

REBUILD BY DESIGN RESIST & DELAY & STORE & DISCHARGE

Hoboken

Weehawken

Jersey City

New Jersey

CULTURAL RESOURCES TECHNICAL ENVIRONMENTAL STUDY

VOL.1 (TEXT, FIGURES, PHOTO PLATES)

EXECUTIVE SUMMARY

The United States Department of Housing and Urban Design (HUD) has awarded \$230 million to the State of New Jersey for the "Hudson River Project: Resist, Delay, Store, Discharge" (the Project). This comprehensive urban water strategy was developed for the Hoboken, Jersey City and Weehawken area and includes hard infrastructure and soft landscape for coastal defense (Resist), policy recommendations, guidelines and urban infrastructure to slow storm water runoff (Delay), green and grey infrastructure improvements to allow for greater storage of excess rainwater (Store), and water pumps and alternative routes to support drainage (Discharge).

This Cultural Resources Technical Environmental Study (TES) evaluated the potential for the proposed flood reduction improvements as part of the RBD project and Project activities to impact cultural resources. The TES consists of a Phase IA Archaeological Assessment and a Historic Architectural Eligibility and Effects Survey of the Project's Area of Potential Effect (APE).

The four aspects of the Project (Resist, Delay, Store, and Discharge) can be divided into two categories - 1) Resist and 2) Delay, Store, Discharge (DSD) given their location within the Study Area. The Resist portion will generally be located along or near the waterfront. The DSD portions of the Project will be distributed throughout the interior of the Study Area. Given that the Project's Environmental Impact Statement (EIS) will evaluate three build alternatives, along with a no build alternative, to arrive at the Project's Preferred Alternative, the TES also evaluates each of the three alternatives along with DSD elements.

The TES completed background research to identify previously documented historic properties and field investigations were performed to evaluate the potential of the APE to contain previously unidentified historic properties and to evaluate the potential of the Project to impact known historic properties. Contextual overviews of prehistoric and historic resources were also prepared to establish a baseline upon which the significance of potentially important historic properties within the APE can be evaluated.

The archaeological assessment has determined that each of the three alternative alignments have the potential to impact historic archaeological resources. These historic resources include landfill and railroad related development, including features associated with the Erie-Lackawanna Terminal, the Long Slip Canal, and the PATH Tunnel along the southern portion of the alternatives, late-nineteenth to early-twentieth century elevated rail line remains along the southern portion of the alternatives, deposits associated with the development and expansion of the waterfront, including industrial development and the transatlantic shipping and passenger lines, along the eastern portion of the alternatives, and the potential for seventeenth through early-twentieth century shipwrecks within Weehawken Cove.

Portions of each alternative exhibit sensitivity for historic sewer deposits along Observer Highway, Washington Street, Newark Street, 3rd Street, and 14th Street; Alternatives 2 and 3 are sensitive for early-nineteenth century historic seawall deposits in the vicinity of Hudson, Washington, 13th and 15th streets. The southern portions of the alternatives are sensitive for late-nineteenth to mid to late-twentieth century resources associated with industrial and railroad-related development including industrial buildings associated with the meat packing industry in Hoboken. Portions of Alternative 1 along the waterfront were also found to have the potential for mid-nineteenth century residential deposits associated with mapped historic structures. Portions of Alternatives 2 and 3 possess historic archaeological sensitivity for mid-nineteenth century structures along Washington Street near 13th Street, in the alleyway between Washington and Garden streets, and along River Street between 1st and 3rd streets; the far northern extent of Alternative 3 was similarly considered sensitive for historic deposits associated with two mid to late-nineteenth century Tietjen & Lang Dry Docks and the Erie Freight Terminal in Weehawken. As the depth of disturbance associated with the resist elements is assumed to extend to bedrock, any potential extant historic deposits would be impacted by the resist structures.

Portions of each alternative have the potential for buried prehistoric deposits. In particular, the area around Weehawken Cove and areas to its north and the vicinity of Option 2 within each alternative were found to have the potential for cultural-bearing prehistoric deposits at depths generally below 10 to 15 feet from the surface. Given the limit of disturbance associated within the resist elements, there is a high likelihood that any extant prehistoric deposits would be affected by the proposed Project.

Of the approximately 61 individual DSD sites, only five sites do not present archaeological sensitivity. A total of 42 of the individual tank sites possess potential prehistoric archaeological sensitivity. In each case, potential prehistoric deposits are anticipated at depths greater than 15 feet below the surface. Given that the maximum excavation depth for the proposed tank sites will not extend to 15 feet below the surface, the disturbance associated with the DSD locations is not anticipated to impact potential prehistoric cultural-bearing soils for these DSD sites.

A total of 25 tank sites possess sensitivity for historic sewer deposits dating from the mid-nineteenth to the earlytwentieth century. It is anticipated that the majority of these sewers consist of brick sewer lines. Three of the tank sites are sensitive for late-eighteenth to mid-nineteenth century historic road deposits.

Three tank sites are sensitive for historic deposits associated with the late-nineteenth to early-twentieth century North Hudson County Railway Company (NHCRC) elevated train line along Observer Highway. Archaeological remains associated with the elevated train line may include foundation supports, landfill, and/or features associated with elevated train platforms and stops and are anticipated at depths less than 10 feet below the surface.

The Block 10 site possesses the potential for deposits associated with the mid-nineteenth century Paterson Plank Road and for late-nineteenth to early-twentieth century deposits associated with the NHCRC elevated train line. Deposits associated with the plank road and with the elevated train are considered to be above or within the landfill and are anticipated at depths shallower than 10 feet below the surface.

For the NJ Transit Site, areas north of 3rd Street are sensitive for prehistoric remains at depths greater than 15 feet below the surface. Portions of the NJ Transit Site along Marshall Street between 3rd and 4th streets and at the northwest corner of Marshall and 4th streets are also considered sensitive for mid to late-nineteenth century residential deposits at depths less than 15 feet below the surface. Similarly, portions of the NJ Transit Site along Harrison Street between 3rd and 4th streets are sensitive for early to mid-twentieth century industrial and residential deposits. The Jackson Street portion of the NJ Transit Site between 2nd and 4th streets is also considered sensitive for early-twentieth century sewer-related deposits. These deposits are anticipated at depths greater than seven feet below the surface.

The drainage pipe (DP) associated with the NJ Transit Site is sensitive for prehistoric deposits north of 3rd Street. The piping is also sensitive for historic deposits associated with the late-nineteenth to early-twentieth century trolley line and railroads along the western extent of Hoboken, particularly the Old Horseshoe Curve. The historic deposits within the DP are anticipated at depths less than 15 feet below the surface.

Portions of the stormwater storage basin at the BASF Site are sensitive for prehistoric archaeological deposits at depths below 15 feet below the surface. Similarly portions of the proposed BASF piping between 11th Street and a point midway between 12th and 13th streets area also sensitive for potential prehistoric deposits. Historic Block 108 within the BASF Site is considered sensitive for mid to late-nineteenth century residential or commercial deposits less than 15 feet below the surface. Given that the maximum depth of excavation associated with the stormwater basin is 9.5 feet below the surface, the BASF Site has the potential to impact extant historic deposits associated with the nineteenth century residential/commercial occupation and the twentieth century industrial occupations. The proposed Project activities within the site will not extend to depths of anticipated prehistoric deposits.

The BASF piping area is sensitive for deposits associated with the early-nineteenth century seawall and the midnineteenth century Bergen Turnpike/Hackensack Plank Road along 16th Street east of Clinton Street, and with a mid-nineteenth structure associated with James Stevens around 16th Street and Park Avenue. However, the piping will not impact any potentially extant deposits given the anticipated depth of the piping, approximately six feet below the surface, will not extend to the anticipated depths of archaeological potential at 15 to 17 feet below the surface.

The eastern extent of the BASF piping along 16th Street is sensitive for prehistoric and historic deposits around Weehawken Cove, but the piping will not extend to the depth of the potential archaeological resources. A portion of the BASF piping is also sensitive for potential seventeenth to early-twentieth century shipwrecks along Weehawken Cove, but again any such deposits would be located beneath the limits of disturbance associated with the piping. The eastern end of the piping is sensitive for historic deposits associated with the early to mid-twentieth century Tietjen & Lang Dry Docks. There is also the potential for relatively shallow historic waterfront deposits within this area.

Portions of both the NJ Transit Outfall and the BASF Outfall are sensitive for prehistoric deposits. Specifically, the eastern terminus of both outfalls in the vicinity of Weehawken Cove and the portion of the NJ Transit Outfall west of Grand Street are sensitive for prehistoric deposits at depths greater than 15 feet below the surface. Both of the outfalls are also sensitive for deposits associated with the early-nineteenth century seawall around Willow and Park avenues and the mid-nineteenth century Bergen Turnpike/Hackensack Plank Road around Clinton Street. The outfalls are sensitive for early to mid-twentieth century industrial deposits in the vicinity of Willow and Park avenues. The outfalls are sensitive for historic sewer lines along both Park and Willow Avenues. Both outfalls are located in the vicinity of an early-twentieth century lumber yard, the Lawson and MacMurray yard, around 16th, 17th, Adams, Grand, and Clinton streets. A gangway superstructure associated with the lumber yard was located within the outfalls and, therefore, foundation remains and/or postholes associated with the frame feature may be located within the NJ Transit and BASF outfalls. The eastern extent of both outfalls is also considered sensitive for mid-nineteenth through twentieth century waterfront deposits associated with the Tietjen & Lang Dry Docks.

Aside from the nineteenth century seawall and Bergen Turnpike, potential historic deposits within the NJ Transit Outfall and the BASF Outfall would be located within or above the historic landfill as these developments occurred after the filling. Therefore, these historic deposits are anticipated at depths less than 15 feet from the surface. It is assumed that the installation of the outfalls would result in a disturbance of approximately six feet. Thus, construction and installation of the outfalls has the potential to disturb multiple historic deposits including twentieth century industrial and commercial remains, waterfront features, sewer lines, and bridge and railroad related infrastructure and structures.

The APE contains 25 previously identified historic properties. There are seven properties listed in the National Register. Eighteen (18) properties have SHPO Opinions of Eligibility from the NJHPO; nine are historic districts, of which six are overlapping historic districts in Hoboken. In addition to the 25 historic properties, seven previously identified historic properties are no longer extant either due to replacement and/or demolition. These include: the 14th Street Viaduct; the Cooper Hewitt Electric Co. Factory; the Former Elevator Supply & Repair Company; Maxwell House Complex; the Port Authority Pier Headhouses; Seaman's Mission; and the USDA Plant Quarantine Building. Additionally, one property, Erie Pier D and Piershed, has been rebuilt and no longer reflects the historic structure.

The architectural survey recorded 136 resources 50 years old or older within the APE. An intensive-level survey was conducted for newly surveyed and/or evaluated properties within the APE. Properties surveyed and located within a historic district were reviewed to determine whether the resource was extant and whether the property continued to contribute to the district. Survey forms were only generated for those properties surveyed on the intensive level. Based on the results of the intensive-level architectural survey, 11 additional historic properties were identified: 224-232 Jefferson Street; 401 and 403 Adams Street; 509 Madison Street; the R.B. Davis Company Manufacturing Complex; the R. Neumann & Co. Complex; Standard Brands & Lipton Tea Plant; Society Madonna dei Martiri (332 Adams Street); St. Francis Italian Catholic Church; Chappell, Chase, Maxwell Coffin & Casket Factory (aka National Casket Company); 77-79 Garden Street (all in Hoboken); and the 3rd Street Historic District, a new historic district, which includes 224-232 Jefferson Street, St. Francis Church, and the Chappell, Chase, Maxwell Coffin & Casket Factory, as well as the State and National Register-listed Keuffel and Esser Manufacturing

Complex. The buildings at 77-79 Garden Street are located in the Hoboken Historic District, however, this block has been extensively altered and new residential buildings introduced, such that the Hoboken Historic District boundaries should be updated.

Considering all of the segments proposed in Alternative 1, except for the BASF Site, Block 10 Site, the NJ Transit Site, and the DSD Sites, potential effects to 46 historic properties were evaluated. Alternative 1 resulted in a finding of adverse effect for 14 historic properties for Option 1; when considering Option 2, there are adverse effects to 13 historic properties. Under Option 2, there are five historic properties with a finding of conditional no adverse effect, given that conditions are established to address effects that may result from potential construction-related vibration and excavation; Option 1 has four historic properties with conditional adverse effects. The remaining 28 properties will result in no adverse effect under either Option 1 or 2.

For Alternative 2, except for the BASF Site, Block 10 Site, the NJ Transit Site, and the DSD Sites, potential effects to 54 historic properties were evaluated. Alternative 2 resulted in a finding of adverse effect to 12 historic properties for Option 1; when considering Option 2, there are adverse effects to 11 historic properties. Under Option 1, 24 historic properties resulted in a finding of conditional no adverse effect, given that conditions are established to address effects that may result from potential construction-related vibration and excavation; Option 2 has 25 historic properties with conditional adverse effects. The remaining 18 properties will result in no adverse effect.

For Alternative 3, except for the BASF Site, Block 10 Site, the NJ Transit Site, and the DSD Sites, potential effects to 54 historic properties were evaluated. Alternative 3 resulted in a finding of adverse effect to 10 historic properties for Option 1; when considering Option 2, there are adverse effects to 9 historic properties. Under Option 1, 26 historic properties resulted in a finding of conditional no adverse effect, given that conditions are established to address effects that may result from potential construction-related vibration and excavation; Option 2 has 27 historic properties with conditional adverse effects. The remaining 18 properties will result in no adverse effect.

For elements associated with the BASF Site, Block 10 Site, the NJ Transit Site, and the DSD Sites, assessment of effects to historic properties resulted in the following findings. No historic properties are located in proximity to the BASF Site, therefore construction at the BASF site would result in no adverse effect to historic properties. Implementation of the plans for Block 10 has the potential to create a conditional no adverse effect to one historic property. No historic properties are located in proximity to the NJ Transit Site; therefore, the NJ Transit Site will not affect historic properties. Project effects from implementation of the DSD sites results in conditional adverse effects to 28 historic properties.

Additional consultation with the NJHPO as well as identified consulting parties is recommended to develop a Memorandum of Agreement that will provide a specific set of stipulations in order to minimize and/or mitigate adverse effects that are expected to result from the proposed project.

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1.0 INTRODUCTION

In order to address the need for increased resiliency within the Superstorm Sandy-affected region, the United States Department of Housing and Urban Design (HUD) launched the Rebuild by Design (RBD) competition in 2013 inviting communities to craft pioneering resiliency solutions. During the course of this competition, a comprehensive urban water strategy was developed for the Hoboken, Jersey City and Weehawken area that included hard infrastructure and soft landscape for coastal defense (Resist), policy recommendations, guidelines and urban infrastructure to slow storm water runoff (Delay), green and grey infrastructure improvements to allow for greater storage of excess rainwater (Store), and water pumps and alternative routes to support drainage (Discharge). The Hudson River RBD proposal was selected in the first round of RBD grants and HUD has awarded \$230 million to the State of New Jersey for the "Hudson River Project: Resist, Delay, Store, Discharge" (the Project).

This Cultural Resources Technical Environmental Study (TES) was prepared by Dewberry Engineers Inc. (Dewberry), on behalf of the New Jersey Department of Environmental Protection (NJDEP), to evaluate the potential for the proposed flood reduction improvements and Project activities to impact cultural resources. The TES consists of a Phase IA Archaeological Assessment and a Historic Architectural Eligibility and Effects Survey of the Project's Study Area. A summary of this TES will be provided in the Environmental Impact Statement (EIS) for the Project.

1.1 **Project Location**

The Project's Study Area encompasses the City of Hoboken and includes the southern portion of the Township of Weehawken and the northern portion of Jersey City. The Study Area has the following approximate boundaries: the portion of the Hudson River which encompasses piers within the Study Area to the east; Baldwin Avenue (in Weehawken) to the north; the Palisades to the west; and 18th Street, Washington Boulevard and 14th Street (in Jersey City) to the south (Figures 1 and 2).

The upland area within the Study Area encompasses approximately 1,020 acres. The Study Area encompasses approximately 233 acres of the Hudson River. The topography of the Study Area is highest along the east-central portion abutting the coastline of the Hudson River at Castle Point. From here, the land slopes gently downward to the north (towards Weehawken Cove), south (towards the Hoboken Terminal and Jersey City) and to the west (towards the foot of the Palisades). This topography reflects the Study Area's history; when originally settled, Castle Point was an island surrounded to the north, south and west by wetlands. These wetlands were gradually filled in as the area grew. Today, these areas - in particular those to the west - are still extremely low-lying, in some places no more than three feet above mean sea level.





2.0 REGULATORY CONTEXT

The Project's award comes in the form of Community Development Block Grant-Disaster Recovery (CDBG-DR) funding, which requires compliance with the National Environmental Policy Act (NEPA). Because of the Project's possible environmental impacts, NEPA requires the preparation of an EIS. The NJDEP Office of Flood Hazard Risk Reduction Measures (OFHRRM) will be conducting the EIS. A Draft and Final EIS will be prepared in accordance with the Council on Environmental Quality's (CEQ) NEPA regulations at 40 CFR Part 1502. Furthermore, the Project's federal funding requires compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended [36 CFR 800.4(a) (1) and 36 CFR 800.4(b) (1)], along with guidelines outlined in the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716).

This report presents the results of a Cultural Resources TES conducted by Dewberry in support of the EIS. The TES consists of a combined Phase IA Archaeological Assessment and a Historic Architectural Eligibility and Effects Survey of the Project's Study Area. The report has been prepared in accordance with the NHPA, the Secretary of Interior's Standards, and also the New Jersey Historic Preservation Office's (NJHPO) Guidelines for Phase I Archaeological Investigations: Identification of Archaeological Resources, Guidelines for Architectural Surveys, and Guidelines for Preparing Cultural Resources Management Archaeological Reports Submitted to the Historic Preservation Office (1996, 2000). As part of this project Dewberry has consulted with the NJHPO and identified interested parties under 36 CFR 800.2.

On May 2, 2016, a Project Initiation Letter (PIL) was submitted to the NJHPO. The PIL introduced the Project, outlining the Project background and funding sources, in addition to the Study Area and defining the Area of Potential Effects (APEs). The APEs are described in Chapter 3. On June 2, 2016, the NJHPO concurred with the APE, the description of efforts to involve the public, and the list of consulting and interested parties, as submitted in the PIL for Section 106 Consultation.

2.1 REPORT ORGANIZATION

The Cultural Resources TES report includes an Introductory Chapter (Chapter 1) followed by this discussion of the regulatory context and report organization (Chapter 2). A project description and the Areas of Potential Effects are defined in Chapter 3. A discussion of the report's methodology is provided in Chapter 4. Chapter 5 presents a discussion of the Study Area's Environment. A brief history of the Study Area is presented in Chapter 6. Chapter 7 consists of a discussion of previously conducted cultural resources studies and previously identified archaeological sites. Chapter 8 consists of contextual studies of specific topics/themes within the history of land use and development of the Study Area. These topics consist of Prehistory; Commercial; Residential, Sewage, and Water; Institutional; Industrial; Cemeteries and Churches; Docks, Wharves, and Landfill; and, Transportation. The archaeological assessment of the archaeological APE is provided in Chapter 9. The historic architectural survey, including a discussion of previously identified historic properties, is presented in Chapter 10. Chapter 11 consists of an assessment of the Project effects with respect to potential archaeological resources. Chapter 12 presents an

assessment of the Project effects with respect to historic architectural resources. Chapter 13 summarizes the conclusions of the TES with respect to cultural resources. The report references are presented in Chapter 14. All plates referenced within the report are located in Appendix A. Appendix B contains NHJPO correspondence regarding the Project along with information regarding the project's public outreach under Section 106. The Historic Architectural Survey Forms completed as part of the TES study are presented in Appendix C. The soil boring data referenced by the report is presented in Appendix D. Given the large number of previously conducted cultural resource studies within the Study Area, a tabular list of the studies is presented in Appendix E. The resumes of the professionals who completed the TES are presented in Appendix F. Appendix G contains the Annotated Bibliography.

3.0 PROJECT DESCRIPTION

As previously noted, the Study Area for the project consists of the entire City of Hoboken (Hoboken), the southern extent of Weehawken, and the northern extent of Jersey City. All of the proposed Project activities will be conducted within the Study Area. The four aspects of the Project (Resist, Delay, Store, and Discharge) can be divided into two categories - 1) Resist and 2) Delay, Store, Discharge (DSD) given their location within the Study Area. The Resist portion will generally be located along or near the waterfront. The DSD portions of the Project will be distributed throughout the interior of the Study Area. The Project's EIS will evaluate three build alternatives, along with a no build alternative, to arrive at the Project's Preferred Alternative. Within each alternative, the DSD portion will remain constant while the Resist alignments will vary among the three alternatives. This cultural resource assessment evaluates the potential effect of the undertaking (as defined at 36 CFR 800.16(y)) to historic properties. Below is a description of the Project components.

The Project's DSD consist of three large stormwater detention facilities and approximately 61 small tanks (ROW sites) that will include new and/or improved stormwater management techniques designed to complement other efforts by Hoboken as part of the Green Infrastructure Strategic Plan and multiple redevelopment plans. Details on individual sites and specific plans have been developed as part of the Feasibility design. The text below describes the major components that comprise this element of the Project. The location of the proposed facilities are based on studies of the existing flooding "hotspots" in Hoboken.

BASF Site: The northwest corner of Hoboken south from the NHSA Treatment Plan is a natural topographical low point and catchment area where collection and delay/storage of stormwater can be enhanced by the development of the Northwest Park (BASF Property). The six-acre property was acquired by the City of Hoboken as part of the Green Infrastructure Strategic Plan and is also included as part of Hoboken's Western Edge Redevelopment Plan. The site, which is currently paved and impermeable, is planned for conversion to green park space with an underground stormwater storage/holding tank. A new pump and outfall would be linked to this facility to provide a discharge from the overall catchment area.

New Jersey Transit (NJ Transit) Site: The area surrounded by the Hoboken Housing Authority (HHA) at Jackson and Harrison Streets from 2nd Street to 6th Street also serves as a natural low-lying catchment area. A High Level storm sewer collection system will be added in this 17-acre development to support the discharge component of the Site and direct the stormwater overflow towards the west. On the west side of this neighborhood, a linear stormwater detention facility will be incorporated along the light rail line to provide storage of the water drained from the HHA area. A pump station would be incorporated to discharge overflows from the stormwater tank into the existing ditch located at the west side of the NJ Transit Light Rail. An existing NJ Transit ditch currently conveys runoff from the Light Rail property and the Palisades Hill slope to an existing discharge at the Hudson River.

- Block 10: The site is located in the southwestern corner of Hoboken adjacent to Academy Bus facility and south of Paterson Avenue. Portions of this currently-paved parcel will be converted to a permeable park space allowing water to infiltrate into the ground. A High Level storm sewer collection system will be added to this 8.0 acre watershed, stormwater runoff will be conveyed to a proposed underground detention facility where peak flows will be controlled and delayed before discharging into the existing NHSA combine sewer.
- Pump Stations: Three pump stations will be required as part of the "discharge" component. One pump station will discharge the overflow from the proposed NJ Transit site detention facility (Housing Authority) while a force main from the pump station will cross under the HBLR and discharge to the existing channel located at the east site of the Light Rail. A second pump station will discharge overflows from the BASF site detention tank. A 2,700 foot long force main will convey the runoff to a new discharge proposed at Weehawken Cove; and a third pump is proposed at the north of Clinton Street (north end of the existing NJ Transit channel) in the vicinity of the NHSA treatment plan. The purpose of the Clinton Street pump station is to release flows from the channel to compensate the additional flow discharged from the NJ Transit (Housing Authority) site, and to prevent surcharge of the existing channel during backflow conditions. A 720 foot long force main will convey the runoff to a new discharge "component of the Project. One outfall pipes in northern Weehawken Cove are proposed as the "discharge" component of the BLR line. This outfall is proposed to be located in the northern part of the Cove near Lincoln Harbor. The second outfall will be located north of Harborside Park to drain the BASF catchment area via force main discharge.

With respect to the Resist elements, current design plans propose three alternative alignments (Figures 3-5).

Alternative 1 locates the Resist structures primarily along the waterfront (see Figure 3). This alternative's Resist structure generally follows the waterfront from the Lincoln Tunnel in Weehawken south to Weehawken Cove where it is envisioned that a boathouse (alternatively funded) will be incorporated into the structure. The Resist structure in this area ranges from 12 to 16 feet in height at Lincoln Harbor and nine feet tall along Weehawken Cove. In addition, a bermed and terraced Cove Park will be incorporated into the southwest corner of Weehawken Cove. This would include existing undeveloped land as well as the currently-developed Harborside Park (adjacent to Harborside Lofts at 1500 Garden Street).

The alignment continues around the waterside of the Hudson Tea Building (a.k.a. Standard Brands & Lipton Tea Plant), at a height of between nine and 14 feet, and heads south in front of Maxwell Place at about ten feet in height. The Resist structure continues south along the waterfront to the intersection of Sinatra Drive North and Frank Sinatra Drive (FSD), just south of Maxwell Place Park where the ground elevation begins to rise, and the wall tapers down to meet it at height of five feet and then two feet. There will be a series of gates along the waterfront to allow access onto piers and across road intersections during non-flood conditions. Possible designs for the Resist structure in this area may include an elevated promenade north of the Hudson Tea Building, raised terraced parks adjacent to Shipyard Park, and bermed/terraced park areas at the location of the existing Maxwell Place Park.



Study Area
Alternative 1 - Proposed Resist Structure
Alternative 1 - Proposed Underground Tank
Alternative 1 - Proposed Underground Piping
Municipal Boundary
Hudson-Bergen Light Rail
Topographic Contour Elevation - 5
Topographic Contour Elevation - 10
Topographic Contour Elevation - 15
Park/OpenSpace



23	Study Area
	High Level Storm Sewer System
	Alternative 2 - Proposed Resist Structure
•	Alternative 2 - Proposed Underground Tank
	Alternative 2 - Proposed Underground Piping
	Municipal Boundary
+-	Hudson-Bergen Light Rail
	Topographic Contour Elevation - 5
	Topographic Contour Elevation - 10
	Topographic Contour Elevation - 15
	Park/OpenSpace



.23	Study Area
	High Level Storm Sewer System
	Alternative 3 - Proposed Resist Structure
0	Alternative 3 - Proposed Underground Tank
	Alternative 3 - Proposed Underground Piping
	Municipal Boundary
+	Hudson-Bergen Light Rail
	Topographic Contour Elevation - 5
	Topographic Contour Elevation - 10
	Topographic Contour Elevation - 15
	Park/OpenSpace

The Resist structure also has a component along Sinatra Drive from 4th Street to 1st Street, in South Hoboken, where the design may consist of an elevated walkway and park space that ties into a deployable system running east/west on 1st Street (six to nine feet high). In the southern portion of the Study Area, two options will be analyzed: Option 1 features an alignment south of Observer Highway, within the rail yard (south of the proposed Hoboken Yard Redevelopment Area) at approximately seven to 11 feet in height. Option 2 includes an alignment along Observer Highway from Washington Street to Marin Boulevard, on an alignment behind NJ Transit offices ranging from seven to 11 feet in height. The alignment includes gates for access at various locations including the Marin Boulevard, Grove Street and Newark Avenue underpasses beneath the rail lines, as well as protection where the HBLR tracks pass below the NJ Transit overpass in the southwest corner of the Study Area. Alternative 1 will also include the installation of features along the eastern frontage of Henderson Street north of 18th Street and on a segment of 18th Street south of the Long Slip Canal; both of these sections are located in Jersey City.

Alternative 2 Resist structure begins near the HBLR Lincoln Harbor station at Waterfront Terrace at an initial height of about eight feet, traveling south towards Harbor Boulevard at a height of seven to 13 feet. Opportunities for urban enhancement in the northern portion of the Study Area under Alternative 2 are limited due to siting conditions and include lighting, murals and seating. The Resist feature then runs south along Weehawken Cove at nine feet (see Figure 4) where it is envisioned that a boathouse (alternatively funded) will be incorporated into the structure. In addition, a bermed and terraced Cove Park will be incorporated into the southwest corner of Weehawken Cove. This would include existing undeveloped land as well as the currently-developed Harborside Park (adjacent to Harborside Lofts at 1500 Garden Street).

The structure continues to 15th Street, and travels east along 15th Street from the northern end of Garden to Washington streets where it will be between eight and ten feet high. Urban amenities in this area may include a bermed park long 15th Street in front of the Tea Building. The feature then continues south along Washington Street, tapering in height between 14th and 13th Streets from eight feet to five feet high. Street crossings will feature gates to allow for access during non-flood conditions. Consideration will be given to adapting the use of structures in a way to provide urban amenities and landscape enhancements, including elevated walkways and pocket parks, plantings and/or seating areas along Washington Street. There will then be two options in the south, along the Hoboken Terminal rail yard: Option 1 will feature an alignment south of Observer Highway, within the rail yard (south of the proposed Hoboken Yard Redevelopment Area) at approximately seven to 11 feet in height. Option 2 will includes gates for access at various locations including the Marin Boulevard, Grove Street and Newark Avenue underpasses beneath the rail lines, as well as protection where HBLR tracks pass below the NJ Transit overpass in the southwest corner of the Study Area. Alternative 2 also includes segments on Henderson Street and 18th Street in Jersey City as in Alternative 1.

During a coastal storm surge event, water from the Hudson River is expected to inundate unprotected areas of the Hoboken waterfront. If the river water overtops the waterfront bulkhead during a storm event, water can enter into the storm sewer system through existing inlets and unsealed manhole covers. While Alternative 1 would prevent a storm surge from entering the city streets, Alternative 2 leaves portions of the city streets and sewer system

unprotected. To prevent water intrusion into the existing sewers under Alternative 2, a separation of the sanitary/storm water collection system is proposed by the construction of a "High Level" storm sewer collection system. In addition to the installation of this new storm sewer system, the existing NHSA combined sewer inlets and manholes would be sealed and lined. This proposed drainage would be designed to prevent additional sewer backflow that could cause major flooding issues within the Alternative 2 protected areas during a storm surge event. Storm water collected in this "High Level" storm sewer system would be pumped into the Hudson River.

This alternative's Resist structure begins at 8 feet in height near the HBLR Lincoln Harbor station at Waterfront Terrace, traveling south along HBLR rising to about 12 feet in height, and then continuing south along Weehawken Cove (nine feet high) towards Garden Street (see Figure 5). Opportunities for urban enhancement in the northern portion of the Study Area under Alternative 3 are limited due to siting conditions and include lighting, murals and seating. It is envisioned that a boathouse (alternatively funded) will be incorporated into the structure. A bermed and terraced Cove Park will be incorporated into the southwest corner of the Weehawken Cove. This would include existing undeveloped land as well as the currently-developed Harborside Park (adjacent to Harborside Lofts at 1500 Garden Street).

A nine foot high structure would then travel down the east side of Garden Street adjacent to the west of the Hudson Tea Building Parking Garage; the structure along Garden Street may consist of an elevated planter seating. The structure would then continue down an alleyway midway between 15th and 14th streets from Garden to Washington streets at six feet in height. The structure would then travel south along Washington Street at five feet high, ending between 14th and 13th streets. Street crossings will feature gates to allow for access during non-flood conditions. Consideration will be given to adapting the use of structures in a way to provide urban amenities and landscape enhancements.

There will then be two options: Option 1 will include an alignment south of Observer Highway, within the rail yard (south of the proposed Hoboken Yard Redevelopment Area) at approximately seven to 11 feet in height. Option 2 will feature an alignment along Observer Highway from Washington Street directly to Marin Boulevard. The alignment includes gates for access at various locations including at the Marin Boulevard, Grove Street and Newark Avenue underpasses beneath the rail lines, as well as protection where HBLR tracks pass below the NJ Transit overpass in the southwest corner of the Study Area. Alternative 3 also includes segments on Henderson and 18th streets in Jersey City as in Alternatives 1 & 2.

Lastly, as in Alternative 2, a separation of the sanitary/storm water collection system is proposed by the construction of a "High Level" storm sewer collection system.

3.1 Area of Potential Effects

As stated above the Project's federal funding requires compliance with Section 106 of the NHPA, as amended [36 CFR 800.4(a) (1) and 36 CFR 800.4(b) (1). This legislation requires consideration of the effect(s) of any federally assisted undertaking on historic properties, defined as a prehistoric or historic district, site, building, structure, or

object included in, or eligible for inclusion in, the National Register of Historic Places (National Register), during the project planning process. The undertaking establishes the Project's Area of Potential Effects (APE), defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist."¹ The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking [36 CFR 800.16(d)]. For this Project, the APE is defined as the geographic area within which the Resist and DSD elements of the RBD Hudson River Project may directly or indirectly alter the character or use of National Register-eligible or listed resources. The APE for the proposed Project includes those areas containing potential National Register listed or eligible cultural resources whose character and/or setting could be directly, secondarily, or cumulatively affected by the proposed undertaking. Potential effects to historic properties can be permanent or temporary, and can include damage, destruction, and acquisition, as well as visible, audible, economic, and social impacts.

The APE for archaeological resources is defined to include the limits of construction resulting from the proposed Resist element under consideration for each of the three build alternatives plus the DSD elements. For the purposes of Section 106, it is assumed that potential ground disturbances associated with the proposed undertaking will be confined to the land designated for construction of the Resist and DSD elements only and will not encompass the entirety of the Study Area. No provisions in this TES are made for unpaved staging areas outside the defined limits of disturbance. The archaeological APE incorporates the footprints for all three build alternatives for Resist structures and encompasses the entirety of the DSD elements that will be constructed to support the Preferred Alternative. The archaeological APE is shown on Figure 6.

The APE for historic architectural resources includes areas that may contain historic properties that could be directly impacted by construction of the Project or indirectly affected by the Project (i.e., either by changing the visual context of the historic resource or by affecting the resource from vibration during construction). The APE for historic architectural resources incorporates the extent of the archaeological APE (i.e., the limits of ground disturbance) plus a distance beyond to account for potential visual impacts (Figure 7). For the Resist portion of the Project, the historic architectural APE was calculated by adding one city block from the footprint of the proposed Resist elements. In the case of the DSD elements, construction would cause direct impacts to the public right-of-way, but would also create vibrational effects to the ground surface that could create an indirect effect to historic properties in close proximity to construction. A distance of 90 feet was used to account for the effects of vibration to historic properties, consistent with methods used in urban settings in the metropolitan region to account for the potential effects of construction to historic buildings within a similar geomorphological context as Hoboken's setting on landfill and bedrock outcrops.² The 90-foot buffer distance was established following guidance applied in New York City and was endorsed by NJHPO following discussions on April 25, 2016. As with the archaeological APE, the historic architectural APE does not encompass the entirety of the Study Area. The historic architectural APE is therefore represented by the visual effect of Resist combined with the direct effect and vibrational effect of DSD construction, as shown in Figure 6.

¹ National Historic Preservation Act of 1966, as amended 2004, 36 CFR 800.16d.

² New York City Department of Buildings Technical Policy and Procedure Notice #10/88–*Procedures for Avoidance of Damage to Historic Structures Resulting from Adjacent Construction*, http://www.nyc.gov/html/dob/downloads/ppn/tppn1088.pdf.





4.0 METHODOLOGY

As part of the cultural resource assessment, background research was conducted and a field investigation was performed in order to evaluate the potential of the APE to contain previously unidentified historic properties, and to evaluate the potential of the Project to impact any known historic properties. Historic properties may include any district, site (prehistoric or historic), object, building, or structure listed in, or eligible for listing in, the National Register.³

4.1 Methodology for Phase IA Archaeological Assessment

As part of the cultural resource assessment, Dewberry developed contextual overviews of prehistoric and historic resources in order to establish a baseline upon which the significance of potentially important historic properties within the APE can be evaluated. The National Park Service defines the concept of historic context as:

an organizational framework of information based on theme, geographical area, and period of timeis recommended as the basis for organizing information pertinent to the research design and survey results...Historic contexts may be based on the physical development and character, trends, and major events, or important individuals and groups that occurred at various times in the history or prehistory of a community or other geographical unit.⁴

In developing contextual studies for the archaeological assessment, Dewberry referred to the Phase IA archaeological assessment conducted for the proposed Hudson Yards 7 Line Extension and the Phase IA Archaeological Survey Report conducted in association with the EIS for the Access to the Region's Core (ARC) project.⁵ Dewberry utilized the Hudson Yards Phase IA as a heuristic model for the current study as it similarly examined a relatively large urbanized area and utilized contextual studies to help frame and organize a larger discussion and assessment of archaeological sensitivity. As the Hudson Yards project area similarly consisted of a partial waterfront location which had experienced past landfilling events and had a long history of development from the eighteenth century through the present day, it provided a useful example of a framework for assessing larger development contexts or trends which may be evidenced by cultural resources within a large urbanized project area like the current Study Area. The Phase IA for the ARC project argued that the subjective and ambiguous nature of significance as a measure of eligibility for the National Register under Criterion D necessitates the formation of frameworks or research issues from which a site's ability to provide potential useful information can be evaluated. The development of prehistoric and historic contexts from which research questions and issues could be formulated would be instrumental in assessing the potential significance of a site. Therefore, Transit Link Consultants

³ National Park Service (NPS), *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, (Washington, D.C.: U.S. Department of Interior, National Park Service, Cultural Resources, Interagency Resources Division) 1995.

⁴ NPS, *National Register Bulletin 24: Guidelines for Local Surveys: A Basis for Preservation Planning*, (Washington, D.C.: U.S. Department of Interior, National Park Service, Cultural Resources, Interagency Resources Division) 1985.

⁵ Historical Perspectives, Inc. and The Louis Berger Group, Inc., *Archaeological Documentary Study No. 7 Line Extension/Hudson Yards Rezoning, New York, New York* (On File, New York: Landmarks Preservation Commission) 2004; Transit Link Consultants, *Phase IA Archaeological Survey Report Access to the Region's Core* (On File, Trenton: NJHPO) 2008a.
developed four contexts within which they framed the potential for archaeological resources within the ARC project area. These contexts consisted of: Cemeteries, Industrial Sites, Transportation, and Domestic Sites. After reviewing the history of development within the Study Area, Dewberry identified several larger contexts integral to the historical development of the Study Area. Dewberry prepared contextual studies for the topics of:

- Prehistory
- Commercial
- Residential, Sewage, and Water
- Institutional
- Industrial
- Cemeteries and Churches
- Docks, Wharves, and Landfill
- Transportation

For the Prehistoric context study, Dewberry developed a prehistoric overview and discussed any previously identified prehistoric archaeological sites within the Study Area (Section 8.1). On the basis of the previously identified archaeological sites, the prehistoric overview, and a review of previously conducted cultural resource studies, Dewberry discussed the potential for encountering prehistoric archaeological resources within the Study Area. For the historic context studies, an historic overview of the development of each respective context within the Study Area was discussed. Case studies drawn from previously conducted cultural resource investigations are presented. The case studies are presented in order to provide an example of the types of potential resources and information that can be found in association with each context. The case studies are followed by a general discussion of the likelihood of finding particular resources within the Study Area and the potential information that could be gleaned from any such deposits. With respect to historic resources the majority of the contextual discussion focuses upon the mid-nineteenth through early-twentieth centuries—the heyday of waterfront and industrial development within the Study Area.

For the contextual studies and the larger assessment, research was conducted at several institutions. This research included examination of state files, maps, reports and databases available at the NJHPO, Trenton, and the Archaeology and Ethnology Bureau, New Jersey State Museum (NJSM), Trenton, to locate previously identified historic properties and cultural resource surveys conducted in the project vicinity. Prior historic period land use was also researched through a review of historic maps, historic aerial photographs, local histories, and secondary sources. The historic research included an examination of primary documents at the Hoboken City Clerk's Office, deed research at the Hudson County Register's Office in Jersey City, examination of historic maps at the New Jersey State Library in Trenton, and a review of digitally available federal census records and historic city directories. Additional secondary research was undertaken at the New Jersey State Library, the New Jersey State Archives, the Hoboken Historical Museum, Hoboken, the Hoboken City Clerk's Office, Hoboken, and the Hudson County Register's Office in Jersey City. Historic topographic maps were reviewed in order to reconstruct the pre-urbanization and predevelopment

landscape. In addition to reviewing previous cultural resource reports, this study also analyzed available soil boring data and past geomorphological studies to help delineate the potential for deeply buried cultural bearing deposits within the APE (Appendix D). The North Hudson Sewerage Authority (NHSA) also provided Dewberry with the 1940 As-Built plans for the Hoboken Sewer System and with their contemporary GIS data.⁶ The source material for their GIS data was unknown and, therefore, the accuracy of this information was unclear. The NHSA information was used to determine the chronology and type, if possible, of sewer lines installed within the Study Area from 1850 to the present-day. Research Institutions and online repositories were also consulted including the New York Public Library digital collections, the Library of Congress' digital collections, David Rumsey's online map collection, Princeton University, Rutgers University, the National Register of Historic Places, HABS-HAER documentation, and the collections of the Hoboken Historical Museum. In order to obtain the highest quality of images for use in the report, digital images of maps and historic photographs within the collections of Rutgers University, Princeton University, and the Hoboken Historical Museum were sought out and reproduced to the extent possible.

With respect to each proposed alternative, the archaeological assessment was designed to:

- establish the predevelopment conditions of each location;
- determine the historic land use and occupancy of each location and evaluate the potential historic and/or archaeological significance of the occupation;
- evaluate the nature, vertical, and horizontal extent of past disturbance at each location and the potential, if any, for that disturbance to have disturbed any pre-existing archaeological deposits;
- determine the potential project-related impacts to any identified areas of archaeological sensitivity; and
- recommend potential project mitigation measures, if necessary.

Ultimately, with respect to each alternative, the archaeological assessment attempted to determine the potential for significant prehistoric or historical archaeological resources within the APE. Critical to this examination was the extent of past disturbance in any given location and the potential for that disturbance to have affected, compromised, or destroyed any potential preexisting archaeological deposits.

