue, and Convention Center
Facing southeast from Marginal Street at West 38th Street 9/13/89

West 38th Street to West 34th Street, N.Y.C. Impoundment piersheds within study area boundaries
Facing southwest from West 38th Street and Twelfth Avenue 9/13/89

Figure 4-2 (cont'd)

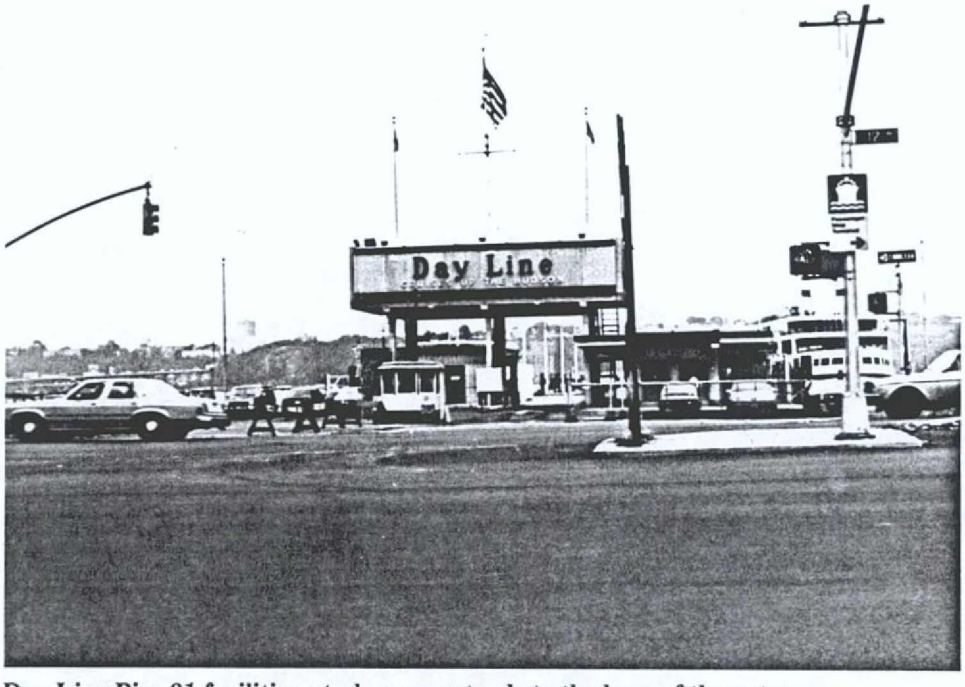


West 40th Street
Facing east from Marginal Street 9/13/89

Ventilator building pier facilities, parking in Marginal Street within study area
Facing west from West 40th Street 9/13/89

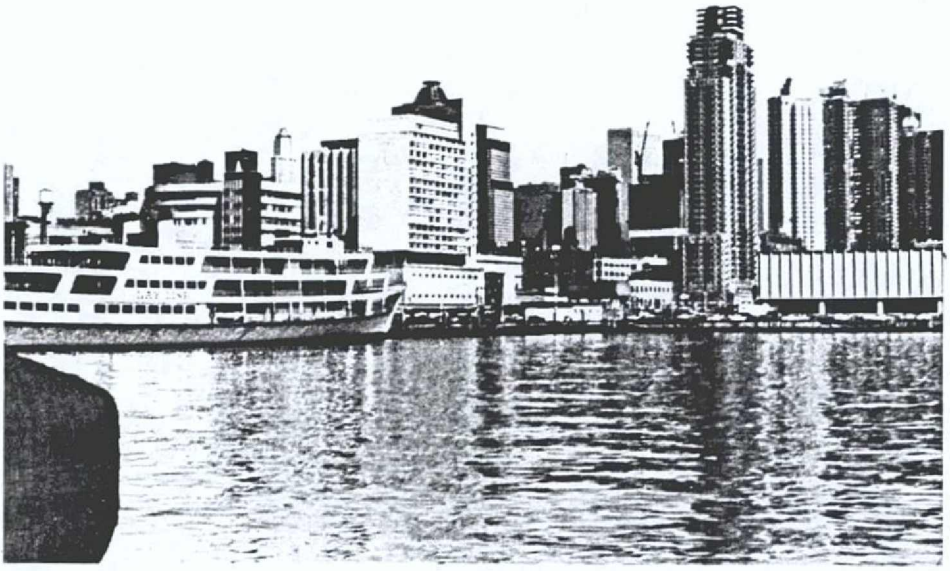
Figure 4-2 (cont'd)

West 41st Street
Facing east from Marginal Street in front of Pier 81 9/13/89



Day Line Pier 81 facilities, study area extends to the base of the entryway
Facing west from West 41st Street 9/13/89

Figure 4-2 (cont'd)



Pier 81, Day Line ferry at left, bulkhead center right
View from the Hudson River facing northeast 4/27/89

West 42nd Street
Facing east from Marginal Street from between Piers 81 and 83 9/13/89

Figure 4-2 (cont'd)

Twelfth Avenue and Marginal Street
Facing west from West 42nd Street 9/13/89

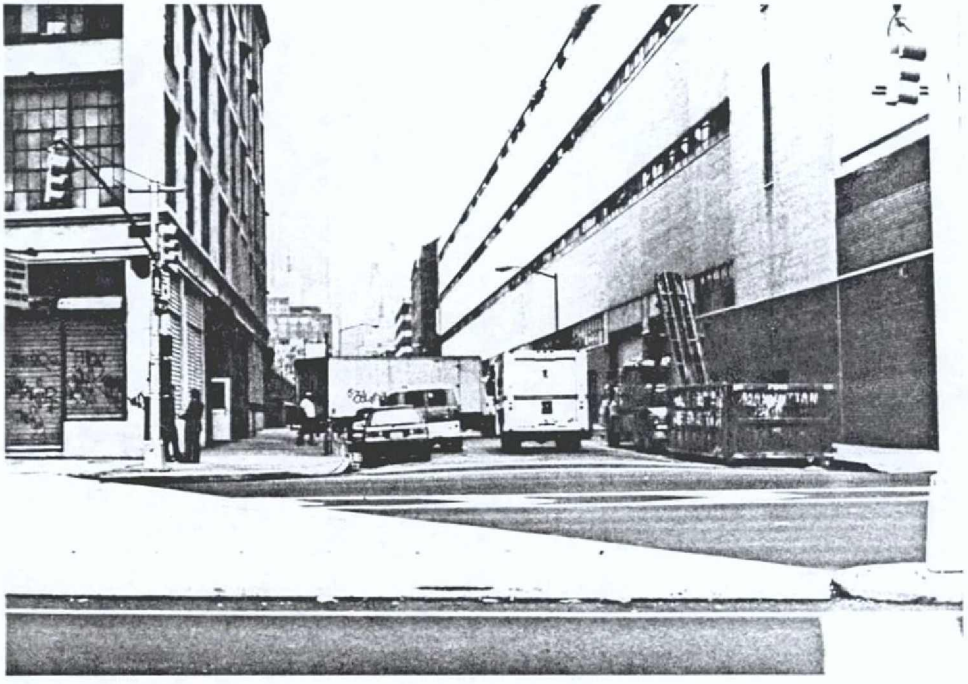
West 43rd Street
Facing east from Marginal Street in front of Pier 83 9/13/89

Figure 4-2 (cont'd)

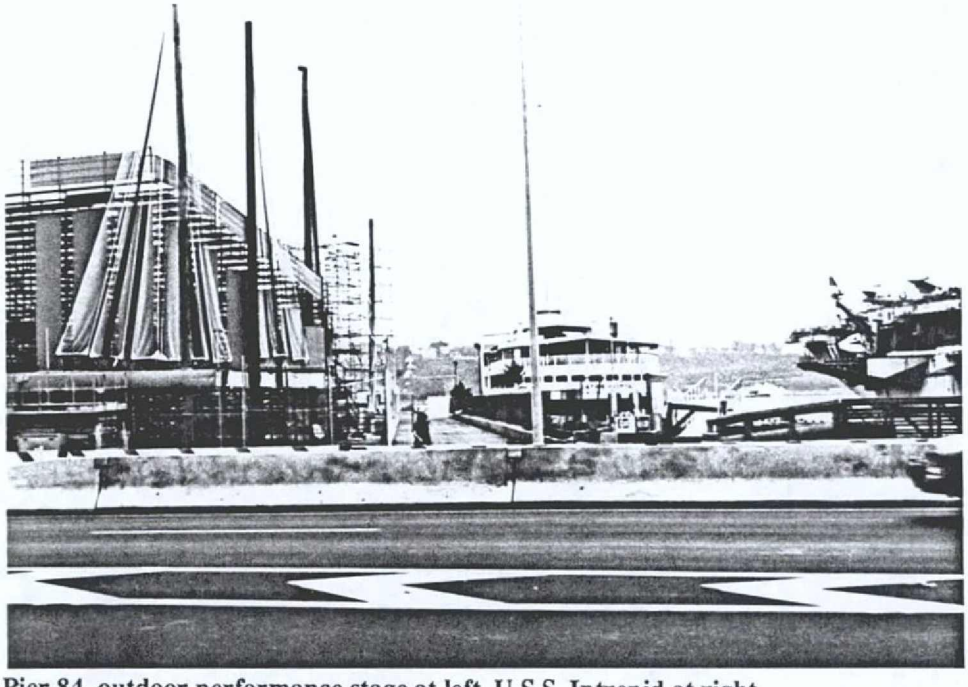
Circle Line Pier 83 facilities, Marginal Street, and Twelfth Avenue
Facing west from West 43rd Street 9/13/89

Pier 83
View from the Hudson River facing southeast 4/27/89

Figure 4-2 (cont'd)



West 44th Street
Facing east from Marginal Street in front of Pier 84 9/13/89



Pier 84, outdoor performance stage at left, U.S.S. Intrepid at right
Facing west from West 44th Street 9/13/89

Figure 4-2 (cont'd)

Pier 84 in foreground, U.S.S. Intrepid at left, remaining section of elevated West Side Highway at center, UPS facility at right
View from the Hudson River facing east 4/27/89

Figure 4-2 (cont'd)

A. PREHISTORIC RESEARCH

PREHISTORIC BACKGROUND

The scant archeological record that characterizes Manhattan renders it necessary to rely on regionally established models of prehistoric sequences for a comparative reference. Prehistoric settlement and subsistence trends have been established for the lower Hudson Valley and coastal New York areas, providing a contextual understanding of prehistoric land and resource utilization. The outline presented summarizes the prehistory of the region, based on long term archeological research. It should be noted that as research in the area continues, theoretical issues become more refined, affecting this regional chronology.

Prior to the arrival of Native Americans and subsequently Europeans, the Northeast experienced heavy glacial activity. During the last episode of the Pleistocene in the Northeast, the Wisconson, ice reached its maximum advance between 18,000 and 16,000 years ago. After this period, glaciers slowly began to retreat north, with glacial gravel being deposited along the melting margin. By 13,000 years ago, ice had retreated north far enough so that the lower Hudson Valley and surrounding area was open for the re-establishment of flora and fauna. As ice melted, glacial lakes formed, eventually filling with sediments and becoming swamps. Current studies indicate that shortly after deglaciation, Native American populations arrived in the Northeast.

PaleoIndian Period (12,000-9,500 B.P.)

Between 14,000 and 12,000 years ago the Northeast was generally characterized as open woodland, rich in spruce. By 10,000 years ago, this had changed and the region was predominately pine (Gaudreau 1988:240). Pollen analysis shows that the southeastern New York region was comprised of a mixed coniferous-hardwood forest following deglaciation (Salwen 1975:43). The post glacial environment supported a diverse array of mega-fauna including mammoth, giant ground sloth, horse, and giant beaver, undoubtedly hunted for prehistoric subsistence. The PaleoIndian period represents the earliest documented human occupation in the Northeast, dating approximately between 12,000 to 9,500 B.P. (Before Present).

Few remnants of these first inhabitants have been encountered. It is quite possible and probable that Native Americans first occupied the continental shelf which was exposed during glaciation. The massive amount of water locked up in ice sheets and glaciers drastically lowered the sea level, extending the Atlantic coastline twenty to thirty miles south and east of what it currently is (Ibid.). The exposed continental shelf, now submerged beneath the ocean, would have possessed the resources necessary to support the emergent PaleoIndian population (Edwards and Emory 1977:19).

Artifacts attributed to this period from sites in the Hudson River Valley and throughout the Northeast include diagnostic Clovis-type fluted projectile points and processing tools such as scrapers, gravers, and drills. Often these were made from cherts originating in eastern New York, and jasper from Pennsylvania and New Jersey. Lithics recovered far from their sources suggest well-defined or extensive travel or trade networks in operation at that time. Research in the Northeast has lead to the postulation that small bands of hunters nomadically roamed large territories, relying predominantly on post-pleistocene megafauna. Alternative hypotheses based on research in eastern New York suggest that PaleoIndians inhabiting the area utilized a wide array of resources and had a restricted territory in which they operated (Eisenberg 1978:139). Additional research continues to assist in developing and refining models of subsistence and settlement.

There are many unanswered questions regarding the settlement and subsistence systems of PaleoIndians. Sites that have been identified tend to be located in three specific geographic locales: on lowland waterside camps near coniferous swamps and near larger rivers; on upland bluffs in areas where deciduous trees dominated; and on ridge tops also dominated by deciduous trees (Eisenberg 1978:138). Throughout the Northeast it has been more common to locate isolated spot finds of diagnostic artifacts than habitation sites. The lack of recovered habitation sites may be due to post-glacial changes in topography or development where habitation sites once existed (Saxon 1973:252). The rising sea levels and resultant changes in water courses have probably inundated numerous encampments. However, since the Hudson River is a fjord (a narrow inlet of the sea bordered by steep cliffs), it is possible that early occupation sites may be preserved along the naturally elevated post-glacial shoreline (Snow 1980:180). Currently, no habitation sites have been identified on Manhattan Island.

Nearby on Staten Island, a PaleoIndian habitation site was located at Port Mobil (Ritchie 1980:xvii). The site was situated on high ground, sloping down to the Arthur Kill, about 1000 feet away. Although the site experienced significant disturbance, several fluted points were recovered together with additional tools made of eastern Pennsylvania tan and yellow jasper, and eastern New York Normanskill flint. Nearby along the tidal beach of the Arthur Kill, six fluted points were also found, made of jasper and local and exotic flints (Ibid.). This represents the only PaleoIndian component recovered within the metropolitan New York area. Spot finds further north have occurred along the Hudson River and its tributaries (Funk 1976:205).

Archaic Period (9,500-3,000 B.P.)

The Archaic period, spanning approximately 6,500 years, has been subdivided into the Early, Middle, Late, and Terminal periods. During the Early Archaic (9,500-7,000 B.P.) fluctuations in the environment occurred, eventually giving way to a gradual warming trend, allowing newly available resources to become established. Although sea levels were rising, New York Harbor was still considerably smaller than it is today (Salwen 1975:49). As a result of environmental changes, it appears that the primary dependence on big game gave way to a hunting, fishing,

and gathering economy, reliant upon a diversity of resources. The more reliable resource base may have facilitated population growth.

Artifacts of the period include bifurcate-base points which are often found along major drainages. Early Archaic sites in the coastal New York area tend to be located on tidal inlets, coves, and bays, and on fresh water ponds (Ritchie 1980:143). Few inland sites of the Early Archaic period have been found in northern New York and New England. However on Staten Island four sites containing cultural materials dating to this period were reported (Salwen 1975:50). Salwen attributes the earlier and more prolific population of the southeastern New York area to the early establishment of hardwood forests in that region (Ibid.). Although resources may have been abundant in the more northern areas, the climatic instability would not have provided a reliable resource base. The established hardwood forests may have attracted people to the more stable, southern New England and New York area (Dincauze and Mulholland 1977:450).

Middle Archaic cultures thrived from about 7,000 to 5,500 years ago, as the climate continued to warm allowing new flora and fauna to become established. Dincauze and Mulholland (1977) suggest that at this time seasonal movements based on the exploitation of specialized resources became well established, which may have encouraged territoriality. Tool kits expanded in response to diverse resource utilization, and artifacts include Neville and Stark projectile points. During the Middle Archaic period the exploitation of oysters along the Hudson River is represented by numerous shell middens. At Croton Point and Montrose Point, north of the project area along the Hudson in Westchester County, shell middens yielded dates of between 5,600 to 5,800 B.P. (Brennan 1974:85).

From approximately 5,500 to 4,000 B.P., Late Archaic cultures flourished across the Northeast. Warming trends promoted a resource-rich environment. Point types diagnostic of this period include small stemmed points such as Lamokas and Taconics, as well as Squibnocket and Brewerton Points. The lower Hudson Valley experienced increased habitation, with numerous shell middens along it dating to this period (Brennan 1974:87). Sites of this period include rockshelters, open woodland camps, and high bluffs along the Hudson. Archaic points found in the metropolitan New York area represent a high percentage of quartz use for this period (Suggs 1966:42). The dependence on local lithics could represent decreased areas of seasonal migration or a reduction in trade with neighboring groups.

The subsistence pattern in operation may have been one of a centrally based wandering pattern focused on the exploitation of seasonal resources. A high degree of cultural complexity is represented by the wide range of site types and the great diversity in site locations. More Late Archaic sites have been reported than for either of the two previous periods. The increase in the number of sites may reflect either an increase in the population brought on by the stabilizing environment, or a bias in site visibility. By the Late Archaic period, sea levels were much as they are today, and sites of this period would have less of a chance of being inundated. In addition, archeologists in the Northeast have postulated that small stemmed quartz points attributed to this period, actually represent an underlying cultural tradition,

persistent through later periods (McBride 1984:133). Therefore, sites attributed to this period based on projectile point typologies may actually have been misidentified.

Three cultural traditions persisted in the Northeast during the Terminal Archaic period (4,000-3,000 B.P.). These include the Laurentian tradition represented by the Vergennes phase and the Vosberg complex; the small stemmed tradition represented by the Sylvan Lake complex; and the Susquehanna tradition represented by the Snook Kill and Orient phases (Funk 1976:250). Although Funk defines these three separate traditions as persisting in the Hudson River valley, Snow reassesses the distribution of Terminal Archaic points and suggests that the Susquehanna tradition dominated the first half of the period, comprised of Snook Kill, Perkiomen and Susquehanna Broad points, while the latter half of the period was dominated by the Orient complex characterized by the Orient Fishtail point (Snow 1980:237). The precise sequence of Terminal Archaic traditions, complexes and phases is a continued source of debate.

It is postulated that these traditions, based on distinct projectile point types, have different settlement patterns representing utilization of specific resource niches. According to Funk and Ritchie, authors of Aboriginal Settlement Patterns in the Northeast, sites of the Snook Kill Tradition, predominant in the southern sub-area, tend to be located on high, sandy river terraces (1973:342). Orient phase habitation and burial sites have been recovered from eastern Long Island (Ibid.:344). Whether these three distinct traditions, Laurentian, small stemmed and Susquehanna, represent the migration of new people into the area, or the spread of technologically new ideas, has yet to be determined. Lithic technologies were predominantly based on locally available raw materials, with the small stemmed point tradition relying heavily upon quartz.

Terminal Archaic groups ground and polished soapstone into bowls and other items. The majority of sites encountered in the region thus far existed along the Hudson River and its major tributaries. This appears to result from high visibility along major river drainages as opposed to the actual lack of sites in remote settings, as continued research from interior areas has produced sites of this period. Orient points have been radiocarbon-dated to approximately 4,000 to 2,800 B.P. in the Hudson Valley.

Woodland Period (3,000-500 B.P.)

The Woodland period persisted in the Northeast from approximately 3,000 to 500 years ago. Again divided into three sub-categories, this period consists of the Early, Middle and Late periods. The first of these, the Early Woodland period, lasted from about 3,000 to 1,700 years ago and is represented by the Middlesex Phase in eastern New York. This period is marked by the introduction of ceramic vessels as part of the material culture. Crude, undecorated pottery called Vinette 1 was often tempered with steatite. Simply designed pottery of this type has largely been recovered from sites on major waterways and tributaries. Early Woodland, Middlesex Phase sites are commonly discovered during sand and gravel mining

operations near a lake or river, as sites tend to be located on well drained knolls adjacent to fresh water (Ritchie 1980:201).

During this period a gradual cooling of the climate occurred, perhaps limiting resource availability. Settlement systems varied as a result of the desire to exploit alternative resources. Coastal resources providing year round stability were often sought, while upland hunting and gathering remained an important activity. Fish runs in rivers provided a stable and reliable resource. Woodland period fish weirs were utilized in the Hudson and smaller tributary rivers for the recovery of large quantities of anadramous fish (Brumbach 1986:35).

The Middle Woodland period, lasting from ca. 1,700 to 1,000 B.P., is marked by regional changes in ceramic styles. Stone tool assemblages of this period are characterized by Jack's Reef Corner Notched and Pentagonal as well as Fox Creek projectile points. A significant amount of exotic lithic materials were utilized, perhaps indicating increased trade networks. By this time, subsistence and settlement seem to have been characterized by semi-permanent settlements with task-specific locations utilized for the purpose of exploiting target resources. Ritchie and Funk identify several settlement types for Middle Woodland cultures including recurringly occupied small and semi-permanent large camps, small temporary camps, cemeteries, burial mounds and workshops (1973:349).

Numerous shell middens along the coast and the Hudson River attest to the importance of aquatic resources. During this period, maize was introduced from Meso-America and horticultural practices were slowly adapted into the lifeways of local Indians. The nature and extent of maize use prehistorically has been much debated by archeologists working in the Northeast. Research on Long Island has led to the hypothesis that prior to European contact, maize was not cultivated on the sandy, nutrient-poor soils of the island. The desire to trade with Europeans led Native Americans to settle more permanently along the coast where shells were available for wampum manufacturing. Concurrent with this shift in the settlement system was the need for a stable, storable economic resource. It is thought that maize horticulture was adopted to provide the support required for these villages (Ceci 1979:72). In addition to the research conducted in coastal New York areas, archeologists throughout the Northeast are now questioning the distribution and adoption of non-indigenous horticultural goods.

Material items of this period include ornamental pendants, pins, and the bow and arrow. Ceramics became technologically more advanced as walls became thinner and overall shape became rounded. It is suggested that the change to a rounded bottom corresponds with the introduction of maize and resulted from the desire to cook food longer (Braun 1980:100). Netmarking became a popular mode of decoration associated with this period. Ornamentation of the collars and bodies of pots also increased, often suggesting the cultural affiliation of the maker. Overall the remains representative of this period recovered from eastern New York are limited in number, compared to those found further to the west in the Great Lakes region (Funk 1976:298). This may be a misrepresentation resulting from biased sampling and preservation rather than the actual lack of sites.

The Windsor tradition was established in this period, with components of this tradition found along the Long Island Sound, and the Hudson and Connecticut drainages. In the lower Hudson Valley and on western Long Island, the tradition is represented by the Windsor North Beach and Clearview phases (Snow 1978:63). The Fox Creek Phase of the Middle Woodland period appears to have its center of distribution in the New York coastal region, and in the eastern New York drainages (Ritchie and Funk 1973:356). Settlement patterns reflect a restricted wandering system, excluding large base camps and semi-permanent villages. However, general trends of the period show a move toward a settlement system incorporating semi-permanent village occupations.

During the Late Woodland period, 1,200 to 500 years ago, the climate was similar to that of today. The documented settlement pattern indicates the use of diverse environmental settings including inland rockshelter sites, coastal and island sites, inland sites on major drainages, and campsites located near swamps and along streams. There is marked evidence of an overall increase in site size, abundance and artifact frequencies. An annual subsistence round of seasonal movements between riverine, coastal and inland wintering sites may have existed. The increase in horticultural activities may have affected seasonal movements, with spring and summer spent planting crops. While maize, beans, and squash became available, these did not comprise the entire subsistence base, as deer, small mammals, nuts, berries, and shellfish continued to be utilized. The semi-permanent settlement pattern may have led to competition and defense of arable land, contributing to regional territoriality (Mulholland 1988:163).

Artifact types of this period include the Levanna triangular projectile point and Cayadutta Incised pottery. The Windsor tradition was replaced by the East River tradition by about 600 B.P., and the Bowmans Brook and later Clasons Point phases are local manifestations of this period (Snow 1978:63). It is thought that the Bowmans Brook culture entered New York from New Jersey through Staten Island, where artifacts of this phase have been found (Ritchie 1980:269). Sites of this phase are situated on tidal streams or coves, with large village sites containing between fifty to one hundred pit features (Ibid.). Shellfish utilization is apparent at such sites. Ritchie notes that sites of the Clasons Point culture tend to be located on the second rise of ground above high-water level, on tidal inlets, and have many of the characteristics of the Bowmans Brook Phase (Ibid.:271).

Contact Period (500-300 B.P.)

The Contact period dating from 500 to 300 B.P. is typified by the initial interactions between Native American groups and Europeans. Native settlement patterns at the beginning of this period were essentially the same as those of the Late Woodland, and consisted of seasonal hunting and gathering. In spring and fall, areas along streams were occupied to take advantage of fish runs. Upland and inland task specific sites were occupied for short periods for hunting, trapping, and lithic procurement activities. Semi-permanent villages near planted fields were also located in the interior, containing oval and round, bark and mat covered houses. Large pits were used for storing dried meat, fish, and corn, and it was common practice to burn

fields to facilitate hunting, trapping and planting. It was not uncommon for horticultural villages to move to new locations after ten or twenty years as soil fertility, firewood and nearby game resources were depleted (Salwen 1975:57).

The first contacts between Native Americans and Europeans occurred when early explorers began to trade with the native population. As European materials were introduced, settlement and subsistence patterns changed drastically. Traditional tools were replaced by adopted European goods such as copper and iron. Shell beads and wampum were produced and furs were collected by Native Americans as a medium of exchange. Europeans were anxious to acquire furs from Native Americans, thus numerous trading posts were established along the Hudson River. Although early historic accounts suggest the presence of stockaded villages or forts in the Hudson Valley and coastal New York, archeological data indicate they were not present prior to the middle of the seventeenth century (Ritchie and Funk 1973:368).

During the seventeenth century, Manhattan was occupied by Indians speaking a Munsee dialect of the Eastern Algonquian language (Goddard 1978b:73; Figure 5-2). Northern Manhattan was primarily occupied by Native Americans, identified by the colonists as Wiechquesgeck (Grumet 1981:60). Large scale conflicts did not break out in New York until the arrival of Governor Willem Kieft in 1638, who maintained a hard-line policy with the local Indians. This policy caused the death of 1000 Native Americans between 1640 and 1645 due to conflicts (Washburn 1978:98). In 1655 Native Americans attacked New Amsterdam, and the ensuing Esopus Wars, named so for the involvement of the Esopus Indians, lasted until 1664. As a result, Algonquian bands in the lower Hudson Valley lost independence and fell under Dutch control (Ibid.).

The subsequent breakdown of native sociopolitical organization during the seventeenth century was caused by intertribal stress, plagues, and the desire of newcomers to obtain land rights. The plagues of 1616-1620, introduced by Europeans, depopulated many groups, with population losses in southern New England and New York estimated between 70-90 percent (Snow 1980:34). The conflicts engendered by rapid colonial expansion, war, and epidemics, caused many Native American groups either to leave the area or take up habitation in established communities (Brasser 1978:85).

At the time of European contact, the closest known Native American habitation site to the project area between West 30th and 44th Streets was Sapohanikan Point now in Greenwich Village (Figure 5-1). Bolton reports that Sapohanikan was probably a landing place for canoes arriving from and departing to New Jersey (Bolton 1934:53). However, Skinner states that Sapohanikan was an Indian village probably located near the block bounded by Gansevoort, Little West 12th, West, and Washington Streets, and that there was an Indian settlement there as late as 1661 (Skinner 1961:52). He also notes that the name may have been applied to the general area. Skinner also reported Site 9, a village site on the Collect Pond near Canal Street, which possessed a large deposit of shells (Ibid.:630).

Grumet noted several other features south of this portion of the project area as possessing Native American names. These include "Kapsee," a ledge of rocks now under Battery Park (Figure 5-1). Bolton suggested that this translated to "where the sharp rocks are," however Grumet notes that this was probably a derivation of the Dutch word "Kaaphoekje," meaning a little cape or promontory (Grumet 1981:17). In addition, "Catiemuts" was possibly a "fort or hill located near Pearl Street and Park Row" (Ibid.:8). "Ishpatena" was identified as a hill between Chatham and Varick Streets, which has since been leveled (Ibid.:16). "Werpoes," a label seen on many historic maps such as the MacCoun 1609 Hudson River map (MacCoun 1909a), was a derivative of the Delaware word "Wipochk," which meant a bushy place or thicket (Ibid.:58). This was the name given to an area of elevated land below Canal Street. At the time of European settlement, Native Indians referred to the Hudson River as "Mahicanituk," which translated to "the great waters or seas, which are constantly in motion" (Grumet 1981:22). The island of Manhattan itself was called "Minna-atn" which meant "Island of Hills" (Bolton 1934:47).

Established cultural chronologies are based on prehistoric sites found in the Metropolitan New York Area. On Staten Island, numerous prehistoric sites have been reported, ranging from the PaleoIndian through Woodland periods. A burial site on the southern portion of the island was found on a bluff overlooking the shoreline. The Tottenville site may include a wampum manufacturing station (Jacobson 1980:5). In total, over one hundred prehistoric sites have been reported from Staten Island, although significantly fewer have been scientifically studied. It has been postulated that cultural groups occupying the island were probably affiliated with groups in New Jersey and the mid Atlantic region. The island may have been between the bounds of New York and New Jersey groups (Ritchie 1980:145). If this is the case, then the role of Manhattan Island may have been similar. Because of the proximity of New Jersey cultural groups, as well as Long Island Sound groups, cultural traits of Manhattan Indians would undoubtedly reflect these associations.

