EXISTING CONDITIONS REPORT

ARCHAEOLOGICAL RESOURCES

HUDSON RIVER PARK PROJECT

WEST 46TH STREET TO WEST 59TH STREET

MANHATTAN, NEW YORK

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DRAFT

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TABLE OF CONTENTS

FIGURES

I. INTRODUCTION

The potential creation and development of a recreational waterfront park, spanning from Battery Place to 59th Street, has been undertaken by the Hudson River Park Conservancy (HRPC), a subsidiary of the New York State Urban Development Corporation (NYSUDC). The planning and engineering process of the proposed development, to include 60 acres of parkland, 330 acres of water, four and a half miles of esplanade, and 13 recreational piers, has necessitated preparing an Environmental Impact Statement (EIS) including the identification of potentially sensitive archaeological and historical resources within the project site (Figures 1, 2). This cultural resource assessment is designed to determine what, if any, potential archaeological resources have been deposited within the project site, and to identify the effects of prior demolition, excavation, or a change in historic context to any such resources. This report includes an identification of probable archaeological sites, a discussion of research potential, a preliminary assessment of integrity for those sites with research potential, and a final inventory of sites which may be potentially significant based on criteria for nomination to the National Register of Historic Places. A discussion of project impacts and recommendations can only be put forth after a final construction plan is designated.

The proposed Hudson River Park project site spans from Battery Place north to West 59th Street and includes all land west of the course of Route 9A, west to the United States Pierhead Line (Figure 1).* Because the project site extends into the Hudson River, piers, docks, wharves, bulkheads, and all other features extending into the water are included in this study. This report is concerned with the section between West 46th and West 59th Streets. This includes extant Piers 88, 90, 92, and 94 through 99. The project site bounds are as follows: the north is bounded by West 59th Street, while the south is bounded by West 46th Street. The west is bounded by the U.S. Pierhead Line, while the east is bounded by the western boundary of walkway/bikeway directly adjacent to the newly designed Route 9A (Figure 2). Piers 88 through 92, however, are not within the proposed park's jurisdiction.

Report Design

The following cultural resource assessment was designed to identify potential archaeological and historical features and to assess potential sensitivity. Much of the research was previously compiled for other nearby projects and is reviewed in this report. The report is laid out as follows:

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* Piers 76, 78, 88, 90, 92, and 94 are not within HRPC's jurisdiction.

- Chapter II: A Theoretical Overview was compiled to present and address current research issues in similar urban areas. Categories of potential site property types were developed.

- Chapter III: A summary of Research Methods was prepared detailing the specific research plans and goals of the assessment.

- Chapter IV: A brief overview of the Project Site Conditions was compiled based on a walkover survey and recent conditions reports.

- Chapter V: A summary of Prehistoric Research was compiled, including the Prehistoric Background, Site Survivability, Shoreline Reconstruction, and Prehistoric Sensitivity.

- Chapter VI: A summary of Historical Research was compiled, including the Historical Background, Known Sites in the Vicinity, Historical Land Use, and Historical Sensitivity.

- Chapter VII: An Evaluation of each Property Type was compiled for sites identified in chapters four and five, based on potential significance, archaeological visibility, and feasibility of retrieval.

- Chapter VIII: The Disturbance Record was compiled from a number of sources including boring logs at the NYC Topographic Bureau, previous hazardous materials reports, the walkover survey, and existing utilities.

- Chapter IX: A Summary chapter synthesizes the findings of this report.

Summary of Research

Prehistorically, the project site both inboard and outboard of the bulkhead wall was mostly land beneath water since the Manhattan shoreline was located about one block east of its current location, east of the project site. After deglaciation about 15,000 years ago, water levels were periodically lowered, exposing land along the shore. Portions of the Hudson River were narrowed, and areas submerged at the time of European settlement were exposed for

habitation by flora and fauna. While exposed shorelines were probably once occupied by Native Americans in southern Manhattan, the shoreline between West 46th and West 59th Streets was initially inundated by about 6000 years ago and was entirely submerged by 500 years ago. Before that time, there were no landforms present which would have been conducive for long-term Native American use. Therefore, there is no sensitivity for prehistoric remains to have ever existed either inboard or outboard of the bulkhead wall.

Historically, development and landfilling were slower along the Hudson River'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 Hudson River's use increased. Filling episodes pushed the man-made shoreline west, from its original course along Tenth Avenue, out to its current location and in some places even farther west. Pre-twentieth century piers and other waterfront structures may have been incorporated into the Marginal Street landfill. In the early twentieth century, a plan to build longer piers prompted the removal of 250 feet of land and fill between West 46th and West 54th Streets. Marginal Street was realigned inland. New piers, accommodating 1000 foot ships, were built between West 46th and West 54th Streets.

The following archaeological study addresses the potential prehistoric and historical archaeological sensitivity of the project site between West 46th and West 59th Streets. The analysis has provided a synopsis of potentially sensitive areas, together with a record of the subsequent disturbance to these areas. A final list of potential cultural resources was compiled to present those features considered to be archaeologically sensitive and previously undisturbed.

II. THEORETICAL OVERVIEW

This existing conditions report identifies the loci of potentially important cultural resources in the Hudson River Park project site. Based on documentary research, four categories of site property types have been identified from the entire study area between Battery Place and West 59th Street: Prehistoric Sites; Piers, Pier Sheds, and Wharves; Landfill; and Other. While this category list is not meant to be exhaustive or representative of all possible property types, it simply submits that these were the property types encountered within the project site boundaries during this study. A fifth category of site property type - bulkhead walls and inboard relieving platforms - has been the subject of extensive research and is not included in this report.[1] The project site between Battery Place and West 59th Street was subdivided into seven distinct geographic neighborhoods - and therefore seven separate project sites. Each of the identified property types is not necessarily found in each neighborhood.

This Theoretical Overview presents a discussion of the characteristics that would make a resource significant in each property type by providing the circumstances necessary to make a determination of significance. Significance must be assessed, for each site, within a contextual framework. Chapters V and VI provide both a prehistoric and historical contextual overview. Chapter VII of this report will, among other things, evaluate each identified resource within this context, and provide an appraisal of potential significance.

Documenting the existing conditions of the project site has entailed meeting the requirements of the State Environmental Quality Review (SEQR), the City Environmental Quality Review (CEQR), and the Department of the Interior, National Park Service (NPS). Regulations of both SEQR and CEQR echo those of the NPS in their assessment of a property's eligibility for placement on the National Register of Historic Places. The goals of the Hudson River Park project are to identify archaeological resources that are eligible for nomination to the National Register of Historic Places or else meet SEQR or CEQR criteria for sensitivity. The NPS has established the following associative criteria for the evaluation of significance as it relates to a determination of

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[1]A NYSOPRHP Building-Structure Inventory Form has been prepared about the bulkhead walls and inboard relieving platforms by Raber Associates and Allee King Rosen & Fleming, Inc. as part of the planning for this Hudson River Park project. The "blueform" was submitted to SHPO in March 1997 for a determination of eligibility. Therefore, the bulkhead walls and inboard reliving platforms will not be discussed as potential archaeological resources.

eligibility for inclusion on the National Register of Historic Places (36 CFR 60.4):

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, association, and:
>
> a. that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> b. that are associated with the lives of persons significant in our past; or
>
> c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> d. that have yielded, or may be likely to yield, information important in prehistory or history (United States Department of the Interior 1976:xv).

Archaeological resources present in the Hudson River Park project site are most likely potentially eligible for the National Register under associative criteria a., c., and/or d.

Upon determining importance based on the above four associative values, assessment of integrity is necessary. In order to nominate a site to the National Register, the site must also have retained its integrity defined by its original and current location, setting, design, materials, workmanship, feeling, and association. To retain integrity, a property must possess at least one, and more typically several, of these components.

In addition to echoing the NPS guidelines, the current SEQR regulations address properties unique to the State of New York, while CEQR regulations regarding cultural resources specifically concern properties unique to the history, culture, and aesthetics that define the City of New York. CEQR addresses the relevance of properties either designated as landmarks by the New York City Landmarks Preservation Commission (NYCLPC), or calendared for consideration by that commission. Cultural resources, either archaeological or historic, include buildings, structures, objects, sites, and districts. The New York City Landmarks Law established and authorized the NYCLPC to designate and regulate important cultural resources, with importance determined by a resource's

ability to illuminate an aspect of the City's cultural, social, economic, political, and/or architectural history.

To assess importance and integrity, archaeologists have to look at what we know about a particular time and place in history and try to understand what forces created a particular situation. In order to accomplish this, historic contexts must be established. As defined by the National Park Service, "historic contexts provide a framework for the identification, evaluation, designation, and treatment of cultural resources associated with particular themes, areas, and time periods. Historic context-based planning permits recognition of individual properties as parts of larger systems. Historic contexts also help managers and others evaluate properties within their proper levels of significance. As such, they provide both a systematized basis for comparison and a comprehensive frame of reference. In so doing, historic contexts provide cultural resource managers with a guide for rational decision-making" (Grumet 1990:18). Potential significance can only be assessed within a locally and regionally developed historical context.

Research issues that urban archaeologists, historians and anthropologists are currently focusing on include the following: 1) the process of urbanization, 2) settlement patterns and their change over time, 3) socioeconomic status or class, 4) ethnicity, 5) trade and commerce, 6) consumer choice, and 7) analysis comparing urban areas (e.g., Dickens 1982; Salwen 1982). The potential sensitive archaeological resources must be evaluated with regard to these research issues. If a resource can yield information related to one of these research topics, further arguments for significance can be made.

Prehistoric Sites

The preservation of <u>in situ</u> prehistoric sites in the urban landscape is virtually unheard of. Historical development has typically disturbed or destroyed earlier, shallowly deposited, prehistoric sites. This is particularly true in Manhattan where development has been occurring for over three hundred years, and where the once-pristine terrain has been virtually obliterated. Recently, however, prehistoric archaeological sites have been found in the highly developed borough of Manhattan proving that this remains a possibility. "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 <u>in situ</u> Contact period feature was found in direct association with the Dutch West India storehouse (Karen Rubinson, personal communication to Cece Kirkorian, June 27, 1989). In addition to these <u>in situ</u> prehistoric finds, secondary deposits of prehistoric materials have also been recovered at numerous sites in Manhattan.

Both professional and amateur archaeologists have been active in Manhattan since the late nineteenth century. However, before the 1930s field techniques, recordation, and analysis were not comparable to the more scientific procedures used today. Recovery and analysis techniques are continually being refined. The data from these early excavations are generally ambiguous, lacking the ability to be assigned to a particular temporal period (Baugher-Perlin et al. 1982:5). According to Alanson Skinner's prolific 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 14th Street and just east of the project site. He concluded that the only Indian remains left on Manhattan were probably located at the extreme northwestern end of the island, far from the project site (Skinner 1926:51). He does note, however, that the preponderance of findings from northern Manhattan reflects both lower Manhattan's earlier development, and northern Manhattan's relatively late occupation by Native Americans.

Our knowledge of prehistoric life in Manhattan remains limited, however, because so few sites have been investigated by professionally trained archaeologists. Therefore, prehistoric sites associated with the Hudson River Park project site, that are determined to be both potentially sensitive and accessible for excavation, may be significant because of the need for data to address some of the gaps in our knowledge of prehistoric life.

Wharves and Piers

The significance of wharves and piers as resources needs to be understood in terms of the overall development of Manhattan's west side waterfront from the eighteenth century to the present because New York City's rise to commercial dominance has been closely tied to waterfront development (Henn et al. 1985:1). Because of topography and social factors, much of the west side remained underdeveloped until the nineteenth century. Prior to this, the East River proved adequate for most early shippers. Wharves and piers, dating before 1800, are only likely to have been constructed near the very southern tip of the west side of Manhattan because this was the only highly developed area of the city at that time. As time passed, however, the expanding city required more land and better docking facilities, resulting in the general spread of development to the west side of Manhattan. New landfilling techniques and ship designs prompted developers to take advantage of the deeper and faster flowing Hudson River.

Creating a contextual framework, drawing on other urban waterfront projects, is necessary to assess the significance of the potential waterfront resources in the Hudson River Park project site. In looking over the previous research from comparable

settings, it becomes clear that almost all potential waterfront resources, for similar contexts and time periods as those associated with the Hudson River Park project, have been encountered. It appears that little could be gained from investigating this resource archaeologically, unless it can be demonstrated that these past projects have left significant unanswered questions which new data could address.

During the last ten to twenty years waterfront development has been a primary research topic for archaeological projects undertaken in Manhattan, mainly along the East River. Excavations undertaken at Crueger's Wharf exposed the remains of a wharf constructed of solid logs notched at the corners (Berger 1989:V-10). Construction of this wharf dated to 1739/1740. Two cobb wharves, dating to the mid-eighteenth century, were uncovered during excavation of the Telco Block in 1981. At 175 Water Street, another east side site, archaeologists documented the presence of several eighteenth century wharves that were solid raft-like structures (Berger 1989:V-11). Another cobb wharf was discovered at the Barclays Bank site (Berger 1989:V-12). A late eighteenth century cobb wharf was discovered at the Baches Wharf site (Berger 1989:V-12). At the Assay site, still another east side site, archaeologists discovered the remains of three cobb wharfs dating to the 1780s. To date, the only west side excavation that has revealed the presence of wharves is Site 1 of the Washington Street Urban Renewal Area (Berger 1989:V-11). At this site, archaeologists discovered a late eighteenth, early nineteenth century cobb wharf.

The archaeologists analyzing data recovered at the Assay site compared the construction methods of wharves built at sites located throughout the east coast of the United States, including those sites located in New York City described above (Berger 1989:V-8-14). Many similar sites were reviewed for comparative purposes, and include sites in Portsmouth, New Hampshire; Salem and Boston, Massachusetts; New London, Connecticut; and Alexandria, Virginia. These sites dated to the seventeenth through nineteenth centuries (Ibid.).

Berger's analysis concluded that there were distinctive construction techniques, such as the type of fill, used at different wharves. They discovered that there was "no discernible decrease in the diversity of wharf construction" during the late eighteenth and early nineteenth centuries (Berger 1989:V-19). The major techniques used in wharf construction appear to have been fairly evenly distributed over a two hundred year period. Other wharf characteristics, including the type of fill, the fill treatment of timbers, and fasteners, were also evenly distributed during this time period.