In addition to the documentary and cartographic research undertaken for the archaeological assessment, a pedestrian reconnaissance of each alternative was conducted on June 24, 2015, March 24, March 30, April 5, and April 11, 2016. This site inspection was aimed at identifying any previously documented potential historic properties and locating surface indications that would suggest the presence of unidentified historic properties. Pedestrian reconnaissance involved the inspection of any obvious ground disturbance, subsurface utilities, exposed waterfront features, and areas with clear surfaces. An attempt was made to photo document portions of each Resist element and each DSD location. Photographs of the APE are located in Appendix A of this report. A photo key of each referenced photograph is also located in Appendix A.

⁶ Whittemore, J.O., *Map of the City of Hoboken, N.J., Showing Existing Sewers Built Previous to 1940* (Hoboken: North Hudson Sewerage Authority) 1940; North Hudson Sewerage Authority, GIS Sewer Data, 2016.

4.2 Methodology for Historic Architectural Eligibility & Effects Survey

Areas of proposed ground disturbance were investigated in order to determine whether the proposed Project would cause changes in the character or use of historic properties. With respect to the DSD sites, an approximate 90-foot buffer around each site was investigated to locate any previously identified historic architectural resources, any potentially eligible previously unidentified historic architectural resources, and any resources that may be over 50 years of age. Dewberry defined the 90-foot buffer as the limit of potential vibration-related impacts associated with the Project-related activities at each of the DSD sites. With respect to the alternative Resist structures, Dewberry examined a one-block radius around each proposed structure to locate any previously identified historic architectural resources that may be over 45 years of age. The one-block radius was identified as the limit of any potential visual impacts associated with the installation of the resist elements.

The primary objective of the intensive-level architectural survey is to identify historic properties within the APE(s) that are listed in or potentially eligible for listing in the National Register. Section 106 of the NHPA, 36 CFR Part 800, defines a historic property as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register. In order to assist in identifying known or potential historic properties that may exist within the APE(s), archival research was conducted at several state and local repositories, as well as available online archives, including the NJHPO, the State Library, the City of Hoboken, the Hoboken Historical Museum, the Hoboken Public Library, and the Weehawken Historical Society. Historic maps, tax assessment records, and select deeds records at the County Clerk's office were used to assist in determining the dates of construction. Previous surveys and regulatory reports on file at the NJHPO were also consulted, including the 1978-1979 historic sites inventory of Hoboken, contained in *Hoboken, New Jersey: A Physical and Social History.*⁷ Additional background research included a review of relevant primary and secondary data, including maps, historic accounts, and internet sources.

To identify historic properties in the APE, an intensive-level architectural survey was conducted in March 2016 by an architectural historian following NJHPO's Guidelines for Architectural Survey.⁸ A total of 149 resources in the APE (including the historic districts and identified properties within districts; excluding demolished or replaced properties) that were 50 years old and older and have the potential to be impacted by one or more of the alternatives were included in the survey. In addition, information request letters were sent to interested parties in order to solicit information for the survey, and information was obtained from those that responded. Records of relevant correspondence can be found in Appendix B. NJHPO Architectural Survey Forms were completed for newly surveyed resources, and a historic district overlay form and eligibility worksheet were prepared for a historic district that was identified as a result of the survey (the 3rd Street Historic District). These forms can be found in Appendix C.

⁷ Elan Zingman, *Hoboken New Jersey: A Physical and Social History*, 1978.

⁸ Shelby Weaver Splain, New Jersey Office of Historic Preservation, Guidelines for Architectural Survey: Guidelines for Historic and Architectural Surveys in New Jersey, ed. Mary Joan Kevlin, for NJ Department of Environmental Protection (Trenton, New Jersey: NJ Historic Preservation Office, 1999).

4.3 National Register of Historic Places Criteria for Evaluation

In order to provide a framework with from which to understand any National Register-eligibility or ineligibility recommendations made by this study, the following sections provide the criteria by which properties are evaluated for inclusion on the National Register and the criteria used in evaluating adverse effects to an historic property.

The criteria applied to evaluate properties for inclusion in the National Register are specified in 36 CFR Part 60.4 and are listed below.

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

- A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. that are associated with the lives of persons significant in our past; or
- C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. that have yielded, or may be likely to yield, information important in prehistory or history.⁹

Ordinarily, cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years would not be considered eligible for the National Register. However, such properties would qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- (a) a religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- (b) a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- (c) a birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his or her productive life; or
- (d) a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or

⁹ National Park Service, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, (Washington, D.C.: U.S. Department of the Interior) 1995.

- (e) a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- (f) a property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- (g) a property achieving significance within the past 50 years if it is of exceptional importance.¹⁰

In addition to meeting significance criteria listed above, a property must possess "integrity" to be considered eligible for listing in the National Register. According to National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation, the property must physically represent its history by possessing integrity of location, design, setting, materials, workmanship, feeling, and association.

4.4 Criteria of Adverse Effect

Section 106 of NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The agency, in consultation with the SHPO/THPO, makes an assessment of adverse effects on the identified historic properties based on criteria found in ACHP's regulations 36 CFR 800.5.

The criteria of adverse effect 36 CFR 800.5 (a)(1) is defined as:

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.¹¹

In order to determine if a proposed undertaking would have an adverse effect on identified historic properties, the criteria of adverse effect is applied. Pursuant to 36 CFR 800.5 (a)(2), adverse effects on historic properties include, but are not limited to:

- (i) Physical destruction of or damage to all or part of the property;
- (ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

¹⁰ National Park Service 1995.

¹¹ NHPA 36 CFR 800.5 (a)(1).

- (iii) Removal of the property from its historic location;
- (iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- (v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
- (vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- (vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.¹²

¹² NHPA 36 CFR 800.5 (a)(2).

5.0 ENVIRONMENTAL SETTING

The Study Area is primarily located within the City of Hoboken. The northernmost portions of the Study Area extend into the Township of Weehawken; the southernmost portion of the Study Area extends into Jersey City. The Study Area is located within the Piedmont Physiographic Province of New Jersey. The Piedmont province is characterized as a low rolling plain which is divided by a series of higher ridges. The most prominent ridge within the province is the Palisades which has a maximum elevation of 547 feet. Portions of the Palisades are located to the immediate west of the Study Area, forming the western boundary of the City of Hoboken.¹³

Several different geologic units underlie the Study Area. The eastern portion of the Study Area from a point west of Clinton Street to the shoreline and from Newark Avenue to 8th Street is underlain by Cambrian and Late Proterozoicage Serpentinite (Czs). In New Jersey, these deposits of light yellow green to dark green stone have been exposed only along the Hudson River waterfront in Hoboken. The western portion of the Study Area, west of the Serpentinite deposits, and along the majority of the northern Study Area from 10th Street northward, is associated with the Stockton Formation (Trs). The Stockton Formation dates to the Upper Triassic and consists of primarily sandstone deposits with lesser amounts of mudstone, siltstone, and shale. A narrow swath of the Study Area, a triangular area from a point west of the intersection of Clinton and 3rd streets which extends to the northeast towards the intersection of 14th Street and FSD on its northern extent and the intersection of 12th Street and FSD on its southern extent, consists of Manhattan Schist (CZm) deposits dating to the Late Cambrian and/or Late Proterozoic. Manhattan Schist consists of medium-dark gray, medium to coarse-grained schist and gneiss deposits.¹⁴

According to the Natural Resource Conservation Service (NRCS) Web Soil Survey, a total of eight distinct soil types have been mapped within the Study Area (Figure 8; Table 1). Six of these soil types consist of urban land complex soils or composite urban land complex soils, with three being variants of Urban Land and Greenbelt Complex soils. The remaining two soil types–Greenbelt Loam (GtbA) and Laguardia Artifactual Coarse Sand (LagA)–are both associated with modified landscapes in urbanized areas. Greenbelt Loam soils consist of very deep, well-drained soils which formed in a mantle of human transported materials. Laguardia Artifactual Coarse Sand soils formed in a thick mantle of construction debris intermingled with human transported soil materials. The western and northern portions of Hoboken and the extreme northern portion of the Study Area in Weehawken are associated with Urban Land, wet substratum soils. The majority of the eastern portion of the city consists of Urban Land, till substratum soils. The Laguardia-type soils have been mapped in a few locations along the eastern shoreline, to the west of Weehawken Cove, and to the south and west of the Erie-Lackawanna Terminal. Greenbelt-type soils have been mapped in a few small locations within the central portion of Hoboken.¹⁵

http://mrdata.usgs.gov/geology/state/state.php?state=NJ.

¹³ Richard Dalton, *Physiographic Provinces of New Jersey*, accessed March 21, 2016,

http://www.state.nj.us/dep/njgs/enviroed/infocirc/provinces.pdf; Roy Schlische, *NJ Geology: Global and Regional Context*, accessed March 21, 2016, http://www.rci.rutgers.edu/~schlisch/103web/NJcontext/njcontext frame.html; Peter Wolfe, *The Geology and Landscapes of New Jersey* (New York: Crane, Russak & Company Inc.) 1977, 205, 244-275.

¹⁴ Dalton et al, *Bedrock Geology and Topographic Base Maps of New Jersey,* accessed March 21, 2016,

¹⁵ National Resource Conservation Service, Web Soil Survey, accessed March 21, 2016,

http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.



Table 1: Soil Types Mapped within the Study Area

SOIL TYPE	HORIZON	DEPTH (INCHES)	SOIL COLOR	SOIL TEXTURE	SLOPE	DRAINAGE
Greenbelt Loam (GtbA)	A	0-5	Dark Reddish Brown	Loam	0-3%	Well-drained
	Bw1	5-16	Dark Reddish Brown	Loam		
	Bw2	16-30	Dark Reddish Brown	Loam		
	С	30-79	Dark Reddish Brown	Sandy Loam		
Laguardia Artifactual Coarse Sand (LagA)	А	0-8	Brown	Cobbly-artifactual coarse sandy loam	0-3%	Well-drained
	BCu	8-26	Brown	Very cobbly- artifactual coarse sandy loam		
	Cu	26-79	Brown	Very cobbly- artifactual coarse sandy loam		
Urban Land, bedrock substratum (URBEDB)	M1	0-6	Not provided	Material	0-8	Not provided
	M2	6-20	Not provided	Material		
	2R	20-79	Not provided	Bedrock		
Urban Land, till substratum (URTILB)	M	0-15	Not provided	Material	0-8	Not provided
	2C	15-79	Not provided	Gravelly Sandy Loam		
Urban Land, wet substratum (URWETB)	M1	0-6	Not provided	Material	0-8	Not provided
	M2	6-20	Not provided	Material		
	2Cu	20-79	Not provided	Very Artifactual Coarse Sandy Loam		
Urban Land- Greenbelt Complex (USGRTA)	М	0-15	Not provided	Cemented Material	0-3	Not provided
	2C	15-79	Not provided	Gravelly Sandy Loam		
Urban Land- Greenbelt Complex (USGRTB)	М	0-15	Not provided	Cemented Material	3-8	Not provided
	2C	15-79	Not provided	Gravelly Sandy Loam		
Urban Land- Greenbelt Complex (USGRTC)	М	0-15	Not provided	Cemented Material	8-15	Not provided
	2C	15-79	Not provided	Gravelly Sandy Loam		

The Study Area is generally level at an elevation less than 10 feet above sea level. The topography rises to the east around Garden Street and steadily increases towards a crest at Castle Point situated approximately 100 feet above sea level. The higher terrain along the eastern portion of the city represents the original highlands, the first portions of the Study Area to be historically settled. The remaining segments of the Study Area were tidal marshlands in the eighteenth and for much of the nineteenth centuries. Speilmann and Brush's *Sanitary and Topographical Map of Hudson County* of 1880 reflects the presence of undeveloped marshland in the majority of the Study Area from

Bloomfield Street to the west and extending from Newark Avenue to north of 17th Street. These marshlands were fed by a drainage which was located in the southwestern portion of Hoboken, the Hoboken Creek. The sinuous course of the creek is depicted on nineteenth-century maps of Hoboken between Newark Avenue and Second Street from Willow Street to the base of the Palisades. By the turn of the twentieth century, the creek appears to have been infilled.¹⁶

Portions of the Study Area are located immediately adjacent to the Hudson River. The far western portions of the Study Area are over 4,500 feet from the Hudson River. Given that the eastern shoreline of Hoboken has been historically filled and developed, prior to waterfront expansion resulting from urban development, the western extent of the city was historically much closer to the river.

The Hudson County region experienced relatively rapid geomorphological and environmental change during the late Pleistocene and Holocene periods. Until approximately 11,000 years ago, several glacial lakes were located behind the Harbor Hill moraine. At this time the lakes drained and the current landscape of northeastern New Jersey began to develop. After the glacial retreat, the existing periglacial grasslands and birch were first replaced with boreal forest cover and later pine, hemlock, and deciduous species.¹⁷

The existing New York Harbor was formed with glacial retreats over successive ice ages. The glacial recessions ultimately gouged the rift which forms the Hudson River Valley. The current Hudson River Valley Gorge extends 125 miles out to sea and measures approximately 7,500 feet in depth; the Hudson River is 7 miles wide at its widest point. Estimates vary regarding the extent of sea-level regression during the Wisconsin glaciation. Nevertheless, there is general consensus that a broad expanse of the continental shelf was exposed during the Late Wisconsin Period, with the Hudson River etching a valley across this exposed plain until approximately 12,000 years ago. Mastodon and mammoth remains have been found along the submerged shelf suggesting that the exposed area provided an attractive environmental setting for megafauna occupation and may have been similarly attractive to Paleoindian groups.¹⁸

Between 8,000 and 2,000 years ago, the vegetation within the region resembled more modern conditions. The Hackensack River began to take its modern course approximately 8,000 years ago. Sea levels rose continuously during this period as the Laurentide ice sheet receded; coincident with this, the rate of submergence exceeded the rate of sedimentation. As a result, the coastal area and river estuaries were open water, lined with freshwater peat bogs or muddy banks. Circa 3,000 years ago, the rate of submergence subsided and the rate of sedimentation increased resulting in significant changes to coastal environments in the region. Along the coastal margins,

¹⁶ Spielmann and Brush, *Sanitary and Topographical Map of Hudson County*. Hoboken: Speilmman and Brush, 1880; L.F. Douglas, *Topographical Map of Jersey City, Hoboken, and the Adjacent Country* (Jersey City: Douglas) 1841; M. Dripps, *Topographical Map of New York City, County, and Vicinity* (New York: M. Dripps, 1855).

¹⁷ Federal Transit Administration (FTA) and NJ Transit, Access to the Region's Core Final Environmental Impact Statement: Appendix 6. (on file, Trenton: NJHPO) 2008.

¹⁸ FTA and NJ Transit 2008; A.L. Bloom, "Sea Level and Coastal Morphology of the United States through the Late Wisconsin Glacial Maximum," *Late Quarternary Environments of the United States, Vol 1, the Late Pleistocene* (Minneapolis: Minnesota) 215-229, 1983.

extensive intertidal mud flats developed; these environments were quickly colonized by salt marsh species and developed into high grass meadows.¹⁹

Prior to the urbanized development of Hoboken, the upland portion of the Study Area consisted of New Jersey mesic uplands which most likely supported a mixed oak forest. Mixed oak forests are generally associated with red, white, and black oak trees. Other tree varieties often associated with mixed oak forests include chestnut oak, scarlet oak, hickory, sugar maple, ash, beech, and tulip trees. The undergrowth in these forests often included dogwood, sassafras, and iron wood, in addition to viburnum or spicebush shrubs. The meadowlands within the western and northern portions of the Study Area would have supported saline-tolerant marsh grasses. These marshes may have also supported the growth of goldenrod, sea myrtle, and marsh elder.²⁰

Historic and modern development of the Study Area has dramatically altered the environment and removed the predevelopment vegetation. The Study Area currently consists of a dense urban core of development including residential buildings, commercial buildings, and small scale industrial operations along its northern, southern, and western periphery. The waterfront has been extensively developed from the early-nineteenth century through the present-day. The current waterfront consists of green spaces, public parks and walkways, and a few new residential developments along its northern extent. Historic rail lines and the current HBLR-light rail are located along the southern, western, and northern extent of the Study Area.

The Study Area is located within the Central Zone of New Jersey in terms of climate variability across the state. The region is defined by several heavily urbanized areas which tend to retain more heat given the density of buildings and paved surfaces. These areas are often regularly warmer than surrounding suburban or rural areas particularly in the nighttime when daytime heat becomes trapped. The average temperature within Hudson County is 51.9 degrees Fahrenheit. The county tends to have its coldest temperatures in January and February and its warmest temperatures in July. Annual precipitation within the county has been recorded as 49.03 inches.²¹

¹⁹ FTA and NJ Transit 2008.

²⁰ Beryl Robichaud and M.F. Buell, *Vegetation of New* Jersey (New Brunswick: Rutgers University Press) 1973, 123, 169; RGA, Inc. (RGA), *Stage IA Cultural Resources Survey: Washington Street Water Main Replacement and Complete Street Redesign, City of Hoboken, Hudson County, New Jersey,* (On file, Trenton: NJHPO), 2015a.

²¹ Office of the New Jersey State Climatologist, "The Climate of New Jersey," accessed online August 11, 2016 at <u>http://climate.rutgers.edu/stateclim/?target=NJCoverview;</u> USA.com, "Hudson County Weather," accessed online August 11, 2016 at http://www.usa.com/hudson-county-nj-weather.htm#HistoricalTemperature.

6.0 HISTORICAL OVERVIEW

The Project is located within three municipalities in Hudson County–Hoboken, Weehawken, and Jersey City. The majority of the Study Area is situated within Hoboken. The far northern extent of the Project is located within Weehawken; the far southern extent of the Project is located within Jersey City. The following discussion provides a brief history of the development of the three municipalities. As the Study Area is only located within a small portion of Weehawken and a small portion of Jersey City, the historic overviews of these areas will focus primarily upon those sections that are located within the Study Area. General details regarding the history of Weehawken and Jersey City will be presented, however these discussions will not be as extensive as the historic overview of Hoboken.

This chapter presents an overview of the history of the Study Area. A more detailed discussion of certain themes within the developmental history of the Study Area, including the prehistoric record for the area, is presented in Chapter 8. These themes include: prehistoric, commercial, residential, industrial, institutional, cemeteries and churches, waterfront development and landfill, and transportation.

6.1 European Settlement of Hoboken

The City of Hoboken is bounded by Jersey City to the south, the Hudson River to the east, Weehawken Township to the north, and Union City to the west. In 1849, the Township of Hoboken was formed from North Bergen and included present-day Hoboken and Weehawken. In 1855, Hoboken was incorporated as a city.²²

The earliest European reference to the area that would become Hoboken was made during Henry Hudson's 1609 exploration of the Hudson River. On their voyage down river, Hudson and his team were attacked by a group of Native Americans. Hudson reportedly anchored his ship, the Half Moon, at a safe distance "across from the island called Manhatta," at a place his first mate called "a very good piece of ground"–present-day Weehawken Cove.²³ Various explanations have been given for the origin of the name Hoboken. One is that the area at the time of European Contact was known as Hobocan Hackingh, which means "the land of the tobacco-pipe," in the Iroquois and Manhican languages. Another theory is that the Indian name for the place was Hopaghan, which was later corrupted to Hoboken.²⁴

In 1630, after the Dutch West India Company established the feudal patroonship system of land tenure to encourage more agricultural settlement, Michael Pauw acquired land from the native inhabitants through the Director and Council of New Netherland. Pauw, a director of the Dutch West India Company, never left Amsterdam. The transaction was the earliest deed and reference to the name Hoboken. Members of the Dutch West India Company, who established a colony of 50 adults (15 years and older) within four years, were entitled to 16 miles of riverfront

²² Zingman, n.p.; Lurie and Mappen, 858.

 ²³ Leonard Luizzi in Maxine N. Lurie and Marc Mappen, *Encyclopedia of New Jers*ey (New Brunswick: Rutgers University Press, 2004), 378.
 ²⁴ Daniel Van Winkle, *History of the Municipalities of Hudson County, New Jersey, 1630-1923* (New York: Lewis Historical Publishing Company, 1924), 285-286.

and would own the property outright. Pauw called his colony Pavonia, a wordplay on the family name meaning "land of the peacocks."²⁵

Pavonia extended along the west side of the Hudson from the Narrows (tidal strait separating Staten Island and Brooklyn and location of the Verrazano-Narrows Bridge) to Weehawken and included Staten Island. Pauw's patroonship included present-day Weehawken, Hoboken, and Jersey City. Pavonia was intended to become a trading and agricultural settlement, however, the venture proved to be unsuccessful, and the land was surrendered to the Dutch West India Company. Cornelis van Vorst, Pauw's agent, remained on the land (in the vicinity of present-day Jersey City) to farm and trade until his death in 1683. As a result, Pavonia is considered the site of the first permanent European settlement in New Jersey.²⁶

In January 1641, Aert Teunissen Van Putten entered into a 12-year lease to establish farming and trade in an area north of van Vorst's farm. He cleared the land, brought in livestock, planted fruit trees, and may have built the first house in what would become Hoboken, as well as constructed the first brew house in New Jersey. Many of Van Putten's improvements were destroyed in 1643 when war broke out between the Native Americans and the Dutch; only the brewery remained. Van Patten, who was on a trading expedition at the time, lost his life at Sandy Hook.²⁷

In 1658, the Native Americans deeded the lands between the Hackensack and Hudson rivers to Petrus Stuyvesant, the last Dutch Director General of New Netherlands. In 1664, the English took New Netherland, and renamed the colony New York after the English Duke of York and Albany, who would become King James II. Under English rule, Stuyvesant successfully negotiated the articles of provisional transfer, which allowed the Dutch living in the colonies to retain their liberties. In 1663, Stuyvesant deeded his property including Hoboken, known as the Hoboken Patent, to his brother-in-law Nicholas Varlet. This deed included all the upland and marshland within the current city. According to Shaw, Varlet was residing in Bergen when he acquired this patent. The majority of the consulted historic accounts did not indicate that there were any occupants or development occurring within Hoboken prior to the early-eighteenth century.²⁸ However, a traveler's account dated to 1680 suggested that there may have been a late-seventeenth century occupation.

In a minute description of the whole country in 1608, by one George Scott, Hoboken was referred as follows: 'further up is a good plantation in a neck of land almost an island, called Hobuck. It did belong to a Dutch merchant, who formerly, in the Indian war, had his wife, children and servants murdered by the Indians, and his house, cattle and stock destroyed by them. (This was Arent Teunissen.) It is now settled again, and a mill erected there by one dwelling in New York.'²⁹

 ²⁵ Charles A. Stansfield Jr. *A Geography of New Jersey: The City in the Garden* (New Brunswick: Rutgers, 1983; second edition 1989), 71.
 ²⁶ Van Winkle 1924, 287; Firth Haring Fabend in Lurie and Mappen 2004, 622; Carmela Karnoutsos, Jersey City Past and Present (Jersey City: New Jersey City University, 2007), accessed online at

https://www.njcu.edu/programs/jchistory/pages/D_Pages/Dutch_West_India_Co.htm.

²⁷ Luizzi, 378; Charles H. Winfield, *Hopoghan Hackingh: Hoboken, A Pleasure Resort for Old New York* (New York: The Caxton Press, 1895), 26

²⁸ Van Winkle 1924, 287; Lurie and Mappen 2004, 378; Doherty 1986, 14-20; Shaw 1884, 1209.

²⁹ Shaw 1884, 1209.

Shaw further indicated that few incidents appear in the history of the city prior to 1700. Around this time, Susanna, the daughter of Nicholas Varlet, and her husband, Robert Hickman inherited Nicholas Varlet's estate. Circa 1710 to 1711, Samuel Bayard, a New York merchant who was a nephew of Peter Stuyvesant, purchased the Hoboken parcel. Bayard built a country estate at Castle Point, a high rocky outcropping along the eastern extent of Hoboken. The Bayards maintained this estate up through the Revolutionary War. The Bayards remained loyalists during the American Revolution, which ultimately resulted in confiscation of their property by the State of New Jersey.³⁰

In 1784, Colonel John Stevens, a veteran of the Revolutionary War, purchased the Hoboken tract from the Commissioners of Forfeited Estates for \$90,000. He retained a portion of the land for his own use, established ferry service across the Hudson River to Manhattan, and fostered growth of the Village of Hoboken, transforming the old farm into an urban center. He is also responsible for the current spelling of Hoboken.³¹

The Stevens family is considered the first family of Hoboken. They created a thriving center at Hoboken, were deeply involved in New Jersey and New York, and left a legacy of innovations that had a national and global impact.³² Stevens and his sons, Robert Livingston, John Cox and Edwin Augustus, constituted a prominent family that contributed greatly to business and society. Colonel Stevens, who was the "leading engineer and naval architect in America," was a founding member of the Camden and Amboy Railroad, the first rail charter in the United States.³³ Colonel Stevens along with his son, Robert, also a businessman and inventor, built the first steamship, the Phoenix, which successfully navigated the ocean.

Robert Stevens also invented the T-flanged rail used by railroads. John Cox Stevens was an avid sports enthusiast. He built several yachts and was the head of the syndicate that built and raced the schooner America. In 1851 this ship won first place in the race which would eventually become the America's Cup. John Cox Stevens was a founding member and the first commodore of the New York Yacht Club; he was also a founding member of the Union Club, the oldest Gentlemen's society in New York. John Cox also ran the Stevens' ferry company. Edwin Stevens was an engineer, inventor, and entrepreneur. He was entrusted at an early age to handle the family's business affairs. Edwin and his brother, Robert, were commissioned by the United States government to build an iron-clad naval vessel. Edwin also developed the Stevens plow, and various other innovations; he was an investor in the America. In 1853, he built Stevens Castle, a 40-room mansion, on the family estate. Through a bequest in his will, Edwin founded the Stevens Institute. Although he left the bulk of his estate to his wife and family, he set aside land adjoining the family estate in addition to monies for the establishment of an institution. In total, Stevens allocated \$150,000 for the erection of a building as well as \$500,000 as an endowment. The Stevens Institute was established as an engineering school with a curriculum that would lead to the completion of an undergraduate degree in mechanical engineering.

³⁰ Sources vary on the date of Samuel's ownership. Joan F. Doherty, *Hudson County: The Left Bank* (Northridge, California: Windsor Publications, Inc., 1986), 16; Van Winkle 1924, 499; Shaw 1884, 1209.

³¹ Jim Hans, *100 Hoboken First* (Hoboken: Hoboken Historical Museum, 2005), 113.

³² Hoboken Historical Museum, The Stevens Family (Hoboken: Hoboken Historical Museum, 2012), accessed online at https://www.hobokenmuseum.org/history/the-stevens-family.

³³ Wheaton J. Lane, *From Indian Trail to Iron Horse* (Princeton: Princeton University Press, 1939), 176.

6.2 Early Growth of Hoboken

Initially, Colonel Stevens cleared trees and restored farming at Hoboken. He built a house, Castle Point, on the highest ground; the house was used as a family summer retreat from 1786 to 1814. In 1814, the family moved from Manhattan to live in Hoboken year round. Stevens cleared land for development and laid out the street grid from the Hudson River to Willow Avenue, and from Observer Highway (historic Ferry Street) to 8th Street. Stevens lobbied the New Jersey State Legislature to establish a road to Hoboken that would compete with the toll road from Newark to Paulus Hook in Jersey City; in 1802, he became the president of the Bergen Turnpike Company. He was also the owner of the ferry from Hoboken to New York. However, Robert Fulton is credited with the invention of the first steamboat. Fulton formed a partnership with Robert R. Livingston and was granted a 20-year monopoly on the right to navigate steamboats in New York. In 1808, Fulton enforced this right of exclusivity on Stevens.³⁴

In 1804, Stevens began selling lots within Hoboken, slowly attracting new residents. In 1821, Stevens improved the ferry service, and "by 1829 there was a post office, four hotels, four groceries, three smithies, one wheelwrights, two carpenter shops, one livery stable, one distillery, one steel manufactory, three schools and a population of between four and five hundred persons."³⁵ To facilitate development, a public sale of land was held. The advertisements claimed that approximately 800 25-foot wide lots were available; the average price was \$450. The lots followed the turnpike to Hackensack for one-half mile and a square was to be reserved at the center of town for public use. An incentive was given to anyone who built a dwelling on their lot within the first year; a similar benefit, generally four years free of interest, was given for construction of wharves and storehouses on waterfront lots.³⁶

Stevens developed Hoboken as a resort community adding attractive landscaping, creating gardens and pleasure grounds. His ferries were comfortable and relatively elegant; they quickly became popular with the public. Stevens undertook several waterfront improvements including: the expansive Green with its gardens, various amusements, and refreshments; the tree-lined River Walk Promenade; and the Elysian Fields. These amenities attracted thousands of visitors, especially from New York, to Hoboken from the 1820s to the 1850s. Steven's believed strongly in the importance of steam engines. In 1825, he built a demonstration railroad with a steam locomotive to pull carriages on its circular track. In the 1830s, additional improvements were made to the public resort including a Grecian-style pavilion, called the Colonnade which was built at Elysian Fields, and the spring at Castle Point which was excavated and named Sibyl's Cave. During the first half of the nineteenth century, the Elysian Fields, north of Castle Point, was one of the most frequented pleasure grounds in the country. As many as 20,000 visitors a day would ascend on Hoboken to enjoy the promenade and the park at Elysian Fields (Figure 9).³⁷

While Stevens' Castle Point and associated amenities were attracting thousands of visitors to Hoboken, development of the larger city was slow. In 1814, Samuel Swartout and his brother Robert purchased the marsh portion of Hoboken from John Stevens. They made a vegetable garden in the marshland and tried to reclaim a large

³⁴ Lane, 176; Hoboken Historical Museum, Stevens; Hans, 113: Elan I. Zingman, Hoboken, New Jersey: a Physical and Social History (Hoboken, 1978), n.p.

³⁵ Boice DuBois, quoted in Hans, 114.

³⁶ Winfield, 32; Hans, 115.

³⁷ Hans, 114; Winfield, 59; Lorett Treese, *Railroads of New Jersey* (Mechanicsville, Pennsylvania: Stackpole Books, 2006), 109; L.F. Douglas, *Topographical Mop of Jersey City, Hoboken, and the Adjacent Country* (Jersey City: Douglas) 1941.



portion of the land. The brothers attempted to reclaim the land by erecting permanent dikes and opening ditches, creating seawalls.³⁸ "The most prominent of the sea walls...ran through the marshes at the head of Weehawken Cove" and eventually became a part of the River Walk along the western banks of the Hudson River.³⁹ By 1819 Samuel Swartout pastured around 100 cattle and raised some crops in the reclaimed marsh; however, he quickly abandoned this venture as it was not profitable. In this same year, John G. Coster acquired title to the Swartout property. The area appears to have remained relatively undeveloped until Coster laid out building lots in 1860.⁴⁰

Stevens' resort development within Hoboken not only attracted visitors on day trips, but also the affluent and noteworthy persons of the day. In 1829, John Jacob Astor, considered the wealthiest man in America during his life, built a villa on the southwest corner of Washington and 2nd streets. Stephen Foster lived in Hoboken, as did Hetty Green, one of the richest women in the country. William Cullen Bryant, Robert C. Sands, and Washington Irving were visitors. Madame Jumel and her husband, Aaron Burr, Robert Fulton, Daniel Webster, P.T. Barnum and many others visited Hoboken during the early to mid-nineteenth century. It was considered a place of beauty and solitude.⁴¹

6.3 Hoboken as a Commercial Center

In 1838, John Stevens' heirs incorporated the Hoboken Land and Improvement Company to dispose and manage his estate. The company made investments in areas that supported the overall growth and prosperity of Hoboken. Transportation was an integral component to the development of the city. Stevens had organized two ferries within Hoboken, each of which connected to points in New York City–one to Barclay Street; and in 1836, a ferry to Christopher Street was introduced. Rail service was extended to Hoboken when the Hoboken Land and Improvement Company built a railroad from Hoboken to Newark where it connected with the Morris and Essex Railroad (M&E). Historic accounts suggest that the Hoboken Land and Improvement Company invested in the Erie Canal and subsequently built a rail line from the canal to the Delaware and Hudson Canal Company's coal docks in Weehawken.

The Hoboken Land and Improvement Company also regulated development within the city and guided it in a "distinctly urban direction."⁴² New buildings had to be at least three stories high; these structures had to be either brick or stone. Defined neighborhoods were constructed with distinctive rows of buildings.

By the 1850s, Hoboken had been a tourist community for several decades. The population in 1851 was 3,292, a substantial increase from the previous year when the population was 2,431. In July 1852, the New York Times reported that 150 new buildings had been erected during the previous season and that the number was expected to be even higher during the current year (Figure 10). Most of the residents worked with luxury goods and services for the tourist trade. A large group of artisans that supported the shipping industry, including ship carpenters and

³⁸ Winfield 1874, 320.

³⁹ THE Partnership 2009, 2-2.

⁴⁰ Shaw 1884, 1210.

⁴¹ Robert R. Rieser and Volk (A.J.) Co., Three Centuries of Progress: A Brief History of Hoboken, New Jersey and Teaneck, New Jersey from 1609-1940 (Hoboken: A.J. Volk Co.., 1940), 12-13.

⁴² Zingman, n.p.



sail makers, worked on the docks. Many were employed in conjunction with the ferry services. A large segment of the population also worked in the buildings trades. These occupations included carpenters, masons, and plasterers, craftsmen needed in a rapidly expanding city. During this period, the former Stevens' villa and piers were replaced by a new mansion.⁴³

The 1850s marked a peak in Hoboken's tourist industry; around this same time, the economy of the city began to shift towards industry. The Hoboken Land and Improvement Company continued to develop railroads, such as the Lackawanna and Western Railroad (the subsequent Delaware, Lackawanna and Western Railroad (DLWRR)), which made Hoboken its terminus on the Hudson. Known for its reliance on clean burning anthracite coal, the DLWRR brought the coal industry to Hoboken. By the mid-nineteenth century, immigrants began to settle within Hoboken, filling an increasing need for workers. These early immigrant groups included the Irish who were fleeing the potato famine, and the Germans who were escaping unrest among the German states. The German population was the largest ethnic group within Hoboken up until World War I. By the twentieth century Hoboken would be known as the "most German city in America."

The first church, St. Paul's Protestant Episcopal Church, was consecrated in Hoboken in 1835. The Dutch Reformed Church was erected in 1850. The first stage coach arrived in 1855; initial water mains were installed within the city in this same year. In 1858 the city gained its first Public School, School No. 1 (No. One). In 1849, the Township of Hoboken was formed from North Bergen and included present-day Hoboken and Weehawken. In 1855, Hoboken was incorporated as a city; the Weehawken portion was setoff as a separate township in 1859.⁴⁴

In the 1860s, the tourism industry had severely diminished, and Hoboken was developing into a shipping-railroadindustrial city. This period witnessed the advent of transatlantic shipping and development of Hoboken as a port with piers stretching out into the Hudson. The first shipping lines, the Hamburg America Steamship Company and the North German Lloyd Steamship Line, opened in 1863. They were followed by the Netherlands American Steam Navigation Company in 1872, the Thingralla Steamship Company in 1873, the Wilson Line and the Scandinavian American Line in the 1880s, and the Holland America Line in 1897. The city swelled with new workers, more than doubling in population between 1860 and 1870, when the population went from 9,659 to 20,297, respectively.⁴⁵

The expanding city population created a need for worker housing. Beginning in the 1880s, development within the city began to expand to the north and west of the initial upland core. Bailey and Ward's 1881 *Birdseye View of the City of Hoboken* illustrates the quickly expanding city and the development of densely clustered buildings, particularly rowhouses to the north of 5th Street (Figure 11).⁴⁶ Development during this period was often located in the low-lying meadowlands, previously undesirable areas which required filling.

⁴³ Zingman, n.p.; Jersey City, *The New York Times* (July 13, 1852); M. Dripps, *Topographical Map of New York City, County, and Vicinity* (New York: M. Dripps) 1855.

 ⁴⁴ Zingman, n.p.; Lurie and Mappen, 858.
 ⁴⁵ Zingman, n.p.

⁴⁶ O.H. Bailey and A. Ward, *The City of Hoboken, New Jersey* (Boston: O.H. Bailey & Co.) 1881.



The growing population also spurred the creation and extension of municipal services. In 1863, the Hoboken Gas Company, which provided gas to Hoboken, Union Hill, and West Hoboken, was organized. Water was supplied to Hoboken from Jersey City from 1857 to November of 1882. The Hackensack Water Company Reorganized was formed in 1881. By November of 1882 the company began supplying water to Hoboken. The company eventually supplied water to Union, West Hoboken, Weehawken, North Bergen, and Hackensack.⁴⁷ Sewer lines had originally been installed within the original upland portion of Hoboken in the 1850s. Attempts were made to expand this system to the north and west throughout the mid-nineteenth and early-twentieth centuries to service newly laid streets and the growing population. By 1884, there were six sewer outlets for the city; this system was found to be inadequate with particular respect to the meadowlands and contributed to deleterious conditions within portions of Hoboken in the late-nineteenth century.⁴⁸ The sewer system will be discussed in greater detail in Chapter 8.3.

Located one mile across the Hudson from Manhattan, Hoboken's transformation into a major port facility during the mid- to late-nineteenth century was "a critical part of the expansion of the Port of New York in response to increased trade with, and emigration from, Europe."⁴⁹ By the start of the twentieth century, Hoboken had docks and warehouses along River Street and along the Hudson River waterfront. The city also had a readily available immigrant labor force, resulting from the European transatlantic lines and, the opening of Ellis Island in 1892. The extensive waterfront development and labor force, coupled with the available rail transportation, set the stage for industrial growth within Hoboken.

By the end of the nineteenth century, Ziegler-McPherson, author of *Immigrants in Hoboken*, pointed out that five major railroad depots existed along the west side of the Hudson River, and each provided ferryboat service for passengers to cross to and from Manhattan.⁵⁰ The New York Central Railroad had its eastern terminus at Weehawken; Jersey City had terminals for three railroads, the Erie, the Pennsylvania Railroad, and the Central Railroad of New Jersey. In Hoboken, the DLWRR operated and owned the eventual Erie-Lackawanna Ferry Terminal in the southern part of the city; this terminal formed the eastern terminus of the rail line, terminating at the ferry station to Manhattan. By the late-nineteenth to early-twentieth century, the Erie Railroad had also constructed an extensive freight terminal in the southern portion of Weehawken.

The West Shore Railroad extended along the hillside to the west with a depot along the shoreline in Weehawken, north of the Erie Freight Terminal. The Hoboken Manufacturers' Railroad, a shortline later called the Hoboken Shore Railroad, extended along Hoboken's waterfront and connected to the New Jersey rail system. The 14th Street ferry began operations in the 1880s. Horse-drawn trolleys traversed Washington Street beginning in 1861, and were replaced by electric trolleys in 1892. A late-nineteenth to early-twentieth century elevated trolley line was located along Observer Highway, and extended to the west over the Palisades and into Jersey City. By the late-nineteenth century, this transportation network of rail, ferries, and steamships contributed to Hoboken's industrial development and population growth, its connection to New York City, and its development as an immigrant city.⁵¹ In short,

⁴⁷ Shaw 1884, 1217-1219.

⁴⁸ Shaw 1884, 1211-1213.

⁴⁹ Christina A. Ziegler-McPherson, Immigrants in Hoboken: One-Way Ticket, 1845-1985 (Charleston: The History Press, 2011), 13.

⁵⁰ Ziegler-McPherson, 31.

⁵¹ Ziegler-McPherson, 31.

Hoboken and its neighboring Hudson River cities became the conduit between New York City and rail lines to the west, enabling a connection between Manhattan and the rest of the country.

On June 30, 1900, one of the worst maritime disasters took place along Hoboken's waterfront. On this date a fire began at the German Lloyd piers and quickly spread from ship to ship, destroying ships, piers, and the nearby warehouses; hundreds of people died. Another fire in 1905 destroyed the DLWRR Ferry sheds, the DLWRR depot, and Dukes House, one of Hoboken's most notable restaurants. The DLWRR Erie-Lackawanna terminal was rebuilt and opened in 1907.⁵²

By the end of the nineteenth century, Hoboken was a bustling city with five hotels, 19 churches, two theaters, a concert hall, and social clubs. Educational institutions included seven private schools, six public schools, and the Stevens Institute. The town boasted several tanneries, a number of iron works, and manufacturers of leather goods, soap, food products, paper, oils, cloth, boxes, artists' materials, and lead pencils. Industrial companies included lumber companies, suppliers of plaster, varnish, paints, and millworks for moldings, and a brass manufacturer. In addition to the steamship piers and ferry docks, coal pockets were located along the Hudson River where Campbell & Co. operated large public storehouses and piers.⁵³

6.4 Hoboken through the 20th Century and Into the Present Day

In 1910, Hoboken's population had swelled to over 70,000 residents; the population had increased by more than 10,000 residents each decade from 1860 through 1910.⁵⁴ The population peaked in 1910. In subsequent decades, the population steadily declined through the remainder of the twentieth century.⁵⁵

Development of Hoboken spread to the north and west of the early settlements. In July 1912, the Hoboken Land and Improvement Company began construction of the 10-story Factory Terminal Building between 15th Street and Washington Cove. Inspired by the 1911 Bush Terminal Company Facility in Brooklyn, the Hoboken Land and Improvement Company wanted to build modern manufacturing loft buildings in a location that was both serviced by rail lines and near the water. The first building within the Factory Terminal was opened to occupants in 1913. By 1914, 10 tenants occupied the building. Five additional buildings were constructed within this area by 1916. Businesses which occupied the six-building complex through the early and mid-twentieth centuries included the Lipton Tea Company, the Jewel Tea Company, and the Independent Warehouses, Inc. By 1940, Standard Brands and General Foods had acquired four of the six buildings. These companies were two of the leading manufacturers of retail products in the mid-twentieth century. Standard Brands represented a 1929 merger of Fleischmann (Yeast) Company, Royal Baking Powder, and E.W. Gillett, Ltd. (a Canadian maker of baking powder and extracts).⁵⁶

⁵² New Jersey Transit, 100 Years Hoboken Terminal (Newark: NJ Transit, February 2007), 1.