The apparent settlement systems established for the coastal New York area have primarily been based upon the large and highly visible shell midden sites along the coast. An intensive survey of Shelter Island in the Long Island Sound has yielded a number of small short term lithic workshops and food processing stations, previously unseen and excluded from settlement pattern studies (Lightfoot et al. 1985:59). Further research and unbiased testing strategies in upland areas have shown that numerous sites exist in these locales. While the coast of Manhattan was undoubtedly attractive for Native American habitation, smaller interior sites may have been utilized as well.

SITE SURVIVABILITY

Professional and amateur archeologists have been excavating on Manhattan since the late nineteenth century. However, until after the 1930s, field techniques and recording procedures were not comparable to the more scientific procedures used today. The data from these excavations are generally ambiguous so that findings cannot be assigned to a particular period (Baugher-Perlin et al. 1982:5). According to Alanson Skinner's research at the turn of this century, in southern Manhattan there had been Indian settlements at the Collect Pond along the east end of Canal Street, on Corlear's Hook at the East River, and at the village of "Sappokanican," situated on the Hudson River just south of West 14th Street. His estimation was that the only Indian remains left on Manhattan Island apparently were located at the extreme northwestern end (Skinner 1926:51). He does note, however, that the preponderance of findings from northern Manhattan is a reflection of both lower Manhattan's earlier development and northern Manhattan's relatively late occupation by Native Americans.

Recently, it has been demonstrated that prehistoric archeological sites do still exist in the highly developed borough of Manhattan. "In 1980 during the excavation of Stone Street, as part of the Stadt Huys block, aboriginal pottery and lithics were found in the lowest levels of the excavation" (Baugher-Perlin et al. 1982:12). In the later Broad Street field investigation led by Joel Grossman, an in situ Contact period feature was found in direct association with the Dutch West India stockhouse (Karen Rubinson, personal communication to Cece Kirkorian, June 27, 1989). In addition to these in situ prehistoric finds, secondary deposits of prehistoric materials have also been recovered at numerous sites in Manhattan.

SHORELINE RECONSTRUCTION

A cartographic reconstruction of the prehistoric shoreline is necessary in order to assess the potential for deeply buried prehistoric archeological sites to exist beneath landfill. A subsurface soil and fill profile of Twelfth Avenue was constructed by HCI during the original survey for the Westway project. Based on core samples, paleoecologists and prehistorians reconstructed the post glacial shoreline between Battery Place and West 44th Street (Rutsch et al. 1983:17). Research was largely concerned with the nature of shoreline development outboard of current West Street. The research concluded that prior to European settlement, West Street was submerged beneath the Hudson River, and that "the area north of approximately Gansevoort Street was inundated by rising sea level at least as early as 13,000 B.P." (Ibid.:20). The topography of the top of the glacial gravel surface deposited prior to inundation was generally lowest in this section of the study area near West 32nd Street (Rutsch et al. 1983:19).

Borings taken north of Charles Street showed a stratum of inorganic silts between organic silt deposits and the lower surface of glacial deposits. There were also indications of the presence of a deep canyon prior to inundation (Rutsch et al. 1983:43). The discrepancy in the levels of organic content in the two silt levels may have resulted from differences in the level of pollen deposited in various periods

after glaciation. Both silt levels were believed to be the result of river silt deposited after inundation, indicating when the shoreline was no longer accessible for habitation.

PREHISTORIC SENSITIVITY

It has been demonstrated that sites tend to be located on well drained elevated soils near fresh water resources. Environments providing diverse resource availability are conducive for prehistoric habitation. Coastal and riverine areas are particularly attractive habitation spots for this reason, providing a mix of aquatic, estuarial and terrestrial resources. In particular, the confluence of streams and/or rivers were considered primary spots for habitation, and have a high potential to yield prehistoric archeological resources. Coves and inlets, providing protection from the strong winds coming down the Hudson would have also been desirable habitation sites. Archeological research on islands within the southern New England area shows that settlement patterns are often affected by strong prevalent winds. Research on Nantucket and Block Island, each with strong northerly winds, shows a preference for settlement on south facing slopes (Little 1985:26). Presumably the strong winds coming down the Hudson would have had a similar affect on settlement patterns.

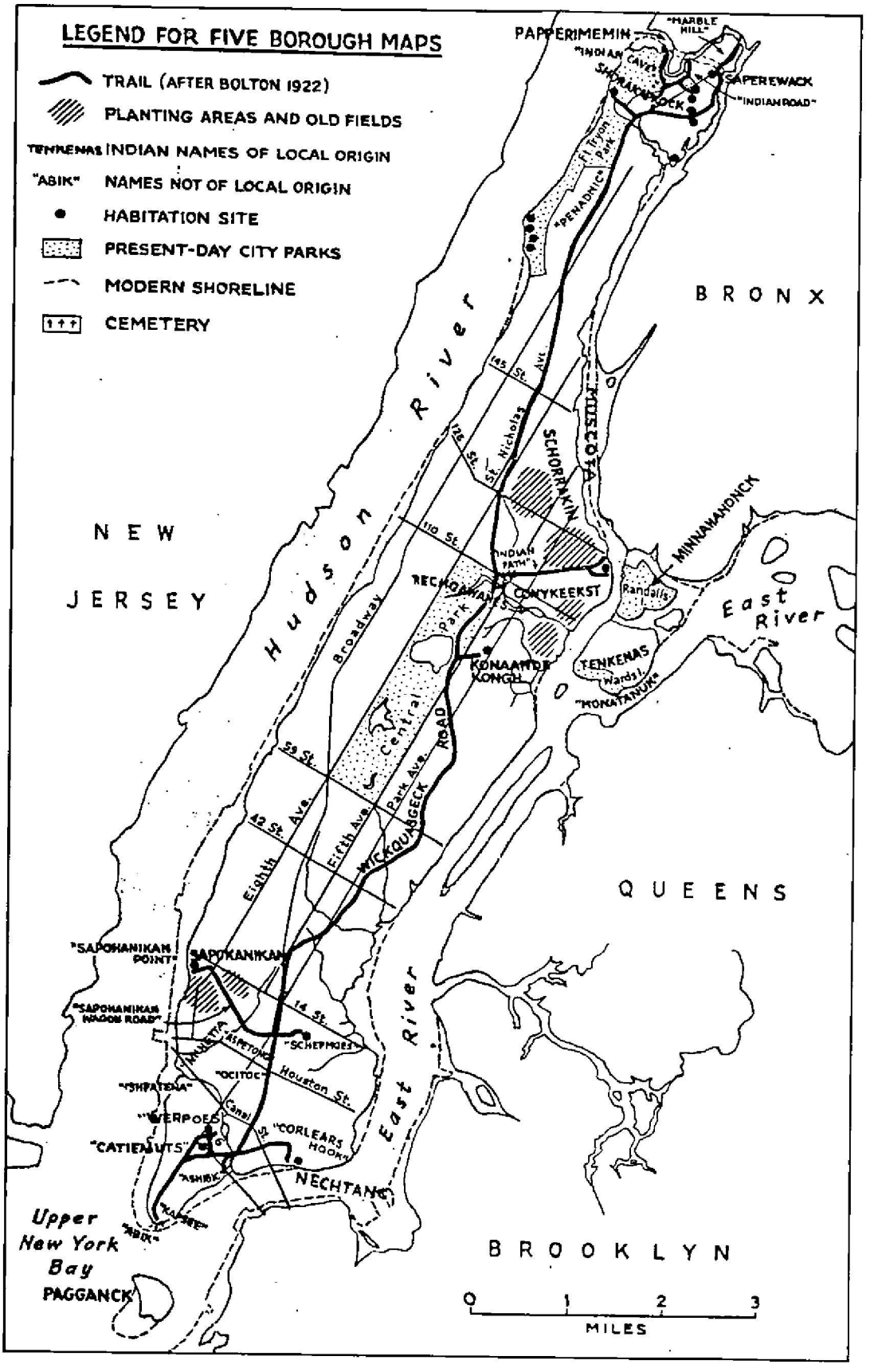
According to a study done by the New York City Landmarks Preservation Commission (NYCLPC), which identified areas potentially sensitive for prehistoric archeological remains within Manhattan, there are no sensitive areas within this section of the project parcel (Figure 5-3). It should be noted that the model is based on the potential to recover sites from the area of Manhattan that existed as original land at the time of European settlement. The model does not attempt to determine the potential sensitivity of drowned shorelines, once exposed for habitation. However, this particular task was attempted for the project parcel during the original Westway project.

Research, conducted for the Westway project by HCI for the New York State Department of Transportation (see Rutsch et al. 1983), entailed a cartographic reconstruction of prehistoric shoreline development prior to filling. All of Twelfth Avenue and Marginal Street between West 30th and West 44th Streets were submerged beneath the Hudson River when Manhattan was first settled by Europeans. However, during various prehistoric time periods when water levels were reduced, these areas were exposed and the Hudson's shoreline was further west. These historically submerged areas may have supported Native American populations prehistorically.

The paleoenvironmental study of the Westway project between Battery Place and West 44th Street was conducted by Richard R. Pardi and Dennis Weiss of Queens College and City College, respectively. The following is a synopsis of their conclusions (for a full description of research conducted, see Rutsch et al. 1983:Appendix 2). Radiocarbon and chemical samples from cores were used to establish the prehistoric chronological development of the shoreline. A topographic map was constructed showing the location and elevation of the shoreline as it changed through time. Specific areas categorized as potentially sensitive for

prehistoric habitation were identified, based on topography and characteristics known to be conducive for prehistoric habitation. These areas are currently deeply buried beneath nineteenth century fill and river silts.

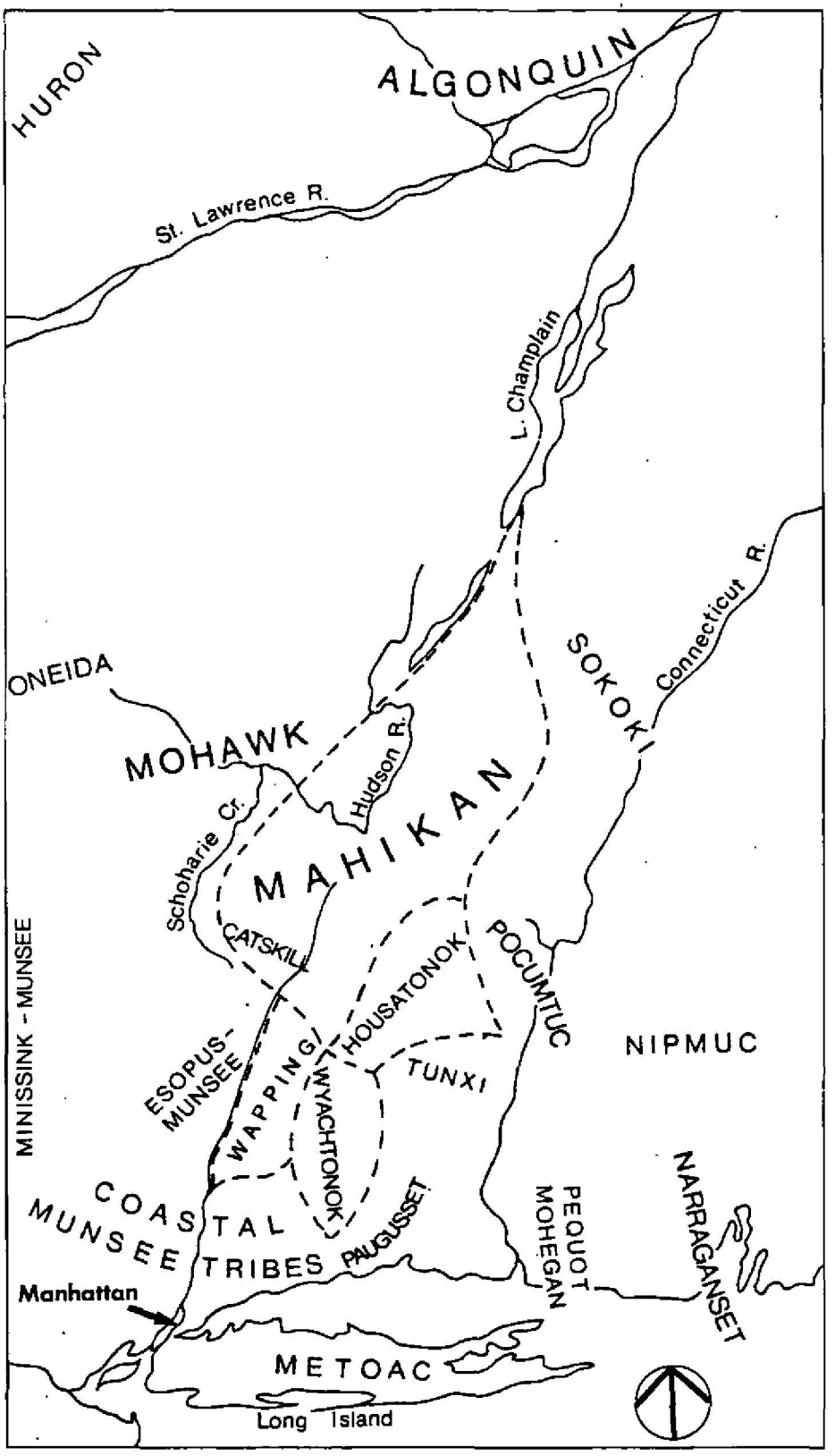
Although numerous areas were identified in lower Manhattan by HCI as having the potential to possess prehistoric archeological remains, no areas were identified north of Gansevoort Street. The research conducted by HCI indicated that the shoreline within the project area north of Gansevoort Street, including this section, was inundated by 13,000 year ago, prior to the introduction of Native Americans into the area (Rutsch et al. 1983:20). Therefore, there is no sensitivity for prehistoric resources to have once existed beneath Twelfth Avenue landfill in this section of the project area.



ROUTE 9A RECONSTRUCTION PROJECT

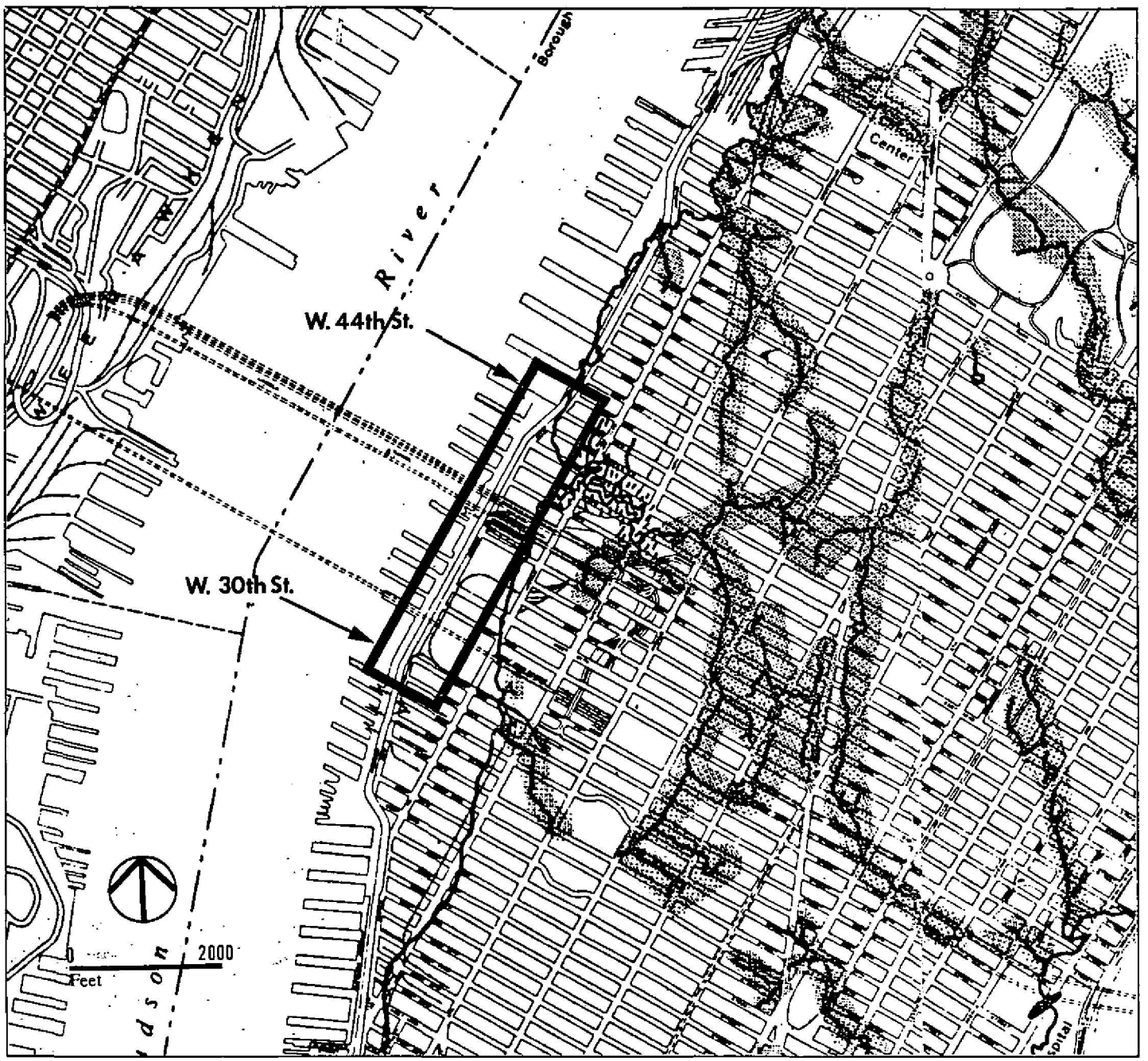
17th-century Native American Trails and Place Names on Manhattan Island

Figure 5-1



17th-century Native American Territories
Source: Brasser 1974

Figure 5-2



ROUTE 9A RECONSTRUCTION PROJECT

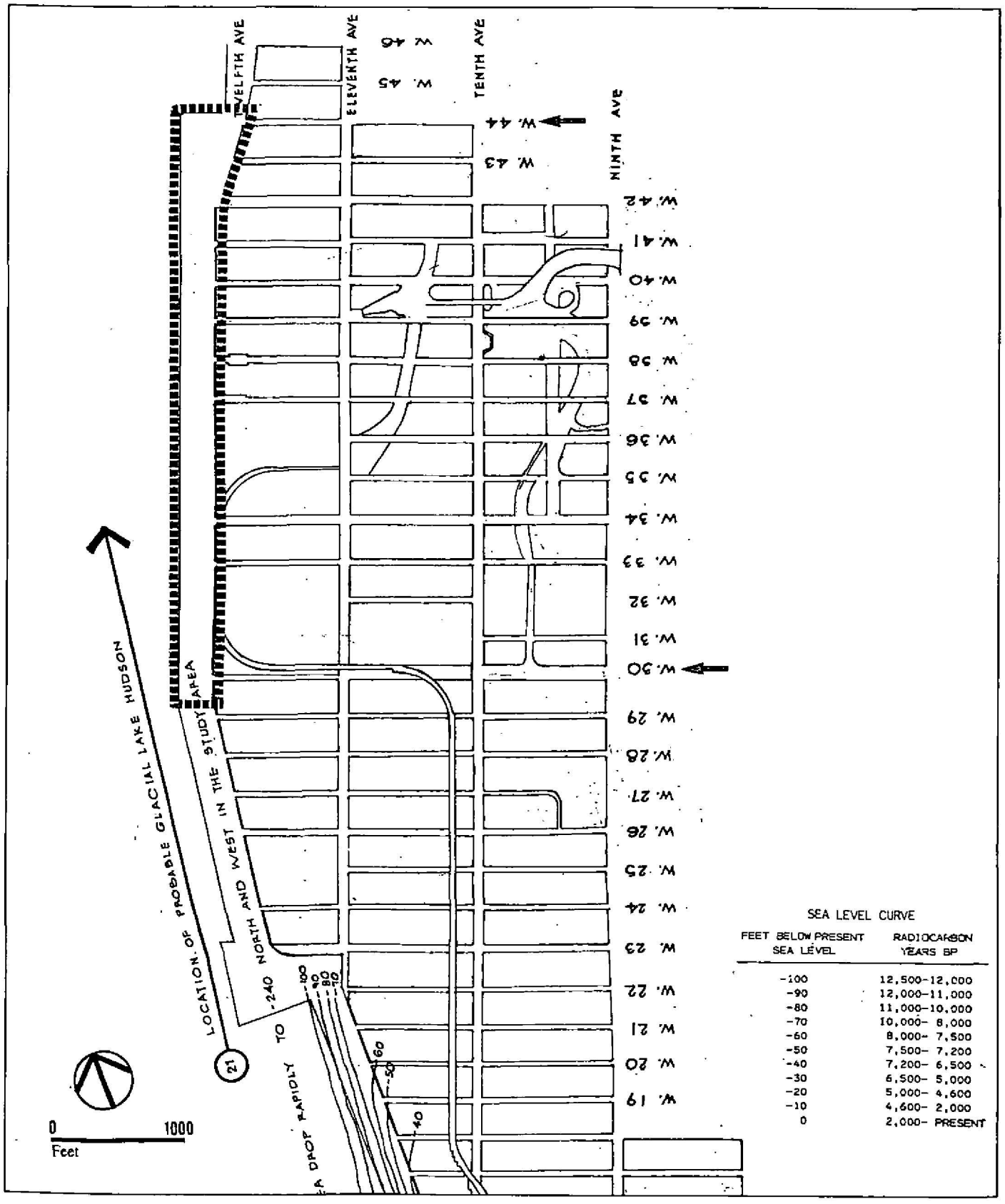
Legend

High Potential Site

Approximate Boundary of Study Area

Detail of Fig. 2: Prehistoric Sites, from the New York City Landmarks Preservation Commission Report "Towards an Archaeological Predictive Model for Manhattan: A Pilot Study"

Figure 5-3



Legend

Extrapolation of Contour Lines

Map Reference Areas

Approximate Boundary of Study Area

Prehistoric Sites Identified in the Westway Project Investigation by Historic Conservation and Interpretation, Inc.

Source: Rutsch, et al. 1983:48

Figure 5-4

A. HISTORIC RESEARCH

HISTORIC BACKGROUND

The first European to view Manhattan was probably Giovanni de Verrazano, when he sailed into New York harbor in 1524. Despite reports of Portuguese explorers entering into the bay prior to Henry Hudson's voyage, historical accounts are sketchy and often can not be verified (Kieran 1982:2). The nature of early trading voyages suggests that even if they did sail into the bay and up the Hudson River, activities were probably confined to the traders' ships, so as not to set foot on unexplored territory. It was not until 1609 when Hudson sailed up the great river, now bearing his name, that Europeans first landed on the island.

In 1613 the New Netherlands Company, which sponsored many voyages to the new world in search of trade goods, set up a storage and trade house on the southern tip of Manhattan (Wilson 1902:395). In addition, several shacks were built for traders settling on the island. As the fur trade grew, so did the population of Manhattan, and the small village expanded. In 1623 the Dutch West India Company received from the Dutch States General, a grant for all lands within Manhattan (Hoag 1905:32). Later, in 1626 Peter Minuit, the Director General, purchased Manhattan Island from the local Indians for what amounted to less than 25 dollars (Jones 1978:10). By 1664 the English had obtained possession of the island, and King Charles II granted the land to the Duke of York.

The early settlement on Manhattan was concentrated on the southern tip of the island. The Wall Street stockade, built in 1653 by the Dutch, demarcated the northern boundary of the city (Works Progress Administration 1939:58). In 1699 the British removed the stockade and the city slowly began to expand northward. At that time, West Street between West 30th and 44th Streets was submerged land, and the shoreline along the Hudson River ran between what are now Tenth and Eleventh Avenues.

Shortly after the Dutch settled Manhattan, the western portion of the island, spanning between what are now West 14th and West 125th Streets, including the project area, became farmland. Now known as the middle-west side, "Bloomingdale" was described as "Fertile, rolling fields, for the most part free of crags or clumps of underbrush" (Works Progress Administration 1939:146). The land was farmed for nearly two centuries and farms in Bloomingdale grew as demand for produce to supply the city increased.

Despite the early settlers' reliance upon waterways for transportation, the Hudson (or North) River was not a popular place for docking, and the East River was more heavily relied upon. The depth of the Hudson and the high bluffs along the shore impeded its usage, and there were few coves to provide protection to ships from the strong northerly winds coming down the valley. In addition, during the winter

months the Hudson was more likely to ice up than the East River (Buttenwieser 1987:27). All of these reasons contributed to the low usage of the Hudson shoreline during the seventeenth and eighteenth centuries.

In 1686 the Dongon Charter was put forth by Lieutenant Governor Thomas Dongon, who granted a charter to the Mayor Alderman of New York City, transferring land ownership from the Crown to the City of New York out to the low water mark (Hoag 1905:32). Private expansion along the Hudson River was slow compared to that along the East River, largely because the small number of wealthy landowners who controlled the use of the waterfront had no interest in expanding their properties since they enjoyed the residential atmosphere (Buttenwieser 1987:32). The earliest filling episode documented along the Hudson occurred between 1699 and 1701. This involved a grant issued to Meiser and others. Twelfth Avenue was still land under water at that time.

In 1730 the Montgomery Charter extended owner privileges two blocks beyond the low water mark, and grants were issued that included the provision for three streets to be built parallel to the river (Hoag 1905:32). The grant ran from Bestaver's Killitie or riverlet, which emptied into the Hudson at the present Charlton Street, to the tip of the island at Fort George, now the intersection of State Street and Battery Place (Rutsch et al. 1983:94). These streets, Greenwich, Washington, and West, did not get built immediately, and development on the middle-west side was not encouraged since the demand for additional space in this area was minimal (Buttenwieser 1987:34). The earliest docks constructed on the Hudson River were south of Vesey Street.

In an attempt to spur the construction of a street along the shore, in 1795 the Common Council passed an ordinance creating an outer street, 70 feet wide, beyond which no grants could be made and no buildings erected. Three years later this was named West Street (Buttenwieser 1987:28). The proposed construction of West Street was intended to compel landowners to pursue landfilling where they were granted water rights. At that time the shoreline meandered between Tenth and Eleventh Avenues.

In 1811 a city plan was devised to provide for a system of streets and avenues for Manhattan. The Commissioner's Plan laid a grid system over the city, disregarding natural topographic features which may have impeded road construction. Regulation of the streets involved grading and filling, removing massive rocks and boulders, and tearing down houses standing in the path of proposed roadway construction. Although the plan was laid down on paper, many of the roads were not actually constructed until decades later. West Street was depicted as a mostly completed outer street extending as far north as Christopher Street, although it was incomplete in far more places than shown. According to the Commissioner's Plan, the Canal Street Basin and Townsend's Dock at West 12th Street were the only major docking facilities on the Hudson north of Harrison Street (Rutsch et al. 1983:245). As a result, the tight development of narrow finger piers at each street-end south of West 59th Street was encouraged.

Although the Common Council was active in their attempt to assure the complete construction of West Street, the filling and development was slow. In the 1820s the project parcel had experienced no filling and the proposed route of Twelfth Avenue remained west of the shoreline (Figure 6-1). On the Hudson in the 1830s water lots were made into land to the west of Tenth Avenue as far north as West 16th Street, however filling north of this was slower (Buttenwieser 1987:40). John Jacob Astor, a realtor and proponent of landfilling, was responsible for filling in water lots between West 14th and West 16th Streets west of Tenth Avenue. Shorefront bluffs were leveled to "make streets and land for factories, warehouses and rowhouses. Debris was simply dumped into the river toward the newly mapped Thirteenth Avenue" (Ibid.).

Two distinct processes were associated with land reclamation and filling which entailed either unstructured harbor buildup and river accretion, or carefully engineered fill put within deliberately placed retaining devices (Geismar 1983:672). In lower Manhattan, ships have been sunk as cribbing in order to stabilize fill (Berger 1983:9). After wharves and piers were built, derelict ships were often sunk, and together these features contributed to and operated to retain fill. In one such case, a burned seventeenth century Dutch ship named the "Tiger" was sunk, only to be encountered during subway excavation at the corner of Dey and Greenwich Streets in 1916 (Solecki 1974:109). During the excavation of the adjacent World Trade Center, archeologists unsuccessfully searched for a portion of the ship not found during the subway construction.

Wood was a popular material for maritime use since it was a durable material which preserved well in water. Wooden cofferdams, wharves and bulkheads were also built as retaining devices, framed with hewn logs, filled with loose stone, and covered with earth (Geismar 1983:30). The use of timber grillage as cribbing, common in Manhattan, has been traced to fifteenth century architect Marcus Vitruvius Pollio. Colonists continued to use this method as both the Dutch and English had previously, largely aided by the abundant supply of wood in the new world. Quays were built which entailed driving a row of wooden piles into the river with diagonal braces bolted to the inside, forming the face work of the quay. Earth and excavvation materials filled the area behind, which was then planked over to form a roadway level with adjacent streets (Ibid.:31). Wooden jetties helped to enlarge the accommodations of ports, and were built in the same manner as quays.

Landfill used to create Twelfth Avenue and the necessary cross roads originated from an array of sources. When the monetary value of clean fill from building excavations was realized, this ceased to be used for filling along the Hudson. (Buttenwieser 1987:41). Often wharves and piers were used as dumping boards, where collected garbage was eventually pushed overboard into scows. Between West 30th and West 44th Streets, only one dumping board was documented. It existed at West 30th Street in 1910 (Ibid.:44). Often garbage collected on piers and wharves, only to be thrown into the adjacent slips as landfill. Rubbish, ash, ballast, street trash, and previously excavated materials deposited along the Hudson pushed the shoreline further west.