Only the joinery techniques used in construction appeared to show variation in relation to the date of construction. Berger

suggests that this variation might be related to the size of the wharves and the lack of excavation information, rather than to real differences in construction techniques (Berger 1989:V-24). With few exceptions, the geographic location of the wharf did not have a positive correlation with the type of construction technique employed (Berger 1989:V-24). Only Massachusetts craftsmen appear to have used unique techniques. Instead, "site specific circumstances clearly play an important role in the types of wharves built" (Berger 1989:V-24). Site specific factors might include local water conditions, such as the current and tides, type of river bottom conditions, and the financial situations of the individuals financing wharf construction. Other researchers have come to similar conclusions (Norman 1987:104-105; Henn et al. 1985:12).

The mid-nineteenth century introduction of the steam driven pile driver forever transformed waterfront construction (Henn et al. 1985:12). Open piling piers replaced cobb wharves in lower Manhattan. As Weber notes, "The historic creation of land through wharf construction and other engineering techniques led, in most cases, to the preservation of archaeological sites" (1988:1). If so, the open piling piers, as archaeological sites, may be preserved. Documenting the change to steam driven piles may be possible through study of intact resources.

The Assay site analysis, referred to above, has lead archaeologists to recommend that wharves "should not be used to address non-site specific research issues, given the factors which determine the configuration of the structures" (Berger 1989:V-24). It was suggested that further research should perhaps be focused on documenting the joinery techniques employed in wharf construction since this particular feature may prove more sensitive to the craftsmanship of a structure than other variables. Joinery represents one of the major engineering components of a wharf, and typically varies with the original planned use of the wharf (Berger 1989:V-25).

Piers and wharves which may be located in the Hudson River Park project site should be assessed with these two issues in mind, that is, the type of joinery techniques employed and the effects of adopting steam driven piles. Previous archaeological studies on the wharves and piers of Manhattan have focused primarily on resources dating to the eighteenth and very early nineteenth centuries. The mid-nineteenth century transition to the pile driven wharves has not been documented up to this point, leaving a real gap in our knowledge of the history of wharf construction. Study of potentially intact Hudson River Park project resources may allow us to learn a great deal about this transition period of wharf construction.

Landfill

The significance of potential cultural resources located within the Hudson River Park project site must be examined in light of their historical circumstances and relevant current research issues. There is little question that this project site may contain resources that might include information germane to the landfilling process and the development of Manhattan's waterfront. Although previous archaeological projects have produced much information about these research topics relating to Manhattan history, there remain gaps in our knowledge. Much of this past research has concentrated on documenting the east side of the city, along the shore of the East River, since both the earliest and the more recent development has occurred on this side. There remains much to be learned about the development of the west side of Manhattan, the location of this project. The question becomes whether these resources in the Hudson River Park project area will allow archaeologists to take a significant step toward filling these gaps in our knowledge.

For about the past ten years archaeologists have focused on research documenting changes in urban landfill and the growth and development of the urban waterfront. These two issues have important implications for our understanding of the process of urbanization. The majority of the research on these types of sites has been conducted within the boundaries of New York City, with Manhattan receiving most of the attention because of the intensive development currently occurring on the island. At the same time, archaeologists from up and down the East Coast, particularly in Baltimore, Philadelphia, Alexandria, Virginia and Wilmington, Delaware have examined portions of the extant eighteenth and nineteenth century landfill and waterfront areas in their respective cities.

Beyond increasing our knowledge of Manhattan's development, archaeologists must also be interested in the possibility that information from these archaeological resources might cast light on the process of urbanization in general. This might be done through comparison of data from sites located in different cities and associated with different time periods. The process of land reclamation began in the eighteenth century and continues today. Numerous archaeological projects within Manhattan have documented land reclamation along both the shores of the East and Hudson Rivers (Huey 1984, Berger 1987a, Henn et al. 1985, Sapin 1985, Rockman et al. 1985, Berger 1989, Geismar 1983, and Geismar 1987b).

Although records of the Common Council documented landfilling episodes, many earlier archaeological projects were designed to develop a clear description of the technology employed in the landfilling process since the documentary sources did not clearly address this. Sapin (1985:171) reports that the "observed alignments of the wharves and bulkheads as well as the stratigraphy

and ceramic content of the different landfill episodes supplemented the landfilling scenario developed using solely documentary sources." Because so much work has already been done towards documenting the general filling process in Manhattan, by other professional archaeologists, research issues appear to have been adequately addressed. More so, the various archaeological sites researched all demonstrated similar characteristics in terms of the technical aspects of land creation and the types of fills used in the process.

Unless a filling deposition can be tied to a specific episode by a group or individual, such as a manufacturer discarding waste materials from the production process, landfill in and of itself has little to contribute to the historical record. If specifically documented resources are in situ, precise information can be gathered regarding a manufacturing process or an individual's lifeways. If deposition is simply the collection of trash from an undesignated area, together with materials excavated elsewhere and debris from a variety of sources, then the landfill lacks associative value.

The contents of landfill may not contribute to our knowledge of early historical lifeways and neighborhood development. However, retaining devices designed to create fast land varied technologically and may be considered potentially sensitive. Just as with wharf technology, retaining device technology changed through time as new materials and methods were adopted, and thus joinery techniques may vary. These types of features are rarely documented cartographically, thus, areas within the Hudson River Park project area which experienced filling may be sensitive for the remains of retaining devices.

Other

The fourth and final category of site property type has been identified as "Other." Evaluation of significance for resources that fall into this category will have to be made on an individual basis.

III. RESEARCH METHODS

Background research was conducted to establish a prehistoric and historical framework for the interpretation of potential resources. Areas of prehistoric and historical sensitivity were identified through archival and cartographic research, following those criteria put forth in both the current SEQR and CEQR handbooks, and by the Department of the Interior, National Park Service (NPS). The previously completed Cultural Resource report prepared for the Westway project in 1983 by Historic Conservation and Interpretation, Inc. (Rutsch et al. 1983), was applicable to the Hudson River Park project site as it addressed potential cultural resource sensitivity for the Hudson River shoreline between Battery Place and West 44th Street. Similarly, Appendix C, or the Cultural Resources section of the Final Environmental Impact Statement, prepared for the Route 9A Reconstruction Project also identified resources pertinent to this project site (Allee King Rosen and Fleming, Inc., et al. 1994).

Previous Reports

The 1983 prehistoric sensitivity assessment for Westway included reconstructing the prehistoric shoreline both inboard of the bulkhead wall, beneath West Street and Marginal Street, and outboard of the bulkhead wall, beneath the Hudson River, from Battery Place north to West 44th Street (Rutsch et al 1983). Sensitivity was based on prehistoric topography, and the likelihood that Native Americans once found specific topographic features attractive for subsistence and settlement. The final analysis, based on current theoretical and methodological issues, sufficiently assessed archaeological sensitivity for the current project site south of West 44th Street. Prehistoric sensitivity both inboard and outboard of the bulkhead wall for the area between West 44th and West 59th Streets was later addressed in a similar fashion in the Route 9A Reconstruction Project report (Allee King Rosen and Fleming, Inc., et al. 1994). This report also proved sufficient for assessing prehistoric archaeological sensitivity for the current project site north of West 44th Street.

The 1983 Westway report by HCI provided details of historical development at specific interchange areas only, while the 1990 Route 9A Cultural Resource Assessment provided an in-depth level of research throughout the inboard study corridor from Battery Park north to West 59th Street. These, and other reports completed for project sites on the Hudson River shoreline, have helped to create a detailed cartographic reconstruction of historical development in the current Hudson River Park project site corridor. Episodes of filling, construction, and disturbance have also been traced for the entire length of the corridor.

Several phases of research were performed for previous reports to determine the past uses of the site, the disturbance to the site, and the significance of deposits that may remain. Research included documentary research, cartographic analysis, and site files review. The scope of each of these tasks, designed to meet SEQR criteria and the Secretary of the Interior's Guidelines for Archaeology and Historic Preservation, Federal Register, Vol. 48, No. 190, is presented below.

Documentary Research

For previous Hudson River shorefront reports, a literature search was conducted of available ethnographic and historic accounts, and reports and data pertinent to the historical and prehistoric archaeological record. Archaeological 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

The Hudson River Park project culled pertinent information from these sources applicable to the current project site.

Cartographic Analysis

Historical maps and atlases were obtained and examined to establish the presence of standing structures and features on the Hudson River shoreline throughout documented history, and to establish the prehistoric topographic and environmental conditions. Numerous maps and atlas were reviewed at five-to-ten year intervals, since buildings of shorter duration were probably not substantial enough to have retained integrity and thus would not greatly contribute to the archaeological record. In addition, these temporary structures usually lacked permanent subterranean foundations and therefore did not cause substantial disturbance to other cultural resources.

For other west side Manhattan cultural resource assessments, in addition to the above repositories, the United States Army Corps of Engineers provided maps of their projects to reconstruct shoreline disturbance. At the Borough President's Office, the Topographic Bureau provided historical and geological maps. These previously collected data bases were reviewed for pertinent information for the Hudson River Park project site.

Property Research

Land ownership histories were compiled for the previous Route 9A reconstruction project proved relevant to the Hudson River Park project site. These were obtained by reviewing land transaction records at the New York City Department of Finance, Index Division, while individual lot development was traced by obtaining Block and Lot files and microfiche from the New York City Buildings Department. This level of research was limited to reviewing ownership records, and did not include deed research.

Site Files Review

The NYCLPC was contacted for information on archaeological sites previously identified in the project area and vicinity. In addition, the NYCLPC provided a predictive model of prehistoric site location for the project area. Archaeological 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 on October 5, 1994 of the entire project area between Battery Park and West 59th Streets to

establish "ground truth." Photographs were taken along the route and from the Hudson River facing the project site. Specific features were noted and photographed, and recent construction episodes were recorded.

IV. PROJECT AREA CONDITIONS

A. Environmental Conditions

The prehistory and history of Manhattan was in part shaped by the topography, ecology, and economic conditions that prevailed at various times. Understanding the city's geologic history aids in understanding the land-use history. 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 46th and West 59th 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. 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 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 46th and West 59th 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 Eleventh and Twelfth 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).

B. Current Conditions

For this section of the project site, between West 46th and West 59th Streets, the boundaries include all land west of the newly proposed bicycle/walkway for Route 9A out to the bulkhead wall, and extends west to include the Hudson River itself out to the U.S. Pierhead Line. Between West 48th and West 52nd Streets, the boundary is actually west of the physical bulkhead and is situated over an outboard platform built in the 1960s.

Included or adjacent to the project site are Piers 88, 90, 92, and 94 through 99. Piers 88, 90, and 92 are the superliner piers, once more regularly serving large ships, and are not within the proposed park's jurisdiction (Photograph A). Pier 94 is the former Curnard pier and headhouse, now leased to North River Consolidators, a freight company (Photograph B). Piers 95 and 96 are dilapidated and unused (Photographs C and D). Pier 97 is used by the Department of Sanitation for employee car parking, and Pier 98 is used by Con Edison in a similar fashion (Photographs E and F). Pier 99 is an active Department of Sanitation Marine Transfer Station (Photograph G). East of the bulkhead between West 54th and 57th Streets is the site of the inactive New York City Cement Plant.

The elevated West Side Highway, once supported on piers and looming over Twelfth Avenue, has been removed from this section of the project, and an at-grade roadway exists in its place. Project site photographs show the current area conditions along the shoreline between West 46th and West 59th Streets (Photographs A-G). The area is generally non-residential, characterized by shipping related facilities, warehouses, and cruise lines. The extant piers have remained active.

V. PREHISTORIC RESEARCH

A. Prehistoric Background

Archaeologists interpret prehistoric finds within both a locally derived and regionally based contextual framework. Established models for prehistoric cultural chronologies are based on previously investigated archaeological sites. Prehistoric settlement and subsistence trends have been established for the lower Hudson Valley and coastal New York areas, providing a framework for understanding prehistoric land and resource utilization that can represent stages in Manhattan's prehistory, and therefore, the Hudson River Park project area's prehistory. Based on long term archaeological research, the following chronological description outlines the prehistory of the region. As research in the area continues, data bases increase and theoretical issues become more refined, further enhancing this regional chronology.

Archaeologists have concluded that Native Americans established themselves in the Northeast after the last glacial episode, the Wisconsin. Between 18,000 and 16,000 years ago, the last episode of the Pleistocene in the Northeast, ice reached its maximum advance and then receded north. Glacial gravels and erratics were left along the melting margin. Striations can be seen on Manhattans bedrock outcrops marking the path of receding glaciers. By 13,000 years ago, ice had retreated north enough so that the lower Hudson Valley and surrounding area were 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 the exact date Native Americans first occupied the Northeast was around 12,000 years ago, although there is increasing evidence to suggest an earlier date. Until this evidence becomes substantiated, the accepted date remains c. 12,000 years Before Present (B.P.).

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

The prehistoric environment of post-glacial New York was far different than it is today. Between 14,000 and 12,000 years ago the Northeast was characterized by a spruce dominated open woodland, and by 10,000 years ago the region was predominately defined by pine (Gaudreau 1988:240). Pollen samples show that the southeastern New York region had a mixed coniferous-hardwood forest following deglaciation (Salwen 1975:43). This post-glacial environment supported mega-fauna hunted by PaleoIndians including mammoth, giant ground sloth, horse, and giant beaver. The PaleoIndian period represents the earliest documented human

occupation in the Northeast, dating approximately between 12,000 to 9,500 B.P.

Few sites have actually been found dating to this period, perhaps because Native Americans first settled on the exposed continental shelf, now submerged. The immense quantity of water retained 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).

A typical artifacts assemblage from PaleoIndian sites in the Hudson River Valley and throughout the Northeast include diagnostic Clovis-type fluted projectile points (points) and processing tools such as scrapers, gravers, and drills suggesting animal processing. Stone tools were made from cherts native to eastern New York, and jasper from Pennsylvania and New Jersey. To some archaeologists, lithics recovered far from their sources suggest well-defined or extensive travel or trade networks in operation at that time. Other 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 the mid-Hudson valley suggest that PaleoIndians inhabiting the area used a wide variety of resources and had a restricted territory in which they operated (Eisenberg 1978:139). Further research continues to assist in developing and refining models of regional and local subsistence and settlement.

Despite the years of research, there are still many questions left unanswered regarding the culture and settlement and subsistence systems of PaleoIndians. Sites found tend to be situated in one of 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 subsequent 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.

Several miles southwest of the Hudson River Park project site, on nearby Staten Island, a PaleoIndian habitation site was found 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 was substantially disturbed, several fluted points were recovered together with tools made of eastern Pennsylvania tan and yellow jasper, and eastern New York Normanskill flint. Not far from Port Mobil, on 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 lasted for about 6,500 years. Unique point types and tool kits have caused this period to be further subdivided into the Early, Middle, Late, and Terminal periods. Throughout the Early Archaic (9,500-7,000 B.P.) fluctuations in the climate occurred, giving way to a gradual warming trend and allowing new resources to become established. Although sea levels were rising, New York Harbor, contiguous to the project area, 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, relying upon a diversity of resources. The more reliable resource base may have encouraged population growth.