 ⁵³ Sanborn-Perris Map Co., *Insurance Maps of Hudson County, New Jersey*, Vol. 7 (New York: Sanborn-Perris Map Co., 1891); Doherty.
 ⁵⁴ Ziegler-McPherson, 32, 38.

⁵⁵ Phillips Preiss Shapiro Associates, Inc., Hoboken Today: How Do We Compare (February 2003), accessed online at http://www.hobokennj.org/pdf/mplan/Demographics.pdf.

⁵⁶ Sanborn-Perris Map Co. (1891); Real Estate Record and Builders' Guide, "Current Building Operation: Factory and Railroad Terminal in Hoboken Project Similar to the Bush Development in South Brooklyn," Vol. 96 n. 2477, September 4, 1915; Hoboken Board of Trade, "Manufacturers Find Hoboken a Desirable Locality," *Hoboken Board of Trade Bulletin* Vol. IV No. 1, January 1914, "An Ideal Location for Your Business," *Hoboken Board of Trade Bulletin* Vol. IV No. 4, April 1914, "Hoboken's Prosperity Assured," *Hoboken Board of Trade Bulletin* Vol IV No. 7, October-November 1914.

The initial attempts at construction of a rail tunnel under the Hudson River, connecting Manhattan and Hoboken, began in 1873 with the founding of the Hudson Tunnel Railroad Company. Former Union Army Colonel DeWitt Clinton Haskins organized the tunnel company, and began construction of a Hudson River tunnel in 1879. The tunnel was intended to extend from the Hoboken Ferry Terminal to Christopher Street in Greenwich Village. The first effort at construction of the tunnel was terminated in 1880, following a blowout of the pressurized digging chamber resulting in 20 deaths. In 1888, the Hudson River Tunnel Company began a second attempt at completing the tunnel. The project was, however, terminated before completion due to financial difficulties.⁵⁷

In 1902, attorney William Gibbs McAdoo began to obtain financing to complete the tunnel project. McAdoo founded the Hudson and Manhattan Railroad Company (H&M). This third attempt at constructing the tunnel used the efforts of the previous two attempts, resuming work on the tunnel that was initially opened and using the Greathead Shield which had been abandoned in place by the second attempt. On February 25, 1908, a nine-car inaugural train was run along the completed H&M. The line extended for 6.2 miles from 19th Street and 6th Avenue in Manhattan to the ferry terminals in Hoboken. The ride lasted approximately 10.5 minutes. In this same year, the H&M constructed railroad repair shops in Hoboken near Hudson Street and Hudson Place.⁵⁸

Within a few years, the H&M was a tremendous success. By 1910, the H&M had opened four new stations and several miles of new tracks and tunnels. By 1913, the H&M had been extended to 33rd Street in Manhattan and to locations in Jersey City and Newark. The rail line consisted of approximately 7.25 miles in New York and 11 miles in New Jersey; the railroad maintained a total of 190 rail cars.⁵⁹

At the turn of the twentieth century, additional railroads that terminated in New Jersey across the river from New York City pursued the establishment of a direct link with Manhattan. The Pennsylvania Railroad was one such rail line; the Pennsylvania Railroad determined that constructing a tunnel under the river would be the most affordable means by which to connect to Manhattan. Between 1904 and 1910, the Pennsylvania Railroad constructed a system of trackage and tunnels, including a tunnel through Bergen Hill and a tunnel under the Hudson, to connect Manhattan with New Jersey and Long Island. All of the new trackage was electrified; the tunnels within New Jersey and under the Hudson are known as the North (Hudson) River Tunnels. A vent shaft for the North River Tunnels was established in Weehawken between the east end of the river tunnel and the beginning of the west end of the Bergen Hill Tunnel. The vent shaft originally consisted of a man-made open well with a 115 foot by 55 foot opening at an elevation of 50 to 60 feet below grade. The well was covered circa 1943 with a 4'6" thick concrete slab and then backfilled up to the surrounding grade. Four headhouses were built over the vent.⁶⁰

⁵⁷ French 2002, 78; Joe Mysak, *Perpetual Motion: The Illustrated History of the Port Authority of New York and New Jersey* (Los Angeles: General Publishing Group, Inc.) 1997, 20; Lynn Drobbin, "Hudson & Manhattan Railroad Repair Shops," *Historic American Engineering Record* 1997, 7-8.

⁵⁸ Hans 2005, 48-49; Drobbin 1997, 7-8.

⁵⁹ Drobbin 1997, 8.

⁶⁰ NJHPO, "North River Tunnels: Amtrak Northeast Corridor under Hudson River, Bergen Portal to 10th Ave. Portal, NY," Property File (Trenton: NJHPO) 1998; Condit 1980, 272-273.

In the early 1930s, the Port Authority of New York and New Jersey (PANYNJ) initiated plans to build a Midtown Hudson Tunnel, similar to the recently completed Holland Tunnel. Construction of the tunnel began in 1934 with crews working simultaneously from the New Jersey side in Weehawken and from the New York outlet between 31st and 32nd streets. The first "hole through" was achieved on August 3, 1935. The center tube of the Lincoln Tunnel was opened for traffic on December 22, 1937. The north tube was opened on February 1, 1945; the south tube was opened on May 25, 1957.⁶¹

In association with the opening of the Lincoln Tunnel the PANYNJ constructed a curved viaduct known as the Helix. The Helix is a component of an approximately 2.8-mile long road artery constructed between 1938 and 1939 to serve as the main New Jersey approach to the Lincoln Tunnel. The roadway, historic Route 3, present-day Route 495, was designed to carry the roadway from the low meadows west of Bergen Hill up to the open-cut in Bergen Hill and then back down to the tunnel entrance east of Bergen Hill. Numerous bridges had to be built along the roadway and in association with pre-existing local streets which had to be extended over the cut. A bridge was also built for crossing of Hudson Boulevard. The viaduct is composed of a series of concrete girders and four longer spans of deep Warren deck trusses on the outside matched with haunched deck girders on the inside. The viaduct was widened in 1957. The NJHPO determined that a portion of the Helix, the NJ 495 Viaduct over Baldwin Avenue and Conrail, is eligible for listing in the National Register under Criterion C as an innovative engineering solution to building a highway with limited access and through a congested area.⁶²

In 1912, after the United States had entered World War I, the federal government seized the piers and warehouses of German-owned shipping companies in Hoboken. The piers were then used as a point of embarkation for U.S. troops and supplies. The former shipping piers became the center of wartime activity, and a major shipping port for food and military supplies.⁶³ Two million soldiers were transported to France by way of Hoboken. As a result of the military's seizure of the ports, Hoboken lost the tax revenues from the steamship line. Shipping activities were diminished and would never rebound to pre-World War I levels; the German character of Hoboken was also lost as clubs closed and German names were eliminated from local businesses. Tax revenues were also lost from the army's closure of beer gardens and taverns; this situation was further compounded by prohibition.⁶⁴

During the interwar years, Hoboken continued as a transportation center. According to the WPA guide written in the 1930s, there were ten steamship lines, three of which carried both passengers and freight, and five railroads, one of which only served the manufacturing industries of Hoboken. In 1930, Thomas Edison operated the first electrified train on the DLWRR, which departed from Hoboken and travelled to Montclair. Several of the larger manufacturing concerns within Hoboken in the early to mid-twentieth century had begun in the early 1890s or before. These businesses included the R. Neumann & Co., leather tannery; W. & A. Fletcher Company who operated the North River Iron Works; Keuffel & Esser, manufacturers of blueprint paper, drawing instruments, and artists' supplies; and R.B. Davis & Co, manufacturers of baking powder. Most workers were employed on the railroads, on the

⁶¹ Mysak and Schiffer 1997, 82-87; Port Authority, "Lincoln Tunnel: History," accessed March 28, 2016, http://www.panynj.gov/bridgestunnels/lincoln-tunnel-history.html.

⁶² NJHPO, "NJ 495 Viaduct over Baldwin Avenue and Conrail," Property File (Trenton: NJHPO) 1995.

 ⁶³ Baranowski 1988; Mary Delaney Krugman & Associates and William Sandy 2014; Hartman and Lewis 2016; Hoboken Planning Board 2014.
 ⁶⁴ Doherty, 69; also Captain King W. Snell, *With the Army at Hoboken* (New York: Elbert E. Wonderly, 1919).

waterfront, or in factories. During this period, the Italian population became the largest ethnic group within Hoboken.⁶⁵

The end of World War I accelerated the economic decline within Hoboken. The stoppage of military-related industry and the relocation of the German population contributed to a loss in population. Between 1910 and 1940, the population of Hoboken shrank by 20,000. By 1940, there was a 15.7 percent vacancy rate in housing.⁶⁶

World War II helped to bring Hudson County out of the Depression. After the war a new era of urban planning was ushered in, as urban renewal and community development initiatives reshaped urban areas. Much of the railroad shipping and pedestrian industry diminished in the mid-twentieth century. The new importance of air travel and the development of containerized cargo which required deep water ports unlike the Hoboken waterfront, undermined Hoboken's shipping industry and resulted in increasing decline and disrepair along the waterfront. The nature of the middle class within Hoboken also changed in the 1940s. The children of the early-twentieth century Italian immigrants moved away and immigration from Puerto Rico and Cuba in the 1950s increased the Latino population. By 1954, the Puerto Rican population within Hoboken reached 400,000.⁶⁷

In 1949, Congress enacted Harry Truman's American Housing Act (Title V of P.L. 81-171) as part of his Fair Deal initiative. The American Housing Act provided for federal financing for slum clearance programs associated with urban renewal; it also extended federal money to build public housing. Hoboken established the Hoboken Housing Authority (HHA) as a result of the American Housing Act and made plans for improvements to the city. Hoboken quickly applied for Public Housing Grants to finance construction of low-cost housing projects. These projects would provide for the construction of new low-cost housing to replace the same number of sub-standard slum dwellings. In March 1950, Hoboken announced that its eight million dollar municipal low-cost housing project had been approved by the Federal Public Housing Administration (FPHA). As a result of this grant the first public housing projects, Andrew Jackson Gardens and Christopher Columbus Gardens, were built in 1952; Harrison Gardens was completed in 1959.⁶⁸

Land was also cleared for parks and athletic facilities. After more than 100 years of influence over development in Hoboken, the Hoboken Land and Improvement Company dissolved in 1956. Around this same time, the Hoboken Catholic Academy (1955) and the Hoboken High School (1962) were built. In November 1967, the Hoboken Ferry was terminated; the ferry service was restarted in 1989.⁶⁹

The Depression era heralded a decline in rail use as vehicular traffic became the preferred mode of commuter and freight transport. Given continuing declines in ridership, in 1954 the DLWRR combined with the Erie Railroad

⁶⁵ Federal Writers' Project of the Works Progress Administration for the State of New Jersey, Newark Public Library, New Jersey Guild Associates, *The WPA Guide to 1930 New Jersey*, reprint 1986 (New Brunswick: Rutgers University Press, 1939), 264; New Jersey Transit; Sanborn Map Company, *Insurance Maps of Hudson County, Hoboken, New Jersey*, vol. 7 (New York: Sanborn Map Company, 1938).
⁶⁶ Zingman, n.p.

⁶⁷ David Hartman and Barry Lewis, "History of Hoboken," accessed online <u>http://www.thirteen.org/hoboken/history.html</u>; Zingman, n.p.

⁶⁸ Hoboken Housing Authority; John Milner Associates, Inc., *Public Housing in New Jersey Historic Context Study*, 2001.

⁶⁹ Sanborn, various; Hoboken Housing Authority; Doherty.

Company. In 1968 the Erie-Lackawanna Railroad merged with a new company, Doreco. By 1972, the railroad merged with Conrail. By the end of the 1970s, the railroad was under the control of its current owner, NJ Transit.

With commuters increasingly using automobiles and the construction of the Hudson Tunnel, the Lincoln Tunnel, and the George Washington Bridge, easing vehicular access to Manhattan, ridership of the H&M also declined. In the 1950s, the H&M fell into bankruptcy but continued to operate. The Port Authority Trans-Hudson Corporation (PATH) was formed in 1962 as a subsidiary of the PANYNJ. PATH assumed control of the H&M and continues to maintain and operate the system.⁷⁰

As the twentieth century came to a close, Hoboken, which had diminished and experienced a marked decline in the 1970s, experienced a revitalization and renewed civic spirit. Small steps towards the rejuvenation of the city began in 1967 when Hoboken received a "Model City" designation. "This early federal block grant program required minimal local cash shares in project cost, thus making renewal projects accessible to poorer cities."⁷¹ Beginning in the early 1970s, the Applied Housing Corporation within Hoboken, enacting a federal philosophy expressed by the Department of Housing and Urban Development which shifted from a program of social renewal to physical renewal and began to rehabilitate large swaths of dilapidated housing stock. These structures were removed and replaced with new affordable housing. By April 1977, Hoboken Mayor Steve Cappiello reported that 20 percent of the housing stock within the city had been wholly or partially rehabilitated since 1972. During this time, there was a shift in the city's population with artists and musicians moving into Hoboken in search of affordable urban living in proximity to Manhattan.

The artist communities were followed by young, white-collar professionals seeking the same locational and cost benefits. The 1970s also witnessed an increase in new construction within Hoboken. Around this time, the history and architecture of the city were surveyed and historic districts in the eastern sections of town were designated and preserved.⁷²

Between 1975 and 1976, the Keuffel and Esser west building became Hoboken's first adaptive use project. The former factory building was converted into apartments. In 1984, the company's east building was also converted. The converted Keuffel and Esser factory became known as the Clock Tower Apartments. During the 1990s, Hoboken experienced its first population increase in decades; the population increase was significant. By 2000, Hoboken had a population of approximately 38,600, a count which represented a 16 percent population increase from 1990.⁷³

During the 1990s, much of the development within Hoboken was located along the waterfront. Old docks and marinas which were no longer used were transformed into parks, walkways, and roads. Hoboken was soon considered a portion of New Jersey's Gold Coast, a stretch of real estate stretching along the Hudson River opposite

⁷⁰ Drobbin 1997, 8; Port Authority of NY & NJ, "PATH: History," accessed March 17, 2016, http://www.panynj.gov/path/history.html.

⁷¹ Hoboken Planning Board, 2004, 22.

⁷² Gabrielan, 10; Doherty; Hoboken Planning Board 2004, 7, 21-23.

⁷³ Gabrielan, 127; Doherty; Hoboken Planning Board 2004, 7.

from Manhattan. This area includes Jersey City, Hoboken, Weehawken, West New York, and Edgewater. Each of these towns has experienced increased commercial and residential development from the 1990s through to the present-day in association with rising rents and housing shortages in Manhattan and its surrounding boroughs. The Gold Coast communities provide easy transit access to the city along with waterfront views and cheaper rents.⁷⁴

Additional residential development and adaptive reuse of historic structures occurred through the 1990s and into the 2000s. In 2000, the Hudson Tea Buildings were adaptively remodeled as condominiums. By 2003, two 12-story towers of The Shipyard apartment complex were completed on the rebuilt 14th Street pier. Similarly in 2008, a series of five-story low rise apartment buildings were opened along the waterfront on 11th Street, in the location of the former Maxwell Complex. New high-rise constructions have also been built within the city including the 1987 Skyline at 551 Observer Highway, the 2002 Hoboken Grande at 610 Newark Avenue, and Harrison Court at 659 1st Street.75

In 1989, New York Waterway (NY Waterway) renewed the Hoboken ferry lines. NY Waterway was organized by Arthur E. Imperatore in 1986. The rejuvenation of the Hoboken ferries contributed to the redevelopment of Hoboken's waterfront and development within the city. In 2004, NY Waterway operated ferry service from the Hoboken Terminal to four destinations within Manhattan: the World Financial Center, Pier A at Battery Park, Pier 11 on Wall Street, and West 38th Street. There were also two routes which provided service from 13th Street in Hoboken to West 38th Street and the World Financial Center. Today, NY Waterway continues to operate ferry lines between Midtown Manhattan and 14th Street in Hoboken; Pier 11/Wall Street and the Hoboken Terminal; and between the World Financial Center and 14th Street in Hoboken or the Hoboken Terminal.⁷⁶

The Hudson-Bergen Light Rail (HBLR) was opened in April 2000. The 20-mile system consists of 48 Kinki Shrayo articulated low-floor LRVs powered by overhead catenary. The system uses former railroad right-of-ways (ROWs) at its northern and southern ends and has a newly built ROW between Liberty State Park and Hoboken Terminal. In 2004, a branch line was opened from Hoboken Terminal to Lincoln Harbor, extending from Hoboken Terminal to the west and then north along an existing ROW at the base of the Palisades. This line then turns to the northeast around 17th Street and extends into Weehawken to the west of Waterfront Terrace. The HBLR system is a vital component within the daily commuter traffic network.77

During the early 2000s, some of the newer constructions along Hoboken's waterfront began to crumble. A section of Sinatra Park caved into the Hudson River in 2009. A portion of the park was located on a timber bulkhead which had been worn away by shipworms, tiny mollusks who bored into the wood. A piece of the promenade at Castle Point also collapsed in 2007. An examination of Pier A, located to the immediate north of the Hoboken Terminal, found that the underlying mud had receded below the concrete jackets, exposing the steel support beams to corrosive salt water. Portions of FSD had collapsed several times since its construction in 1998.⁷⁸

⁷⁴ Deborah Bailin, Hoboken's Post-Sandy Resilience: Learning from the Past, Rebuilding for the Future (Washington, D.C.: Union of Concerned Scientists) 2014; Richard Pérez-Pêna, "As Hoboken's Riverfront Crumbles, the Cost for Repairs Soars," The New York Times February 7, 2011.

 ⁷⁵ Gabrielan, 94-97, 127-135; Doherty; Hoboken Planning Board 2004, 7.
 ⁷⁶ New York Waterway, "About Us," accessed online August 15, 2016 at <u>http://www.nywaterway.com/AboutNYWaterway.aspx</u>; Hoboken Planning Board, 2004, 74.

⁷⁷ Jeremiah Cox, "New Jersey Transit's Hudson-Bergen Light Rail," accessed April 13, 2016 at http://subwaynut.com/hblr/index.php. ⁷⁸ Pérez-Pêna 2011; Bailin 2014.

On October 29, 2012, Superstorm Sandy slammed into the eastern United States. The storm resulted in a massive storm surge which inundated Hoboken, knocking out the power grid, flooding the Hoboken Terminal and associated train tunnels, flooding homes, and stranding residents. As a result of the storm, damages within Hoboken were estimated as well over \$100 million to private property, including 1,700 homes, \$100s of millions of dollars to the transit system, and \$10 million to city property, including three fire stations, the community center, the public works garage, the volunteer ambulance corps, and municipal parks and recreational facilities. Businesses also suffered with over 200 businesses flooding; 60 percent of businesses reported a loss in revenue months after the storm. The Hoboken Terminal, including the PATH train, was shut down for several months due to flooding and associated damage. This closure affected not only commuters living within Hoboken and adjacent communities, but also commercial businesses, particularly restaurants and bars, who would service commuting populations. Limited PATH train service renewed on December 19, 2012; complete service was restored by January of 2013.⁷⁹

For the most part, over these early decades of the twenty-first century, Hoboken's population has increased due largely to a number of new residential towers and continued rehabilitation of older industrial buildings. Development continues in Hoboken as the city continues to provide an attractive urban setting for individuals looking for transit access to Manhattan alongside more affordable housing prices. Today, Hoboken describes itself as a vibrant urban destination that embraces its rich history and offers cultural, recreational, and commercial development. With its proximity to Manhattan, new residential projects overlooking the waterfront, and viable historic districts, Hoboken has entered a new and revived chapter in its history.⁸⁰

6.5 Weehawken Early Development⁸¹

Weehawken Township is bounded by Hoboken to the south, the Hudson River to the east, West New York to the north, and Union to the west. Originally part of Hoboken, the township was formed in 1859.⁸² Although several suggestions have been made regarding the origins of the name Weehawken, it is generally considered to derive from the Algonquian term for "land of maize." Weehawken is bisected by the cliffs of the Palisades with a strip of low-lying land along the Hudson on its east and the high ground on the Palisades on its west. The Palisades rise about 300 feet above high tide and in some places form a sheer rock wall.⁸³

Weehawken shares much of its early history with Hoboken. The township was the far northern extent of the seventeenth century patroonship of Pavonia held by Michael Pauw, a director of the Dutch West India Company. As Pauw was unable to meet the settlement requirements for a patroonship, he had to relinquish his claim to the

⁷⁹ Bailin 2014; Ray Rivera, "Its Restaurants Empty and Its Trains Stalled, Hoboken Encounters Storm's Increasing Toll," *The New York Times* December 16, 2012; Charles Hack, "Hoboken Commuters' Verdict: Reopened PATH Train Service was 'Flawless," *The Jersey Journal* December 20, 1012.

⁸⁰ Hoboken, New Jersey, Hoboken's History, accessed online at <u>http://www.hobokennj.org/visit/history/</u>.; Rich Bockmann, "Gold Coast Development Glut in NJ?" *The Real Deal: New York State Real Estate News* October 1, 2014.

⁸¹ As previously noted, the histories of Weehawken and Jersey City will focus primarily upon those portions which fall within the Study Area. Detailed histories of the two municipalities are outside the scope of the current study given how little of the Study Area is located within either Weehawken or Jersey City.

⁸² Daniel R. Campbell in Lurie and Mappen, 858; John E. Snyder, *The Story of New Jersey's Civil Boundaries: 1606-1968* (Trenton: Bureau of Geology and Topography, 1969; reprinted New Jersey Geological Survey, 2004), 148. According to Snyder, Weehawken was formed from Hoboken City and North Bergen Township.

⁸³ Campbell in Lurie and Mappen, 858; Van Winkle, 499.

Dutch West India Company within four years. Present-day Weehawken does not appear to have been settled during this early period.

From an early date, the name Weehawken has been associated with the town, a ferry, and the dueling grounds. The area associated with the town was described as being between two streams, Hoboken Creek and Weehawken or Mill Creek. In 1678, Nicholas Bayard acquired the area of Weehawken and built a sawmill and corn mill. The Weehawken Ferry was one of the earliest to run between New Jersey and Manhattan. Established before 1700, it predated ferry service at Hoboken. This ferry conveyed passengers, cattle, horses, and produce. A slip had not been constructed for the Weehawken Ferry; rather, a small dock extended into the river. Around 1710, Samuel Bayard, who owned the piece of land called Weehawken, requested the right to operate a ferry from this location; an existing ferry had already been in operation for at least twenty years.⁸⁴

The Bayard family retained ownership of the Weehawken area until the Revolution. As previously noted, the Bayards were loyalists during the American Revolution, which resulted in confiscation of their property by the State of New Jersey.⁸⁵ In 1784, Colonel John Stevens, a veteran of the Revolutionary War, purchased the tract from the Commissioners of Forfeited Estates for \$90,000. He retained a portion of the land in Hoboken for his own use, established a ferry at Hoboken, and fostered growth of the Village of Hoboken.⁸⁶ Stevens reportedly sought control of the Weehawken Ferry, but was not successful. In 1802 or shortly thereafter, a second ferry was established at Weehawken; each was distinguished as the "new Ferry" and the "old Ferry." By the 1810s, the Weehawken ferries had lost most of their business to other ferry services, in particular to the Hoboken Ferry.

During the Revolutionary War, Weehawken was used as a lookout point for Continental troops to spy on the British situated in New York and controlling the surrounding waterways.87

6.6 Weehawken During the Nineteenth Century

During the early-nineteenth century, a portion of Weehawken along the Hudson River was used as a notorious dueling ground. According to a description provided by Winfield, the dueling ground was located:

two and a half miles above Hoboken. The rocks here rise almost perpendicularly to one hundred and fifty feet above the river. Under these heights, about twenty feet above the water, on a grassy shelf about six feet wide, and eleven paces long, reached by an almost inaccessible flight of steps, was the dark and bloody ground...The ground was singularly secluded from inquisitive neighbors and meddlesome officials. With no path leading to it along the river or from the heights, its only approach was by boat.88

⁸⁴ Campbell in Lurie and Mappen, 858; Van Winkle, 499.

⁸⁵ Sources vary on the date of Samuel's ownership. Joan F. Doherty, Hudson County: The Left Bank (Northridge, California: Windsor Publications, Inc., 1986), 16; Van Winkle, 499. ⁸⁶ Jim Hans, *100 Hoboken First* (Hoboken: Hoboken Historical Museum, 2005), 113.

⁸⁷Nj.com, "Weehawken: A Township Significant for its Rich History," accessed online May 23, 2016 at

http://www.nj.com/towntours/2016/02/weehawken_a_township_significa.html.

⁸⁸ Winfield 1874, 200-201.

At least a dozen known duels occurred at the Weehawken dueling ground, although it is believed that many unknown duels also transpired. The most notable duel to have occurred within Weehawken was the duel between Aaron Burr and Alexander Hamilton on July 11, 1804. Hamilton was mortally wounded and died the following day.⁸⁹

During the mid-nineteenth century, prior to the separation of Hoboken and Weehawken, visitors to Colonel Stevens' Hoboken estate often visited Weehawken. Histories place Charles Dickens as a visitor to Weehawken in 1842; historical accounts associate Elysian Fields and Sybil's Cave as much a part of early Weehawken as Hoboken.⁹⁰

Through most of the nineteenth century, development of Weehawken was limited. After the establishment of Weehawken from Hoboken in 1859, the township continued to remain sparsely settled. The G.M. Hopkins 1873 Map of Weehawken indicates that most of the area consisted of large estates owned by New York businessmen including James G. King and James Brown. Industrial and transportation-related growth began along the waterfront after the Civil War and Hoboken's associated resort industry waned alongside the industrial growth, including railroad expansion, oil tanks, and the Delaware and Hudson Canal Company's coal basin. At this same time, the Hoboken Land and Improvement Company, owned by the Stevens' family, also owned parcels near the waterfront.⁹¹ In 1870, a train line was extended through the former dueling grounds in Weehawken.⁹²

Railroads were first expanded into Weehawken due to the efforts of Jay Gould and the New York and Erie Railroad. Having outgrown the Erie's terminal facilities in Jersey City, Gould looked north to find an area on the Hudson for expansion. Specifically, "the Erie required additional waterfront freight facilities for the trans-Hudson traffic on which most lines reaching the Port of New York from the west had to concentrate."93 After acquisition of ROW and purchase of approximately 60 acres of land and water in 1868, the Erie built a separate branch line, the New York and Fort Lee Railroad, along the coast from Jersey City to Fort Lee. Rather than develop its own terminal, the railroad initially formed freight agreements. By 1873, the Venango Oil Company operated three piers with several oil tanks and sheds to the immediate north of Weehawken Cove. Venango was controlled by Ohio Standard, which became part of Standard Oil in 1882. Erie also hauled coal to the docks, first possibly to the Pennsylvania Coal Company, and later to the Delaware and Hudson Canal Company.94

In 1881, and while in receivership, a separate Erie construction arm was formed, and construction began for a terminal and expanded facilities. Before the terminal had been completed, the rival New York Central gained control of the New York and Fort Lee Railroad in 1886, north of the canal basin.95

⁸⁹ Campbell in Lurie and Mappen, 859; Van Winkle, 497, 501.

⁹⁰ Rieser and Volk Co., 12; Van Winkle, 502. See also Weehawken Historical Society.

⁹¹ Griffith Morgan Hopkins, Plan of Weehawken, Combined atlas of the State of New Jersey and the County of Hudson (Philadelphia: G.M. Hopkins & Co., 1873); Lauren Sherman and Ellen Robb Gaulkin, Weehawken, for the Weehawken Historical Commission (Charleston: Arcadia Publishing, 2009), 10.

⁹² Atlas Obscura, "Weehawken Dueling Grounds," accessed May 23, 2016 at http://www.atlasobscura.com/places/weehawken-dueling-

grounds. ⁹³ Raber Associates, Assessment of Cultural Resources in the Lincoln Harbor Development Sites, Township of Weehawken and City of Hoboken, Hudson County, New Jersey (South Glastonbury, Connecticut: Raber Associates, October 1986), 8.

⁹⁴ G.M. Hopkins & Co. 1873.

⁹⁵ Raber, 9.

Weehawken was also the terminus of the West Shore Railroad (West Shore). The West Shore was the successor to the New York, West Shore & Buffalo Railway, which extended from Weehawken to Buffalo, New York, and was chartered in 1882 to compete with the New York Central. In 1885, the company was reorganized as the West Shore, a subsidiary of the New York Central under lease for 475 years. Ferry service at Weehawken was revived by the completion of the railroad to Weehawken. The Weehawken Ferry Company was incorporated in March 1852; the ferry was revived on January 1, 1859.⁹⁶ The railroad had freight yards as well as two ferry landings. A trolley connected the ferry to the Weehawken Heights above the Palisades.⁹⁷

6.7 Weehawken in the Twentieth Century and into the Present Day

During the early-twentieth century, Weehawken's Hudson River location made it a desirable major railroad and transportation center. As previously discussed with respect to the history of Hoboken, several railroads, including the Pennsylvania Railroad, pursued the establishment of a direct rail link between New Jersey and New York City. Between 1904 and 1910, the Pennsylvania Railroad installed its North River Tunnels, which included a vent shaft in Weehawken between the east end of the river tunnel and the beginning of the west end of the Bergen Hill Tunnel. In 1943, four headhouses were built over this vent shaft.⁹⁸

In 1952, the West Shore merged with the New York Central. With the rise of Federally-funded interstate highways, shifting traffic patterns to truck freightage, and the growth in passenger air travel, railroad revenues plummeted throughout the mid-twentieth century. As a result, on February 1, 1968, New York Central merged with Pennsylvania Railroad, becoming Penn Central. In the following year, Penn Central also absorbed the ailing New York, New Haven, & Hartford Railroad. Despite these mergers and attempts to eliminate duplicate facilities, Penn Central declared bankruptcy in 1970. In 1976, the Federal government bailed out the fledgling railroad industry with the creation of the Consolidated Rail Corporation, Conrail. Conrail acquired the collapsed Penn Central along with the bankrupt Erie Railroad and the Lehigh & Hudson River. By 1981, Conrail's operations were turning a profit. On June 1, 1999, Conrail was split into Northern Southern and CSX Transportation (CSX). Existing sections of the West Shore trackage are used by CSX; this trackageremains the primary freight route from New York City north along the west side of the Hudson River.⁹⁹ Portions of the former West Shore rail line have also been repurposed by the HBLR system.

The New York Central Railroad discontinued ferry operations within Weehawken in 1959. In the mid-1980s, Arthur Imperatore, a New Jersey trucking magnate, purchased the former New York Central rail yards in Weehawken with an intent to resume ferry service. By 1986, New York Waterway was conducting ferries from Weehawken to lower Manhattan. Today, NY Waterway operates three ferry lines from Weehawken–one from Lincoln Harbor to West 39th

⁹⁶ Winfield 1874, 240.

⁹⁷ Van Winkle, 498; Railfan.net, The New York, West Shore and Buffalo, New York Central System, Accessed online at http://nyc.railfan.net/westshore.html; NY Central West Shore Website, Accessed at

http://www.kinglyheirs.com/NewYorkStateRailroads/WestShore1.html.

⁹⁸ NJHPO, "North River Tunnels: Amtrak Northeast Corridor under Hudson River, Bergen Portal to 10th Ave. Portal, NY," Property File (Trenton: NJHPO) 1998; Condit 1980, 272-273.

⁹⁹ Railfan.net 2016; New York Central System Historical Society, Inc., "NYC Railroad History," accessed online August 17, 2016 at http://nycshs.blogspot.com/2008/05/nyc-railroad-history.html; American-Rails.com, "Conrail, The Consolidated Rail Corporation," accessed online August 17, 2016 at http://www.american-rails.com/conrail.html.

Street; one from Port Imperial to Wall Street; and, one from Port Imperial to the World Financial Center. The Lincoln Harbor Ferry site is located within the northern portion of the Study Area.¹⁰⁰

Over the last several decades, Weehawken has established itself as a home to a vibrant New York City commuter ferry service. New commercial development within the township is attracting New York City companies. In 2000, Weehawken had a population of 13, 501 with a median household income of \$50,196.¹⁰¹

Weehawken also experienced extensive flooding as a result of Superstorm Sandy. Approximately seven feet of water rushed through the Shades, a downtown neighborhood located within the northern portion of the Study Area. The Shades is the lowest topographical point within Weehawken; as such, the impacts of the hurricane were more severe within this area. Most of the basements, garages, and ground floor apartments within the neighborhood were flooded. The Weehawken Waterfront Park and Recreation Center also experienced extensive damage with debris from the park stretching approximately 200 feet inland from the Hudson River. By October of 2013, conditions had been nearly restored to pre-hurricane conditions within the Shades. The majority of the evacuated residents had moved back to their homes.¹⁰²

Like Hoboken, Weehawken is a community within the Gold Coast region of New Jersey. The township has experienced residential and commercial growth associated with the influx of urban residents looking for more affordable housing options than those available within Manhattan or Brooklyn.¹⁰³

6.8 Jersey City Early Development¹⁰⁴

Jersey City is bounded by the City of Bayonne to the south, the Hudson River to the east, Hoboken, Union City, and North Bergen Township to the north, and the Town of Kearny to the west. In 1838, Jersey City was incorporated as a municipality independent of the larger Bergen Township.

Present-day Jersey City which encompasses territory that was known as Communipaw and Harsimus by the local Unami tribes was also included within the 1630 Pavonia patroonship of Michael Pauw. Sometime thereafter, the area was referred to as Paulus Hook in honor of the governor of the area, Michael Paulusen. By 1638, the Dutch West India Company, dissatisfied with Pauw's settlement, conveyed Paulus Hook to Abraham Isaacsen Planck (Ver Planck). Around this time, buildings had been erected at Communipaw and at Harsimus by order of the Dutch West India Company–Jan Evertse Bout owned the Communipaw structure; Cornelis Van Vorst occupied the Harsimus structure. Planck also leased a portion of his Paulus Hook holdings to Gerrit Dicksen for a tobacco plantation.¹⁰⁵

¹⁰⁰ New York Waterway 2016; Lenore Person, "The History of Hudson River Ferry Service," accessed online August 17, 2016 at http://www.hudsonriver.com/hudson-river-ferry.

¹⁰¹ Campbell in Lurie and Mappen 2004, 859.

¹⁰² FEMA, *Preliminary Flood Insurance Study, Hudson County, New Jersey* 2013; Dean DeChiaro, "One Year Later, Shades Residents Back on Their Feet," *Hudson Reporter* October 27, 2013.

¹⁰³ Bockmann 2014.

¹⁰⁴ As previously noted, the histories of Weehawken and Jersey City will focus primarily upon those portions which fall within the Study Area. Detailed histories of the two municipalities are outside the scope of the current study given how little of the Study Area is located within either Weehawken or Jersey City.

¹⁰⁵ Shaw 1884, 1138-1140; city-data.com, "Jersey City: History," accessed May 23, 2016 at http://www.city-data.com/us-cities/The-Northeast/Jersey-City-History.html.

After several skirmishes between the local indigenous groups and the European settlers, the early European settlements were abandoned and then reestablished by Petrus Stuyvesant in the 1670s. These Dutch farmers settled on Bergen Hill, and established the first local government, school, and church in New Jersey. Over the next century, the area developed as an agricultural region, and was serviced by increasing transportation developments, including ferries to New York and historic and stage coach roads to Philadelphia.

During the Revolutionary War, the British maintained an outpost on Paulus Hook. On August 18, 1779, Major Henry "Light Horse Harry" Lee of the Continental Army led a night time raid on the outpost. Lee's raid was successful with the Continentals losing only two soldiers, and capturing nearly a third of the English garrison.¹⁰⁶

6.9 Jersey City During the Nineteenth Century

In 1804, a group of New York real estate investors purchased land and ferry rights at Paulus Hook. By 1812, Robert Fulton's *Jersey* steam ferry was operated from Paulus Hook. The settlement was incorporated as Jersey City in 1820; however, at this time, Jersey City was still considered a part of the Town of Bergen.

Development of Jersey City began in earnest in the 1830s following the establishment of a formal boundary between New York and New Jersey as the middle of the Hudson River. In 1836, the Morris Canal and two rail lines were extended into Jersey City. Two years later Jersey City was incorporated independent of Bergen Township. The transportation developments within the city bolstered its shipping and distribution capabilities, resulting in increased industrialization. Over the next several decades, businesses began settling within Jersey City; these businesses included the Colgate-Palmolive Company, makers of soaps, perfumes, and toiletries; the Joseph Dixon Crucible Company, lead pencil manufacturers; the Dummer's Jersey City Glass Company, makers of flint glass among other products; Isaac Edge's fireworks factory; and, the American Pottery Company. From 1860 to 1870, Jersey City's population increased from 7,000 to 29,000. In 1873, Jersey City and Bergen, along with the three villages of Van Vorst, Hudson, and Greenville, consolidated into present-day Jersey City.¹⁰⁷

By the latter part of the nineteenth century, three major railroads—the Pennsylvania, the Jersey Central, and the Erie—"built down to the Jersey City shoreline, slicing or tunneling through Bergen Hill, filling in underwater lands, spreading railroad yards, shops, warehouses, terminals, and piers along the entire waterfront."¹⁰⁸ Thousands of immigrants settled in Jersey City to provide the labor for both the railroad expansion and the factories. These immigrant groups included Germans, Irish, Poles, Italians, Ukrainians, Romanians, and Slavic groups.¹⁰⁹

During the Civil War, Jersey City was an important location along the Underground Railroad. Escaping slaves entered the city hidden aboard Erie Canal boats. The city was also an embarkation point for Union soldiers.¹¹⁰

¹⁰⁶ city-data.com 2016.

¹⁰⁷ city-data.com 2016; Petrick in Lurie and Mappen 2004, 423.

¹⁰⁸ Petrick in Lurie and Mappen 2004, 423.

¹⁰⁹ city-data.com 2016; Petrick in Lurie and Mappen 2004, 423.

¹¹⁰ city-data.com 2016.

6.10 Jersey City in the Twentieth Century and Into the Present Day

In the early-twentieth century, a railway tube was opened between Jersey City and New York. By 1933, the H&M service had also been extended to Jersey City. In 1920, the New Jersey Interstate Bridge and Tunnel Commission and the New York State Bridge and Tunnel Commission appropriated funds and began construction on the Hudson River Vehicular Tunnel. In 1937, the tunnel was opened and named the Holland Tunnel in honor of its first chief engineer, Clifford M. Holland. Holland died before the tunnel was completed. His successor, Milton Freeman, also died before the tunnel's completion. The project's third chief engineer, Ole Singstad, oversaw the completion and opening of the Holland Tunnel. The Holland Tunnel, the first Hudson River vehicular crossing, connects Canal Street in Manhattan with 12th and 14th streets in Jersey City. The PANYNJ took over operations of the Holland Tunnel in 1930.

One design obstacle with the Holland Tunnel was dealing with the automobile fumes within the 1.6-mile closed space. Singstad's solution for this problem was the creation of a circular tunnel with automatic ventilation system:

Four ventilation buildings, two on each side of the Hudson River, house 84 immense fans that provide a change of air every 90 seconds, keeping air quality well within established safety limits. This innovation made the Holland Tunnel the first mechanically ventilated underwater vehicular tunnel.¹¹¹

By the mid-twentieth century, with the decline of the railroad industry and the increasing popularity of automobiles, the population of Jersey City also began to decline. Factories closed, and Jersey City fell into a period of general decline. Efforts to revitalize the city began in the 1980s with redevelopment projects. By the late 1980s, many New York City businesses began relocating to Jersey City in search of lower rents and taxes; many of these firms were in the finance and commerce industries. In addition, the offices of major shipping lines also opened in Jersey City. Modern freight trains continued to travel through the city. In addition, former railyards were redeveloped into shopping malls and waterfront parks. During the 1990s, approximately 30 firms moved to or began operations within Jersey City.

Liberty State Park opened in 1976 for the nation's Bicenntenial celebration. The creation of Liberty State Park included the acquisition and renovation of the former Jersey Central Terminal and Plant. Today, the park provides breathtaking views, ferries to Ellis Island and the Statue of Liberty, and houses the Liberty Science Center.¹¹²

In 2000, the HBLR opened its first leg within Jersey City. The population of Jersey City in this year totaled 240,055. The median household income at this time was \$37,862. By the early- twenty-first century, Jersey City had a number of new middle and moderate-income housing units, and an increase in professional and service jobs.¹¹³

http://www.jerseycityonline.com/history/jc_history.htm.

¹¹¹ Port Authority of New York & New Jersey, "Holland Tunnel: History," accessed May 23, 2016 at http://www.panynj.gov/bridgestunnels/holland-tunnel-history.html.

¹¹² Jersey City online, "Jersey City: America's Golden Door," accessed online May 30, 2016 at

¹¹³ city-data.com 2016; Petrick in Lurie and Mappen 2004, 423; Jersey City online 2016.

All of Jersey City was impacted by wind and/or flood damage as a result of Superstorm Sandy. Jersey City's 30.7mile waterfront was inundated during the storm. Floodwaters entered the city from the Hackensack River and Newark Bay to the west and from the Hudson River and Upper New York Bay to the east. Superstorm Sandy inundation maps indicate that flood waters covered approximately 39 percent of Jersey City's land area. Residential, commercial, industrial, private and public school, church, and cemetery properties were flooded. Jersey City Medical Center's emergency room was flooded as was City Hall. Jersey City Housing Authority facilities were also hit hard with basement flooding and extensive damage to electrical systems. Three PSE&G substations in Jersey City were also damaged with approximately 75 percent of the city's population having lost power for several days.¹¹⁴

Alongside the recovery from Superstorm Sandy, development continued within Jersey City. By the end of 2012, housing demand for new apartments and homes within the city was as high as it was throughout the Gold Coast region. By February of 2013, prices for condominiums within Jersey City were selling for 39 percent greater than their asking price. The 2011 census indicated that there were 94,599 occupied households in Jersey City. Currently, the city is home to a waterfront regional employment center, maintains a major shipping port, and has sizable manufacturing, wholesale, retail, and service sectors. Jersey City is the second most populous city within New Jersey.¹¹⁵

¹¹⁴ Douglas Greenfeld and Naomi Hsu, Sandy Recovery Strategic Planning Report, City of Jersey City 2014.