By the middle of the 1800s the use of the Hudson waterfront increased as newly designed ships required deeper berths. The introduction of the steamboat in 1807 and the production of larger vessels by local shipbuilders contributed to the need for longer piers in deeper water. The opening of the Erie Canal in 1825 and the demand for coal in New York City also contributed to this need (Buttenwieser 1987:39). To accommodate these industries, new piers were built extending into the Hudson. In the 1830s a large influx of immigrants spurred the filling of water lots west of Tenth Avenue to provide land for tenements. However, land west of Eleventh Avenue remained largely industrialized.

Prior to 1844 private parties or individual owners built the piers, wharves, and slips along the rim of Manhattan (Hoag 1905:36). The waterfront conditions along either side of the island during the middle of the nineteenth century were considered deplorable. The solid base construction of the piers prohibited the flow of sewage out to sea, which created disease-infested waters (New York Pier and Warehouse Co. 1869:58). Recurrent plagues drove New Yorkers northward into cleaner residential districts. The piers themselves were also in a state of disrepair. Transportation of goods to and from the waterfront on the Hudson River was difficult due to the large volume of freight and numerous pedestrians.

In 1847 the Hudson River Railroad was organized and a track was laid from Chambers Street to West 30th Street (Rutsch et al. 1983:258). The railroad served waterfront docks and helped to spur the industrial and commercial nature of the middle-west side of Manhattan. By 1851 a railroad station was opened at West 30th Street and Eleventh Avenue, and by 1852 the Eight Avenue Railroad opened a line between Chambers and West 51st Streets (Works Progress Administration 1939:146). Also in 1852 the Hudson River Railroad had built a large yard at West 31st Street between Eleventh and Twelfth Avenues, consisting of a station house, car house, baggage office building, and engine house. "In this yard, locomotives were replaced by horses, which drew the cars further downtown. For this reason, the West 31st Street Station was the company's main New York depot until Grand Central Station opened in 1871" (Rutsch et al. 1983:259). The use of railroads increased and 1875 marked the completion of elevated railways in Manhattan, facilitating travel to and from the southern part of the city (McCabe 1882:239). The railways maintained an interest in shorefront shipping, and in 1889 the Hudson River Railroad built a covered pier at the foot of West 32nd Street (Vollmer Associates 1987:3-14).

Ease of access to the area enticed speculators to construct densely clustered tenements north of West 30th street on cheaply acquired land (Works Progress Administration 1939:147). The industrial nature of the middle-west side is also suggested by a report of the neighborhood's sanitary conditions during the nineteenth century. The ill effects of industrial factories on the lives of New Yorkers at the southern end of the island had driven industries further north into the cheap undeveloped land of the middle-west side. The "Special Nuisances" particular to the area included swill milk producers, stables, breweries, hide and fat companies, among others, all associated with the "necessarily offensive materials and operations which are incident to civic life" (Citizens Association of New York 1865:xcii).

Shanties were common along the shores of the Hudson, and were often occupied by Irish and German rag-pickers. Gutters along streets were formed of unevenly laid stones, often trapping solid waste. The sewers themselves were "ten to fifteen feet below the open surface" (Citizens Association of New York 1865:296). The Weehawken Ferry Dock at the foot of West 42nd Street facilitated coal shipping and was often covered with animals transported into the city for slaughtering. The privies of houses in the vicinity were reported as often overflowing into the yards and streets (Ibid.).

In the 1870s new piers facilitated car floats between West 30th and West 33rd Streets, and gas companies were building landings for coal barges and utility floats at West 44th Street (Buttenwieser 1987:57). The Manhattan Market building was built in 1872 between West 34th and West 35th Streets and Eleventh and Twelfth Avenues (Figure 6-2). The brick, iron, and glass building partially burned in the 1870s and the remaining standing portion of the structure was razed in 1938 (Vollmer Associates 1987:3-14).

Also in 1870, the Department of Docks was created and, in the following year, the Commissioner of the Land Office granted rights and land to New York City for the construction of wharves, bulkheads, docks, piers, basins, and slips. The McClellan plan resulted in the construction of a solid block and granite bulkhead wall around the southern half of Manhattan between West 61st and East 51st Streets. The wall was placed outside of the previously existing bulkhead to allow for the expansion of streets and the construction of Marginal Street (Figure 6-3). Directly along the shoreline adjacent to the bulkhead, Marginal Street was designed to handle shorefront traffic, relieving congestion from Twelfth Avenue and West Street (Buttenwieser 1987:73).

The width of Twelfth Avenue, together with Marginal Street, was slated as 250 feet as per the McClellan Plan. However, in the 1890s Twelfth Avenue in this vicinity was still cluttered with intrusions due to the tremendous shorefront activity (Rutsch et al. 1983:297). *Transatlantic crossings in the late nineteenth and early* twentieth centuries became very competitive, and steamship companies vied for space at the few longer piers that existed south of Perry Street (Buttenwieser 1987:83). Each year steamships were built longer and longer, and New York's pier space could not keep up with the needs of steamship companies.

The early twentieth century development of "Bloomingdale" was slow compared to other areas of Manhattan. The area remained characterized by poor industrial conditions and undesirable living conditions for industrial workers (New York City Department of Docks and Ferries 1913:3). Little private development occurred on cross streets due to the restricted movement and development of upland properties. Twelfth Avenue was stagnant, not benefitting from the vast volume of waterfront commerce. The railroad track on Eleventh Avenue made crossings hazardous to pedestrians and prevented residential development in the vicinity (Stern et al. 1987:427). Additionally, the presence of New York Central Railroad's West 30th Street yard, between West 30th and West 37th Streets and Eleventh and Twelfth

Avenues, dominated the character of the community (Works Progress Administration 1939:156). The 1906 Saxe Law eliminated railroads from grade level which resulted in the West Side Improvement Plan for the removal of tracks from Eleventh Avenue (Buttenwieser 1987:159). The plan, implemented between 1910 and 1920, resulted in the elevation of tracks south of West 59th Street.

The early twentieth century pier plan, proposed by the Docks Department, provided for the construction of 1000 foot piers between West 48th and West 50th Streets. Although the piers were actually north of this section of the project area, it was necessary to realign the route of Twelfth Avenue north of West 42nd Street in order to accommodate the newly built piers. Pier construction consisted of removing 250 feet of land and fill along the shoreline to allow for long slips. Between West 42nd and West 44th Streets, Twelfth Avenue was moved eastward to traverse what were previously Blocks 1090 and 1091. The original route of Twelfth Avenue between these two cross streets is still within the project area, now part of Marginal Street.

In 1937 the Lincoln Tunnel was built beneath the Hudson River connecting West 39th Street with Weehawken, New Jersey. The entrance to the tunnel spanned between West 38th and West 39th Streets. In the 1930s West Street was edged with busy docks and was the "main highway for the city's incoming and outgoing supplies" (Works Progress Administration 1939:58). The West Side Highway (Highway) was constructed in the 1920s and 1930s to help alleviate waterfront congestion (Figure 6-4). In the 1930s the Highway ran from its northern border at West 72nd Street as far south as Duane Street where entrance and exit ramps were located (Works Progress Administration 1939:71). By 1947 the elevated structure continued as far south as Rector Street. Between Rector Street and West 39th Street the "viaduct columns were supported on grillage-type footings which in turn were supported by 18 inch diameter steel pipe piles driven to bedrock and filled with concrete" (Vollmer Associates 1989:10). The Highway was demolished south of West 43rd Street in the 1970s, and an at-grade roadway was built to replace it. The remainder of the Highway south of West 59th Street was removed in 1989.

WEST SIDE HIGHWAY CONSTRUCTION

In 1925 Nathan Miller, Manhattan Borough President, outlined plans for an elevated highway running from Canal to West 72nd Street, to alleviate traffic from Twelfth Avenue and Marginal Street. The plan was approved by Governor Smith in 1926 and construction was started in 1927 (Stern et al. 1987:698). The City and Hudson River Railroad Company shared in the expense of construction. In 1929 the Depression caused a temporary halt in construction, and when funds ran low, Robert Moses convinced Governor Herbert Lehman that the entire highway was a continuous grade crossing and thus could receive funding from the Grade-Crossing Elimination Fund (Ibid.:698). Highway construction was completed between Canal Street and 72nd Street, and opened by 1938 (Csanyi 1938:177). The construction along the shoreline for the highway caused a tremendous amount of disturbance, as described below.

According to the Contract Bid proposal for the construction of the West Side Highway, the construction entailed numerous stages. The following is a list of requirements for the construction of the highway:

> Fill and Backfill-"All trenches shall be backfilled, and backfill shall include clean earth, clean ash, clean cinders, and stone."
>
> Sidewalks-"Sidewalks shall be graded to a depth of 10" below the finished sidewalk grade."
>
> Piles-"Piles that are less than 24' shall be constructed of cement and reinforced steel." Some piles are over 40 feet long.
>
> Width of Excavation-"For each as follows: sewers, basin counts, drains, manholes, inlets...6" wide pipe=2'6" wide trench. 8" wide pipe=2'8" wide trench. 10" wide pipe=2'10" wide trench. 12" wide pipe=3' wide trench. 15" wide pipe=3'3" wide trench. 18" wide pipe=3'6" wide trench. 24" wide pipe=4' wide trench. For all concrete sewers, one foot on each side of the sewer, above the foundation. For manholes, risers, basins, overflow chambers, and inlets, one foot on all sides of the structure above the foundation."
>
> Depth of Excavation-"Water pipe trenches: 4" pipe=2.4' wide, and 1' below top of pipe. 6" pipe=2.5' wide, and 1.1' below top of pipe. 8" pipe=2.7' wide and 1.3' below the top of pipe. 12"
>
> pipe=3' wide and 1.6' below the top of pipe. 16" pipe=3.3' wide and 2' below the top of pipe. 20" pipe=3.7' wide and 2.3' below top of pipe. 24" pipe=4' wide and 2.7' below top of pipe."
>
> Hydrants-"Total excavation in addition to the pipe trench is 4' long and 4' wide, the depth to 15" below the bottom of the hydrant."

> Restoration of Park Areas-"Excavate, regrade and replace top soil and subsoil within the limits of...park."

General construction activities which caused subsurface disturbance entailed the following:

> Remove rock ledge from areas adjacent to sewer structures by blasting, barring and wedging....If necessary to relocate water lines-permission must be granted by the Department of Water Supply, Gas and Electric. Fence posts extend 3' into the ground. Existing granite-block pavement will be covered with cement. Install under-ground lead-covered cables in the conduit provided for the Fire Alarm System (City of New York 1926:45-138).

The construction of the highway during the 1930s entailed sinking cast-iron cassions between 40 and 48 feet deep, and 4 to 5 feet wide. According to a report on the construction of the Miller Elevated Highway, subsurface conditions encountered during excavation proved to be quite interesting.

> The original shoreline was much farther inland than it is at present and various buildings, docks and piers were built in what is now Twelfth Avenue. All these subsurface structures were allowed to remain when the area was filled in to form Twelfth Avenue...Rock-filled cribs and old bulkhead walls were frequently encountered. Such conditions were not at all unusual (Harrington 1934:124).

BLOCK HISTORIES

The block histories presented are based on cartographic sources. An extensive array of maps and atlases were reviewed in order to observe potentially sensitive archeological features within the project area. Maps and atlases were reviewed at approximately five-to-ten year intervals. In some cases, several maps were used dating to the same period since the accuracy of each was difficult to ascertain. It was believed that this is sufficient to identify potentially sensitive areas and accurately track landfilling episodes. Buildings or features present for less than five to ten years rarely are constructed in such a manner as to leave a vertical or horizontal footprint on the landscape. Additionally, disturbance by these short term structures tends to be minimal. The chronological description presented is based on the atlases and maps reviewed. A full title list of cartographic sources referenced is provided in the Map and Atlas Section of the Bibliography, and the repositories where research was conducted are listed in the Methodology section. This section only presents potentially sensitive areas without assessing disturbance. Subsequent impact to these areas is presented in the Subsurface Disturbance section.

Historical development has been traced along Twelfth Avenue for the nineteenth and twentieth centuries. The filling and development of Twelfth Avenue is presented from south to north, with each section demarcated by adjacent cross streets. Each section presented includes the development that occurred between the south boundaries of both the southern and northern cross streets.

The actual route of Twelfth Avenue between West 30th and West 42nd Street was planned and construction commenced as landfilling permitted. These areas were never subjected to lotting or development, and there would be little gained by acquiring land transaction records. Therefore, land transaction records were only reviewed for those sections of the project area that included parcels that were lotted at some time historically. Water lot grants were not included. Between West 42nd and West 44th Streets two lotted and developed blocks existed within the project area. Here the route of Twelfth Avenue was moved inland from its original shoreline path in the 1930s. Blocks 1090 and 1091 each possessed developed lots, now traversed by Twelfth Avenue, within the project area. The land transaction records were acquired for these two blocks.

All lot numbers referenced in this section correspond to those visually presented on Figure 6-5 for clarification of each lot's location. For consistency, the lot numbers presented reflect the location of the lots as per the 1879 Bromley atlas. At later dates, lots were often renumbered, subdivided, or expanded to include a number of lots. In order to avoid confusion, the 1879 lot numbers were consistently used to refer to the specific location of features.

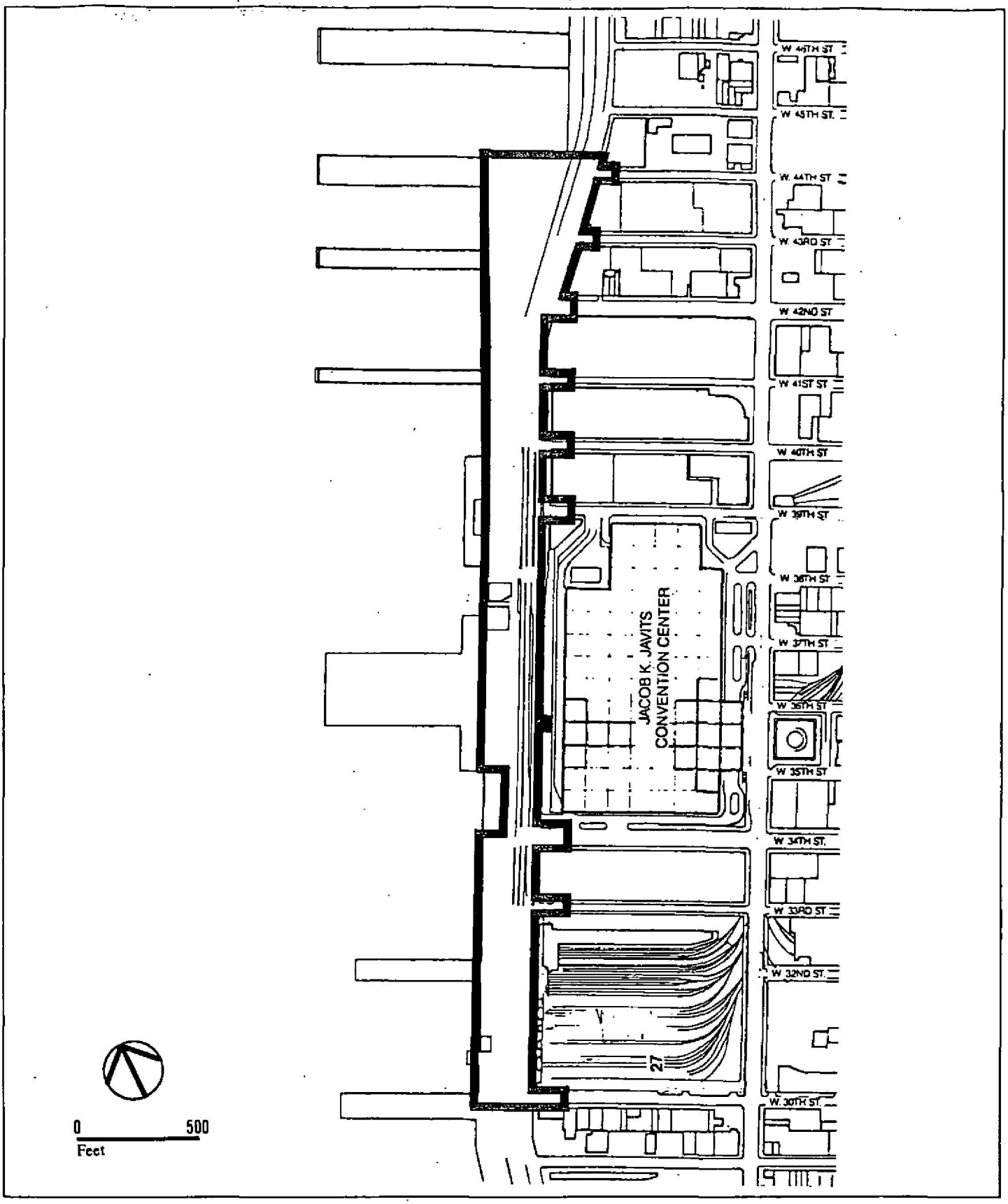
While performing cartographic research, it was noted that there were several inconsistencies and problems with some of the resources as discussed below.

Unfortunately maps compiled prior to the beginning of the nineteenth century depicted development of the city core at the southern end of the island, largely

ignoring the undeveloped land to the north. Therefore, the maps reviewed for this section date from 1811 and thereafter. Since the project area was west of the shoreline prior to the middle of the nineteenth century, this did not prove to be a problem. The 1859 Viele Map of the City of New York, showing the original topography of Manhattan Island, does not pay attention to detail and obliterates many of the smaller features noted by Randel within the project area. Since the original historic shoreline is east of the project area, the 1859 Viele map was not included in this report.

Documenting development in the 1860s posed a problem since there were few resources found dating to this period. During the Civil War, New York's cartographers were redirected, and atlases were not produced in the abundance that they were in the 1850s (Alice Hudson, Director of the Map Division, New York Public Library, personal communication to Faline Schneiderman-Fox, April 1989). The only detailed map found dating to this period, Dripps 1868 Plan of New York City, showed Twelfth Avenue as a continuous road along the shoreline of the river, uninterrupted by intrusions. It seems that Dripps simply depicted the road as it was supposed to be for convenience.

The Galt and Hoy Birds-Eye View of New York more accurately reflected development shown on the later 1885 Robinson Atlas than its given date of 1879, and therefore was not heavily relied upon. The 1879 Bromley atlas of New York was more reliable for that date.



Legend

Archeological Study Area Boundaries

Reference map for the following section
West 30th Street to West 44th Street

West 30th Street to West 31st Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1852 Dripps - (Figure 6-1) Twelfth Avenue between West 30th and West 31st Streets is west of the original shoreline, in the Hudson River.

1859 Perris - (Figure 6-6) In the route of what will be West 30th Street is a pier extending from the shoreline, through the routes of what will be Twelfth Avenue and Marginal Street.

1868 Dripps - Twelfth Avenue and Marginal Street are shown filled in, although this is probably a cartographic error.

1874 Viele - A pier is shown in West 30th Street as on the 1859 Perris map, and there is a second pier north of it extending from the middle of the block through the path of Twelfth Avenue, but not into Marginal Street.

1879 Bromley - (Figure 6-2) The pier in West 30th Street is labeled as a City pier. All else appears the same as on the 1874 Viele map.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Twelfth Avenue, Marginal Street, and West 30th Street are entirely filled in.

1913 Hyde - (Figure 6-9) There is a small wooden structure just north of West 30th Street in the west side of Marginal Street which does not appear to be a pier shed.

1925 Bromley - In the middle of the block between West 30th and West 31st Streets is a structure labeled "Coal" fronting the shoreline. The small building that appeared on the 1913 Hyde atlas is still present.

1930 Bromley - Same as the 1925 Bromley atlas. The coal shed is labeled "Weber McLoughlin Coal Co."

1950 Hyde - The coal shed is still present, and the smaller structure that appeared on the 1913 Hyde atlas in Marginal Street has been removed. The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

The routes of Twelfth Avenue and Marginal Street were west of the original shoreline, and were filled in between 1897 and 1902. A pier was present in the

route of West 30th Street and traversed the route of Twelfth Avenue and Marginal Street. The pier stood between at least 1859 and when the route was filled in 1902. A second pier was built mid-way between West 30th and West 31st Streets by 1874, and also stood in the route of Twelfth Avenue. Both piers may have become part of the landfill.

HISTORIC SENSITIVITY

In addition to the two piers mentioned above which are considered to be sensitive, there were two small sheds in Marginal Street which stood between at least 1913 and 1950.

West 31st Street to West 32nd Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1859 Perris - (Figures 6-1 and 6-6) Twelfth Avenue between West 31st and West 32nd Street is west of the original shoreline, in the Hudson River.

1868 Dripps - There is a pier off of the end of West 31st Street through the path of Marginal Street. Both Twelfth Avenue and Marginal Street appear entirely filled in, although this appears to be incorrect according to later maps.

1874 Viele - Twelfth Avenue and Marginal Street are not yet filled in, as they were shown on the 1868 Dripps map. Just south of West 32nd Street a pier extends through the path of Twelfth Avenue and into Marginal Street. The West 31st Street pier does not appear on the map.

1879 Bromley - (Figure 6-2) The pier just slightly south of West 32nd Street has been widened on the northern side, to extend into West 32nd Street. The pier houses a freight shed and still extends west through the routes of what will be Twelfth Avenue and Marginal Street. It is labeled "NYC and H.R.R. Co."

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Both Twelfth Avenue and Marginal Street have been entirely filled in, and there is a pier shed extending from West 31st Street to West 32nd Street along the shoreline in Marginal Street.

1913 Hyde - (Figure 6-9) Same as the 1902 Bromley atlas.

1925 Bromley - Same as the 1902 Bromley atlas.

1930 Bromley - Same as the 1902 Bromley atlas.

1950 Hyde - The West Side Highway has been built on Twelfth Avenue, and all else is the same as on the 1902 Bromley atlas.

SHORELINE FILL

Twelfth Avenue and Marginal Street both experienced filling between 1897 and 1902. A pier, built by 1874 slightly south of West 32nd Street, was expanded through West 32nd Street by 1879 and is therefore listed as potentially sensitive in the West 32nd to West 33rd Street Block.

HISTORIC SENSITIVITY

Pier sheds were present along the shoreline in Marginal Street which stood between at least 1902 and 1950.

West 32nd Street to West 33rd Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1859 Perris - (Figures 6-1 and 6-6) The route of Twelfth Avenue between West 32nd and West 33rd Streets is west of the original shoreline, in the Hudson River.

1868 Dripps - Twelfth Avenue and Marginal Street are both shown as filled in, although this is incorrect according to later maps.

1874 Viele - Twelfth Avenue and Marginal Street are both still land under water. There is a pier mid-way between West 32nd and West 33rd Streets extending west through what will be Twelfth Avenue and Marginal Street.

1879 Bromley - (Figure 6-2) A pier slightly south of West 32nd Street (built by 1874 and discussed in the West 31st to West 32nd Street section) has been widened to extend into the path of West 32nd Street through Twelfth Avenue and Marginal Street. The pier houses a freight shed and is labeled "NYC and H.R.R. Co." The second pier in the middle of the block is labeled "Shed."

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Twelfth Avenue, Marginal Street, and West 32nd Street have all been filled in. There is a pier shed spanning the shoreline between West 32nd and West 33rd Streets along the shoreline in Marginal Street.

1913 Hyde - (Figure 6-9) The pier shed is shown extending from West 32nd Street north to the middle of the block. North of this to West 33rd Street is now covered with railroad tracks.

1925 Bromley - West 32nd Street is labeled "Pennany. and LI RR Tunnel" and there is a dotted line through West 32nd Street indicating the tunnel's route.

1930 Bromley - Same as the 1925 Bromley atlas.

1950 Hyde - The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

Twelfth Avenue and Marginal Street were both land under water prior to landfilling which occurred between 1897 and 1902. A pier at West 32nd Street, built by 1874, stood in the route of Twelfth Avenue and Marginal Street and may have become part of the landfill. A second pier extended west mid-way between West 32nd and West 33rd Streets through the proposed route of Twelfth Avenue and Marginal Street. The pier, built by 1874, may have also become part of the landfill.

HISTORIC SENSITIVITY

In addition to the two piers discussed above, there was a pier shed in Marginal Street along the shoreline which stood between at least 1902 and 1950.

West 33rd Street to West 34th Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1859 Perris - (Figures 6-1 and 6-6) The route of Twelfth Avenue between West 33rd and West 34th Street is west of the original shoreline, in the Hudson River.

1868 Dripps - Twelfth Avenue is filled and there is a pier mid-block through the route of what will be Marginal Street. The filling is probably incorrect according to later maps.

1874 Viele - From the middle of the block between West 33rd and West 34th Streets north to West 34th Street, Twelfth Avenue has been filled in.

1879 Bromley - (Figure 6-2) There is a pier in the path of West 33rd Street extending through Twelfth Avenue and Marginal Street. Twelfth Avenue is still unfilled between this pier and the middle of the block. A grain elevator has been built west of Twelfth Avenue in what will be Marginal Street where Twelfth Avenue has experienced filling.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Twelfth Avenue, West 33rd Street, and Marginal Street have all been entirely filled. There is a large structure in Marginal Street just south of West 34th Street.

1913 Hyde - (Figure 6-9) The structure which appeared in 1902 has been removed, and there are railroad tracks in this location. There is one pier shed from West 33rd Street, half way north to West 34th Street along the shoreline in Marginal Street.

1925 Bromley - Same as the 1913 Hyde atlas.

1930 Bromley - Same as the 1913 Hyde atlas.

1950 Hyde - The West Side Highway has been built on Twelfth Avenue. There is one small structure in Marginal Street, west of the Highway.

SHORELINE FILL

Twelfth Avenue and Marginal Street were both filled between 1897 and 1902. A pier stood at West 33rd Street from at least 1879 through 1902, and may have become part of the Twelfth Avenue and Marginal Street landfill.

HISTORIC SENSITIVITY

In addition to the West 33rd Street pier, there was a small temporary structure in Marginal Street which was built by 1902 and was removed by 1913. A pier shed was built north from West 33rd Street by 1913 and stood through at least 1950.

West 34th Street to West 35th Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1852 Dripps - (Figure 6-1) The route of Twelfth Avenue between West 34th and West 35th Streets was west of the original shoreline, in the Hudson River.

1859 Perris - (Figure 6-6) There is a pier in the path of West 34th Street extending through the path of what will be Twelfth Avenue.

1868 Dripps - Twelfth Avenue appears filled, although this is incorrect according to later maps.

1874 Viele - Twelfth Avenue appears filled in only at West 34th Street. The West 34th Street pier has been extended west through the route of what will be Marginal Street.

1879 Bromley - (Figure 6-2) Twelfth Avenue is entirely filled and Marginal Street is filled in on the eastern portion, half way out to the bulkhead line. Marginal Street between the two cross roads is labeled "Cattle Yards," and there is a small square structure just south of West 35th Street in the cattle yard.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Marginal Street has been entirely filled. There are two square structures south of West 35th Street in Marginal Street, and one smaller square structure just north of West 34th Street also in Marginal Street. The square structure which appeared on the 1879 Bromley atlas appears to have been removed or replaced.

1913 Hyde - (Figure 6-9) The only buildings shown are two small structures in Marginal Street north of West 34th Street. One of these appears to have been present on the 1902 Bromley atlas, while the second is an addition.

1925 Bromley - All of the structures have been removed from Marginal Street.

1930 Bromley - Same as the 1925 Bromley atlas.

1950 Hyde - The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

Twelfth Avenue first experienced filling by 1874 and the route was entirely filled by 1879. Marginal Street was filled in between 1874 and 1902. A pier at West

34th Street first appeared by 1859 and may have become part of the Twelfth Avenue landfill.

HISTORIC SENSITIVITY

In addition to the West 34th Street pier, there were several short term structures in Marginal Street between 1902 and at least 1930.

West 35th Street to West 36th Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1859 Perris - (Figures 6-1 and 6-6) The route of Twelfth Avenue between West 35th and West 36th Street is west of the original shoreline, in the Hudson River.

1868 Dripps - Twelfth Avenue is filled and there is a pier off of West 35th Street through the route of what will be Marginal Street.

1874 Viele - Twelfth Avenue is not filled as shown on the 1868 Dripps map, and there is a pier in the path of West 35th Street which runs through the path of Twelfth Avenue and Marginal Street.

1879 Bromley - (Figure 6-2) Twelfth Avenue is entirely filled, and Marginal Street has been partially filled although not yet as far west as the bulkhead line.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Marginal Street is entirely filled. Just north of West 35th Street in Marginal Street on the waterfront is a square structure extending half way north to West 36th Street labeled "35th Street Station."

1913 Hyde - (Figure 6-9) The 35th Street station is gone, and there are railroad tracks where the structure previously stood.

1925 Bromley - Same as the 1913 Hyde atlas.

1930 Bromley - Same as the 1913 Hyde atlas.

1950 Hyde - The West Side Highway appears in Twelfth Avenue.

SHORELINE FILL

Twelfth Avenue was entirely filled between 1874 and 1879. Marginal Street first experienced filling between 1874 and 1879, and was entirely filled by 1902. By 1874 a pier stood in the route of West 35th Street, and may have become part of the Twelfth Avenue and Marginal Street landfill.

HISTORIC SENSITIVITY

The pier discussed above is considered to be sensitive. Additionally, the West 35th Street station in Marginal Street was built prior to 1902 and was razed prior to 1913.

West 36th Street to West 37th Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1859 Perris - (Figures 6-1 and 6-6) The route of Twelfth Avenue between West 36th and West 37th Street is land under water.

1868 Dripps - Twelfth Avenue appears filled.

1874 Viele - From the middle of the block north to West 37th Street, the eastern border of Twelfth Avenue has been filled in.

1879 Bromley - (Figure 6-2) Twelfth Avenue and West 36th Street have been filled. Marginal Street has been partially filled, but not yet as far west as the bulkhead line.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) There has been some additional filling in Marginal Street, although it still does not extend as far west as the bulkhead line. There is a pier off of West 36th Street through the route of Marginal Street. Half way between West 36th and West 37th Streets is a loading dock extending through Marginal Street, associated with a railroad freight yard east of the project area.