Diagnostic projectile point types of this period are predominantly bifurcate-based points found on major drainages. Sites in the coastal New York area have been found on tidal inlets, coves, and bays, and on fresh water ponds (Ritchie 1980:143). Few inland sites of the Early Archaic period have been recovered and excavated in northern New York and New England. However, on nearby Staten Island four sites were found with an Early Archaic component (Salwen 1975:50). Salwen ascribes the earlier and more prolific population of the southeastern New York area to the early establishment of hardwood forests in this region (Ibid.). Although resources may have been abundant in more northern regions, climatic fluctuations and extremes would have prohibited the establishment of a reliable resource base. The locally established hardwood forests may have attracted people to the southern New England and New York area (Dincauze and Mulholland 1977:450).

Subsequently, Middle Archaic cultures populated the region from about 7,000 to 5,500 years ago, as the climate continued to warm allowing assorted flora and fauna to grow. Dincauze and

Mulholland (1977) suggest that in this period seasonal population movements, based on the exploitation of specialized resources, became well established and may have led to the creation of territories. Tool kits expanded in response to diverse resources, with artifacts including Neville and Stark projectile points. Middle Archaic shell middens, situated to the north along the Hudson River, show a growing reliance on shellfish. At Croton Point and Montrose Point, archaeological sites on the Hudson River in Westchester County north of the Hudson River Park project area, shell middens yielded dates of between 5,600 to 5,800 B.P. (Brennan 1974:85).

Late Archaic cultures radiated across the Northeast from approximately 5,500 to 4,000 B.P, with continued climatic warming providing a resource-rich environment. Diagnostic projectile point types of this period include small stemmed points such as Lamokas and Taconics, as well as Squibnocket and Brewerton Points. The lower Hudson Valley has evidence for increased habitation, with numerous shell middens along it dating to this period (Brennan 1974:87). Site types of this period include rockshelters, open woodland camps, and high bluffs along the Hudson, identified north of the project site. Archaic points found in metropolitan New York were commonly made from locally available quartz (Suggs 1966:42). The switch to local, versus exotic, lithics could mean decreased seasonal migration or a reduction in trade with neighboring groups.

Settlement and subsistence patterns in operation may have been a centrally based wandering pattern focused on the use of seasonal resources. A high degree of cultural complexity is suggested by the wide range of site types and the great diversity in site locations. More Late Archaic sites have been found than sites of either of the two previous periods. This may be because of either an increase in the population brought on by the more stable 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 another interpretation, archaeologists 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 misinterpreted.

During the Terminal Archaic period (4,000-3,000 B.P.), three cultural traditions persisted in the Northeast. 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 New

York State Archaeologist Bob 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 and was 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 continuing source of debate.

These three cultural traditions, based on unique projectile point types, may represent distinct settlement patterns centered on the use 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 new technological ideas, has yet to be answered. Each of these tool traditions predominantly used locally available raw materials, with the small stemmed point tradition relying heavily upon quartz.

Local Terminal Archaic groups added a new type of artifact to their tools kit. Bowls and other utilitarian and decorative items were fashioned from ground and polished steatite, or soapstone. The majority of sites found in the surrounding region were located on the banks of the Hudson River and its major tributaries. This may be because of the high visibility along major river drainages rather than the actual lack of sites in remote settings. Continued research from interior areas has more recently begun to find sites of this period. Orient points recovered in the Hudson Valley have been radiocarbon-dated to approximately 4,000 to 2,800 B.P.

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

The Woodland period continued in the Northeast from approximately 3,000 to 500 years ago. Like the Archaic period, the Woodland is further divided into three sub-categories: 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 manifests itself by the Middlesex Phase in eastern New York. Crude, undecorated ceramic vessels, called Vinette 1 pottery, were tempered with steatite. Simple pottery designs of this type have been found at sites on major waterways and tributaries. Early Woodland, Middlesex Phase sites are commonly uncovered at sand and

gravel mining operations near fresh water as these sites tend to be located on well drained knolls adjacent to water (Ritchie 1980:201).

The climate gradually cooled during this period, perhaps reducing resource availability. Settlement systems changed with the need to exploit alternative resources. Coastal resources, providing year round availability, were sought while upland hunting and gathering supplemented coastal resources. Fish runs in rivers provided a stable and reliable resource. Fish weirs were used in the Hudson and smaller tributary rivers to catch large quantities of anadromous fish to feed the growing population (Brumbach 1986:35).

The Middle Woodland period lasted from ca. 1,700 to 1,000 B.P. This period is marked by regional changes in ceramic and projectile point styles. Stone tool assemblages include Jack's Reef Corner Notched and Pentagonal points, and Fox Creek points. More exotic lithics were used, perhaps suggesting a growth in trade networks. By this time, subsistence and settlement seems to have been characterized by semi-permanent settlements with task-specific locations used for the purpose of exploiting target resources. Ritchie and Funk identify several settlement types for Middle Woodland cultures including repeatedly occupied small and semi-permanent large camps, small temporary camps, workshops, cemeteries and burial mounds (1973:349).

Shell middens found on the seacoast and shores of the Hudson River suggest an increase in the reliance on aquatic resources. During this period, maize horticulture was introduced from the west and horticultural practices were slowly adapted. The nature and extent of prehistoric maize cultivation has been debated among archaeologists working in the Northeast. Research on Long Island has led to the hypothesis that before European contact, maize was not cultivated on the sandy, nutrient-poor soils of the island. Nonetheless, with the benefits of trading with Europeans, Native Americans on Long Island settled more permanently along the sandy coast where shells were available for wampum manufacturing, an integral part of the mercantile exchange. Concurrent with this was the need for a reliable and storable food source. It is theorized that maize horticulture was incorporated to provide food, and a commodity for trade, required to support villages (Ceci 1979:72). Other archaeologists throughout the Northeast are now questioning the distribution and adoption of non-indigenous, that is, introduced, horticultural systems.

Again, artifacts encountered changed with the addition of ornamental pendants and pins, and the bow and arrow. Ceramics changed technologically as walls were thinned and overall shape was

rounded. Some interpretations suggest that the shift to a rounded bottom corresponds to the adoption of maize and results from the desire to cook food longer (Braun 1980:100). Surface decorations included netmarking and ornamentation of the collars and bodies, reflecting the cultural affiliation of the producer. Overall, the material remains in the region are limited in number, compared to those found further to the northwest in the Great Lakes region of New York (Funk 1976:298). This bias may be due to sampling and preservation rather than the actual lack of sites.

Within the Late Woodland period, the Windsor cultural tradition was defined with its components found in the Long Island Sound area and in the Hudson and Connecticut River 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 may have been centered in the New York coastal region, and in the eastern New York drainages (Ritchie and Funk 1973:356). Artifact types of this period include the Levanna triangular projectile point and Cayadutta Incised pottery.General trends of the period show a move towards semi-permanent villages.

By the Late Woodland period, 1,200 to 500 years ago, the climate was much as it is now. Settlement patterns suggest the use of diverse topographic settings including coastal and island sites, inland sites on major drainages, and campsites located near swamps and along streams as well as inland rockshelter sites. There is evidence of an increase in site size and number in addition to abundance and frequency of artifacts. The annual subsistence round may have included seasonal movements among riverine, coastal and inland wintering sites. Increased use of horticulture may have affected seasonal movements, with spring and summer spent planting crops. While maize, beans, and squash were procurable, these did not comprise the entire subsistence base. Hunting and gathering were continued. A semi-permanent settlement pattern may have led to competition and defense of productive land, contributing to territoriality (Mulholland 1988:163).

The Windsor tradition was replaced by the East River cultural tradition by about 600 B.P., while the Bowmans Brook and later Clasons Point phases are local manifestations of the ceramics associated with this period (Snow 1978:63). The Bowmans Brook culture may have entered New York from New Jersey through Staten Island, where many artifacts of this phase have been found (Ritchie 1980:269). Sites have been found on tidal streams or coves, with large village sites containing between fifty to one hundred storage pit features (Ibid.). There appears to be more shellfish use at these sites. Ritchie notes that sites of the Clasons Point culture tend to be found on the second rise of ground

above high-water level, on tidal inlets, and have many of the characteristics of Bowmans Brook Phase sites (Ibid.:271).

Contact Period (500-300 B.P.)

The initial interactions between Native Americans and Europeans typifies the Contact period, dating from 500 to 300 B.P. At the beginning of this period, Native American settlement patterns were essentially the same as those of the Late Woodland period. Stream side camp sites were occupied in the spring and fall to take advantage of bountiful fish runs. Upland and inland task specific sites were also occupied for short periods for hunting, trapping, and lithic procurement. Semi-permanent villages, with oval and round bark and mat covered houses, were located near planting fields. Large pits were used for storing dried meat, fish, and corn, and to bury unwanted trash. Planting fields were commonly burned at the end of the season to encourage new growth and, as a result, fauna. Horticultural villages were commonly moved to a new site after ten or twenty years when soil fertility, firewood, and nearby game resources were reduced (Salwen 1975:57).

Initial interactions between Native Americans and Europeans transpired when early explorers traded with the native population. As non-indigenous materials were introduced into the native material culture, tool assemblages and settlement and subsistence patterns changed drastically. Traditional stone, bone, and wood tools were replaced by European goods made of copper and iron. Shell beads and wampum were produced, and furs were collected by Native Americans as a medium of exchange. Europeans were happy to procure furs from Native Americans, resulting in many trading posts being established along the Hudson River. Although early historical accounts discuss the presence of Native American stockaded villages or forts in the Hudson Valley and coastal New York, archaeological data does not confirm their presence until the middle of the seventeenth century (Ritchie and Funk 1973:368).

In the seventeenth century, metropolitan New York was populated by Native Americans speaking a Munsee dialect of the Eastern Algonquian language (Goddard 1978b:73). Northern Manhattan was primarily occupied by a group identified by colonists as the Wiechquesgeck (Grumet 1981:60). At that time, Native Americans called the Hudson River "Mahicanituk," which translated to "the great waters or seas, which are constantly in motion" (Ibid.:22). Manhattan itself was called "Minna-atn," which meant "Island of Hills" (Bolton 1934:47).

The arrival of Governor Willem Kieft in 1638, who maintained a hard-line policy with the local Indians, resulted in large scale conflicts between Native Americans and European settlers. His policies resulted in the deaths of about 1,000 Native Americans between 1640 and 1645 (Washburn 1978:98). In 1655 Native Americans attacked the growing city of New Amsterdam, and the ensuing Esopus Wars, named so for the involvement of the Esopus Indians of the mid-Hudson Valley, lasted until 1664. As a result, Algonquian bands in the lower Hudson Valley lost their independence and fell under Dutch control (Ibid.).

Plagues, intertribal stress, and the pursuits of Europeans to obtain land rights resulted in the subsequent breakdown of native sociopolitical organization during the seventeenth century. The plagues of 1616-1620, inadvertently introduced by Europeans, depopulated many groups with total losses in southern New England and New York estimated at between 70-90 percent of the original population (Snow 1980:34). Moreover, 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, i.e. reservations (Brasser 1978:85).

The foregoing cultural chronologies are based, in part, on prehistoric sites found in the metropolitan New York area, although none were ever found within the project site. On Staten Island, numerous prehistoric sites have been reported, ranging from the PaleoIndian through Woodland periods. The Tottenville site, a burial site on the southern portion of the island, was found on a bluff overlooking the shoreline and may represent 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 is thought that cultural groups inhabiting Staten Island were probably affiliated with groups in New Jersey and the mid Atlantic region. Staten Island may have demarcated the boundary 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. With the proximity of New Jersey cultural groups, as well as the Long Island Sound groups, cultural traits of Manhattan Indians would undoubtedly reflect these associations.

Because of the lack of sites actually recovered on Manhattan, the accepted settlement system established for the coastal New York area has been based primarily on the large and highly visible shell midden sites found along the coast of Long Island Sound. Yet more recent archaeological research indicates a variety of occupation sites other than villages associated with shell middens. An intensive survey of Shelter Island in the Long Island Sound, many

miles east of the project site, 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 also shown that many sites exist in these locales. While its true that the coast of Manhattan was undoubtedly attractive for Native American habitation and resource procurement, smaller sites located inland may have been used as well but would be situated east of the project site.

B. Known Sites in the Vicinity

At the time of European contact, the only known Native American habitation site in the vicinity of the project site was Sapohanikan Point in what is now Greenwich Village (Figure 3). 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 - far south of this section of the project site - 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 vicinity. Skinner also reported Site 9, a village site on the Collect Pond near Canal Street many blocks south and east of the project site, which possessed a large deposit of shells (Ibid.:630). No sites were actually within or adjacent to this section of the project site.

C. Shoreline Reconstruction

At the time Europeans first set foot on Manhattan, the project site was land under water. Consequent landfilling pushed the shoreline further west and Marginal Street was created, burying prehistoric landforms. In some cases, archaeological sites may also have been buried. In 1989, a paleo-environmental study was conducted for the shoreline spanning between West 44th and West 59th Streets. This study was completed by Dr. Dennis Weiss in conjunction with the Route 9A Reconstruction project.

Dr. Weiss analyzed 360 borehole test results to reconstruct the prehistoric shoreline. Samples were taken both inboard from Twelfth Avenue and Marginal Street and outboard to the U.S. Pierhead Line. These were used to interpret geologic and paleo-environmental conditions. The general stratigraphy indicated in the logs for most of the boreholes proved to be similar. Although varying in depth and/or thickness, the general stratigraphy displayed in the boreholes consisted of bedrock (at times weathered

or decomposed), overlain by gravel and sand which in turn may have been overlain by sands of varying size, color, and thickness. Organic silt or clay was found to overly the gravel and sand sequences, and in some instances rested directly on the bedrock (Weiss 1989:2).

According to Weiss, the optimal evidence desired for the determination of past shoreline positions, in the New York - New England coastal zone, is the presence of tidal marsh peats lying immediately above bedrock or till. Since this type of vegetation grows within the tidal range at many coastal sites, its occurrence in a core or borehole log is used to indicate the presence of sea level or shoreline position (Weiss 1989:3). The contact between the lowest layer of peat and the underlying bedrock or till marks the period of time when coastal marine or estuarine conditions were initially established. In addition, when obtained as actual samples, the lowermost peat can be dated using Carbon-14 to give an indication of the time coastal inundation by marine or estuarine conditions actually occurred. Unfortunately peat layers were often not reported in the borehole logs examined. Weiss notes that the absence of peat may have been a function of the sampling interval used or subsequent erosion and not an indication of its nonexistence in the project area.