¹¹⁵ Greenfield and Hsu 2014; Roland Li, "Recovery from Hurricane Sandy Prompts New Projects and Fresh Customers in New Jersey's Waterfront Cities," *New York Daily News* October 4, 2013.

7.0 PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL RESOURCES

7.1.1 Previous Cultural Resource Surveys

Research conducted at the NJHPO revealed that nearly 100 cultural resource studies have been conducted within the Study Area and its vicinity. Appendix E provides a tabular list of these previous cultural resource surveys, including the title, author, and date of each report. Eleven (11) of these studies are associated with the installation or collocation of wireless towers. Approximately 12 of these reports consist of historic structure assessments of the Erie-Lackawanna Terminal. The majority of the previously conducted archaeological studies consist of Phase IA assessments–portions of the Study Area have been previously determined to possess the potential for prehistoric deposits, historic roads, waterfront features, and nineteenth to early-twentieth century wooden or brick sewer lines.

Joan Geismar has conducted several cultural resource investigations, including archaeological assessments, monitoring reports, soil boring, and archaeological field testing, within the Study Area in association with the HBLR. As a result of these investigations, Geismar exposed the log cribbing and relatively *clean* landfill associated with the Long Slip canal; documented the stratigraphic profile and history of marsh formation within the southwestern corner of the Study Area; and, identified and documented at least one brick foundation pier associated with an historic elevated train line.¹¹⁶ Richard Grubb & Assocciates, Inc. (RGA) has also conducted multiple Phase IA archaeological assessments, archaeological monitoring, and field testing studies within the Study Area. In particular, RGA has documented intact historic wooden and brick sewer lines within several locations in Hoboken including along Grand Street between 3rd and 6th streets, beneath the eastern portions of Observer Highway, and along 14th Street. RGA has also investigated the Maxwell House Site. Their work included archaeological monitoring of construction and demolition activities on the site, HABS-HAER documentation of the site, and the completion of an historic background study and public booklet regarding the Maxwell House Coffee Plant. RGA documented the North Pier of the complex prior to its removal; their monitoring work also identified a potential area of original shoreline, railroad remains associated with the early to mid-twentieth century industrial occupation, and surviving bulkhead remains.¹¹⁷

The work conducted by Geismar and RGA, along with other past archaeological studies have investigated infrastructure, transportation, industrial, and/or waterfront resources within the Study Area. Several of these investigations either documented the potential for extant historic resources or uncovered historic resources within

¹¹⁶ Joan Geismar, *HBLR MOS-2 Jersey Avenue Viaduct Phase IB Technical Report* (On file, Trenton: NJHPO) 2006; Geismar, *HBLR MOS-1 Long Slip, Jersey City-Hoboken, Hudson County, New Jersey, Field Testing and Data Recovery Report* (On file, Trenton: NJHPO) 2004a; Geimsar, *HBLR MOS-2, 2nd Street Station, Hoboken, Hudson County, New Jersey, Memo Report on Archaeological Field Testing* (On file, Trenton: NJHPO) 2004b.

¹¹⁷ RGA, Stage IA Cultural Resources Survey: Washington Street Water Main Replacement and Complete Street Redesign, City of Hoboken, Hudson County, New Jersey (On file, Trenton: NJHPO) 2015b; RGA, Archaeological Monitoring North Hudson Sewerage Authority Grand Street Combined Sewer Rehabilitation, City of Hoboken, Hudson County, NJ (On file, Trenton: NJHPO) 2015a; RGA, Archaeological Monitoring of Demolition and Construction Activities, Maxwell House Site, City of Hoboken, Hudson County, NJ (On file, Trenton: NJHPO) 2006b;.RGA, Field to Factory: The Story of the Maxwell House Coffee Plant (On file, Trenton: NJHPO) 2005a;RGA, Historic Background and Development of the Maxwell House Site, City of Hoboken, Hudson County, New Jersey (On file, Trenton: NJHPO) 2005b; RGA, Archaeological Monitoring/Stage IB Archaeological Survey, North Hudson Sewerage Authority, Solids/Floatables Removal Project Package 1 (H-6/H-7 Consolidation Conduit) City of Hoboken, Hudson County, NJ (On file, Trenton: NJHPO) 2006d.
the Study Area. Several such investigations are used as case studies in Chapter 8. Specific studies will also be discussed in further detail as they relate to the locations of the proposed Resist elements and/or DSD locations.

7.1.2 Previously Identified Archaeological Sites

A review of archaeological site files maintained by the NJSM and the NJHPO identified four previously recorded archaeological sites within a one-mile radius of the Study Area (Table 2). None of these sites were located within or adjacent to the Study Area. Only one of the previously recorded sites, 28-Hd-008, wais prehistoric; the remaining three sites were mid to late-nineteenth century historic sites. Site 28-Hd-008 was identified by the Indian Sites Survey. The site is described as one of 11 sites from which celts (skinning knives), gouges, mortars and pestles, hoes and spades were found. The description suggests that projectile points, awls, pipes, drills, pendants, and spearheads were also recovered from some of these sites. It is unclear, however, what specific artifacts were recovered from Site 28-Hd-008. There is no further description provided for the site.¹¹⁸

Historical accounts of the Hoboken area indicate that a trading station, Hobokan Hackingh, had been established at Castle Point by the Late Woodland or Early Contact period. Historic ethnographic accounts also suggest that there was a prehistoric occupation of Castle Point. In their investigation of a water main replacement within the northwestern portion of Hoboken, RGA observed that the Hobokan Hackingh site may have also contained an Archaic period component. The source or evidence for this observation was not provided, however.¹¹⁹

SOURCE	SITE #	NAME	CHRONOLOGY/NOTES	LOCATION
NJSM	28-Hd-8		Unidentified Prehistoric	One-mile southwest
NJSM	28-Hd-19	Exchange Place Landfill	Mid to Late 19th Century	One-mile south
NJSM	28-Hd-24	23 Seaman	Mid to Late 19th Century	One-mile west
NJSM	28-Hd-25	25 Seaman	Mid to Late 19th Century	One-mile west

Table 2: Previously Identified Archaeological Sites within One-Mile of the Study Area

The three remaining previously identified sites included two adjacent sites which yielded historic features and nineteenth century domestic debris (28-Hd-24 and 28-Hd-25). Site 28-Hd-19 consisted of a mid to late-nineteenth century landfill at the foot of Montgomery Street in Jersey City. According to the site file, this landfill was associated with the former location of a railroad depot and ferry terminal. No further description is provided for any of the historic period sites. There is no indication that any of the four previously identified sites have been recommended eligible for listing in the National Register.¹²⁰

¹¹⁸ NJSM, Archaeological Site Files.

¹¹⁹ RGA 2015, 3-14.

¹²⁰ NJSM, Archaeological Site Files.

8.0 CONTEXTUAL STUDIES

As discussed in Chapter 4.1, Dewberry developed contextual studies to frame the historical development of the Study Area. These contexts were designed to anticipate the types of archaeological resources which might be encountered within the Study Area, the potential for such resources to have remained intact and uncompromised, and the potential National Register significance of any such resources if they were encountered. Some of the historical information within the contextual studies touches and elaborates upon historical information provided in Chapter 6. While Chapter 6 was intended as a general overview of the history of the Study Area, the following contextual discussions are a more detailed and descriptive discussion of specific topics with a particular interest in the potential archaeological deposits or signatures that might have resulted from such historic development. Each of the following contextual studies consists of an historic discussion of development within the Study Area as it pertains to the context. This discussion is followed by a description of previously identified archaeological sites and/or case studies from other cultural resource studies which inform upon the nature and types of archaeological resources that relate to the particular theme and have been identified. Wherever possible the case studies were drawn from previously conducted work within the Study Area or a similar urban setting. The final section within each of the contextual discussions consists of an analysis of the potential for archaeological resources associated with the research context within the Study Area. Theoretical arguments regarding the potential National Register eligibility of any such resources are also provided.

The contextual studies consist of: Prehistoric, Commercial; Residential, Sewage, & Water; Institutional; Industrial; Cemeteries & Churches; Docks, Wharves, & Landfill; and Transportation. As the majority of the Study Area is located within the City of Hoboken, most of the following contextual studies focus upon the city, its development and history. The far northeastern extent of the Study Area is located in the southeastern corner of Weehawken Township. Historically, settlement of this portion of Weehawken has focused upon waterfront and transportation developments. Thus, the contextual discussions of the Study Area within Weehawken will primarily consist of the Prehistoric, Dock, Wharves, and Landfill, and Transportation themes.

8.1 Prehistoric

In order to provide a contextual framework from which to evaluate the importance of prehistoric cultural resources, which may have once existed in the vicinity of the Study Area, Dewberry has conducted a review of the archaeological literature of the prehistory of the region. This research included a review of previously identified archaeological sites on file with the NJSM and NJHPO, a review of previously conducted cultural resource studies within the vicinity of the Study Area on file with NJHPO, and a review of regional literature and overviews of the prehistory of the area. From this research, a prehistoric overview was developed for the region. A brief summary of the prehistoric overview is presented below.

8.1.1 Prehistoric Overview

Archaeologists typically organize the prehistoric occupation of New Jersey and the larger Middle Atlantic United States into three broad time periods: the Paleo-Indian, the Archaic, and the Woodland.¹²¹ These periods establish a heuristic framework within which to frame the 12,000 years of human occupation of the area prior to European colonization. The Archaic and Woodland periods are generally further divided into Early, Middle, and Late sub-periods. The prehistoric chronology ends around circa 1550 to 1600 A.D. with the earliest records of European contact with the indigenous peoples.

a. Paleo-Indian Period (13,000 to 11,600 B.P.)

During this period sea levels were significantly lower than their current levels. Environmental conditions in the Middle Atlantic after the Pleistocene would have provided for a mixed boreal forest adaptation in contrast to a reliance on big-game hunting. Populations during this time most likely organized as small hunter-gatherer bands characterized by low population density and high mobility.¹²² These groups most likely occupied short-term open air camps which enabled exploitation of wide-ranging subsistence resources including the hunting of deer and other small prey, and the gathering of plants such as blackberries, hackberries, hawthorn plums and grape, amaranth, and nuts.¹²³ Paleo-Indian peoples exploited a variety of lithic material types from cobble resources and outcrops. Paleo-Indian sites generally consist of isolated fluted projectile points. Over 280 fluted point sites have been recorded within New Jersey; 131 of these points came from the Plenge Site in northwestern New Jersey. Less frequent lithic artifacts from this time period include gravers, wedges, unifacial tools, endscrapers, denticulate tools, prepared cores, drills, and awls.¹²⁴

b. Early Archaic Period (11,600 to 10,000 B.P.)

This period is marked by a continued expansion of forest habitats. This expansion would precipitate the in-migration of various nut-bearing oak and chestnut species which may have provided for greater plant exploitation, gathering, and processing. This period is generally distinguished from the preceding Paleo-Indian period by a technological change from fluted points to large corner-notched points. Early Archaic diagnostic notched and stemmed projectile points include Amos, Palmer, Charleston, Lost Lake, Decatur, and Kirk types.¹²⁵ New tool types such as grinding slabs, milling stones, and pitted cobbles have also been found in Early Archaic contexts further suggesting a broader plant-based subsistence strategy. There also appears to be a shift in lithic material types in the Early Archaic. Whereas Paleo-Indian sites suggest an overwhelming, if not exclusive, preference for cryptocrystalline material, Early Archaic sites display an assortment of local and non-local lithic materials. This shift reflects not only

¹²³ Grossman-Bailey 2001, 82-83.

¹²¹ Olga Chester (editor), *New Jersey's Archaeological Resources from the Paleo-Indian Period to the Present: A Review of Research Problems and Survey Priorities* (Trenton: Office of New Jersey Heritage, 1982); Dorothy Cross, *Archaeology of New Jersey, Volume 1* (Trenton: The Archaeological Society of New Jersey and the New Jersey State Museum, 1941); Jay Custer, *Prehistoric Cultures of Eastern Pennsylvania* (Harrisburg: Historical and Museum Commission, 1996); Ilene Grossman-Bailey, "The People Who Lived by the Ocean: Native American Resource Use and Settlement in the Other Coastal Plain of New Jersey" (PhD diss., Temple University, 2001); Herbert Kraft, *The Lenape-Delaware Indian Heritage: 10,000 BC to AD 2000* (Union: Lenape Books, 2001); R. Alan Mounier, *Looking Beneath the Surface: The Story of Archaeology in New Jersey* (New Brunswick: Rutgers University Press, 2003).

¹²² Joseph Gingerich, "Shawnee-Minisink Revisited: Re-evaluating the Paleoindian Occupation" (Master's Thesis, University of Wyoming, 2007); RGA, Inc. (RGA), *Stage IA Cultural Resources Survey: Washington Street West Main Replacement and Complete Street Redesign, City of Hoboken, Hudson County, New Jersey* (Trenton: NJHPO, 2015).

¹²⁴ Grossman-Bailey 2001.

¹²⁵ Kraft 2001.

technological changes, but also a potential shift in settlement patterns.¹²⁶. Within the Middle Atlantic, Early Archaic Sites have typically been found in proximity to major drainages. Cremated remains dating to this period have been found along the Atlantic Coast of New Jersey.¹²⁷

c. Middle Archaic Period (10,000 to 6,800 B.P.)

In general, the Middle Archaic Period within New Jersey and the Middle Atlantic is thought to be poorly understood.¹²⁸ The variety of projectile point types increases during this period with many forms including the Piney Island, Poplar Island, Lamoka, Morrow Mountain, and Rossville dating from the Middle Archaic through the Middle Woodland periods. Distinctly Middle Archaic point types include Neville and Stanly points with shallow basal notching.¹²⁹ The types of exploited lithic materials broadened during the Middle Archaic, with less reliance on high-quality cryptocrystalline material and increasing use of argillite, rhyolite, and quartzite. Other tool types which appeared on Middle Archaic period sites include endscrapers, concave scrapers, grinding stones, netsinkers, polished stone axes, gouges, and adzes. These tools suggest more intensive woodworking and a greater exploitation of local food resources such as nuts, seeds, and fish.¹³⁰ The greater time investment associated with such exploitation suggests that there was a decrease in mobility during the Middle Archaic. Bundle burials associated with an argillite artifact found at Abbott Farm in New Jersey were determined to pre-date the Late Archaic period.¹³¹

d. Late Archaic Period (6,800 to 300 B.P.)

The Late Archaic Period is associated with expanding populations and larger and more complex sites. The increase in population and diversity of site types may reflect the development of more favorable environmental conditions opening up new environmental settings for exploitation and encouraging a higher degree of sedentism.¹³² A greater variety and density of tools are associated with the Late Archaic period suggesting greater and more diverse resource exploitation. These tools include mortars and pestles for plant processing; grooved axes, adzes, and celts for woodworking; and netsinker and fish hooks for fishing. Argillite was extensively used during the Late Archaic period. Extensive trade networks also existed during this time; jasper, argillite, rhyolite, ironstone, steatite, marine shell, and copper were traded throughout the Middle Atlantic Region.¹³³

The initial appearance of steatite bowls and early ceramics date to the later part of the Late Archaic period, often referred to as the Transitional period. Projectile point types of the Late Archaic include notched and stemmed varieties including Bare Island, Brewerton, Lackawaxen, Lamoka, Macpherson, and Normanskill types.

¹²⁶ Grossman-Bailey 2001, 84.

¹²⁷ Andrew Stanzeski, "Two Decades of Radiocarbon Dating from the New Jersey Shore," *Bulletin of the Archaeological Society of New Jersey* 51 (1996): 42-45; Stanzeski, "Four Paleoindian and Early Archaic Sites in Southern New Jersey," *Archaeology of Eastern North America* 26 (1998): 41-53.; RGA 2015.

¹²⁸ Custer 1996.

¹²⁹ RGA 2015; Grossman-Bailey 2001, 85-86.

¹³⁰ Grossman-Bailey 2001, 86.

¹³¹ R. Michael Stewart, "Archaic Indian Burials at the Abbott Farm" in *Bulletin of the Archaeological Society of New Jersey* 50 (1995): 73-79.

¹³² RGA 2015; Grossman-Bailey 2001, 87.

¹³³ RGA 2015; Michael R. Stewart, *Ceramics and Delaware Valley Prehistory: Insights from the Abbott Farm* (Trenton: Louis Berger & Associates, Inc., 1998).

Broadspears, including Susquehanna, Savannah River, Snook Kill, Lehigh/Koens-Crispin, and Perkiomen, and fishtail-type projectile points are also associated with the Late Archaic.¹³⁴

Late Archaic period site types consist of large camps, cemeteries, procurement stations, small transient camps, and isolated activity areas. The largest Late Archaic sites appear to have been positioned in proximity to major rivers and other environmentally favorable locations. Cemetery sites like Savich Farm are also associated with the Late Archaic, suggesting increased mortuary ceremonialism from the Late Archaic into the Woodland periods.¹³⁵

e. Early Woodland Period (3,100 to 2,000 B.P.)

The Early Woodland period is generally seen as an extension of the lifeways and adaptations which had developed during the Late Archaic. Early Woodland sites reflect a growing reliance on seasonal exploitation of resources reflected by settlement patterns including semi-sedentary base camps in riverine settings and intermittently occupied procurement camps. Interregional exchange networks and mortuary ceremonialism which began in the Late Archaic became more elaborate throughout the Early and Middle Woodland periods.¹³⁶

Diagnostic artifacts associated with the Early Woodland period include Hellgrammite points, teardrop points, Cadwaller side-notched points, and Rossville points. Exotic artifacts which have been found within Early Woodland sites include distinctive bifaces such as Adena contracting stemmed points, stemmed Cresap points, Robbins blades, copper beads, birdstones, boatstones, shell beads, and tube pipes. Ceramic types have also been identified with the Early Woodland period. These types include Vinette I and Marcey Creek-type ceramics. Ceramic wares tended to get thinner and have smaller temper inclusions over time.¹³⁷

f. Middle Woodland Period (2,000 to 1,000 B.P.)

While there is continuity in settlement patterns from the Early Woodland into the Middle Woodland period, sites are generally larger and are found in slightly different settings in the Middle Woodland period. Middle Woodland sites tend to reflect the emergence of sedentary base camps, experimentation with horticulture, and continuing developments in ceramic technology. The mortuary ceremonialism and exotic materials associated with some Middle Woodland period sites suggests trade and contact with groups outside of the Middle Atlantic Region. There appears to be local variation in Middle Woodland period site types and artifacts.¹³⁸

Diagnostic projectile points of the Middle Woodland period include Fox Creek Stemmed and Lanceolate points, basally notched points like Jack's Reef Corner-Notched, and Pentagonal points. Ceramic types associated with the

¹³⁴ Patricia E. Miller et al., *Archaeological Investigations Susquehanna River Bridge Dauphin and York Counties, Pennsylvania* (Harrisburg: Pennsylvania Historic and Museum Commission, 2007); Kraft 2001; Michael R. Stewart, "Stone Bowls and Early Pottery," *Journal of Middle Atlantic Archaeology* 27 (2011): 143-160.

¹³⁵ RGA 2015.

¹³⁶ RGA 2015; Custer 1996; Kraft 2001; Michael R. Stewart, "A Regional Perspective on Early and Middle Woodland Prehistory in Pennsylvania," *Foragers and Farmers of the Early and Middle Woodland Periods in Pennsylvania* (Harrisburg: Pennsylvania Historic and Museum Commission, 2003).

¹³⁷ Grossman-Bailey 2001, 89-92; RGA 2015.

¹³⁸ RGA 2015; Grossman-Bailey 2001, 92-93.

Middle Woodland include criss-cross cord marked pottery and interior marked pottery; net-marked surface treated pottery is also associated with this period.¹³⁹

In the Upper Delaware Valley, the Adena-Middlesex mortuary complex is considered a hallmark of the Middle Woodland. This complex has also been found in the coastal portions of New Jersey. The Adena-Middlesex mortuary complex consists of graves with a high density of exotic grave goods from Ohio and Illinois.¹⁴⁰

g. Late Woodland Period (1,000 to 400 B.P.)

The Late Woodland Period is characterized by increasing semi-sedentary settlement patterns, smaller territory sizes than in the Early and Middle Woodland periods, and a transition to more intensive horticulture in portions of the Middle Atlantic Region.¹⁴¹ This period has also been associated with changes in social organization, material culture, and site structure. Restricted distribution of local pottery styles and an apparent focus on the exploitation of local lithic sources suggests a greater deal of territoriality within the Late Woodland period. Ethnohistoric accounts document the territorial concerns of some indigenous groups within the Middle Atlantic Region.¹⁴²

Diagnostic artifact types associated with the Late Woodland period include triangular projectile points and ceramic types with more complex incised designs. Collared, decorated ceramics have also been found within the northern portion of the Middle Atlantic Region during the Late Woodland Period. The introduction of Levanna and Madison-type triangular points may have coincided with the introduction of bow-and-arrow technology.¹⁴³

h. Contact Period (400 to 150 B.P.)

In October 1609 Henry Hudson, exploring for the Netherlands, anchored his "Half Moon" in Weehawken Cove. Hudson's first mate observed cliffs in this area which he described as being a white green stone resembling a copper or silver mine. This stone appears to be the green serpentine indigenous to Hoboken.¹⁴⁴

At the time of Hudson's landing, a chieftancy of the Unami tribe occupied present-day Hoboken. According to Bolton, the Hackensack, a "numerous and warlike group," occupied the riverside areas of Hackensack, Weehawken, Hoboken, Jersey City, and Bayonne.¹⁴⁵ Their territory may have extended over Newark to the Passaic River. At the time of contact, the local peoples operated a trading station at present-day Castle Point. This station was known as Hobokan Hackingh (Hopoghan Hackingh). The name means *Land of the Tobacco Pipe* and appears to refer to the

¹³⁹ Stewart 1998, 2003; Custer 1996; Matthew D. Harris, "A Middle Woodland Settlement System in the Schuylkill River Valley, Southeastern Pennsylvania" (Master's Thesis, Temple University, 2007).

¹⁴⁰ Mounier 2003; Darrin Lowery, "The Delmarva Adena Complex: A Study of the Frederica Site, Kent County, Delaware," *Archaeology of Eastern North America* 40 (2012): 27-58; Stewart 2003; RGA 2005.

¹⁴¹ Custer 1996; John Lawrence and Brian M. Albright, *Data Recovery Archaeological Investigation Report, River Road Site (36BU379), I-95/Scudder Falls Bridge Improvement Project, Lower Makefield Township, Bucks County, Pennsylvania* (Harrisburg: Pennsylvania Historic and Museum Commission, 2012); Timothy Messner, *Acorns and Bitter Roots: Starch Grain Research in the Eastern Woodlands* (Tuscaloosa: University of Alabama Press, 2011); Michael R. Stewart, "The Status of Late Woodland Research in the Delaware Valley," *Bulletin of the Archaeological Society of New Jersey* 53 (1998): 1-12.

¹⁴² Custer 1996; Kraft 2001; RGA 2015.

¹⁴³ RGA 2015; Grossman-Bailey 2001, 93-94.

¹⁴⁴ "Short History of Hoboken," Hoboken Historical Museum, accessed February 5, 2016, <u>https://www.hobokenmuseum.org/history/short-history-of-hoboken</u>; Charles H. Winfield, *History of the County of Hudson, New Jersey* (New York: Kennard & Bay Stationery, 1874); Sydne B. Marshall, *Cultural Resources Reconnaissance: Hoboken to North Bergen Reach* (Trenton: NJHPO, 1981).

¹⁴⁵ Reginald Pelham Bolton, "New York City in Indian Possession," *Indian Notes & Monographs*, Vol II, No. 7 (New York: Heye Foundation, Museum of the American Indian, 1920), 280-282.

serpentine rock which was used to carve tobacco pipes. According to Bolton, the trading station was situated in a prime location as "its position on the highest southerly ground along the river-front commanded the passage of trade" to and from Manhattan.¹⁴⁶ Hopokan Hackingh's location also provided access for foot travel to the mountain regions to the north and west.

In 1658, Peter Stuyvesant, the Dutch Governor of Manhattan, purchased the land between the Hackensack and the Hudson River from the Hackensack for "80 fathoms of wampum, 20 fathoms of cloth, 12 kettles, six guns, two blankets, a double kettle, and half a barrel of beer."¹⁴⁷

8.1.2 Previously Identified Prehistoric Sites in the Study Area

As previously noted, a site file search at the NJSM and the NJHPO was undertaken in July 2015. No previously identified prehistoric sites were identified within the Study Area. One previously identified prehistoric site is located approximately one-mile to the southeast of the Study Area. This site, Site 28-HD-008, was identified by the Indian Sites Survey in 1936. The site is described along with 10 other prehistoric sites in Hudson County. The site file and the description within the Indian Sites Survey fail to provide a clear description of the artifacts recovered from the site; they also fail to indicate the site type. Given the description within the Indian Sites Survey, it seems likely that chipped stone artifacts were recovered from Site 28-HD-008; ground stone artifacts and pipes may have also been recovered.¹⁴⁸

Historical accounts indicate that a trading station, Hobokan Hackingh, had been established at Castle Point by the Late Woodland to Early Contact period. The name of the site refers to the local serpentine rock which local Native American groups exploited for the creation of tobacco pipes.¹⁴⁹ These ethnohistorical accounts suggest that there was at the very least a prehistoric occupation of Castle Point during Late Woodland times. Given that the area was named by the Hackensack for its stone outcrops and in light of the strategic location of the trading station, it seems likely that the area was occupied and exploited prior to the Late Woodland-Early Contact Period and may have functioned as a waypoint during the interregional trade associated with the Early and Middle Woodland periods in the Middle Atlantic region. Furthermore, with respect to the Hobokan Hackingh site, in a 2005 study, RGA observed that the site may also contain an Archaic component. RGA does not, however, provide a source or further explanation of this suggestion.¹⁵⁰

8.1.3 Research Potential in the Study Area

Several past archaeological studies have examined prehistoric site distribution data to formulate predictive models of likely prehistoric site locations. Settlement pattern studies in New Jersey and the Middle Atlantic have identified several variables as relevant factors for the location of prehistoric archaeological sites. These variables include

¹⁴⁶ Reginald Pelham Bolton, "Indian Paths in the Great Metropolis," *Indian Notes & Monographs*, Misc. Publ. No. 23 (New York: Heye Foundation, Museum of the American Indian, 1922), 199, 239.

¹⁴⁷ Hoboken Historical Museum, accessed 2016.

¹⁴⁸ New Jersey State Museum (NJSM), Archaeological Site Files, On file, Trenton: New Jersey State Museum, varies.

¹⁴⁹ Bolton 1920, 1922; Hoboken Historical Museum 2016.

¹⁵⁰ RGA 2005, 3-14.

proximity to water, the presence of well-drained and elevated soils, and the proximity of known prehistoric archaeological sites.

Typically, prehistoric sites are identified at rather shallow depths usually within three or four feet of the original ground surface. As such, these deposits are particularly vulnerable to disturbance associated with construction, farming, flooding, erosion, and other such natural and man-made processes or effects. Given that heavily urbanized areas such as Hoboken have experienced a long history of development, including construction, grading, filling, utility installation, etc., there is a high likelihood that any preexisting prehistoric deposits may have been compromised or destroyed. Nevertheless, depending on the history of land use and environmental processes within a given area (e.g., past fill episodes which may cap and seal earlier ground surfaces and deposits), it is still possible to identify intact prehistoric deposits within urban settings. A geoarchaeological analysis conducted in association with the proposed 2nd Avenue Subway line in Manhattan illustrates the potential for deeply buried possible cultural bearing strata within a densely urbanized area. After examining a series of soil borings conducted between 92nd and 99th streets along 2nd Avenue, Geoarcheology Research Associates (GRA) determined that the soil profile within this area contained possible cultural-bearing soils at a depth of approximately 15 to 25 feet below the ground surface. These strata were determined to have a moderate potential for Late Archaic through Early Woodland period deposits.¹⁵¹

Similarly, within the immediate vicinity of the Study Area, GRA also conducted a geomorphological analysis to determine the potential for submerged prehistoric cultural resources within the vicinity of the Upper New York and New Jersey Harbor. GRA examined a total of 46 borings and found evidence that the proposed navigation channels within the harbor had moderate to high potential for preserving intact deposits pre-dating 6000 B.P.¹⁵² This study, which involved primarily submerged locations within the harbor, indicates the potential for intact deeply buried deposits despite a history of dredging and the current submerged setting.

In 2000, Joan Geismar conducted archaeological monitoring of a soil boring to the immediate south of the southwestern corner of the Study Area, adjacent to Jersey Avenue and north of 18th Street in Jersey City. The soil boring was conducted to provide a profile of the depositional history of the area. This profile would inform upon the history of filling in the area and would also provide information regarding the geomorphology of the prefilled meadowlands. The soil boring revealed a profile consisting of four layers:

- 1. At a depth of 0-14 feet, historic fill dating to the nineteenth and twentieth centuries;
- 2. At a depth of 14-60 feet, organic silts and fine sands associated with the Upper Middle and Late Holocene;
- 3. At a depth of 60-62 feet, Early Holocene fibrous and matted peats; and
- 4. At a depth of 62-68 feet, Late Pleistocene Rahway Till.

¹⁵¹ Geoarcheology Research Associates (GRA), *Geoarchaeological Study of Buried Landscapes for the Proposed 2nd Avenue Subway between E 92nd and 99th Streets, New York, New York* (New York: Landmarks Preservation Commission, 2008).

¹⁵² GRA, A Geomorphological and Archaeological Study in Connection with the New York and New Jersey Harbor Navigation Study, Upper and Lower Bay, Port of New York and New Jersey (Trenton: NJHPO) 2000.

The geomorphological analysis of the exposed profile found that the boring reflected a "near uniform sequence of mud flat deposits" with little potential for archaeological deposits.¹⁵³ Schuldenrein further noted that:

Archaeological evidence the length of the northeast Atlantic coast converges on the acceleration of differentiated riverine and estuarine site utilization by the onset of the Late Archaic times (after 5000 B.P.)...Such mixed estuarine, brackish, and riverine settings became increasingly attractive during the Woodland period of subsistence specialization. Settlement around coves and along inter-tidal marshes intensified even more around 3000 B.P. as rates of sedimentation finally exceeded rates of submergence of tidal waters.¹⁵⁴

The geomorphological analysis found no evidence for such environmental differentiation within the exposed profile. Thus, the area was considered to be an unattractive setting for prehistoric occupation or exploitation and determined to have little to no prehistoric archaeological potential.

Geismar's work and the associated geomorphological analysis suggests that at least portions of the Study Area have little to no sensitivity for prehistoric deposits given the uniform nature of the Holocene matrix. However, RGA's archaeological investigations in the northern portion of Hoboken, along Shipyard Lane between 14th and 15th streets, and also in Weehawken to the west of Port Imperial Boulevard suggest that the profile exposed by Geismar'r boring may not be uniform throughout the Study Area. RGA's excavations along Shipyard Lane revealed organic deposits at a depth of approximately nine feet below the surface. RGA's excavations in Weehawken revealed two alluvial deposits beneath overlying fill at a depth of approximately 13 feet below the surface. A 2.3-foot thick peat layer was found beneath the alluvia. The peat stratum consisted of a black organic silt with cedar roots and tree fragments.¹⁵⁵

Although RGA did not identify any prehistoric artifacts or features within the organic surfaces they exposed, they nevertheless concluded that these surfaces suggested the potential for prehistoric deposits within the northern portion of Hoboken and a segment of Weehawken despite past urbanization and development. The buried organic surfaces, including peat deposits, exposed by RGA also suggest that the profile exposed by Geismar is not a uniform continuous deposit across the entire Study Area. Rather there appears to have been diversity in past environmental and geomorphological processes within the Study Area which may have resulted in the creation of attractive settings for prehistoric exploitation and occupation.

In Chapter 9, an assessment of the prehistoric and historic archaeological sensitivity of the APE will be conducted. With respect to prehistoric sensitivity, this analysis will include an examination of land use history, a review of predevelopment and historic topographic maps of the region, and analysis of any available soil boring data. This information will be used to create a picture of the potential Holocene conditions within the APE which will then be assessed in light of the environmental variables that have been previously associated with known prehistoric

¹⁵³ Geismar 2006, 23-24.

¹⁵⁴ Geismar 2006, 24.

¹⁵⁵ RGA, Stage 1B Cultural Resources Survey CSO W-5, Planning Area III North Hudson Sewerage Authority Long Term Solids & Floatables Plan Hoboken, Weehawken, Union City, West New York, Guttenberg, and North Bergen, Hudson County, New Jersey (On file, Trenton: NJHPO) 2002; RGA 2006a

settlements and/or occupations. The assessment will also include an awareness of the Contact Period Native American outpost at Castle Point and the potential prehistoric conditions of Weehawken Cove which may have been used as a docking station for prehistoric vessels in a similar fashion to its known historic use.

If intact prehistoric occupation surfaces or deposits were identified within the Study Area, such deposits would be potentially eligible for listing in the National Register. Specifically, given the scarce record of identified prehistoric deposits within heavily urbanized settings, if such deposits were found they would not only provide data regarding the prehistoric occupation of the area for which there is minimal current information, but also evidence of past preservation and morphological processes within an urban setting.

8.2 Commercial

This contextual study provides an overview of the history of commercial development within Hoboken and the types of commercial sites that might be extant within the Study Area. The earliest commercial enterprise within Hoboken may have started in the mid-seventeenth century; however, the inception of commercial development within Hoboken is associated with John Stevens' acquisition of Hoboken in 1784. The following discussion elaborates upon the historical overview provided in Chapter 6. The historical context of commercial development within the Study Area is integral to an assessment of the potential for commercial-related archaeological resources and the types of such resources which may be extant within the APE; the context is also integral to an evaluation of the potential National Register eligibility of any such resources.

8.2.1 Historical Background

According to Shaw, the earliest European occupation of Hoboken dated to 1640 when Arent Teunissen Van Putten established a farmhouse and brewhouse. This occupation was short lived; in 1645, Van Putten was killed while on a trading expedition. His farm and cattle were also destroyed at this time.¹⁵⁶

Following the Revolutionary War, Colonel John Stevens acquired present-day Hoboken and gave the area its current name. Stevens envisioned the development possibilities of the marshy island and began to develop Hoboken as a resort. Stevens initially constructed a mansion, his summer residence, atop the eastern cliff in Hoboken in 1784. Between 1814 and 1820, he began to convert much of the property into a resort. He created a scenic river walk from the ferry in the south around Castle Point to the dense woods in the northernmost section of Hoboken. He built a hotel and pavilion with Greek columns known as The Colonnade. Stevens also cleared woods and fields to the west of the hotel for the creation of the Elysian Fields. In 1829, Stevens added several amusements to the River Walk including a merry-go-round, a ten-pin alley, wax figures, a *Camera Obscura*, and other amusement rides (Figure 12).¹⁵⁷ In 1836, Cybil's Cave (Sybil's Cave) was opened on River Walk. Sybil's Cave was a spa where one could buy a glass of mineral water for a penny; the shaft of the well within the cave extended to a depth of over 30 feet to reach a fresh water spring (Figure 13).¹⁵⁸ Stevens' development became a popular resort for wealthy

¹⁵⁶ William H. Shaw, *History of Essex and Hudson Counties, New Jersey* (Philadelphia: Everts & Peck, 1884), 1208.

¹⁵⁷ Winfield 1895, 69.

¹⁵⁸ Gleason's Pictorial Drawing Room Companion. "Sybil's Cave at Hoboken, N.J.," June 19, 1852.



REBUILD BY DESIGN HUDSON RIVER = RESIST = DELAY = STORE = DISCHARGE =

Dewberry Department of Environmental Protection

Illustration of Ferris Wheel Construction within Elysian Fields, circa 1829

August 2016				
FIGURE 12				



Manhattanites. In 1846, the Elysian Fields became the site of the first organized baseball game between the Knickerbocker Club from Manhattan and a team from New York.¹⁵⁹

While Stevens' Castle Point and associated amenities were attracting thousands of visitors to Hoboken, development of the larger city was slow. In 1814, Samuel Swartout and his brother Robert purchased the marsh portion of Hoboken from John Stevens. They made a vegetable garden in the marshland and tried to reclaim a large portion of the land. Their effort failed; in 1819, John G. Coster acquired title to their tract. The area appears to have remained undeveloped until Coster laid out building lots in 1860.¹⁶⁰

An 1829 account of the area indicated that commercial development within Hoboken consisted of four hotels and four groceries.¹⁶¹ An 1834 description of the village indicated that development had occurred primarily upon one street and included "3 licensed taverns, many unlicensed houses of entertainment, 4 or 5 stores, and several livery stables and gardens."¹⁶²

In 1838 with the death of Colonel Stevens, his heirs established the Hoboken Land and Improvement Company to sell off Stevens' property. This company had "the power to purchase, improve, mortgage and dispose of lands and other estates in and about Hoboken, for the purpose of grading and laying out the streets and squares, erecting wharves, etc."¹⁶³ The Hoboken Land and Improvement Company was ultimately responsible for much of the development and building construction within Hoboken during the mid to late-nineteenth century.

In the mid-nineteenth century, two banks, the Hoboken City Bank and the Hoboken Bank for Savings, were opened. At this time, there were at least three hotels within Hoboken and several restaurants including the Duke House at the foot of Ferry Street, and another on Hudson Street between Newark and 1st streets. During the mid-nineteenth century, Washington Street became the main commercial street. At this time, the street was filled with shops, offices, taverns, and hotels.¹⁶⁴

Bailey and Ward's 1881 *Bird's Eye-View of the City of Hoboken* illustrates the dense development within the southeastern portion of Hoboken by the late-nineteenth century (see Figure 11). While much of this development was tied to industrial operations and transportation-related industries, there was also increased commercial development. The Bailey and Ward's map identifies several commercial enterprises within Hoboken including: four hotels, two livery stables, three insurance companies, two butchers, five furniture dealers, an undertaker, a hatter and furrier, two grocery stores, three bakeries, a boot and shoe store, three apothecary/pharmacies, three florists,

Accessed February 9, 2016. <u>http://hoboken.pastperfect-online.com/32340cgi/mweb.exe?request=record;id=9EA7BE19-B8FC-4CD8-9CFA-227148117549;type=301.</u>

¹⁵⁹ Hoboken Historical Museum, accessed 2016; David Hartman and Barry Lewis, "A Walk Through Hoboken," accessed February 9, 2016, <u>http://www.thirteen.org/hoboken/history.html</u>; Stevens Institute of Technology, "History," accessed February 9, 2016, <u>http://www.stevens.edu/sit/about/history.cfm</u>; Charles. F. Winfield, *Hopoghan Hackingh Hoboken: A Pleasure Resort for Old New York* (New York: Caxton Press, 1895).

¹⁶⁰ Shaw 1884, 1210.

¹⁶¹ Winfield 1895, 55.

¹⁶² Thomas F. Gordon, *A Gazetteer of the State of New Jersey* (Trenton: Daniel Fenton, 1834) 158.

¹⁶³ Shaw 1884, 1218.

¹⁶⁴ Hoboken Planning Board, *City of Hoboken Master Plan* (City of Hoboken: Hoboken Planning Board, 2014).

a watchmaker and jeweler, and an optical instruments store. There were also several establishments which provided timber and mason building supplies and a hay and grain dealer.¹⁶⁵

Hughes and Bailey's 1904 *Bird's Eye View of Hoboken* illustrates increased development in the early-twentieth century, with the marshes having been filled to the north and west of the development in 1881 (Figure 14). While this development included expansions in industrial enterprises and manufacturing, there was also considerable commercial development. According to the Hughes and Bailey map, this commercial development included seven real estate and insurance firms, six furniture stores, five banks/loan brokers, eight hotels, 12 restaurant or other eating establishments, two coroners, two pharmacies, two livery stables, a cigar store, a dentist, two civil engineers, three attorneys, a coffee store, a horseshoer, a sign painter, and a wine sample room. There were at least six wine and liquor dealers/importers, a tea and coffee importer, a hay and grain dealer, a dealer in milk and cream, and a dealer in smoked, salt and preserved fish also in operation.¹⁶⁶

While Hoboken experienced fairly rapid growth from 1860 to 1910, the city's economy was devastated by the military's usage of its peers during World War I. Technological changes in cargo shipment and the rise of air travel in the mid-twentieth century severely undermined the waterfront industry and overall economy of Hoboken.

8.2.2 Archaeological Case Studies

The review of previously conducted cultural resource studies within the Study Area did not identify any previous excavations of commercial sites. However, past archaeological excavations within Manhattan indicate that intact archaeological deposits can be found despite recent or historic urban development. Although the history of landfill and development within Manhattan and Hoboken are quite different, each city, nevertheless, has a history of diachronic and sequential occupations with modern structures having been constructed in the same location as historic occupations dating to the nineteenth or twentieth century, and potentially earlier. Therefore, archaeological case studies from Manhattan can provide insights into the types of historic commercial resources which may remain extant within the Study Area.

In 1985, Greenhouse Consultants, Inc. (Greenhouse) conducted an archaeological excavation at the Broad Financial Center Site in the Wall Street district. Greenhouse uncovered the footings of a small outbuilding in the backyard of a lot within which they had found the seventeenth century warehouse of Augustine Heerman. Excavation of the outbuilding revealed thousands of clay tobacco pipe fragments. In total, they recovered almost 7000 fragments representing nearly 900 clay pipes, the largest sample of tobacco pipes from the early-eighteenth century ever recovered from a single feature in New York. An analysis of the pipe fragments revealed that they did not represent high-quality pipes; rather, the fragments were defective, with malformations that had occurred during the molding stage. While a detailed analysis of the pipe fragments was unable to determine where they were made or why they were dumped in this location, the study suggested that the fragments may have been deposited

¹⁶⁵ O.H. Bailey and A. Ward, *The City of Hoboken, New Jersey* (Boston: O.H. Bailey & Co., 1881).