1913 Hyde - (Figure 6-9) Marginal Street has been entirely filled, and the loading dock has been removed. The pier at West 36th Street now extends west of Marginal Street.

1925 Bromley - Same as the 1902 Bromley. The Marginal Street fill shown on the 1913 Hyde atlas is not present, although the loading dock and pier are present.

1930 Bromley - Same as the 1925 Bromley atlas.

1950 Hyde - Marginal Street is completely filled, and the West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

Twelfth Avenue and Marginal Street were originally east of the shoreline. Landfilling occurred in Twelfth Avenue between 1874 and 1879. In Marginal Street, landfilling began between 1874 and 1879, although some ambiguity remains as to when the route was actually entirely filled. Twentieth century maps indicate that it was filled sometime between 1913 and 1950. A pier stood at the foot of West 36th Street by 1902 in the route of Marginal Street. This may have become part of the landfill.

HISTORIC SENSITIVITY

No additional features were identified other than the pier discussed above.

West 37th Street to West 38th Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1859 Perris - (Figures 6-1 and 6-6) Twelfth Avenue between West 37th and West 38th Streets is west of the shoreline, in the Hudson River.

1868 Dripps - Twelfth Avenue appears filled.

1874 Viele - Twelfth Avenue is partially filled. There is a pier extending from West 37th Street through the path of what will be Marginal Street. West 37th Street is filled through Twelfth Avenue.

1879 Bromley - (Figure 6-2) There is no filling in Twelfth Avenue, and the pier is still shown extending from West 37th Street through Twelfth Avenue and Marginal Street.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Twelfth Avenue and Marginal Street are completely filled. Just north of West 37th Street on the waterfront, north to the middle of the block, is a square structure in Marginal Street.

1913 Hyde - (Figure 6-9) Same as the 1902 Bromley atlas.

1925 Bromley - The square structure is labeled "Penna. RR. Freight Station." There is a second, smaller structure north of the freight station, also in Marginal Street.

1930 Bromley - Same as the 1925 Bromley atlas.

1950 Hyde - The southern structure is still present, while the northern structure is gone. A larger structure has been built in Marginal Street along the waterfront, just south of West 38th Street. The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

The route of Twelfth Avenue first appeared filled in 1874, although later maps indicate that the fill either never existed or was removed. The route was permanently filled between 1897 and 1902. Marginal Street was entirely filled between 1897 and 1902. A pier at West 37th Street was built by 1874 and may have become part of the landfill in both Twelfth Avenue and Marginal Street.

HISTORIC SENSITIVITY

In addition to the West 37th Street pier, there were two structures in Marginal Street dating to 1902 and 1925. The 1902 structure stood through 1950, while the 1925 building was removed by 1950. An additional building was constructed in Marginal Street by 1950.

West 38th Street to West 39th Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1859 Perris - (Figures 6-1 and 6-6) The route of Twelfth Avenue between West 38th and West 39th Streets is west of the shoreline, in the Hudson River.

1868 Dripps - Twelfth Avenue is filled and there is a pier at the foot of West 38th Street running through the route of Marginal Street.

1874 Viele - There is some filling in Twelfth Avenue between West 38th and West 39th Street. West 38th Street is filled through Twelfth Avenue, and a pier extends west off the end of it through the path of what will be Marginal Street.

1879 Bromley - (Figure 6-2) There is no filling in Twelfth Avenue as previously seen on the 1874 Viele map. The pier at the foot of West 38th Street extends through the route of Twelfth Avenue and Marginal Street.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) The eastern border of Twelfth Avenue has been filled and the pier at West 38th Street is still present.

1913 Hyde - (Figure 6-9) Half way between West 38th and West 39th Streets there are several small sheds extending from east of the project area into Twelfth Avenue. Twelfth Avenue and Marginal Street are still incomplete.

1925 Bromley - The sheds have been removed, and there is no additional filling in the project area.

1930 Bromley - Twelfth Avenue is entirely filled and there is partial filling in Marginal Street. The pier is still extending from West 38th Street through the route of Marginal Street.

1950 Hyde - Marginal Street is completely filled and the Lincoln Tunnel is under Marginal Street and Twelfth Avenue at West 39th Street. The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

Twelfth Avenue first appeared to have been partially filled in 1874, although later maps indicate that either this fill was never present or it was removed. Permanent filling occurred between 1902 and 1930. Marginal Street was filled between 1930 and 1950. A pier at West 38th Street was built by 1868 and may have become part of the landfill.

HISTORIC SENSITIVITY

In addition to the West 38th Street pier there were several short term sheds in Twelfth Avenue between 1913 and 1925.

West 39th Street to West 40th Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1852 Dripps - (Figure 6-1) The route of Twelfth Avenue between West 39th and West 40th Streets is west of the shoreline, in the Hudson River.

1859 Perris - (Figure 6-6) A pier extends from West 39th Street through the path of Twelfth Avenue and Marginal Street. There is no filling in the project area.

1868 Dripps - Twelfth Avenue is shown filled, and the pier at West 39th Street extends west in the path of what will be Marginal Street.

1874 Viele - Twelfth Avenue is shown as only being partially filled, and the pier is again shown as extending through the path of Twelfth Avenue and Marginal Street as on the 1859 Perris map.

1879 Bromley - (Figure 6-2) Twelfth Avenue has no filling as seen on previous maps, and the West 39th Street pier is still present.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Same as the 1879 Bromley atlas.

1913 Hyde - (Figure 6-9) Same as the 1879 Bromley atlas.

1925 Bromley - The eastern border of Twelfth Avenue is filled although there is still no filling in Marginal Street. The West 39th Street pier still runs through Marginal Street.

1930 Bromley - Twelfth Avenue has been completely filled and Marginal Street is partially filled, but not yet as far west as the bulkhead line. The West 39th Street pier is still present.

1950 Hyde - The Lincoln Tunnel runs under West 39th Street east and west, and Marginal Street has been completely filled. The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

Twelfth Avenue first appeared to have been partially filled in 1874 although later maps indicate that either this filling never actually existed or it was removed. Later filling began by 1925 and was completed by 1930. Filling in Marginal Street started between 1925 and 1930 and was complete by 1950. The West 39th Street pier stood

in the route of Twelfth Avenue and Marginal Street since it was built prior to 1859 and may have become part of the landfill.

HISTORIC SENSITIVITY

The West 39th Street pier previously mentioned is the only potentially sensitive feature identified.

West 40th Street to West 41st Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1852 Dripps - (Figure 6-1) The route of Twelfth Avenue is west of the shoreline, in the Hudson River.

1859 Perris - (Figure 6-6) A short pier extends west from West 40th Street through the path of Twelfth Avenue, but does not extend into the route of what will be Marginal Street.

1868 Dripps - Twelfth Avenue is completely filled in and the West 40th Street pier depicted on the 1859 Perris map is no longer present, although it is outlined.

1874 Viele - Same as the 1868 Dripps map.

1879 Bromley - (Figure 6-2) There is no filling in Twelfth Avenue as seen on the 1868 and 1874 maps, however the West 40th Street pier has reappeared in its original position through Twelfth Avenue and now extends through Marginal Street.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Same as the 1879 Bromley atlas.

1913 Hyde - (Figure 6-9) Same as the 1879 Bromley atlas.

1925 Bromley - Same as the 1879 Bromley atlas.

1930 Bromley - Twelfth Avenue has been filled, and there is partial filling in Marginal Street although it does not extend as far west as the bulkhead line. The Central Railroad of New Jersey freight station pier at West 40th Street is still present extending through Marginal Street.

1950 Hyde - Marginal Street has been entirely filled and the West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

The first filling in Twelfth Avenue appeared to occur between 1859 and 1874, however later maps indicate that either this filling never actually occurred or it was subsequently removed. Later filling occurred between 1925 and 1930. Marginal Street first experienced filling between 1925 and 1930 and the route was entirely filled by 1950. A pier at West 40th Street, built by 1859, traversed Twelfth Avenue and Marginal Street and may have become part of the landfill.

HISTORIC SENSITIVITY

The West 40th Street pier previously discussed is the only potentially sensitive historic feature identified in this area.

West 41st Street to West 42nd Street - Twelfth Avenue and Marginal Street.

CARTOGRAPHIC REVIEW

1811 Commissioners through 1852 Dripps - (Figure 6-1) The route of Twelfth Avenue is land under water.

1859 Perris - (Figure 6-6) From the middle of the block north to West 42nd Street, there are coal sheds extending from east of the project area onto landfill in Twelfth Avenue.

1868 Dripps - Twelfth Avenue appears entirely filled and there is a pier extending from the middle of the block through the path of what will be Marginal Street.

1874 Viele - There is some filling in Marginal Street, and there is a dock complex between West 41st and 42nd Streets. A pier extends west from West 41st Street off of Twelfth Avenue through the path of Marginal Street. The pier previously shown in the middle of the block is shown west of it's previous location, now in Marginal Street. A wide pier just below West 42nd Street also runs through the path of Marginal Street.

1879 Bromley - (Figure 6-2) The southern two piers have been removed, leaving no fill in Twe lfth Avenue at West 41st Street. There is a new pier off of Twelfth Avenue in the route of Marginal Street, slightly north of West 41st Street. The northern pier is still present.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) The northernmost pier has been widened as fill in Marginal Street, and all else is the same as on the 1879 Bromley atlas.

1913 Hyde - (Figure 6-9) Twelfth Avenue and Marginal Street have both been filled at West 41st Street. Marginal Street is completely filled.

1925 Bromley-Same as the 1913 Hyde atlas.

1930 Bromley - Same as the 1913 Hyde atlas.

1950 Hyde - The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

Landfilling first appeared in Twelfth Avenue by 1859 and continued sporadically until it was completed in 1913. Marginal Street was filled between 1874 and 1913. There was a pier, dating to c.1874, just below West 42nd Street in Marginal Street which may have become part of the landfill. A second pier, built by 1879, was just

north of West 41st Street in Marginal Street, which also may have become part of the landfill.

HISTORIC SENSITIVITY

The only historically sensitive features identified within this section were the two piers previously discussed.

West 42nd Street to West 43rd Street, Block 1090 - Twelfth Avenue and Marginal Street.

The lots that are within the project area include Lots 1 through 4 and 61 through 64.

HISTORIC LANDOWNERS

According to the early twentieth century historian, Isaac Newton Phelps Stokes, Block 1090 was part of the Robert B. Norton Farm (Vol. 6, 1926:125). The following is a list of landowners as portrayed by Stokes:

1667 Governor Nicolls to Johannes Van Brugh
? Heirs of Van Brugh to Aernout Webbers
1713 Aernout Webbers to John Balme
1714 John Balme to Matthias Hopper
1778 Matthias Hopper to William, Matthew and John Hopper
1785 Matthew Hopper to John Leake
? John Leake to Martha Norton
1797 Martha Norton to Robert B. Norton

As per the Index Division's Block summary:

"This block lay wholly within the R.B. Norton tract. By his will, R.B. Norton devised his property to his children who in 1830 partitioned it among themselves and part of the property including this block to the high water mark was conveyed to James C. Norton. James C. Norton by his will devised the property including this block to the high water mark to his children, James C. Norton, Jr., Pierre Norton, and R.B. Norton. On a partition among the Norton heirs, this block was sold by P.T. Ruggles, Master in Chancery, in lots and parcels. A grant of the land under water adjoining the property in this block was made in 1850 by the City of New York to Caleb F. Lindsley."

GRANTOR	GRANTEE	LOTS	DATE	LIBER	PAGE
Mayor Aldermen	Lindsley	1-15 1/2	1850	336	16
Mayor Aldermen	Lindsley	33-64	1850	336	22
Lindsley	LaFarge	1-19,43-64	1855	695	329
LaFarge	Appleby	1-8,58-64	1863	867	591
Appleby	42nd St.RR Co.	1-8,58-64	1863	866	624
42nd St. RR Co.	42nd St.RR Co.	1	1899	68	99
42nd St. RR Co.	NYC RR Co.		1912	231	444

GRANTOR	GRANTEE	LOTS	DATE	LIBER	PAGE
NYC RR Co.	City of NY		1929	3736	8

CARTOGRAPHIC REVIEW

1811 Commissioners through 1845 Ensign - (Figure 6-1) There is a pier extending from the shoreline into the eastern ends of Lots 4 and 64 and there is no filling within the project area.

1852 Dripps - The block has been filled to the eastern border of the original Twelfth Avenue, and the entire project area is vacant.

1859 Perris - (Figure 6-6) Lots 1 through 4 are vacant. On Lots 61 through 64, there is a complex of three structures labeled "Ice Houses." None of the buildings front either of the cross roads or what will be Twelfth Avenue. A small structure at West 42nd Street extends from east of the project area into Twelfth Avenue and is labeled "Ferry to Weehawken." This is on the only filling in Twelfth Avenue.

1868 Dripps - Twelfth Avenue is entirely filled and there is the outline of a pier in Marginal Street at West 42nd Street, labeled as the ferry to Weehawken. There appear to be two small structures flanking the pier entrance in Twelfth Avenue. The ice houses have been removed and there is now a large structure spanning the width of the block covering all of the lots. The building is labeled "42nd Street and Grand Street Ferry R.R. Stables."

1874 Viele - Same as the 1868 Dripps map.

1879 Bromley - (Figure 6-2) Only the eastern half of Twelfth Avenue appears filled althoug h it was shown as entirely filled on previous maps. The ferry landing is still present at West 42nd Street and extends into Marginal Street. The structure spanning all of the lots is now labeled "Grand Street P.R.W. Co. Stable."

1885 Robinson - (Figure 6-7) The structure is labeled "Grand Street P.R.W. Depot" and is depicted as a brick building.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) Twelfth Avenue has been completed, and the ferry landing is still extending through Marginal Street. There is no additional filling in Marginal Street. Spanning all of the lots is a two-story building now labeled "Metropolitan Traction Co."

1913 Hyde - (Figure 6-9) Marginal Street has been completely filled and the ferry is still present. Pier sheds span the block along the shoreline. The two-story structure is now labeled "Metropolitan St. Ry. Co. Car Depot."

1925 Bromley - The route of what will eventually be the new Twelfth Avenue and West Side Highway is overlaying the project area lots. The building is now labeled "N.Y. Railways Co."

1930 Bromley - The new route of Twelfth Avenue and Marginal Street are present and the building within the project area has been removed for the new route.

1950 Hyde - The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

Lots 1 through 4 and 61 through 64 were filled between 1845 and 1852. The original route of Twelfth Avenue first experienced filling by 1859 and was entirely filled by 1902. Marginal Street was filled between 1902 and 1913. Prior to 1811, a pier was built from the original shoreline and extended through the eastern ends of Lots 4 and 64. Between 1845 and 1852 the pier was either removed or became part of the landfill. The Weehawken ferry pier at the foot of West 42nd Street, built by 1868, stood in the route of Twelfth Avenue and Marginal Street and may have become part of the landfill.

HISTORIC SENSITIVITY

In addition to the two piers, a building spanned all of Lots 1 through 4 and 61 through 64. The brick structure stood within the project area from c.1868 until Twelfth Avenue was moved eastward in the 1930s causing its demolition. The building operated as a stable in the middle of the nineteenth century, and subsequently was occupied by a depot and later a traction company.

West 43rd Street to West 44th Street, Block 1091 - Twelfth Avenue and Marginal Street.

The lots that are within the project area include Lots 1 through 5 and 58 through 64.

HISTORIC LANDOWNERS

According to the early twentieth century historian, Isaac Newton Phelps Stokes, Block 1090 was part of the Robert B. Norton Farm (Vol. 6, 1926:125). The following is a list of landowners as portrayed by Stokes:

1667 Governor Nicolls to Johannes Van Brugh
? Heirs of Van Brugh to Aernout Webbers
1713 Aernout Webbers to John Balme
1714 John Balme to Matthias Hopper
1778 Matthias Hopper to William, Matthew and John Hopper
1785 Matthew Hopper to John Leake
? John Leake to Martha Norton
1797 Martha Norton to Robert B. Norton

As per the Index Division's Block summary:

"This block lay wholly within the R.B. Norton tract. By his will, R.B. Norton devised his property to his children who in 1830 partitioned it among themselves and part of the property including this block to the high water mark was conveyed to James C. Norton. James C. Norton by his will devised the property including this block to the high water mark to his children, James C. Norton, Jr., Pierre Norton, and R.B. Norton. On a partition among the Norton heirs, this block was sold by P.T. Ruggles, Master in Chancery, in lots and parcels. A grant of the land under water adjoining the property in this block was made in 1850 by the City of New York to Caleb F. Lindsley. Eugene Higgins in December 1902 obtained a grant from the City of New York of the land under water adjoining the property in this block."

* Indicates that this is a lease.

GRANTOR	GRANTEE	LOTS	DATE	LIBER	PAGE
N. Reynal	E. Higgins	1-28,37-64	1884	1786	117
E. Higgins	C. Hubert*	1-28,37-64	1906	112	185
C. Hubert	Ellis Real Est.	1-28,37-64	1906	116	385
Ellis Real Est.	Gilmartin *	1	1909	132	446
NY Manufacturers	Thompson Co.*	1-24	1915	168	79

GRANTOR	GRANTEE	LOTS	DATE	LIBER	PAGE
NY Manufacturers	Green *	1-25	1916	171	125

CARTOGRAPHIC REVIEW

1811 Commissioners through 1845 Ensign - (Figure 6-1) The project area is land under water.

1852 Dripps - Lots 5 and 60 have been completely filled as have the eastern halves of Lots 61 through 64. There is a pier at the end of West 43rd Street through the path of Twelfth Avenue. There is no filling in Twelfth Avenue.

1859 Perris - (Figure 6-6) The block has been completely filled although there is no filling in Twelfth Avenue. There is a structure covering the western halves of Lots 1 through 3 fronting the river. The entire western half of the block including the project area lots is labeled "E. S. Higgins and Co. Carpet Factory." In the eastern halves of Lots 1 and 2 and on all of Lot 5 there is a building fronting West 43rd Street labeled "Pickers etc." On the eastern halves of Lots 62 through 64, and Lot 4, and the western half of Lot 60 is a storehouse for the carpet factory. In the northwestern corner of Lot 61 is a structure labeled "Sulphur House." There is another structure fronting West 44th Street on the northern third of Lot 60. The pier is still present.

1868 Dripps - The building on Lots 1 through 3 has been removed. The building covering all of Lots 1 and 2 and the southern half of Lot 5 is still present. The storehouse on Lots 62 through 64, 4 and 60 is still present. The sulphur house on Lot 61 has been removed and the northern half of Lot 60 is vacant. Twelfth Avenue is entirely filled and, to the west of it, the West 43rd Street pier is labeled "Knickerbocker Ice Company."

1874 Viele - The West 43rd Street pier is still present and Twelfth Avenue is filled. There are no structures depicted on this map.

1879 Bromley - (Figure 6-2) The buildings are all the same as on the 1868 Dripps map with the addition of a building on the northern third of Lots 58 and 59 fronting West 44th Street. Twelfth Avenue has not been filled as shown on the 1868 Dripps map.

1885 Robinson - (Figure 6-7) Same as the 1879 Bromley atlas.

1897 Bromley - Same as the 1879 Bromley atlas.

1902 Bromley - (Figure 6-8) The area is still labeled "E.S. Higgins Carpet Factory." All of the buildings described on the 1879 Bromley atlas are still present. In addition, the building that was on Lots 58 and 59 has been extended to the west onto Lots 60 and 61. A wood building has been built on the remainder of Lot 61

through 64 and 4, fronting Twelfth Avenue. Twelfth Avenue is entirely filled and there is still no fill in Marginal Street.

1913 Hyde - (Figure 6-9) On Lots 58 and 59 the structure is still present and is a four-story building with a basement. The extension on Lot 60 is now labeled as a one-story building with a basement, and the extension onto Lot 61 has been replaced by a one-story building labeled "Automobiles." The storehouse on Lots 62 through 64, 4 and 60 is shown as a two-story building. The building on Lots 1, 2, and 5 is also still present and is shown as a four-story brick structure. The wood building on Lots 61 through 64 and 4 has been removed. Marginal Street is completely filled and there are pier sheds spanning the block along the waterfront.

1925 Bromley - Same as the 1913 Hyde atlas.

1930 Bromley - All of the lots are vacant, and the new route of Twelfth Avenue has been laid out.

1950 Hyde - The West Side Highway has been built on Twelfth Avenue.

SHORELINE FILL

Twelfth Avenue was filled between 1897 and 1902 and Marginal Street was filled between 1902 and 1913. A pier at West 43rd Street was built by 1852 and extended through the path of both Twelfth Avenue and Marginal Street. The pier may have become part of the landfill.

HISTORIC SENSITIVITY

A four-story brick building with a basement stood on Lots 58 and 59 between 1879 and 1925. On Lots 1, 2, and 5 stood a four-story brick building, once labeled "Pickers etc.," which was present from c.1859 through at least 1925 and was associated with Higgins Carpet Factory. A two-story brick storehouse stood on Lots 62 through 64, 4 and 60 between c.1859 and 1925, also associated with the carpet factory.

HISTORIC SENSITIVITY

Specific areas sensitive for potentially significant historical remains exist between West 30th and West 44th Streets. Few buildings actually stood in the route of Twelfth Avenue that could be considered potentially sensitive. Areas identified are referenced in the Block Histories section, which is based largely on cartographic data. The following presentation also includes information gathered at the Buildings Department, Block and Lot Division, and from secondary sources.

Categories of sensitivity were devised, and include dwellings and associated outbuildings; industrial buildings/complexes; piers and wharves; landfill; and other. The blocks along Twelfth Avenue include the potential sensitivity for the cross street on the south. Going from south to north the following areas have been identified as being potentially sensitive for historical remains.

Dwellings and Associated Outbuildings

NONE.

Industrial Buildings and Complexes

Several buildings were identified as potentially sensitive that fit into this category. Although several small temporary sheds once existed in Marginal Street within this portion of the project area, none of them were deemed sensitive due to the late dates of construction, the short duration of presence, and their usage largely as storage facilities for incoming and outgoing freight. The only buildings identified were on Blocks 1090 and 1091 which were once east of Twelfth Avenue and are now within the project area. On Block 1090 a building spanned all of Lots 1 through 4, and 61 through 64 between c.1868 and the 1930s (Figures 6-6 through 6-9). The building was occupied by the West 42nd Street ferry railroad stables in 1868, was subsequently used as a depot, and was later occupied by a traction company. No records of construction for any buildings within this section were available at either the Buildings Department or Municipal Archives.

On Block 1091 Lots 58 and 59 had a four-story brick building with a basement standing between c.1879 and 1925 (Figures 6-2 and 6-9). Lots 1, 2, and 5 also had a four-story brick building standing between c.1859 and 1925 (Figures 6-6 through 6-9). The only label on the building stated that it was occupied by Pickers etc. On Lots 62 through 64, 4 and 60 stood a storehouse between c.1859 and 1925 (Figures 6-6 through 6-9). All three of these buildings may have been associated with the Higgins Carpet Company. As was the case with Block 1090, there were no building records available for any lots within this section.

Piers and Wharves

Numerous eighteenth and nineteenth century piers traversed the route of Twelfth Avenue and Marginal Street. Going from south to north, the following piers and wharves were identified.

Between West 30th and West 31st Streets, the West 30th Street pier was built by 1859 and was owned by the City of New York (Figure 6-6). This may have become part of Twelfth Avenue and Marginal Street landfill by 1902. A second pier stood mid-block between at least 1874 and 1902 and may have become part of the Twelfth Avenue landfill. Between West 32nd and West 33rd Streets, the West 32nd Street pier was built by 1874 and extended through the routes of both Twelfth Avenue and Marginal Street between at least 1879 and 1902 (Figures 6-2 and 6-8). The West 32nd Street pier was occupied by the New York City and Hudson Railroad Company in 1879, and may have become part of the landfill. A second pier, slightly north of West 32nd Street, extended through both Twelfth Avenue and Marginal Street between at least 1874 and 1902. A pier at West 33rd Street also extended through the two routes, and stood between at least 1879 and 1902 (Figures 6-2 and 6-8).

A pier at West 34th Street extended through the route of Twelfth Avenue and stood between at least 1859 and 1879 when it may have become part of the landfill (Figures 6-2 and 6-6). At West 35th Street a pier extended through Twelfth Avenue and Marginal Street. The pier, built by 1874, may have had the eastern portion become part of Twelfth Avenue landfill by 1879 with the western portion becoming part of Marginal Street landfill by 1902 (Figures 6-2 and 6-8). At West 36th Street a pier, built by 1902, extended through the route of Marginal Street (Figure 6-8). This may have become part of the landfill by 1950.

The West 37th Street pier was built by 1874 and extended through the routes of both Twelfth Avenue and Marginal Street. The pier may have become part of the landfill by 1902 (Figures 6-2 and 6-8). At West 38th Street a pier extended through Marginal Street and Twelfth Avenue. The pier, built by 1868, may have become part of the Twelfth Avenue landfill by 1930 and part of the Marginal Street landfill by 1950 (Figure 6-2). At both West 39th and 40th Streets, a pier was built through Twelfth Avenue and Marginal Street by 1859 (Figure 6-6). Each may have become part of the Twelfth Avenue landfill by 1930 and part of the Marginal Street landfill by 1950.

Between West 41st and West 42nd Streets, the West 41st Street pier was built by 1879 and may have become part of the Marginal Street landfill by 1913 (Figure 6-2 and 6-9). Slightly north of this, just south of West 42nd Street, another pier was built by 1874 which may have also become part of the Marginal Street landfill by 1913 (Figures 6-2 and 6-9). Between West 42nd and West 43rd Streets, a pier was built off of the original shoreline prior to 1811 and extended through the eastern end of Lots 4 and 64 until they were filled between 1845 and 1852 (Figure 6-1). At West 42nd Street, the Weehawken Ferry Pier was built sometime prior to 1868. The pier may have become part of the Twelfth Avenue landfill by 1902, and part of the Marginal Street landfill by 1913. At West 43rd Street a pier extended through the route of Twelfth Avenue and Marginal Street by 1852, and may have become part of the landfill between 1902 and 1913 (Figures 6-6 and 6-8).

Landfill

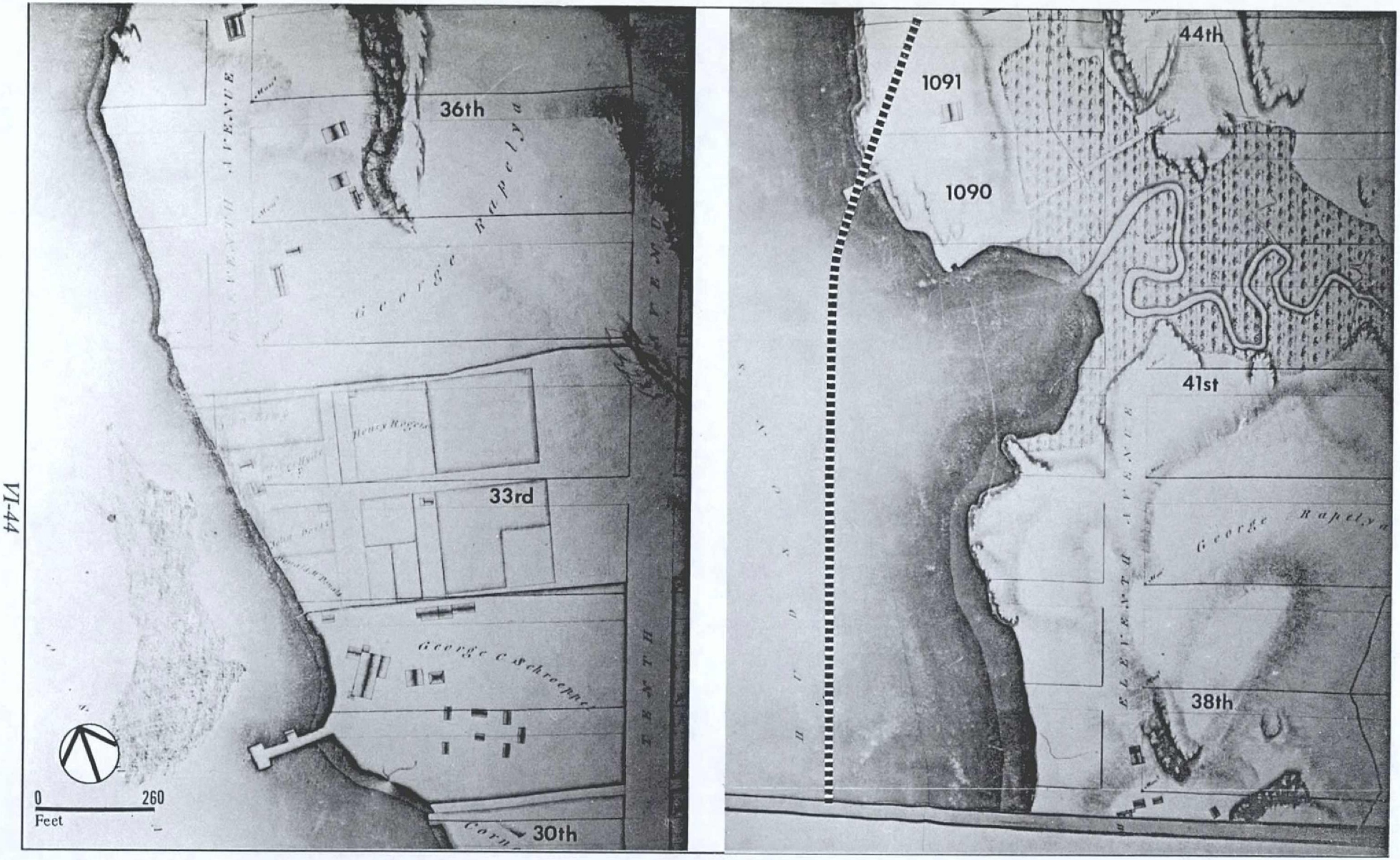
The process of filling the shoreline and expanding the size of Manhattan began in the eighteenth century and has continued through the twentieth century. The earliest known episode of landfilling in Twelfth Avenue in this section of the project area began sometime between 1852 and 1859 between West 41st and West 42nd Streets, and was completed by 1913. The majority of landfilling took place between 1897 and 1902 (Figures 6-7 and 6-8), with the remainder occurring by 1930. In Marginal Street landfilling dates as early as 1874, with the majority of filling completed between 1897 and 1902 (Figures 6-7 and 6-8). Some filling in Marginal Street was not completed until sometime between 1930 and 1950, such as the block between West 39th and West 40th Streets. Blocks 1090 and 1091, now part of Twelfth Avenue, were filled between the 1840s and 1850s.