Using the above information, boundary lines were then drawn to separate estuarine from non-estuarine conditions on the basis of the sediment present. With this premise as the working model, a series of horizontal levels were made by searching the borehole log data (Weiss 1989:3). Paleo-environmental maps were then constructed (Weiss 1989:4). In addition, a composite Paleo-Shoreline position map was constructed to show the transgression of estuarine conditions into the project area from 6000 years B.P. to 500 years B.P. (See Weiss 1989).

The Paleo-Environmental and the Paleo-Shoreline maps indicate that the West 46th to West 59th Street area was progressively inundated from the north and the south during the time interval studied (Weiss 1989:5). The central-most part of the project area, between West 49th and West 54th Streets, appears never to have been covered by estuarine waters. For earlier levels, i.e. 7000 years B.P., only the northernmost (West 59th Street) areas were inundated by the tidal conditions of the estuary. Older periods (more than 8000 years B.P.) show only a few sites which indicate possible estuarine conditions.

To the north, the shoreline progressively transgressed southward ultimately reaching the area of West 54th Street. As a result of the absence of borehole data to the east of the project site, the eastward transgression of the estuary could not be

plotted. At the southern end of the project area, estuarine conditions migrated to the north ultimately developing a small tidal embayment extending from West 46th Street to midway between West 48th and 49th Streets (Weiss 1989:4). As indicated on all the maps prepared for this study, the central part of the project site, West 49th to West 54th Street appears to have never been affected by estuarine conditions. Borehole log data indicate that bedrock, till, or sand has always stood above water (lake, stream, or estuarine).

Bedrock elevations along the U.S. Bulkhead Line are reported to be approximately 50 feet below present mean tide level. The westernmost borehole data along 12th Avenue indicated that the bedrock, and/or till surfaces are as much as eight feet above the present datum. Weiss reports that this indicates a relatively steep bedrock surface just east of the bulkhead wall (Weiss 1989:4). Without adequate data, shoreline positions in the West 49th Street to West 54th Street area could not be located accurately. Weiss assumed that it existed somewhere within a relatively narrow seventy-five feet wide strip bounded by the westernmost line of available borehole logs, the bulkhead wall, West 49th Street, and West 54th Street (Ibid.).

The first marked indication of wide-spread estuarine conditions in the project area dates to ca. 6000 year B.P. The map for that period shows an irregular shoreline outlined in the northern part of the project area, north of West 46th Street. The inundation in this area probably followed the trend of earlier stream channels flowing westward into the Hudson River's valley. Similar conditions were not displayed in the southern part of the area. As sea level rose, more of the area was subsequently flooded by estuarine conditions.

D. Prehistoric Sensitivity

As discussed in the Prehistoric Background section above, archaeologists typically encounter sites on well drained elevated soils near fresh water resources. However, environments with a broad spectrum of resources were favorable for prehistoric habitation. Coastal and riverine areas could provide a mix of aquatic, estuarial, and terrestrial resources. In particular, the confluences of streams and/or rivers were considered choice sites for habitation and have a high potential to yield prehistoric archaeological resources. Coves and inlets would have provided protection from strong winds coming down the Hudson Valley. Settlement studies on islands in the southern New England area show that settlement patterns are often affected by strong prevalent winds, such as those experienced in the lower Hudson Valley (Little 1985:26).

Several years ago, various agencies attempted to create a model of potential prehistoric site locations in the metropolitan New York area. In an attempt to provide a planning tool, the NYCLPC created a model identifying potentially sensitive areas where prehistoric archaeological remains may be found in Manhattan. No sensitive areas within this section of the linear project parcel were identified. However, the model is based on the potential to recover sites from land that was exposed and suitable for habitation at the time of European settlement. The model does not attempt to determine the potential sensitivity of submerged shorelines, once exposed for prehistoric habitation. However, as discussed above, this particular task was addressed by Dr. Weiss for the Route 9A Reconstruction project.

The following is a synopsis of conclusions reached for the paleoenvironmental studies performed. Radiocarbon and chemical samples from cores were used to establish the prehistoric development of the shoreline. A topographic map was then constructed depicting the locations and elevations of shoreline features as they changed through time. These locations were then compared to the known settlement patterns prevalent at each specific point in time. Specific areas were then identified as being potentially sensitive for prehistoric habitation based on topography and site characteristics which may have affected settlement patterns, as described above. These identified areas are currently deeply buried beneath nineteenth century fill inboard of the bulkhead wall, and/or river silts outboard of the bulkhead wall.

Inboard of the Bulkhead Wall

No potentially sensitive sites were identified between West 46th and West 59th Streets inboard of the bulkhead wall for a number of reasons. Because the physical bulkhead and Bulkhead Line differ between West 48th and West 52nd Streets, the eastern project site boundary is located **outboard and west** of the actual bulkhead wall. Therefore, there is no part of the project site located inboard of the bulkhead wall between these two cross streets.

Between West 46th and West 48th Streets, and West 52nd and West 54th Streets, the current Bulkhead Line and physical bulkhead are one and the same, and the eastern project site boundary is situated **inboard and east** of the current bulkhead wall. However, this project site boundary line is located **outboard and west** of the ca. 1934 bulkhead wall (Bromley 1934). That is, in 1934 what is now the project site boundary ran across piers and over open slips of water between them. In the 1960s a platform and more recent bulkhead wall were built between the piers, outboard and west of

the ca. 1934 bulkhead wall. The project site boundary now runs across the 1960s platform, **inboard and east** of the newer bulkhead wall.

The ca. 1934 slips of water between the piers were substantially excavated and dredged as part of the Pier Plan to accommodate the deep hulls of massive oceanliners. Construction entailed blasting and removing tons of earth, destroying the natural riverbed between West 46th and West 54th Streets. Any prehistoric landforms beneath the Hudson River, which may have once been exposed for habitation, have been physically removed.

Between West 54th and West 58th Streets, the project site boundary is also inboard and east of the bulkhead wall. Here Weiss concluded that the area had been inundated by 6000 years ago. Also, there were no topographic features observed through the borings analysis which would have been potentially attractive for Native American use prior to inundation (Weiss 1989:5). Between West 58th and West 59th Streets the project site boundary is only a few feet (i.e. less than 10) east of the bulkhead wall. Since Weiss concluded this area was submerged by 6000 years ago and there were no topographic features conducive for settlement, there is also no sensitivity for prehistoric resources.

Outboard of the Bulkhead Wall

Weiss's research found similar circumstances for the area outboard of the bulkhead wall between West 46th and West 59th Streets (Weiss 1989:Paleo-Shoreline Map). North of West 54th Street, inundation proceeded from the north to the south between 6000 and 500 years ago. Conversely, south of West 48th Street inundation proceeded from the south to the north over the same period. No topographic features conducive for habitation were observed. Also, because of the extensive early twentieth century dredging between West 46th and West 54th Streets, the river bottom has been literally removed between these two cross streets. Therefore, there is no sensitivity for prehistoric resources between West 46th and West 59th Streets.

VI. HISTORICAL RESEARCH

A. Historical Background

When Giovanni de Verrazano first sailed into New York harbor in 1524, the project site was land under water. The shoreline on the banks of the pristine Hudson River, named for Henry Hudson who first sailed up it in 1609, were further east than they are today. Early trading and exploring ventures by Europeans were such that traders sustained few interactions with Native Americans, conducting transactions on ships to avoid entering unexplored territory. As trading ventures increased in frequency and the new territory was explored, European settlements were slowly established. By 1613 a trade house was built on the southern tip of Manhattan by the New Netherlands Company, a sponsor of many voyages to the new world in search of trade goods (Wilson 1902:395). Shacks were also built to house the few traders who chose to settle on the island. The rapidly expanding fur trade up and down the Hudson River proved enticing for European entrepreneurs and thus the small village at Manhattan's southern tip grew.

In 1623 the Dutch West India Company was granted rights to all lands within Manhattan by the Dutch States General (Hoag 1905:32). Subsequently 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 regranted the land to the Duke of York. Once land rights were granted, the growing community on Manhattan built a gristmill near Battery Place and Greenwich Street (Rutsch et al. 1983:334). Ensuing land disputes provoked the Dutch to build a wall at what is now Wall Street in 1653 to demarcate the northern boundary of the city and keep out undesirables (Works Progress Administration 1939:58). In 1699 the British removed the stockade and the city slowly expanded northward. Although the center of community growth was situated farther south than this section of the project site, by 1639 there were a number of farmhouses nearby along the shore of the Hudson River.

In 1686 the Dongon Charter was decreed by Lieutenant Governor Thomas Dongon, granting a charter to the Mayor Alderman of New York City, and the City of New York became officially established. Land ownership, out to the low water mark, was transferred from the Crown to the City of New York (Hoag 1905:32). At that time, Marginal Street was still submerged land and the shoreline along the Hudson River was situated east of its current location, between what are now Eleventh and Twelfth Avenues.

The earliest travelers found the East River a better and safer harbor as the high bluffs and jagged edges of the Hudson River thwarted docking. However, the Hudson River did prove vital in linking northern territories to the growing village on Manhattan. The depth of the Hudson, the lack of protected coves needed to provide shelter from strong northerly winds, and the propensity for winter ice floes left the Hudson shorefront virtually unused (Buttenwieser 1987:27). As a result, early landfilling was not avidly pursued on the banks of the Hudson River for lack of economic interest (Buttenwieser 1987:32).

Inland, just east of the project site between West 46th and West 59th Streets, the fertile upland proved more valuable. Fertile farmland once spanned between what are now West 14th and 125th Street. This tract, named "Bloomingdale," was described as "Fertile, rolling fields, for the most part free of crags or clumps of underbrush" (Works Progress Administration 1939:146). The middle-west side was productively farmed for nearly two centuries, providing necessary produce to the growing urban center on southern Manhattan. Unlike the southern part of the island, there was abundant space in the vast region of Bloomingdale, and thus landowners did not readily fill waterlots.

In 1730 the Montgomery Charter was established, extending land ownership privileges an additional two blocks beyond the low water mark into the Hudson River, prompting these landowners to reassess their actions. The charter included a provision for creating three streets - Greenwich, Washington and West - parallel to the river (Hoag 1905:32). Following the Revolutionary War another attempt was made to urge the construction of the street along the Hudson River originally provided for in the 1730 charter. In 1795 the Common Council again passed an ordinance creating West Street, a 70 foot wide outer street, demarcating the western boundary of the city. These early land reclamation efforts were directed at the urban center south of Bloomingdale. By the early nineteenth century, many docks and piers had been built on the Hudson River shorefront in the southern part of the city, but the northern shoreline remained virtually untouched. Only a few docks were built to serve the private summer cottages and estates dotting the shorefront.

By the early nineteenth century chaotic street placements spawned the creation of a city plan to provide for the systematic laying out of streets and avenues throughout Manhattan. The resultant Commissioner's Plan of 1811 imposed a grid system over the city, disregarding natural topographic features which may have impeded road construction. Street regulations called for extensive grading and filling, removing massive rocks and boulders, and tearing down existing houses located in the path of proposed

roadways. Although the plan was laid down on paper, many of the roads were not actually created until decades later. For this section of Manhattan, Thirteenth Avenue was slated to demarcate the western boundary of the city (1811 Commissioners of New York State; 1927-30 Ewen).

The frustrations experienced by the City in their attempts to actually create an outer street caused the Common Council to pass yet another ordinance in 1825, demanding the filling of water lots. Land reclamation and filling along the Hudson River waterfront was pursued by either allowing unstructured harbor silts and river accretion to build up, or by placing fill in engineered retaining devices (Geismar 1983:672). In lower Manhattan, ships were sometimes deliberately sunk as cribbing to help stabilize fill (Berger 1983:9). After wharves and piers were built, derelict ships were sunk adjacent to them, and together these features contributed to and operated to retain fill. In one such case, part of the burnt seventeenth century Dutch ship "Tiger" was sunk and subsequently encountered during subway excavation at the corner of Dey and Greenwich Streets in 1916 (Solecki 1974:109). During the later excavation of the adjacent World Trade Center, archaeologists unsuccessfully searched for the remainder of the ship.

Wooden cofferdams, wharves, and bulkheads were built as fill retaining devices, framed with hewn logs, filled with loose stone, and covered with earth (Geismar 1983:30). Timber grillage was commonly used as cribbing, a practice first employed in Europe. Colonists continued to use this method, as both the Dutch and English had previously, aided by the ample supply of wood in the region. To retain fill, quays were first built by driving a row of wooden piles into the river with diagonal braces bolted to the inside, forming the face work. Earth and fill was then placed in the vacant area behind the piles, and was then planked over to form a roadway level with adjacent streets (Ibid.:31). Wooden jetties were similarly built. Once the economic value of clean fill generated from building excavations was realized, this was no longer used as fill. Instead, wharves and piers were frequently used as dumping boards, where garbage was collected and pushed overboard into scows or directly into the river. Rubbish, ballast, and street trash pushed the shoreline further west.

The relatively slow pace of development which characterized the eighteenth century was succeeded by rapid expansion on the Hudson River shorefront in the nineteenth century. The influx of immigrants and the northward migration in the nineteenth century resulted in a generalized leveling of the land in Bloomingdale to accommodate development. Natural topographic features were obliterated, valleys were filled, hills and terraces were razed, and the shoreline was pushed further west. North of West 50th

Street was low marshy ground interspersed with hills and intermittent streams. By 1865 all of the cross streets from West 50th to West 59th Streets were graded, except for parts of West 53rd, West 54th and West 58th Streets near the Hudson River (Citizen's Association Report 1865:298).

By the middle of the nineteenth century, new technologies fostered interest in the relatively unused Hudson River waterfront. The invention of the steamboat in 1807, the production of larger vessels by local shipbuilders, the opening of the Erie Canal in 1825, and the demand for coal in New York City generated more shipping through the port of New York and a demand for deeper berths (Buttenwieser 1987:39). To accommodate these growing industries, new piers were built off of Twelfth Avenue into the Hudson River. The acceptance of gas power and heating grew rapidly and by 1853 miles of cast-iron gas mains were laid under the city's streets (Jones 1978:77). Nearby, Gas Companies had established facilities between West 44th and 46th Streets. By the 1870s piers were built at the ends of these cross roads to receive incoming coal barges (Buttenwieser 1987:57).