¹⁶⁶ Hughes and Bailey, *City of Hoboken, New Jersey* (New York: Hughes & Bailey, 1904).



underneath the floor of the building as a form of paving or bedding. Pieces of ceramic have been known to have been used for pavement and pavement bedding as they can promote drainage and reduce flooding.¹⁶⁷

Greenhouse's excavations also uncovered the foundations remains of Heerman's Warehouse and three yellow brick features associated with the warehouse. The foundation remains showed evidence of structural change and reorientation over time. The excavations identified a multi-component occupation which spanned from the seventeenth century into the mid-nineteenth century. Greenhouse was able to identify unique contexts dating to 1640-1650, 1680-1710, 1710-1720, and 1850. A total of 43,318 artifacts were recovered from the excavations. From an analysis of the material remains associated with each of the defined contexts, Greenhouse developed a site chronology which charted transitions in material cultural from primarily Dutch materials to British items, consumer material preferences over time, and dietary shifts. The results of this excavation offered a window into earlier colonial life in lower Manhattan, in an area within which the first municipally mandated meat and commodities markets operated. The study also provided insights into the history of land use in this portion of Wall Street and evolving consumer habits from the late-seventeenth through the mid-nineteenth century.¹⁶⁸

In 1981, Joan Geismar conducted an archaeological investigation at 175 Water Street Block in New York City. These excavations recovered broken ceramics in the backyard lots of several former china stores. In the backyard of one former nineteenth-century crockery, ceramic sherds of matching patterns were found in a wood-lined privy pit and in a barrel. In the backyard of an adjacent nineteenth-century crockery, a large stone privy containing thousands of ceramic and glass sherds was uncovered. Reconstruction of the recovered material indicated that more than 400 dishes were represented including painted and printed teawares, plain white plates, and platters, all of which were made in England and then imported to New York.¹⁶⁹

In addition to finding evidence regarding the occupation of these early-nineteenth century crockeries, Geismar's excavations at 175 Water Street yielded evidence of the block's historic transition from early-nineteenth century mixed commercial and residential use to its mid-nineteenth century light industrial and warehouse occupation which persisted until the mid-twentieth century. As a result of the excavations at 175 Water Street and historic research conducted as part of the archaeological investigation, Geismar was also able to develop an historic model for nineteenth-century mercantile development on this block. This model,

documents two stages of development. The first, the merchant specialist/middleman, an outgrowth of the colonial all-purpose merchant, evolved from this earlier merchant after 1815 to act as a retailer and wholesale-supplier in a developing commercial market. The second, a warehouse/distributor, developed after 1850 in response to the need to store and distribute goods in a time of increased availability of goods and a burgeoning market.¹⁷⁰

¹⁶⁷ Greenhouse Consultants, Inc., *The Broad Financial Center Mitigation Final Report, Volumes I, II, III, & IV. The Excavation of Augustine Heerman's Warehouse and Associated 17th Century Dutch West Indian Company Deposits (New York: Landmarks Preservation Commission, 1985); Anne-Marie Cantwell and Diana diZerega Wall, <i>Unearthing Gotham* (New Haven: Yale University Press, 2001).

¹⁶⁸ Greenhouse 1985.

¹⁶⁹ Joan Geismar, *The Archaeological Investigation of the 175 Water Street Block New York City* (New York: Landmark Preservation Commission, 1983); Cantwell and Wall 2001.

¹⁷⁰ Geismar 1983, 849.

Similarly, Louis Berger & Associates (Louis Berger) conducted an archaeological investigation of Block 31, bounded by Pearl, Wall, and Water streets north of Hanover Square. Louis Berger's research documented that Block 31 was originally developed as a series of water lot grants in 1694 to 1695. The lots were filled in association with some of the earliest commercial activities along the waterfront. By the early-nineteenth century, the block consisted of mixed residential use with occupations including chemist/druggists, artists, and small-scale merchants. The block soon transitioned to brokerage and warehousing usage; by 1820, it was entirely commercial. Louis Berger also conducted subsurface testing within Block 31. These excavations revealed extensive yard deposits, middens, privies, wells, cisterns, and building foundations concentrated within the center of the block. The archaeological deposits primarily dated between 1780 and 1820 and reflected residential and commercial activities. Louis Berger also found that any archaeological resources along the street fronts of Block 31 had been destroyed by more recent development.¹⁷¹

8.2.3 Discussion

While much of the mid-nineteenth through early-twentieth century development of Hoboken was directly connected to the development of the wharves and industrial growth spurred by this development, commercial and mercantile growth also occurred during this period. The earliest commercial ventures were associated with the resort industry introduced by Colonel Stevens. Stevens' investments led to the growth of hotels and restaurants by the early to mid-nineteenth century. With the founding of the Hoboken Land and Improvement Company and the break up and sale of some of Stevens' property, more intensive development followed. Maps of the late-nineteenth and early-twentieth centuries reflected the presence of commercial interests including pharmacies, importers, furnishing stores, groceries, butchers, bakeries, stables, and other small personal shops.

As the case studies in the previous section illustrate, archaeological remains associated with historic commercial activity may remain extant despite modern development and urbanization. As such, it is possible that remnants of the mid-nineteenth through early-twentieth century commercial occupation of Hoboken may also remain extant. Resources reflective of commercial occupations could include a broad variety of features reflecting the nature of a given commercial enterprise, as well as more discrete features, such as wells, privies, and cisterns, for the workers at the site if such occupations predated the extension of municipal water and sewer lines. Given the current relative lack of archaeological information regarding commercial activity within Hoboken in the mid-nineteenth or early-twentieth centuries, any such deposits would have to be evaluated for their potential eligibility for listing in the National Register under Criterion D for their potential to provide insights into the historic development of Hoboken.

8.3 Residential, Sewage, & Water

This contextual study provides an overview of the history of residential, sewage, and water development within Hoboken and the types of archaeological deposits or features associated with this context that might be extant within the APE. The development of sewers and municipal water lines within the Study Area was generally spurred by the

¹⁷¹ Louis Berger & Associates (Louis Berger), *Druggists, Craftsmen, and Merchants of Pearl and Water Streets, New York: The Barclays Bank Site* (New York: Landmarks Preservation Commission, 1987).

growing population and resulting development. Given the direct impacts of the development of sewer and water lines on residential properties, i.e., transitioning from private outhouses and/or wells to municipal sewer and water lines, and the overall connection between the location of the municipal utilities and residential development, these three topics are presented as a single context.

As previously noted, the earliest occupations of Hoboken were located within the eastern uplands. Permanent European settlement of the area dates to before the Revolutionary War. This settlement, however, was short-lived; more extensive development did not occur until the mid-nineteenth century.

Several previous cultural resource studies have examined the sewer system in Hoboken. In particular, RGA conducted in-depth background research regarding Hoboken's sewer system in association with archaeological monitoring of a sewer rehabilitation along Grand Street in 2015. In the following discussion of the residential development of Hoboken, RGA's study will be heavily referenced given their detailed and extensive research.¹⁷²

8.3.1 Historical Background

As previously discussed, there was limited recorded development within the Study Area prior to Colonel Stevens' land acquisition in 1784. Earlier European-related development consisted of Arent Teunissen Van Putten's short-lived farmhouse and brewhouse circa 1640 to 1645 and Samuel Bayard's eighteenth-century country estate.¹⁷³

Soon after his land acquisition, Colonel Stevens began to develop Hoboken as a resort. An 1829 description of Hoboken indicated that the area had between 400 and 500 inhabitants. In 1834, Gordon indicated that the Village of Hoboken was chiefly built on one street and had approximately 100 dwellings and between 600 and 700 inhabitants.¹⁷⁴ David Burr's 1832 Map of the City and County of New York depicts Hoboken as primarily undeveloped marshland.¹⁷⁵ The only development within the settlement consisted of a southwest to northeasterly trending road, the Turnpike to Newark, which crossed Hoboken Creek and terminated at a dock in the southeastern corner of Hoboken; and, another roadway (historic Washington Street) which extended to the north near the eastern shoreline through Hoboken towards Weehawken, John Stevens Estate at Stevens Point, and a small collection of unlabeled buildings on an informal drive near the waterfront in the southeastern portion of Hoboken. The 1837 United States Coast and Geodectic Survey Topographic Map of the New Jersey Coast illustrates denser development than Burr's 1832 map.¹⁷⁶ As with Burr's map, development was concentrated in the southeastern portion of Hoboken and is located primarily along the Turnpike to New Jersey and Washington Street. Denser development is depicted on the eastern and western frontage of Washington Street and may have extended as far north as present-day 6th Street. A lone structure may have been located around present-day 8th or 9th Street. The only other development within the village consisted of a secondary east-westerly roadway to West Hoboken which connects to Washington Street in the northern extent of the Study Area. While neither the Burr nor the Coastal Survey map labels the depicted

¹⁷² RGA, Archaeological Monitoring North Hudson Sewerage Authority Grand Street Combined Sewer Rehabilitation, City of Hoboken, Hudson County, New Jersey (Trenton: NJHPO) 2015b.

¹⁷³ Shaw 1884, 1208; Hoboken Historical Museum 2016; Hartman and Lewis 2016.

¹⁷⁴ Winfield 1895, 55; Gordon 1834, 158.

¹⁷⁵ David Burr, *Map of the City and County of New York with the Adjacent Country* (DeWitt, 1832).

¹⁷⁶ United States Coast and Geodectic Survey, *Topographic Survey of the New Jersey Coast, Sheet T-17*. (United States Coast Survey, 1837).

structures, it seems likely that they represent residential, commercial, and industrial development within the early village settlement.

During the nineteenth century, many of the buildings built within Hoboken were erected to standards set by the Hoboken Land and Improvement Company, resulting in a general coherence and consistency to the architectural forms. The company also established an orderly street pattern within the village, particularly as development expanded to the north and west of the initial upland settlement.¹⁷⁷

In 1849, Hoboken was set apart from North Bergen and incorporated into a township. The population of the settlement had steadily grown throughout the 1830s and 1840s. By 1850, Hoboken Township had a population of 2,608. By 1855 the population had doubled and Hoboken was incorporated into a city.¹⁷⁸ Dripps' 1855 *Map of New York City, County, and Vicinity* reflects expanded development within the southeastern portion of Hoboken. Several streets may have been laid out by this time; from east to west, the map shows Hudson Street to Marshall Avenue and from north to south, Ferry Street to at least 12th Street. Development, however, appears to have been in a restricted area from Ferry Street on the south to 6th Street on the north and from the eastern shoreline to Grand Avenue on the west. It appears that the streets north of 6th Street and the streets west of Grand Avenue were not extant in 1855 as the streets were not formally authorized by the New Jersey State Legislature until 1863.¹⁷⁹ Comparing the Burr and Dripps' maps suggests that by 1855 portions of the meadowland within Hoboken had been filled. Historical accounts indicated that meadow streets which have been graded within Hoboken were generally filled in to a height of about two feet above high water.¹⁸⁰

During the 1840s through the 1860s, the Hoboken Land and Improvement Company constructed and sold entire blocks of rowhouses within the central portion of Hoboken. In the 1840s, many of these structures were constructed in a Greek Revival style. Homes from the 1850s and 1860s were typically Italianate-style structures; the majority of these 1840 through 1860 homes were three-story rowhouses. At this time, Washington Street became the main commercial street. More extensive residential development occurred from the 1870s through the 1890s, corresponding with the growth of the shipping industry.¹⁸¹

The Board of Water Commissioners and Water Registrars had control of the water supply of the city from its inception in the 1850s. From 1857 to 1882, Hoboken was supplied water from Jersey City. The first mains were installed in Hoboken in 1857 with the supply being taken from the Passaic River at Belleville. In 1882, Hoboken switched their water supplier to the newly formed Hackensack Water Company Reorganized. The switch resulted in lower water rates for the city and a new water source, the Hackensack River at New Milford. The main water pipes which connected to the company's reservoir at Cherry Hill entered Hoboken through Willow and Park Avenues. The

¹⁷⁷ Hoboken Historical Museum 2016.

¹⁷⁸ Daniel Van Winkle, *History of the Municipalities of Hudson County, New Jersey: 1630-1923* (New York: Lewis Historical Publishing Company, 1924), 289.

¹⁷⁹ M. Dripps, *Topographical Map of New York City, County, and Vicinity* (New York: M. Dripps, 1855); RGA 2015b, 3-3; New Jersey State Legislature, "Act of Confirm the Laying Out of the Westerly Part of the City of Hoboken," *Acts of the Ninetieth Legislature of the State of New Jersey* (Paterson: Chiswell & Wurts, 1863).

¹⁸⁰ Shaw 1884, 1211; Van Winkle 1924, 289-290.

¹⁸¹ Hoboken Planning Board 2014.

main pipes consisted of a 12-inch, a 16-inch, and a 24-inch line which had a combined carrying capacity of more than 12 million gallons per day.¹⁸²

Van Winkle observed that:

After the incorporation of Hoboken as a city and its gradual enlargement, the reclaiming of marsh lands soon became a problem that engrossed the attention of the authorities, it being necessary to fill these low and wet surfaces with wholesome earth before buildings could be erected or streets made. The reclamation of the uplands was a comparatively simple affair, because it could be easily effected by tidal sewers, that is, by sewers built on such a grade and at such elevations above low mean water that they would freely discharge their contents directly into the tidewaters. The drainage of the marshlands proved a much more intricate problem.¹⁸³

Alongside the need to drain the marshlands, the growing population and development of the city also necessitated the development of a formal drainage and sewerage system. The city adopted a tidal sewer system to address its drainage issues. RGA cited minutes of the Hoboken City Council that indicate the first sewers were installed along Washington Street (south from 6th Street), Bloomfield Street (south from 8th Street), and Newark Street in 1860. The lateral sewers along Washington and Bloomfield streets drained into the Newark Street trunk sewer which emptied into the Hudson River. Receiving basins were also installed at various street intersections to drain stormwater from the improved roads and funnel it into the sewers.¹⁸⁴

The tidal sewer system was designed to work in concert with tidal cycles. The sewer outlets were constructed at an altitude just above mean low tide. With the rising tide, the sewer gates would be left open to allow water to enter the sewer system. Once high tide was reached, the gates would be closed so as not to flood the system. Near low tide, the gates would be opened theoretically allowing gravity to pull the captured tidal water and sewer contents out into the river. The flood gates were initially manually operated; over time their operation was automated.¹⁸⁵

The earliest sewers within Hoboken's uplands were constructed of brick. They varied in shape from circular to ovular and ranged in diameter between 2.5 and 5 feet. From 1866 to 1868, a brick lateral sewer was constructed along portions of Garden Street, a trunk sewer was built in 3rd Street from Adams Street to the Hudson River, and brick sewers were installed along portions of Meadow and Willow streets. RGA identified only one instance of a cement pipe installation during this period–an 1867 extension of the Garden Street sewer from 9th to 11th streets. Manholes were also installed at several locations to provide maintenance access to the sewer system.¹⁸⁶

¹⁸⁵ RGA 2015b, 3-1.

¹⁸² Van Winkle 1924, 293-294; Shaw 1884, 1217-1219.

¹⁸³ Van Winkle 1924, 296.

¹⁸⁴ RGA 2015b, 3-1; Hoboken City Council, "Minutes of the Hoboken City Council" (Hoboken: Hoboken City Clerk's Office, 1860-1871).

¹⁸⁶ RGA 2015b, 3-1; Hoboken City Council, 1866-1868; Thomas H. McCann and Alphonse Fteley, *Reports of Thomas H. McCann, City Surveyor, and Alphonse Fteley, Consulting Engineer, on a General Sewerage Plan, for the City of Hoboken, N.J.* (Hoboken: The Evening News Print, 1890).

The earliest drainage map of the marshlands within Hoboken dates to 1866. At this time, civil engineers proposed the installation of sewers extending from east to west across Ferry, 1st, 3rd, 10th, and 15th streets. These sewers were all intended to discharge into the Hudson River at low tide. In 1869, it was reported that approximately three miles of box sewers and ditches had been built, primarily along Ferry and 1st streets. Another drainage map for the marshlands was proposed in 1869 which called for dividing the city into three districts, each with its own main sewer line. Only one of these sewer lines was constructed along 3rd Street, extending from the Hudson River to Adams Street, receiving drainage from the Garden Street, Park Avenue, Willow Avenue, Clinton Street, Grand Street, and Adam Street sewers and depositing their contents on the back meadows at Monroe Street.

The sewers within the meadowlands were generally wooden box constructions and ranged in size from small boxes (2.5 feet by 4 feet) to larger ones (4 feet by 8 feet). Box-type sewers were installed in Ferry Street (from the western extent of the city to Newark Avenue), in Newark Avenue (from Madison to Meadows streets), in Adams Street (from 1st Street to Newark Avenue), and Willow Street (from 2nd Street to Newark Street) from 1866 to 1869. Additional box sewers may have also been installed along Jefferson Street (from 1st Street to Newark Avenue) and along Grand Street (from 2nd to Newark streets). In 1868, Hoboken's sewer commission also entered into agreement with the M&E "to build a box outlet sewer from the junction of the Newark Avenue/Street and Ferry Street sewers, at Jefferson Street, south across the land of the railroad to its Eighteenth Street tidal basin."¹⁸⁷ This sewer would allow for the meadows to drain to the south and into the railroad basin.

Between 1869 and 1871, residents petitioned for the installation of additional box sewers within the meadowlands. These sewer applications included: Grand Street, between 2nd and 6th streets; Clinton Street, between 1st to 5th streets; Madison and Monroe streets, between 1st Street to Newark Avenue; Jackson Street, between 1st to Ferry streets; and in Harrison Street, between Paterson Plank Road to 1st Street.¹⁸⁸

Soon after the installation of this tidal box sewer system within the meadows, the system was found to be inadequate and insufficient to meet the drainage needs of the meadowlands. A study commissioned by the Common Council in 1870 identified two methods to relieve the drainage from the meadows—the installation of another outlet sewer or the creation of large underground reservoirs to receive the draining water from the meadowlands and from which the water and sewage could be pumped into the river. The Common Council did not act on either of these options. In 1873, a *New York Times* article documented the poor drainage conditions within the Hoboken meadows and the petitions of local residents to induce the Hoboken Common Council to action. The *New York Times* described the deleterious conditions within the meadows as follows:

That the Hoboken meadows require proper drainage no one who has been ever there can dispute. From Adams-street for half a mile westward, to the foot of the Hudson City Halls, the city is flooded with stagnant pools and health-destroying offal. Down through the ravine comes the sewage from

¹⁸⁷ RGA 2015b, 3-3; Hoboken City Council, 1866-1868; New Jersey State Legislature, "A Further Supplement to an Act Entitled 'An Act to Provide for the Drainage of Certain Low Lands Lying in the City of Hoboken and the Township of Weehawken," *Acts of the Ninety-Second Legislature of the State of New Jersey* (New Brunswick: A.R. Speer, 1868).
¹⁸⁸ RGA 2015b, 3-3; Hoboken Common Council 1869-1871.

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the Heights and spreads itself over the lowlands in the western part of the city. Every rain, too, floods the city. There are no sewers to carry the water away, and it lies there until, partly evaporated, it settles into stagnant pools. Health in a plague-infested spot such as this is impossible, and sickly little children and emaciated men and women are the people whom poverty compels to live there.¹⁸⁹

In an attempt to ameliorate the situation with the meadows and appease the upset property owners within the area, the City Council installed a box sewer in 1st Street in 1874; this sewer extended from the western boundary of the city through to Meadow Street. The sewer line continued in a southerly direction along Meadow Street under the rail line and emptied into the railroad's basin on 18th Street. The Willow Street sewer was also extended at this time from 2nd Street to Newark Street. A small nine-inch pump was installed on Meadow Street, between Ferry and 1st streets. This pump was able to sufficiently control all of the water south of 3rd Street except during storms. A smaller pump was also placed in the southwestern section of the city and operated for approximately 20 minutes every two hours. This pump was capable of draining nearly 25 acres, except during storms. This latter pump was abandoned after a six-month trial.¹⁹⁰

Sanitary conditions within portions of Hoboken were considered so poor that Hoboken was selected as a subject community in a study of several Hudson County communities examining the relationship between sanitation, causes of disease, and death rates. The sanitation study ultimately found that where railroad construction had impacted the marshlands in both Hoboken and Jersey City and where no adequate sewer system had been supplied, there had been a negative impact on overall health with the number of deaths attributed to certain diseases having increased. The report provided an illustration of Hoboken's 3rd Street sewer as an example of a defective tidal sewer in that sections of the sewer had sunk below the mean low tide, and were therefore not properly draining into the Hudson River. ¹⁹¹

Speilmann and Brush produced a topographical map in association with the Board of Health's sanitation study (Figure 15). This map shows the extent of meadowlands within the city of Hoboken. The meadowlands extended from the Western Rail Road on the west to points as east as Garden and Willow streets. The meadows also extended from Newark Avenue on the south to points as north as 17th Street. Speilmann and Brush's map also indicates that there were six outlets to the sewer system within Hoboken–three to the Hudson River to the east and three to the DLWRR to the south.¹⁹²

The sanitation study found that that nearly half of Hoboken did not contain sewers by 1880. It also concluded that given that this non-sewered area was primarily swamp or meadow land, lying only about two feet above tide, that as a "natural consequence it is constantly saturated and covered with water, which, being mostly stagnant and

¹⁸⁹ New York Times, "Hoboken Meadows: Opposition to the Drainage Commission by the Common Council," *New York Times* August 6, 1873. ¹⁹⁰ Van Winkle 1924, 297; RGA 2015b, 3-4; New Jersey State Legislature, "A Supplement to an Act Entitled 'An Act to Provide for the Construction

of a Main Sewer in the City of Hoboken and Township of Weehawken," Acts of the Ninety-Eighth Legislature of the State of New Jersey (Paterson: Chiswell & Wurts, 1874).

¹⁹¹ Van Winkle 1924, 298-299; RGA 2015b, 3-4; National Board of Health, *Annual Report of the National Board of Health* (Washington, D.C.: Government Printing Office, 1879) 174.

¹⁹² Spielmann and Brush, *Sanitary and Topographical Map of Hudson County*. Hoboken: Speilmman and Brush, 1880.







poisoned by the addition of sewage matter from privies, refuse, and garbage from houses and animal secretions, becomes very foul, and pollutes the atmosphere in the entire neighborhood, thus rendering it unfit to be breathed."¹⁹³

In his 1886 report on the Social Statistics of Hoboken, George Waring, Jr. noted that three quarters of the houses within the city used privy vaults as opposed to water closets for the disposal of human and liquid waste. All of the water closets within the city were connected to the public sewers. Waring noted that approximately 75 percent of the privy vaults were water tight. Waring cited the nineteenth-century Hudson County Board of Health's regulations for the construction and emptying of privies as follows:

All vaults and privies shall be made of brick and cement, and contain at least 80 cubic feet, and the inside of the same shall be at least 3 feet distant from the line of every adjoining lot, and at the same distance from every street, lane, alley, court, square or public place or public or private passageway; and they shall be constructed as to be conveniently approached, opened, and cleaned. Every vault shall be water tight, so that the contents thereof cannot escape therefrom.¹⁹⁴

The Board of Health also prohibited opening of the privy vaults between June 1 and September 15 aside from instances within which the owner had received a dispensation from the Board of Health. Waring also noted that night soil was used as a fertilizer.¹⁹⁵

The Hoboken City Council commissioned several studies over the next three decades in hopes of solving the drainage issues within the meadows. Each study generally offered two solutions to the problem—raising the surface of the meadowland or installing pumps to remove the excess water. The pumping system was always the preferred option as raising the meadows was cost prohibitive. Residents of the meadowlands were not satisfied with the pump solution. They contended that the submerged portions of the meadow were owned by wealthy speculators who wanted residents to pay for drainage of their land. They also worried about the ramifications of lowering the water table in areas of the meadow which had already been developed. Many structures that had been built within the meadows were placed on wooden pile foundations; there was local concern that these foundations would be exposed and rot if the water table was lowered.¹⁹⁶

The 1890 sewerage plan commissioned by McCann and Fteley provided several descriptive details regarding the extant sewerage system within Hoboken. Specifically, they observed that half of the tidal sewers within the meadows were brick on piles and half were wooden boxes. They noted that these sewers had been installed without an integrated plan or vision. They noted only three outlets for the sewer system—one on Jefferson Street which terminated into the DLWRR Canal; one at the southerly end of Park Avenue which also terminated at the canal; and, one on 3rd Street which terminated at the Hudson River. The Jefferson Street sewer lines started at Ferry Street as a 4- foot 6 inch by 6-foot wooden box which reduced to a 30-inch iron pipe at the railroad embankment and

¹⁹³ New Jersey Board of Health, *Fourth Annual Report of the Board of Health of the State of New Jersey* (Trenton: New Jersey State Library, 1880), 48; RGA 2015b, 3-7.

 ¹⁹⁴ George Waring, Jr., *Report on the Social Statistics of Cities* (Government Printing Office: Washington) 1886, 695.
 ¹⁹⁵ Waring 1886.

¹⁹⁶ New York Times, "Property-Owners Exercised over the Question of Drainage," New York Times August 11, 1881; RGA 2015b, 3-7.

thence continued as an 8-foot square crib box. The Park Avenue outlet consisted of an 8-foot wooden square. The 3rd Street outlet consisted of a three foot by four foot wooden box at Monroe Street which connected to a four-foot circular brick sewer at Grand Street; the brick sewer increased to a five-foot circular brick sewer at Washington Street. The lateral sewers connecting to these outlets were partially brick, 2-foot 6 inch by 3-foot 9 inch, of oval shape and partially wooden boxes, 3 feet by 4 feet. Within the lateral sewers, McCann and Fteley noted that "in some places water and gas mains pass through the sewers, forming dams within." Ultimately, McCann and Fteley found that the sewer outlets were creating a vile environment within the canal; and that the 3rd Street outlet and many of the lateral sewer lines were generally only one foot above mean low water level. McCann and Fteley also observed that with the adoption of modern plumbing practices within the city that nearly all cesspools and water closets had been connected to the sewer system. 197

As with previous sewer studies, McCann and Fteley ultimately proposed the installation of a pumping drainage system within the meadows. Such a system would make use of the existing sewer system as a combined sewer, for both sewage and rain water. Ulitmately, despite McCann and Fteley's study and a subsequent study performed in 1912, none of the proposals for pump sewage systems were adopted and sewers continued to be built as before.198

Bien's 1891 Atlas of the Metropolitan District and Adjacent County indicates that additional meadows had been drained. Territory from the west of Clinton Street to Jackson Street and to a point generally south of 5th Street had been drained.¹⁹⁹ A seventh sewer outlet had also been installed along 14th Street. A total of 500 receiving basins were situated throughout the improved streets of the city. Nevertheless, Hoboken continued to have problems with its sewer system throughout the nineteenth and into the early-twentieth century. These issues were slowly alleviated over time. New trunk lines were constructed within 11th and 14th streets, alongside several additional lateral sewers. By the 1920s, aided by twentieth-century sanitation technology, Hoboken had improved its sewer system to a satisfactory level. By the late 1930s, all of the meadow land within the city had been reclaimed and developed. 200

In 1899, the Hoboken Land and Improvement Company officially opened Hudson Street between 10th and 14th streets. Members of the Stevens family, who still held title to these parcels, began selling off their parcels for residential development. In selling the property, the Stevens family imposed deed restrictions to ensure the maintenance of the neighborhood and restrict the types of buildings which could be constructed. Castle Point Terrace was similarly opened and sold in 1903. This portion of Hoboken, along Hudson Street and around Castle Point Terrace, became some of the city's most prestigious neighborhoods.²⁰¹

From 1860 to 1910, Hoboken experienced both a building and a population boom. By 1910, the city's population was over 70,000. At the turn of the century, around 40 percent of the city's population was composed of immigrants, with German immigrants representing over half of the immigrant population. The harsh treatment of the German

¹⁹⁷ McCann and Fteley 1890, 4.

¹⁹⁸ Van Winkle 1924, 295; RGA 2015b, 3-10.

¹⁹⁹ Joseph Rudolph Bien, Atlas of the Metropolitan District and Adjacent Country (New York: Julius Bien, 1891).

²⁰⁰ Van Winkle 1924, 295; RGA 2015b, 3-10; Hoboken Board of Trade, "Sewers Again!" Hoboken Board of Trade Bulletin May-June 2014. ²⁰¹ Hoboken Planning Board 2014.

population during World War I, with the seizure of German shipping assets, precipitated a dramatic decline in the German population. During the mid and late-twentieth century, immigrant groups from Ireland, Italy, Yugoslavia, Central and South America, and India settled in Hoboken. During the mid-twentieth century, the first public housing projects were constructed within Hoboken. These housing projects, including the Andrew Jackson Gardens, the Christopher Columbus Gardens, and the Harrison Gardens, were constructed in the industrial portions of the city which previously contained worker housing. Despite the mid-twentieth century immigration trends and development of public housing, the city's population generally declined every decade from 1910 to 1990.²⁰²

8.3.2 Archaeological Case Studies

The review of previously conducted cultural resource studies within the Study Area identified at least three previous studies within which buried sewer lines were uncovered and one study within which an assessment of the entire city's sewer system was provided. The research did not, however, identify any previous excavations of residential sites within the Study Area. As with the preceding commercial discussion, past archaeological excavations within Manhattan can provide insights into the types of historic residential resources which have been uncovered in heavily urbanized contexts.

Sewer System

In 1978, Herbert Kraft conducted a Historical and Archaeological Survey in association with the Hudson County Sewerage Authority's Facilities Plan Area III. This survey included a sensitivity assessment of the majority of Hoboken. In this study, Kraft concluded that there were approximately 1.9 miles of wooden sewers extant within Hoboken. He observed that the wooden sewers would be approximately 3 ½ feet wide and 4 feet deep and that they were built between 1850 and 1875. According to Kraft wooden sewers within the city should be expected under Jackson Street between 5th Street and Paterson Avenue, on Grand Street between 7th Street and Newark Avenue, potentially under Madison Street between 6th and 8th streets, on 1st Street between Marshall and Jackson streets, and on Newark Avenue between Adams and Jefferson streets. Kraft also noted that brick sewers and manholes built before the turn of the twentieth century are also extant within portions of Hoboken. He further concluded that the remaining sewers consist of concrete, vitrified clay, and cast iron pipes. It should be noted that Kraft did not provide the source material for his conclusions regarding the sewer system.²⁰³

In 2006, RGA conducted archaeological monitoring and a Stage 1B archaeological survey in association with the proposed installation of several sewer overflows and a consolidation conduit. Archaeological monitoring at test location CSO H-6 documented the presence of an intact brick sewer. In particular, the excavation of Junction Box No.4 exposed the intact nineteenth-century brick sewer extending along 14th Street. The sewer was exposed near the eastern terminus of 14th Street, in the northeastern extent of the current Study Area, immediately south of Weehawken Cove. RGA documented the exposed sewer via line drawings and photography per the request of the

 ²⁰² Hoboken Historical Museum 2016; Hartman and Lewis 2016; Hoboken Planning Board 2014.
 ²⁰³ Kraft 1978.

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NJHPO. The exposed sewer was of the "egg-shaped" variety and dated to the late-nineteenth or early-twentieth century. It may in fact have been associated with the sewer outlet installed along 14th Street in the 1890s.²⁰⁴

In 2011, RGA conducted archaeological monitoring in association with sewer line maintenance and upgrades along Hudson Street and Observer Highway. RGA conducted extensive background research to document the history of sewer construction within this area. Through this research, RGA found that a brick sewer was initially installed along Observer Highway (formerly Ferry Street) in 1895. The research indicated that this sewer line most likely extended in an easterly direction beneath present Observer Highway near Jefferson Street to Hudson Street where it turned to the southeast and extended below the rail yard of the DLWRR to one of the railroad's piers. At this point, the sewer turned east and extended beneath the pier terminating at the Hudson River. Historic records indicated that three different methods of construction had been used to create the sewer line—the portion below Observer Highway being brick, a 48-inch cast iron pipe being installed below the railroad, and a wooden box sewer being located beneath the railroad's pier. The sewer also contained tidal gates. In 1954 a concrete regulator vault was installed at the outfall sewer at Court Street.²⁰⁵

At the eastern extent of their project area, RGA observed and recorded the existing brick tidal gate chamber where the brick combined pipe transferred sewer flow to two 48-inch pipes. The tidal gate chamber was rectangular in shape measuring approximately 7 feet in width by 11 feet in length. The walls of the chamber were approximately one-foot thick and consisted of three brick courses. The chamber was approximately 14 feet deep. The sewer pipe entered the brick chamber base from the west; the gates were situated on the chamber's east wall.²⁰⁶

The excavation also exposed the existing brick sewer at a depth of approximately eight feet below existing grade. The sewer consisted of a semicircular vault. RGA documented and photographed a cross-section of the sewer. The cross-section revealed that the brick arch was approximately 1-foot thick and consisted of three courses of brick laid on flat and extending lengthwise down the sewer alignment. The base of the sewer consisted of a single flat layer of edge-lain bricks. RGA also documented the builder's trench for the sewer line and identified the construction sequence used during the sewer installation. The builder's trench was approximately 15 feet wide and located 17 feet below surface grade. Wooden sheet piling comprised of pine boards was driven down through the base of the trench, perpendicular to the floor of the trench. The base of the trench was filled with approximately three feet of large stone rip-rap, smaller crushed stone, and earthen fill. A layer of six-inch thick by eight-inch wide pine board planks was placed on top of the stone and formed the base of the sewer. The sewer was installed upon the pine base; the overall radius of the sewer arch was 4.5 feet. The exterior of the sewer was first filled with two feet of stone rip-rap; the stones were then covered with a dark yellowish brown (10YR4/6) sandy loam fill. No artifacts were observed within the trench or sewer.²⁰⁷

²⁰⁴ RGA, Archaeological Monitoring/Stage 1B Archaeological Survey North Hudson Sewerage Authority Solids/Floatables Removal Project Package 1 (H-6/H-7 and Consolidation Conduit) City of Hoboken, Hudson County, New Jersey (Trenton: NJHPO) 2006.

²⁰⁵ RGÅ, Archaeological Monitoring North Hudson Sewerage Authority H1 Screening and Wet Weather Pump Station City of Hoboken, Hudson County, New Jersey (Trenton: NJHPO) 2012.

²⁰⁶ RGA 2012. ²⁰⁷ RGA 2012.

As a result of the archaeological monitoring, RGA was able to record and photo document portions of the midnineteenth century sewer system within Hoboken including an intact brick sewer, a tidal gate chamber, and the builder's trench for the sewer line. They were also able to document the initial construction sequence for the installation of the sewer and to compare As-Built plans for the sewer with the extant sewer line.²⁰⁸

As previously discussed, RGA also conducted archaeological monitoring in association with the rehabilitation of wooden sewers along Grand Street in Hoboken. As a component of this study, RGA conducted an extensive literature review regarding the Hoboken sewer system. This review was referenced in the preceding historic background section. RGA also monitored the replacement of a manhole and excavations to restore areas within which the original sewers had collapsed.

The trench excavation began near Manhole #15 on Grand Street between 4th and 5th streets. Collapsed portions of the wooden sewer and an unmapped, abandoned brick manhole was identified approximately 25 feet north of Manhole #15. The abandoned manhole was ovoid in shape and consisted of seven courses of mortared brick on top of a wood beam which rested upon the vertical support beams for the original wood sewer. RGA determined that the manhole was installed sometime after the mid-twentieth century. The exposed wooden sewer within this area consisted of two vertical 0.4-foot wide by 0.55-foot thick beams spaced 1.7 feet apart that were used to support the wooden side boards (planks) that were oriented and stacked vertically to line the edge of the rectangular wooden sewer. The wooden sewer was found to be intact in this area necessitating no further excavations. Manhole #15, a ca. 1950s-1960s brick manhole, was removed and excavation continued to the south of the manhole. As the sewer line was intact in this area, no further excavations were conducted. RGA photo documented and drew a profile of the intact wooden sewer illustrating the sewer construction. This profile consisted of: "two vertical beams supporting side boards and covered by a horizontal top board. The rectangular sewer interior bordered by the vertical support beams and the top board was approximately 4.7 feet tall by 1.8 feet wide and the top of the wood sewer was identified at approximately 3.8 feet below the surface of the asphalt road."²⁰⁹

RGA also monitored excavations between 3rd and 4th streets. Along this segment, Manhole #14, a wooden manhole possibly associated with the nineteenth-century construction of the wooden sewer, was removed. RGA also monitored excavations around Manhole #13, a brick manhole. Excavations in the vicinity of these two manholes evidenced wooden sewer line construction similar to that seen around Manhole #15. RGA also documented areas within which other wooden features, e.g., notched wood pieces and a lateral wood box, were observed suggesting additional aspects of the original wooden sewer. An atypical concrete deposit was noted near Manhole #13 indicating that concrete had been used at some point to repair this portion of the sewer line. An unmapped buried wooden manhole was also identified in Grand Street. The manhole was left in place; however, a new cap of mortared concrete was installed around it.²¹⁰

²⁰⁸ RGA 2012.

²⁰⁹ RGA 2015b, 4-3.

²¹⁰ RGA 2015b, 4-10.

Archaeological monitoring was also conducted along two segments between 1st Street and Newark Street along Grand Street. For the most part, the excavations revealed a similar sewer construction as seen in the other segments of Grand Street. However, the excavation of Manhole #9 revealed a wooden wall composed of vertical wood planks. The top boards of the wood sewer in this segment of Grand Street were located at approximately 6.65 feet below grade. Notably, in the other excavated segments of Grand Street, the top of the wood sewer was approximately 3.5 to 4 feet below the road. RGA determined that the trough that was used to carry the effluent was approximately 2 feet wide and at least 8 to 12 inches in depth. This trough was significantly shallower than the trough observed in the other segments of the Grand Street sewer. This deeper segment of the sewer line with a shallower trough extended for approximately 50 feet between Manhole #8 and Manhole #9. On either side of this 50-foot segment, the shallower and typical dimensions of the wooden sewer were observed.²¹¹

RGA also took four wood samples from the four different blocks within which the wood sewer was observed on Grand Street. Each of the samples was identified as pine; however, a specific species of pine could not be discerned given the degraded condition of the wood. The wood analysis did determine "that the use of resinous coniferous wood resistant to rot and stable when exposed to liquid over long periods of time was preferred."²¹²

RGA's monitoring study yielded insights into the construction history of the wood sewer along Grand Street. Specifically, their monitoring work revealed a general consistency in the construction of the sewer except for a 50foot anomalous segment. RGA also analyzed wood samples from the sewer indicating a preference for treated pine in the sewer construction. Given that the collapsed wooden sewer elements were replaced during the project, RGA also took still photographs of these elements and of the interior of the sewer.

Residential Deposits

Archaeological investigations within lower Manhattan have yielded a great deal of information regarding the residential history of this area, particularly in the eighteenth and nineteenth centuries. These discoveries complemented with historic and cartographic research have enabled archaeologists to recreate vivid representations of individual and family lives.

Past archaeological studies within Lower Manhattan have uncovered the remains of the earliest forms of privy shafts, which differ from the privy forms during post-Colonial times. Excavations at the Stadt Huys Block and at the Broad Financial Center identified barrel-shaped privies with wood sides.²¹³ Such privies were formed by placing two barrels on top of each other, creating a five-foot deep shaft. The bases of these privies were lined with shell; the walls were encased in clay and surrounded by additional soil. When these privies were abandoned they were filled with refuse from the early-eighteenth century.²¹⁴

²¹¹ RGA 2015b, 4-14-15.

²¹² RGA 2015b, 4-18.

²¹³ Nan Rothschild et al, *The Archaeological Investigation of the Stadt Huys Block: A Final Report* (New York: Landmarks Preservation Commission, 1987; Joel Grossman, *The Excavation of Augustine Heerman's Warehouse and Associated 17th Century Dutch West India Company Deposits: The Broad Financial Center Mitigation Final Report* (New York: Landmarks Preservation Commission, 1985).
²¹⁴ Grossman 1985.

In the mid-eighteenth century, privy construction had shifted to unfired brick which was used to form a circle approximately three feet in diameter. These types of privies were also found at the Stadt Huys Block and at the Broad Financial Center. These privies had dirt floors so that the waste would drain into the ground. The presence of both privy forms at these two sites reflects changes in sanitation practices during the early and mid-eighteenth century.²¹⁵

Privy technology within Manhattan changed again by the late-eighteenth century and into the nineteenth century. Privies at this time were either rectangular or square and were constructed with wooden sides and a dirt floor. Such wooden box privies have been identified at the Assay Site, the 175 Water Street Site, and the Telco Block Site.²¹⁶ Some of these wooden privies were constructed using the existing sides of wharves; privies of this type were found at the Assay Site.²¹⁷

In 1833, the Board of Health required that privies constructed in Lower Manhattan (below Sprint Street) must be constructed of stone or brick. Such privy types have also been documented at several sites in Lower Manhattan and in other portions of Manhattan and the outer boroughs.²¹⁸

In addition to information regarding sanitation technology and changes over time, shaft features like privies, cisterns, and wells, if they were filled with domestic refuse when they were closed, can also provide a glimpse into the domestic habits of a given household. Archaeological excavations at the Courthouse site in the Five Points district of New York City revealed domestic deposits which contradicted the historic depiction of this area. Historic accounts of the Five Points in the early to mid-nineteenth century depicted the area as dirty, dangerous, and debaucherous. However, archaeological deposits found within the backyard cesspool contrasted with the historic descriptions of the area. In particular, the archaeologists recovered a variety of brightly colored printed and molded white ceramics, a few gilded porcelains, elegant stemmed glasses, and a cruet of imported Irish glass. The excavations also recovered flowerpot fragments and decorative figurines reflecting the fact that the occupants had a vision of what materially makes a home. The Courthouse site also yielded a variety of children's toys associated with middle-class neighborhoods and suggests that the children in these households had time to play and did not need to supplement the family income by scavenging or working.²¹⁹

The historic and archaeological work at the Courthouse site illustrated how the combination of historic and archaeological research can enrich the interpretation of an archaeological deposit. The historic record provided a

²¹⁵ Rothschild et al 1987; Grossman 1985.