The landfill in and of itself is not judged to be sensitive since filling episodes have been documented and artifacts found in this secondary context render little information. Numerous projects within lower Manhattan have documented land reclamation along both the shore of the East and Hudson Rivers. Records of the Common Council also documented landfilling as it occurred. In order for landfill itself to be considered worthy of subsurface archeological investigation, the deposition must be tied in to a specific episode by a group or individual, such as a manufacturer discarding waste materials from the production process. Thus, if the resources are in situ, specific information can be gathered regarding manufacturing process or individual's lifeways. If deposition is simply the collection of trash from an undesignated area, together with materials excavated elsewhere and debris from disasters, the information that can be acquired in such a context is minimal. In addition, since this section was filled in the late nineteenth and early twentieth centuries, there is probably no sensitivity for sunken ships to exist within the landfill.

Although the contents of landfill may not contribute to our knowledge of early historical lifeways and neighborhood development, the retaining devices designed to create fast land varied technologically and may be considered potentially sensitive. Undoubtedly construction techniques changed through time as new materials and methods were adopted. While these types of features are rarely documented cartographically, areas which experienced filling may be sensitive for these types of remains.

Other

NONE.



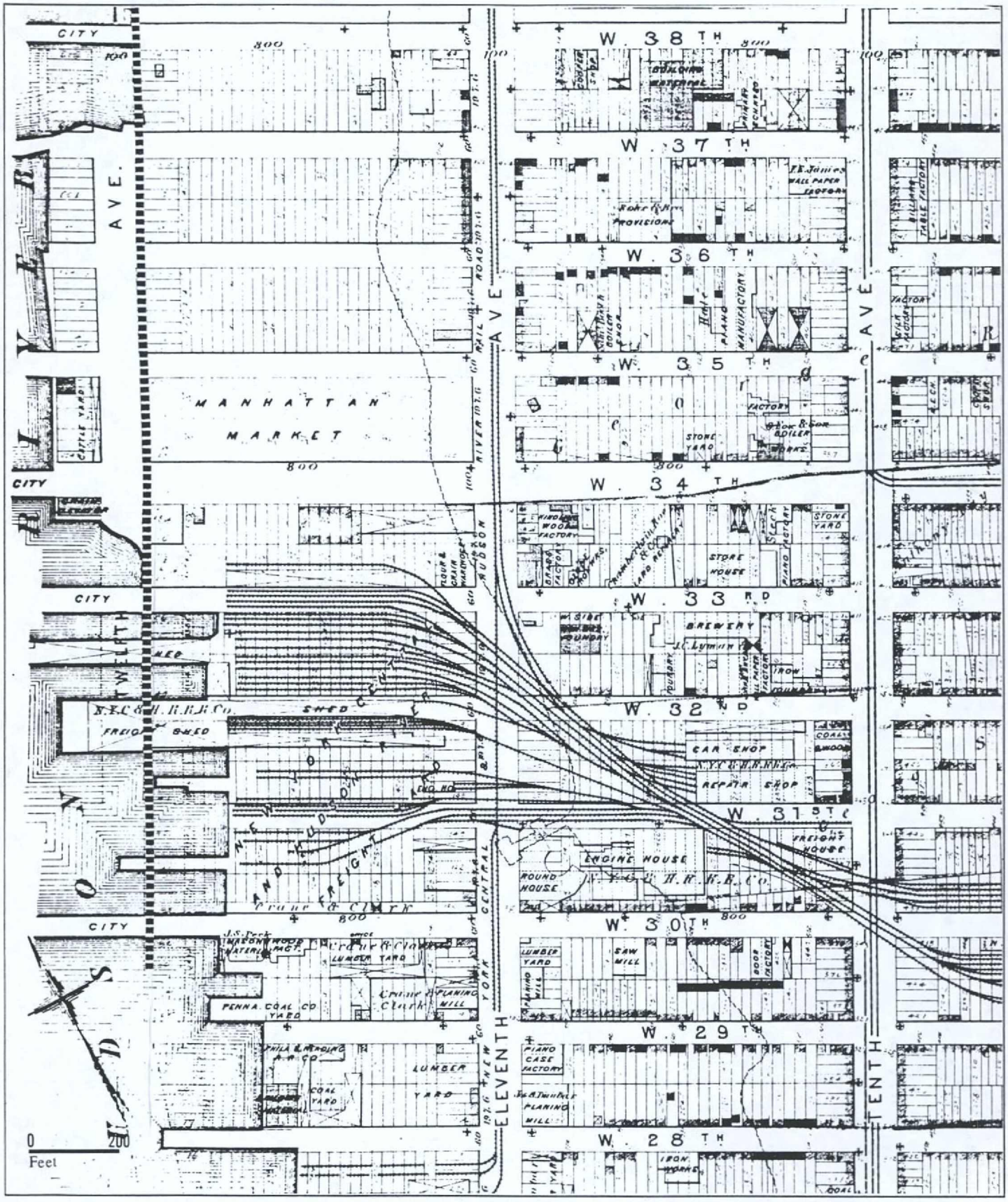
ROUTE 9A RECONSTRUCTION PROJECT

1820 Randel Map of Farms

Legend

▪▪▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*
(West of visible shoreline 39th to 37th Streets)

Figure 6-1



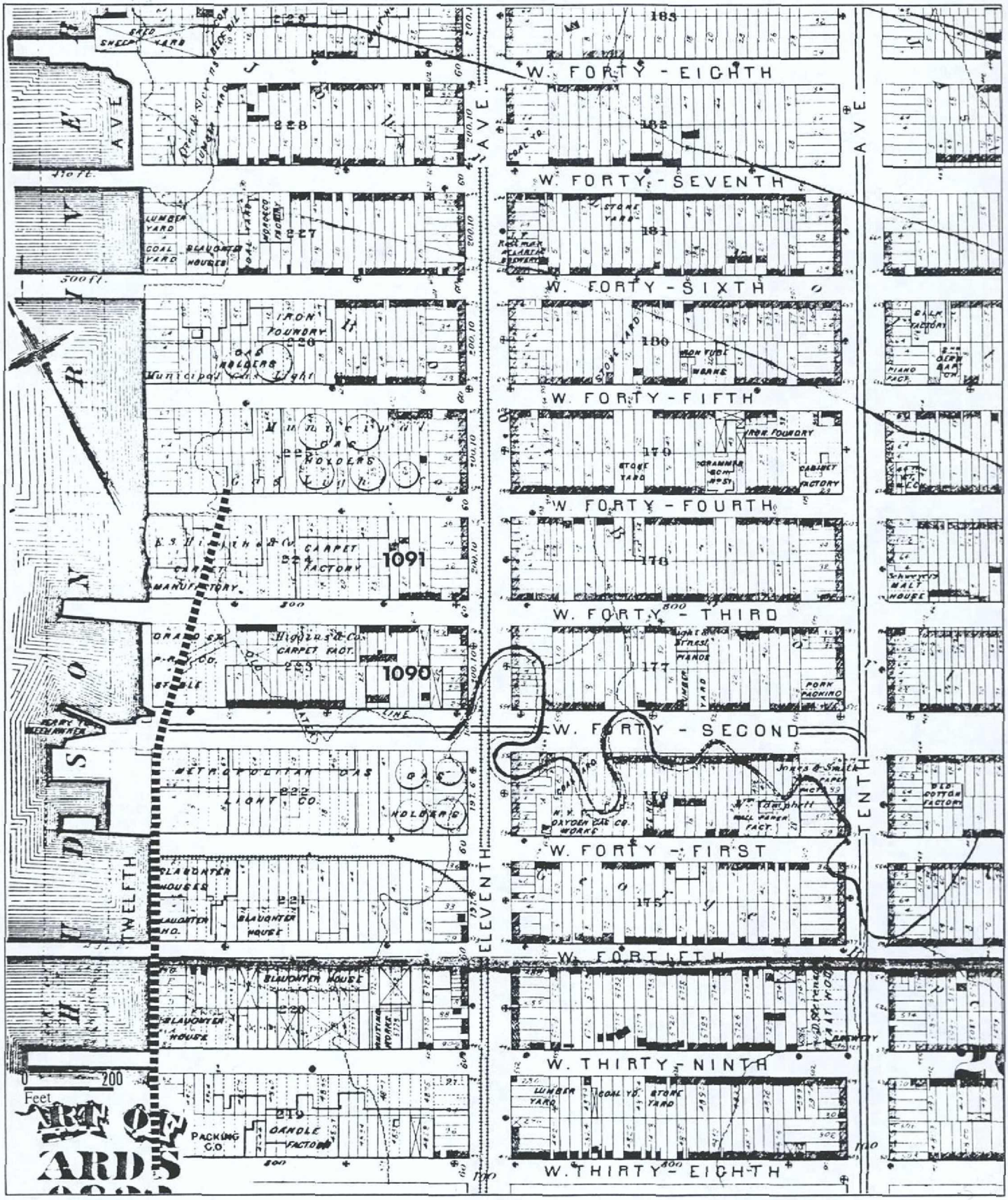
ROUTE 9A RECONSTRUCTION PROJECT

Legend

1879 Bromley Atlas of the City of New York

▪▪▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*

Figure 6-2A



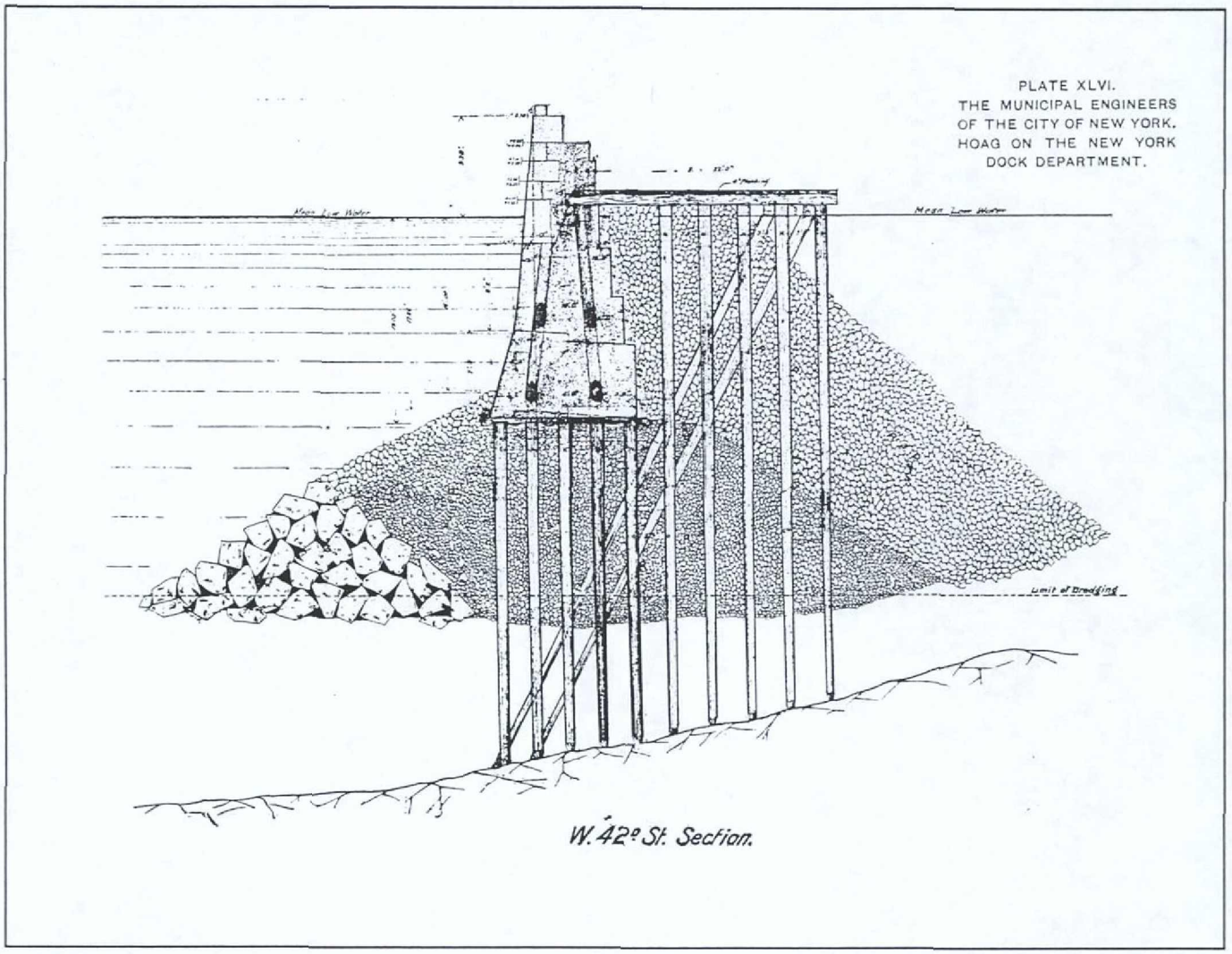
ROUTE 9A RECONSTRUCTION PROJECT

Legend

Approximate Eastern Boundary of Study Area

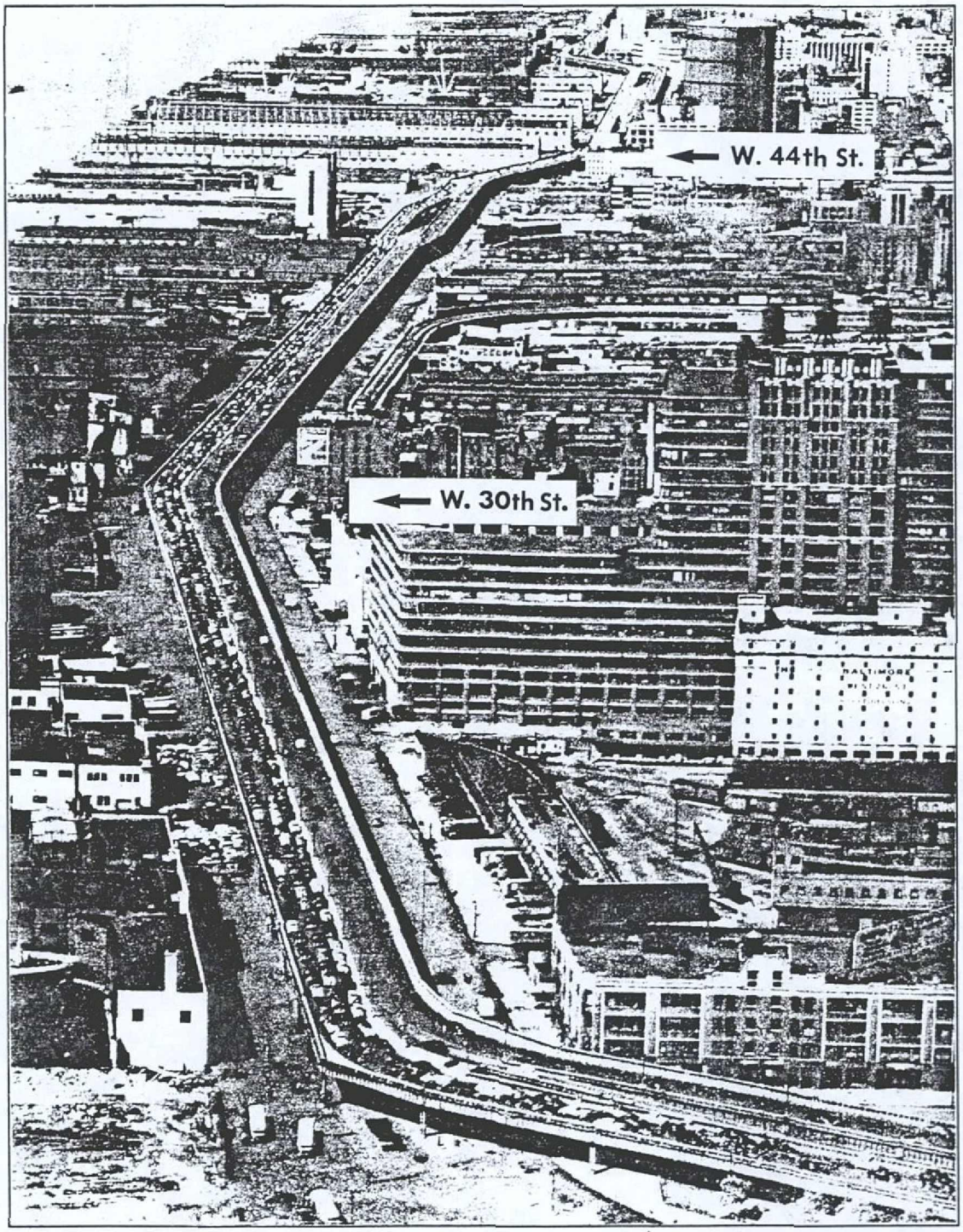
1879 Bromley Atlas of the City of New York

Figure 6-2B



Bulkhead Construction in the Vicinity of West 42nd Street
Source: Hoag 1905

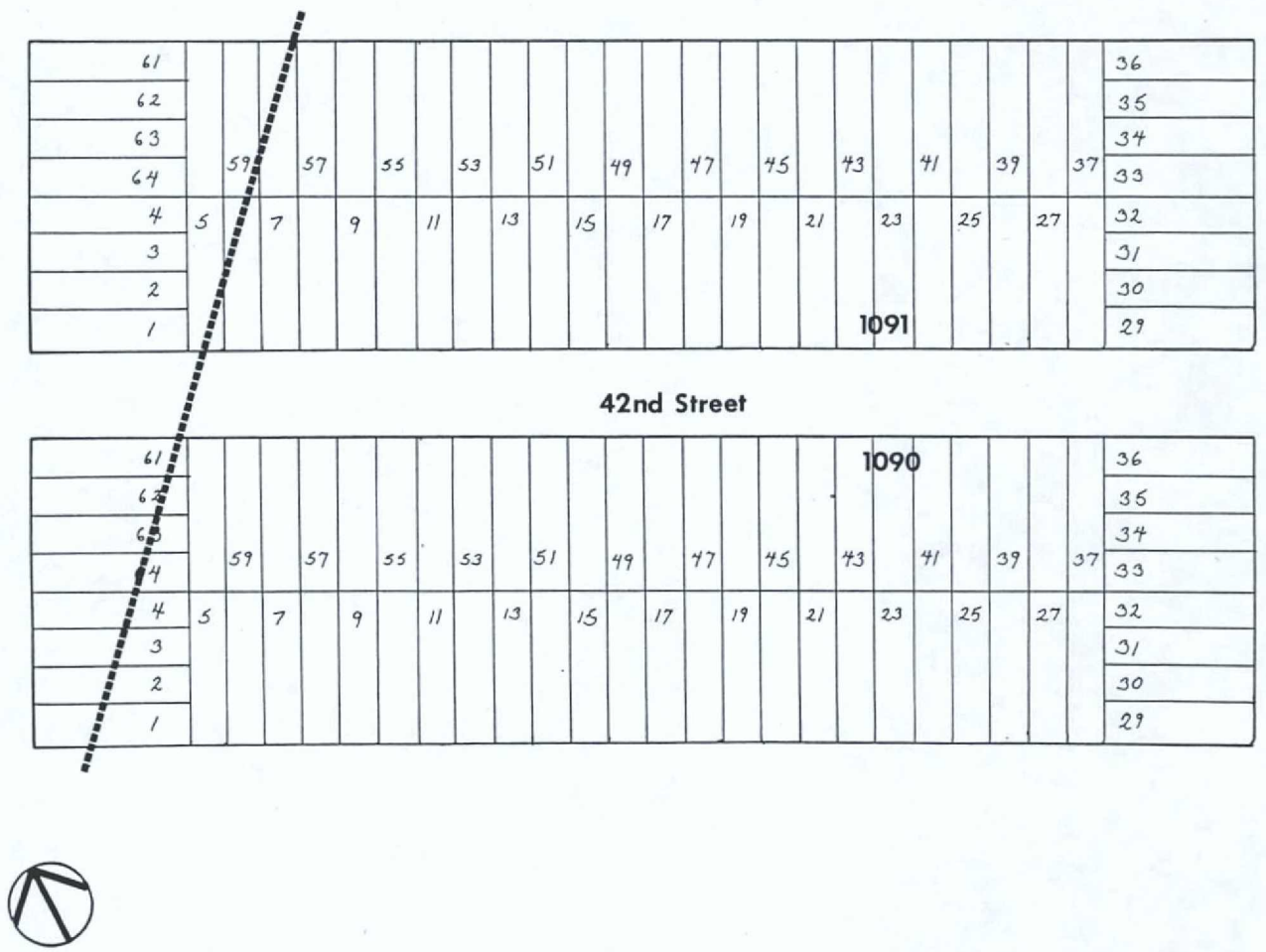
Figure 6-3



ROUTE 9A RECONSTRUCTION PROJECT

Aerial View of West Side Highway
West 30th Street to West 44th Street
Source: Borough President of Manhattan Report 1957

Figure 6-4



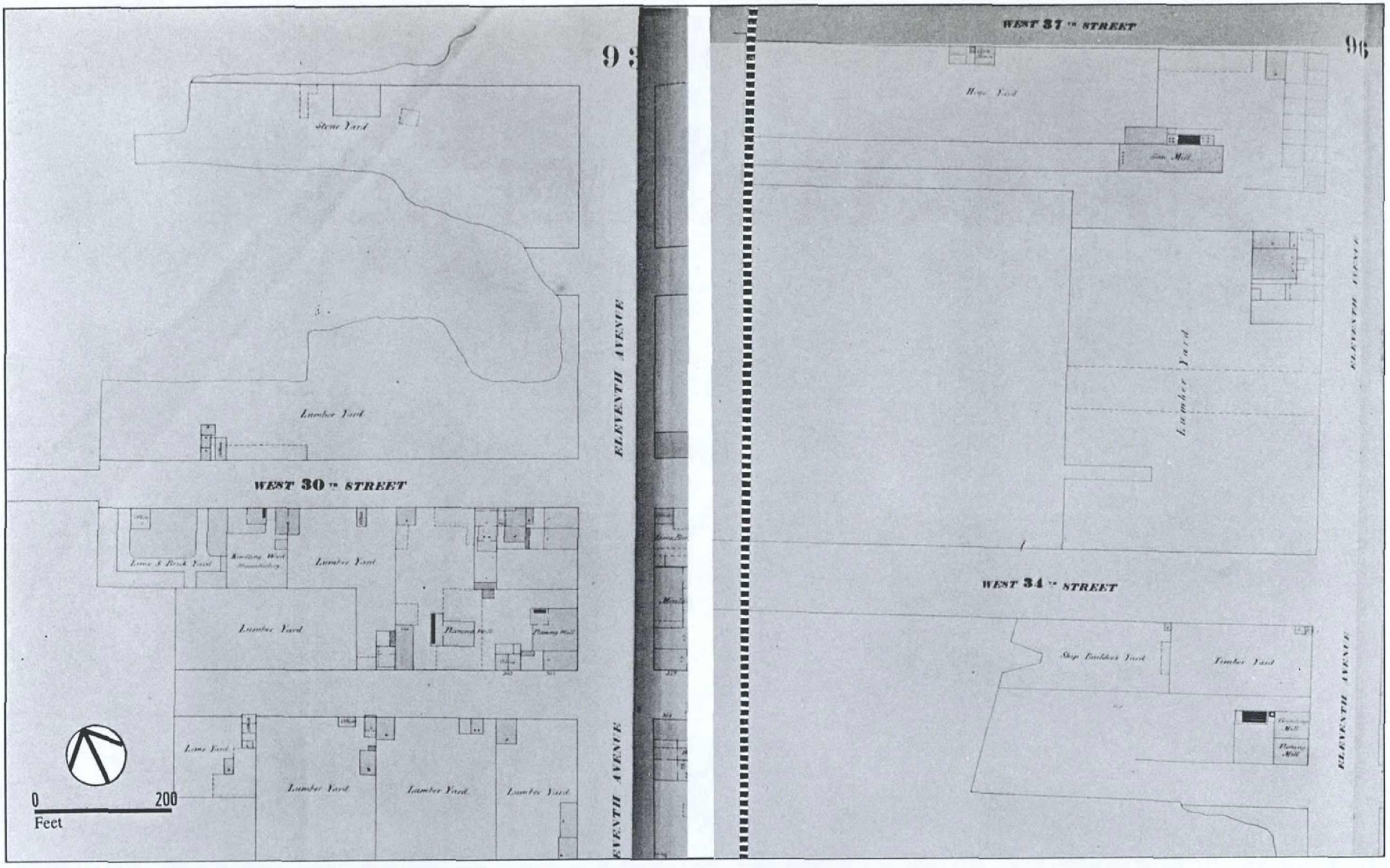
ROUTE 9A RECONSTRUCTION PROJECT

Legend

Approximate Boundary of Study Area

Schematic Lot Configuration for Blocks 1090 and 1091
According to the 1879 Bromley Atlas

Figure 6-5



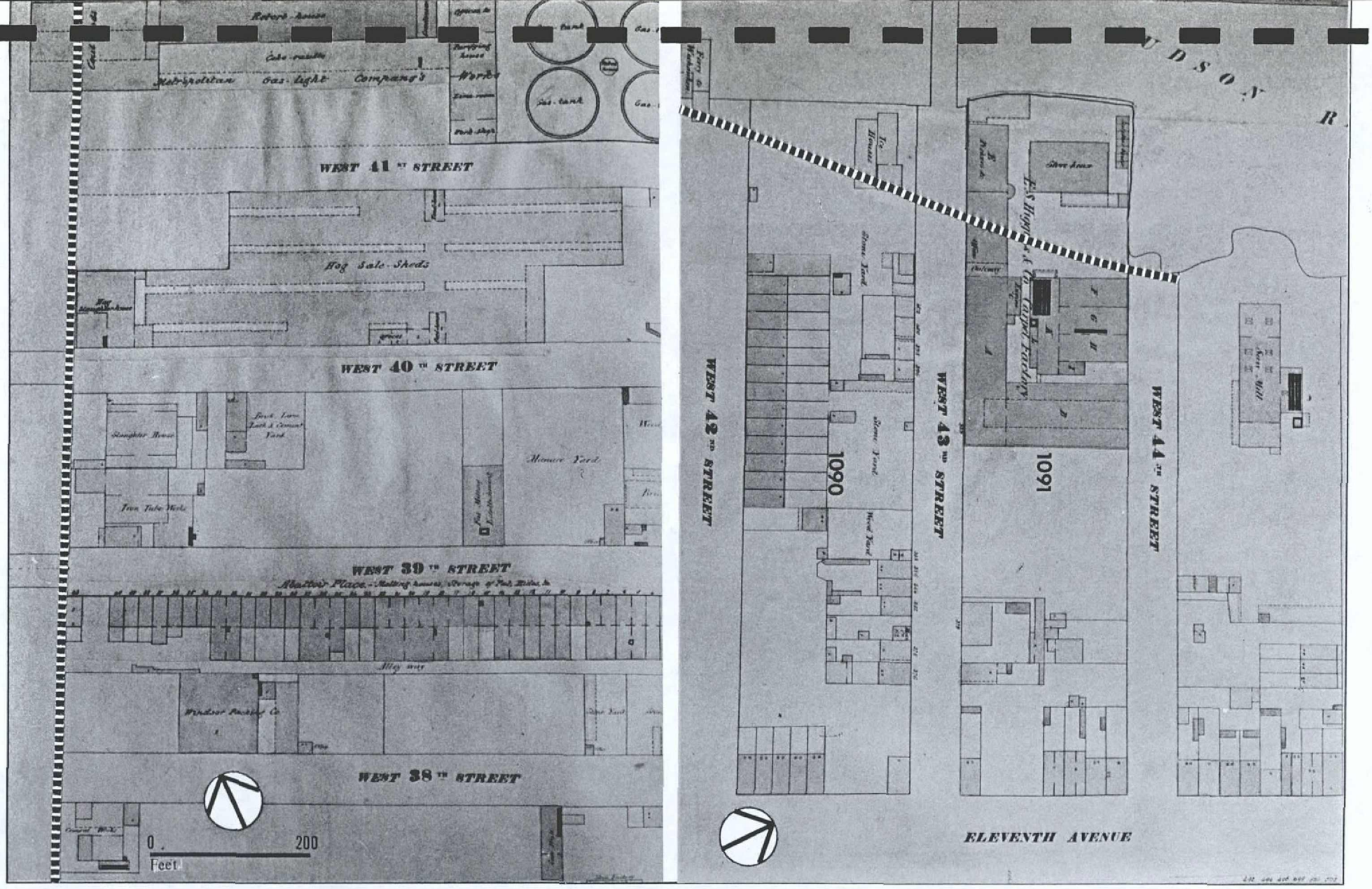
ROUTE 9A RECONSTRUCTION PROJECT

Legend

▪▪▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*
(West of visible shoreline from 28th to 32nd Street)