At that time the irregularly shaped, privately owned piers spanning the shoreline were in a continual state of disrepair. Furthermore, the solid base construction of piers prohibited the flow of sewage, draining from the shores out to sea, creating disease-ridden waters (New York Pier and Warehouse Co. 1869:58). Conveying merchandise to and from the Hudson River waterfront was also impeded by the tremendous volume of freight and pedestrian traffic. The miserable waterfront conditions desperately called for corrective measures, and numerous public agencies were established to deal with these issues.

One of the agencies created to address waterfront conditions was the Department of Docks, established in 1870. The department was granted rights and land for the construction of wharves, bulkheads, docks, piers, basins, and slips. They then instituted the McClellan Plan which 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, over the course of the next sixty years. The wall was to be placed outside of the previously existing bulkhead to allow 250 feet for the width of West and Marginal Streets (Buttenwieser 1987:73). Unfortunately, problems were encountered in creating these outer streets, and by the 1890s both Twelfth Avenue and Marginal Streets were still incomplete (Rutsch et al. 1983:297). At that time the project site was west of the shoreline (Bromley 1879; *Figure 4*).

In 1847 waterfront commerce was further amplified when the Hudson River Railroad was organized and a track was laid from

Chambers Street north to West 30th Street (Rutsch et al. 1983:258). The railroad served the waterfront by spurring industrial and commercial growth. In the 1870s the Hudson River Railroad merged with the New York Central and added a new passenger and freight terminal at St. Johns Park near Canal and Hudson Streets to accommodate ferry users (Buttenwieser 1987:75). By 1851 a railroad station was opened at West 30th Street and Eleventh Avenue, and by 1852 the Eight Avenue Railroad opened a second line between Chambers and West 51st Streets (Works Progress Administration 1939:146).

Deplorable sanitary conditions continued to characterize most of the middle-west side of Manhattan through the nineteenth century. Ease of access to the area enticed speculators to construct densely clustered, cheaply made tenements on inexpensive land north of West 30th Street (Works Progress Administration 1939:147). Immigrant laborers found refuge in the tenements, working nearby for little pay in any one of the noxious industries which had been pushed out of the city's more affluent neighborhoods, and into the relatively undeveloped middle-west side. A report on sanitary conditions and the "Special Nuisances" particular to the neighborhood described the offensive nature of the nearby swill milk producers, stables, breweries, and hide and fat companies (Citizens Association of New York 1865:xcii). Living conditions were further compromised by poor sewage disposal. Surface drainage was also extremely poor. A sanitation report stated that there was so much water in buildings' basements that in the case of a flooded cellar on West 53rd Street, "fish have lived for months" (Ibid.:305).

On the Hudson River's shoreline, shanties were crudely constructed by Irish and German rag-pickers who could not afford better housing. Streets were littered and the poorly made gutters beside them trapped solid waste instead of permitting its discharge. Although sewer lines were situated "ten to fifteen feet below the open surface," not every dwelling was piped into them (Citizens Association of New York 1865:296). Private privies were often left to overflow into yards and streets. The middle-west side was quickly absorbing that which was expelled from the remainder of the city. The area remained characterized by poor industrial conditions and undesirable living conditions for laborers (New York City Department of Docks and Ferries 1913:3).

In the early twentieth century nearby piers received tons of freight bound for any one of the neighborhood's industries. Goods were shipped on float cars from New Jersey's railroad terminals, and were unloaded and reloaded onto Marginal Street (Smith 1916:13). Marginal Street was perpetually obstructed with shipments. Pier owners were permitted to construct bulkhead sheds

50 feet outshore from Marginal Street for freight storage. Many of these temporary sheds actually extended east into Marginal Street. In 1916 a proposal to alleviate traffic congestion along the waterfront included elevating pedestrian crosswalks and providing truck platforms (Ibid.:14). However, this plan was never implemented.

The City of New York subsequently acquired land between West 42nd and West 48th Streets for the construction of new passenger and freight steamship terminals. The proposed Pier Plan was modified by the Docks Department to provided for 1000 foot piers (Smith 1917:45). Since the War Department declared that no further encroachments on the river would be permitted, that is that the U.S. Pier Line could not be moved farther west, piers had to be extended inland to accommodate their 1000 foot lengths. This resulted in physically removing 250 feet of land and fill along the shoreline, pushing the shore eastward by 250 feet, and relocating Twelfth Avenue and Marginal Street (New York City Department of Docks and Ferries 1913:7). A temporary cofferdam was constructed to hold back the river while excavating the slips. Excavations for the piers were impeded by extensive bedrock which required blasting. In the late 1920s and early 1930s, more piers were built between West 48th and West 52nd Streets. Similarly, 250 feet of land and fill had to be removed from the shoreline.

Because of the relocation of Twelfth Avenue, all of the blocks between West 42nd and West 57th Streets were shortened up to 250 feet, and many structures were razed (Levy 1931:19). The route of Twelfth Avenue was reconstructed directly on top of the previous location of many buildings whose foundations were filled and paved over (Ibid.:19). Marginal Street now rests on top of the previous route of Twelfth Avenue. As a result of the Pier Plan, there is now a sweeping curve along Twelfth Avenue between West 42nd and West 57th Streets. The original path of Twelfth Avenue and Marginal Street was physically removed.

Despite the upgrading of the shorefront, this section of the middle west side was frequently referred to as Hell's Kitchen, characterized as one of the most dangerous sections of the city during the late nineteenth and early twentieth centuries (Works Progress Administration 1939:155). Plagued by gangs undaunted by local police, a special crime task-force was organized by the New York Central Railroad. Hazardous conditions were further created by the railroad track on the surface of Eleventh Avenue (Stern et al. 1987:427). In response to hazardous street surface conditions, the 1906 Saxe Law was passed. The law eliminated railroads from grade level and prompted the creation of the West Side Improvement Plan. The plan, implemented between 1910 and 1920, resulted in the

removal and subsequent elevation of tracks on Eleventh Avenue south of West 59th Street (Buttenwieser 1987:159).

Steamship, ferry, and transit lines continued to generate substantial pedestrian and automobile traffic on neighborhood streets. As a result of increasing congestion, plans were enacted in the 1920s and 1930s to help alleviate Twelfth Avenue traffic, and thus the West Side Highway (Highway) was constructed. By 1947 the elevated structure continued as far south as Rector Street, supported on piles driven to bedrock (Vollmer Associates 1989:10). The Highway has since been demolished and an at-grade roadway was built to replace it.

B. Known Sites in the Vicinity

While there are many historical structures and features throughout the area, site file searches at the New York State Museum, New York State Office of Parks, Recreation, and Historic Preservation, and the New York City Landmarks Preservation Commission revealed no inventoried archaeological sites within the Hudson River Park project site.

C. Historical Land Use

Previous archaeological assessments, reviewed for this project, scrutinized an extensive collection of maps and atlases in order to identify potentially sensitive archaeological features. Such potential archaeological features may also exist within the current project site (see Map and Atlas Section in the Bibliography of this report). Specifically Rutsch's 1983 Westway report, the 1990 Route 9A Reconstruction report, and several smaller site-specific studies for tangential sites each entailed extensive cartographic research. Rather than repeat this effort unnecessarily, a synopsis of previous research and findings is presented.

Maps and atlases were generally reviewed at approximately five-to-ten year intervals, while in some cases several maps were used dating to the same period to verify accuracy. This interval of map dates proved sufficient to identify potentially sensitive areas and accurately track landfilling episodes. Buildings or features present for less than five to ten years rarely were constructed in such a manner as to leave a vertical or horizontal footprint on the landscape and disturbance by these transient structures tended to be minimal, therefore reviewing maps at shorter intervals seemed unproductive.

Cartographic research revealed inconsistencies with some of the early maps. Maps compiled prior to the beginning of the nineteenth century depicted development of the city core at the southern end of the island, providing a rich resource base for this section of the project site. However, the 1859 Viele Map of the City of New York, showing the original topography of Manhattan Island, accurately shows the shoreline east of the project area and thus was not consulted for this section.

Documenting development in the 1860s also posed a problem since few maps were found dating to this period. During the Civil War, New York's cartographers were redirected, and maps 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 West Street as a continuous road along the shoreline of the river, uninterrupted by intrusions. It seems that Dripps simply depicted the road as it was planned 'for convenience.'

D. Historical Sensitivity

Few areas sensitive for potentially significant historical remains exist between West 46th and West 59th Streets. Resources were identified from cartographic sources, while additional information was gathered at the City's Buildings Department and Block and Lot Division, and from secondary sources. To help clarify the positions of identified resources in the following discussion, resources are described in relation to the nearest east-west running cross street. Going from south to north the following resources have been identified.

Piers and Wharves

The only identified resources in this property type are the extant piers now extending off of the route of Marginal Street, and their associated pier sheds.

Extant Piers

By 1902 almost every street end marked the site of a pier extending off of Marginal Street out to the U.S. Pierhead line. However, the timber-framed finger piers were removed between West 46th and West 54th Street with the early twentieth century Pier Plan. Between these two cross streets there are now ca. 1930 piers

extending west into the river from the current bulkheaded shoreline.

Extant Piers 88, 90, and 92, off of West 48th, 50th and 52nd Streets, respectively, were built as part of the early twentieth century Pier Plan. These piers were built in the late 1920s through early 1930s to be used by oceanliners (Photograph A). In the last thirty years a large concrete and metal building was constructed for the Cunard Steamship Lines. The building is situated between Pier 92 at West 52nd Street north almost to West 55th Street. In conjunction with this construction, extant Pier 94, situated just south of West 54th Street, was built west of the Cunard Building and the new bulkhead wall (Bromley 1955; Bromley 1967; Photograph B).

Extant Piers 95 and 96, off of West 55th and West 56th Streets, were built between 1902 and 1913 (Bromley 1902; Hyde 1913). In 1934 these were used by the Furness Bermuda and Grace Line, which later became the Furness Bermuda Line (Bromley 1934; Bromley 1955; Photographs C and D). Extant Pier 97 was constructed between 1921 and 1934 (Bromley 1921; Bromley 1934). In 1934 it was used by the Italian Line and the Swedish American Line, but by 1955 had become occupied by the Furness Bermuda Line (Bromley 1934; Bromley 1955; Photograph E). Extant Pier 98 was built by ca. 1913 (Hyde 1913). In 1934 it was used by the Interborough Rapid Transit Company (IRT) which later became known as the New York City Transit System (Bromley 1934; Bromley 1955). By 1967 Consolidated Edison (Con. Ed.) had taken over the pier (Bromley 1967; Photograph F).

Extant Pier 99 was also probably built by ca. 1913 (Hyde 1913). The original Pier 99 shown in 1913 measured 60 feet wide by 665 feet long. The extant pier is 745 feet long and has a platform jutting to the south off of its western end. There is now a two-story building occupied by the Department of Sanitation atop the pier (Photograph G). Both the platform and building were added between 1934 and 1955 (Bromley 1934; Bromley 1955). The pier was probably lengthened in conjunction with these other additions.

Pier Structures

Structures identified in this category include pier sheds once present in the route of Marginal Street either constructed on docks or along the shoreline. Pier sheds were built in the 1920s and 1930s in conjunction with the Pier Plan, and were removed or replaced within the last thirty years. Pier sheds spanned from Pier 95 north to Pier 99 and were used as headhouses by the steamship lines occupying adjacent piers (Photograph B). There was also a coal pocket just south of Pier 98 used to supply the IRT.

Landfill

The on-going process of pushing Manhattan's shoreline outward via landfilling commenced in the seventeenth century and continues today. The earliest documented episode of landfilling in Marginal Street, within the project site between West 46th and West 59th Streets, dates to between 1885 and 1902 (Bromley 1879; Robinson 1885; Bromley 1902; Figure 4). Most of the project site in this section is located west of the landfill on top of a fairly recent outboard platform.

VII. EVALUATION OF SITE PROPERTY TYPES

Documentary research identified four property types within the project site boundaries between Battery Place and West 59th Street. For the West 46th Street to West 59th Street section of the project site, potential resources were identified from the property types of Piers, Pier Sheds, and Wharves; and Landfill. The following is a discussion of the potential of each of these property types to be archaeologically important, and whether each has the ability to contribute to the historical record in a meaningful way. The significance of each property type is dependent upon associative value, integrity, visibility (i.e., the inherent potential of a site to have left an interpretable archaeological record, remains, or footprint), and feasibility of recovery.

Piers, Pier Sheds, and Wharves

Currently there are nine extant piers between West 46th Street and West 59th Street. Piers 88, 90, and 92 (which are not included within the proposed park's boundary) were built in the late 1920s/early 1930s. Pier 94 was built between 1955 and 1967 (it is not within HRPC's jurisdiction). Piers 95, 96, and 98 were built by ca. 1913, and Pier 97 was built between 1921 and 1934. Pier 99 was probably built by ca. 1913, but was expanded upon between 1934 and 1955. There are strong arguments against the archaeological sensitivity of extant piers since the original construction of early and mid-twentieth century piers tends to be well documented. The Pier Plan was a monumental undertaking, one which required extensive engineering plans and documentary efforts. These valuable artifacts, recording the planning and construction of the piers, are readily available and are undoubtedly the best source for recounting original construction designs and techniques.

Some of the piers have little integrity, since years of weathering and neglect have rendered them virtually destroyed. Both the underlying timber piles and above platforms were exposed to the naturally destructive effects of salinity, tidal action, and inclement weather. As a result, piers were undoubtedly rebuilt and updated throughout the twentieth century in order to maintain function. Original construction techniques have been compromised by both these actions, that is by weathering and refurbishing. Studying original engineering plans and descriptions of construction would be more productive towards documenting technological variations than investigating existing structures with little integrity.

Pier sheds also have minimal archaeological value. Undoubtedly, there would be minimal or no foundations associated with buildings once constructed on top of pier platforms. Also, there is minimal archaeological visibility of sheds and headhouses because of their functions as storage facilities and conduits for

passengers. During a recent waterfront excavation of a nineteenth century storage facility in downtown Baltimore, only minimal artifacts were recovered (i.e. one bale seal). The scant archaeological deposits contributed no new information towards the historical record (Lisa DeLeonardio, Baltimore Center for Urban Archaeology, personal communication to Cece Kirkorian, October 22, 1994).

In a topic-intensive study of pier sheds and waterfront structures compiled for the Route 9A study, a strong argument was made against the potential research contributions of pier sheds. According to the Final Environmental Impact Statement (FEIS), Appendix C, Cultural Resources, "The subsurface archaeological visibility of the sheds that were erected on fast land must be considered very low. Also, it is assumed that a minimum of potential is present for recovering significant archaeological data on materials temporarily housed in sheds" (Allee King Rosen and Fleming, Inc., et al. 1994:II-26). The nature of these buildings, largely functioning as offices and storage sheds for pier operators and owners, together with the lack of foundations, renders these buildings as having minimal visibility. Pier sheds lack associative value and integrity, both of which are required for a declaration of significance (New York City Department of City Planning 1993:3F-2). SHPO concurred with the recommendation that no further consideration be required for this category. Therefore, of the pier sheds in this section of the project site, none require further discussion.