²¹⁶ Louis Berger, *Archaeological and Historical Investigations at the Assay Site, Block 35, New York, New York*, (New York: Landmarks Preservation Commission, 1991); Geismar 1983, Diana Rockman et al, *The Archaeological Investigation of the Telco Block, South Street Seaport Historic District, New York, New York*, (New York: Landmarks Preservation Commission, 1983).

²¹⁷ Louis Berger 1991.

²¹⁸ Rockman et al 1983; Rothschild et al 1987; Louis Berger 1991; Joan Geismar, *Teacups and Opium: The Bishop Mugavero Geriatric Center Archaeological Field Report, Block 189, Brooklyn* (New York: Landmarks Preservation Commission, 1992); Joan Geismar, "Where is the Night Soil? Thoughts on an Urban Privy," in *Health, Sanitation, and Foodways in Historical Archaeology, Historical Archaeology* 27(2): 57-70, 1993; Nan Rothschild and Arnold Pickman, *The Archaeological Excavations on the Seven Hanover Square Block* (New York: Landmarks Preservation Commission, 1990; Bert Salwen and Rebecca Yawin, *The Archaeology and History of Six Lots: Sullivan Street, Greenwich Village, New York City* (New York: Landmarks Preservation Commission, 1990).

²¹⁹ Heather Griggs, "Go gCuire Dia Rath Blath Ort (God Grant that you Prosper and Flourish): Social and Economic Mobility Among the Irish in 19th-Century New York" *Historical Archaeology* 33(1): 87-101, 1999.

few assumptions regarding the types of artifacts that might be expected at such a low-income area. The recovered archaeological remains stood in contrast to those expectations and enabled a more vivid reconstruction of the early to mid-nineteenth century occupation of the site.

8.3.3 Discussion

As the preceding sections observed, there was much residential development within Hoboken in the mid-nineteenth century. The growth in residential development led to the extension of water lines into the city and the development of a sewer system. The sewer system initially dealt with draining the upland portions of the city; it would ultimately develop in a piecemeal fashion to drain the meadows throughout the western and northern portions of the city. McCann and Fteley's study of the sewage system within the city observed that many houses had connected their water closets to the sewer system by the late-nineteenth century. This observation indicates that many of the nineteenth-century residences within both the meadows and the uplands had initially used a privy. Given that historic archaeology within Lower Manhattan has uncovered deep shaft deposits, i.e., preserved privies, despite urban development, it is possible that intact or truncated privies or other shaft features may remain extant within the Study Area. Any archaeological remains associated with nineteenth-century residential development within Hoboken would have to be evaluated for their potential eligibility for listing in the National Register under Criterion D, for their potential to provide insights into the historic development of Hoboken.

Previous archaeological studies within the city have observed and documented intact portions of the historic sewer line, including both wooden and brick features. It is highly likely that additional components of this original sewer system remain extant within portions of the Study Area. Such features, if uncovered, should be photo documented and recorded as previous studies have done.

8.4 Institutional

This contextual study provides an overview of the history of the institutional development within Hoboken and the types of archaeological deposits associated with this context that might be extant within the Study Area. Archaeological resources derived from institutional complexes are associated with schools, colleges, hospitals or any other establishment designed to provide services (education, health care, etc.) en masse. Such institutions would require a centralized facility where individuals either live or report to on a daily basis. Archaeological resources associated with institutional sites have the potential to provide information on quality of educational services, socioeconomic status/class issues, religious practices, and quality and organization of public health. Presently, there are six public schools, one charter school, and one Catholic school within the Study Area. The Hoboken University Medical Center/Christ Hospital and the Hoboken Public Library are also located within the Study Area.

This study presents a brief history of the institutional complexes that were present in the Study Area and summarizes the varieties of archaeological material that derive from institutional complexes. A few previously completed archaeological studies are cited to highlight the information that can be gleaned from institutional archaeological

features. Notably, the review of previously conducted studies within Hoboken did not identify any such institutional studies. Thus, examples of institutional archaeological sites have been taken from work within New York City, much of which has occurred over the last 15 years.

8.4.1 Historical Background

The earliest public school within Hoboken was held in a rented building. This school may date to the city's incorporation in 1855. At the time of its incorporation up until 1865 control of the public schools was entrusted to a board of trustees and a school superintendent. In 1854 the Hudson Land and Improvement Company erected a school building and furnished all of the school's furniture. This building was known as No. 1 and was located at Garden Street, near 3rd Street. The original No. 1 is no longer extant; in 1913, a new Public School No. 1, the David E. Rue School, replaced the original building. This building is still extant at the northeast corner of Garden and 3rd streets.220

Between 1860 and 1861, the Hoboken Land and Improvement Company erected and furnished a second school building, No. 2. This school was located at Garden Street, near 9th Street. In 1921, the historic building for No. 2 was replaced; between 1951 and 1979, this building was renamed the Joseph F. Brandt Public School No. 2. There were two additional school buildings within Hoboken; these buildings were erected by the city. No. 3 was located at Adams Street, near 3rd Street; No. 4 was a Grammar and High School located at Park Avenue, between 5th and 6th streets. By 1918, Public School No. 3 had been removed; a new building was installed at the northeast corner of Adams and 5th streets. This building was renamed the Daniel Kelly School between 1955 and 1979. Between 1979 and 2006, School No. 3 had been converted into condominiums. From 1939 to at least 1966, offices for the Board of Education were located in School No. 4. In 1976, a new building was erected at 524 Park Avenue for Public School No. 4, the Calabro School. This building is still extant. 221

In 1884, the public school system within Hoboken consisted of one high school, four grammar schools, four primary schools in the same buildings as the grammar schools, one evening school, and one Saturday Normal School. The Normal School was established on November 5, 1870 to instruct all teachers below the grade of principal. Teachers for the primary and grammar schools were selected from the Normal School graduates.²²²

In 1860, the Hoboken Academy was organized at Willow and 5th streets. The academy was organized under a special New Jersey State Legislature charter. The founders of the school, who erected and furnished the school building via public subscription, were all German-Americans. The school provided for ten grades. Shaw noted that the Hoboken Academy had a distinctly German character.223

In 1866, St. Mary's Hospital was established by the Sisters of the Poor St. Francis at the northwest corner of Willow and 4th streets. The hospital was established to care for all persons of any religion or nationality for a small sum; the

²²⁰ Shaw 1884, 1131, 1223; NJHPO, "Streetscape Survey Form, Garden Street" (On file, Trenton: NJHPO), 1978.

²²¹ Shaw 1884, 1131-1132, 1223; Sanborn Library, LLC 1939-2006. ²²² Shaw 1884, 1132.

²²³ Shaw 1884, 1136.

hospital was free for those in need. Improvements were made to the hospital in 1883 so that its capacity reached 150 beds. In 1916, a new wing was added to St. Mary's Hospital.²²⁴

One of the most longstanding institutional complexes within Hoboken consists of the Stevens Institute of Technology. The Stevens Institute was established by the will of Edwin Stevens. Upon his death in 1868, Stevens provided for a 425-foot by 200-foot lot and \$150,000 for the establishment of a university. The lot was located between Hudson and River streets, extending from 4th to 5th streets. The trustees of the institute were incorporated in 1870; the Stevens Institute of Technology opened the following year.²²⁵ This building was designed by architect Richard M. Upjohn, the son of the architect who designed the Trinity Church of Manhattan.²²⁶ The original trustees established the curriculum for the institute as a rigorous engineering program leading to a baccalaureate degree in Mechanical Engineering.²²⁷

The Stevens family continued to make donations to the university throughout the nineteenth and twentieth centuries. Martha Bayard Stevens donated two plots of land and a house for the institute's president. Her sons, Edwin Jr. and Robert Jr., jointly donated a tract of land on the southwest corner of River and 7th streets. In 1911, the Stevens family sold the Stevens Castle and its grounds to the institute for less than market value.²²⁸

The Stevens High School was opened around the same time as the Stevens Institute. This school was a preparatory school for the institute and was initially located in the same building. Other schools were opened in Hoboken in the mid to late-nineteenth century. These schools included a Roman Catholic School on Grove Street near 5th Street which was connected to St. Peter's Parish and opened in 1848. In 1857, Reverend Leopold Mohn founded the Martha Institute at the corner of 6th Street and Park Avenue. This was a German-American school and classical academy. The Academy of the Sacred Heart was founded in 1875; it was located on Washington Street between 7th and 8th streets. Around 1868 Miss Mathilda Schmidt opened Miss Matilda Schmidt's School for Young Ladies on Bloomfield Street near 9th Street. Mrs. William McFarlane's English, French, and German School was located at the Franklin Lyceum on Bloomfield Street between 8th and 9th streets.²²⁹

In 1887, Martha Bayard Stevens established an Industrial Education Association dedicated to teaching young women home economics and the principles of saving. In 1896, the Stevens family donated land and funds for the establishment of the Hoboken Public Library at 5th and Park streets. The Hoboken Public Library is still located at this address. The Stevens family also established the Hammond Home for Children and the Robert L. Stevens Fund for Municipal Research.²³⁰

Today, the Stevens Institute consists of a 55-acre campus. The campus extends from Hudson Street on the west to the Hudson shore on the east, and from 5th Street on the south to 10th Street on the north. The campus includes

²²⁴ Shaw 1884, 1229; Van Winkle 1924, 354.

²²⁵ Shaw 1884, 1136; Stevens Institute of Technology 2016.

²²⁶ Hoboken Planning Board 2014.

²²⁷ Shaw 1884, 1136; Stevens Institute of Technology 2016.

²²⁸ Stevens Institute of Technology 2016.

²²⁹ Shaw 1884, 1223-1224.

²³⁰ Stevens Institute of Technology 2016.

over a dozen buildings and several athletic fields. The university has evolved into a multifaceted institution of crossdisciplinary research with a variety of graduate and undergraduate programs in science and management as well as engineering.²³¹

8.4.2 Archaeological Case Studies

The review of previously conducted cultural resource studies within the Study Area did not identify any previous archaeological investigations of institutional-type sites. As with the preceding discussions, past archaeological excavations within Manhattan will be described as they can provide insights into the types of historic institutional resources which have been uncovered in heavily urbanized contexts.

Louis Berger conducted excavations at the Children's Aid Society Industrial School located at 630 East 6th Street (Block 388, Lot 24) in 1998. The Industrial School had been constructed between 1889 and 1890. Louis Berger's excavations uncovered historic archaeological material from the mid to late-nineteenth century within a disturbed context including building debris. The building debris was most likely associated with houses demolished in advance of the school construction. One historic feature was uncovered–a footer and lower brick courses from a rear wall and foundation associated with a former annex to the school. The recovered artifacts included ceramic sherds and smoking pipe fragments from the mid-nineteenth century and a small collection of personal items, including a glass button, a black glass bead, and the bone handle to a brush. Louis Berger concluded that the recovered artifacts were not associated with the school, but rather with the school construction.²³²

Archaeological investigations at the proposed location of P.S. 325-K, located at the southwest corner of Bedford Avenue and Church Avenue in Flatbush, Brooklyn, identified remains associated with the nineteenth-century P.S. 90 School which had been located in this area. The fieldwork uncovered a brick-lined privy vault filled with buttons (porcelain and hard rubber), hard rubber combs, porcelain dolls, clay and glass marbles, porcelain tea cup fragments, leather from shoes and/or belts, eyeglass lenses, smoking pipe fragments, whiteware sherds, numerous slate pencils, writing slates, pharmaceutical bottles, perfume bottles, and ink bottles. Given the high frequency of writing tablets and children's toys, Historical Perspectives, Inc. identified the artifacts within the privy as being associated with a nineteenth to twentieth-century educational facility. This privy deposit contrasted with a typical residential privy that generally contains domestic artifacts such as architectural debris and kitchen-related materials. The presence of a privy and artifacts associated with the historic P.S. 90 provided insights into the school population in the Flatbush area during the nineteenth to early-twentieth century.²³³

In June 1987, Professors H.A. Bankoff and F.A. Winter of Brooklyn College conducted an archaeological field school on the campus of Erasmus Hall High School. Their excavations which consisted of nine trenches situated throughout the campus identified evidence for architectural changes and use of the campus over its history. Bankoff and Winter

²³¹ Stevens Institute of Technology 2016.

²³² Louis Berger, *Phase I Archaeological Study: Lower Eastside Service Center, 630 East 6th Street, New York*, (New York: Landmarks Preservation Commission, 1998).

²³³ Historical Perspectives, Inc., *Stage 1B Archaeological Investigation, P.S. 325-K, Church and Bedford Avenues, Brooklyn, New York*, (New York: Landmarks Preservation Commission, 2002).

identified a small segment of a foundation wall dating to an eighteenth-century structure; they also found evidence of additions made to this same structure in the late-nineteenth century. The ash underbedding for several former walkways were also identified and reflected a reorientation of the campus in the twentieth century. The excavations did not produce a high density of artifacts, though a large number of slate pencils were recovered.²³⁴

From the 1980s through the early 2000s, several archaeological studies were conducted within City Hall Park in Lower Manhattan. These excavations uncovered archaeological deposits associated with New York City's original almshouse.²³⁵ The almshouse was initially constructed in the 1730s at the then northern edge of the city; it was designed to house the homeless in Manhattan. The almshouse was used until the end of the eighteenth century when the city constructed a new almshouse on Roosevelt Island (then Blackwell's Island). Excavations uncovered a brownstone foundation and cellar hole from an eighteenth century building interpreted to be the almshouse's kitchen. Amongst the artifacts recovered from the site were numerous bone button blanks and backs.

The presence of bone backs, blanks, or bone by-products at the site suggests that the manufacture of bone buttons was an important activity at the site during the 18th century. Ross (1988: 159) notes that the almshouse was equipped with tools and that residents were required to work in return for their food, lodging, and clothing. Apparently, New York City sold the goods produced in the almshouse, including such items as yarn. It is reasonable to conclude, therefore, that the residents probably made clothing with cloth-covered bone buttons for their own use.236

The presence of self-made buttons at the site also reflected the impoverished nature of the almshouse residents. The almshouse deposits illustrate the manner in which archaeological deposits can inform upon the daily lives of those often not represented in written historical accounts.237

8.4.3 Discussion

Within the United States, there have been relatively few previously identified institutional archaeological sites. Such sites have the potential to yield information relating to individuals, segments of society, and/or aspects of daily life which were not recorded in historic documents. As in the case of the New York City Almshouse, archaeological deposits within the city helped to inform upon the lifeways of the poor individuals who resided there and how they may have worked for their stay. Similarly, the history of schools and other institutions like hospitals, and the people who lived, worked, and/or died there, may also be reconstructed from the archaeology of institutional sites.²³⁸

²³⁴ H. Arthur Bankoff and Frederick A. Winter, Erasmus Hall High School: Report of the Trial Excavations Conducted by the Brooklyn College

 ²³⁵ H. Arthur Bankon and Frederick A. winter, *Erasmus Han nigh School. Report of the That Excavations Conducted by the Brookyn Conege Summer Archaeological Field School*, (New York: Landmarks Preservation Commission, 1987).
 ²³⁵ Sherene Baugher, "Visible Charity: The Archaeology, Material Culture, and Landscape Design of New York City's Municipal Almshouse Complex, 1736-1797," *International Journal of Historical Archaeology* 5 (2): 175-202, 2001; Sherene Baugher and Edward Lenik, "Anatomy of an Almshouse Complex," *Northeast Historical Archaeology* 26 (1), 1997; Joel Grossman, *The Buried History of City Hall Park: The Initial Archaeological Identification, Definition, and Documentation of Well-Preserved 18th Century Deposits and the Possible Structural Remains of Contents of Contents and the Possible Structural Remains of Contents of Contents of Contents and the Possible Structural Contents of C* N.Y.C.'s First Almshouse, (New York: Landmarks Preservation Commission, 1991); S. Spencer-Wood, "Introduction and Historical Context to the Archaeology of Seventeenth and Eighteenth Century Almshouses," International Journal of Historical Archaeology 5(2): 115-122, 2001. ²³⁶ Baugher and Lenik 1997, 18-19.

²³⁷ Cantwell and di Zerega Wall 2001, 276.

²³⁸ C. Berghoffen, Phase IA Archaeological Assessment Report, Triborough Bridge and Tunnel Authority, Triborough Bridge Rehabilitation Project, Randall's and Ward's Islands, Manhattan (New York: Landmarks Preservation Commission, 2001); Robert Jacoby, "Our Cross to Bear:

Two studies in the 2000s addressed the relative lack of schoolhouse archaeology and provided theoretical perspectives with which to approach future archaeological studies of schools. In 2000, James Gibb and April Beisaw conducted an overview study of previous archaeological investigations of schoolhouses in the Northeastern United States. After tracing the history of school development within the Northeastern United States, Gibb and Beisaw contended that architectural remains at schoolhouse sites should be viewed as a primary source of information. They noted that such remains alongside historic documents in the form of school records and other primary and secondary resources relating to education at a respective time and place could reflect "community attitudes towards public education and larger social issues, e.g., the length and seasons of the school year, length of the school day, separation of the sexes (Peña 1992), sanitation and public health, and abstract learning versus manual training."239 Gibb and Beisaw observed that at most schoolhouse sites the analysis of non-architectural debris has been disappointing given the overall paucity of material. While they maintained that such artifacts should still be analyzed, they urged greater attention "to the architecture of schoolhouses and associated structures such as fuel storage sheds and coal bins, privies, fences, wells, and other special use buildings..."240

In 2003, Deborah Rotman presented a paper where she concurred with many of Gibb and Beisaw's findings. However, Rotman placed a greater emphasis on non-architectural remains, particularly the presence of domestictype artifacts on schoolhouse sites. She observed that the deposit of cultural materials at a schoolhouse are generally associated with use for educational purposes or special events as opposed to daily activities associated with a household. As such, "the artifacts from schools seem to be particularly meaningful and deliberate."241 Rotman further argued that archaeologists view schools more than just centers of education and training, but also as settings within which important community events occurred and performances of individual and communal identities were performed. In conclusion, she stressed that "since the schoolhouse does not generally represent an occupation, the objects recovered archaeologically had to be brought to the site with a degree of deliberate intention. Therefore, an apparent dearth of domestic objects may yield considerable information."242

School sites have the potential to offer new insights into historic attitudes towards education and social attitudes towards public and private space. Schools sites within urban settings could also yield data on resource availability to lower-income students; retention of ethnicity by children in a blended urban setting; a community's perspective on state involvement in education; and, neighborhood social and economic conditions and how these are reflected in the public sphere.243

The Intersection of Law, Tradition, and Archaeology at a Potters Field" (paper presented at the 70th Annual Meeting of the Eastern States

Archaeological Federation, Mount Laurel, NJ, 2003). ²³⁹ James Gibb and April Beisaw, "Learning Cast up from the Mire: Archaeological Investigations of Schoolhouses in the Northeastern United States," *Northeast Historical Archaeology* 29 (1): 107-129, 2000; Elizabeth Peña, "Educational Archaeology: Historical Archaeological Investigations at Schoolhouse 12 in the Town of LeRay, Jefferson County," *The Bulletin, Journal of the New York State Archaeological* Association 103: 10-19, 1992.

²⁴⁰ Gibb and Beisaw 2000, 125.

²⁴¹ Deborah Rotman, "Learning and Community: Exploring the Materiality of Rural Education in America," (Paper presented at the Annual Meeting of the Society for Historical Archaeology, Providence, Rhode Island, January 15-19, 2003).

²⁴² Rotman 2003.

²⁴³ Historical Perspectives, Inc. and Louis Berger, Archaeological Documentary Study No. 7 Line Extension/Hudson Yards Rezoning, New York, New York (New York: Landmarks Preservation Commission, 2004).
Depending on the extent and integrity of any institutional complex archaeology from the mid to late-nineteenth century, these remains could potentially yield new information regarding the socioeconomic status of the school children in Hoboken or on the dynamics of the education system at this time. Therefore, any archaeological remains associated with nineteenth century institutional development within Hoboken would have to be evaluated for its potential eligibility for listing in the National Register under Criterion D, for its potential to provide insights into the historic development of Hoboken.

8.5 Industrial

This contextual study provides an overview of the history of industrial development within Hoboken and the types of archaeological deposits associated with this context that might be extant within the Study Area. Within the discipline of Archaeology, Industrial Archaeology has developed as a distinct field of study which is concerned with the investigation, survey, recording, and preservation of industrial resources. In studying such resources, industrial archaeologists attempt to situate them within larger contexts of social and technological histories. Within New York City, in particular, industrial archaeologists have "used archaeology, history and even ethnography to explore the rapid and profound social changes that accompanied the industrialization of the region in the late-nineteenth and twentieth century."²⁴⁴ In urbanized settings like New York City, industrial archaeological studies would examine any industrial resources in terms of larger topics such as race, class, and colonialism, processes and attitudes that structured the rise of industrialization within the United States.

This section presents a brief history of the industrial complexes that were present in the Study Area and summarizes the varieties of archaeological material that derive from industrial complexes. A few archaeological case studies will also be provided to highlight the information that can be garnered from industrial archaeological features. One site, the Maxwell House Site, has been extensively investigated within Hoboken and will be discussed. Additional examples of industrial archaeological sites have been taken from work within New York City and other urban centers.

8.5.1 Historical Background

Industrial development within Hoboken began in earnest in the mid-nineteenth century when the Hoboken Land and Improvement Company began to sell off its properties to industries. By 1873, the M&E had extended its lines into the southern portion of the Study Area. The M&E became part of the DLWRR Company around this time. The 1870s also witnessed the rise of the shipping industry within Hoboken which marked the shift from recreational use of the waterfront to more industrial usage. These developments helped to precipitate the industrial growth of Hoboken which would peak in the early-twentieth century.²⁴⁵

²⁴⁴ Historical Perspectives, Inc. and Louis Berger 2004, III E-1.

²⁴⁵ Shaw 1884, 1220; Hartman and Lewis 2016; G.M. Hopkins & Co., *Atlas of the State of New Jersey and the County of Hudson,* (Philadelphia: G.M. Hopkins & Co., 1873).

By 1884, the business industries within Hoboken included: the American Lead Pencil Company; the Universal Rubber-Works; the manufactory of Keuffel & Esser; the manufactory of essential oils of Fritzsche & Co.; Mansfield & Fagen's iron foundry; Page's Dye-Works; Klein & Brothers' repairs shops; Seitz and Campbell's file stores; Thomas Langdon Co.'s coffin and casket factory; S.M. Meyenberg's silk factory; Hotopp & Co.'s varnish factory; and Francisco's opaque cloth mill. There was also a paper mill operated by J.L. Reynolds, a riding academy, and a machine and boiler shop.²⁴⁶ In 1889 there were approximately over 3,000 manufacturing employees in Hoboken.²⁴⁷

The American Lead Pencil Company was initially opened in 1860 by Edward Weissenborn. With this company, Weissenborn made vast improvements in the manufacture of lead pencils. The company occupied close to a full city block within Hoboken. The American Lead Pencil Company would import the cedar wood for its manufactory from parts of Florida and then had them rafted to Cedar Keys. The company created close to 800 varieties of lead and colored pencils for a variety of purposes. It had several international offices and supplied the United States Government with pencils. The Keuffel & Esser Company was founded in 1866 by William Keuffel and Hermann Esser. Their initial building was located at the corner of 3rd and Adam streets. It consisted of a large L-shaped, five-story brick building. The Keuffel & Esser Company initially manufactured blueprint paper within this building. Over time, the company produced an assortment of fine instruments and materials needed by engineers and architects including ruling pencils, compasses, dividers, protractors, trammels of rosewood or mahogany, and ink in small glossy cakes. The company continued to expand its offerings through the twentieth century becoming manufacturers of telescopes, submarine periscopes, and optical reading theodolites. Their complex in Hoboken was altered over time and by the early to mid-twentieth century consisted of a reinforced concrete building covering the block between Adams and Jefferson streets.²⁴⁸

In 1888, the R. Neumann & Co. factory was established in Hoboken along Observer Highway between Willow Avenue and Newark Street. The factory was established by Raphael and David Neumann, brothers, who were manufacturers of leather products and skins. Their initial building consisted of a brick factory within which they employed 70. The original factory building was expanded to the north on both its east and west ends, creating a J-shaped factory. By 1915, the company had grown in size and had 226 employees. They added a six-story factory to the west end of their complex in 1919. In 1888, Lehman & Company also established their leather works in Hoboken. They erected a large plant at the corner of Willow and Ferry streets consisting of a five-story brick structure. At the time of its establishment in Hoboken, the company had an annual output of more than half a million dollar's worth of goods.²⁴⁹

In 1853, the Fletcher, Harrison & Company was established by William and Andrew Fletcher and Joseph G. Harrison. The company entered the shipbuilding industry and acquired the former Phoenix Iron Works on West

²⁴⁶ Shaw 1884, 1221.

²⁴⁷ Hartman and Lewis 2016.

²⁴⁸ Van Winkle 1924, 340-341; Charles Wyatt, *National Register of Historic Places Inventory Form: Keuffel and Esser Manufacturing Complex* (On file, Trenton: NJHPO) 1984.

²⁴⁹ Van Winkle 1924, 340-341; Charles Wyatt, *National Register of Historic Places Inventory Form: Keuffel and Esser Manufacturing Complex* (On file, Trenton: NJHPO) 1984; Maggie Land Blanck, *Hoboken Manufacturers 1901*, accessed online June 29, 2016 at <u>http://www.maggieblanck.com/Hoboken/HobokenMfg.html</u>; Sanborn Map Company, *Insurance Maps of Hudson County, New Jersey, Vol 7: Hoboken* 1891, 1937; Shoe and Leather Reporter Company, *Shoe and Leather Reporter*. Vol. 118 (Boston: Shoe and Leather Reporter Company) June 24, 1915.

Street in Manhattan. They renamed the ironworks the North River Iron Works. The company was reorganized as the W. & A. Fletcher Company in 1883 following the death of William Fletcher. In the fall of 1889, the company announced its plans to build a new shipyard in Hoboken. The W. & A. Fletcher Company leased an undeveloped parcel along the waterfront from the Hoboken Land and Improvement Company. Development of the parcel began with the extension of Hudson Street from 10th to 14th streets and the extension of the shoreline approximately 300 feet east of the 1890 shoreline. The new shipyard, known as the North River Iron Works, was completed between 1890 to 1891. By 1893, a second pier was added to the north of the original pier; the company employed over 500 workers (see Figures 11 and 14).²⁵⁰

With the opening of their shipyard in Hoboken, W. & A. Fletcher Company expanded its operations beyond design and construction of engines and boilers and became involved in vessel construction. Expanding their production capabilities within Hoboken, the company began manufacturing of superstructure elements and a range of furnishings for ships. "Bare hulls constructed in other shipyards in the region were towed to the Fletcher yard, and yard's expanded output was utilized in the fabrication of finished vessels." ²⁵¹ By the late-nineteenth century, W. & A. Fletcher Company had become one of the leading marine steam engine builders in the United States.

During the early-twentieth century, the company's operations shifted in concert with shifts in the shipbuilding industry with a greater emphasis on repair work, specializing in turbine and diesel engine rehabilitation. A second parcel of land was leased in order to allow for the expansion of the shipyard with additional buildings and a new pier. The outbreak of World War I resulted in increasing business for the company; the shipyard was active in the conversion of merchant vessels as troop transports. By 1919, the company employed 2,800 workers and continued to expand its facilities.²⁵²

By 1904, the Tietjen & Lang Dry Docks occupied several buildings and piers within Weehawken Cove, to the north of the North River Iron Works. By 1909, the Tietjen & Lang Dry Dock Company was associated with nine dry docks along Weehawken Cove.²⁵³ A dry dock is an area within which construction, repairs, and maintenance of vessels and boats is conducted.

The unique construction allows the water to be filled up in that area, also known as lock, so that vessels can be maneuvered in and out of the area. Once the vessel enters the dry dock, the gates are closed and the seawater is drained out so that the hull and other areas of the ship which have been exposed to sea water for a long time are available for carrying out maintenance and repair work.²⁵⁴

²⁵⁰ Porter et al, *Historic American Engineering Record: Bethlehem Steel Company Shipyard* (Philadelphia: National Park Service) 1994; Bailey and Ward 1881; Hughes and Bailey 1904.

²⁵¹ Porter et al, 1994, 41.

²⁵² Porter et al, 1994.

²⁵³ Hughes and Bailey 1904; Hopkins 1909.

²⁵⁴ Marinelnsight, "Dry Docks, Types of Dry Docks & Requirements for Dry Docks," accessed online August 18, 2016 at http://www.marineinsight.com/guidelines/dry-dock-types-of-dry-docks-requirements-for-dry-dock/.

Therefore, the Tietjen & Lang Dry Dock also provided ship repair service and a space for such service in the earlytwentieth century. In 1916, the Todd Shipyards Corporation was formed through the purchase and merger of several shipyards including the Tietjen & Lang Dry Dock Company in Hoboken and Weehawken. The property became known as the Tietjen & Lang Plant of the Todd Hoboken Dry Docks, Inc. In later years, the operation would be called the Todd Shipyards, Hoboken Division. A 1919 edition of *The Convoy*, a naval publication during World War I, contains an advertisement for the Tietjen and Lang Dry Dock Company. The advertisement indicated that the company was located at 17th Street and Park Avenue in Hoboken and that it provided both marine repairs and dry docking.²⁵⁵

The industrial economy of Hoboken continued to grow throughout the twentieth century. From 1900 to World War I, more than 250 manufacturing plants were opened in Hoboken. By 1909, there were over 9,000 manufacturing employees within the city.²⁵⁶ Much of the industrial growth within Hoboken was concentrated on the western side of the city, along basically the whole north-south length of the city west of Clinton Street (see Figure 14).²⁵⁷

In the early and mid-twentieth century, the area in the vicinity of Henderson Street, Observer Highway (Ferry Street), Newark Street, and Jefferson Street was referred to as meat packers' row. Observer Highway functioned as a main thoroughfare which provided access to transportation links, particularly rail lines, that spurred industrial development. In addition to the R. Neumann & Company and the Lehman & Company tanneries, a wholesale butcher was located at the corner of Jefferson Street and Observer Highway by 1937; and the New York & New Jersey Beef and Provision Company was located at 497-499 Observer Highway from at least 1928 to the 1930s. Between 1917 and 1919, the Wilson & Co. Meat Storage House was constructed on Marin Boulevard. The plant contained a main storage room, a provisions storage room, and a cooler for butter, cheese, and eggs. In 1917, the Wilson & Co. ranked as one of the 50 largest industrial corporations in the United States. In 1920, Wilson & Co. was included as one of the five largest meat-packing firms in the industry. By 1951, the meat-packing plant of Ben Grunstein & Sons was located at 500-504 Observer Highway. These buildings were demolished by 1979.²⁵⁸

During the early to mid-twentieth century, the primary industry within Hoboken was shipbuilding and ship repair. Despite shipbuilding's primacy, several other industries were pursued within the city. Some of these industries included the Cooper-Hewitt Electric Company; the R.B. Davis Company, manufacturers of baking powder; the Ferguson Brothers Manufacturing Company; F. Ferguson & Son, foundry; Lawson and MacMurray; Thomas J. Lipton, Inc.; Owens & Traeger, who manufactured paper boxes; and the Union Iron Works. Van Winkle provided a list of a least a dozen additional early-twentieth century industrial enterprises within Hoboken.²⁵⁹ Several products that are commonplace today were once produced within Hoboken including Lipton Tea, Maxwell House Coffee, and Hostess products. The Tootsie Roll, slide rule, zipper, and ice cream cone were all originally produced in

²⁵⁶ Hartman and Lewis 2014.

²⁵⁵ Hoboken Historical Museum, "Todd Shipyards Corporation," accessed March 25, 2016,

http://hoboken.pastperfectonline.com/bysearchterm?keyword=Todd+Shipyards+Corporation&page=3#sthash.GedfJ25i.dpuf; *The Convoy. "Advertisement for Tietjen and Lang Dry Dock Company." Vol 1, No. 3, May 1919, 25,*

²⁵⁷ Hoboken Planning Board 2014; Hughes and Bailey 1904

²⁵⁸ Sanborn Insurance Maps, 1891 and 1937; Zingman 1979.

²⁵⁹ Van Winkle 1924, 338-341.

Hoboken.²⁶⁰ The R.B. Davis Company was originally founded in New York City in 1878. By 1891, the company relocated its manufacturing operations to Hoboken. The factory was located at 8-18 Jackson Street. By 1923, the company had expanded to include the whole block bounded by Jackson, Newark, Harrison, and Ferry streets, including a large warehouse on the west side of Harrison Street. A fire in 1928 destroyed the Davis warehouse; the structure was rebuilt. In the mid-twentieth century, the R.B. Davis Company produced Cut-Rite Wax Paper; they also manufactured My-T-Fine Pudding in Hoboken.²⁶¹

Industrial development along Hoboken's waterfront was spurred by the actions of the Hoboken Land and Improvement Company. In 1912 to 1913, the company constructed the initial structure of a complex of modern manufacturing loft buildings between 15th Street and Weehawken Cove. This location was selected due to its proximity to both rail lines and the Hudson River. By January 1914, the 10-story loft Building A contained ten tenants; this building was eventually occupied by Franklin Baker, manufacturers of coconut. In total, the Hoboken Land and Improvement Company constructed a complex of six Factory Terminal Loft Buildings. Building D of the complex was occupied by Lipton Tea; the Jewel Tea Company occupied Building E; and, Independent Warehouses, Inc. occupied Building F. By the 1940s, Standard Brands had acquired Buildings D, E, and F and General Foods had acquired Building A. In 1940, these two firms were considered the two leading manufacturers of retail products in the United States.. General Foods vacated Building A by 1965; Lipton Tea vacated Building D by 1978.²⁶²

General Foods Maxwell House Coffee's warehouse complex on the eastern waterfront at the terminal ends of 11th and 12th streets was constructed during the 1930s. This complex was the first industrial complex within Hoboken to be built in a modernist Bauhaus style. ²⁶³ The Maxwell House plant was once one of Hoboken's major employers. The plant was outfitted to provide for the entire manufacturing process from the receipt and roasting of coffee beans to the canning of the finished product. In 1992, General Foods closed the Hoboken plant which had prospered for several decades.²⁶⁴

Following World War I, the W. & A. Fletcher Company experienced a significant reduction in business. The shipyard was fully converted to ship repair by 1925 and functioned in this limited capacity through 1929. On March 1, 1929, the W. & A. Fletcher Company merged with six other independent New York harbor shipyard concerns to form Union Dry Docks, Inc. Union Dry Docks, Inc. concentrated on ship repair and controlled approximately half of the ship repair capacity within New York harbor. The company's Fletcher plant within Hoboken functioned exclusively as a repair facility. In 1934, the Union Dry Docks, Inc. fell into receivership; it unsuccessfully reorganized as United Shipyards, Inc. in 1936. By 1937, the Fletcher plant was closed.²⁶⁵

²⁶⁰ Hartman and Lewis 2014.

²⁶¹ [The] New York Times, "Paint Explodes in Fire: Hoboken Cooperage Plant and Warehouses Destroyed with \$25,000 Loss" (July 31, 1928); Linda Stradley, "Baking Powder - History of Baking Powder. Whats Cooking America," accessed June 23, 2016 online at <u>http://whatscookingamerica.net/History/BakingPowderHistory.htm</u>; G.M. Hopkins Co., *Plat Book of Hudson County. Hoboken, Volume II* (Philadelphia: G.M. Hopkins Co.), 1909, 1923; Melissa Clark, "You Call that Pudding, Grandma?" *The New York Times* April 23, 2008, accessed at http://www.nytimes.com/2008/04/23/dining/23appetite.html.

²⁶² Hoboken Board of Trade, January 1914, April 1914, October-November 1914; Real Estate Record and Builder's Guide, 1915; Rachalle Garbarine, "Residential Real Estate; Tea Warehouse in Hoboken Becoming Apartment Tower," *The New York Times.* April 21 2000.

²⁶³ Hoboken Planning Board 2014.

²⁶⁴ Gabrielan 2010, 95.

²⁶⁵ Porter et al 1994, 5-6.

In June 1938, United Shipyards, Inc. sold its assets to the Bethlehem Shipbuilding Corporation. The Bethlehem Shipbuilding Corporation was a shipbuilding subsidiary of the Bethlehem Steel Corporation (Bethlehem Steel). Shortly after it acquired United Shipyards, Inc., the Bethlehem Shipbuilding Corporation was reorganized as the Shipbuilding Division of Bethlehem Steel. The Hoboken shipyards positioned Bethlehem Steel to handle the demand for shipbuilding services which resulted from the efforts of the Federal government to build up the United States Navy around World War II.

Bethlehem's Shipbuilding Division handled both new construction and conversions, building and refitting warships and cargo vessels of all sizes and types. The Hoboken Yard was utilized as a repair and conversion facility, and, together, with the nearby Todd Shipyard Corporation yard, it contributed to establishing the City of Hoboken as one of the country's most important centers of these activities during the war. Bethlehem's Hoboken Yard is said to have handled more than 4,000 ships and employed as many as 11,000 individuals during the course of the war.²⁶⁶

During World War II, Bethlehem Steel was the largest ship builder in the world. Its steamboats were used internationally; it was the forerunner in its use of the steam turbine, an innovation first introduced in England. The Hoboken yard retrofitted and repaired battle-damaged ships during the war effort.²⁶⁷

The demand for shipbuilding services during World War II resulted in an expansion of Bethlehem Steel's shipbuilding division facilities. The company purchased the Union Shipyards property along with the former Nungesser Seed Company property and land to the north of the yard associated with the Hudson Land and Improvement Company. The Todd Shipyard Corporation also played a significant role in shipbuilding and repair during World War II. With the close of the war, there was a reduction in shipbuilding demand which caused a contraction of the industry. Foreign competition and the expansion of the commercial aviation industry also led to a slowdown within the shipbuilding industry. By 1963, the former Fletcher shipyard was Bethlehem Steel's only remaining repair facility within New York. The Hoboken Yard continued as a center for a variety of repair and conversion operations. In 1983, the Hoboken Yard was sold to the Briswell Corporation. They operated the shipyard until 1984, at which point the facility was shut down. Similarly, Todd Shipyards Corporation also experienced declining revenues by the mid-twentieth century. In 1969, the company relinquished its property in Hoboken to the city. ²⁶⁸

Overall, the mid to late-twentieth century rise of air travel and the development of containerized cargo requiring deep water ports ultimately undermined Hoboken's waterfront. Many of Hoboken's industries moved away or closed during this time. The city was considered an industrial wasteland up until the 1970s when the city began a resurgence as a commuter settlement for those who worked in New York City. With this transition, community-based businesses and warehouse spaces were converted into residential space or demolished to make way for new

²⁶⁶²⁶⁶ Porter et al 1994, 7.

²⁶⁷ C. Terry Pfoutz, "Upland Waterfront Development Permit Bethlehem Shipyard," Correspondence to John Weingart, Assistant Commissioner for Environmental Regulation, November 16, 1993.

²⁶⁸ Porter et al 1994; Č. Bradford Mitchell, *Every Kind of Shipwreck: A History of Todd Shipyards Corporation* (New York) 1981.

residential construction. The R. Neumann & Company factory was leased by other occupants during the latter half of the twentieth century. Multiple tenements currently occupy the former factory building. The empty loft buildings along the waterfront which had previously housed the Standard Brands and General Foods industrial operations were redeveloped into residential and commercial space in the 1990s and 2000s.²⁶⁹

8.5.2 Archaeological Case Studies

As previously noted, the review of previously conducted cultural resource studies within the Study Area identified several studies conducted in association with the Maxwell House Site. These studies will be discussed below. That discussion will be followed by additional industrial archaeology case studies drawn from outside of the Study Area; where possible case studies were taken from urbanized contexts similar to the existing conditions within the Study Area.

Maxwell House Site

Beginning in 2003, RGA conducted several cultural resource studies, including both architectural and archaeological assessments, in association with proposed construction activities at the former Maxwell House Site.²⁷⁰ The Maxwell House Site consisted of a 14-acre parcel bounded on the south by FSD, on the north by 12th Street, on the west by Hudson Street, and on the east by the Hudson River. The site consisted of 12 buildings built between 1939 and the 1970s. The site became the largest coffee roasting plant in the world, producing more than half of the General Food Corporation's output of Maxwell House coffee. This complex also housed the Central Laboratories of the General Food Corporation, the company's research and development division for testing and introducing new products and brands. Prior to its closure in 1992, the Maxwell House Site had been the largest employer within Hoboken.²⁷¹

In 2003, RGA conducted a cultural resources investigation of the Maxwell House Site in advance of its proposed redevelopment. This investigation included both an architectural assessment of the site and an archaeological assessment of the property. RGA contended that the Maxwell House Site was potentially eligible for listing in the National Register under Criterion A as a historically significant resource associated with the industrial development of Hoboken. As such, they recommended that any disturbance to the site be mitigated by a Historic American Buildings Survey-Historic American Engineering Record (HABS-HAER) recordation of the site in advance of any proposed construction. For the archaeological assessment, RGA conducted a pedestrian reconnaissance and cartographic review of the property. RGA determined that the site had low prehistoric archaeological sensitivity given the extensive history of construction within this area. RGA identified several features from the map research and/or pedestrian survey of potential historic significance within the property. In particular, they identified: the first railroad wharf with associated spurs; a masonry warehouse associated with the Ocean Steamship Company that

²⁶⁹ Hartman and Lewis 2014; Garbarine 2000; Zingman 1979; *The New York Times*, "Long-Term Lease Taken in Trenton," July 1, 1951; *The New York Times*, "Industrial Deals Closed in Jersey. Hoboken Space Taken," July 25, 1959.

