# STAGE I CULTURAL RESOURCES SURVEY FOR THE PROPOSED RESOURCE RECOVERY FACILITY SITE BROOKLYN NAVY YARD, NEW YORK CITY

by

David E. Church
and
Edward S. Rutsch, S.O.P.A.

of

HISTORIC CONSERVATION & INTERPRETATION, INC.
Box 111, RD 3, Newton, New Jersey 07860

for

CAMP, DRESSER & McKEE
1 Center Plaza
Boston, Massachusetts

FEBRUARY 1982

CONTENTS

# LIST OF ILLUSTRATIONS

## LIST OF FIGURES



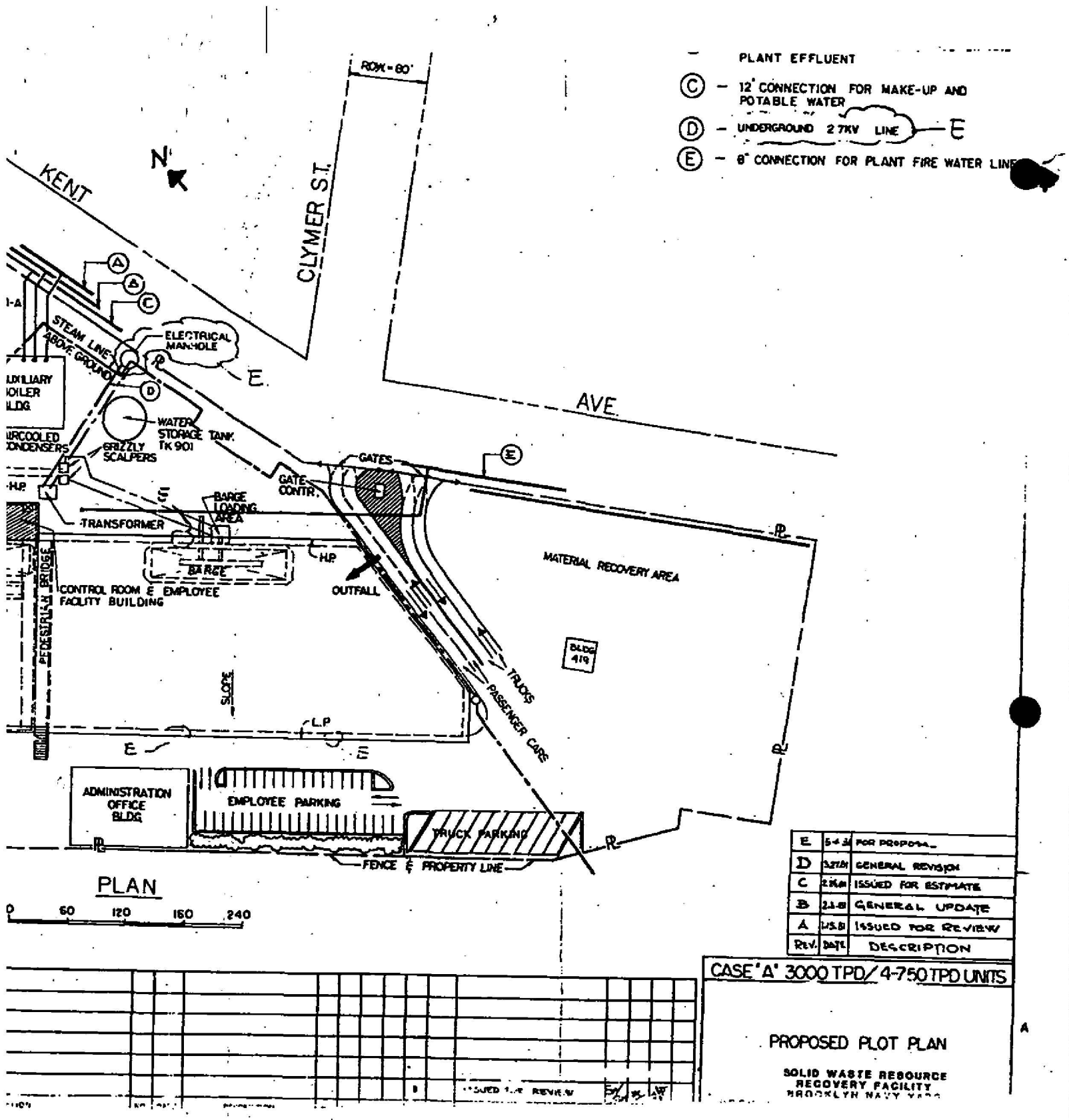
## LIST OF PLATES

# I. INTRODUCTION

## A. BACKGROUND

This report, prepared by Historic Conservation and Interpretation, Inc. (HCI) of Newton, New Jersey for Camp, Dresser and McKee of Boston, Massachusetts, presents the results of a Stage 1 Cultural Resources Survey of the Proposed Resource Recovery Facility Site, Brooklyn Navy Yard, New York City. The project area is currently the Brooklyn Navy Yard Kent Avenue Site on Wallabout Channel, owned by the City of New York and leased to the Commerce Labor Industry Corporation of Kings County (CLICK), a non-profit industrial development corporation. The proposed facility will produce steam from barge-delivered municipal solid waste and deliver the steam to the Consolidated Edison Hudson Avenue Station. As shown in Figures 1 and 2, this facility will be situated on the west side of Kent Avenue and will straddle Wallabout Channel.

The procedures followed, and the conclusions and recommendations presented in this report, are designed to comply with the requirements of the National Environmental Policy Act of 1969, the Archeological Conservation Act of 1974, the Historic Preservation Act of 1966, Executive Order 11593, and the procedures and regulations set forth by the New York State Division of Historic Preservation and the U.S. Environmental Protection Agency, Region II.




Recovery
amp, Dresser

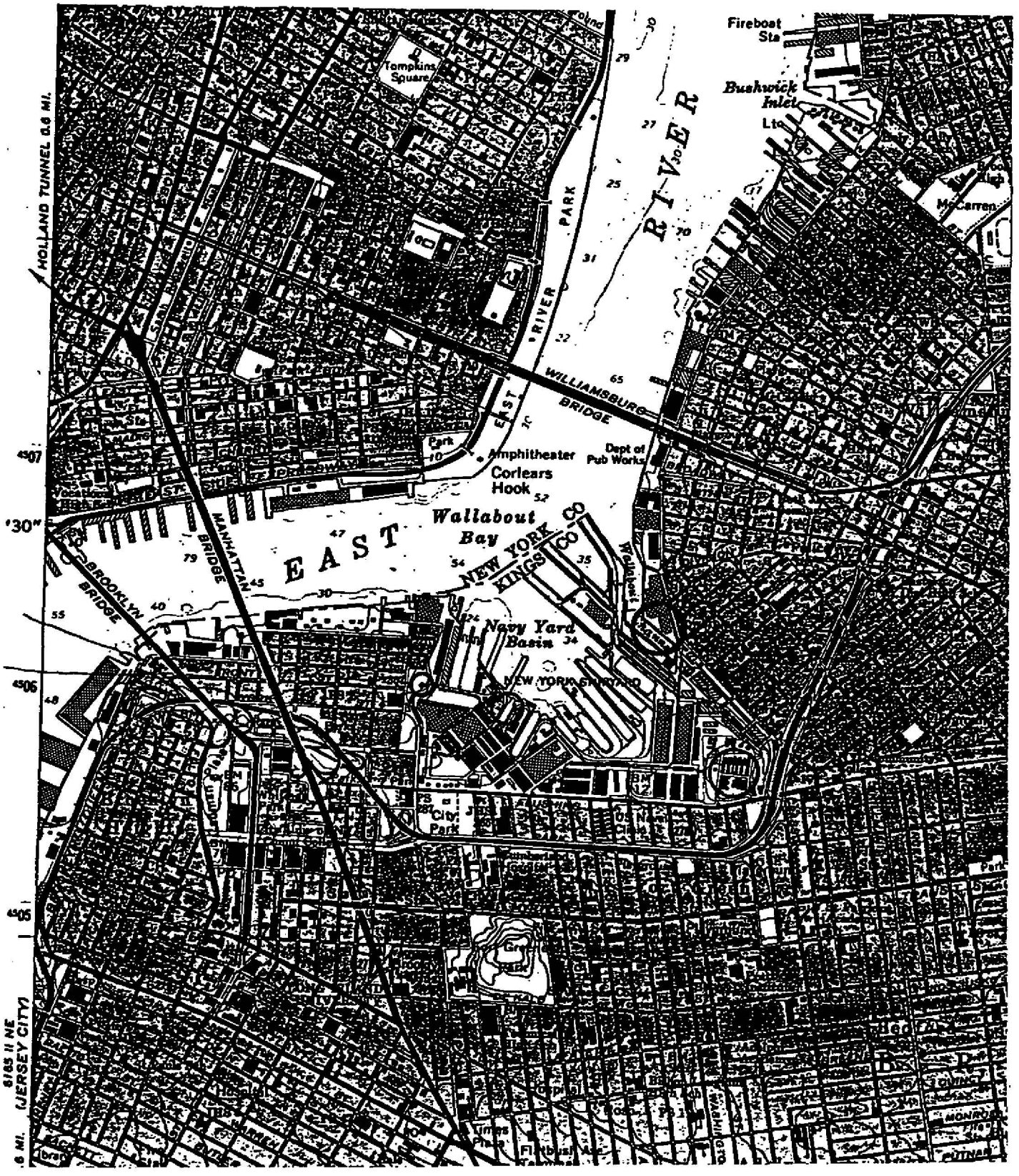



FIGURE 1. Portion of the U.S.G.S. Brooklyn Quadrangle (1967), showing the relationship between the project area (second circle from right) to National Register properties within the Brooklyn Navy Yard: the Commandant's House (circle at far left), Dry Dock No. 1 (second circle from left), and the New York Naval Hospital (circle at far right).

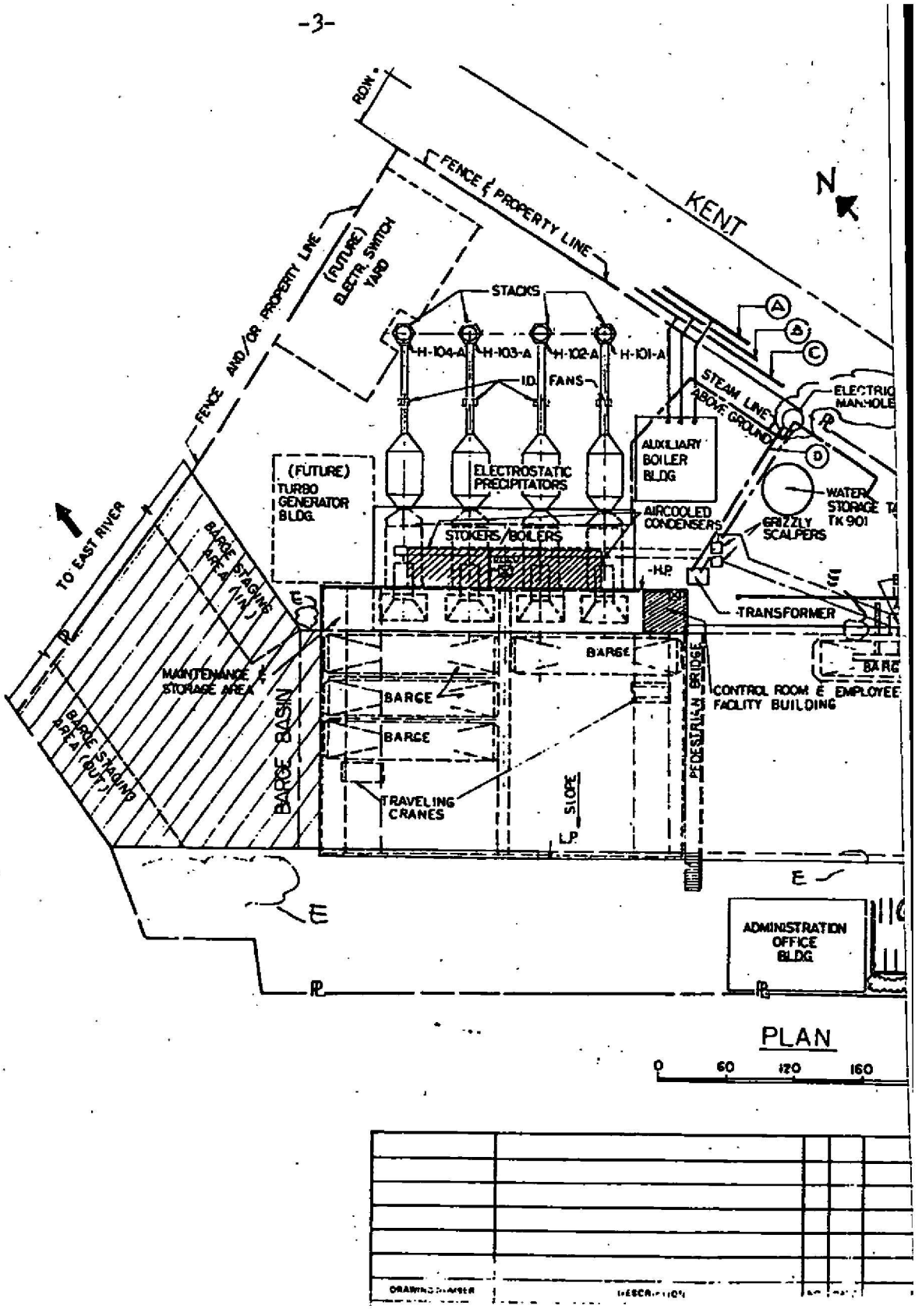



FIGURE 2. Proposed plot plan, Solid Waste Resource Recovery Facility, Brooklyn Navy Yard, Brooklyn, New York. (Camp, Dresser and McKee, Inc.).