1859 Perris Map of the City of New York

Figure 6-6A



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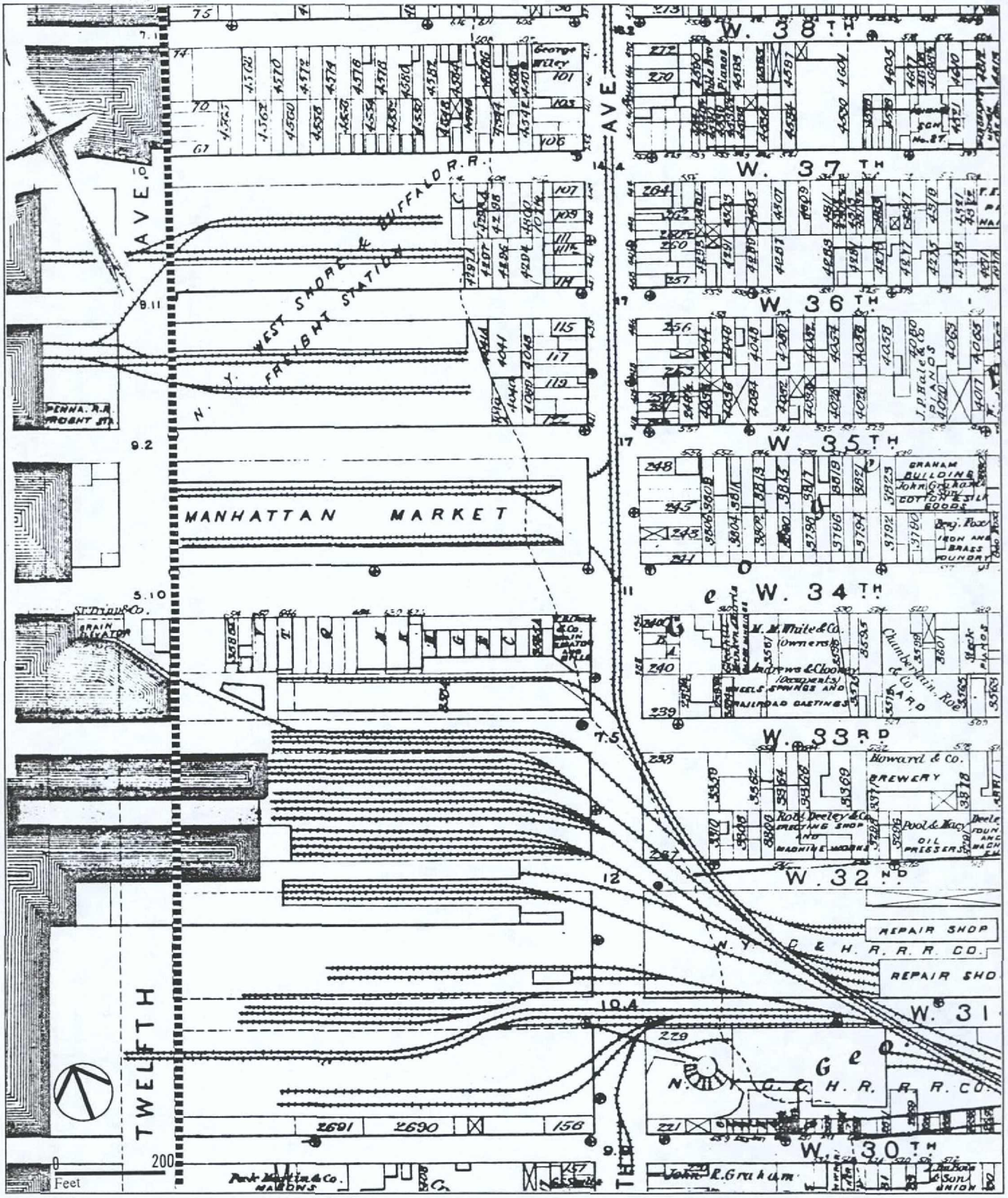
▪▪▪▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*

1859 Perris Map of the City of New York

Figure 6-6B



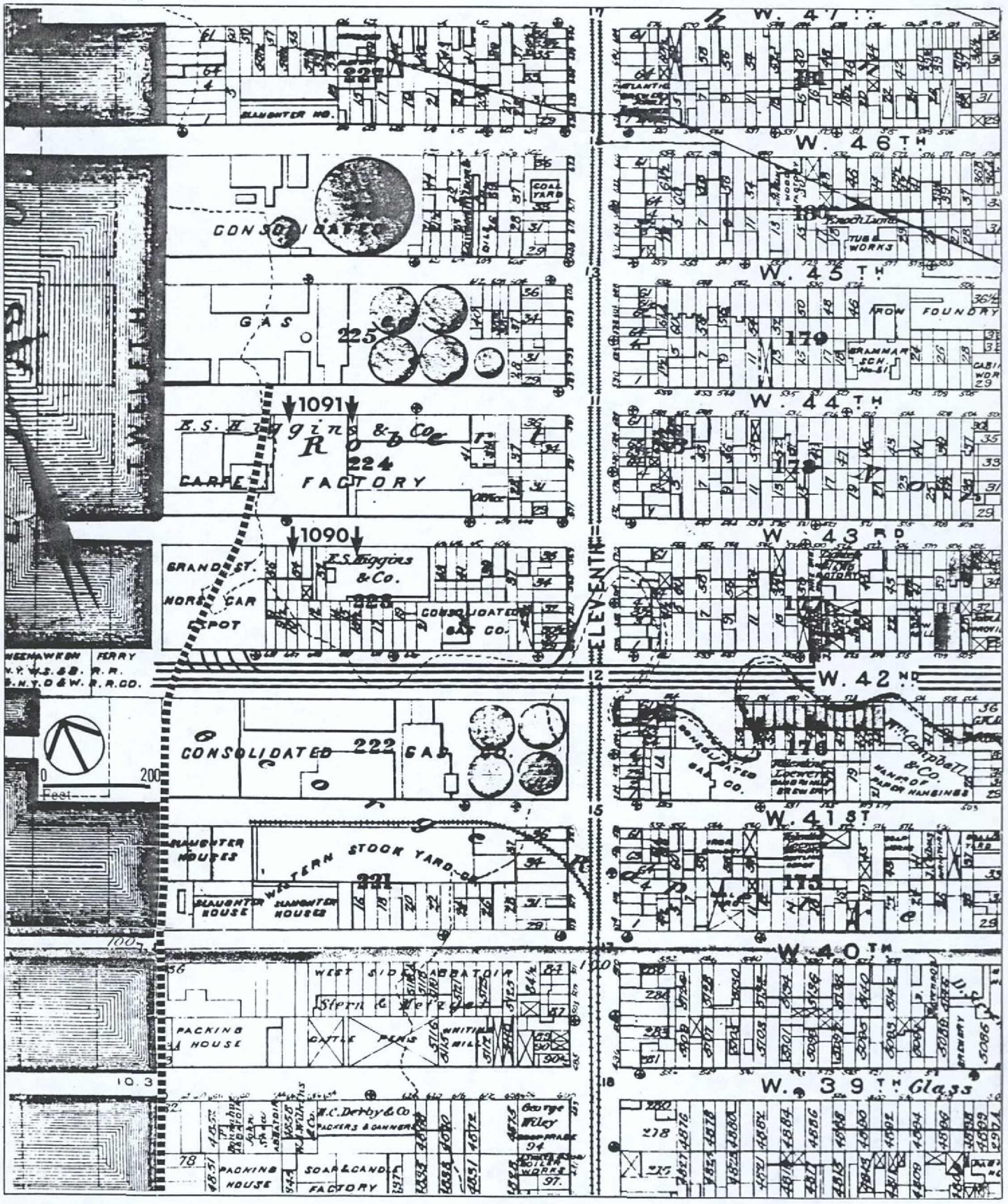
ROUTE 9A RECONSTRUCTION PROJECT

Legend

1885 Robinson Atlas of the City of New York

Approximate Eastern Boundary of Study Area

Figure 6-7A



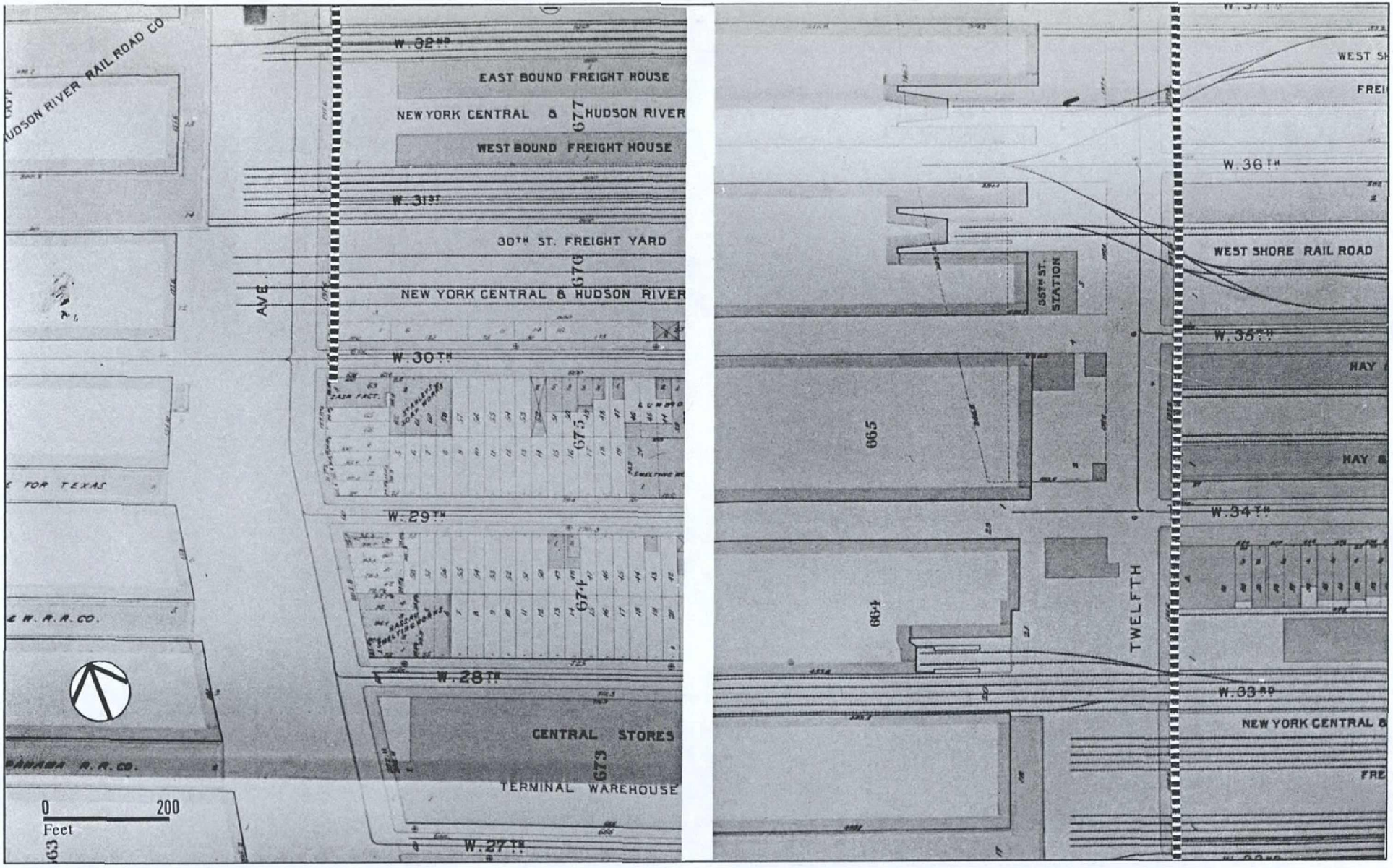
ROUTE 9A RECONSTRUCTION PROJECT

Legend

1885 Robinson Atlas of the City of New York

Approximate Eastern Boundary of Study Area

Figure 6-7B



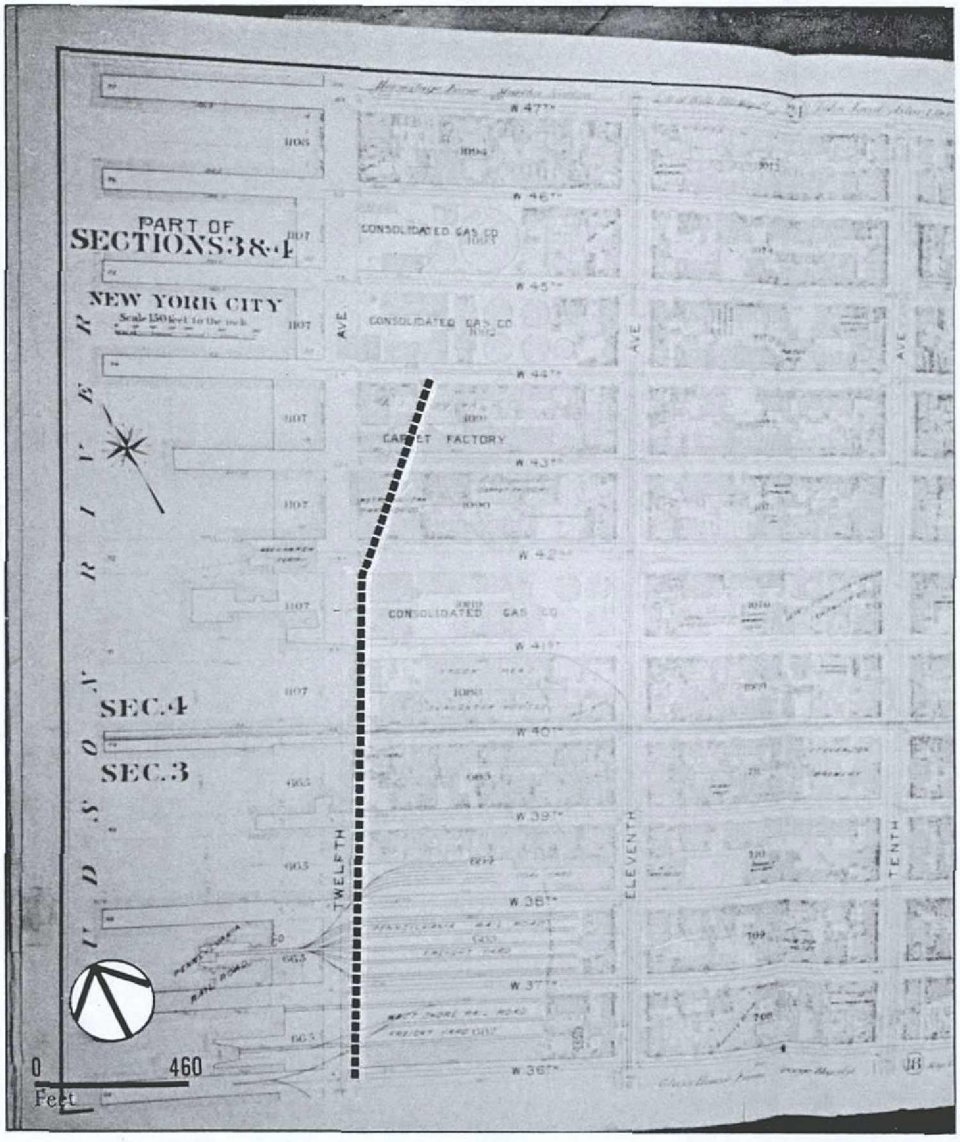
ROUTE 9A RECONSTRUCTION PROJECT

Legend

▪▪▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*

1902 Bromley Atlas of the City of New York

Figure 6-8A



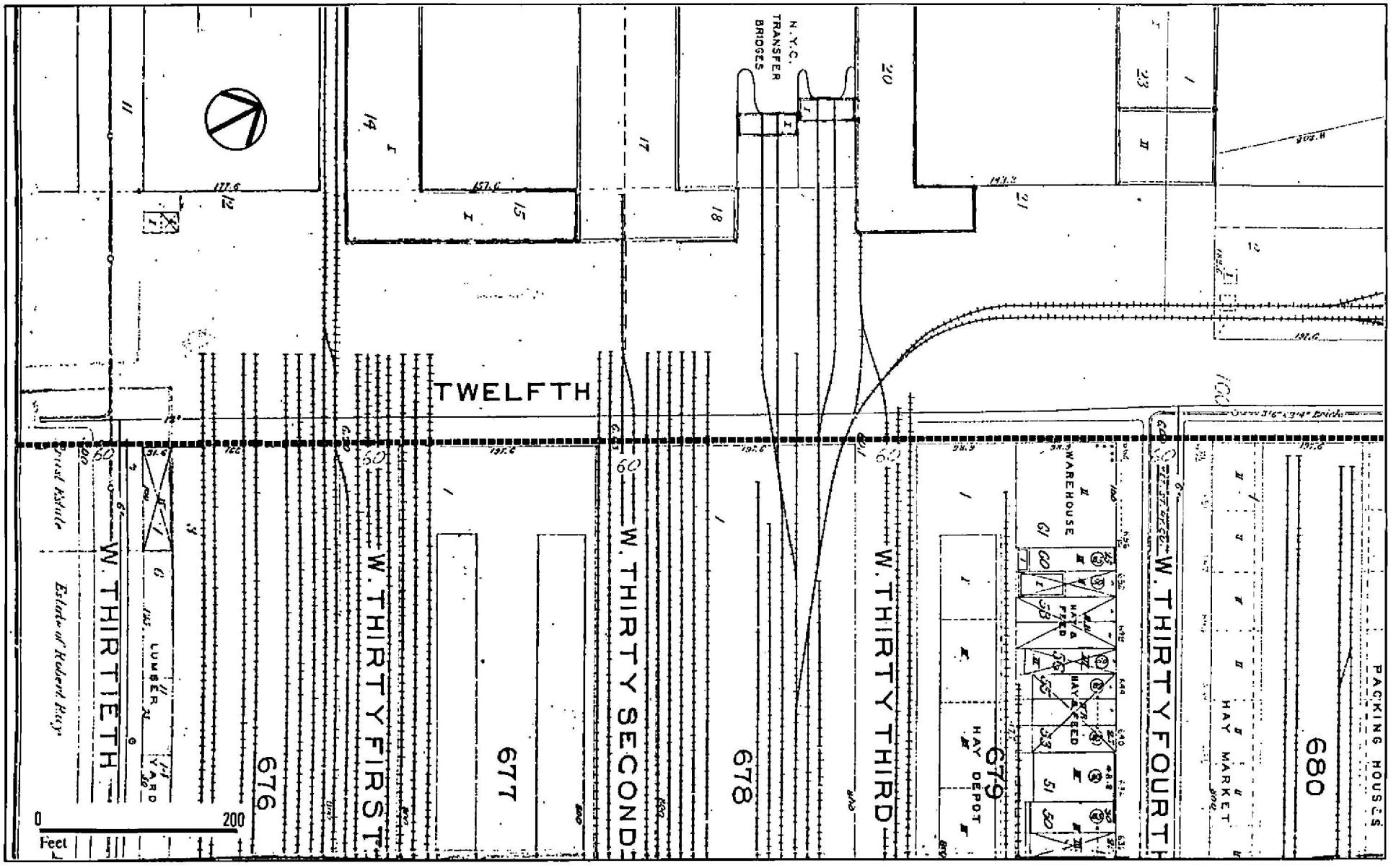
ROUTE 9A RECONSTRUCTION PROJECT

Legend

1902 Bromley Atlas of the City of New York

▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*

Figure 6-8B

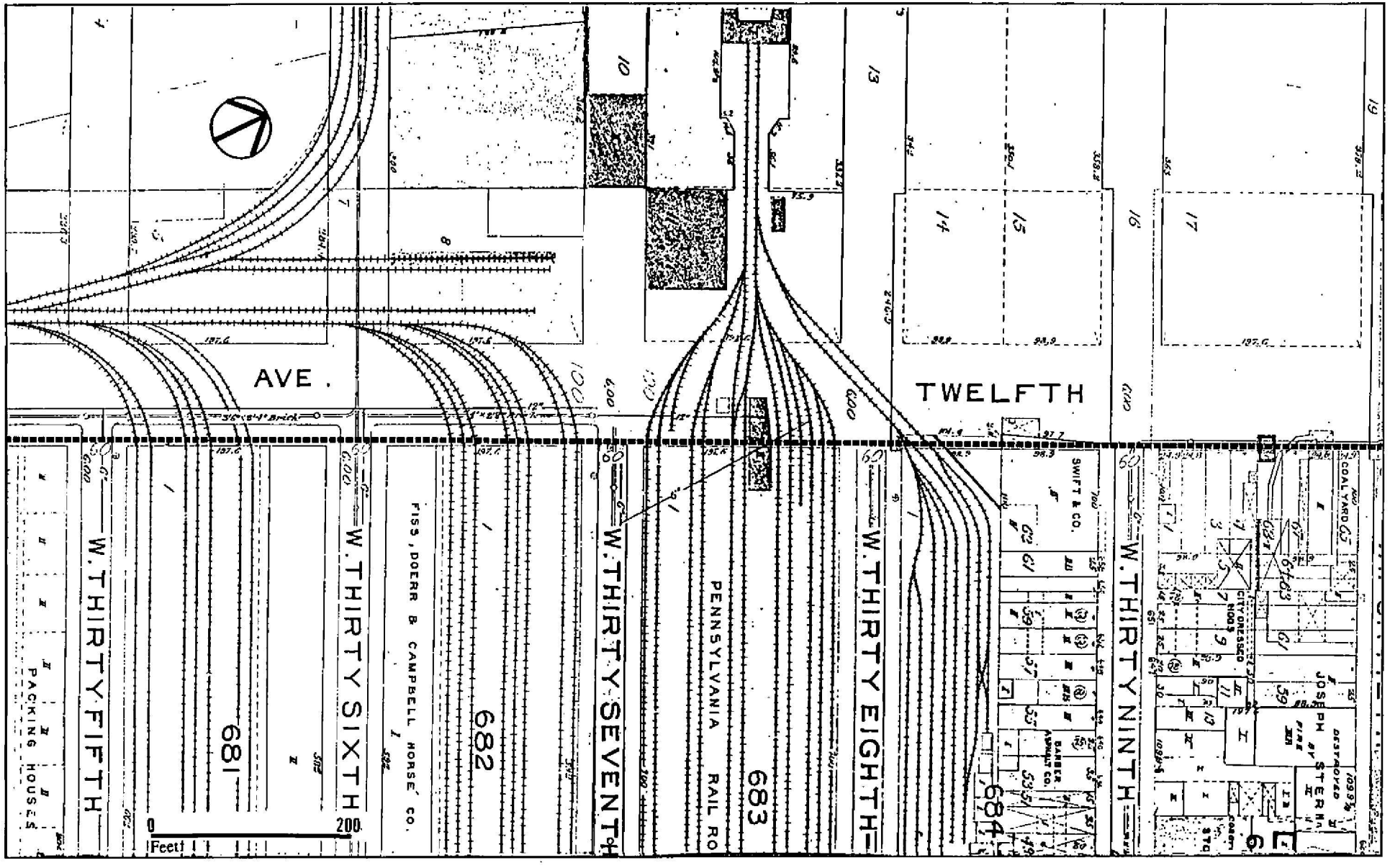


Legend

▪▪▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*

1913 Hyde Atlas of the Borough of Manhattan

Figure 6-9A



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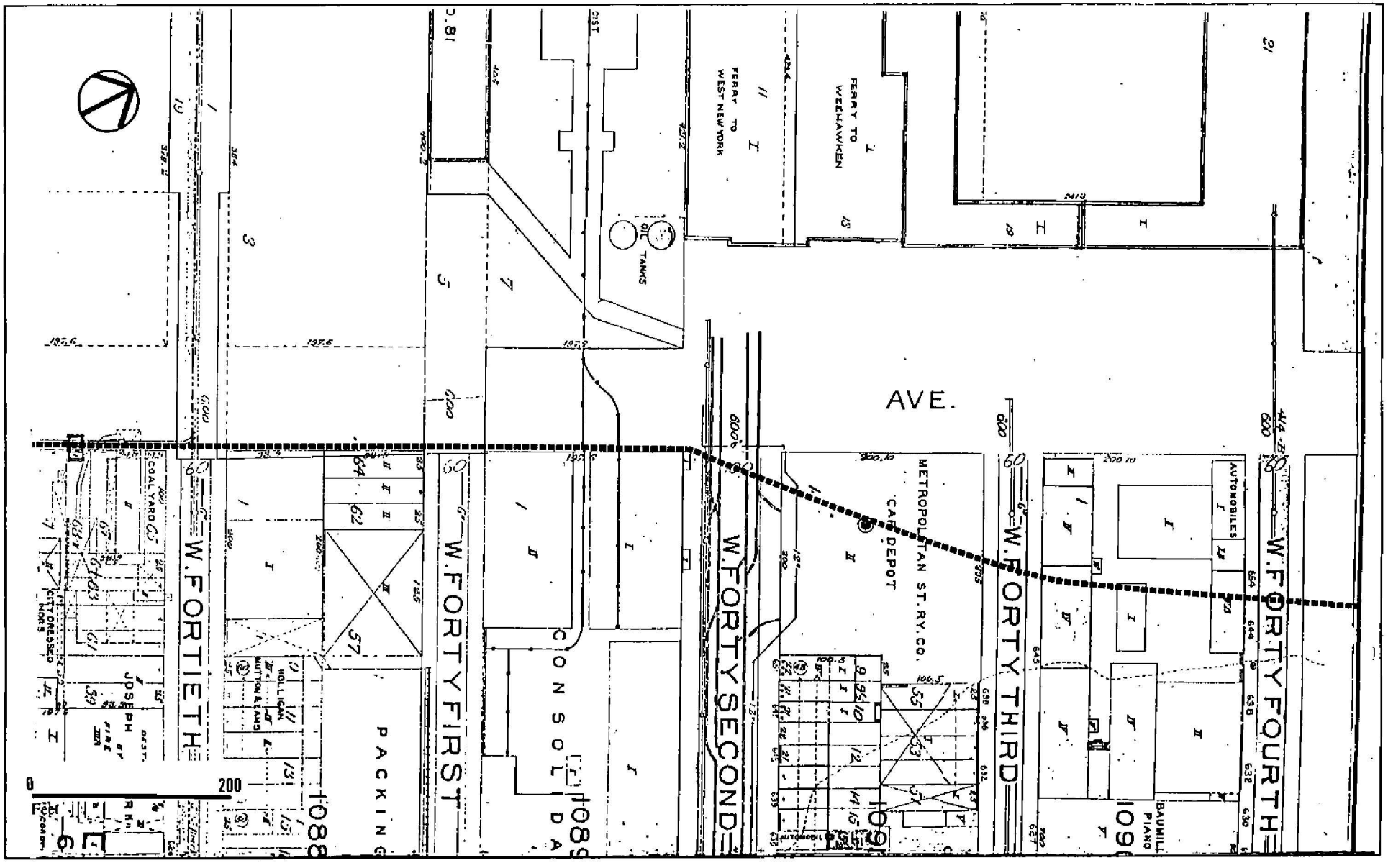
▪▪▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*

1913 Hyde Atlas of the Borough of Manhattan

Figure 6-9B



Legend

▪▪▪▪▪▪▪ *Approximate Eastern Boundary of Study Area*

1913 Hyde Atlas of the Borough of Manhattan

Figure 6-9C

A. SUBSURFACE DISTURBANCE

The research has identified several areas potentially sensitive for archeological remains. In order to determine the degree of potential for recovering such resources, it is necessary to reconstruct prior disturbance to these areas. Prior disturbance may have resulted from road construction and reconstruction, utility line installation, and demolition activities. The known disturbances are reported here to assess potential survivability of cultural resources.

Each potentially sensitive area was evaluated as to the amount of disturbance the area had received. Five categories were used:

- Very disturbed - 100% of the area appears to have been disturbed.
- Disturbed - 75-100% of the area appears to have been disturbed.
- Somewhat disturbed - 50-75% of the area appears to have been disturbed.
- Fairly disturbed - 25-50% of the area appears to be disturbed.
- Undisturbed - 0-25% of the area appears to be disturbed.

Although the archeological potential of an area may not be totally destroyed by prior disturbances, sites that appear to be over 50% disturbed have not been recommended for additional investigation.

In the 1940s a report by the Works Progress Administration stated that the WPA was recurbing sidewalks and doing road adjustments along Marginal Street at that time (Works Progress Administration 1940:4). At that time, there were 14.14 miles of sewers in New York, and 98 sewers discharged into the Hudson (Ibid.:58).

Numerous utility lines exist in Twelfth Avenue and Marginal Street. These include water, gas, electric, and telephone lines, as well as private facilities for other purposes. A report on utilities in the Final Environmental Impact Statement for the West Side Highway Project stated the following:

> Water main systems...are located near the surface of the City's streets. The sizes of the mains vary from six to 30 inches in diameter. Gas mains, including manholes, regulators, drip traps and pumping standpipes are located near the east property line in West Street. The size of gas mains in the Corridor are four to six inches in diameter. Steam lines coming from Rector Street, King Street and 15th Street terminate in West Street. Electric power lines are located throughout the Study Corridor. Telephone lines, including splice chambers

and terminal boxes are located throughout the Study Corridor (Federal Highway Administration 1975:135).

Plans compiled by the Environmental Protection Administration, Department of Water Resources (EPA) dating to 1968, show some of the subsurface conditions in the route of the project area (Figure 7-1). Old and new utility lines are shown in relation to the present configuration of Twelfth Avenue and Marginal Street. The detailed maps also include the locations of the 1857 bulkhead, some of the piers built prior to filling Marginal Street, old cribs, West Side Highway footings, electric, telephone, gas, water, and sewer lines. The majority of utility lines run through the center of the 70 foot width of West Street, and at cross roads branch off to run through the center of those as well. Sewer and utility lines are generally less than five feet below the surface, with the exception of the intercepter sewer line which is between 10 to 20 feet below the paved surface. The majority of old cribs and piers shown on the 1968 EPA map appear in the route of Marginal Street beneath the West Side Highway and have been bisected by few utility lines.