Landfill

The landfill in and of itself is not judged to be sensitive since filling throughout this section of the project site dates to the late nineteenth century and early twentieth century. Landfill itself could only be considered worthy of subsurface archaeological investigation if the deposition is associated with 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 a manufacturing process or an individual's lifeways. If deposition is simply the collection of trash from an undesignated area, together with materials excavated elsewhere and debris from various sources, the information that can be acquired in such a context is minimal. For this section of the project site, there are no documented in situ deposits.

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. However, since construction techniques changed through time as new materials and methods were adopted and retaining devices were

rebuilt as needed, archaeological remains would reflect the rebuilt features, not their original form. SHPO concurred with the conclusion that landfill and retaining devices would have limited research potential (Allee King Rosen and Fleming, Inc., et al. 1994:II-27).

VIII. SUBSURFACE DISTURBANCE

Each potentially sensitive resource was evaluated as to the degree of prior disturbance it had undergone. Disturbance was assessed both horizontally, for lengths and widths of impact, and vertically, for depths of impact. Simplified, the location of each resource was compared, vertically and horizontally, to maps of subsurface utility lines, maps of buried tanks, and information from block and lot folders to determine the extent of prior impacts. Subsequently, three levels of disturbance were devised and assigned to each resource.

Very disturbed	-	Most of the site appears to have been disturbed.
Partially Disturbed	-	Part of the site appears to have been disturbed.
Undisturbed	-	None of the site appears to have been disturbed.

Historical Resources

The only historical property type identified through research and determined to have associative value was the bulkhead wall. The NYSOPRHP Building-Structure Inventory Form prepared by Raber Associates and Allee King Rosen & Fleming, Inc. and submitted to SHPO in March 1997 addresses this resource's potential for eligibility for National Register status.

IX. SUMMATION OF POTENTIALLY SENSITIVE AREAS

The following property types were utilized for classifying potentially sensitive archaeological remains:

1) Prehistoric Remains
2) Historical Remains
   a) Piers and wharves
   b) Landfill
   c) Bulkhead Wall and Inboard Relieving Platforms
   d) Other

For this section of the project site, located between West 46th and West 59th Streets, identified resources fell only into the property type categories of a, b, and c of Historical Remains. No prehistoric sites were identified either inboard or outboard of the bulkhead wall.

The historical period sites which were initially identified as potentially sensitive proved, upon more in-depth analysis, to have little potential to contribute to the archaeological record, and thus do not require any further consideration as concurred by SHPO. The bulkhead wall are given further consideration in the accompanying NYSOPRHP Building-Structure Inventory Form.

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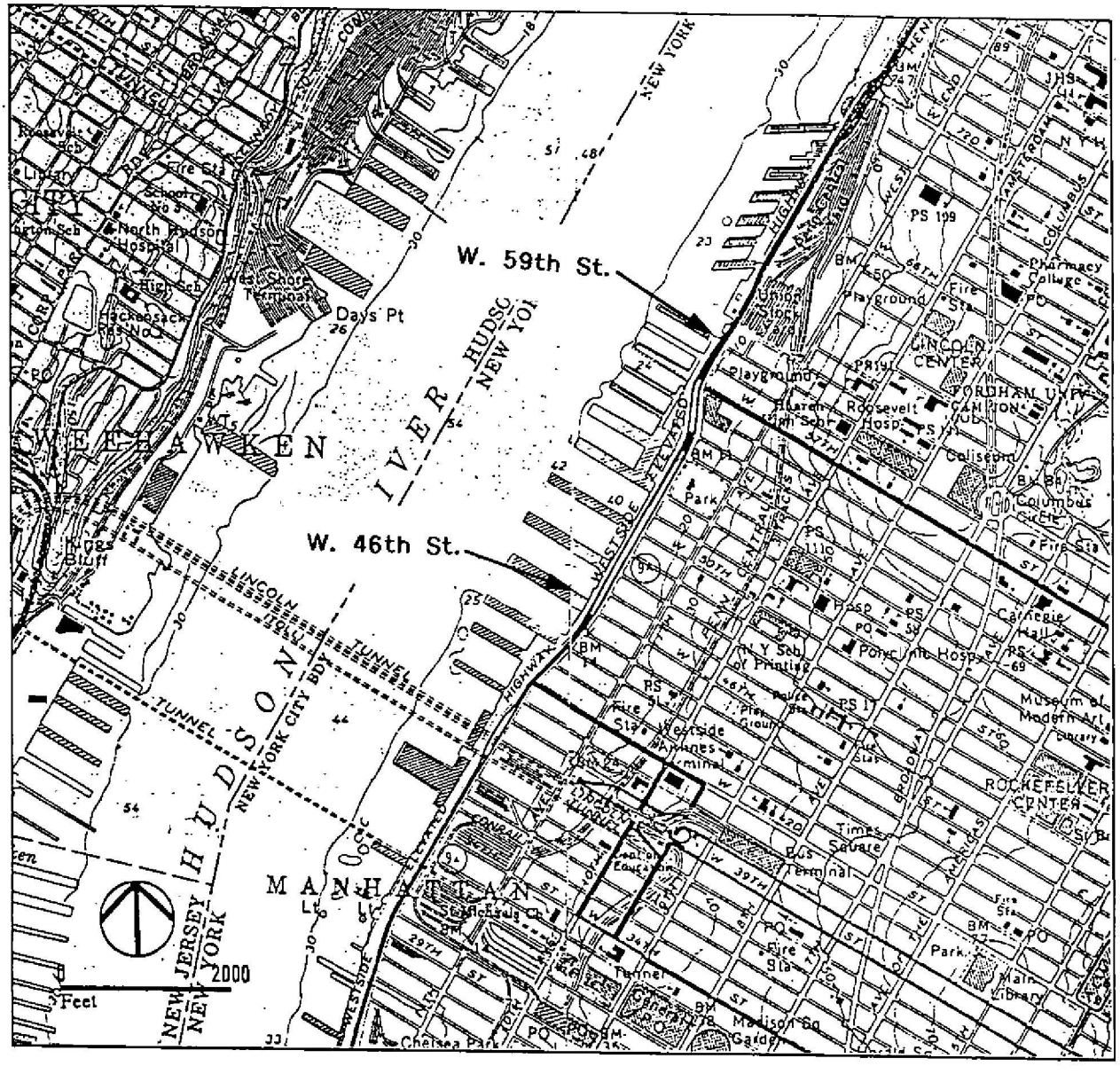