## B. METHODOLOGY

The purpose of this survey was to identify the potential for cultural remains within the study area through a documentary and infield investigation. Research in primary and secondary documentary sources was conducted during the fall and early winter of 1981. Documentary research was carried out at the Brooklyn Public Library, the New York Public Library, the New York State Library (Albany), and at the libraries of the Long Island Historical Society and Columbia University. Sources or listings related to cultural resources which were consulted include the National Register of Historic Places, the New York State Archeological Site Files, the New York State Historic Buildings Survey at the New York State Division of Historic Preservation, and the New York City Landmarks Preservation Commission. The findings of this research were used as guidance for the infield examination of the project area and for specific predictions regarding potential cultural remains at this site.

An infield survey of the project area was also conducted. This examination was designed to assess the present condition and land use of the project area, to identify any above-ground cultural remains or structures, and to determine the subsurface characteristics of the project area and its potential for archeological remains. The project area was visually inspected and walked over on several occasions. Photographs and infield information were collected regarding above-ground and surface indications of former activities. The documentary and infield research indicates that potential cultural remains may exist on the east side

of the project area below the mantle of fill and surface covering of concrete and macadam adjacent to and along Kent Avenue. Subsurface testing for such potential remains was not appropriate during this survey.

## II. PHYSICAL SETTING

As the East River flows southward between Manhattan Island and northwestern Long Island, its channel makes a gradual bend between the Williamsburg and Manhattan bridges before emptying into the upper bay of New York Harbor. Originally the outside or southern banks of this river bend formed a broad tidal flat and marsh which the Dutch called "Wallabout Bay." Today, fill and pilings within this tidal bay support a marine, industrial complex known as the Brooklyn Navy Yard (see Figure 1). The Brooklyn Navy Yard Kent Avenue Site study area is situated on fill flanking Wallabout Channel, a dredged canal on the northeastern margin of the navy yard. Because the present physical setting of the project area differs greatly from its past conditions, a brief, conjectural model of former environments is presented here.

The study area is located on what is termed the inner part of the Atlantic Coastal Plain physiographic province. Although the surrounding terrain is like a coastal plain, characteristically low and level to gently rolling, most of both the surface and underlying materials are not true coastal plain deposits but are of Pleistocene age, the results of morainal and outwash accumulations associated with the cycles of continental glaciation (Fuller 1914; Schuberth 1968: 213).

The ancestral terrain of Long Island was probably created during the Tertiary Period, 1.5 to 65 million years before present (B.P.). Some of the tougher sand and clay deposits of the Raritan and Magothy formations, laid down during the previous Cretaceous period, resisted the erosive force of the large stream which eventually became Long Island Sound and emerged as a line of hills rising as much as 400 to 600 feet above sea level. This line of hills was the northeastern continuation of the cuesta which forms part of the present-day Coastal Plain of New Jersey. The northern slope, overlooking Long Island Sound, was relatively steep, whereas the southern slope was more gentle (Schuberth 1968: 164-80).

Most of the familiar land features of Long Island and Brooklyn are the result of glacial action (Figure 3). Two terminal moraines are evident, both resulting from substages of the last glacier, the Wisconsin, which retreated from this area by 15,000 years ago. Evidence of the older moraine, the Ronkonkoma, is obscured by the younger Harbor Hill moraine. This younger morainal ridge runs from Orient Point at the northeastern tip of the island to New York Harbor, where it is cut by the channel known as The Narrows, and thence into New Jersey. These morainal ridges form the "backbone" and the two "flukes" of the whale to which the shape of Long Island has been compared (Schuberth 1968: 184-87).

Although much of the terrain characteristics of Brooklyn have been obscured by the intensity of urban development, the morainal ridge is still evident and is now partially marked by much of the city's green space--i.e., Prospect Park, Greenwood Cemetery, and the cemeteries near Ridgewood. The northwest slope of this ridge is drained by three

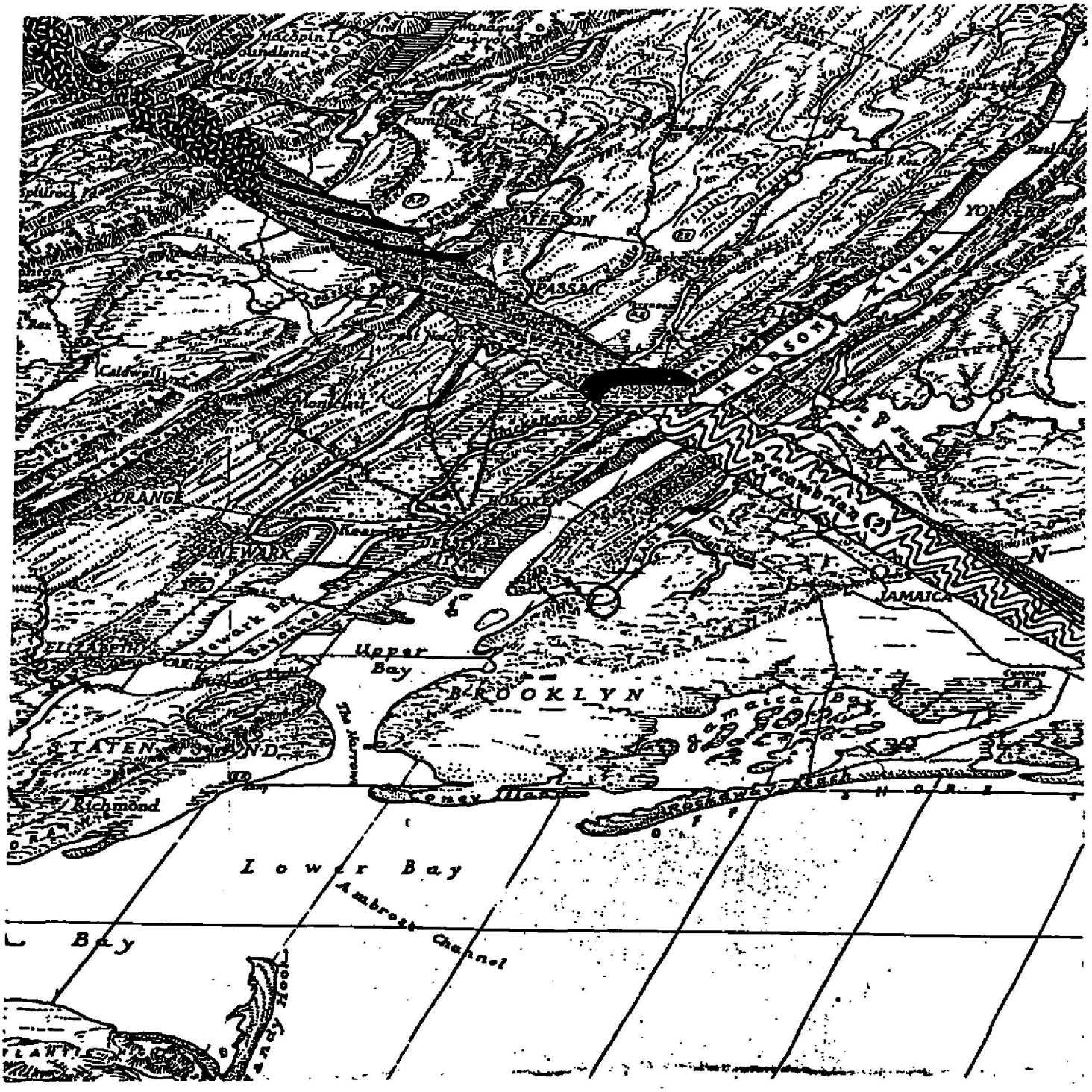



FIGURE 3. Topographical map of New York Harbor and environs showing the geological makeup of the region (Schuberth 1968). The approximate location of the Brooklyn Navy Yard is indicated by the circle.

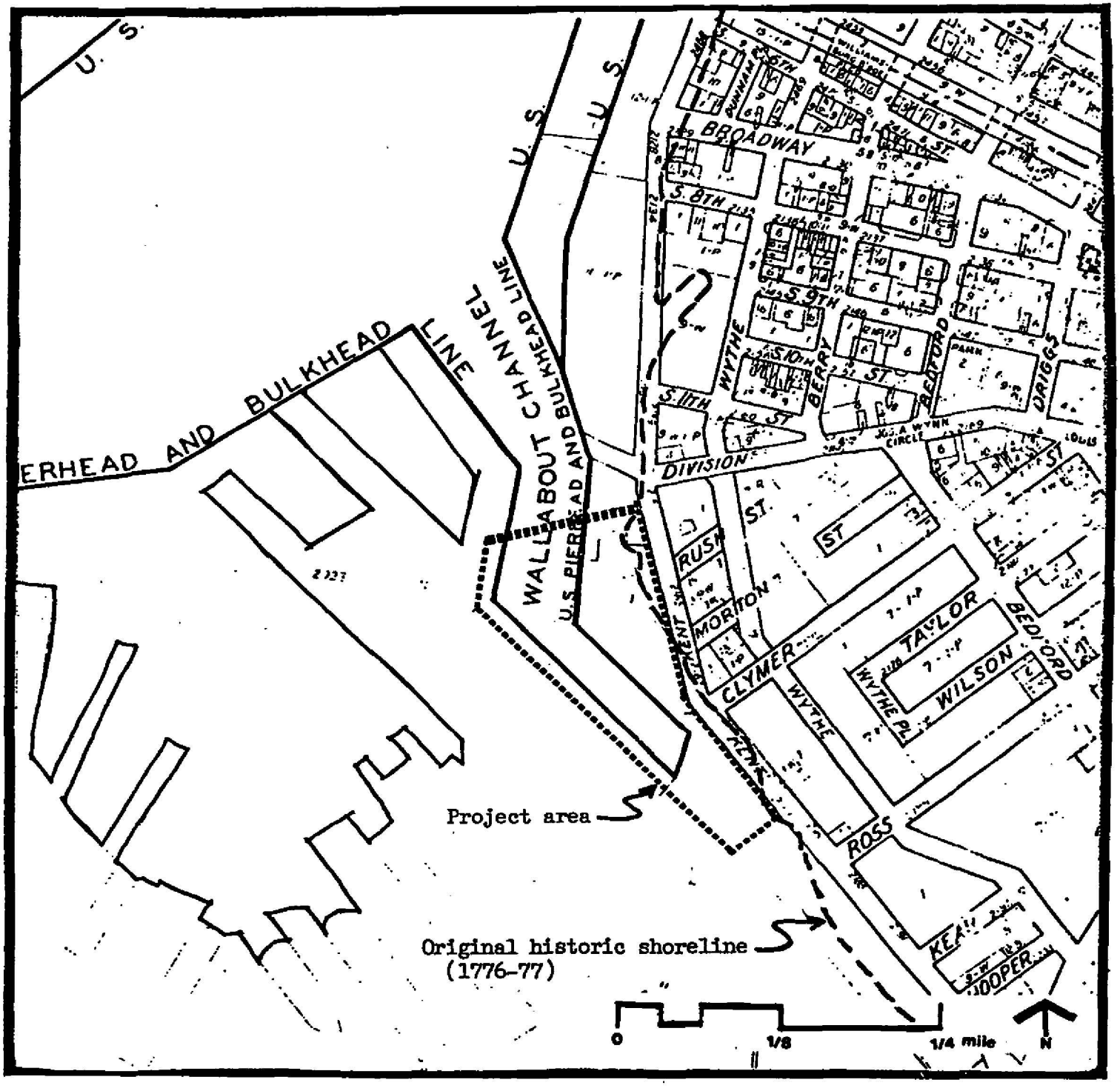
now channelized and culverted creeks: Newtown, Wallabout, and Gowanus. Post-glacially, these streams have reworked the upper levels of sandy (with silt and gravel) sediments before reaching tidal influence. The smallest of the creeks, Wallabout, drained a small, low area before emptying into the tidal marsh and mudflats of Wallabout Bay. The tidal dominance in most of the Wallabout drainage is well documented historically, but this influence has been lessened over time as industrial filling and dredging lifted land out of the marshy mudflats to accommodate the growth of the navy yard and surrounding urban industries.