²⁷⁰ RGA, *Cultural Resources Investigation Maxwell House Site, City of Hoboken, Hudson County, New Jersey* (On File, Trenton: NJHPO) 2003; Philip A. Hayden, *Historic American Buildings Survey Maxwell House Complex* (On File, Trenton: NJHPO) 2005; Philip Hayden and Glenn Modica, *Field to Factory: The Story of the Maxwell House Coffee Plant* (On File, Trenton: NJHPO) 2005; RGA, *Archaeological Monitoring of Demolition and Construction Activities Maxwell House Site, City of Hoboken, Hudson County, New Jersey* (On File, Trenton: NJHPO) 2006b.
²⁷¹ RGA 2003.

operated in this area prior to General Foods; timber cribbing associated with the second railroad wharf; the North Pier; the South Pier; and features associated with the Maxwell House Site. RGA concluded that these features had the potential to yield information relating to the development of Hoboken's waterfront, piers, bulkheads, and other structures, and wharf construction technology from 1880 to 1940. Given the potential significance of these resources, RGA recommended archaeological monitoring of the proposed development of the Maxwell House Site.²⁷²

In 2005, RGA completed HABS-HAER documentation of the Maxwell House Site which the NJHPO had previously determined eligible for listing in the National Register under Criteria A and C.²⁷³ The following year RGA conducted archaeological monitoring of demolition and construction activities at the site. The archaeological monitoring did not identify any evidence of the Ocean Steamship Company warehouse that predated the Maxwell House occupation. Rather, it appeared that construction of the present seawall and construction of the Maxwell House complex had completely destroyed any remnants of the former warehouse. RGA monitored the removal of the North Pier which had been badly damaged during a storm in 2004. While historic research indicated that this pier predated the Maxwell House occupation, its continued use by Maxwell House made it a contributing element to the historic property. The archaeological monitoring and documentation ultimately mitigated the project impacts on the North Pier. RGA identified the North Pier as an earth filled pier and further suggested that its presence on Hoboken's waterfront suggests that the city's waterfront may contain other earth filled piers. RGA also documented the presence of railroad remains, a small section of the early-twentieth century railroad spurs within this area, and a segment of what appeared to be the original shoreline. Except for the removal of the North Pier, RGA concluded that the project posed no adverse effect to archaeological resources contributing to the Maxwell House Complex. The archaeological monitoring offered some insights into waterfront development and technology; however, little additional information relating to the Maxwell House complex was gleaned.274

Ironworks

Van Winkle's history indicated the presence of several ironworks within Hoboken in the early-twentieth century including the Wilson Brothers Iron Works, the Tidewater Iron Works, the Summit Brass & Iron Works, and the Consolidated Iron Works.²⁷⁵ Ironworks have been a relatively popular subject of study within Industrial Archaeology; several archaeological studies of historic ironworks within the United States have been previously conducted. A few of these studies will be discussed to provide examples of the types of information that can be derived from ironwork sites.

In a 1996 study, Robert Gordon described investigations at five iron-related sites in Connecticut. These sites, listed from oldest to youngest, consisted of Aaron Eliot's Forge, Hotchkin-Snow Bloomery, Gutherie-Chittenden Forge, Mount Riga Ironworks, and Canfield & Robbins Ironworks. In discussing these sites, Gordon highlighted the waste deposits from the ironworks as valuable archaeological deposits even when clear structural remains were not extant.

²⁷² RGA 2003.

²⁷³ Hayden 2005.

²⁷⁴ RGA 2006.

²⁷⁵ Van Winkle 1924, 338-340.

Gordon's study investigated several questions including how metal smiths overcame initial difficulties in iron production in the seventeenth and eighteenth centuries and how early iron workers created new types of wrought iron compatible with newly developed mechanized production systems.²⁷⁶

In 2004, Gordon Pollard and Haagen Klaus presented a study of the Clintonville Site in the Adirondack region of New York State. In their study, Pollard and Klaus traced the development of the bloomery iron forges in the Adirondack portion of New York from the late 1700s through 1907. They charted the development of various modes and scales of operation within the area and how each bloomeries access to ore, fuel, and power, available capital for investment, and, managerial skill, resulted in their respective histories of success and/or growth. Pollard and Klaus used detailed documentary research in combination with the results of archaeological investigations at Clintonville's Lower Forge to highlight Clintonville's historic research to identify several individual bloomers and hammersmen who were instrumental in the development and success of the Clintonville forge.²⁷⁷

From 2002 to 2008 Michigan Technological University's Industrial Archaeology Summer Field School investigated the West Point Foundry site in Cold Spring, New York.²⁷⁸ Over the course of their seven-year investigation, the field school conducted historical, archaeological, and archaeometallurgical investigations of the furnace operation, development, structure, and product materials. Their investigations have resulted in several detailed studies of the furnace's operation including an analysis of the waterpower system at the West Point Foundry.²⁷⁹ Another study by T. Arron Kotlensky charted the development of the charcoal blast furnace and production of pig iron at the West Point Foundry approximately 10 years after the foundry began producing munitions for the army and navy. Through a combination of historical analyses and the results of the archaeological investigations, Kotlensky also documented the shift within the West Point Foundry system from making pig iron to purchasing pig iron from less costly external sources.²⁸⁰

Unlike the previously referenced studies which refer to archaeological investigations in relatively undisturbed or minimally developed settings, Louis Berger's 1987 archaeological investigation of a parcel in lower Manhattan illustrates the difficulties in researching a nineteenth century ironworks within a heavily urbanized setting. The 1987 excavation focused on two parcels on the west side of Manhattan located between West Street on the west, Greenwich Street on the east, North Moore Street on the south, and Hubert Street on the north. The West Point Foundry Association had leased these two parcels in the early to mid-nineteenth century; this was the location within which the first American-made locomotive was assembled in 1830. Ca. 1840, the foundry moved to a mid-block location on the north side of Beach Street; its former foundry location was occupied by another foundry. Sometime

²⁷⁶ Robert Gordon, *American Iron, 1607-1900* (Baltimore: Johns Hopkins University Press, 1996); Historical Perspectives, Inc. and Louis Berger 2006: III E-11.

²⁷⁷ Gordon C. Pollard and Haagen Klaus, "A Large Business: The Clintonville Site, Resources, and Scale at Adirondack Bloomery Forges," *Industrial Archeology* 30(1): 19-46, 2004.

²⁷⁸ "MichiganTech: West Point Foundry Archaeology Project at Cold Spring, NY," MichiganTech, accessed February 25, 2016, http://www.westpointfoundry.org/.

²⁷⁹ Kimberely Finch, "Waterpower: A Geophysical and Archaeological Investigation of the Waterpower System at West Point Foundry Cold Spring, NY" (Master's Thesis, MichiganTech, 2004).

²⁸⁰ T. Arron Kotlensky, "From Forest and Mine to Foundry and Cannons: An Archaeological Study of the Blast Furnace at the West Point Foundry," IA: The Journal of the Society for Industrial Archaeology 35(1-2): 49-72, 2009.

after 1860, the foundry shops were replaced by larger buildings. At the turn of the twentieth century, these buildings were replaced by a four-story warehouse which occupied the property until its demolition in 1968. Louis Berger's excavations at the primary location of the historic foundry found that subsequent construction had destroyed any evidence of the original West Point Foundry. Testing in a secondary yard area revealed an ash and sand-filled brick feature in addition to oxidized soils. Louis Berger noted that the feature and soil deposit suggested a past foundry function; however, no conclusive evidence of the foundry was found. A paucity of domestic artifacts were recovered in contrast to a higher density of architectural materials including slag. The predominance of slag and other architectural remains further suggested the association of this deposit with the historic foundry occupation.²⁸¹

Shipyards

As previously noted, shipbuilding was a prominent industry within Hoboken during the late-nineteenth through midtwentieth century. During this period, first, the W. & A. Fletcher Company and then Bethlehem Steel became leading marine builders within the United States. By World War II, Bethlehem Steel had become the largest shipbuilder in the world. The Todd Shipyard, located in the vicinity of Weehawken Cove to the north of the Bethlehem Steel plant, was also a significant player in the shipbuilding and repair industry during the war.

Over the last few decades, shipyard archaeology has become a more prominent research topic in international and maritime archaeological research. Within the United States, much of this research has focused upon preindustrial, typically Colonial period shipyards, and the difficulties in identifying historic wooden shipyards whose locations were not reliably recorded in historic records or maps. Several recent studies have focused on the social dynamics manifested within colonial shipyards in South Carolina and have provided a GIS predictive model for identifying previously unrecorded shipyard sites. While the focus of these studies is dissimilar to the shipyards within the Study Area, as the shipyards in the Study Area were industrial, post-Colonial, and their locations are known, nevertheless the archaeological literature does provide some relevant examples of features that can be anticipated within a shipyard site.²⁸²

In his 2011 dissertation on shipbuilding sites in Somerset County, Maryland, Jason D. Moser identified three general functions of preindustrial shipyards–construction, repair, and breaking (dismantling) of vessels. He further noted that the construction of new vessels would have required the greatest investment of time, labor, and materials; he also observed that repair and maintenance activities probably comprised the largest proportion of work activities within many shipyards. Both construction and repair activities occurred within the Hoboken shipyards; it is unclear to what extent ship breaking or dismantling occurred. Moser argued that each of these activities would produce different material signatures. He further noted that the size of the shipyard and the intensity of production within the shipyard, i.e., a shipyard producing a single vessel in contrast to one which produced vessels year round, would also result in the formation of dissimilar archaeological sites.²⁸³

²⁸¹ Louis Berger, *Archaeological Investigation of Site 1 of the Washington Street Urban Renewal Area, New York City* (New York: Landmarks Preservation Commission, 1978).

²⁸² Ben Ford, "Down by the Water's Edge: Modelling Shipyard Locations in Maryland, USA," *The International Journal of Nautical Archaeology* 36.1, 2007, 125-137; Lynn Harris, "South Carolina Shipyards: Labour, Logistics, Lumber and Ladies," *J Mari Arch* 5, 2010, 17-35; Jason Moser, "The Art and Mystery of Shipbuilding': An Archaeological Study of Shipyards, Shipwrights, and Shipbuilding in Somerset County, Maryland 1660-1900," (PhD Dissertation, Tallahassee: Florida State University) 2011.

Rebuild by Design Hudson River:
Resist
Delay
Store
Discharge

Moser noted that the very largest shipyards of the eighteenth and nineteenth centuries,

also possessed additional infrastructure such as dry docks, wet docks, larger cranes, ropewalks, sail lofts, and other infrastructure that distinguishes them from smaller commercial shipyards. It is the non-arbitrary spatial relationship of these activity areas that reflect the organizing principles of the shipyard and underlying social, economic, and technological rules of the communities of individuals who owned and worked at shipyards.²⁸⁴

The W. & A. Fletcher Company/Bethlehem Steel Hoboken Yard was a year-round relatively large shipyard which may have contained infrastructure similar to what Moser associated with larger eighteenth and nineteenth century shipyards. With respect to infrastructure, Moser outlined multiple features which would be associated with both small and large shipyards including slipways for the construction of vehicles and launching of vehicles; groundways for supporting the launching platform; and the support system for constructing new vessels. He noted that dry docks were often used in place of slipways for storage, repair, and launching of vessels. Dry docks required a greater investment in capital and labor than the simpler slipways. He also discussed the invention of marine railways, like those documented at the Washington Naval Yard. A marine railway consists of an inclined plane of parallel rail tracks which pulled a vessel out of the water.²⁸⁵

Moser also proposed a typology for classifying preindustrial shipyards. The typology focused on

The most identifiable and classifiable aspects of material culture such as the number of launching ways, the method of launching (e.g., slipways vs. drydock), culturally sensitive traditions of ship launching (e.g., side, bow, or stern), and the complexity of the structures necessary to support the ship construction. Other information, such as the presence or absence of a blacksmith's shop, storage sheds, wharves, saw houses, saw pits, utility buildings, workers housing, slave quarters, mould lofts, cranes, mast ponds and other structures and features often associated with shipyards will help to further refine this typology.²⁸⁶

Moser's typology ranked shipyards into five broad categories or types ranging from the largest Tier I Shipyards which were state owned and operated to Tier V shipyards which were small expediently organized shipyards with little permanent infrastructure. The typology was utilized in order to understand the patterning of shipyard sites within Somerset County between 1692 and 1900. Moser contended that the spatial relationships of the different shipyard sites to each other and to larger geographical centers reflected underlying social and economic relationships. Moser offered his typology to discuss the spatial arrangement of 58 shipyard sites that he identified through historic research and archaeological survey within Somerset County. He noted that the greatest potential for intact shipyard

²⁸⁴ Moser 2011, 83.

²⁸⁵ Moser 2011, 89-123.

²⁸⁶ Moser 2011, 218.

deposits were those locations along small creeks and rivers as opposed to more densely settled urban shipyards which had experienced redevelopment and renewal.²⁸⁷

A 1991 study by Allen Pastron and James Delgado examined a mid-nineteenth century shipbreaking yard in San Francisco, California. This study discussed archaeological excavations at the Charles Hare shipbreaking facility off of Rincon Point. Shipbreaking became a significant industry in California during the mid-nineteenth as many travelers seeking to participate in the Californian Gold Rush sailed to San Francisco and abandoned their vessels in the port. The sizeable number of abandoned vessels alongside the eastward expansion of the city led to the towing of abandoned vessels to Rincon Point where the shipbreaking industry took hold. Pastron and Delgado identified evidence for the systematic and organized dismantling of vessels within Charles Hare's yard; the dismantled parts were then recycled into the local economy providing materials to the local shipbuilding industry as well as to several small foundries. Excavations at the site of Charles Hare's yard identified localized clusters of wood and metal artifacts which reflected a dismantling of vessels into distinct components. Given the relatively low density of recovered artifacts, Pastron and Delgado argued that the archaeological deposits reflected the last period of site occupation from 1857 to 1859, a period within which four vessels were recorded as being dismantled within the ship yard. The authors further contended that the relative low density of artifacts reflected the thoroughness of ship dismantling and recycling activities on the site prior to its final occupation, with their being few remnants of previous ship dismantlement activities on site, suggesting that all of the materials had been removed and deposited elsewhere.288

Chemical Manufacturing

In the early-twentieth century there were at least three chemical companies operating within Hoboken. These businesses consisted of the Commonwealth Chemical Corporation, the European Color & Chemical Co., and the Helkulin Chemical Company.²⁸⁹ Several archaeological studies of historic chemical corporations within the United States have been previously conducted. A few of these studies will be discussed to provide examples of the types of information that can be derived from these industrial sites. The Hudson Yards Phase IA Archaeological Assessment provided a brief overview of the history of chemical manufacturing within the United States.²⁹⁰ The following discussion draws from this history.

The gunpowder production facilities at Chart Mills in Wilmington, Delaware have been studied both historically and archaeologically. Eleutherian du Pont established the facilities at Chart Mill in the early 1800s; demand for gunpowder increased dramatically during the War of 1812. Archaeologists have uncovered a series of stone mills set in pairs along the banks of the Brandywine River. These mills, alongside other structural remains within the site, "present a picture of gunpowder manufacturing which is unequalled anywhere in the world."²⁹¹ Kenneth Hudson observed that the Chart Mill remains offer a unique archaeological window into a nineteenth century chemical

²⁸⁷ Moser 2011, 216-223.

²⁸⁸ Allen Pastron and James Delgado, "Archaeological Investigations of a Mid-19th-Century Shipbreaking Yard, San Francisco, California," *Historical Archaeology* Vol. 25 (3): 61-77, 1991.

²⁸⁹ Van Winkle 1924, 338-340.

²⁹⁰ Historical Perspectives, Inc. and Louis Berger 2006, III E-7-E-8.

²⁹¹ Kenneth Hudson, World Industrial Archaeology (London: Cambridge University Press, 1979) 231.

manufacturing operation. As Hudson noted, chemical manufactories typically provide little archaeological evidence as the nature of their processes is often ephemeral. Given the potential environmental hazards posed by their waste materials and component parts, remediation or thorough clean-up is often necessary once the chemical plant has ceased operations which, in turn, would most likely remove any archaeological deposits associated with the chemical plant.²⁹²

Brian Coffey also examined how Industrial Archaeology can provide new insights into studies of chemical manufacturing. The case study for his analysis was the fertilizer production industry in Muscle Shoals, Alabama. During World War I, the demand for certain types of explosive material was high within the United States. As a result, the military conscripted chemical factories, like fertilizer plants, into producing the explosive aluminum nitrate. This conscription required factories like U.S. Nitrate Plant Number 2 to quickly adapt their production techniques and convert their chemical fertilizers into explosive material.²⁹³

A 2003 symposium held by West Virginia University and the Institute for the History of Technology and Industrial Archaeology examined the history of the Kanawha Valley Chemical industry. Papers from the symposium addressed a wide range of topics relevant to chemical manufacturing and industrial archaeology including: the development of the salt industry; the Kanawha Valley's contribution to chemical manufacturing; the impact of the industry's products including ammonia, nylon, fertilizer, and plastics; and, the development of the industry in a broader regional and national context.²⁹⁴

Of more relevance to the chemical manufactories within Hoboken were the mid to late-nineteenth century trends within the chemical industry which moved production out of yards and into buildings. The earlier system of using sunken vats for mixing and aging products was replaced by large containers within buildings. With the nineteenth century developments in mill technology and the development of fire-resistant construction materials, the standard practice within the chemical industry had become the use of interior production spaces. This development has had direct implications on archaeological deposits as often when a chemical works moved or its building was demolished, the industrial resources which were housed within the building were also removed or destroyed. As the chemical companies within Hoboken consisted of more urbanized operations within buildings, the potential for extant resources associated with these defunct companies is remote.²⁹⁵

Glass Production

Several historical and past archaeological studies have been conducted on glass production sites in the northeastern United States. There appear to have been at least two glass manufactories within Hoboken in the early-twentieth century. These companies include the Koscherak Siphon Bottle Works and the New York Bottlers' Supplies Manufacturing Company.²⁹⁶ In 1991 Hartgen Archeological Associates (Hartgen) developed a contextual

²⁹² Hudson 1979.

²⁹³ Brian Coffey, "Fertilizers to the Front: HAER and U.S. Nitrate Plant No. 2," *IA: Journal for Society of Industrial Archaeology* 23(1): 25-42, 1997.
²⁹⁴ Lee Maddex et al, *Great Kanawha Valley Chemical Heritage Symposium Proceedings* (Morgantown, WVA: Institute for the History of Technology and Industrial Archaeology, 2003); Historical Perspectives, Inc. and Louis Berger, 2006.

²⁹⁵ Historical Perspectives, Inc. and Louis Berger 2006, III E-8.

²⁹⁶ Van Winkle 1924, 338-339.

study for the Bloomingdale Flint Glass Works in New York City. This study provides an overview of the history of glass production and a discussion of past archaeological investigations of glass production sites. The following discussion will draw from Hartgen's contextual study.²⁹⁷

The first glass factory within North America was established at Jamestown in 1608. This complex consisted of four furnaces, a well, and an on-site clay pit. Glass was produced in stone melting pots called crucibles; the majority of the finished products were exported to England. Historic records suggest that a glass factory was also operating near the southern tip of Manhattan during the 1600s. By 1732, the New York metropolitan area had two glassworks. One of these consisted of the Glass House Farm in the vicinity of West 34th Street. While the structure was extant through the 1860s, the factory ceased operating ca. 1767.

Prior to the turn of the nineteenth century, consumers within the United States primarily relied upon European imports of glass. Following the War of 1812, domestic glass production was necessitated. By the 1830s, there were at least ninety glass producers within the United States. During the mid-nineteenth century,

In the Northeast, glasshouses were established in Massachusetts, New Hampshire, Vermont, Connecticut, New York, New Jersey, and Pennsylvania. By the 1870s, over 40 glasshouses were established in New York State (McKearin 1941:171). Many of these new manufacturers produced tablewares for homes, steamboats, inns and hotels, as well as more utilitarian items such as gas globes, lamps and candlesticks (Ibid.: 135). Some of the more well known of these enterprise include the New England Glass Works in Cambridge, Massachusetts, the Sandwich Glass Works in Sandwich, Massachusetts, and Bakewell and Company of Pittsburgh, Pennsylvania.²⁹⁸

The Bloomingdale Flint Glassworks was established in 1820 around 47th and 48th streets. The glassworks was known for the production of cut flint glass and decorative wares. The glassworks was established by the Fisher brothers, and John L. Gilliland, and was also known as the Fishers' Factory. The Fishers were known for the high quality of their glass products; the glassworks closed in 1840 following the death of Robert Fisher. In 1820 a glassworks was also opened near Chatham Square; this operation closed by 1923. Around this same time, the Brooklyn Glass Works in Brooklyn and the Jersey Glass Company had been established. The Brooklyn Glass Works was moved to Corning, New York in 1868 where it was established as the Corning Glass Works.²⁹⁹

The number of glass factories within the northeast declined during the latter portion of the nineteenth century. This decline was in part a response to the 1837 depression and the exhaustion of timber supplies which had provided fuel for the furnaces. The discovery of natural gas in Pennsylvania in the 1850s prompted many glasshouses to move and reestablish their operations in the midwest.

²⁹⁷ Hartgen, *Route 9A Reconstruction Project: Draft Contextual Study Bloomingdale Flint Glass Works* (New York: Landmarks Preservation Commission, 1991).

²⁹⁸ Hartgen 1991, 3; George S. and Helen McKearin, *American Glass* (New York: Crown Publishers, Inc., 1941).

²⁹⁹ Hartgen 1991, 4-5.

Hartgen indicated that at least five glass sites dating to the seventeenth and eighteenth centuries and five sites dating to the nineteenth century have been archaeologically investigated. For the seventeenth and eighteenth century glass sites, archaeological investigations identified: the four furnaces, well, and on-site clay pit at Jamestown; a glasshouse, three additional house foundations, a dump, and an outside oven or kiln at the New England Glassworks in Temple, New Hampshire; a waste heap, fritting ovens, a few tools at the Amelung Glass Works in Maryland; the main melting furnace at the Albany Glassworks site; and features at the Batsto Window Light Factory in New Jersey.³⁰⁰

With respect to nineteenth century glassworks, Hartgen described amateur archaeological excavations at the Boston and Sandwich Glass Company in Sandwich, Massachusetts. The investigators identified a pattern of discarded glass fragments across the site, with pre-1849 glass fragments being found beneath the structure and more refined older patterns being found in other parts of the site. Archaeological investigations have also been conducted at the Phoenix Glass Works in Millville, New Jersey which operated from 1806 to the 1930s. Subsurface investigations at the Phoenix Glass Works consisted of the excavation of six exploratory trenches one of which revealed multiple fill layers consisting of sand, ash, rubble, and coal.³⁰¹

The Glastenbury (Glastonbury) Glass Factory Site in Glastonbury, Connecticut was excavated in 1962. These excavations recovered numerous fragments from melting pots used in glass production. An excavated trash pit contained general refuse to a depth of approximately 75 inches below the surface. Sherds and slag were found scattered across the yard having been deposited after the factory had gone out of business. An area of ceramic sherds, slag, rubble glass, glass-glazed stones and bricks was uncovered in the vicinity of a nearby stream bed; this area appeared to have been a dumping ground during the factory's operation. Excavations at the Ellenville Glass Works in New York, which operated from 1837 to 1894, uncovered subsurface air ducts for the furnaces, foundation walls, numerous glass flasks, and fragments of bottles and canes. According to Hartgen, the Dumont Archaeological Surveys' investigations of the Ellenville Glass Works represents one of the few controlled excavations of a mid to late-nineteenth century glasshouse.³⁰²

Hartgen also described a single glasshouse investigation in an urban setting—the Dummer Glass Works in Jersey City. While much of the former glass works had been destroyed by subsequent development, Ed Rutsch identified a small undisturbed area which contained foundation remains of a possible annealing furnace and a 3-foot by 30-foot bay. Molten glass was also recovered. Historic research conducted in association with the archaeological

³⁰⁰ Hartgen 1991, 6; J.C. Harrington, *Glassmaking at Jamestown: America's First Industry* (Richmond: Dietz Press, Inc., 1952); David R. Starbuck, "The Excavation of the New England Glassworks In Temple, New Hampshire," *New England Historical Archeology*, 1977; Martin and Elizabeth Stohlman, "Amelung Glass-works," *The Antiques Journal* 19(1): 8-17, 1964; Paul Huey, "The Albany Glassworks from 1790 to 1800: A Study of American Industry During the Federal Period," *Journal of Glass Studies* 22: 36-52, 1980.

³⁰¹ Ruth Webb Lee, *Sandwich Glass: The History of the Boston and Sandwich Glass Company* (Massachusetts: Northborough, 1947); Alan R. Mounier, *An Archaeological Survey of Millville Waterfront Park, Block 410, Lot 1, Millville, Cumberland County, NJ* (Millville: City of Millville, 1990).

³⁰² Kenneth Wilson, "The Glastenbury Glass Factory Company," *Journal of Glass Studies* 5: 116-132, 1963; Elizabeth Dumont et al, *An Archaeological Survey and Cultural Resource Assessment of Portions of the Proposed Relocation of Route 29* (Virginia: Byrd, Tallamy, MacDonald, and Lewis, 1980a); Elizabeth Dumont et al, *An Intensive Survey of the Crystal Glass Sand Manufacturing Co. Site (Kass Sand Lot) and the Ellenville Glassworks Site* (Virginia: Byrd, Tallamy, MacDonald, and Lewis, 1980b).

investigation "concluded that the Dummer factory apparently introduced European products and processes, taking advantage of the lack of European goods available in the states following the War of 1812."³⁰³

Ultimately, Hartgen found that past archaeological studies of glass work sites reflected the significant information laden within yard debris, outbuildings, dumps, cisterns, wells, and privies associated with a factory site. They concluded that even though one may not find the factory building or its foundation remains, that features and activity areas associated with the factory could provide valuable insights regarding the operation and evolution of a factory, shifts in commercial products, and discard patterns. Hartgen's conclusions regarding the potential deposits associated with the Bloomingdale Flint Glass Works have direct implications for the former glass manufactories within Hoboken. Specifically, even if factory remains from these operations are no longer extant, there is, nevertheless, the possibility that associated shaft features and/or refuse deposits which could shed light on the factory occupation, still remain extant or relatively undisturbed.

8.5.3 Discussion

Hoboken was considered an important industrial, shipbuilding, and shipping city in the late-nineteenth through the early to mid-twentieth century. Industries including bottleworks, chemical companies, clothing factories, confectioneries, shipyards, and ironworks were located within the city and played a prominent role in its development. As the above case studies have illustrated, industrial archaeological investigations into ironworks, chemical manufactories, and glassworks have each yielded insights into the historic development of these industries as well as the individual production techniques and evolutionary histories of individual operations. Archaeological investigations in combination with detailed primary and secondary historical analyses have enabled the identification of individual artisans and workmen and their respective roles in the development of an industrial enterprise.

While the study of the Maxwell House Complex in Hoboken, and theoretical discussions of chemical production sites, and industrial operations within urbanized settings, suggest that there is only a remote potential for intact structural remains associated with historic industrial sites, nevertheless, there is a greater likelihood for the continued existence of associated activity areas, refuse deposits, and/or shaft features. Such deposits or features could provide valuable insights into the operation of a factory or industrial site, the refuse habits associated with the industrial site, and changing commercial trends over time. Those portions of the Study Area within which historic industrial development occurred, including the meat packing industry in the southern portion of Hoboken, the warehouse development along the northeastern extent of the city, and the shipyard development in the northern portion of the city and along Weehawken Cove, have the potential for industrial archaeological deposits.

With respect to shipyard deposits, in particular, Moser noted that redeveloped shipyards in urban settings have less potential for intact archaeological deposits and features associated with a preexisting shipyard. Hoboken's waterfront presents such urban redevelopment. Thus, it is possible that deposits associated with the W. & A. Fletcher & Company and the subsequent Bethlehem Steel Company and the Todd Shipyard Corporation have been

³⁰³ Hartgen 1991, 8.

removed or seriously compromised by redevelopment of the shipyard sites. Similarly, recent development throughout the Study Area, including the conversion of past industrial warehouses to residential properties, may have removed or compromised existing industrial archaeological remains. Nonetheless, if deposits associated with the shipyard remained extant such remains could potentially reflect the infrastructure within the shipyard sites which enabled the construction and/or repair of vessels, the complexity of activities which occurred on site which may have required associated structures and facilities like a blacksmith shop, and the construction of the piers, bulkheads, and dry docks upon which the shipyards were located. Archaeological deposits associated with other industrial development could also inform upon the history of these industries and the nature of their operations within the Study Area.

Depending on the extent and integrity of any industrial-related deposits and/or features from the mid to latenineteenth to the early to mid-twentieth century found within the Study Area, these remains could potentially yield new information regarding the industrial development of the Study Area and changes in local and regional commercial production. Therefore, any archaeological remains associated with nineteenth to twentieth century industrial development within Hoboken would have to be evaluated for their potential eligibility for listing in the National Register. Such a deposit could potentially be National Register-eligible under Criterion A, for its association with the industrial development of Hoboken, and/or under Criterion D for its potential to provide insights into the historic development of Hoboken.

8.6 Cemeteries & Churches

Some of the earliest development within Hoboken involved the establishment of churches. As Van Winkle observed:

Hoboken with its variety of people from different lands has been as cosmopolitan in belief as in origin...About a third of the population is Catholic and the other denominations are distributed in the proportion usual in cities on the east coast.³⁰⁴

Currently, there are approximately 14 houses of worship, including churches and synagogues, within the Study Area. Historically, there was one known cemetery within the Study Area; since the mid-nineteenth century burials have been disallowed within the Study Area. The Hoboken Cemetery, established in the mid-nineteenth century, is located within North Bergen, New Jersey.

The following discussion presents an overview of the churches, synagogues, and cemeteries which were established within Hoboken. The majority of these institutions were established in the early to mid-nineteenth century. The following discussion will provide a brief history of the religious institutions which developed within Hoboken during the early to mid-nineteenth century through the early-twentieth century.

8.6.1 Historical Background

³⁰⁴ Van Winkle 1924, 330.

St. Paul's Protestant Episcopal Church

St. Paul's Protestant Episcopal Church (St. Paul's) is considered the oldest church in Hoboken. The first service was held in 1832 in a small village school building. In 1835, John Stevens provided land and money for the establishment of a church building. In this same year, the church organization was formally consummated. The first church building was established at the corner of Hudson and 3rd streets, in the historic location of Busch's Hotel. The cornerstone for the structure was laid in May 1836; by October the church was complete. The initial church building was a frame structure that was enlarged in 1851. St. Paul's occupied this building for 30 years.³⁰⁵

In 1854, Trinity Protestant Episcopal Church (Trinity Church) separated from St. Paul's. Trinity Church was established at 701-705 Washington Street, at the northeast corner of Washington and 7th streets. Trinity Church will be discussed in more detail below.

In 1871, St. Paul's Church sold its property at Hudson and 3rd streets to the Hoboken Land and Improvement Company and constructed a new building on Hudson Street between 8th and 9th streets. The new St. Paul's consisted of a rustic Gothic Revival building with a granite block façade.³⁰⁶

A review of historic maps from 1873 through the twentieth century indicates that St. Paul's Episcopal Church had been located on Hudson Street between 8th and 9th streets from 1873 through 1988.³⁰⁷ In 1983, St. Paul's merged with the congregations of the Church of the Holy Innocents and Trinity Episcopal Church to form All Saints Episcopal Parish. Sometime after this consolidation, St. Paul's church building was converted into condominiums. The apartment building is currently known as The Abbey.³⁰⁸

Trinity Protestant Episcopal Church

As previously noted, Trinity Protestant Episcopal Church (Trinity Church) was established as an offshoot from St. Paul's in 1853. Trinity Church held is first meetings over the engine-house at the corner of Washington and 1st streets. Construction of the church on the northeast corner of Washington and 7th streets, at 701-705 Washington Street, began in 1855. The church was completed in 1856. Trinity Church was designed by Richard Upjohn; it is an example of an English Country Gothic Revival church. Between 1864 and 1865, a rectory and school house were added to Trinity's property. A new parish building was also added in the mid to late-nineteenth century. Van Winkle considered Trinity Church the oldest church building within Hoboken.³⁰⁹

The building may have been enlarged and reconsecrated as All Saints in 1882. However, a review of historic maps from 1873 through the twentieth century indicates that Trinity Church has been located on the northeast corner of Washington Street and 7th Street from 1873 through 2006.³¹⁰ The website for All Saints Episcopal Parish indicates

³⁰⁵ Shaw 1884: 1227; Van Winkle 1924:330-332.

³⁰⁶ Judy Abramsohn, "Northern Hoboken Historic District National Register Nomination," (On file: Trenton, NJHPO) 1985.

³⁰⁷ G.M. Hopkins & Co. 1873; Sanborn Library, LLC, *Fire Insurance Maps*, 1885-2006.

³⁰⁸ All Saints Episcopal Parish, "The History of All Saints," accessed March 2, 2016, <u>http://allsaintshoboken.com/history/;</u> Frank L. Greenangel, "The New Jersey Churchscape: Saint Paul's Episcopal Church, Hoboken, Hudson County," accessed March 2, 2016, http://njchurchscape.com/Hoboken-St.Paul%27sEpiscopal.html.

³⁰⁹ Van Winkle 1924, 332-333; Shaw 1884, 1227-1228; Abramsohn 1985; Hoboken Historical Museum, "Hoboken: A Walking Tour and Street Map," accessed March 2, 2016, http://hoboken.pastperfectonline.com/archive/99744F59-DB45-4FB0-96FA-730877201230.

³¹⁰ G.M. Hopkins & Co. 1873; Sanborn Library, LLC, *Fire Insurance Maps*, 1885-2006.

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that this parish was formed through the consolidation of St. Paul's, Trinity, and the Church of the Holy Innocents in 1983.³¹¹ Today, it appears that the All Saints Episcopal Parish occupies the building historically associated with Trinity Church; and, that it has most likely occupied this building since the church consolidation in 1983.

Church of the Holy Innocents

The Church of the Holy Innocents (Holy Innocents) was endowed under a trust by Mrs. Edwin A. Stevens in 1870 following the death of her daughter, Julia Augusta. Julia Augusta died in Rome from typhoid fever at the age of seven. The cornerstone of the church was laid in 1872; in 1874, the building was completed along 6th Street between Willow and Clinton streets. The church was built by Edward Tuckerman Potter in a High Victorian Gothic style. In 1895 the church was enlarged to the rear by architect Henry Vaughn. Holy Innocents was built to serve German and Irish immigrants and did not request a pew fee to be seated. Churches of the time typically charged a fee to be seated. A choir was added to the church in 1913 and the baptistery was added in 1932.³¹²

Holy Innocents does not appear on Hopkins 1873 Atlas of Hudson County.³¹³ The church was depicted in the same location from 1937 through 2006 on the Sanborn Fire Insurance Maps. The Sanborn maps indicate that the Holy Innocents property included a rectory and another building.³¹⁴ Holy Innocents was listed in the National Register in 1977.³¹⁵

As previously noted, the All Saints Episcopal Parish was formed through the consolidation of St. Paul's, Trinity, and Holy Innocents in 1983.³¹⁶ The building is not currently in use; however, it has remained largely intact.³¹⁷

First Dutch Reformed Church

The First Dutch Reformed Church was organized in 1850. Shaw indicated that the First Dutch Reformed Church building was erected between 1855 and 1856. Prior to this point, the church had worshiped in a lecture room on Church Square. The first church building was installed on Hudson Street between 5th and 6th streets. G.M. Hopkins & Co.'s 1873 map shows the First Dutch Reformed Church occupying three lots on the western side of Hudson Street between 5th and 6th streets.³¹⁸ The church building burned in 1890. The following year, the First Dutch Reformed Church purchased a lot on Bloomfield Street between 8th and 9th streets. A new church building was erected on this lot by 1894.319

A review of the available twentieth century Sanborn Fire Insurance Maps indicates that the former location of the First Dutch Reformed Church on Hudson Street between 5th and 6th streets had been converted to apartment flats

³¹¹ G.M. Hopkins & Co. 1873; Sanborn Library, LLC, 1885-2006.

³¹² Hoboken Historical Museum, "Hoboken: A Walking Tour and Street Map"; Shaw 1884, 1227; Van Winkle 1924, 333; Terry Karshcner, "National Register of Historic Places Inventory Form: Church of the High Innocents," accessed March 2, 2016, http://focus.nps.gov/National Register/GetAsset?assetID=404551fb-05cd-4a73-825c-2b32ab7b6e33. 1977. ³¹³ G.M. Hopkins & Co., 1873.

³¹⁴ Sanborn Insurance, LLC, 1937-2006.

³¹⁵ Karschner 1977.

³¹⁶ G.M. Hopkins & Co. 1873; Sanborn Library, LLC, 1885-2006.

³¹⁷ Hoboken Historical Museum, "Hoboken: A Walking Tour and Street Map."

³¹⁸ G.M. Hopkins & Co., 1873.

³¹⁹ GETNJI, "History of Hoboken," accessed March 3, 2016, <u>http://www.welcometohoboken.com/history/index.shtml;</u> Shaw 1884, 1224; Karschner 1985.

by 1937. The Sanborn Maps also indicate that the church on Bloomfield Street between 8th and 9th streets was affiliated with the First Church of Christ Scientists from at least 1937 through the present day. The First Dutch Reformed Church may have moved to a building on Garden and 6th streets in 1910. The church may have also been converted to a Lutheran Church by this time. The 1937 Sanborn map indicates the presence of a German Lutheran Church at Garden and 6th streets. The 1951-2006 Sanborn maps reflect the presence of a Reformed Church in this same location.³²⁰ The current congregation is a union congregation of Methodist and Reformed churches; the congregation is known as the Hoboken Community Church at 606 Garden Street.³²¹

According to the Sanborn Fire Insurance Maps, the Hoboken Community Church was located at the northeast corner of Park and 6th streets from 1979 to 2006. ³²² A review of historic aerial photography of the region indicates that the building on the northeast corner of Park and 6th streets changed between 1997 and 2002 from an apparent church to an apartment building. The aerial imagery suggests that the Hoboken Community Church may have combined with or moved into the Reformed Church building sometime during the late 1990s and early 2000s.³²³

Church of Our Lady of Grace

The beginnings of the Catholic Church of the Church of Our Lady of Grace (Our Lady of Grace) in Hoboken consisted of mass at a priest's home from 1852 to 1855. In 1854 Our Lady of Grace purchased three lots at Willow and 5th streets. In 1855, a small brick rectory was installed on Willow Street near 4th Street. At this time, the church was known as Saint Mary's Church. In 1864, Our Lady of Grace was incorporated. Our Lady of Grace ultimately purchased 24 lots within Hoboken for the construction of their church. Francis Himpler, a local architect who constructed Hoboken City Hall, was commissioned to design the church. In 1875, the cornerstone was laid and the building was consecrated in 1878. Up until the completion of the church, Our Lady of Grace congregated in the brick rectory. At the time of its consecration, the Our Lady of Grace was the largest Roman Catholic Church in New Jersey. When the church was dedicated, members of the Italian and French royalty sent gifts of paintings and ceremonial vessels. The interior of the church was decorated by George Ashdown Audsley. These interior decorations are no longer extant, however, a pipe organ designed by Audsley for the church continues to be used during church ceremonies.³²⁴

Our Lady of Grace established a school in 1859, a hospital in 1863, and a society to feed and house the homeless in 1859. The complex of buildings associated with Our Lady of Grace included the rectory, convent, and school. In 1891, the old brick church was demolished for the installation of the Our Lady of Grace School. In 1902, an orphanage was built between the school and the rectory; the orphanage was demolished in 1974. Our Lady of Grace was listed in the National Register in 1996.³²⁵

³²⁰ Sanborn Insurance, LLC, 1937-2006.

³²¹ Greenagel 2016.

³²² Sanborn Insurance, LLC, 1937-2006.

³²³ Nationwide Environmental Tile Research, LLC (NETR), "Historic Aerial Imagery," accessed March 3, 2016, http://www.historicaerials.com/.

³²⁴ Hoboken Historical Museum, "Hoboken: A Walking Tour and Street Map"; Shaw 1884, 1224; Rev. Richard Carrington, "The Church of Our Lady of Grace, Hoboken, National Register of Historic Places Registration Form," 1996.

³²⁵ Carrington 1996.

G.M. Hopkins & Co.'s 1873 map shows the St. Mary's Church Property across the entirety of Willow Street between 4th and 5th streets.³²⁶ This property included a school, a parsonage, and a small church on the southwestern corner of Willow and 5th streets. Several other buildings are depicted within the parcel. St. Mary's Hospital was located on several lots at the southwest corner of Willow and 4th streets. The 1891 Sanborn Map reflects the complex of buildings on the Willow Street block between 4th and 5th streets. The complex included the large Church of Our Lady of Grace at the northwestern corner of Willow and 4th streets. The parcel also included a rectory, a school, and St. Mary's Church at the southwestern corner of Willow and 5th streets. St. Mary's Hospital was still located on the southwestern corner of Willow and 4th streets. The 1936 Sanborn Map reflects some alterations to the Our Lady of Grace parcel. A convent had been established on Clinton Street between 4th and 5th streets; the orphanage had been constructed; St. Mary's Church had been replaced by a parochial school. By 1979, the orphanage had been removed from the Our Lady of Grace complex; St. Mary's Hospital had also expanded to the south and occupied the entirety of Block 53. The Our Lady of Grace complex and adjacent St. Mary's Hospital remained unchanged on the 1988 and 2006 Sanborn Maps.³²⁷

German Roman Catholic Church (St. Joseph's Church)

The German Roman Catholic Church (St. Joseph's Church) was established on Monroe Street between Ferry and 1st streets in 1874. The church had its beginnings in 1871 with mass being offered at a hall on Grand and Newark streets. St. Joseph's Church was incorporated in 1874 and became a Territorial Parish in 1889. In order to construct their church, St. Joseph's had to fill the lot. In 1897, the present St. Joseph's Church was opened. Church records indicated that the church was installed on 451 piles. The building consisted of a large white stone Gothic Revival building. In 1904, a rectory was installed; in 1907 St. Joseph's School and Convent were built on Jackson Street.³²⁸

The 1937 Sanborn Map shows St. Joseph's Roman Catholic Church and an associated parochial residence on the east side of Monroe Street between Ferry Avenue and 1st Street. The parcel remained unchanged from 1951 through 2006. In 2008, Our Lady of Grace and St. Joseph's Church merged. According to their website, both facilities are undergoing restoration and renewal.