FIGURE 1

Hudson River Park Project Site
West 46th Street to West 59th Street

1981 U.S.G.S. Topographic Map
Jersey City Quadrangle

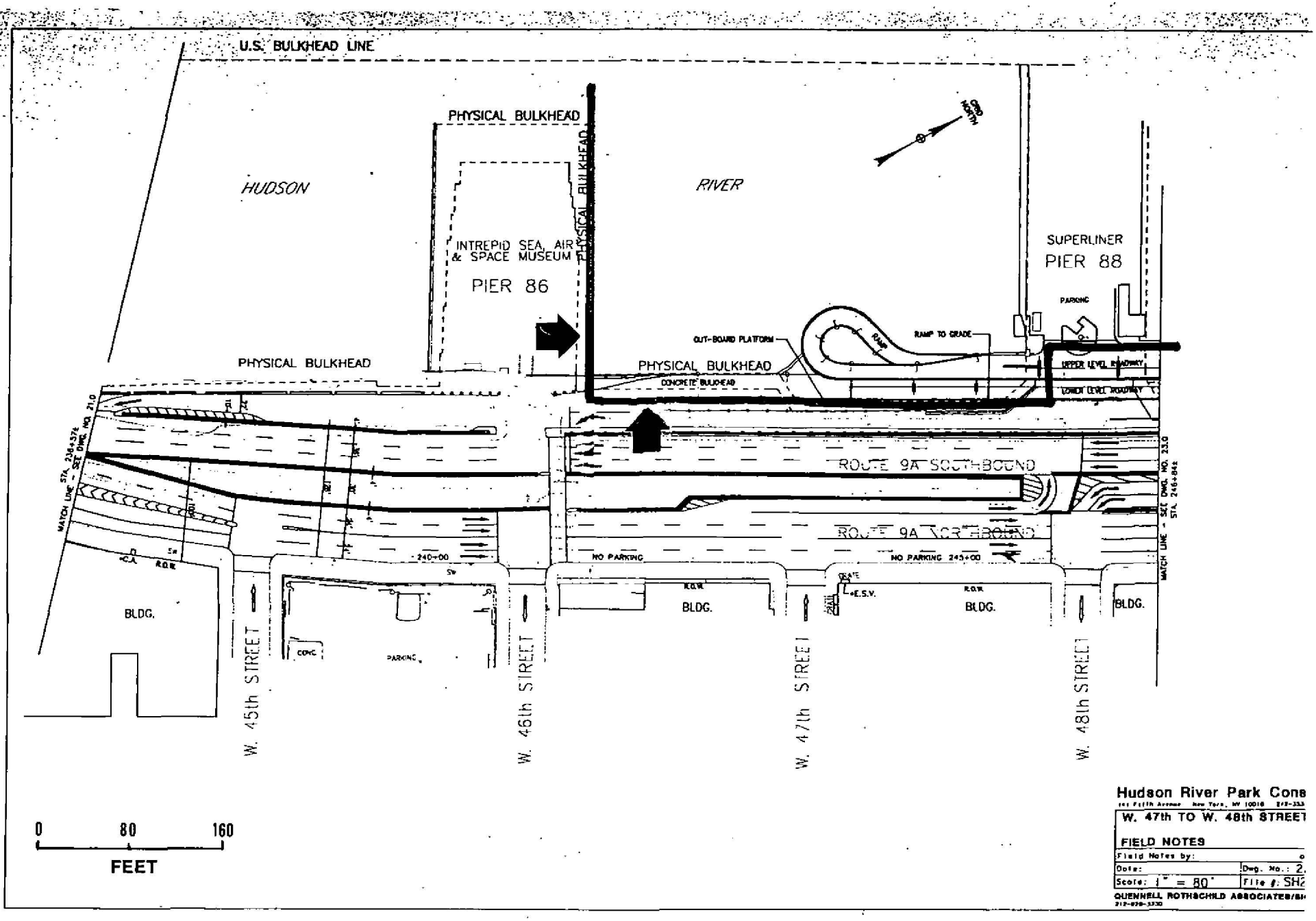


FIGURE 2: Project Site Boundaries,
West 46th to West 59th Street

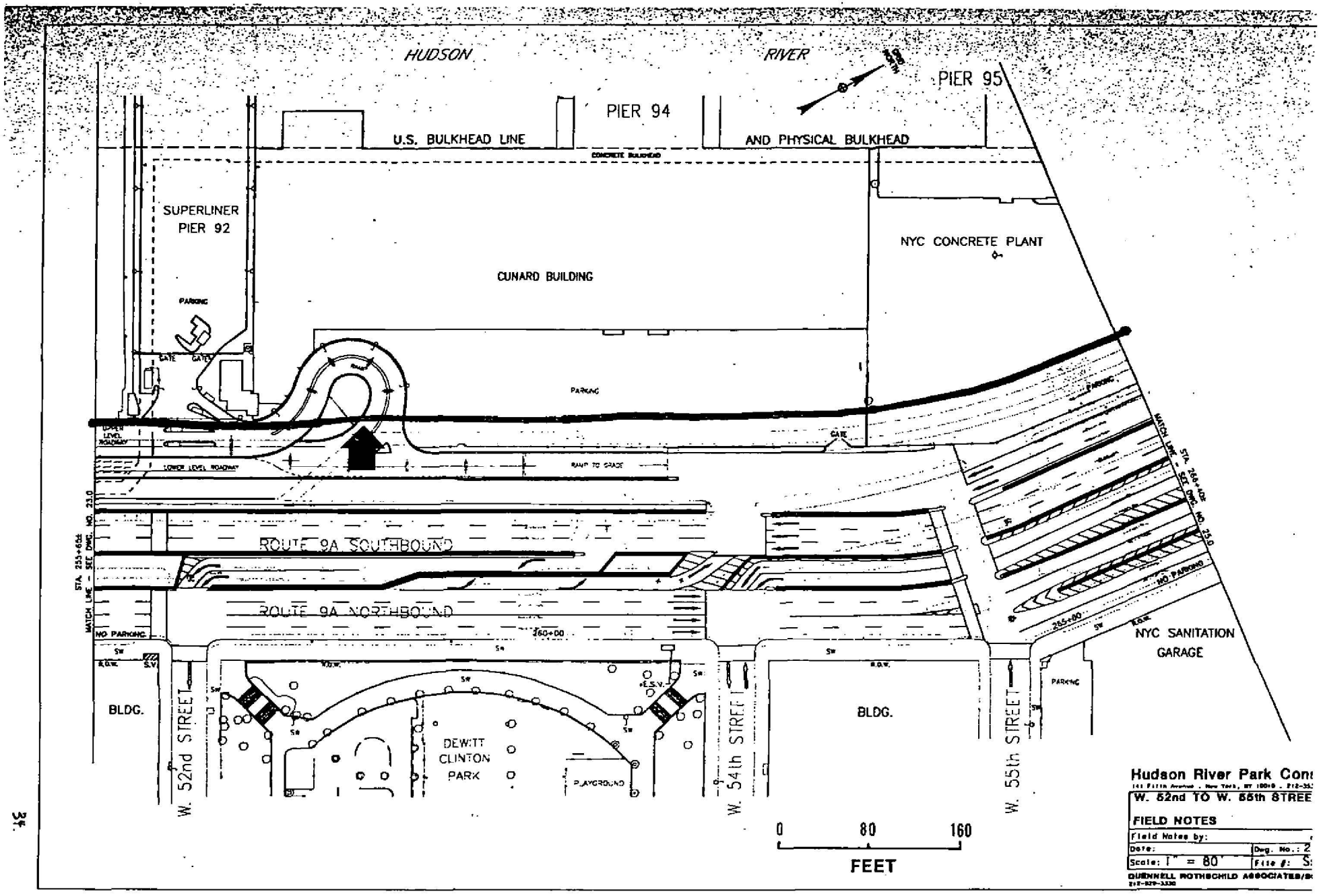


FIGURE 2: Project Site Boundaries,
West 46th to West 59th Street

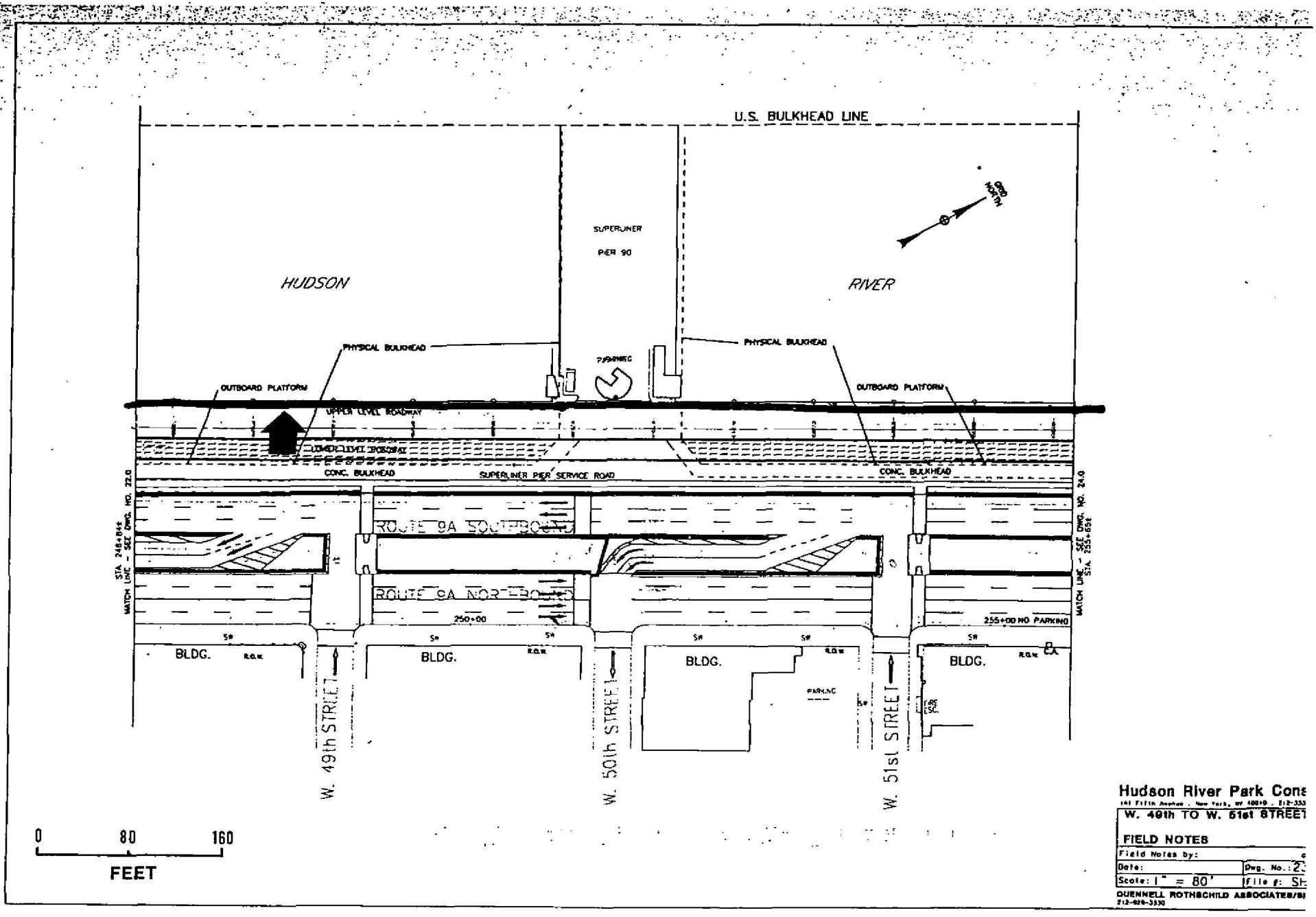


FIGURE 2: Project Site Boundaries,
West 46th to West 59th Street

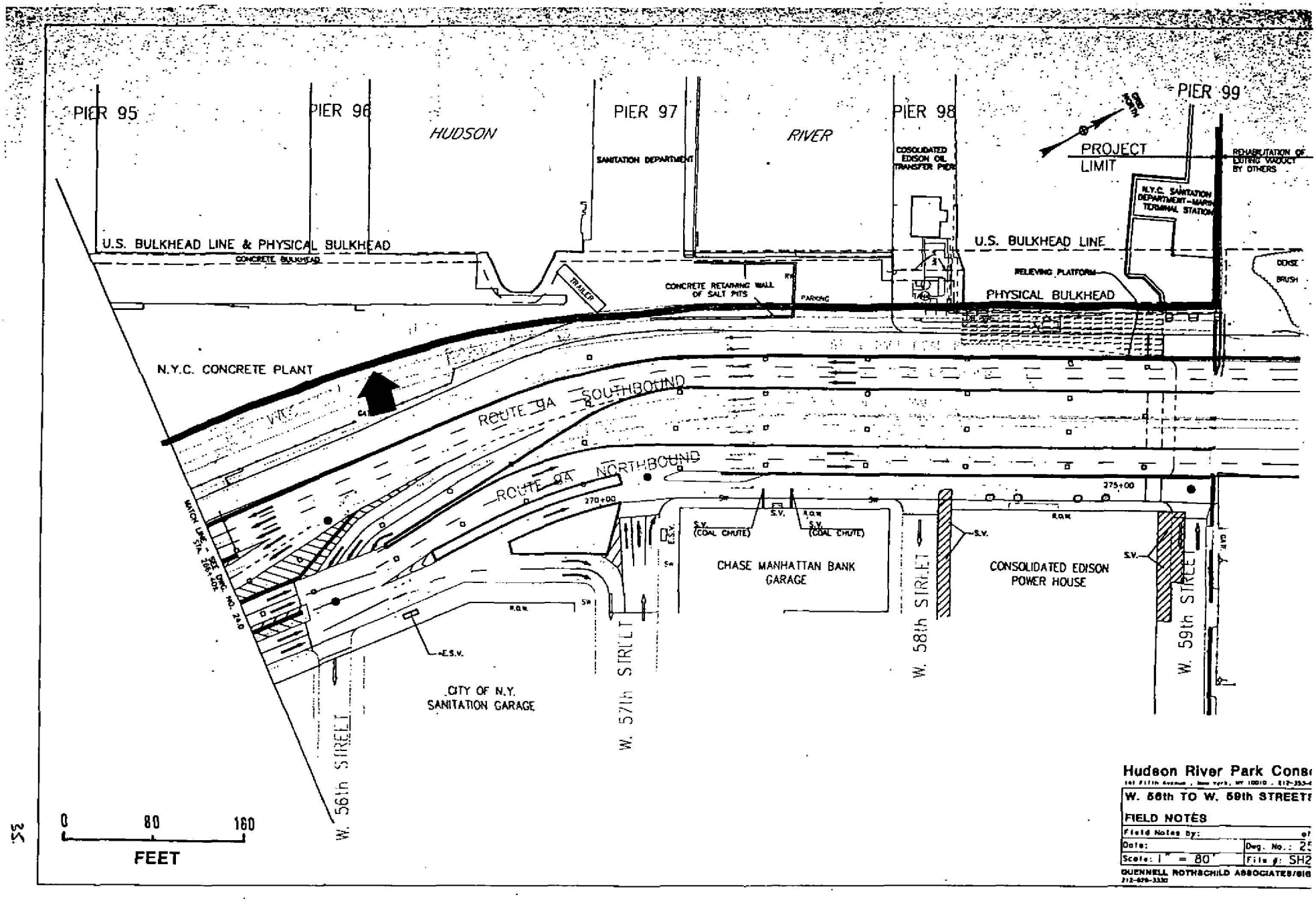


FIGURE 2: Project Site Boundaries,
West 46th to West 59th Street

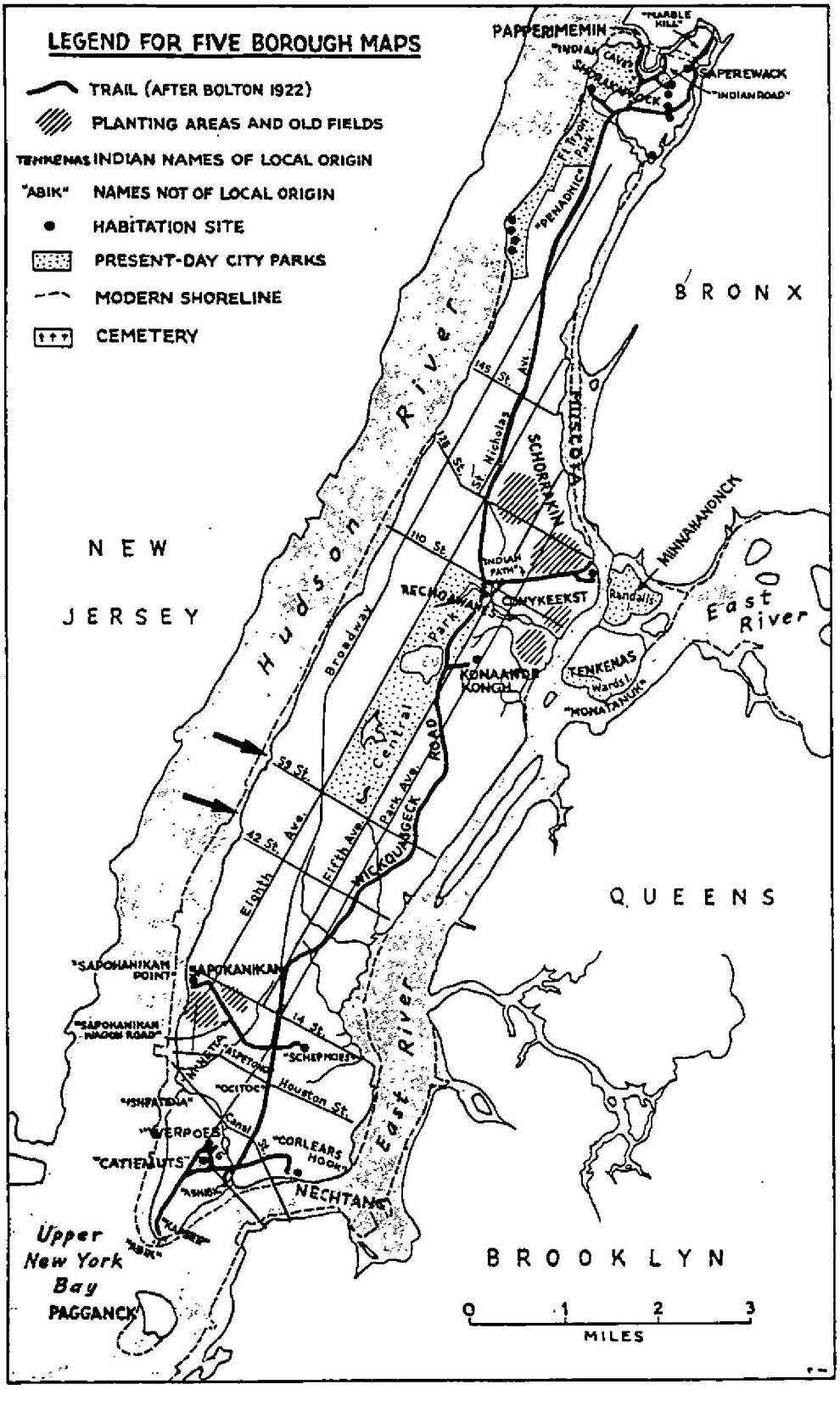


Figure 3

17th-century Native American Trails and
Place Names on Manhattan Island
Source: Grumet 1981

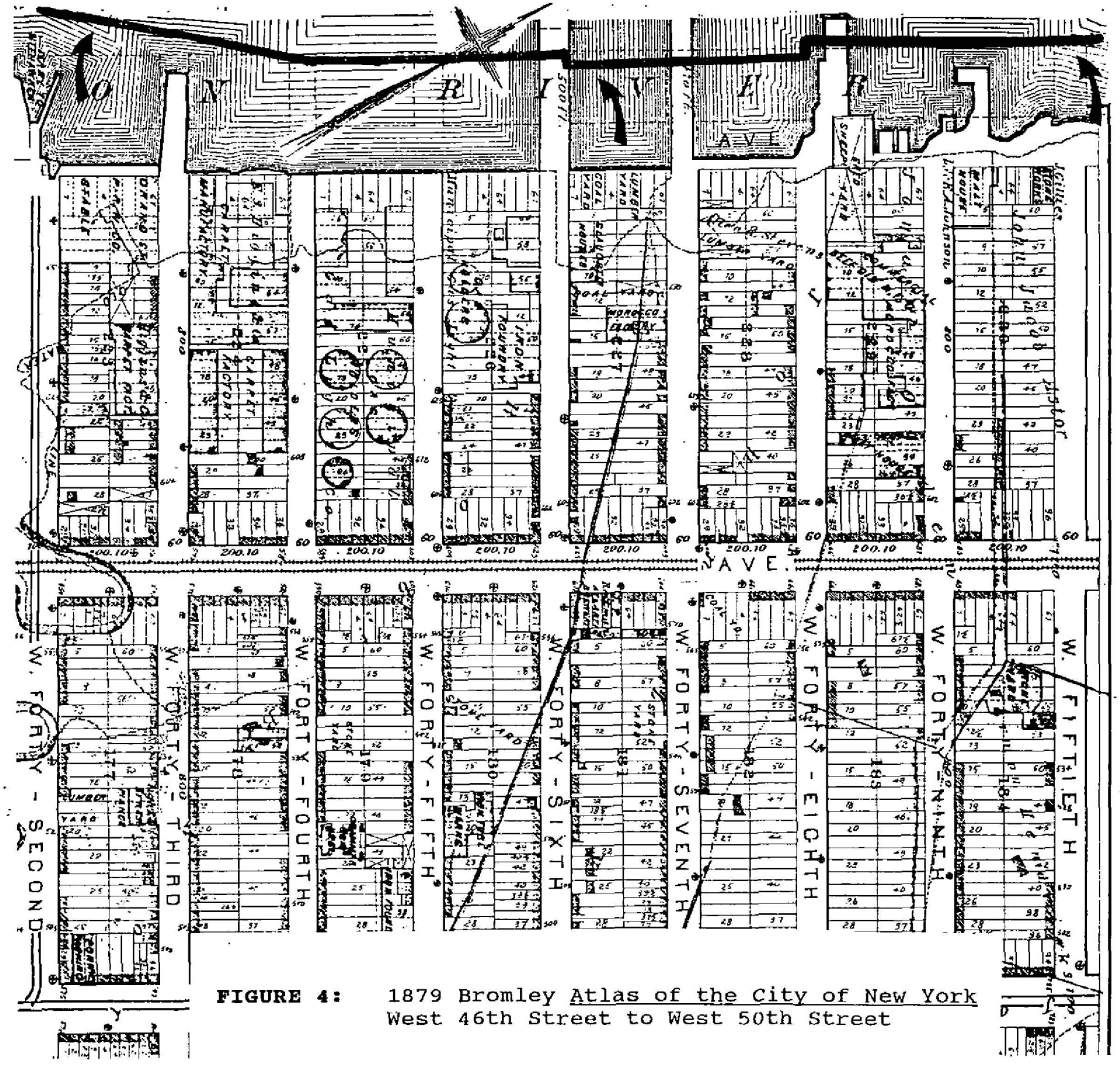


FIGURE 4: 1879 Bromley Atlas of the City of New York
West 46th Street to West 50th Street