In early post-glacial times, tidal influence was also less, as evidenced by the known eustatic or world-wide rise in sea level since that period. The growth of vast areas of coastal marsh throughout the New York Harbor is correlated to the post-glacial rise in sea level. Inasmauch as the volume of surface water on earth has remained unchanged over millions of years, when enormous amounts of water were frozen into expanding glacial ice sheets sea levels were lowered. With the recession of the glaciers, meltwaters fed back into the oceans and sea levels rose. For coastal New York this rise in sea level has been estimated at between 3 and 4 feet per century until 6,000 years ago, when the rate slowed to 1 foot per century. About 2,600 years ago this rate slowed again to 0.45 foot per century (Salwen 1965: 32). The effect of this rise has been the drowning of coastal areas, like Wallabout Bay, many of which may have supported or provided resources for prehistoric inhabitants of lower coastal areas.

The Brooklyn Navy Yard Kent Avenue Site straddles the historic margin between tidal marsh and dry, sandy coast (Figure 4). Comparison of historic maps with more recent graphics indicates that in the eighteenth and nineteenth centuries mud flats or salt meadows formed an undulating tidal border close to the present Kent Avenue right-of-way. Immediately southwest of this border in the vicinity of the project area was Wallabout Creek, a waterway represented now by the much-shortened, widened, and deepened Wallabout Channel or Canal.

Geologic test borings conducted within and around the project area reveal a soil stratigraphy overlain by 10 or more feet of sandy fill, possibly derived from dredging other sections of the Navy Yard or nearby East River. The fill overlies a layer of organic, sandy silt which thins to less than 5 feet near Kent Avenue. This organic layer probably represents marsh or stream deposits close to the former shoreline. Below the organic layer are deep glacial or post-glacially reworked sands, the upper portions of which may have once been located above tidal influence.

Obviously, extensive late nineteenth- and twentieth-century urban expansion has resulted in reclamation, through filling, of the marshy areas of the project area. This filling, combined with the dredging of portions of the original Wallabout Creek, has altered a naturally dynamic coastal environment and has influenced any potential for cultural remains of prior human activities there.




**Brooklyn Navy Yard**

**Figure 4**

Source: The City of New York Department of Sanitation
ENVIRONMENTAL IMPACT STATEMENT
FOR THE PROPOSED
RESOURCE RECOVERY PROGRAM
AT THE BROOKLYN NAVY YARD
CAMP DRESSER & MCKEE SEPTEMBER 1981

# III. PREHISTORIC OCCUPATION

## A. SENSITIVITY

Although a wealth of archeological materials has been discovered in northern and eastern Long Island and on nearby Staten Island, less information is available concerning prehistoric occupation in western Long Island and in the specific project area. The New York State Museum Archeological Site Files do reveal some sites in the City of Brooklyn, but none is within 1 mile of the project area. Sites identified appear to cluster along the shoreline region of Sheepshead and Jamaica bays or along the original banks and mouth of Gowanus Creek, all well south of the Brooklyn Navy Yard. A small site is also reported about 2 miles east of the project area near Flushing and Onderdonk avenues.

Obviously, prehistoric activities occurred throughout Brooklyn, but in the project area historic development has obscured, if not destroyed, any potential archeological sites, if they existed. Since the original terrain now covered by the Brooklyn Navy Yard was dominated by salt marsh and the margins of flanking shoreline, prehistoric archeological sites other than shell heaps or middens are unlikely. These later refuse deposits could exist below fill near original shorelines.

In the following sections, a model of the aboriginal occupation of the region is presented. This model is based on archeological investigations conducted on Long Island and in neighboring regions.

## B. PALEO-INDIAN STAGE

Potential Paleo-Indian occupation within the project area must be inferred from data drawn from other areas. Paleo-Indians probably exploited the earliest post-glacial environments by remaining in small family bands of hunters and gatherers. Because these people represented a highly mobile small population, and because they may have favored areas now extensively exploited by historic populations, there is little archeological record of them. Ritchie (1965: xvii) reports that a Paleo-Indian component was discovered at the Port Mobil Site, Staten Island, New York. Other Paleo-Indian sites are also reported within inland portions of the Northeast (Ritchie and Funk 1973).

Whether Paleo-Indians occupied or exploited the project area is problematic. No Paleo-Indian sites or materials have yet been identified on Long Island.

## C. THE ARCHAIC STAGE

As the post-glacial environment of the Northeast evolved toward more modern conditions, the subsistence and settlement patterns of people occupying this region changed. Newly developed natural resources and an increased knowledge of the environment by its human inhabitants influenced "an early level of culture based on hunting, fishing, and gathering of wild vegetable foods" (Ritchie 1965: 31). Such cultures were probably represented by mobile populations with small-band organization and simple social structuring. Material evidence of people practicing this balanced economy of hunting, fishing, and gathering is generally associated with dates as early as 6,500 years B.P. Within coastal New York, this

evidence has been gathered at several sites on Staten Island and along the eastern and northern shores of Long Island (Ritchie and Funk 1973: 4).

Materials identified in coastal localities suggest land use for camp sites by small bands of people, with a possible emphasis on seasonal exploitation of the abundant shellfish resources (Smith 1950: 106). Unfortunately, with the eustatic rise in sea levels that has inundated extensive coastal areas in post-glacial times, many areas potentially sensitive to Archaic archeological finds may now be drowned (Salwen 1965).

## D. THE TRANSITIONAL STAGE

Along the northern and eastern portions of Long Island, sites representing human activity in the theorized Transitional Stage have been identified. Generally, the beginning of this stage (c. 3,300 years B.P.) is identified by the presence of stone pots in artifact assemblages, otherwise much like the earlier Archaic assemblages (Ritchie and Funk 1973: 71). Transitional populations probably practiced an economy similar to that of the Archaic.

Based on finds in Long Island, Ritchie (1965) has defined much of the Transitional in coastal New York as the Orient Phase of cultural development. Associated with the Orient Phase are lithic projectile points of "semi-lozenge" or "heart-shaped" form, along with evidence of mortuary ceremonialism (Ritchie and Funk 1973: 71). Again, camp sites similar to those from the Archaic are possible near present or original shorelines, whereas burial sites were most probably confined to better-drained areas.

## E. THE WOODLAND STAGE

The Woodland Stage is identified with the appearance of new traits in the archeological record. Beginning with the Early Woodland (c. 3,000 years B.P.) is a pronounced presence of ceramic pottery at archeological sites, as well as other traits such as tubular smoking pipes of clay or stone, birdstones, and boatstones (Ritchie and Funk 1973: 96). Burial ceremonialism is evidenced, becoming more complex and refined throughout the stage.

The subsistence and settlement patterns of the Early and Middle Woodland people remained similar to those of their ancestors. Trash pits and shell middens found throughout coastal New York indicate that Woodland people were subsisting on a variety of foodstuffs but certainly relied heavily on the shellfish resources of the coastal bays and estuaries (Smith 1950: 106; Ritchie 1965: 268).

Later Woodland people continued to use ceramic pottery, now more elaborate and decorated. However, sites dating near the period of contact with Euro-Americans appear to lack the ceremonialism associated with burials of earlier cultures (Ritchie 1965: 267). Ritchie has defined two cultural phases of the Late Woodland for coastal New York: the Bowmans Brook Phase and the later Clasons Point Phase. Distinguished by the ceramic and lithic artifacts found at various trash pits, habitation sites, and burials on coastal New York, these phases represent more sedentary village populations which still exploited the abundant shellfish as well as the game found in the surrounding deciduous forests (Smith 1950: 116-17, 120-21; Ritchie 1965: 267-71). Throughout the Northeast, similar villages were also beginning agricultural practices with maize, beans, squash, and other plant varieties.

The extent of agricultural practice in coastal New York may have been quite minor. Ceci (1977) argues that maize cultivation by the Algonquian Indians of Long Island was never more than marginal owing to the generally infertile quality of the soils. Village life developed for these Late Woodland people around the production of wampum, a shell currency. During the seventeenth century, the Canarsie Indians of western Long Island became involved in trade with the newly arriving Dutch and later English. Wampum, manufactured by local Indians, became an important currency in the fur trade and in acquisition of settlement lands for the Europeans.

However Late Woodland village life began, either through the early requirements of agriculture or through wampum production for trade, villages did exist in western Long Island. The Canarsie Indians had two villages, one located near the present Canarsie section of Brooklyn and the other at Ryders Pond, also called Gerritsen Basin (Bolton 1920: 312-13; Lopez and Wisniewski 1971). A village known as Werpos presumably also existed at the head of Gowanus Creek. The latter site was within 2 miles of the project area.

Seventeenth-century control of western Long Island by Europeans produced a definite and early decline in Indian culture and eventually crowded the Canarsie or any other Indians out of the coastal region (Smith 1950; Ceci 1977: 264-65). Again, post-glacial eustatic sea level rises as well as historic development have significantly affected potential coastal archeological sites, such as those possible within the project area under study.

## IV. HISTORIC OVERVIEW

### A. DUTCH SETTLEMENT

European presence along the New York coast and harbor began in 1609 when Henry Hudson visited the region while searching for a route to the East for the Dutch East India Company. By 1614 the first fort and a few dwellings had been erected on Manhattan Island both to serve fur traders and to confirm Dutch claims to the land. However, serious attempts at colonization in the region were not made until the late 1630s (Wood 1824). The earliest grants of land within present Kings County (Brooklyn) were made in 1636 at the site of New Amersfort, later called Flatlands, and at Bowanus, now Gowanus. In 1637 Joris Jansen de Rapelie purchased from the Indians 336 acres of river shore and meadow situated around a bay of the East River. Rapelie was a French Huguenot and a Walloon, being originally from that southern district of France. He established a family farm on his purchase at what came to be called "Waal-boght," loosely translated as "Walloon's Bay," today's Wallabout Bay (Flint 1896: 65; West 1941: 2). Rapelie's farm estate eventually came to comprise much of the Brooklyn Navy Yard's holdings.

By 1647 a patent for 400 acres of land adjoining Rapelie's land on the east was secured from the New Amsterdam Governor Kieft

by Hans Hansen Bergen, a native of Norway and son-in-law of Rapélie (Stiles 1867: 88). This patent included the marsh and lands within the present project area. Until the Navy Department's tenure on the Wallabout lands began, c. 1801, these lands remained as farms and estates owned by the flourishing family descended from Rapelie. Rapelie, Bergen, Bogart, Vanderbeeck, Remsen and Johnson were all families related by birth and marriage who maintained these lands throughout the seventeenth and eighteenth centuries. These people not only resided on but also farmed the sandy, well-drained lands overlooking the bay, selling any surpluses to the nearby village of Breuckelen or to New Amsterdam, later New York, across the East River. As evidenced in several land disputes presented by Stiles (1867: 90-92), Cutting of marsh grass was also practiced, and was an undoubtedly successful enterprise in the wide tidal flats of Wallabout.

As Rapelie and his descendants cleared land and settled on farms rimming Wallabout Bay, others cleared similar farms and estates along New York's coast around early villages and near colonial New York, slowly civilizing the region. West of and across Wallabout Bay from the project area, the area's first gristmill was erected in 1710, designed to utilize tidal flow for power (Stiles 1867: 80). Other early amenities included the establishment of ferry service across the East River and the clearing of roadways. Probably the first roadway in the Waal-boght area was a crude right-of-way paralleling the bay shore and connecting the surrounding residences. Butt (1846) named this thoroughfare the Wallabout Road. It was located near present Flushing Avenue and connected Division Street and Williamsburg Road, which curved between the present Kent and Wythe avenues in Williamsburg.

Rapelie family farms survived the change in regional sovereignty from the Netherlands to England, and remained as entities through the American Revolution. During the eighteenth century, the original patents or estates were divided into several smaller farms as heirs became more numerous. Lands including the present study area rested within the Cornelius Bogart farm close to his brother Adrian's farm on the north. By 1775 Adrian had sold his farm to Jacob Bloom, while a year earlier Cornelius had sold his farm to Abraham Remsen (Butt 1846; Stiles 1867: 94). The Remsens appear to have been the last of this extended family to hold parcels here; the Abraham Remsen farm and lands adjoining on the south were owned by Remsens and related Johnsons well into the mid-nineteenth century.

Figure 5 shows Wallabout Bay during the Revolutionary War period. Early docking facilities are shown off the Barent Johnson farm near the present foot of Kent Avenue at the Brooklyn-Queens Expressway and at the gristmill on the west side of the bay. Also shown are the positions of various British hospital and prison ships which held Colonial prisoners. The Revolutionary War initiated the military's use of the bay, a custom which began with regrettable events.