Several features considered to be of historical interest were shown on the 1968 EPA map. The placement of utilities and footings for the West Side Highway has deemed some of these more disturbed than others. In some cases several footings for the Highway, together with numerous utility lines traversed potentially sensitive features rendering them sufficiently disturbed as to not warrant subsurface investigations. Two tunnels are also present between West 30th and West 44th Streets, also shown on the utility maps. The Pennsylvania-Central Railroad tunnel at West 32nd Street, and the Lincoln Tunnel at West 38th and West 39th Streets has rendered any potentially sensitive features present in these areas disturbed. The following features were shown in outline on the map, labeled simply as old piers. The degree of disturbance to these features caused by utility lines and West Side Highway construction was assessed based on the map locations and specificiations, and the known disturbances caused by utility line installations described in Section 6-B.

Old West 30th Street Pier deemed disturbed.

Old West 37th Street Pier deemed fairly undisturbed.

Old West 38th Street Pier deemed disturbed.

Old West 39th Street Pier deemed disturbed.

Old West 40th Street Pier deemed disturbed.

Old West 43rd Street Pier deemed somewhat disturbed.

The following piers were known to exist in the route of Twelfth Avenue and Marginal Street, as presented in the Historic Sensitivity section, and did not appear on the utilities map. Thus we have correlated the location of these piers with the utilities present and assessed the potential sensitivity based on prior impacts.

Old West 30th to West 31st Street Pier deemed fairly undisturbed.

Old West 32nd Street Pier deemed disturbed.

Old West 32nd to West 33rd Street Pier deemed fairly undisturbed.

Old West 33rd Street Pier deemed disturbed.

Old West 34th Street Pier deemed disturbed.

Old West 35th Street Pier deemed somewhat disturbed.

Old West 36th Street Pier deemed somewhat disturbed.

Old West 41st Street Pier deemed fairly undisturbed.

Old West 41st to West 42nd Street Pier deemed fairly undisturbed.

Old West 42nd Street Pier deemed disturbed.

Old West 42nd to West 43rd Street pier deemed disturbed.

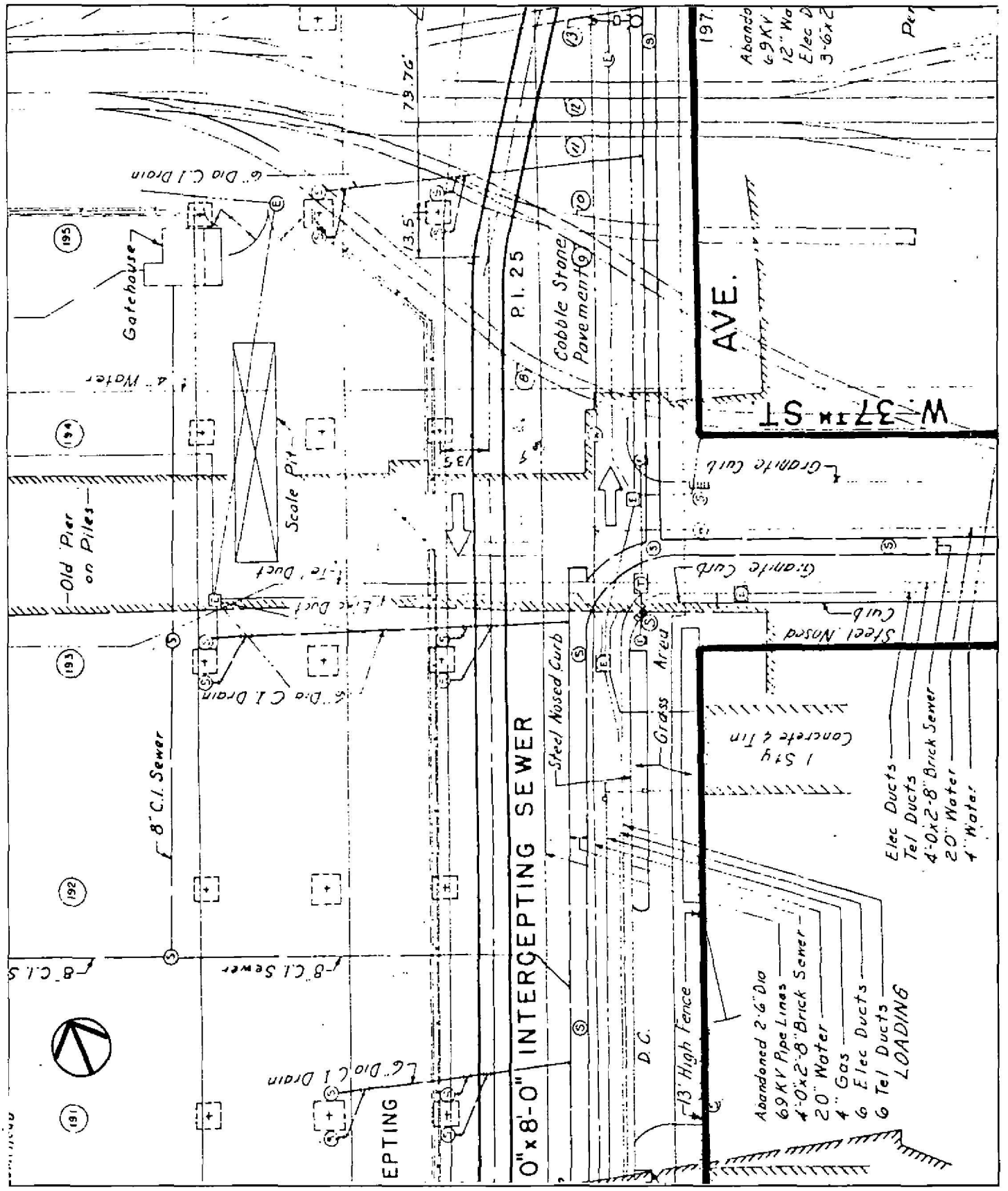
In addition to the piers, several buildings were identified on Blocks 1090 and 1091. Their location, which did not appear on the utility map, has also been correlated with the utilities present and the potential sensitivity has been assessed.

Block 1090 Lots 1-4 and 61-64 brick building deemed somewhat disturbed.

Block 1091 Lots 58 and 59 brick building deemed fairly undisturbed.

Block 1091 Lots 1, 2, and 5 brick building deemed fairly undisturbed.

Block 1091 Lots 62-64, 4 and 60 storehouse deemed fairly undisturbed.



ROUTE 9A RECONSTRUCTION PROJECT

Legend

Archeological Study Area Boundaries

Example of Utilities in Archeological Study Area

Figure 7-1

A. SUMMATION OF POTENTIALLY SENSITIVE AREAS

The following categories were utilized for classifying potentially sensitive archeological remains:

A) **PREHISTORIC REMAINS**
B) **HISTORIC REMAINS**
   1) **Dwellings and associated outbuildings**
   2) **Industrial buildings/complexes**
   3) **Piers and wharves**
   4) **Landfill**
   5) **Other**

A list of sensitive resources within each category is provided below. Location of each resource is referenced in relation to the corresponding cross streets. The following list of areas includes potential sensitivity for Twelfth Avenue bordering the block to the west, and the cross road forming the southern border. For example, Twelfth Avenue between West 41st and West 42nd Streets would include potential sensitivity for Twelfth Avenue, and the 50 foot span on West 41st Street, the southern of the two cross streets.

Much of the subsurface disturbance record has been documented, therefore some areas identified as sensitive in the historic sensitivity sections have subsequently been excluded due to prior disturbance. Features considered either somewhat disturbed or disturbed were not considered to have the potential to yield intact resources, and were therefore excluded from this list. Figure 8-1 shows the sensitive areas within this portion of the project area, as presented below.

PREHISTORIC SENSITIVITY

NONE.

HISTORIC SENSITIVITY

1. Dwellings

NONE.

2. Industrial Buildings and Complexes

Block 1091 Between West 43rd and West 44th Street
- Lots 58 and 59 brick building between c.1879 and 1925.
- Lots 1, 2, and 5 brick building of Pickers etc., c.1859-1925.
- Lots 62-64, 4 and 60 storehouse between c.1859 and 1925. All probably associated with the Higgins Carpet Company.

3. Piers and Wharves

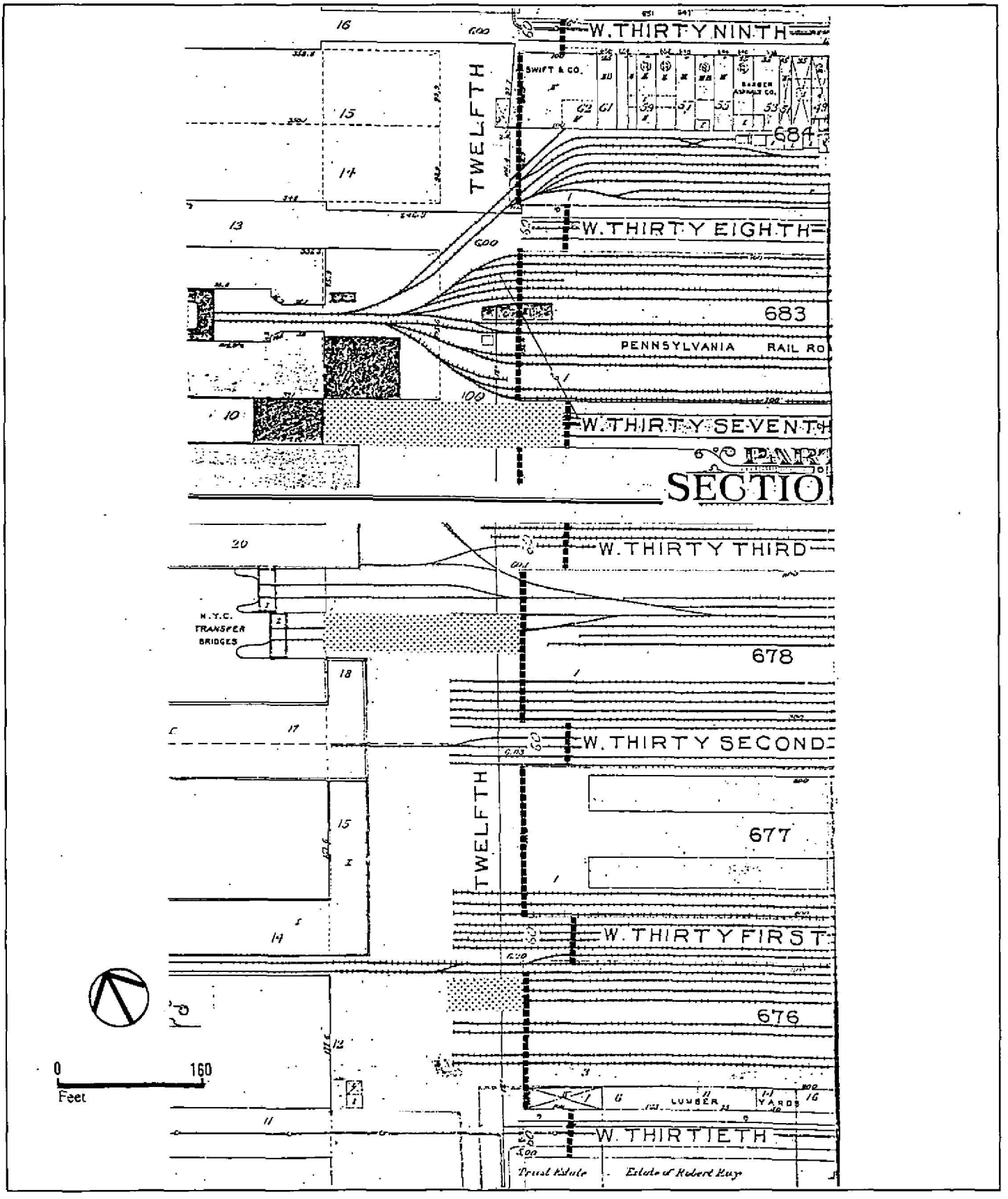
- Old West 30th to West 31st Street Pier, 1874 to 1902, part of landfill between 1897-1902.
- Old West 32nd to West 33rd Street Pier, 1874 to 1902, part of landfill between 1897-1902.
- Old West 37th Street Pier, 1874 to 1902, part of landfill between 1897-1902.
- Old West 41st Street Pier, 1879 to 1913, part of landfill between 1902-1913.
- Old West 41st to West 42nd Street Pier, 1874 to 1913, part of landfill between 1902-1913.

4. Landfill

- Possible fill retaining devices.

5. Other

NONE.



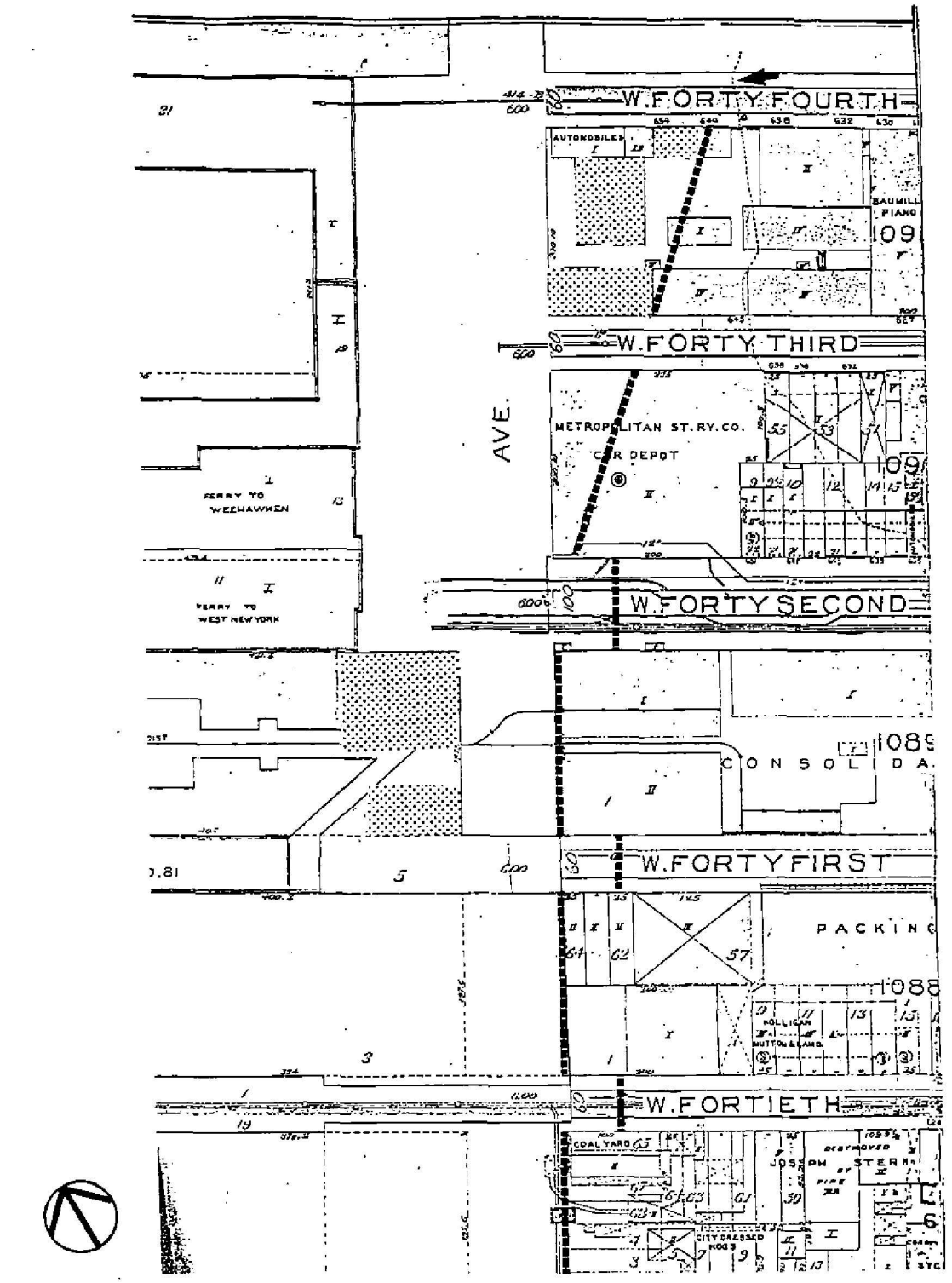
Legend

Historic Sensitivity

Approximate Eastern Boundary of Study Area

Areas of Potential Sensitivity - West 30th to West 44th Street
Superimposed on the 1913 Hyde Atlas of the Borough of Manhattan

Figure 8-1A



Legend

Historic Sensitivity

Approximate Eastern Boundary of Study Area

Base map contained depiction of original shore line

Areas of Potential Sensitivity - West 30th to West 44th Street
Superimposed on the 1913 Hyde Atlas of the Borough of Manhattan

Figure 8-1B

A. SUMMARY AND RECOMMENDATIONS

The extensive documentary and cartographic research to date of the project area between West 30th and West 44th Streets has revealed the location of several areas potentially sensitive for historical cultural remains. Potential remains were initially identified in the prehistoric and historic sensitivity sections. Prior impacts were assessed and a final list of areas deemed to be potentially sensitive was presented in Chapter VIII (See Figure 8-1). Each of the categories is discussed below and a preliminary evaluation of significance is made here. It should be noted, however, that the conclusions presented in this preliminary evaluation may be altered when research on the entire project area is completed and a final list of potentially sensitive areas is compiled.

Numerous piers dating to the nineteenth century were in the route of Twelfth Avenue and Marginal Street and may have become part of the landfill. Construction techniques varied through time and with individual owners. It would be impractical to attempt either excavation or avoidance of all of these features. However the importance of such resources cannot be denied. The sample chosen and presented here for further consideration is preliminary and was based on age of construction and the potential for answering specific questions regarding shoreline development. The following list of shoreline features represents different periods of construction.

West 37th Street Pier-c.1874-1902, part of Twelfth Avenue and Marginal Street landfill by 1897-1902.

West 41st Street Pier-c.1879-1913, part of Twelfth Avenue and Marginal Street landfill by 1902-1913.

It is quite possible that during excavations for the Route 9A Reconstruction project, undocumented piers, wharves, quays, and fill retaining devices may be found. Cartographic references to cribbing have not been encountered, although it is highly probable that these features were constructed during the land reclamation process. Since a diverse number of methods of shoreline expansion were used in Manhattan, varying with age of construction and individualistic techniques, these resources are considered an important research issue toward documenting the development of the city.

Features which may warrant archeological investigations are the buildings once present on Block 1091 between West 43rd and West 44th Streets. Three buildings, built c.1859 - c.1879, stood until the route of Twelfth Avenue was moved eastward to traverse the block. At that time the buildings were razed. The buildings were probably all associated with the Higgins Carpet Company that operated on the block between at least 1859 and 1902 (Figures 6-6 and 6-8).

As stated above, this is a preliminary evaluation and the conclusions presented in this chapter may be altered when research on the entire project area is completed.

BIBLIOGRAPHY

Adams, Arthur G.
1981 The Hudson: A Guidebook to the River. State University of New York Press, Albany, New York.

Alexander, Cooper Associates
1979 Battery Park City Report and 1979 Master Plan. Prepared for Battery Park City Authority, New York.

Barlow, Elizabeth
1971 The Forests and Wetlands of New York City. Little Brown, and Co., Boston.

Baugher-Perlin, Sherene, M. Janowitz, M. Kodack and K. Morgan
1982 "Towards an Archaeological Predictive Model for Manhattan: A Pilot Study." Ms. on file with the New York City Landmarks Preservation Commission.

Berger, Louis and Associates
1983 Barclays Bank Site, 100 Water Street, New York, New York. The Cultural Resource Group of Louis Berger, Inc.

1987a Archaeological Investigation of Site 1 of the Washington Street Urban Renewal Area, New York City. Prepared by Louis Berger and Associates for Shearson Lehman/American Express through the New York City Public Development Corporation, New York.

1987b Druggists, Craftsmen and Merchants of Pearl and Water Streets, New York: The Barclays Bank Site. The Cultural Resource Group of Louis Berger, Inc.

1989 Archaeological and Historical Investigations at the Assay Site BNlock 35, New York, New York. Prepared by Louis Berger and Associates for HRO International, Ltd., New York.

Billings, Wilson
1930 "The Development of Transportation in the Port of New York District." The Industrial Museum of New York 1(2).

Black, George Ashton
1891 "The History of Municipal Ownership of Land on Manhattan Island." Columbia University Studies in History, Economics and Public Law, 1(3). Columbia University, New York.

Black, Mary
1973 Old New York in Early Photographs, 1853-1901. Dover Publications, Inc., New York.

Board of Estimate and Apportionment
1930 Report of the Chief Engineer of the Board of Estimate and Apportionment of the City of New York. Board of Estimate and Apportionment, New York.

Bolton, Reginald P.
1922 Indian Paths in the Great Metropolis. Indian Notes and Monographs, Museum of the American Indian, Miscellaneous Papers 23, New York.

1934 Indian Life of Long Ago in the City of New York. Boltons Books, New York.

Booth, Mary L.
1859 History of the City of New York. W.R.C. Clark and Meeker, New York.

Borough President of Manhattan
1957 Miller Highway West Side Elevated Improvement. Borough President of Manhattan, Triborough Bridge and Tunnel Authority, New York.

Brasser, Ted J.
1974 Riding on the Frontier's Crest: Mahican Indian Culture and Culture Change. National Museum of Man, Mercury Series. Ethnology Division Paper No. 13, National Museum of Canada, Ottawa.

1978 "Early Indian-European Contacts." In Northeast, edited by Bruce G. Trigger, pp. 78-88. Handbook of North American Indians, Vol. 15, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D. C.

Braun, David P.
1980 "On the Appropriateness of the Woodland Concept in Northeastern Archaeology." In Proceedings of the Conference on Northeastern Archaeology, Research Report 19, edited by James Moore, University of Massachusetts, Amherst. pp. 93-108.

Brennan, Louis A.
1974 "The Lower Hudson: A Decade of Shell Middens." Archaeology of Eastern North America 2(1):81-93.

Brown, Henry Collins
1913 Book of Old New York. The Lent and Graff Co., New York.

Brown, Joshua, and David Ment
1980 Factories, Foundries, and Refineries: A History of Five Brooklyn Industries. Brooklyn Rediscovery, Brooklyn Educational & Cultural Alliance, Brooklyn.

Bruce, Wallace
1901 Panorama of the Hudson. Bryant Literary Union, New York.

Brumbach, Hetty Jo
1986 "Anadromous Fish and Fishing: A Synthesis of Data From the Hudson River Drainage." Man in the Northeast, 32:35-66.

Burr, S. D. V.
1885 Tunneling Under the Hudson River. John Wiley and Sons, New York.

Buttenwieser, Ann L.
1987 Manhattan Water Bound. New York University Press, New York.

Byrne, Austin T.
1892 A Treatise on Highway Construction. John Wiley and Sons, New York.

Byrnes, Clara
1918 Block Sketches of New York City. Radbridge Co., New York.

Ceci, Lynn
1979 "Maize Cultivation in Coastal New York." North American Archaeologist 1(1):45-74.

Citizens Association of New York
1865-1866 Report of the Council of Hygiene and Public Health Upon the Sanitary Condition of the City. Appleton and Co., New York.

City History Club of New York
n.d. Syllabus of a General Lecture on the History and Development of the City of New York. City History Club of New York, New York.

City of New York
1926 Contract for Viaduct Construction: Proposal for Bids and Agreement. 2 vols. Office of the President of the Borough of Manhattan, Bureau of Engineering. The City of New York, New York.

City of New York Department of Parks
1902 Commissioners Report for the Year 1902. Martin B. Brown, New York.

Clary, Martin
1929 Mid-Manhattan. Forty-Second Street Property Owners and Merchants Association, Inc., New York.

Cotter, John L.
1962 Archaeological Observations at Castle Clinton. Ms. on file at State Office of Parks, Recreation and Historic Preservation, Albany, New York.

Csanyi, Ladis H.
1938 "The Circumferential Highway System of Manhattan." The Municipal Engineers Journal 24(4):169-194.

Daley, Robert
1859 The World Beneath the City. J.B. Lippincott Company, Philadelphia.

Davies, J. Vipond
1909 "The Hudson - Manhattan Tunnel System, II." Railroad Age Gazette 9/24/1909. pp. 539-545.

1909 "The Hudson - Manhattan Tunnel System, V." Railroad Age Gazette 10/15/1909. pp. 702-706.

1909 "The Hudson - Manhattan Tunnel System, I." Railroad Age Gazette 9/17/1909. pp.449-494.

Department of Public Parks
1897 Catalogue of Buildings, Sheds, Etc. on That Portion of Land Acquired for Public Parks in the 7th, 10th 11th and 13th Wards. Department of Parks, New York.

De Voe, Thomas F.
1867 The Market Assistant. Riverside Press, New York.

1873 Report Upon the Present Condition of the Public Markets of the City and County of New York. Evening Post Steam Presses, New York.

Dickens, Roy S., Jr.
1982 Preface. In Archaeology of Urban America: The Search for Pattern and Process, edited by R.S. Dickens, Jr., pp. XIV-XX. Academic Press, New York.

Dincauze, Dena and Michael Mulholland
1977 "Early and Middle Archaic Site Distributions and Habitats in Southern New England." In Amerinds and Their Paleo-environments in Northeastern North America. Annals of New York Academy of Sciences 288:439-456.

Douglas, R. W. and S. Frank
1972 A History of Glassmaking. G.T. Foulis and Co., Ltd., Oxfordshire, England.

Edwards, Dean, G. Kelcey, and L. Beck
1956 Study of Improvements to the Miller Highway, New York. Ms. on file New York Municipal Reference Library, New York.

Edwards, Robert L. and K. O. Emery
1977 "Man on the Continental Shelf." (As reprinted in The Coastal Archaeology Reader, Vol. V, of Readings in Long Island Archaeology and Ethnohistory. Suffolk County Archaeological Association, 1982.) pp. 12-21.

Eisenberg, Leonard
1978 "Paleo-Indian Settlement Patterns in the Hudson- Delaware River Drainages." Occasional Publications in Northeastern Anthropology, No. 4.

Engineering News-Record
1933 Engineering News-Record. Vol. 110, January-June, 1933. McGraw-Hill Publishing Co., New York.

1934 Engineering News-Record. Vol. 112, January-June, 1934. McGraw-Hill Publishing Co., New York.

1936 Engineering News-Record. Vol. 114, January-June, 1936. McGraw-Hill Publishing Co., New York.

Federal Highway Administration
1975 West Side Highway Administration Action, Final Environmental Impact Statement and Section Four Statement, U.S. Department of Transportation, Federal Highway Administration and NYS Department of Transportation. Albany, New York.

Fisher, Frank L.
1895 A Complete List of West Side Dwellings. West Side Real Estate, New York.

Funk, Robert E.
1976 Recent Contributions to Hudson Valley Prehistory. New York State Museum Memoir 22. The State Education Department, Albany, New York.

Funk, Robert E. and William A. Ritchie
1973 Aboriginal Settlement Patterns in the Northeast. New York State Museum Memoir 20. The State Education Department, Albany, New York.

Futcliffe, Alice
1909 Robert Fulton and the Clermont. The Century Co.

Gaudreau, Denise C.
1988 "The Distribution of Late Quaternary Forest Regions in the Northeast: Pollen Data, Physiography and the Prehistoric Record." In Holocene Human Ecology in Northeastern North America, George P. Nichols, ed. Plenum Press, New York. pp. 215-256.

Gehring, Charles T. ed.
1980 New York Historical Manuscripts: Dutch. Volumes GG, HH, and II, Land Papers. Genealogical Publishing Co., Inc., Baltimore.

Geismar, Joan
1983 The Archaeological Investigation of the 175 Water Street Block, New York City. Soil Systems Division of Professional Services Industries, Inc.

1986 Seventeen State Street, An Archaeological Phase 1 Documentation. Prepared for Seventeen Vista Associates, New York.

1987 Stage 1A Archaeological Evaluation of the Exchange Project Site, 10 Battery Place, New York City. Prepared for EEA, Inc., New York.

1987b "Landfill and Health, A Municipal Concern or, Telling It Like It Was." Northeast Historical Archaeology 16:49-57.

1988 UPS Manhattan South Facility, Phase 1A Archaeological Assessment. Prepared for Allee King Rosen and Fleming, Inc., New York.

Gilder, Rodman
1936 The Battery. Houghton Mifflin Company, Boston.

Gilbert, G.H. and L.I. Wightman
1912 The Subways and Tunnels of New York. John Wiley and Sons, New York.

Goddard, Ives
1978a "Delaware." In Northeast, edited by Bruce G. Trigger, pp. 213-239. Handbook of North American Indians, Vol. 15, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

1978b "Eastern Algonquian Languages." In Northeast, edited by Bruce G. Trigger, pp. 70-77. Handbook of North American Indians, Vol. 15, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D. C.

Grafton, John
1977 New York in the Nineteenth Century. Dover Publications, New York.

Granick, Harry
1947 Underneath New York. Rinehart and Company, New York.

Gratacap, Louis P.
1909 Geology of the City of New York. Henry Holt & Co., New York.

Greene, Carlton
1917 Wharves and Piers. McGraw-Hill Book Company, New York.

1927 Obstacles Overcome in the Hudson River Bridge. Engineering News Record Editorial. Port of New York Authority, New York.

Greene, Nelson, ed.
1931 History of the Valley of the Hudson. Volume 1. S.J. Clarke Publishing Co., Chicago.

Gretarex, Eliza
1875 Old New York from the Battery to Bloomingdale. G.P. Putnam's Sons, New York.

Grossman, Joel
1985 Project, Site 5C, Archaeological/Historical Sensitivity Analysis, Draft Report. Greenhouse Consultants, Inc. Prepared for Public Development Corp., New York.