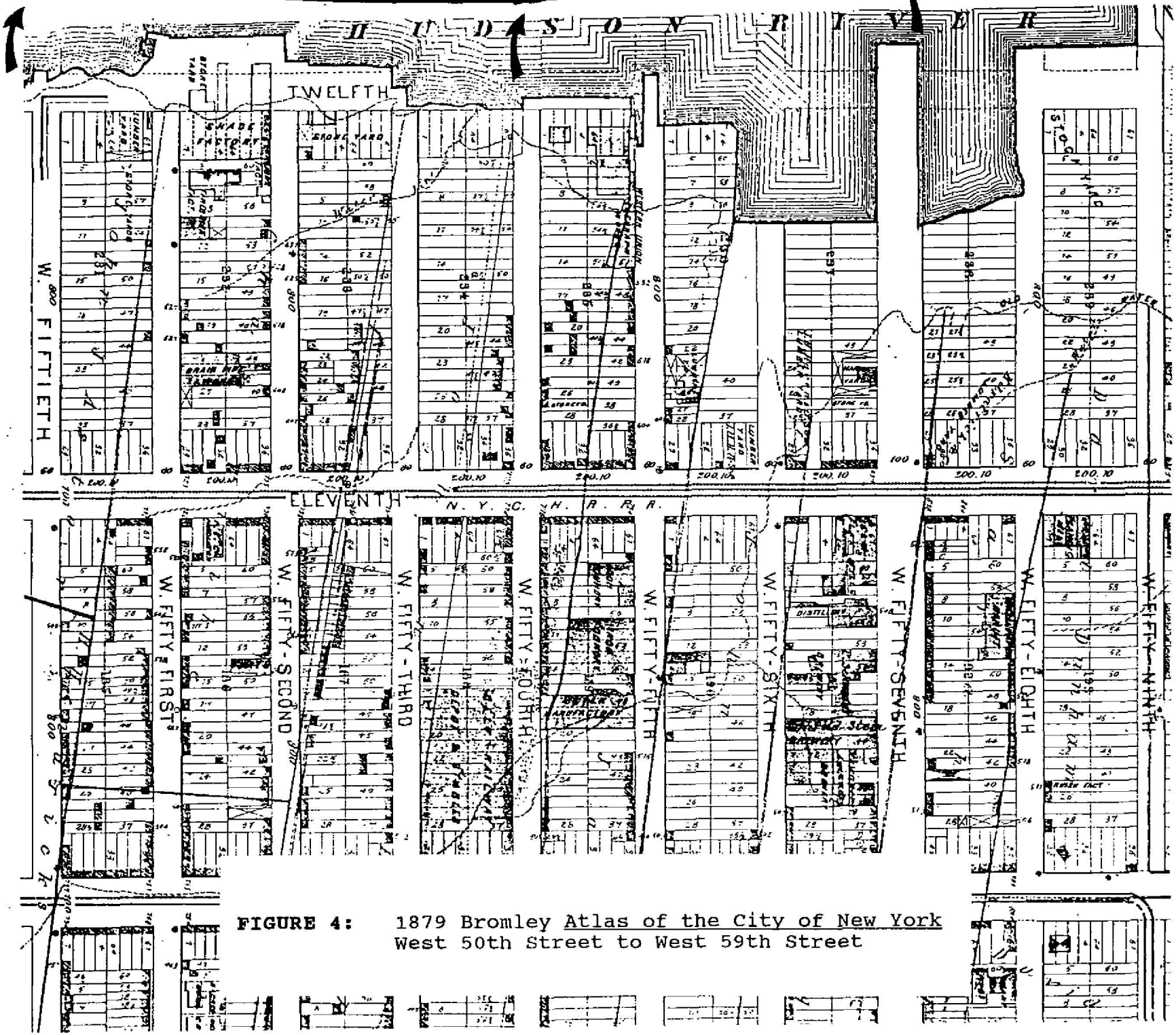
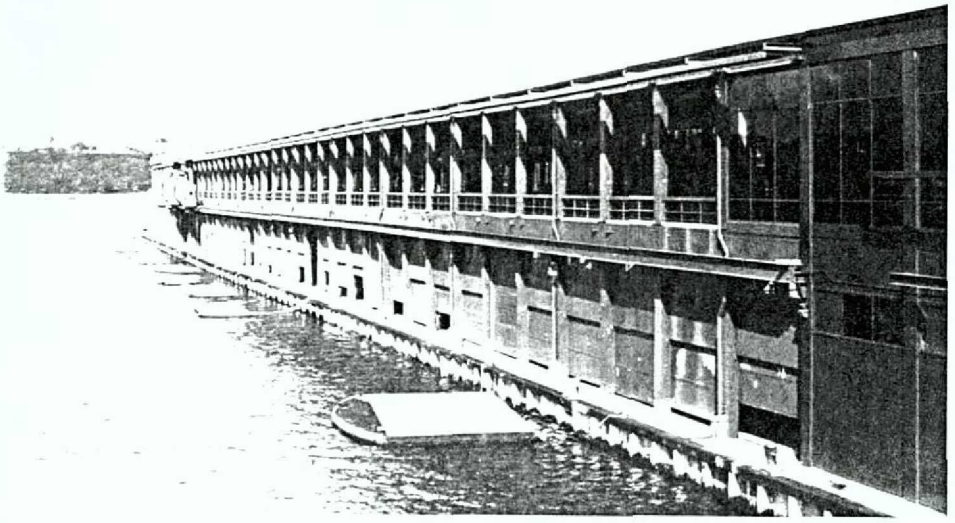
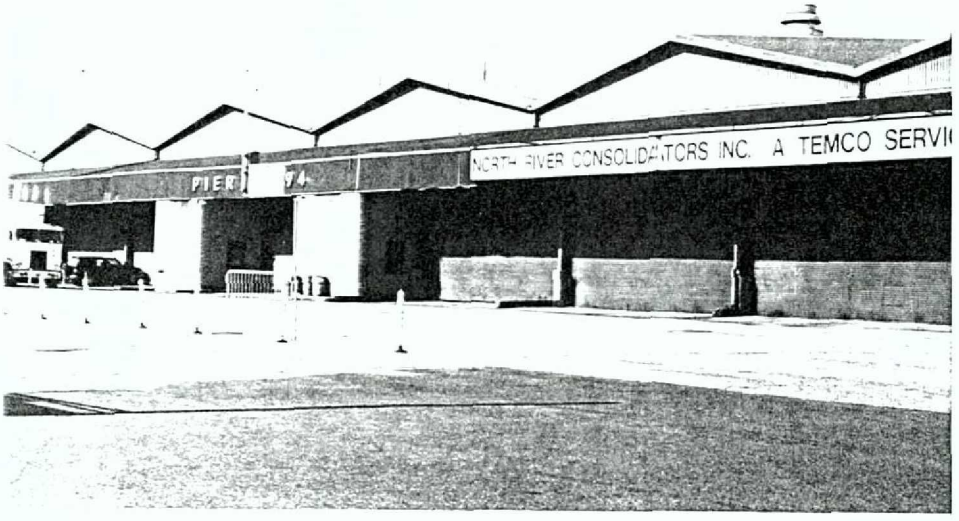


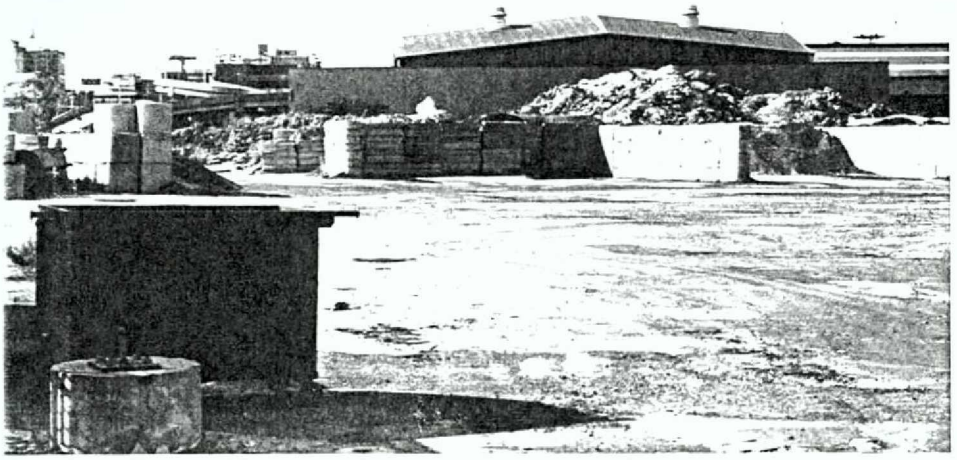
FIGURE 4: 1879 Bromley Atlas of the City of New York
West 50th Street to West 59th Street



PHOTOGRAPH A: Pier 90. Facing northwest from the shoreline.

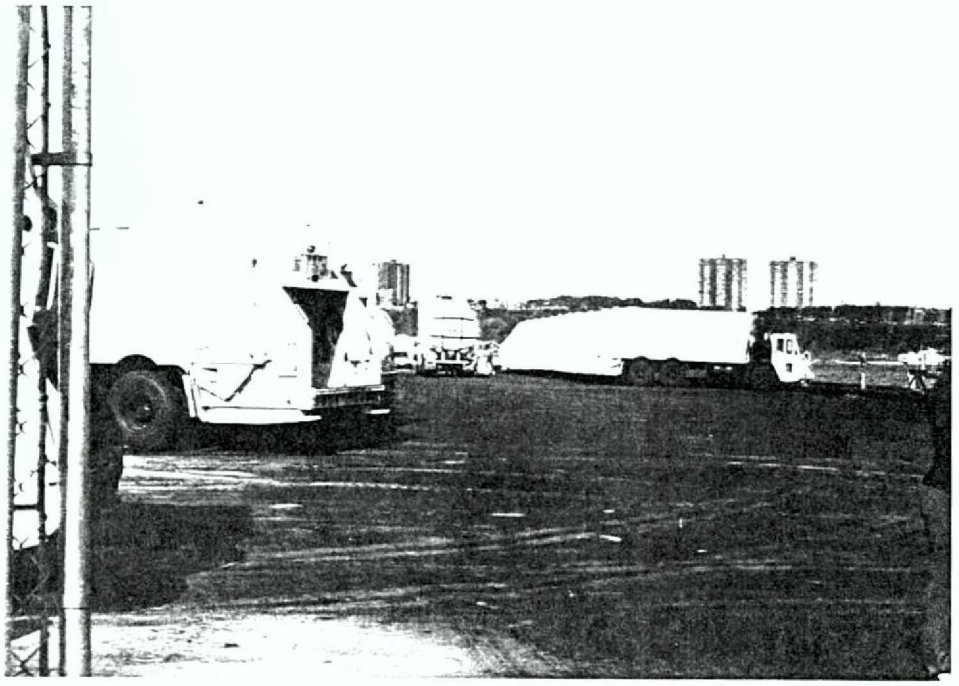


PHOTOGRAPH B: Headhouse of Pier 94. Facing southwest from Marginal Street.

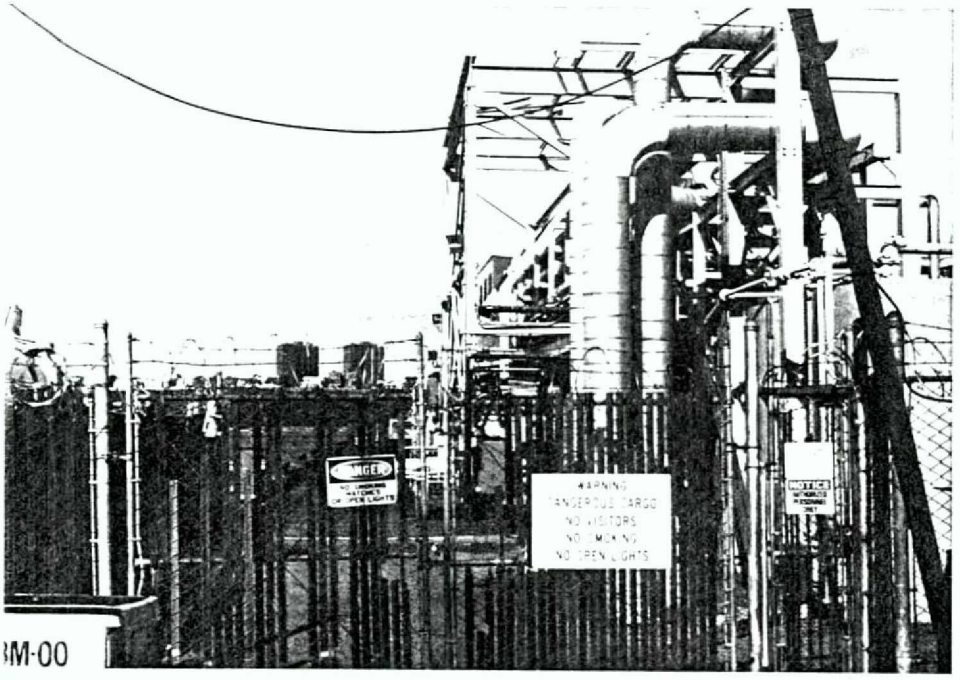


PHOTOGRAPH C: Shoreline by Pier 95. Facing south from Marginal Street.

PHOTOGRAPH D: Inactive Pier 96. Facing west from Marginal Street.



PHOTOGRAPH E: Pier 97. Facing west from shoreline



PHOTOGRAPH F: Con. Edison facility, Pier 98. Facing west from Marginal Street.

PHOTOGRAPH G: Department of Sanitation, Pier 99.
Facing west from Marginal Street.