Although there may have been some minor activity in the bay related to the well-documented Battle of Long Island, the waters and flats of Wallabout Bay are more infamously known as the anchorage sites for the aforementioned British prison and hospital ships, on which numerous Colonial soldiers died. The ships were for the most part worn out, out-of-service warships, the worst being the 65-gun sloop *Jersey*. Since that period, excavations on the shore and banks of the Wallabout have unearthed hundreds of skeletons. Apparently, the dead were buried in long, shallow

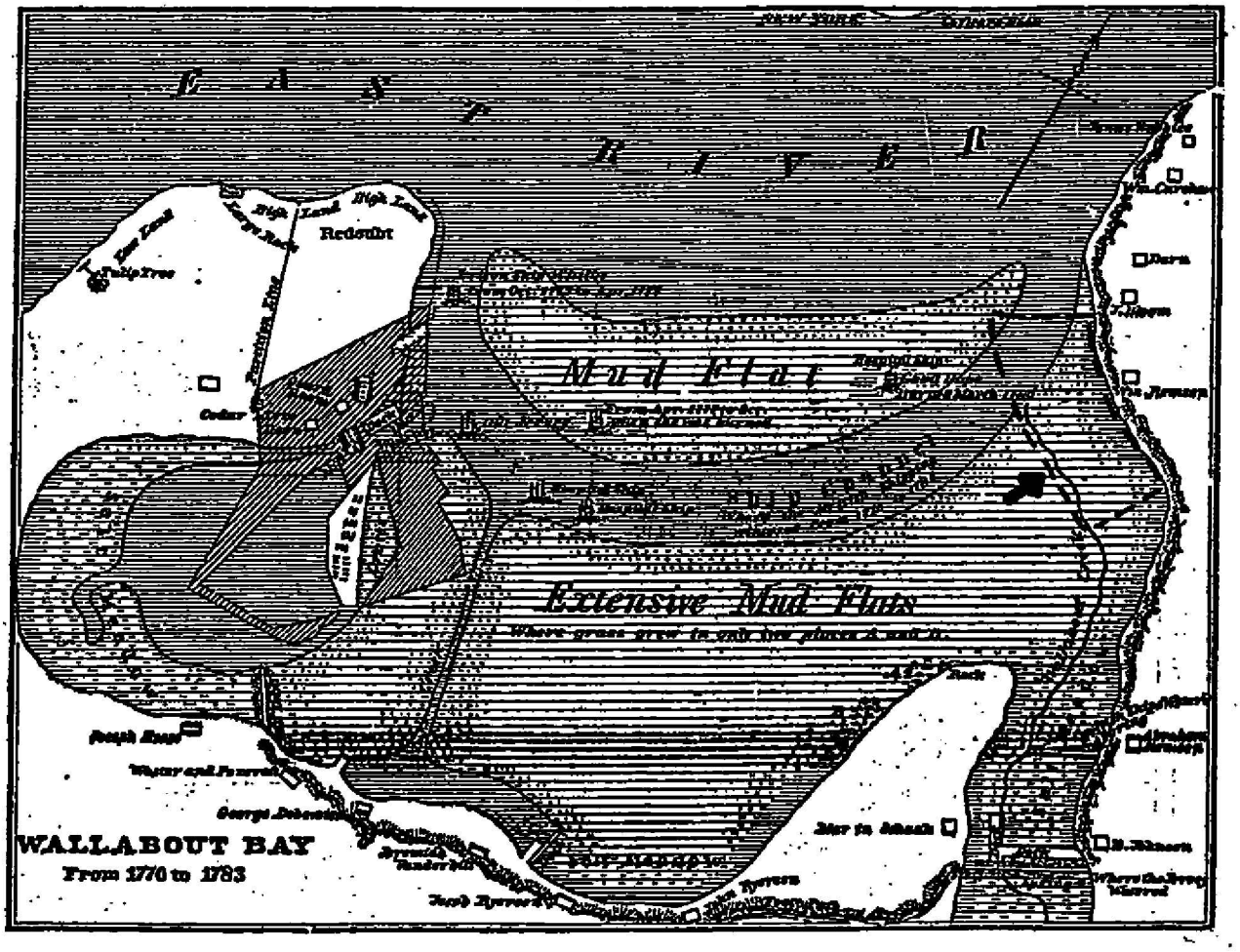



FIGURE 5. Map from Stiles (1867) of Wallabout Bay, 1776-83. The area indicated by an arrow and outlined in a dashed line is the very approximate location of today's study area. Note the locations of the various British hospital and prison ships anchored in the bay. (Reduced copy from the original prepared by Gen. Jeremiah Johnson and deposited by him in the Lyceum, U.S. Navy Yard, Brooklyn, N.Y.)

trenches in the nearest dry land. Bones were found during building excavations in the western or earliest, most intensively used sections of the navy yard. The first skeletons found were eventually memorialized in a vault in the present Fort Greene Park. As recently as 1939, skeletons were discovered in navy yard excavations and removed to the Cypress Hills National Cemetery in Brooklyn (*A Journal of Progress* ... 1951).

In 1781 John Jackson and his brothers Samuel and Treadwell bought at auction a hill and flanking shore and meadow on the western portion of the present navy yard, all originally part of the Rapelie and, later, Corenlius Remsen estate. On their newly acquired waterfront, the Jacksons constructed a small shipyard. Their first ship was the *Canton*, a merchant vessel, and in 1798 the Jacksons built a small frigate, the *Adams*, for the new United States government (West 1941).

## B. THE NAVY YARD

The Jacksons began a long era of shipbuilding in Wallabout Bay which continues today. By 1800 Secretary of the Navy Benjamin Stoddard learned of the proposed auction of the Jackson shipyard, then containing about 30 acres. On February 7, 1801 Francis Childs, an agent for the Government, purchased the shipyard and adjoining hill, comprising a total of about 42 acres, for $40,000. Sixteen days later, Childs transferred the deed to the United States, creating the New York, or, as it is more familiarly known, the Brooklyn Navy Yard (West 1941: 7). Through the nineteenth and twentieth centuries, this property became

the Navy's major shipyard, requiring large adjoining land purchases and extensive construction of facilities. Eventually, one of the most recent land purchases brought the project area into Navy Department control.

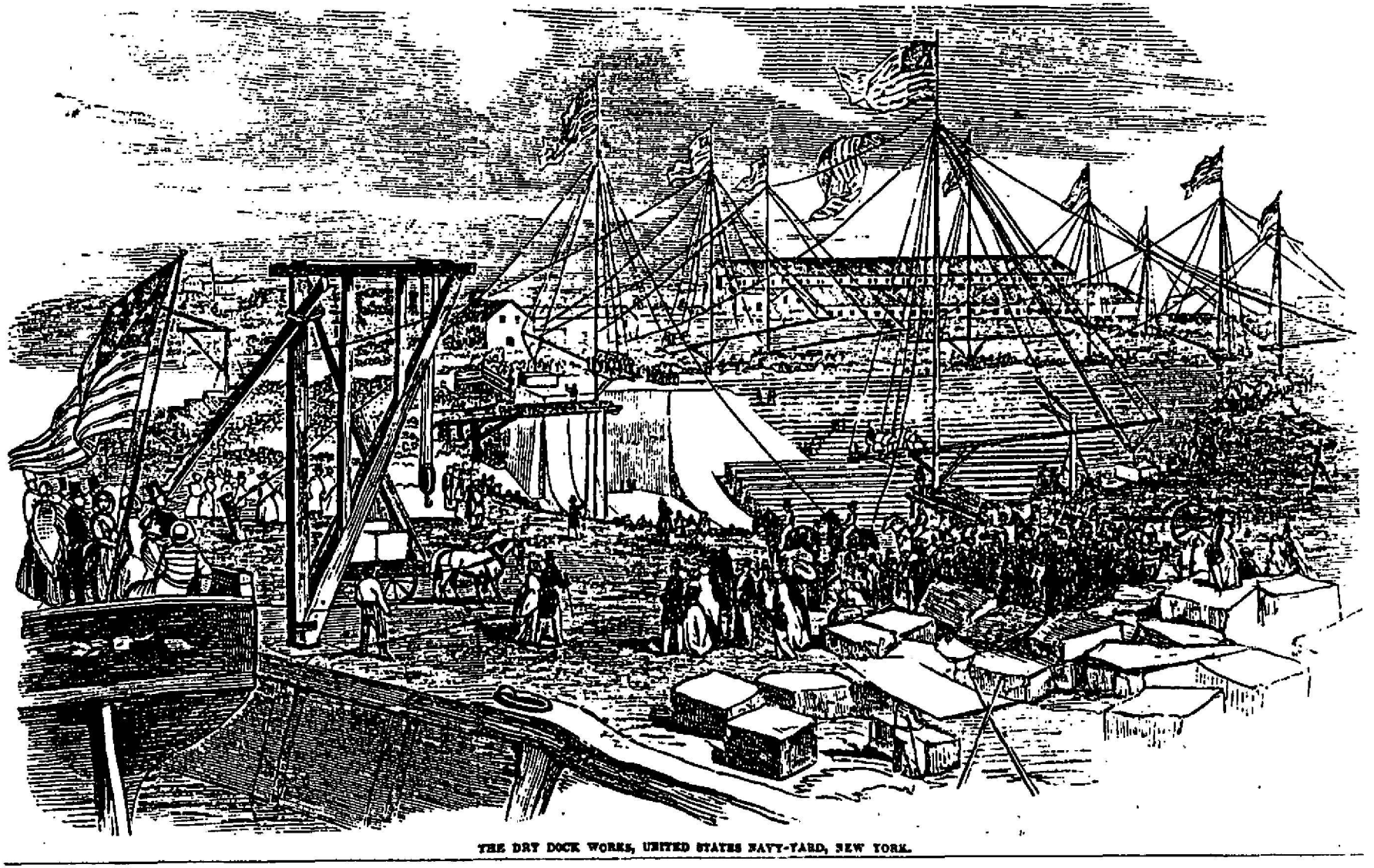
The Brooklyn Navy Yard was one of six yards established by the newly formed Department of Navy. The Brooklyn yard was not without controversy, particularly during peacetime when its use naturally lessened and its problems seemed more in evidence--land disputes, lack of waterfront and docking facilities, and construction in the bay's soft, sandy sediments. In wartime, from the Civil War through World War II, the Brooklyn Navy Yard was invaluable.

Navy ship construction began in the yard in 1817 with the 74-gun frigate *Ohio*, the largest ship built in America at that time. Other wooden sailing ships were built or fitted as warships in this yard following the War of 1812 to help protect the greatly prospering American merchant trade from piracy. During these first decades of the yard, its facilities remained relatively modest. The original Jackson shipyard had consisted of a few buildings used to house wooden boats under construction: the former millpond, in which oak beams and planking were seasoned; the abandoned mill building; and the muddy flats, on which a storage pier and a winding access road had been built (*A Journal of Progress* ... 1951). Initial Navy construction was slow, perhaps owing to the various land disputes surrounding this former mill property and the Jackson's prior use of the millpond. However, several impressive structures were built before the Civil War.

The first of these structures was the Commandant's Quarters, executed by the eminent architect Charles Bullfinch. Completed in 1806, it is still standing on the west hill of the yard (see Figure 1). At this same time, six brick buildings were constructed in the yard as offices and storehouses. Other frame buildings were also completed, such as an octagonal, three-story "round house" and two shiphouses and various sheds within which sailing vessels were constructed. These structures were all torn down and replaced when larger metal steamships replaced wooden sailing vessels in the Navy (*A Journal of Progress* ... 1951).

Other early Navy buildings of note included the Lyceum (c. 1833), an attractive brick building housing a library, reading room, and museum. A variety of public cultural events took place here, and, for several years, a bimonthly magazine was published on the premises. Of the six dry docks built in the yard over the years, the first and only dry dock which never required extensive repair is the surviving Dry Dock No. 1 (c. 1841-51). That this splendid granite and timber structure still stands attests to its superb engineering, inasmuch as it was built on the wet, unstable sandy mud of the bay (see Figure 6; *The Illustrated London News* ~~1949~~ 1849: 275-76; *A Journal of Progress* ... 1951).

The subsequent Civil War, Spanish-American War, World War I, and World War II resulted in tremendous growth of the Brooklyn Navy Yard, with intervening years of slower activity. Ships were constructed, outfitted, and repaired throughout this period, and the changes in facilities were numerous and complex. Ships built or repaired in the yard included the wooden sailing vessels *Ohio*, *Vergennes*, and *Savannah*; the sail- and steam-powered *U.S.S. Trenton*; the Civil War period steam warships *Monitor*, *Monticello*, *Oneida*, *Octorara*, and *Lexington*; the



THE DRY DOCK WORKS, UNITED STATES NAVY-YARD, NEW YORK.

FIGURE 6. Drawing of the dry docks at the U.S. Navy Yard in Brooklyn (*The Illustrated London News*, Oct. 27, 1849: 276).

6682-ton battleship *U.S.S. Maine* (c. 1888-95); the 16,000-ton battleship *U.S.S. Connecticut* (c. 1906); the battleships *Florida, New York,* and *Arizona*; the 43,200-ton battleships *South Dakota* and *Indiana*; numerous World War II destroyers, light cruisers, Coast Guard cutters, and battleships; and the aircraft carriers *U.S.S. Bennington* and, most recently (c. 1950), the *U.S.S. Oriskany* (*A Journal of Progress* ... 1951).