Grumet, Robert Steven
1981 Native American Place Names in New York City. Museum of the City of New York, New York.

Hardesty and Hanover
1976 West Side Highway Inspection and Engineering Evaluation, 42nd to 59th Street. Submitted to The City of New York Transportation Administration, New York.

Harrington, Raymond J.
1934 "The Elevated Public Highway Along the Hudson River Waterfront in the Borough of Manhattan." The Municipal Engineers Journal 20 (4):116-130.

Haskell, Daniel C., ed.
1931 Manhattan Maps, A Cooperative List. The New York Public Library, New York.

Henn, Roselle, Diana Wall, Laurie Boros, Valerie DeCarlo and Jed Levin
1985 "Preindustrial Waterfront Technology in Lower Manhattan." Paper presented at the Annual Meeting of the Society for Industrial Archeology, Newark, Delaware.

Hershey, William D.
1963 Castle Clinton at the Battery. Ms. on file State Office of Parks, Recreation, and Historic Preservation, Albany, New York.

Hill, George E. and George E. Waring, Jr.
1897 "Old Wells and Water-Courses of the Island of Manhattan." Halfmoon Series, 1(10). New York City History Club. Maud Wilder Goodwin, New York.

Hoag, S.W., Jr.
1905 Dock Department and New York Docks. The Municipal Engineers of the City of New York, New York.

Hodgson, A. W.
1910 Ventilation of the Hudson River Tunnels. Garwood Electric COmpany, Garwood, New Jersey.

Hollyer, Samuel
1905 Old New York: Views by S. Hollyer. Samuel Hollyer, New York.

Huey, Paul R.
1984 "Old Slip and Cruger's Wharf at New York: An Archaeological Perspective of the Colonial American Waterfront." Historical Archaeology 18(1):15-37.

Hume, Ivor Noel
1987 The Wells of Williamsburg, Colonial Time Capsules. Colonial Williamsburg Archaeological Series No. 4. The Colonial Williamsburg Foundation, Williamsburg, Virginia.

Innes, J.H.
1902 New Amsterdam and Its People, Studies, Social and Topographical of the Town under Dutch and Early English Rule. C. Scribner's Sons, New York.

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

Johnson, Harry and Frederick S. Lightfoot
1980 Maritime New York in Nineteenth Century Photographs. Dover Publications Inc., New York.

Jones, Pamela
1978 Under the City Streets. Holt, Rinehart and Winston, New York.

Kieran, John
1982 A Natural History of New York City. Second edition. Fordham University Press, New York.

Kirkorian, Cece and Evelyn Tidlow
1984 Phase One Archaeological Impact Report for Sites 1A, 1B, 5B and 5C, Washington Street Urban Renewal Area, New York City, New York. Prepared for Allee King Rosen and Fleming, Inc., New York.

Kolff, Cornelius G.
n.d. Waterfronts and Factory Sites of New York Harbor. Cornelius G. Kolff, New York.

Konvitz, Josef W.
1989 "William J. Wilgus and Engineering Projects to Improve the Port of New York, 1900-1930." Technology and Culture 30:398-425.

Lawrence, R.H. and Otto Hufeland
1981 Valentine's Manuals: A Serial Index. Reprinted from the 1906 and 1900 editions. Harbor Hill Books, Harrison, New York.

Levy, Samuel
1931 Annual Report. President of the Borough of Manhattan, City of New York.

Lewis, Harold M.
1928 Regional Survey of New York and Its Environs. 8 volumes. Committee On Regional Plan of New York and Its Environs, New York.

Lightfoot, Kent, Robert Kalin, Owen Lindauer and Linda Wicks
1985 "Coastal New York Settlement Patterns: A Perspective From Shelter Island." Man in the Northeast 30:59-82.

Little, Elizabeth A.
1985 "Prevailing Winds and Site Aspects: Testable Hypothesis About the Seasonality of Prehistoric Shell Middens at Nantucket, Massachusetts." Man in the Northeast 29:15-27.

Lockwood, Charles
1976 Manhattan Moves Uptown. Houghton Mifflin Co., Boston.

Lossing, Benson J.
1866 The Hudson From the Wilderness to the Sea. Virtue and Yorston, New York.

Lubschez, Ben Judah
1927 Manhattan, the Magical Island. Press of the American Institute of Architects, New York.

Ludwig, John W.
1953 Street Names of Manhattan and the Stories They Tell. Ms. on file Local History Room, New York Public Library.

Luke, Myron H.
1953 The Port of New York 1800-1810. New York University Press, New York.

Lyman, S.E.
1975 The Story of New York. Revised ed. Crown Publishers Inc., New York.

MacElwee, Roy Samuel
1918 Ports and Terminal Facilities. McGraw-Hill Book Company, New York.

1925 Port Development. McGraw-Hill Book Company, New York.

Mackay, Donald A.
1987 The Building of Manhattan. Harper and Row, New York.

Matsumura, Takao
1983 The Labour Aristocracy Revisited: The Victorian Flint Glass Makers 1850-1880. Manchester University Press, Manchester, England.

McBride, Kevin A.
1984 Prehistory of the Lower Connecticut River Valley. Unpublished Ph.D. dissertation, University of Connecticut, Storrs, Connecticut.

McCabe, James D.
1882 New York By Sunlight and Gaslight. Douglass Brothers Publishers, Philadelphia.

McKearin, George S. and Helen
1941 American Glass. Crown Publishers, Inc., New York.

Miller, James
1866 Miller's New Guide to the Hudson River. James Miller, New York.

Morris, James
1969 The Great Port. Harcourt, Brace and World, Inc., New York.

Moscow, Henry
1978 The Street Book. An Encyclopedia of Manhattan's Street Names and Their Origins. Hagstrom Company, New York.

Mott, Hopper Striker
1908 The New York of Yesterday. A Descriptive Narrative of Old Bloomingdale. G.P. Putnams Sons, New York.

Mueser Rutledge Consulting Engineers
1988 Evaluation of the Bulkhead Battery Park City to West 46th Street Hudson River, N.Y. Prepared for Ebasco Constructors, Inc., New York.

1989 Draft Report of the Bulkhead Condition Review Battery Park City to West 59th Street Hudson River, New York For Route 9A Reconstruction Report. Prepared by Mueser Rutledge Consulting Engineers for Vollmer Associates, Inc.

Mulholland, Mitchell T.
1988 "Territoriality and Horticulture: A Perspective for Prehistoric Southern New England." In Holocene Human Ecology in Northeastern North America, George P. Nichols ed. Plenum Press, New York. pp. 137-166.

Museum of the City of New York
c. 1900 Clippings File.

Nelson and Sons
1860 Nelson's Illustrated Guide to the Hudson and Its Tributaries. Nelson and Sons, New York.

New York Board of Trade, Inc.
1929 Piers for 1000 Foot Trans-Atlantic Passenger Ships. New York Board of Trade, Inc., New York.

New York City Board of Aldermen
1836 Report of the Committee on Wharves Relative to the Erection of a Great Pier in the North River. Committee on Wharves, Slips and Piers. William Townsend, New York.

New York City Board of the Assistant Aldermen
1849a Report of the Special Committee for the Enlargement of the Battery. McSpedon and Baker, New York.

1849b Report of the Special Committee Upon the Widening of West Street. McSpedon and Baker, New York.

1853 Report of the Committee on Streets in Favor of Widening Battery Place, from Broadway to West Street. McSpedon and Baker, New York.

New York City Construction Coordinator
1946 Construction Schedule for Arterial Highways and Parkways. New York City Construction Coordinator, New York.

New York City Department of City Planning
1931 In the Matter of: The Application of the North River Bridge Company to the United States War Department on the Construction of a Bridge over the Hudson at West 57th Street. American Society of Civil Engineers, New York.

New York City Department of Docks
1881 Action of the Commissioners on the Construction of the River Wall Designed by George S. Greene, Jr. New York City Department of Docks, New York.

New York City Department of Docks and Ferries
1908 38th Annual Report of the Department of Docks and Ferries. New York City Department of Docks and Ferries, New York.

1912-1913 Reports on West Manhattan Waterfront. Report 24. New York City Department of Docks and Ferries, New York.

New York City Department of Finance
1918 Plan for Improvement of Freight Terminal and Water Front Conditions on The West Side of Manhattan. New York City Department of Finance, New York.

New York City Office of Lower Manhattan Development
1975 Lower Manhattan Waterfront: Battery Park City District, Manhattan Landing Development District, Especially South Street Seaport. New York City Office of Lower Manhattan Development, New York.

New York City Parks Department
1937 Opening of the West Side Improvement. New York City Parks Department, New York.

New York City Police Department
1851 A Hand Book of Streets and Distances Showing the Length and Intermediate Distance from Street to Street in The City of New York. Browne and Co., New York.

New York Pier and Warehouse Company
1869 Piers and Wharves of New York. Evening Post Steam Press, New York.

New York State Bridge and Tunnel Commission
New Jersey Interstate Bridge and Tunnel Commission
1923 "Hudson River Vehicular Tunnel, Contract No. 5: Tunnels between the Canal Street Shaft on the East Side of Hudson Street Between the Spring Street SHaft and the North Side of Dominick Street."

1920 "Hudson RIver Vehicular Tunnel, COntract No. 1: Canal Street Shaft, Spring Street Shaft Manhattan."

Norcross, Frank W.
1901 A History of the New York Swamp. The Chiswick Press, New York.

Norman, J. Gary
1986 "Eighteenth Century Wharf Construction in Baltimore." MA thesis, The College of William and Mary.

Ogden, Charles Burr
1898 Quaker Ogdens in America. J.B. Lippincott Co., Philadelphia.

Parker, Arthur C.
1922 The Archeological History of New York. New York State Museum Bulletin Numbers 235-238. Albany, New York.

Pelletreau, William S.
1900 Early New York Houses. Francis P. Harper, New York.

Pellett, Mirl E.
1927 Genesis, Activities, and Problems of the Port of New York Authority. The Port of New York Authority, New York.

Pierson, H.R.
1867 Report of the Special Committee on Piers, Wharves, Slips, and Bulkheads in the City of New York. Van Benthuysen and Sons, Albany, New York.

Port Authority of New York and New Jersey
1983 "Path Gazette." Diamond Jubilee Souvenir Edition. February, 1983.

Post, John J.
1882 Old Streets, Roads, Lanes, Piers and Wharves of New York. R.D. Cooke, New York.

Raber, Michael S.
1984 Cultural Resources Reconnaissance Edgewater, New Jersey Reach New York Harbor Drift Removal Project. Prepared by Raber Associates for U.S. Army Corps of Engineers, New York District.

1985 Cultural Resources Investigations in Brooklyn Reach 2: New York Harbor Collect and Removal of Drift Project. Prepared by Raber Associates for U.S. Army Corps of Engineers, New York District.

1986 Cultural Resources Reconnaissance of the Manhattan Upper West Side Reach: New York Harbor Collection and Removal of Drift Project. Prepared for U.S. Army Corps of Engineers, New York District.

Rand McNally and Co.
1896 Complete Railway and Street Number Guide of New York City. Rand McNally and Co., New York

1916 Hudson River Guide to Places of Interest to the Tourist and Excursionist. Rand McNally and Co., New York.

Real Estate Record Association
1967 A History of Real Estate, Building and Architecture in New York City. Originally published in 1898 by Record and Guide, New York. Arno Press, New York.

Regional Plan
1929 The Graphic Regional Plan: Atlas and Description. Regional Plan, New York.

Ritchie, William A.
1980 The Archaeology of New York State. Revised edition. Harbor Hill Books, New York.

Rockman, Diana, Wendy Harris, and Jed Levin
1985 The Archaeological Investigation of the Telco Block, South Street Seaport Historic District, New York, New York. Advisory Council on Historic Preservation, Washington, D.C.

Rutsch, Edward, Nan Rothschild, et al.
1983 Westside Highway Cultural Resource Survey, Archaeological Work Program: Cultural Resources Research. Prepared for New York State Department of Transportation.

Salwen, Bert
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." In Northeast, edited by Bruce G. Trigger, pp. 160-176. Handbook of North American Indians, Vol.15, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

1982 Foreward. In Archaeology of Urban America: The Search for Pattern and Process, edited by R.S. Dickens, Jr., pp. XII-XVII. Academic Press, New York.

Sanitary Engineer and Construction Record
1886-1887 Engineering Record. Volumes XV, XIV and XVI. The Sanitary Engineer and Construction Record, New York.

Sapin, Wendy Harris
1985 "Landfilling at the Telco Block." American Archeology 5(3):170-174.

Saxon, Walter
1973 "The Paleo-Indian on Long Island." New York State Archaeological Association Bulletin, 57. March, 1973. (As reprinted in The Coastal Archaeology Reader, Vol. II, of Readings in Long Island Archaeology and Ethnohistory. Suffolk County Archaeological Association, 1978.) pp. 251-261.

Schuberth, Christopher J.
1968 The Geology of New York City and Its Environs. The Natural History Press, New York.

Secretary of the State of New York
1864 Calendar of New York Colonial Manuscripts, Indorsed Land Papers 1634-1803. Weed, Parsons and Co., Albany, New York.

Simpson, Jeffrey
1981 The Hudson: A Guidebook to the River. State University of New York Press, Albany, New York.

Skinner, Alanson
1926 "The Indians of Manhattan Island and Vicinity." The American Museum of Natural History, Guide Leaflet Series. No. 41. New York.

1951 The Indians of Manhattan Island and Vicinity. Ira J. Friedman, Inc., Port Washington, Long Island, New York.

Smith, Alexander
1907 Comments and Suggestions Respecting A Preliminary Report on Improvement of the Terminal Facilities of the Port of New York. The Committee on Foreign Commerce and The Revenue Laws of the Chamber of Commerce of the State of New York, New York.

Smith, Carlyle Shreeve
1950 "The Archaeology of Coastal New York." Anthropological Papers of the American Museum of Natural History. 43:2. Museum of Natural History, New York.

Smith, James Reuel
1938 Springs and Wells of Manhattan and the Bronx, New York City. New York Historical Society, New York.

Snow, Dean
1978 "Late Prehistory of the East Coast." In Northeast, edited by Bruce G. Trigger, pp. 58-69. Handbook of North American Indians, Vol. 15, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D. C.

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

Solecki, Ralph S.
1974 "The 'Tiger,' An Early Dutch Seventeenth Century Ship, And An Abortive Salvage Attempt." Journal of Field Archaeology. Vol. 1:109-116.

Spann, Edward K.
1981 The New Metropolis. Columbia University Press, New York.

Staniford, Charles W.
1913 Report on Pier Extensions. New York City Department of Docks and Ferries, New York.

Stern, Robert, G. Gilmartin and J. Massengale
1983 New York 1900: Metropolitan Architecture and Urbanism 1890-1915. Rizzoli International Publishers, New York.

Stern, Robert, G. Gilmartin and T. Mellins
1987 New York 1930: Architecture and Urbanism Between the Two World Wars. Rizzoli International Publications, Inc., New York.

Stokes, Isaac Newton Phelps
1915- The Iconography of Manhattan Island. Volumes I-VI.
1926 Robert H. Dodd, New York.

Suggs, Robert C.
1966 The Archaeology of New York State. Thomas Y. Crowell Company, New York.

Taintor, Robert
1874 Taintor's Route and City Guides. New York Central and Hudson River Rail Roads. Taintor Brothers, New York.

The Henry Hudson Parkway Authority
1936 Opening of the Henry Hudson Parkway and Progress on the West Side Improvement. The Henry Hudson Parkway Authority, New York.

The Marine News
1919 "North River Pier Leases." The Marine News, December, 1919.

The Triborough Bridge Authority
1941 Fifth Anniversary Report. The Triborough Bridge Authority, New York.

Trager, James
1987 West of Fifth: The Rise and Fall and Rise of Manhattan's West Side. Atheneum, New York.

United States Department of the Interior
1976 National Register of Historic Places. National Park Service, United States Government Printing Office, Washington, D.C.

United States Works Progress Administration
1940a Monthly Report of Progress. 2 vols. Federal Works Agency, Works Progress Administration for the City of New York, New York.

1940b Shore Survey: Sewer Outlets and Water Front Property Use. Interstate Sanitation Commission, New York Harbor, New York.

Valentine, D. Thomas
1847-1866 Manuals of the Corporation of the City of New York.

Viele, Egbert L.
1859 Report on the Topography and Hydrology of New York to the Sanitary Association of the City of New York. Edmund Jones and Company, New York.

Vollmer Associates
1987 "West Side Highway Replacement Study. Technical Appendix 3, Archaeology/Landmarks/Historic Sites." Prepared for NYS Department of Transportation, NYC Department of Transportation, and NYC Department of City Planning, New York.

1989 Route 9A Reconstruction, Preliminary Review of Existing Data and Proposed Subsurface Investigation. Prepared for NYS Department of Transportation, Albany, New York.

Washburn, Wilcomb E.
1978 "Seventeenth-Century Indian Wars." In Northeast, edited by Bruce G. Trigger, pp. 89-100. Handbook of North American Indians, Vol. 15, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Weber, Carmen A.
1988 "Interim Report: An Exploration of Philadelphia's Early Waterfront Through the Hertz Lot Excavation." Ms. on file Philadelphia Historical Commission, Philadelphia, Pennsylvania.

West End Association
1881 Riverside Park and Hudson River Waterfront. West End Association, New York.

West Side Improvement Architects Committee
1929 Reports of the New York City West Side Improvement Architects Committee. West Side Improvement Architects Committee, New York.

White, Norval
1987 New York: A Physical History. Atheneum, New York.

Willensky, Elliot and Norval White
1988 AIA Guide to New York City. Third Edition. Harcourt, Brace Jovanovich, New York.

Wilson, Rufus Rockwell
1902 New York: Old and New. 2 vols. J.B. Lippincott Co., Philadelphia.

Wilstach, Paul
1933 Hudson River Landings. Indianapolis Press, Indianapolis.

Worden, Helen
1934 Round Manhattans Rim. Bobbs-Merrill Co., Indianapolis.

Works Progress Administration
1939 The WPA Guide to New York City. Revised edition. Random House, New York.

1940 New York City Monthly Report. Vol. 1, January through June, 1940. Works Progress Administration, New York.

World Trade Corporation
1947 Report of World Trade Corporation to the City of New York, on Surveys of Plans and Program for the Improvement of Waterfront and World Trade Facilities. World Trade Corporation, New York.

Wund, Jacob C.
1901 Asphalt and Asphalt Block Pavements Laid in the Borough of Manhattan Up to January 1, 1901. Superintendent of Street Openings, Paving and Repair, New York.

MAPS AND ATLASES

Bacon, J.
1856 Barnitz Pier Map of the City of New York. Surveyed and drawn for the New York Corn Exchange, New York.

Board of Public Improvements
1900 General Map of the City of New York. Board of Improvements, Topographic Bureau, New York.

Bradford, William
1731 A Plan of the City of New York from an Actual Survey. G. Hayward for Valentine's Manual, New York.

Bromley, George Washington
1879 Atlas of the City of New York. G.W. Bromley and Co., New York.

1891 Atlas of the City of New York. G.W. Bromley and Co., Philadelphia.

1897 Atlas of the City of New York. G.W. Bromley and Co., New York.

1902 Atlas of the City of New York. Volume 2, Update of 1899. G.W. Bromley and Co., Philadelphia.

1920 Atlas of the City of New York. Volume 2. Update of 1906. G.W. Bromley and Co., Philadelphia.

1921 Atlas of the City of New York. Volume 2. Update of 1906. G.W. Bromley and Co., Philadelphia.

1931 Atlas of the City of New York. Volume 2. Update of 1928. G.W. Bromley and Co., Philadelphia.

1932 Atlas of the City of New York. Volume 2. Update of 1920. G.W. Bromley and Co., Philadelphia.

Burr, David H.
1829 Map of the City and County of New York With the Adjacent Country. Simeon DeWitt, Surveyor General, Ithaca, New York.

1834 Map of the City of New York. David H. Burr, New York.

1837 City of New York. David H. Burr, New York.

1839 Map of the City and County of New York With the Adjacent Country. Simeon DeWitt, Surveyor General, New York.

1846 Map of the City of New York. David H. Burr, New York.

City of New York, Environmental Protection Administration
1968 P.W. - 164 North River Water Pollution Control Project, South Branch Intercepting Sewer Record Drawings. Department of Water Resources, New York.

City Surveyor
1872 Map of the Hermitage Farm and the Norton Estate. Farm Map 20. The City Surveyor, New York.

1880 Map Showing the Perimeters of Farms in Bloomingdale. Farm Map 21. The City Surveyor, New York.

Colton, J.H.
1836 Topographical Map of the City and County of New York and the Adjacent Country. J.H. Colton & Co., New York.

Commissioners of New York State
1807- Map of the City of New York and Island of Manhattan.
1811 William Bridges, New York.

Commissioner of the Sinking Fund
1868 The Wharves, Piers, and Slips, Belonging to the Corporation of the City of New York. North River. Volume 2. The New York Printing Company, New York.

Cozzins, Issachas
1842 Geological History of Manhattan Island. A Geological Map of the Island of New York. I. Cozzins, New York.

Department of Borough Works
1937 Rock Data Map of Manhattan Showing Locations of Borings, Excavations, Etc. Department of Borough Works, Borough of Manhattan.

Department of Docks
1880 Map of the City of New York Showing Existing and Proposed Piers and Bulkheads. Department of Docks, New York.

1902 Pierhead and Bulkhead Lines. Department of Docks, New York.

Department of Docks and Ferries
1902 Charts of the Waterfront of the City of New York. M.B. Brown Co., New York.

Department of Public Works
1873 Map of the City of New York; Showing the Different Stages of Improvement of Streets, Roads and Avenues. Department of Public Works. Joseph Laing Litho, New York.

Dripps, Matthew
1851 Map of the City of New York, North of 50th Street. Surveyed and Drawn by John F. Harrison, New York.

1852 Map of the City of New York Extending Northward to 50th Street. Surveyed and Drawn by John F. Harrison, New York.

1854 Topographical Map of the City of New York. Matthew Dripps, New York.

1868 Plan of New York City. M. Dripps, New York.

1875 Map of the City and County of New York. M. Dripps, New York.

Duyckink, G.
1755 Plan of the City of New York. G. Hayward for Valentine's Manual, New York.

Ensign, T. and E. H.
1845 City of New York. By T. and E.H. Ensign, New York.

Ewen, Daniel
1827- Maps and Surveys of the City of New York. Volume 6.
1830 Daniel Ewen, New York.

Fanning, T.C.
1853 Fannings Map of New York City. Ensign and Bridgeman, New York.

Galt and Hoy
1879 The City of New York. Galt and Hoy, New York.

Gillen, Peter W.
1900 Map of the Borough of Manhattan, New York City. Peter W. Gillen, New York.

Goodrich, A. T.
1828 Plan of the City of New York an the Island as Laid Out by the Commissioners, Altered and Arranged to the Present Time. A. T. Goodrich, New York.

Hills, John
1782 Map of New York. G. Hayward, New York.

Hooker, W.
1824 Plan of the City of New York. Engraved for the Strangers Guide, New York. W. Hooker, New York.

1828 Plan of the City of New York. William Hooker, New York.

1838-1839 Pocket Plan of the City of New York. William Hooker, New York.

Hyde, E. Belcher
1913 Atlas of the Borough of Manhattan. Volume 2. Update of 1906. E. Belcher Hyde, Brooklyn, New York.

1930 Atlas of the City of New York. Volume 2. Update of 1906. E. Belcher Hyde, Brooklyn, New York.

1950 Atlas of the City of New York. Volume 2. Update of 1906. E. Belcher Hyde, Brooklyn, New York.

Karpinski
1781 Reconnaissance Geometrique des Ouviages du Nord de L'Isle de New York: Soutenee par un corps de 5000 hommes aux Ordres des Generaux Washington et Rochambeaux, detache de l'Armee. (avec) "Carte de l'Isle de New York et des Environs." Ministry of War, Service Technique due Genie, Paris. Repository: New York Public Library.

Kitchin
1778 London Magazine-National Society of Colonial Dames in the State of New York. Repository: New York Historical Society.

Longworth, David H.
1808 Plan of the City of New York. David Longworth, New York.

1817 Actual Map and Comparative Plan of New York. David Longworth, New York.

Lyne, James
1729 Plan of New York in 1729. James Lyne, New York.

MacCoun, Townsend
1909a The Hudson River (Cahohatatea) at the Time of Its Discovery by Henry Hudson, 1609. Townsend MacCoun, New York.

1909b 1653-1664, Amsterdam in New Netherland. Townsend MacCoun, New York.

1909c New York, The English Colonial City, 1730. Townsend MacCoun, New York.

1909d The Island of Manhattan at the Time of Its Discovery, 1609. Townsend MacCoun, New York.

Marks, S.
1827 A New Map of the City of New York. S. Marks, New York.

Miller, Rutger
1855 Map of the City of New York Showing the Original High Water Line and the Location of the Different Farms and Estates. Rutger Miller, New York.

Montresor, John
1775 A Plan of the City of New York and Its Environs. Published by A. Dury, England.

Newlin, M.
1898 Map of the City of New York. Board of Estimate and Apportionment, New York.

New York Bay Pollution Commission
1905 Outline Map of New York Harbor and Vicinity, Showing Main Tidal Flow, Sewer Outlets, Shellfish Beds and Analysis Points. New York Bay Pollution Commission, New York.

New York Central and Hudson River Railroads
1890 A Geographically Correct Map of the City of New York Courtesy of the Passenger Department of the New York Central and Hudson River Railroad Companies. Matthews, Northrup and Co., New York.

New York City Department of Docks
1872 Map of the City of New York, South of 60th Street. New York City Department of Docks, New York.

1873 Map Showing the High and Low Water Marks and the Original City Grants of Land Under Water Made to Various Parties From 1686-1873. Battery to 51st Street. New York City Department of Docks, New York.

New York City Department of Docks and Ferries
1902 Waterfront and Harbor of the City of New York. New York City Department of Docks and Ferries, New York.

New York Harbor Line Board
1890 Pierhead and Bulkhead Lines for the East Shore of the Hudson River and the North and West Shores of the East River. New York Harbor Line Board, New York.

New York State Department of the State Engineer and Surveyor
1910 Catalog of Maps and Papers in the Land Bureau of the Department of the State Engineer and Surveyor. J. Bryon Co., Albany, New York.

New York City Mayor's Committee on Property Improvement
1940 Chelsea Neighborhood Study. New York City Mayor's Committee on Property Improvement, New York.

Office of the President of the Borough of Manhattan
1940 Rock Data Map of Manhattan: Details of Borings and Excavations. Second edition. Office of the President of the Borough of Manhattan of the City of New York, New York.

Perris, William
1859 Maps of the City of New York. Volume 6, Plates 99, 102. New York.

1862 Maps of the City of New York. Volume 7, Plate 103. New York.

Perris, William and Browne
1880 Insurance Maps of the City of New York. Perris and Browne, New York.

Poppleton, T.
1817 North River Shore, Battery and 75th Street: A Map of Property on the North Side of Marketfield Street Between Broadway and Fifty-Third to Fifty-Ninth. R. Graves Co., New York.

Prior and Dunning
1826 Plan of the City of New York. Prior and Dunning, New York.

Randel, John
1819- Map of Farms. Vol.4, Plates 20, 24 and 28.
1820 Commissioners of the City of New York, New York.

Ratzer, Bernard
1767 The Ratzer Map of New York City. Struthers and Co., New York.

Redfield, J.S.
1871 Map to Accompany the Travellers Guide to the City of New York. G.W. and C.B. Colton and Co., New York.

Risse, Louis A.
1800 New York in 1800. R.A. Welcke, New York.

Roberts, J. and B. Taylor
1797 A New and Accurate Plan of the City of New York in the State of New York in North America. S. Haywood, New York.

Robinson, Edward
1889 Real Estate Atlas of the City of New York. Volume 5. E. Robinson, New York.

Robinson, Edward and R. H. Pidgeon
1883 Atlas of the City of New York. Volume 1. E. Robinson, New York.

1885 Robinson's Atlas of the City of New York. E. Robinson and R. Pidgeon, New York.

Sackersdorff, Otto
1815 Map of Farms Commonly Called the Blue Book, 1815. Otto Sackersdorff, City Surveyor, New York.

Sanborn Map Company
1922 Pier Map of New York Harbor. Sanborn Map Co., New York.

1928 Pier Map of New York Harbor. Sanborn Map Co., New York.

Slum Clearance Committee of New York
1933-1934 Maps and Charts. The Slum Clearance Committee of New York, New York.

Stevens, B.F.
1900 Facsimile of the Unpublished British Head Quarters: Coloured Manuscript Maps of New York and Environs, 1782. (Reproduced from Original in War Office, London.) B.F. Stevens, London.

Street Commissioners Office
1860 Maps of the Wharves and Piers of the City of New York. F. Heppenheimer, New York.

Stuyvesant, Governor Peter
1699 Nieuw Amsterdam. Update of 1660. Manning Exton, South Port, Connecticut.

Taylor, B. and J. Roberts
1797 A New and Accurate Plan of the City of New York in the State of New York in North America. J. Roberts, New York.

United States Geological Survey
1897 New York-New Jersey: Harlem Quadrangle. United States Geological Survey, Washington, D.C.

Viele, Egbert L.
1859 Map of the City of New York from the Battery to 80th Street, Showing the Original Topography of Manhattan Island. Egbert Viele, New York.

1874 Topographical Atlas of the City of New York. Egbert Viele, New York.

Virckenboons, Johannes
1639 Map of Manhattan. Drawn by Johannes Virckenboons: A Facsimile from the Library of Congress, Washington, D. C.

West Side Association of Commerce, Inc.
1931 The West Side-"A Self Sustaining District." West Side Association of Commerce, Inc., New York.

1933 West Side Survey and Residential Occupancy Map. West Side Association of Commerce, Inc., New York.