## C. HISTORIC DEVELOPMENT IN THE PROJECT AREA

The Brooklyn Navy Yard has been tremendously productive. Every war necessitated larger, more modern ships, which, in turn, required building and repair facilities and deeper, stronger piers and docks. Comparison of historic and contemporary maps of the Brooklyn Navy Yard shows the extensive level of landscape change in Wallabout Bay during the past 150 years. The navy yard began and remained most intensively active on the western side of Wallabout Bay; the eastern side was acquired later and in pieces by the Department of the Navy. After acquiring much of the tidal basin from the City of New York in 1810, the Navy secured 25 acres comprising the eastern hill on which the naval hospital and grounds once operated and still stand, although now empty (see Figure 7). In 1853 the City of New York sold a 36.39-acre portion of the bed of Wallabout Creek for $4,057.50 (West 1941: 10-11), a purchase which brought the Navy into close proximity to the present project area. The Navy also now owned significant water and land rights to the bay, initiating a period of substantial filling, dredging, and later pier and channel construction as the yard stretched to accommodate more and larger vessels.

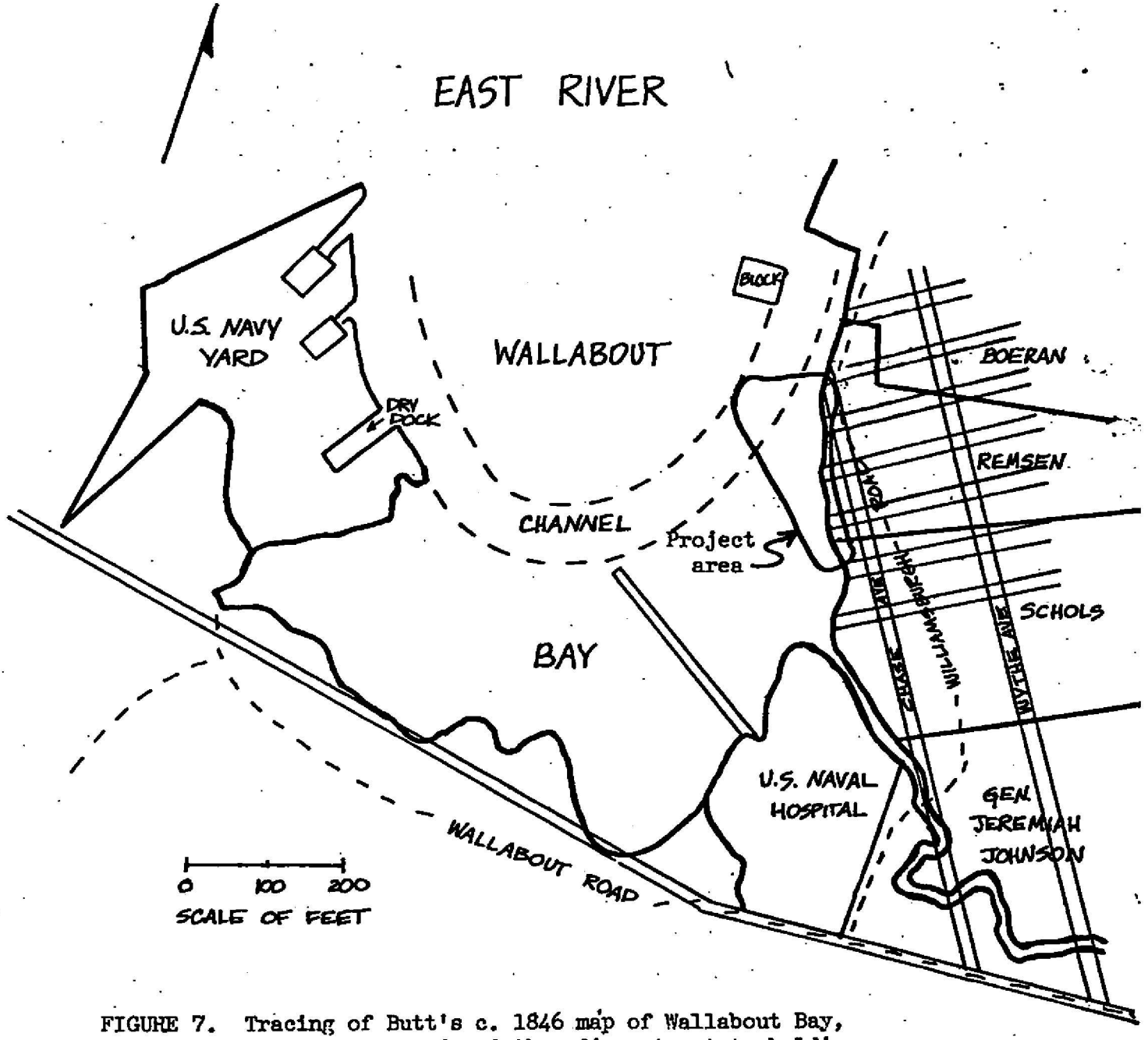



FIGURE 7. Tracing of Butt's c. 1846 map of Wallabout Bay, showing the early navy yard and the adjacent estate holdings in the vicinity of the project area (Butt 1846).

During the late nineteenth century, the present project area remained in private ownership, as did most of the eastern section of the eventual navy yard north of the naval hospital. The Navy owned the Wallabout Creek bed and flats to the west, and sometime between 1849 and 1877 the Wallabout Creek was dredged and channelized from the East River to the hospital grounds (Butt 1846; *New York and Brooklyn* 1877). From this period, the project area and adjacent lands along the east bank of the Wallabout Canal were no longer rural estates but steadily developed into important industrial properties.

By the late nineteenth century, Brooklyn was, of course, a large city placing great demands on the use of its waterfront. Between 1870 and 1900 the improved Wallabout Canal waterfront along Kent Avenue became completely developed, as manufacturing interests, coal yards, stone yards, lumber yards, and grain elevators clustered along the needed wharfage here. Figure 8 shows the navy yard and adjoining neighborhoods early in this development period. By 1893 industrial and commerical activity was extensive here along Kent Avenue in the Williamsburg section of Brooklyn (Figure 9).

Probably the first commercial activity in the eastern portion of the present Brooklyn Navy Yard was the Wallabout Market, located between Washington Avenue and the naval hospital. Begun in 1884 with a permit for market purposes granted to the City by the United States Department of the Navy, the market initially accommodated farm wagon traffic. In the 1890s, the City of Brooklyn purchased land from the Navy and developed the area into a huge marketplace, with piers for boats as well as float-landed railroad cars of the Pennsylvania and the Delaware and Lackawanna railroads (King 1974: 38).

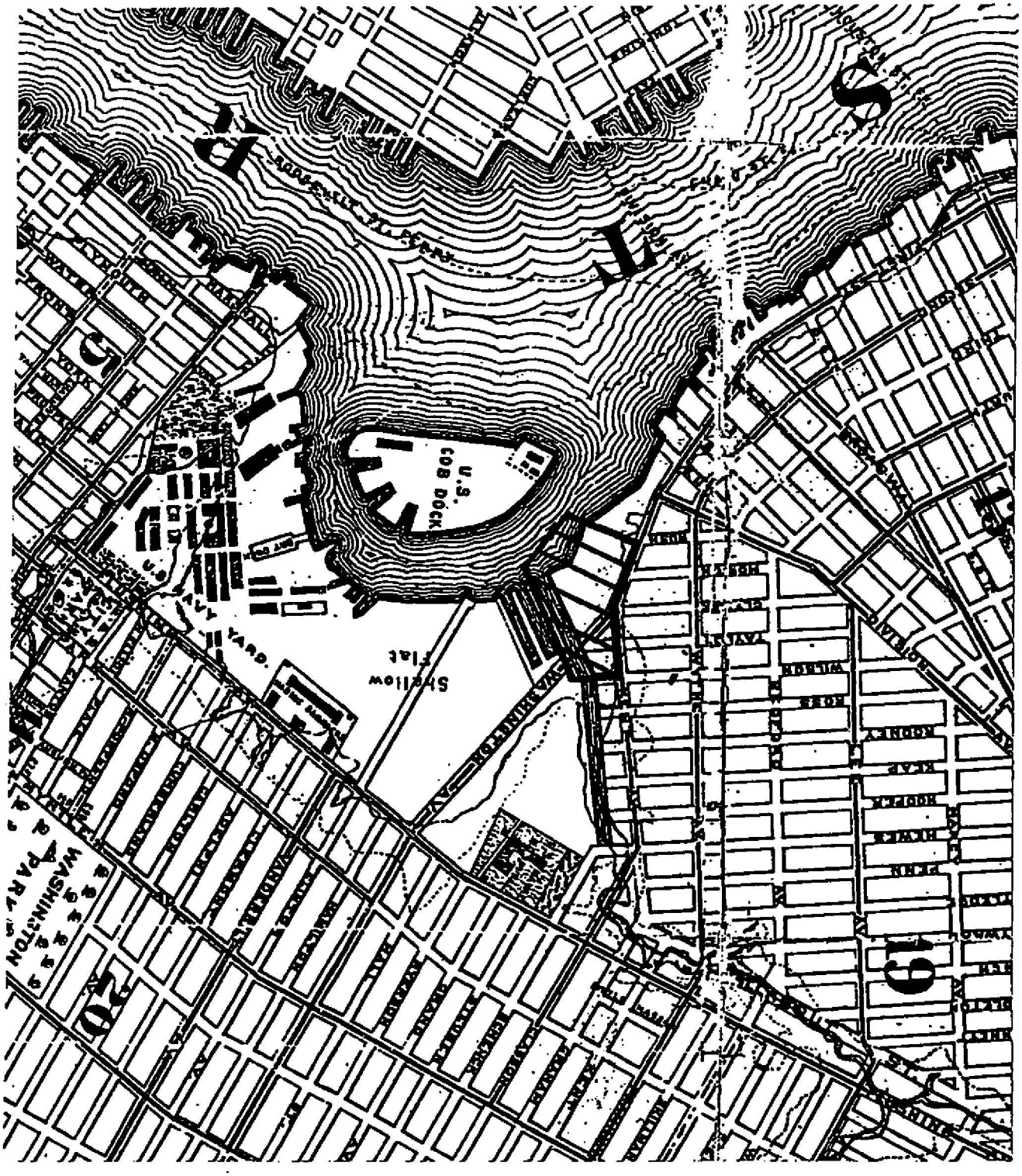



FIGURE 8. Map of Brooklyn c. 1876 showing the Brooklyn Navy Yard and the original shoreline as drawn 100 years earlier (*Map Showing the Original High and Low Ground, Salt Marsh, and Shorelines in the City of Brooklyn, 1776-77*). The approximate location of the project area is shown by cross-hatching.

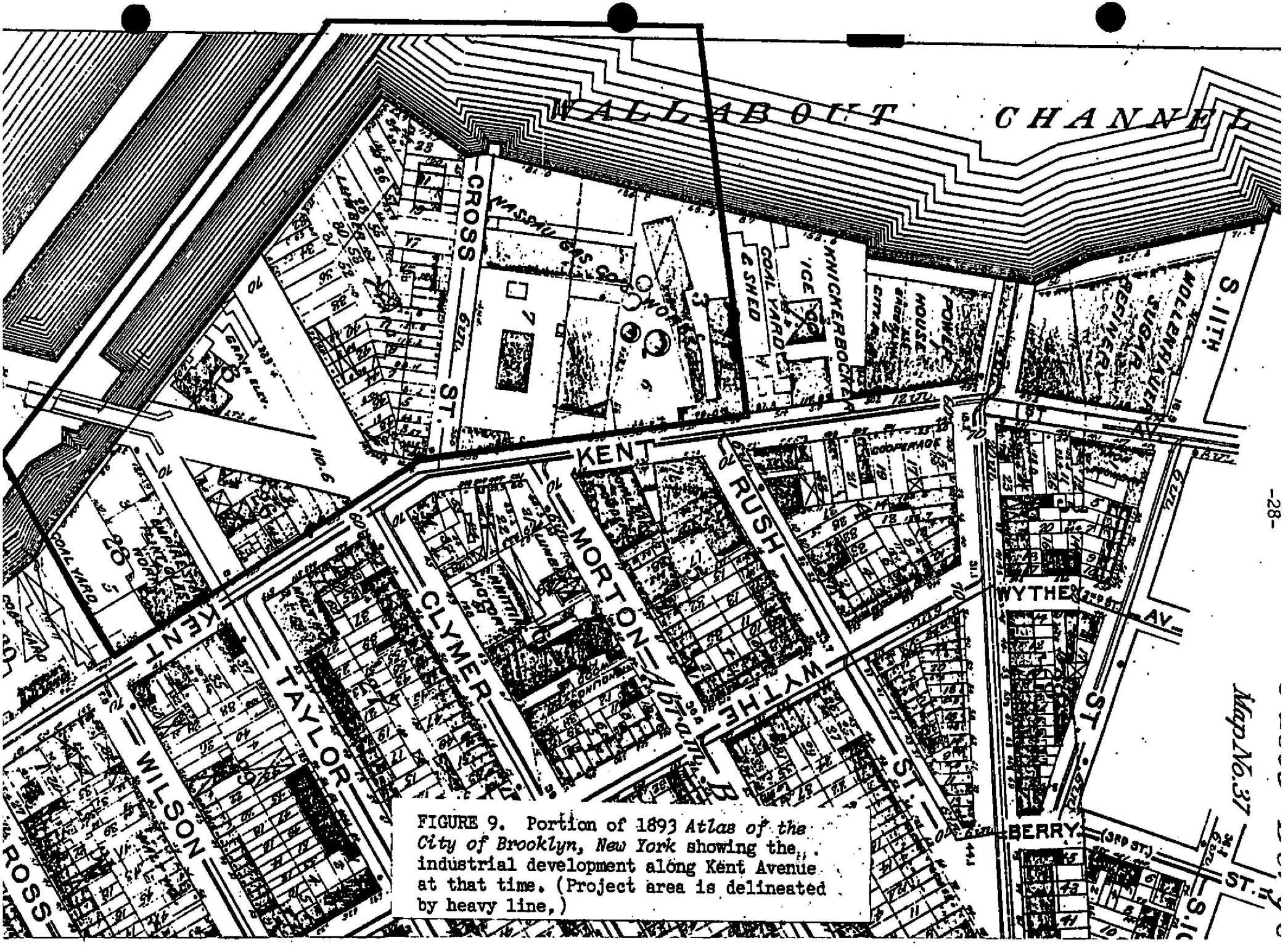



FIGURE 9. Portion of 1893 *Atlas of the City of Brooklyn, New York* showing the industrial development along Kent Avenue at that time. (Project area is delineated by heavy line.)

Fill, possibly from the dredging of the Wallabout Creek bed and nearby bay, helped create the Wallabout Market lands and lands along Kent Avenue where industry came to cover the former farms and meadows of the Remsen and related family estates. As shown in Figure 9, late nineteenth-century activity in the project area included the Nassau Gas Company Works, the lumber yard of Cross, Austin & Company, grain elevators, and the Empire State Flint Glass Works (Robinson and Pidgeon 1886: Plate 9). Of these activities, Stiles reports on the lumber yard and the glass works (Stiles 1884: 644, 759-60). Cross, Austin & Company were said to have one of the largest retail yards in the country for this period. The Empire State Flint Glass Works, owned by Francis Thill and employing 160 persons at its peak, made all types of flint and colored glassware by melting powdered quartz (flint), refined potash or soda, and red lead.

Operation of these yards and industries led to improvements in the Wallabout Creek (now Canal) bed for barges and ships. The navy yard was very active on the west side of Wallabout Canal, dredging, filling, and adding various improvements to its dry docks, buildings, wharfage, and piers. Between 1903 and 1916, pier construction and associated dredging and filling gave the Wallabout Basin a new appearance (Figure 10; West 1941: 68-69).

World War II provided the impetus for the Brooklyn Navy Yard to transform itself for building more and bigger warships. Figure 10 shows the extensive changes made at this time in the eastern portion of the yard, including new piers, new dry docks, and the filling in of the upper or southern section of Wallabout Canal. Between 1941 and 1943, the yard extended to Kent Avenue, emcompassing the former private

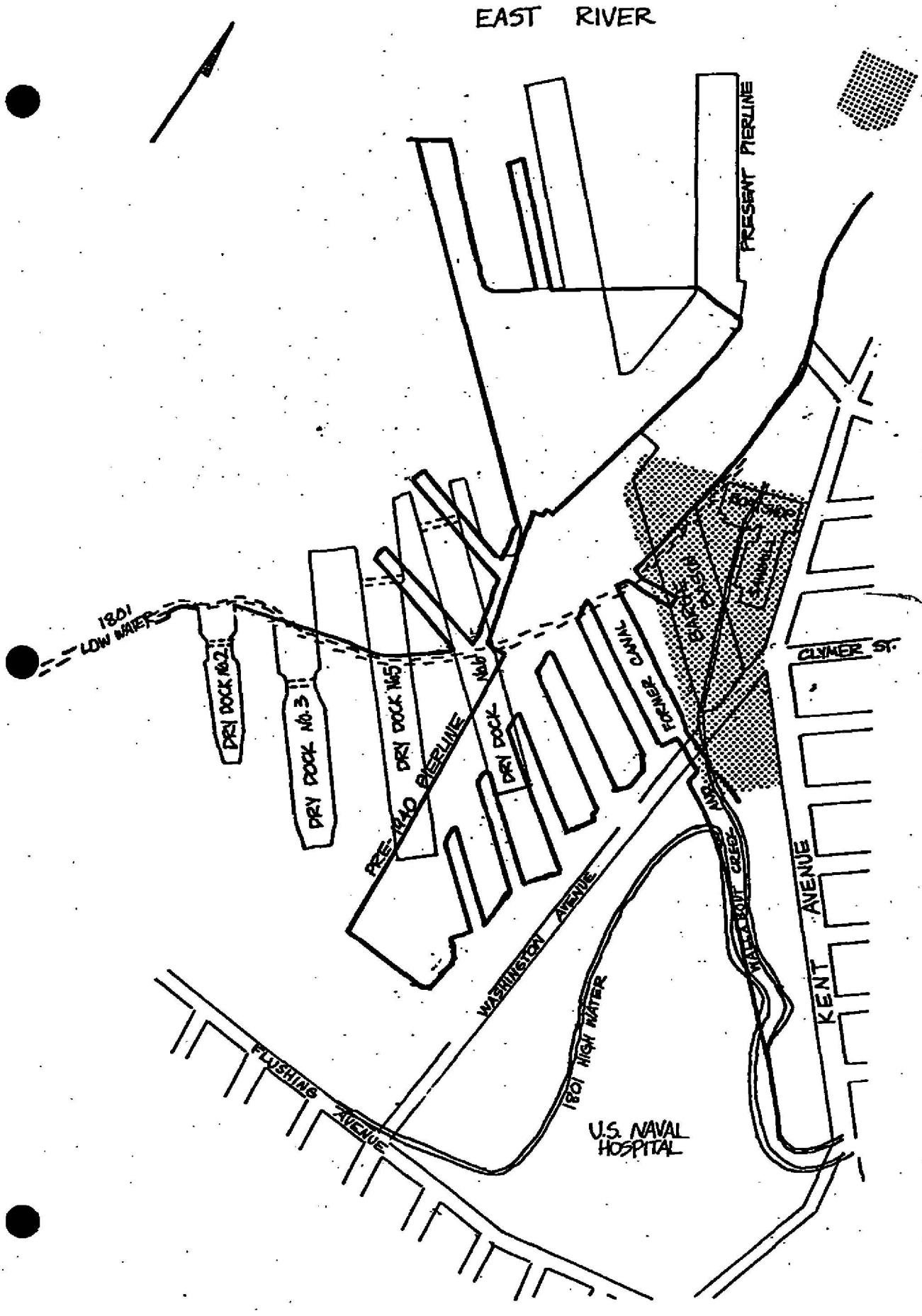



FIGURE 10. Map illustrating the changing shoreline of the project area near Kent Avenue. Shown is the project area's relation to the approximate high and low water lines (1801) as well as two phases of navy yard pier and channel construction. Note former position of boat shop and sawmill structure (Dry Dock Engineers 1943; King and Gavaris 1958).

industries and yards located in the project area (Dry Dock Engineers 1943). Most of the present project area was occupied by the sawmill and boat shop, which accommodated the limited woodworking and small craft assembly required by the modern Navy with its steel and iron ships. Activity within the Brooklyn Navy Yard peaked during World War II, when employment topped 70,000.

By 1966 the Brooklyn Navy Yard was officially closed for various reasons after 165 years of service (*The New York Times* 1968). In it, work had been done on Fulton's steamboat; iron cladding had been applied to the *Monitor*; and scores of keels had been laid and ships completed for the United States Navy. Today, shipbuilding and repair, as well as industrial activity, continue on a minor scale, under the guidance of a city-owned industrial development group, the Commerce, Labor, and Industry Corporation of the County of Kings (CLICK).

## V. INFIELD SURVEY

### A. FIELD REPORT

The Brooklyn Navy Yard Kent Avenue Site has undergone dramatic landscape changes since the mid-nineteenth century, as evidenced by cartographic and infield research. Department of Navy activity in the project area since the 1940s extension of the naval yard to Kent Avenue has greatly influenced the surface characteristics of the site and obscured all potential industrial, Colonial, or prehistoric era archeological remains which may exist buried here. This activity has left the entire site, except the Wallabout Channel, covered by

an average of 10 feet of mixed sandy fill topped by the macadam and concrete surface of the once busy naval yard (King and Gavaris 1958).

As is evident in Plates 1, 2, and 3, the site consists of smooth, level land contours created by uniform filling onto the original marsh and shoreline. The eastern boundary of the project area (right side of Plate 1) is the Kent Avenue right-of-way, situated atop the original tidal marsh shoreline. Figure 4 shows that the shoreline, or edge of tidal influence, ran generally along the present right-of-way of Kent Avenue here. Most of the terrain of the project area was, therefore, historically influenced by tides, with two exceptions. First, pre-industrial farmsteads and estates abutting Wallabout Bay could have included original dry land at the eastern edge of the project area. Second, late nineteenth-century filling west of Kent Avenue created land that was quickly developed by industry and later by the navy yard. Both the industrial buildings and the navy yard structures here were demolished long ago. Indeed, the surrounding neighborhood is now dominated by empty lots and abandoned or semi-abandoned industrial buildings located north and east on Kent Avenue.

A large portion of the project area is the Wallabout Channel. At least two dredging operations, and probably many more, have transformed the original Wallabout Creek bed into first the industrial Wallabout Canal and then the present naval yard Wallabout Channel. Dredging, filling, and pier/wharf construction west of and including Wallabout Channel have been extensive and intensive, as industrial and naval navigation needs changed. Archeological cultural remains in this portion of the project area are not likely, since post-1940 navy yard construction greatly altered the previous terrain.

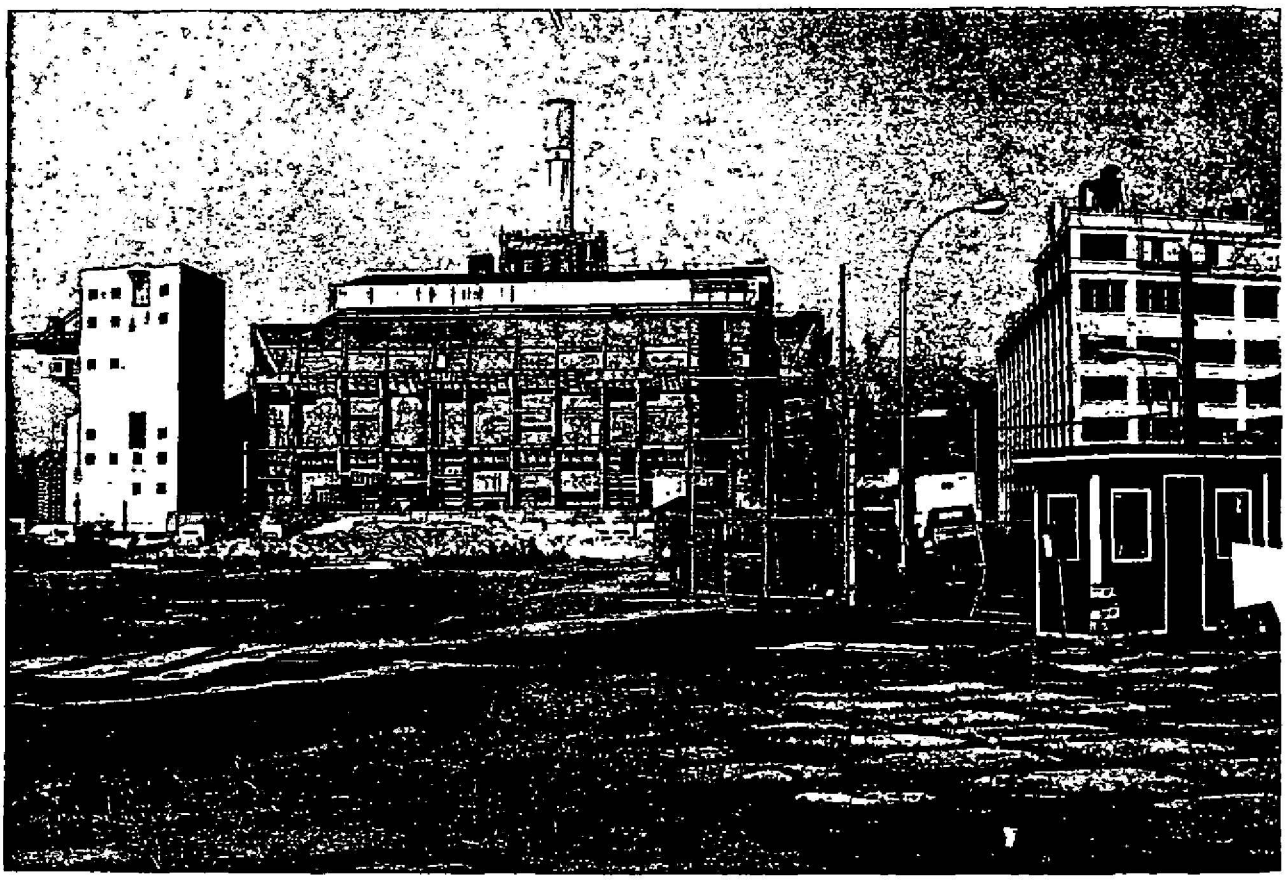


PLATE 1. East side of the project area, looking northeast. Kent Avenue is on the right; the project area occupies the empty lot on the left (west) side of the avenue. Note that Kent Avenue marks the approximate original shoreline. (David Church, photographer, 1981.)

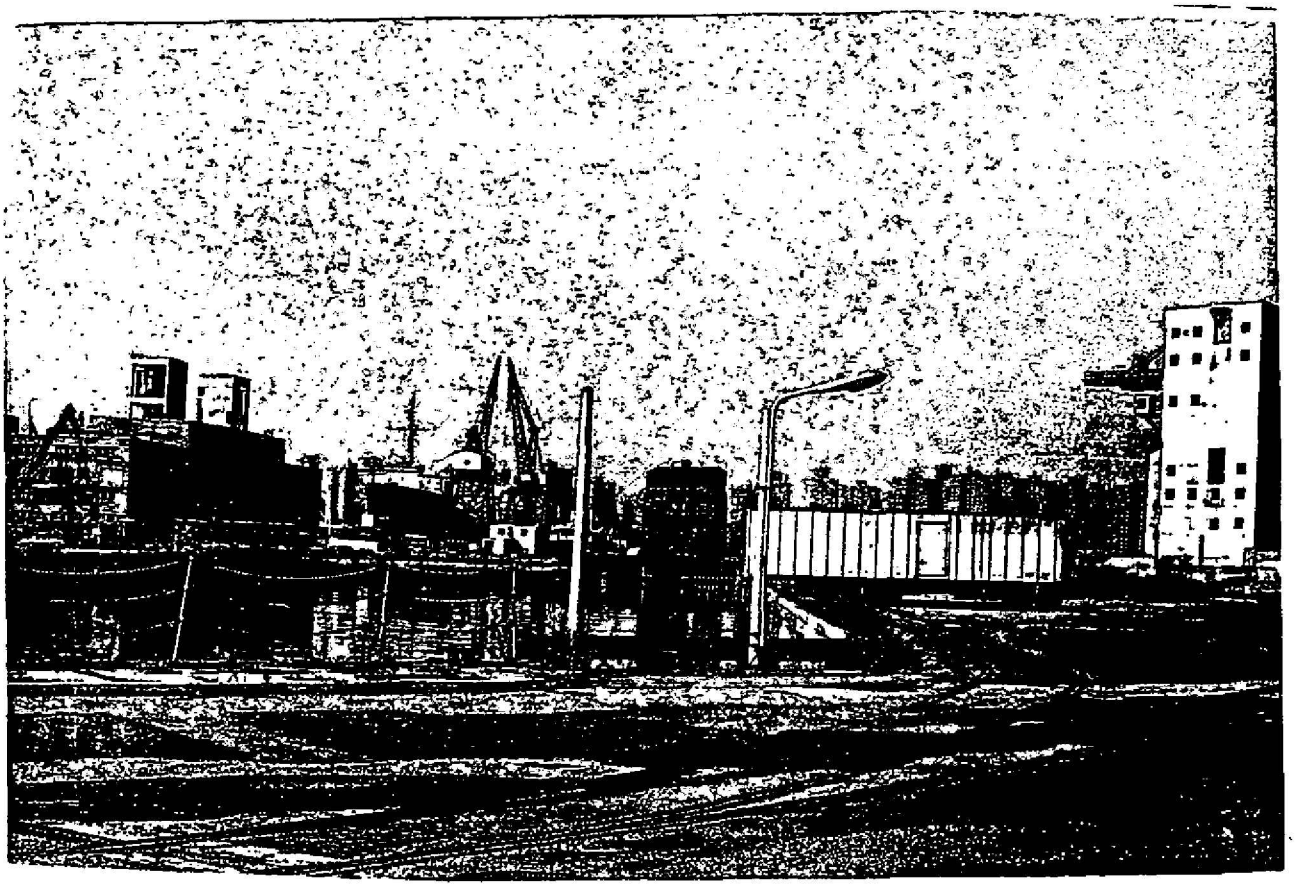


PLATE 2. View of east side of Wallabout Channel, taken immediately west of Plate 1. Note the empty, macadam-covered terrain around the channel as well as the transfer bridge in the center distance. (David Church, photographer, 1981.)

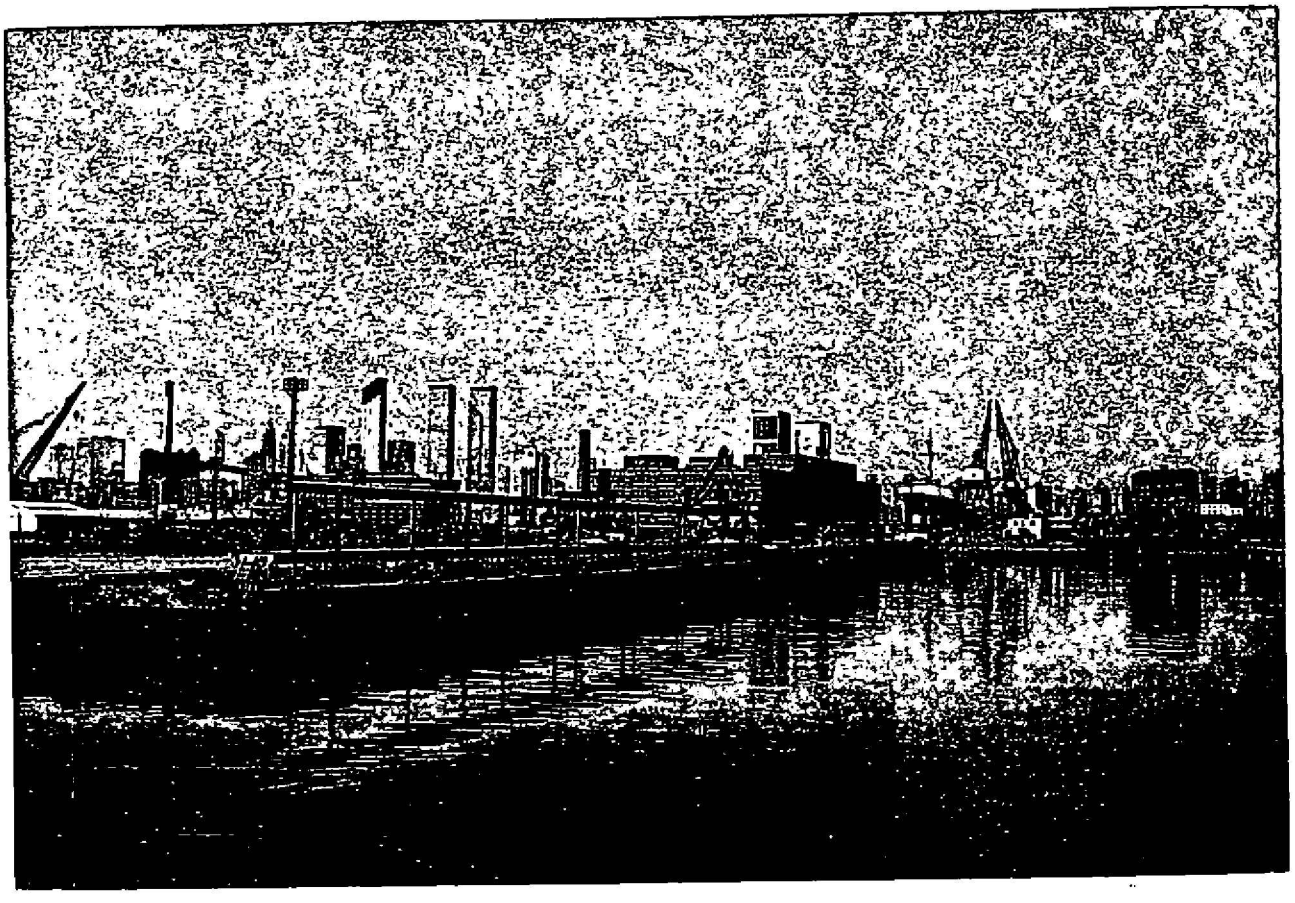


PLATE 3. View of the west side of Wallabout Channel, taken immediately to the west of the view in Plate 2. Note the empty terrain bordering the west side of the Channel. The transfer bridge is in the background at the right, and barges are docked in the channel at the left. (David Church, photographer, 1981.)

Similarly, the terrain east of Wallabout Channel has been greatly disturbed by post-1940 naval activities, which included the construction and eventual demolition of a large sawmill/boat shop building. However, along the eastern margin of the project area bordering Kent Avenue, fill may have provided a protective cover for potential prehistoric as well as historic archeological remains associated with activity along the original shoreline. The existence of such remains is highly problematical and would require machine-assisted testing close to Kent Avenue in locations where previously completed soil borings indicate the presence of a relatively thin mantle of fill over potential artifact-bearing silts and sands.

Although documentary evidence shows the original shoreline cutting through the eastern portion of the project area, evidence of prehistoric and historic activity at this shore, other than post-1880 industrial activity, is not available. Remains associated with the industrial activity may have been extensively removed by later navy yard construction inasmuch as both these activities occupied the same filled terrain. Only subsurface testing can verify the potential for cultural remains in this project area. The greatest potential for undisturbed, significant remains is indicated for the area close to present Kent Avenue.

## B. ABOVE-GROUND STRUCTURES

Evaluation of all possible effects, both direct and indirect, of the proposed undertaking on above-ground structures at the Brooklyn Navy Yard involves the analysis of the yard both as a district, with historical;

architectural, industrial, archeological, and navigation-transportation significance, and as additional individual buildings, structures, objects, and sites with similar significances. Although the New York City Landmarks Preservation Commission has not evaluated the Brooklyn Navy Yard as a district, three individual properties within the yard, but not in the present project area, are listed on the National Register of Historic Places: (1) the Commandant's House; (2) Dry Dock No. 1; and (3) the naval hospital (see Figure 1).

Within the study area proper, no buildings or structures are hereby evaluated to be of cultural significance. [The transfer bridge, adjacent to the project area, is discussed in the following section, where it is evaluated as significant (see Plate 4).] The brick electrical substation (post-1940), situated at the southern edge of the project area (see Figure 2, Building 419), has no architectural integrity.

## C. TRANSFER BRIDGES

The metropolitan area's railroad companies generally transferred freight across the region's unbridgeable bodies of water by two methods. In the first method, the freight was broken down from railroad cars to barges, scows, or ships, usually on a pier which was sometimes covered. In the second, the railroad cars were transported directly onto car floats, which required short bridges to make the transition from the bulkhead to the boat. By the turn of the century, the car float method was dominant in and around the New York Upper Bay (Droege 1912: 224).

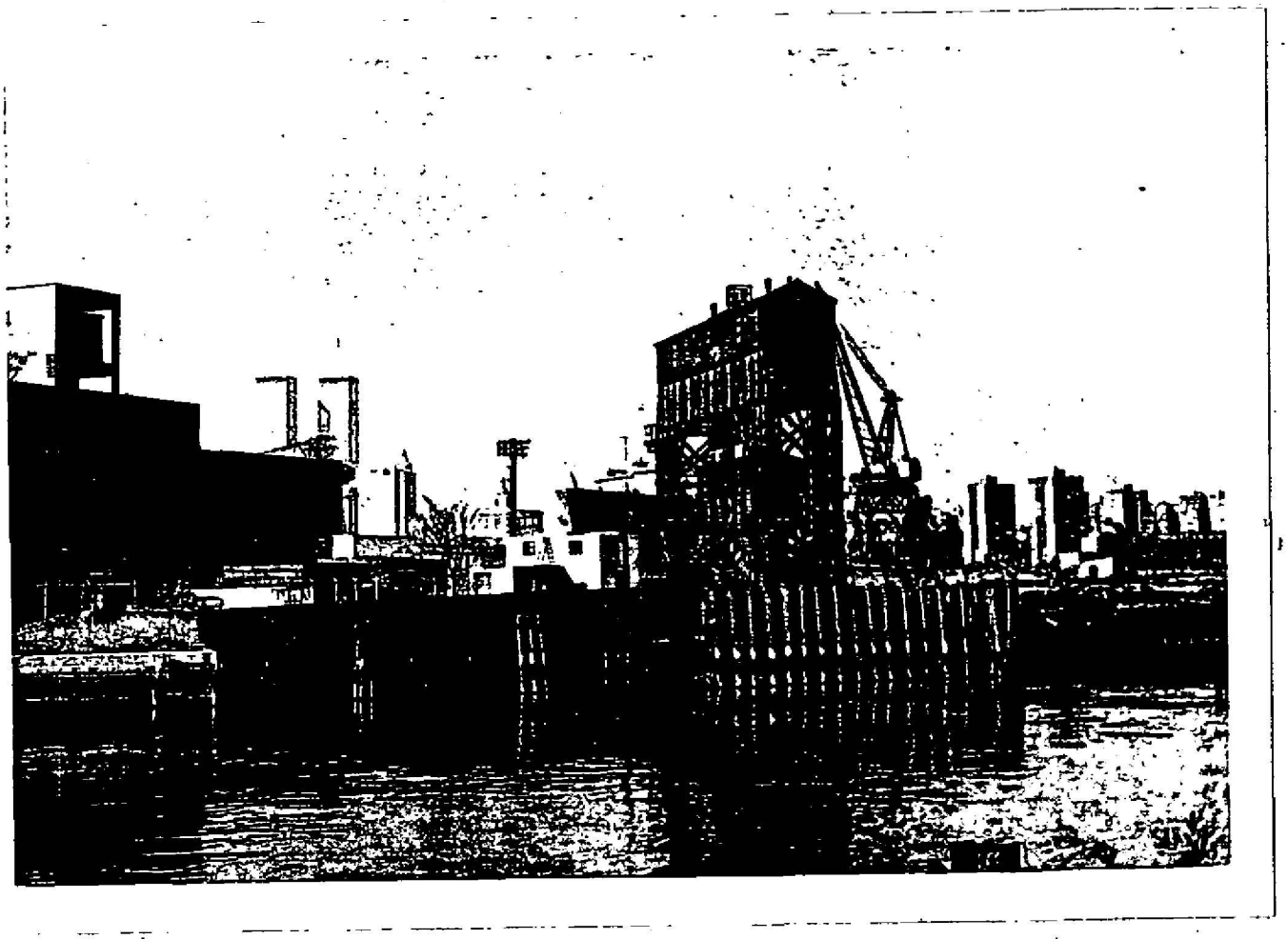


PLATE 4. View of the transfer bridge situated on Wallabout Channel on the northern boundary of the project area. (David Church, photographer, 1981.)

Generally, the transfer bridge process is very similar to an end-loading ferry boat bridge. The major difference is in the great weight of railroad cars versus the relatively lighter weight of the pedestrians and vehicles carried by the ferry boat. A transfer bridge can be as simply built, hinged at the bulkhead and floating at the other end on a pontoon that adjusted to the changing elevation of the barge in the tide. A problem with this design was that the bridge was at the mercy of the tide. To correct this problem, designers allowed the harbor end of the twentieth-century transfer bridge to be suspended in a gallows frame, in which turntables and shafting connected to a walking beam that was counterweighted. Typical car floats accommodated 12 cars, 6 each on either side.

The Pennsylvania Railroad brought transfer bridge technology to its zenith with its units constructed at the Greenville Yard at Jersey City, New Jersey. This yard, built on marsh, was filled and graded between 1900 and 1904. From 1901 to 1906, the company built probably the greatest single complex of yard and terminal facilities for the exclusive handling of freight in the harbor area (Condit 1980: 167). When completed, car floats were transported from Jersey City to Bay Ridge, Brooklyn. By avoiding the East and Hudson rivers, the Pennsylvania was far ahead of all other railroads in freight hauling in and around New York.

In connection with this yard were a group of transfer bridges which were mechanically powered. Machinery sheds spanned across the gallows frame. The advantage here was the ability to lift the bridges

at rapid speed, even when they were fully loaded with cars. These original bridges first had wooden trussed bridges. The New York, New Haven, and Hartford Railroad modified the same design using steel plate girders in 1909 when it built transfer bridges at the Oak Point Yard on the East River (*Engineering News* 1911: 771). By the second decade of the twentieth century, this design became the standard transfer bridge type on the New York Bay.

The transfer bridge adjoining the study area is therefore a typical example of what was a very widespread New York Harbor shore facility, one which played an important role in the moving of fuel, raw materials, and products across the extensive waterways of the metropolitan New York area. The railroad routes connecting this eastern harbor and region with the western hinterland ended at the harbor, where a fleet of railroad ferries, barges, and tugs moved materials to sidings at industrial locations. This traffic was so extensive that the fleet was called the "railroad's navy," and its specialized service was a unique historical phenomenon.

The Wallabout Bay transfer bridge under consideration was probably built just after 1910 when the aforementioned prototype for this style of structure was erected. Thus, it is an extant example of what was, but is no longer, commonplace. For this reason, we evaluate the structure as having the potential of being a significant cultural resource, a conclusion discussed fully in Part VI, Conclusions and Recommendations, which follows..

## VI. CONCLUSIONS AND RECOMMENDATIONS

The present survey has identified two areas of sensitivity for potentially significant cultural resources that may be impacted by the proposed construction of the resources recovery facility site. In each case, a further cultural resource recognition procedure is herewith recommended.

The first potentially significant cultural resource is the existing railroad car transfer bridge. This structure is on the property immediately adjoining the study area, and its railroad spur crosses the study area. During the survey, Mr. Kurt Velsor of Camp, Dresser & McKee told us that this structure would be razed. Mr. Frank Bruno of CLICK said that to the contrary the transfer bridge was to be restored and used to bring coal into the navy yard. Regardless of this difference of opinion, we evaluate the transfer bridge to have the potential to meet criterion D of the National Register of Historic Places. Such railroad transfer bridges were once a very common type of shoreline facility in New York Harbor. Today, only one such set of bridges is in operation, between Greenville in Jersey City and Brooklyn. Our firm was asked to consult with the U.S. Army Corps of Engineers concerning the transfer bridges in Greenville, and there was concurrence between the Army Corps and the New Jersey State Historic Preservation Officer that those transfer bridges were potentially eligible for inclusion on the National Register of Historic Places, based on their significance under criterion D. This criterion allows that the site in question contains a significant amount of information and thus makes a valuable contribution to local and state history. It is therefore

our recommendation that if the transfer bridge is to be razed or otherwise negatively affected by the proposed construction, further cultural resources work should be undertaken in conjunction with 106 review procedures as prescribed by the New York State Historic Preservation Officer and the U.S. National Park Service, Office of Historic Preservation.

The second area of potential significance is the portion of the study area in which the original historic shoreline lies. This zone, on the eastern margin of the project area, has the potential for containing the buried strata of prehistoric, Colonial, and nineteenth-century development, which our documentary research has revealed to have once occupied this area along the shore of Wallabout Bay. We recommend that an infield testing program be undertaken which would break through the macadam parking lot surface covering this zone today, and that an examination of the subsurface remains be made. From such a sample an evaluation of significance can be made. Depending on the results of this examination, additional cultural resources protection procedures may or may not be necessary.

# VI. BIBLIOGRAPHY

## A. WORKS CITED


*A Journal of Progress, Through a Century and a Half of Service to the Fleet*

1951 The 150th Anniversary Committee of the Brooklyn Navy Yard, Brooklyn, N.Y.

Bolton, Reginald Pelham

1920 New York City in Indian Possession. In *Indian Notes and Monographs*, Vol. 2, No. 7, Museum of the American Indian, Heye Foundation, New York.

Ceci, Lynn

1977 The Effect of European Contact and Trade on the Settlement Pattern of Indians in Coastal New York, 1524-1665: The Archeological and Documentary Evidence. Ph.D. dissertation, City University of New York.

Condit, Carl W.

1980 *The Port of New York.* The University of Chicago Press, Chicago.

Droege, John A.

1912 *Freight Terminals and Trains.* McGraw-Hill Book Company, New York.

Dry Dock Engineers

1943 *Report on Subsoil Conditions in Area of 1941-1943 Extension of U.S. Navy Yard, Brooklyn, N.Y.* New York.

*Engineering News*

1911 The 69th Street Car Transfer Bridge of the New York Central & Hudson River Railroad. Vol. 66, No. 26, pp. 770-74. Dec. 28.

Flint, Martha B.

1896 *Early Long Island.* Republished in 1967 by Ira J. Friedman, Inc., Port Washington, N.Y.

Fuller, Myron L.

1914 *The Geology of Long Island, New York.* Dept. of the Interior, U.S. Geological Survey, Professional Paper 82.

King, Moses

1974 *King's Views of New York, 1896-1915 and Brooklyn, 1905.* Benjamin Blom, New York.

King and Gavaris, Consulting Engineers

1958 *Analytical Soil History Brochure, New York Naval Shipyard, Brooklyn, New York.* New York.

Lopez, Julius, and Stanley Wisniewski

1971 The Ryders Pond Site, Kings County, New York. *Bulletin,* New York State Archaeological Association, No. 53, pp. 1-21.

Ritchie, William A.

1965 *The Archaeology of New York State.* The Natural History Press, Garden City, N.Y.

Ritchie, William A., and Robert Funk

1973 *Aboriginal Settlement Patterns in the Northeast.* New York State Museum and Science Service, Memoir 20, Albany, N.Y.

Salwen, Bert

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

Schuberth, Christopher J.

1968 *The Geology of New York City and Environs.* The Natural History Press, Garden City, New York.

Smith, Carlyle S.

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

Stiles, Henry Reed

1867 *A History of the City of Brooklyn,* Vol. 1. Brooklyn, N.Y.

1884 *The Civil, Political, Professional and Ecclesiastical History and Commercial and Industrial Record of the County of Kings and the City of Brooklyn from 1683 to 1884.* W.W. Munsell and Company, New York.

*The Illustrated London News*

1849 New Dry Dock at the United States Navy Yard. Page 276. Oct. 27.

*The New York Times*

1968 $25-Million Price on Navy Yard Agreed To by City. Apr. 19.

West, James H.

1941 *A Short History of the New York Navy Yard.*

Wood, Silas

1824 A Sketch of the First Settlement of the Several Towns on Long Island with Their Political Condition to the End of the American Revolution. *Historic Chronicles of New Amsterdam, Colonial New York, and Early Long Island,* ed. by Cornell Jaray, Ira J. Friedman, Inc., Port Washington, New York, 1968.

## B. MAPS CITED

*Atlas of the City of Brooklyn, New York*

1893 G.W. Bromley & Company, Philadelphia.

Butt, Richard

1846 *Map of the City of Brooklyn and the Village of Williamsburgh.* Benjamin S. Demarest, New York.

*Map Showing the Original High and Low Ground, Salt Marsh, and Shorelines in the City of Brooklyn, 1776-77*

1875-76 From original government surveys prepared to accompany the 1875-76 Report of the Board of Health.

*New York and Brooklyn*

1877 Map on file at the Brooklyn Public Library.

Robinson, Elisha, and R.H. Pidgeon

1886 *Atlas of the City of Brooklyn.*

## C. WORKS CONSULTED

*Brooklyn: Photographics in Black*

c. 1891 On file at the Brooklyn Public Library.

*Industries and Wealth of Brooklyn*

1890 On file at the Brooklyn Public Library.

Law, George Theodore

1867-77 *Business Directory for the City of Brooklyn.*

Munsell, W.W.

1884 *History of Kings County, 1683-1883.* Two vols.

Onderdonk, Henry

1849 *Revolutionary Incidents of Suffolk and Kings Counties.* Leavitt & Company, New York.

*Scientific American*

1900 New York Navy Yard, Brooklyn. Vols. 82-83, pp. 137-39.

Solecki, Ralph S.

1976 Addendum to Archeological Surveys, Imlay and Conover Streets (Contract 2A) in the Red Hook Section, Brooklyn, N.Y.

1977A Stage I Archeological Survey, Fulton Street, Atlantic Avenue, Furman Street, and Joralemon Street, Main and Plymouth Streets, Contract IA, Red Hook Water Pollution Control Project, Brooklyn, N.Y.

1977B Stage I Archeological Survey, Nevins Street, Contract 3F, Red Hook Water Pollution Control Project, Brooklyn, N.Y.

1981 Stage II Archeological Survey. The Archeology and History of Lower Fulton and Joralemon Streets, Brooklyn, N.Y. WP 152, Red Hook Water Pollution Control Project, Contract IA.

*The New York Naval Shipyard Worker*

1941-64 Vols. 1-23.

Thompson, Benjamin F.

1918 *History of Long Island.* Ira J. Friedman, Inc., Port Washington, N.Y. Reprinted 1962.

Toomer, William W.

1962 *Indian Place Names on Long Island.* Ira J. Friedman, Inc., Port Washington, N.Y.

Whitten, G.E.

1867 *Whitten's Business Directory of the City of Brooklyn.* Brooklyn, N.Y.

Wilcox, Julius

1892 *Photographs of New York and Brooklyn.*

Wissler, Clary

1909 The Indians of Greater New York and the Lower Hudson. Anthropological Papers of the American Museum of Natural History, Vol. 3. New York.

Younger, William Lee

1978 *Old Brooklyn in Early Photographs, 1865-1929.* The Long Island Historical Society and Dover Publications, New York.

## D. MAPS CONSULTED

Beers, F.W.

1873 *Atlas of Long Island, N.Y.*

Fulton, Henry

1874 *Farm Line Map of the City of Brooklyn.*

*Map of the City of Brooklyn*

1893 Published for the Brooklyn Directory by Lain & Healy, Brooklyn, N.Y.

*Map of the United States Naval Property, Brooklyn, N.Y.*

1849 Surveyed by William Day.