First Presbyterian Church

The First Presbyterian Church (First Presbyterian) was organized in 1852. Initially, the congregation worshiped in a former Baptist Church on Washington and 3rd streets. The Baptist Church was purchased by First Presbyterian in this same year. The records of the church were destroyed by a fire in the house of Elder Rose in 1860. First Presbyterian sold their church to St. Matthew's German Lutheran Church in 1864. In this same year, First Presbyterian purchased a new lot at Hudson and 6th streets. The new church building was dedicated in 1865.³²⁹

A review of G.M. Hopkins & Co.'s 1873 map indicates that a German Church was located at the southwest corner of Washington and 3rd streets. The map indicates that a Presbyterian Church was located at the northeast corner of

³²⁶ G.M. Hopkins & Co. 1873.

³²⁷ Sanborn Insurance, LLC, 1891-2006.

³²⁸ Church of Our Lady of Grace & St. Joseph, "Historical Timeline," accessed March 3, 2016, <u>http://olghoboken.com/index.cfm?fuseaction=feature.display&feature_id=36</u>; Greenagel 2016; Shaw 1884, 1224. ³²⁹ Shaw 1884, 1225; Van Winkle 1924, 335; GETNJ! 2016.

Hudson and 6th streets.³³⁰ The 1937 and 1951 Sanborn Insurance Maps show the First Presbyterian Church at the northeast corner of Hudson and 6th streets; no other buildings were associated with the church. By 1979, the First Presbyterian Church had moved to a building on the southeast corner of Washington and 9th streets. The church continued to be located at 61 Ninth Street. The former location of the First Presbyterian Church on Hudson and 6th streets was converted to a parking area by 1979.³³¹

German Lutheran Church of St. Matthew

The German Lutheran Church of St. Matthew (GLSM) was first organized in 1858. The initial services of the GLSM were held in Odd Fellows' Hall. In 1864, the GLSM purchased a building belonging to a Presbyterian congregation on the corner of 3rd and Washington streets. The GLSM constructed a two-story brick house in the rear of the church which they rented to raise funds. In 1877, the congregation sold their property on 3rd and Washington streets and purchased a new site on the corner of 9th and Bloomfield streets. They exchanged the Bloomfield site for a property on Hudson and 8th streets. The GLSM built a Romanesque Revival church on the southwest corner of Hudson and 8th streets. The church contained an 150-foot high steeple, a clock tower, and an attached parsonage.³³²

The G.M. Hopkins & Co. 1873 map shows a German Church at the southwest corner of Washington and 3rd streets.³³³ The Sanborn Insurance Maps from 1937 through 2006 show the St. Matthews German Lutheran Church in the same lot at the southwestern corner of 8th and Hudson streets.³³⁴ Currently, the congregation is known as St. Matthew Trinity Lutheran Church and continues to worship at the corner of Hudson and 8th streets. Their website indicates that their original building on Washington and 3rd streets is extant, though altered; the building is currently occupied by a McDonald's restaurant.³³⁵

German Evangelical Church

The German Evangelical Church (German Evangelical) was established in 1856 on Church Square. The German Evangelical was the first church within Hoboken to hold services in the German language. The German Evangelical was permanently organized as a Dutch Reformed Church in August 1856. The German Evangelical constructed a church on the northwest corner of Garden and 6th streets in 1860.³³⁶ G.M. Hopkins & Co.'s 1873 Map indicates the presence of a German Evangelical Church at the northwest corner of Garden and 6th streets.³³⁷ The 1937 Sanborn Insurance Map also reflects a German Lutheran Church at this location. However, the 1951 to 2006 Sanborn maps located a Reformed Church in the former location of the German Lutheran Church.³³⁸

The New Jersey Churchscape website indicated that the Dutch Evangelical Lutheran Church was associated with an address at Garden and 6th streets in 1910. The website further noted that the Dutch Reformed Church may have converted to a Lutheran Church during the early-twentieth century. The mid to late-twentieth century Sanborn maps

³³⁰ G.M. Hopkins & Co. 1873.

³³¹ Sanborn Insurance, LLC, 1937-2006.

³³² Shaw 1884, 1225; Van Winkle 1924, 335; Abramsohn 1985.

³³³ G.M. Hopkins & Co. 1873.

³³⁴ Sanborn Insurance, LLC, 1937-2006.

³³⁵ St. Matthew Trinity Lutheran Church, "History & Photos," accessed March 3, 2016, http://www.stmatthewtrinity.org/15172017.html.

³³⁶ Shaw 1884, 1225; Van Winkle 1924, 336; GETNJ! 2016.

³³⁷ G.M. Hopkins & Co. 1873.

³³⁸ Sanborn Insurance, LLC, 1937-2006.

suggest that the First Dutch Reformed Church and the German Lutheran Church may have combined congregations and been mapped as the Reformed Church. Currently, the Hoboken Community Church is located at 606 Garden Street, the historic location of the German Lutheran Church. The Hoboken Community Church is a union congregation of Methodist and Reformed churches.³³⁹

First United Presbyterian Church

The First United Presbyterian Church (First United) was organized in 1854 as a congregation of the Associate Presbyterian Church. In 1858, there was a union between the Associate Presbyterian and the Reformed Presbyterian churches which formed First United. In 1856, the congregation which would become First United purchased property on the corner of Bloomfield and 7th streets. Their church at Bloomfield and 7th streets was built ca. 1860.³⁴⁰ G.M. Hopkins & Co.'s 1873 Map illustrates a Presbyterian Church along three lots at the southeast corner of Bloomfield and 7th streets.³⁴¹ The First United Presbyterian Church was located in this same corner parcel on the 1937 Sanborn Insurance Map.³⁴²

The 1951 to 2006 Sanborn Insurance maps indicate that a Gospel Hall was located in the former location of First United.³⁴³ According to New Jersey Churchscape, the former First United Church currently houses the Hoboken Gospel Chapel.³⁴⁴ The Hoboken Gospel Chapel is a Christian fellowship church which operates at 641 Bloomfield Street in Hoboken.³⁴⁵

First Baptist Church

The First Baptist Church was first organized in Hoboken in 1845. In 1846, the 16-member congregation began constructing a church building at 4th Street and Park Avenue (then, Meadow Street). In that same year, a storm blew down the walls of the church. Rather than rebuild in this location, the congregation purchased a lot on the southwest corner of 3rd and Washington streets. Within this lot, the First Baptist Church erected a meeting hall which measured 25 feet by 60 feet. The building was dedicated in 1847. By 1852, the congregation had grown too large for the meeting hall and the First Baptist Church purchased a lot on the northwest corner of 3rd and Bloomfield streets. They sold their Washington Street parcel to the Presbyterian Church in 1852.³⁴⁶ G.M. Hopkin & Co.'s 1873 Map reflects the presence of the Baptist Church on the northwest corner of Bloomfield and 3rd streets.³⁴⁷

In 1890, the First Baptist Church moved uptown, north of 8th Street. In that year, they purchased property on the northeastern corner of 9th and Bloomfield streets. They commissioned the architectural firm of French, Dixon & Desaldern to design a place of worship from brick and stone. The cornerstone of the new building was laid in 1890; the building was consecrated in 1891. The new First Baptist Church was designed in the Richardsonian

³³⁹ Greenagel 2016.

³⁴⁰ Shaw 1884, 1225-1226; Van Winkle 1924, 335-336; GETNJ! 2016.

³⁴¹ G.M. Hopkins & Co. 1873.

³⁴² Sanborn Insurance, LLC, 1937.

³⁴³ Sanborn Insurance, LLC, 1951-2006.

³⁴⁴ Greenagel 2016.

³⁴⁵ Hoboken Gospel Chapel, "Hoboken Gospel Chapel," accessed March 3, 2016, http://hobokengospelchapel.org/.

³⁴⁶ Allen Kratz, "First Baptist Church, Hoboken, N.J., National Register of Historic Places Inventory Form," 2005; Shaw 1884, 1226; Van Winkle 1924, 336.

³⁴⁷ G.M. Hopkins & Co. 1873.

Romanesque style. It was three stories tall and more than twice the footprint of their edifice on Bloomfield Street. The new building may have been designed to attract new worshippers as the population and development of Hoboken was increasing in the late-nineteenth century, particularly within the uptown portions of the city. The Bloomfield Street building was transferred to St. John's Lutheran Church.³⁴⁸

Over the course of the twentieth century, the First Baptist Church has served a variety of public services in addition to being a place of worship. The church provided a venue for the Boy Scouts. "During World War I, when Hoboken was 'the Point of Embarkation' for U.S. army and navy troops, the church served as a social center for military personnel passing through the city."³⁴⁹

A review of the twentieth century Sanborn Insurance Maps indicates that a church has been located at the northeastern corner of 9th and Bloomfield streets from 1937 through 2006.³⁵⁰ This building was associated with the First Baptist Church on the Sanborn Maps from 1937 through 1988. The trustees of the First Baptist Church sold this building to the New Jersey Conference Association of Seventh-day Adventists in 1959. Since their acquisition, the New Jersey Conference Association of Seventh-day Adventists have operated the church continuously as the Spanish Seventh-day Adventist Church. The church was put up for sale in both the 1980s and 1990s, but was never sold. In 2005, the First Baptist Church was listed in the National Register.³⁵¹

First Methodist Episcopal Church

The beginnings of Methodism in Hoboken began in 1838 with a small mission in the school house on the Church Square bounded by Garden, 4th, and 5th streets, and Willow Avenue. In 1846, the Methodist congregation began building a structure on the northwest corner of Church Square; the structure blew over the following year. The congregation quickly began constructing a new church. In 1865, the city sued the Methodists claiming that the Church Square was intended as public space. The court case was settled against the Methodists who then purchased a plot of land on Washington Street between 7th and 8th streets from the Hoboken Land and Improvement Company. The church was dedicated in March 1870. In 1875, there was a division within the Methodist community and two new societies were formed–the Methodist Episcopal Free Tabernacle of Park Avenue and the German Methodist Episcopal Church.³⁵² G.M. Hopkins & Co.'s 1873 Map illustrates the M.E. Church on the east side of Washington Street between 7th and 8th streets.³⁵³

A review of the late-nineteenth and twentieth century Sanborn Insurance Maps indicates that from 1887 through 1951 the First Methodist Episcopal Church continued to be located on the eastern side of Washington Street between 7th and 8th streets.³⁵⁴ This occupation continued to consist of a single large L-shaped building. Beginning with the 1979 Sanborn Map, the church on Washington Street was associated with the Mount Olive Baptist Church.

³⁴⁸ Kratz 2005; Abramsohn 1985.

³⁴⁹ Krtaz 2005.

³⁵⁰ Sanborn Insurance, LLC, 1937-2006.

³⁵¹ Krtaz 2005; Greenagel 2016.

³⁵² Shaw 1884, 1226; Van Winkle 1924, 336; GETNJ! 2016.

³⁵³ G.M. Hopkins & Co. 1873.

³⁵⁴ Sanborn Insurance, LLC, 1887-2006.

It appears that the Mount Olive Baptist Church bought the former First Methodist Episcopal Church between 1965 and 1975. The Mount Olive Baptist Church is located at 721 Washington Street.³⁵⁵

The German Methodist Episcopal Church

The German Methodist Episcopal Church (GME) was organized by members of the First Methodist Episcopal Church in April 1875. The GME was organized to conduct services in the German language. In 1879, the GME purchased property and erected a building at Garden Street near 2nd Street.³⁵⁶ The 1891 Sanborn Insurance Map shows the GME on the east side of Garden Street near 2nd Street.³⁵⁷ A 1911 directory of the civic and religious institutions within Hoboken listed the GME at 131-133 Garden Street.³⁵⁸

A review of the mid-twentieth century Sanborn Insurance Maps indicates that by 1937 the building on Garden Street was no longer associated with the GME; from 1937 through 1951 this building was associated with Goodwill Industries. The 1979 Sanborn Insurance Map associates this same building with St. Matthews Baptist Church. From 1979 through 2006, the building was identified as St. Matthews Baptist Church on the Sanborn Insurance Maps.³⁵⁹ It is unclear whether a church is currently operating at this location.

The Methodist Episcopal Free Tabernacle Church

As previously noted, the Methodist Episcopal Free Tabernacle Church (Free Tabernacle) separated from the First Methodist Episcopal Church in April 1875. They initially began worshiping in the Martha Institute on 6th Street and Park Avenue. In May 1875, Free Tabernacle first worshiped in a building on Park Avenue and 5th Street. This building had been constructed by the Free Thinker Society in 1867. In 1883, Free Tabernacle reunited with First Methodist on Washington Street.³⁶⁰ A review of the late-nineteenth and early-twentieth century Sanborn Insurance Maps does not indicate any buildings associated with the Free Tabernacle Church.³⁶¹

Saint Francis' Roman Catholic Church

Saint Francis' Roman Catholic Church (Saint Francis') was established in 1888 by Italian Catholics who were dissatisfied with the English language services provided by St. Joseph's Church. In this same year, the congregation purchased a 100-foot by 100-foot lot at 3rd and Jefferson streets for construction of their church. Saint Francis' Church was designed by architect S. Manner. The church, a late Gothic Revival design, was consecrated in May 1889. Between 1905 and 1906, a new school building was installed adjacent to Saint Francis' Church. The church continues to hold services at 308 Jefferson Street.³⁶²

³⁵⁵ Holy-ny.com, "Mount Olive Baptist Church in Hoboken, NJ," accessed March 3, 2016, http://www.holy-ny.com/Mount_Olive_Baptist_Church_Hoboken_NJ.

³⁵⁶ Shaw 1884, 1226; Van Winkle 1924, 336; GETNJ! 2016.

³⁵⁷ Sanborn Insurance, LLC, 1891.

³⁵⁸ The Robert L. Steven Fund for Municipal Research in Hoboken, *A Directory of Public Officials, Educational, Civic and Charitable Organizations, Churches and Religious Congregations of the City of Hoboken*, accessed March 3, 2016, http://hoboken.pastperfect-online.com/32340cgi/mweb.exe?request=record;id=21106134-8619-46F5-B508-962390866622;type=301.

³⁵⁹ Sanborn Insurance, LLC, 1937-2006.

 ³⁶⁰ Shaw 1884, 1227; Van Winkle 1924, 335.
 ³⁶¹ Sanborn Insurance, LLC, 1891-1937.

³⁶² Saint Francis Church, "Parish History," accessed March 4, 2016, <u>http://stfrancishoboken.net/history.php</u>; GETNJ! 2016.

The 1891 Sanborn Insurance Map indicates the presence of an Italian Catholic Church at the northwest corner of Jefferson and 3rd streets.³⁶³ The church was associated with a small square building to its west. This building was most likely the original friary. An examination of the 1937 through 2006 Sanborn Insurance Maps indicates that Saint Francis' church remained on the northwest corner of Jefferson and 3rd streets. In 1937, a parochial school was located immediately west of the church. By 1951, a rectory had been established immediately north of the church; by 1979, a northern extension had been added to the rectory for a youth center.³⁶⁴ Services continue to be held at Saint Francis' Church.

Saint Ann's Roman Catholic Church

The parish of Saint Ann's Roman Catholic Church (Saint Ann's) was organized in May of 1900 to service the increasing Italian population within the northern portions of Hoboken. Initially, services for Saint Ann's were held at a small chapel on Adams Street that had been purchased by the Saint Ann's Society. In 1903, Saint Ann's began erecting a church at the northwest corner of 7th and Jefferson streets. This church consisted of a Carpenter Gothic building of wood-frame construction. A new church was installed at the northwest corner of 7th and Jefferson streets from 1925 through 1927. The new church was designed by Anton L. Vegliante in the Romanesque Revival style and was built by Louis Infante & Son. The original church building was moved to 715 Madison Avenue and was converted to a parish hall and then a youth center. The building was eventually razed after it was severely damaged by fire. The original rectory was located on the west side of Jefferson Street immediately north of the new church; this rectory was moved to 720 Jefferson Street and then sold to private interests. The new church has been renovated throughout the twentieth century. Services continue to be held at Saint Ann's Church at 704 Jefferson Street.365

A review of the twentieth century Sanborn Insurance Maps indicates that Saint Ann's Church was located at the northwestern corner of Jefferson and 7th streets from 1937 through 2006. According to the 1937 Sanborn Insurance Map, Saint Ann's consisted of a church and priest house.³⁶⁶ In 2012, Saint Ann's Church and the adjacent rectory (the priest house on the Sanborn Insurance Maps) were determined eligible for listing in the National Register under Criteria C for its "significance as a representation of early-twentieth century religious architecture in Hoboken, New Jersey."367

Second Baptist Church

The Second Baptist Church was organized in April 1890 to service the growing community in the southern portion of Hoboken. At this time, the Baptist Church felt that the community in the lower portion of the city lacked a church where services were performed in English. The Second Baptist Church was formed to provide this service. The Second Baptist Church held its initial meetings at the Martha Institute on Park Avenue and 6th Street. The church was open to all and did not charge a fee for worship. In 1894, the Second Baptist Church relocated to Willow Avenue.

³⁶³ Sanborn Insurance, LLC, 1891.

³⁶⁴ Sanborn Insurance LLC, 1937-2006.

³⁶⁵ GETNJ! 2016; St Ann Roman Catholic Church, "Parish History," accessed March 4, 2016, <u>http://www.stannhoboken.com/index.php/parish-information/parish-history</u>; NJHPO, "Saint Ann's Roman Catholic Church and Rectory," Property File (Trenton: NJHPO) 2012; Douglas C. McVarish, "Saint Ann's Roman Catholic Church and Rectory: National Register of Historic Places Registration Form," 2015. ³⁶⁶ Sanborn Insurance LLC, 1937-2006.

³⁶⁷ NJHPO 2012; McVarish 2015.

The church acquired property on Monroe Street near 2nd Street for the construction of a new building in August 1906.³⁶⁸ The 1939 and 1951 Sanborn Insurance Maps indicate the location of a German Baptist Church on the eastern side of Willow Street immediately north of 7th Street. The German Baptist Church may represent the Second Baptist Church. By 1979, there was no longer a church at this location.³⁶⁹

Temple Adath Emuno (Adas Emuno)

The Jewish Congregation of Adath Emuno was organized in September 1871. From 1871 to 1874, the congregation worshipped at Odd Fellows' Hall at 2nd and Washington streets. The congregation then moved to Bloomfield and 5th streets where they remained for nine years. In 1883, Adath Emuno constructed a temple on Garden Street between 6th and 7th streets (279 Garden Street); land which was donated by the Stevens family. This temple was a mixed Gothic Revival and Romanesque Revival design, with Gothic windows and doors and a Romanesque arcade. The architectural style is quite similar to that used in Christian churches. The Adath Emuno congregation is thought to have been the first Reform Judaism congregation within Hudson County, New Jersey.³⁷⁰

During the early 1970s, the Adath Emuno congregation relocated to the Borough of Leonia in Bergen County. The Jewish community within Hoboken had dwindled to less than 300 by this time. The Temple of Adath Emuno was used as a Presbyterian Church and community center for several years. The temple was ultimately converted into apartments.³⁷¹

The 1891 Sanborn Insurance Maps reflect the presence of a Synagogue on the east side of Garden Street between 6th and 7th streets.³⁷² The Synagogue was present on the 1937 and 1951 Sanborn Insurance Maps. However, by 1979, the building appears to have been converted to a community house.³⁷³

Moses Montefiore Jewish Synagogue

The Moses Montefiore Congregation was founded by Eastern European Jewish immigrants in the late-nineteenth century. The congregation organized sometime between 1892 and 1899 and followed the principles of Orthodox Judaism. It appears that the Moses Montefiore Congregation leased space for worship at 76 Grand Street. In 1901, the congregation built a synagogue at 80 Grand Street which may have spanned several lots on Grand Street. The Moses Montefiore Synagogue had two towers.³⁷⁴

Following World War II, the Jewish population within Hoboken began to rapidly decline. By 1942, the Moses Montefiore Congregation was still in existence but appears to have relocated to 79 Grand Street and did not have

³⁷² Sanborn Insurance, LLC 1891.

³⁶⁸ GETNJ! 2016.

³⁶⁹ Sanborn Insurance LLC, 1937-1971.

³⁷⁰ GETNJ! 2016; Mary D. Krugman, "United Synagogue of Hoboken: National Register of Historic Places Registration Form," 2008; Greenagel 2016.

³⁷¹ Krugman 2008.

³⁷³ Sanborn Insurance, LLC 1937-1979.

³⁷⁴ GETNJ! 2016; Krugman 2008.

a regular rabbi. The congregation was disbanded sometime after 1957; it is unclear what happened to their synagogue though records dating to 2007 indicated that the building had been gone for decades.³⁷⁵

An examination of the Sanborn Insurance Maps indicate that the Moses Montefiore Congregation was located at 80 Grand Street, on the west side of Grand Street immediately north of Newark Avenue. By 1979, the congregation was no longer at this location and the lot associated with 80 Grand Street appears to be vacant. By 1988, it appears that a townhouse or apartment building had been installed at this address.³⁷⁶

United Synagogue of Hoboken/Star of Israel

The Star of Israel congregation, seeking a more liberal form of Orthodox Judaism, branched off from the Moses Montefiore Congregation in 1905. The Star of Israel first leased property at 79 Grand Street, across the street from the Moses Montefiore Congregation. Subsequently, they leased floors in a property at 111 Grand Street. In 1914, the Star of Israel congregation purchased two adjacent lots on Park Avenue for the construction of a synagogue. Hoboken architect Max Beyer was commissioned to design the synagogue which opened in 1915. The Star of Israel Synagogue combined a variety of architectural elements including Moorish Revival, Gothic Revival, and Romanesque Revival styles.³⁷⁷

In 1947, the Star of Israel merged with the Hoboken Jewish Center and incorporated as the United Synagogue of Hoboken. The United Synagogue of Hoboken continued to use the synagogue at 115-117 Park Avenue for worship services and maintained a property on Hudson Street for office space. In 1997, all of the congregation's interests were consolidated on the Park Avenue property and a building was constructed adjacent to the synagogue. The Star of Israel Synagogue represents the only surviving synagogue in Hoboken. In 2008, the Star of Israel Synagogue was listed in the National Register.³⁷⁸

Old Potter's Field Cemetery/Hoboken Cemetery

The Hoboken Cemetery is located in New Durham, North Bergen Township. This cemetery was purchased from John H. Bonn on January 25, 1859. Prior to this acquisition, it appears that a burial ground was located in Hoboken at Hudson and 6th streets. According to Shaw, this old Potter's Field burial ground was transferred to Bonn with the sale of the acreage in New Durham. This transaction also included \$4,000, 16 city lots comprising the Old Potter's Field Burying Ground at Hudson and 6th streets, and the removal of the bodies buried therein to the new Hoboken Cemetery. This transaction occurred under a New Jersey State legislative act.³⁷⁹

Dripps' 1855 *Topographical Map of New York City, County, and Vicinity* illustrates a cemetery within Hoboken at the southeast corner of Hudson and 7th streets (see Figure 10).³⁸⁰ The cemetery was located to the immediate north of a reservoir. G.M. Hopkins & Co.'s 1873 map indicates that several vacant lots at the southeast corner of Hudson

³⁷⁵ Krugman 2008.

³⁷⁶ Sanborn Insurance, LLC 1937-1988.

³⁷⁷ Krugman 2008.

³⁷⁸ Krugman 2008.

³⁷⁹ Shaw 1884, 1228.

³⁸⁰ Dripps 1855.

and 7th streets were owned by the Hudson Land and Improvement Company.³⁸¹ The 1887 Sanborn Insurance Map also reflects a lack of development within this area. By 1937, the southeastern corner of Hudson and 7th streets was occupied by athletic fields associated with the Stevens Institute of Technology. From 1959 through 2006, the Sanborn Insurance Maps indicate the presence of a "Tower Tank Building" and a structure associated with the Stevens Institute of Technology in this location.³⁸²

In his study of the Social Statistics of Hoboken, Waring observed that prior to the establishment of the Hoboken Cemetery in North Bergen, interments were made in certain church yards. He contended that these burials were disinterred and reburied in the Hoboken Cemetery after its establishment. Waring further noted that "no records remain concerning these" burials.³⁸³

8.6.2 Archaeological Case Studies

The review of previously conducted cultural resource studies within the Study Area did not identify any previous archaeological investigations of church or cemetery-type sites. In order to establish an idea of the types of information which could be gleaned from an historic church or cemetery-type site the following discussion will refer to a few past archaeological studies of a potter's field and a burial ground in highly urbanized contexts as well as some past archaeological studies of church sites.

Cemetery Sites

From 2003 through 2005, Louis Berger conducted an historic documentary and archaeological investigation of the Secaucus Potter's Field as part of the Secaucus Interchange Project. Within the project area for the Secaucus Interchange Project, Louis Berger exhumed the remains of 4,571 individuals from unmarked graves beneath six feet of landfill. The proposed project was expected to impact approximately three acres of a burial ground associated with Hudson County's former institutional complex at Snake Hill (present-day Laurel Hill). The Hudson County's Burial Ground, including the Potter's Field, was established in 1880 and used up until 1962. Hudson County's institutional complex included insane asylums, jails, almshouses, orphanages, hospitals, and the county agricultural farm and piggery.³⁸⁴

As a result of their archaeological excavations, Louis Berger recovered a total of 113,579 artifacts or non-skeletal objects. While over 50 percent of these artifacts consisted of coffin nails, personal effects were also recovered including dentures, glass eyes, coins, clay smoking pipes, embalming bottles, combs, buttons, ceramic fragments, clothing remnants, shoes, hats, jewelry, military medals, religious items, and medical devices.³⁸⁵

Louis Berger was able to positively identify 825 individuals recovered from the Secaucus Potter's Field as a result of their documentary, artifact, and osteological analyses. Through their osteological analysis they were also able to

³⁸¹ G.M. Hopkins & Co. 1873.

³⁸² Sanborn Insurance, LLC. 1887-2006.

³⁸³ Waring 1886, 694.

 ³⁸⁴ Louis Berger, *Potter's Field Disinterment/Reinterment Secaucus Interchange Project, Secaucus, New Jersey*, (on file, Trenton: NJHPO) 2005.
 ³⁸⁵ Louis Berger 2005.

determine the cause of death of many of the interred individuals. Louis Berger documented evidence of infectious diseases, such as smallpox, tuberculosis, cholera, and influenza; pathologies, including lesions, vertebral fusion, untreated fractures, and developmental defects; and trauma within the interred population. There was also evidence of a number of autopsies and amputations.³⁸⁶

From the artifacts recovered from the Potter's Field, Louis Berger was able to draw several conclusions regarding the nature of the interred population, the state of medical knowledge and hospitalization in the mid-nineteenth to mid-twentieth century, and changes within coronary practices. The recovery of religious items and personal curios from individual burials reflected deep-seated religious beliefs and ethnic and individual identities within the population. Such values are not always associated with destitute and impoverished communities who are often depicted as homogenous groups. Many of the recovered artifacts were interpreted as standard issue items given to patients/inmates at the institutions. These items included clothing with plain glass or porcelain buttons, shaving brushes and razors, toothbrushes, clay smoking pipes, and possibly even rosaries. The presence of clay smoking pipes alongside documentary evidence of tobacco deliveries to the Hudson County Insane Asylum was striking given the number of tuberculosis cases and patients amongst the institutionalized population and suggests that medical knowledge regarding the disease and the impacts of smoking on the lungs were not at the level of current medical awareness.³⁸⁷

Louis Berger also identified variability within grave goods and coffin hardware suggestive of the different wealth status and life histories of the interred. In particular, several individuals were found with military paraphernalia including ribbons and medals. Louis Berger concluded that such individuals were most likely not homeless or indigent, but rather military veterans who had been hospitalized due to a contagious disease. These individuals were most likely buried within the Potter's Field given their medical condition and fear of contagion. Louis Berger also identified evidence for changes in burial practices during the nineteenth century within the Potter's Field burials. The presence of redware flower pot sherds within several burials suggested an attempt to improve the aesthetics around particular burials in keeping with movements towards creating more picturesque cemeteries.³⁸⁸

In 1991, archaeologists working in association with the proposed construction of a federal office complex at 290 Broadway in lower Manhattan uncovered undisturbed burials associated with an eighteenth to nineteenth century African Burial Ground. This project has become truly notable for the immense public response and outreach which resulted from the discovery of the African Burial Ground and the exhumation of more than 400 individuals. Archaeological excavations at the site were halted in 1992; the exhumed remains were transferred to Howard University's Cobb Laboratory for osteological analysis. In 1993, the African Burial Ground was designated as a National Historic Landmark; in 2006, the site was named a National Monument. In October 2003, the disinterred human remains were reburied on site.³⁸⁹

³⁸⁶ Louis Berger 2005.

³⁸⁷ Louis Berger 2005.

³⁸⁸ Louis Berger 2005.

³⁸⁹ Cantwell and diZerega Wall 2001, 282-295; U.S. General Services Administration (GSA), "The African Burial Ground," accessed March 7, 2016, <u>http://www.gsa.gov/portal/content/101077</u>; National Park Service (NPS), "African Burial Ground," accessed March 7, 2016, http://www.nps.gov/afbg/index.htm.

Many details regarding the past lives of the interred individuals were gleaned from the osteological analyses. From the skeletal remains, the investigators found more stress markers within the children's remains in contrast to the adult skeletons. These markers reflected the fact that the children had endured more hardships in their formative years. The investigators also found evidence for widespread malnutrition and disease. The skeletal remains exhibited signs of immense physical strain and effort reflecting the hard labor performed by the deceased. Some remains also reflected a violent death possibly associated with past resistance activities.³⁹⁰

The archaeologists also found evidence of African customs within the burials. In particular, more than 20 individuals were found with distinctly filed front teeth, reflecting a custom among West African and Central West African groups. Several individuals were interred with glass beads. Glass beads play an important role in many West African rituals and rites of passage including marriages, births, puberty, and death. The interment of individuals with beads was considered a way of imparting spiritual power and status to the deceased. The presence of these beads with individuals in the African Burial Ground further reflected the perpetuation of African customs amongst this displaced population.³⁹¹

Church Sites

While Church Archaeology is a prominent subfield within historical archaeology in Europe, the topic has been infrequently addressed by historic archaeologists working in the United States. Much of the work on possible church sites within the United States has focused on missions and on locating churches associated with European colonial settlement. In 2006, Kit Wesler presented a pilot study of church sites in Western Kentucky which in part argued for the development of theoretical perspectives for studying church sites in the United States. Wesler identified three topics within European church archaeology that he recommended be factored into any church archaeology within the United States—fabric studies, burials, and landscape contexts. "The work has provided new information about building techniques and materials, and has often revealed sequences of occupation not previously suspected." He further observed that:

Landscape studies consider such aspects as siting, orientation, size and form of churchyards and churches, the nature of boundaries and entrance positions, alignments with roads, and topographical and chronological relationships of single churches and within multi-church towns.³⁹²

Wesler also drew from architectural principles regarding the design of spaces of worship between individual ritual, communal ritual, and corporate ritual. Each kind of ritual requires its own spatial needs with places of worship being designed to accommodate these needs.³⁹³

³⁹⁰ Cantwell and diZerega Wall 2001, 282-295.

³⁹¹ Cantwell and diZerega Wall 2001, 282-295.

³⁹² Kit Wesler, "A Pilot Survey of Church Sites in Western Kentucky" (paper presented at the Symposium on Ohio Valley Urban and Historical Archaeology, Madison, Indiana, March 18, 2006).

³⁹³ Wesler 2006.

Wesler's paper presented some theoretical perspectives that could potentially inform upon any church sites within the Study Area. Specifically, given the multiple churches which operated within Hoboken during the nineteenth and twentieth centuries, landscape analyses would provide information regarding not only the development of particular church sites, but also the interrelation of these sites within the city. In addition, an examination of church sites as sites of communal and/or corporate ritual may also inform upon the location of buildings and other features, as well as features within a religious structure.

In 2013, the Lower Hudson Chapter of the Louis A. Brennan New York State Archaeological Association (LABLHC) conducted archaeological excavations at the St. George's/St. Mark's Church Site in Mount Kisco, New York. St. George's Church was founded in 1761; by 1773, the cemetery associated with the church was opened. The church hosted General Washington and his troops during the American Revolution. St. George's Church was demolished in 1819 after years of neglect. In 1852, St. Mark's Church was constructed within the old churchyard. In 1916, Saint Mark's Church was sold to the St. Francis AME Zion Church which moved the church across town. In 1970, the Episcopal Church relinquished its cemetery to the Village of Mount Kisco. This cemetery was listed in the National Register in 1989.³⁹⁴

The LABLHC excavations were conducted to investigate the location, construction, and use of the two former church buildings. The excavators uncovered areas of architectural debris which they attributed to St. Mark's and a stone foundation wall that may have been part of St. George's Church. The excavators also identified two refuse areas—one along an old stone wall behind the church sites and one in the front portion of the site. The rear refuse area produced artifacts from the early to late-nineteenth century including a teapot, eyeglass lenses, a naval cuff button, two clay pipe stems, a glass bitters bottle, and an intact soda bottle manufactured in Mount Kisco. Hundreds of pieces of ceramics, glass, and metal were also recovered. Conversely, the refuse area in the front of the site contained primarily architectural artifacts including nails, mortar, window glass, ashlars, slate shingles, and painted plaster. A French gunflint, two stone hand pestles, and a small chert flake were also recovered from the front part of the site. The differing refuse deposits in the front and rear of the site suggested that differing activities occurred across the site—with the rear yard being considered a more proper place for the deposition of trash. The predominance of architectural debris in the front portion of the site suggested that the church buildings were most likely situated in this area.³⁹⁵

8.6.3 Discussion

The earliest church organization within Hoboken began in the 1830s with St. Paul's Protestant Episcopal Church. The majority of the religious development within the city occurred from the mid-1850s through the 1880s. One historic reference suggested that prior to the establishment of the Hoboken Cemetery in North Bergen, certain churchyards functioned as burial grounds. Waring further indicated that there are no extant records reflecting this practice.³⁹⁶ Several of the historic churches were in existence prior to the establishment of the Hoboken Cemetery.

³⁹⁴ Madeline B. Kearin, "The Big Dig," *Louis A. Brennan Lower Hudson Chapter New York State Archaeological Association Newsletter* Summer 2014, 3-5.

³⁹⁵ Kearin 2014.

³⁹⁶ Waring 1886, 694.

In particular, St. Paul's Protestant Episcopal Church occupied a building at Hudson and 3rd streets from 1836 to 1871. Given the 35-year occupancy of this parcel, in light of Waring's observations, it is possible that the church used some of its property as a burial ground. Similarly, the Methodist Episcopal Church was located at the northwest corner of Church Square in the 1840s through 1865. Dripps' 1855 map appears to situate the Methodist Episcopal Church at the northwest corner of Garden and 4th streets, the southeastern corner of Church Square. Given the church's 25-year occupancy of this area, an occupancy which predated the Hoboken Cemetery in North Bergen, it also seems possible that the Methodist Episcopal Church used a portion of its property as a burial ground. The Trinity Protestant Episcopal Church, the First Dutch Reformed Church, Our Lady of Grace Church, the First Presbyterian Church, and the First Baptist Church also organized and worshipped in church buildings prior to 1859. All of these church buildings were, however, constructed in the 1850s, when development within Hoboken was increasing. Therefore, there is less of a likelihood that any of these churches established burial grounds on their property, although a possibility does exist.

The only mapped nineteenth century cemetery within Hoboken was located at the southeastern corner of Hudson and 7th streets. As with the two cemetery studies previously discussed, cemetery sites have the capacity to yield information relating to a myriad of topics including the health of an interred community, the burial practices of a society, and the ethnic and/or religious identity of interred individuals. Historic records indicated that the burials within the Hoboken Cemetery were removed and relocated to the Hoboken Cemetery in New Durham ca. 1859. Given that the exhumation of this cemetery was conducted in the mid-nineteenth century, it is possible that some buried individuals may remain within the original cemetery grounds. Therefore, this portion of Hoboken, at the southeast corner of 7th and Hudson streets, is considered sensitive for potential historic cemetery deposits. Similarly, historic accounts indicated that any nineteenth century church burial ground was also relocated to the Hoboken Cemetery also have the potential for human remains. In particular, the following locations are considered sensitive for human remains:

- St. Paul's Protestant Episcopal Church, Hudson and 3rd streets
- Methodist Episcopal Church, Church Square, Garden and 4th streets
- First Baptist Church and First Presbyterian Church, 3rd and Washington streets
- Our Lady of Grace, Willow Street between 4th and 5th streets
- First Dutch Reformed Church, Hudson Street between 5th and 6th streets
- Trinity Protestant Episcopal Church, Washington and 7th streets

Given that there are no indications that there were any other burial grounds within the city, no other portion of the Study Area is considered sensitive for cemetery-related deposits.

With respect to church sites, several of the churches within Hoboken moved during the nineteenth and twentieth centuries. Depending on the nature of subsequent development of a vacated church lot, it is possible that foundation remains, refuse deposits, and/or features associated with the church occupation may remain extant. The discovery of any such deposit would yield insights on to the historic church or religious occupation. Such information might

include the nature of land use and the orientation of buildings and features associated with a past religious occupation. Several of the church occupations also contained multiple buildings whose function and location may have changed over time. Excavations at such sites would have the potential to inform upon evolving religious ideas regarding church services and the role of a given church within the larger community. Given the multitude of Christian denominations within nineteenth century Hoboken, in addition to the synagogues within the city towards the end of the nineteenth century and into the twentieth century, multiple religious sites could inform upon the differing landscape and ritual practices associated with the respective dominations.

Within the Study Area, those locations within which there were historic religious occupations, including former religious sites, are considered sensitive for religious-related deposits. Those locations which were not historically associated with religious occupations are not considered sensitive for religious archaeological resources.

Depending on the extent and integrity of any church-related deposits from the mid to late-nineteenth century and early-twentieth century, these remains could potentially yield new information regarding the religious development, beliefs, and social rituals in Hoboken. Such deposits may also yield information regarding the differing immigrant groups within Hoboken, including German and Italian populations whose Catholic observances may have been unique resulting in distinct archaeological deposits and/or features. Therefore, any archaeological remains associated with nineteenth to early-twentieth century church-related development within Hoboken would have to be evaluated for its potential eligibility for listing in the National Register under Criterion D for its potential to provide insights into the historic development of Hoboken.

8.7 Docks, Wharves, and Landfill

This contextual study provides an overview of the history of waterfront development, specifically the development of docks, wharves, and piers, and the history of landfilling within Hoboken. Historically, land was filled and created within Hoboken for two major purposes—the expansion of the eastern shore for development and trade, and the reclamation of the meadows in the western portion of the city. While landfill could be treated as a distinct context removed from the waterfront features, the topics are being discussed together given the role that landfill played in the overall development of Hoboken's waterfront. As previously noted, Hoboken's waterfront played a pivotal role in the mid to late-nineteenth century development of the city as an industrial and shipping center.

This section presents a brief history of the waterfront development and history of landfill within the Study Area. The section also discusses the potential information that could be derived from archaeological deposits associated with landfill and waterfront development. A few archaeological case studies will also be provided to highlight the data that can be garnered from landfill and waterfront development-related archaeological features. Several of the case studies present past archaeological projects within Hoboken. Additional examples of waterfront and/or landfill-related sites have been taken from previous work within New York City.

8.7.1 Historical Background

The first ferry within Hoboken was established in 1774. The ferry connected the Corporation Dock at Bear Market in New York with Hoboken and was under the charge of Cornelius Haring, an agent for the State of New Jersey. This early ferry operated by sail and oar. In 1811 John Stevens leased the ferry and launched the first steam ferry in the world, the *Juliana*, from Hoboken to Vesey Street. This initial steam ferry proved to be too expensive and Stevens transitioned back to horse and mule technology, with the boat being propelled by horse-driven machinery. Around the same time, ca. 1804, John Stevens invested in building wharves within Hoboken to accommodate shipping, and for converting the settlement into a seaport town. As with his early steam ferry, this Stevens' initial investment in waterfront development did not succeed.³⁹⁷

Historical accounts suggested that Samuel Bayard may have operated a ferry from a point at or near Weehawken Cove in the early-eighteenth century. It appears that this ferry service may have terminated with the opening of the Hoboken Ferry in 1774. The construction of the Hackensack/Bergen Turnpike ca. 1804 bypassed the site of the Weehawken Ferry, connecting instead to the Hoboken Ferry to the south. Nevertheless, attempts were made to reestablish the Weehawken Ferry from the 1800s through the 1830s. These attempts were not successful. Early to mid-nineteenth century maps of the region suggest that the early Weehawken Ferry may have been located within the northeastern extent of the Study Area. According to Raber Associates (Raber) this landing was "probably a combination of timber cribwork and pile-supported decks" and may have survived up until the late-nineteenth century development of the Weehawken shoreline.³⁹⁸

In June 1817, John Stevens sold his interest in the ferry to John, Robert, and Samuel Swartout. The Swartouts assigned the ferry to Philip Horne in 1813. The ferry operated between Hoboken and Barclay Street at this time. In May 1821, John Stevens reacquired the ferry and began operating a steam ferry boat.³⁹⁹ The following year, Robert Stevens built the first ferry slip for the newly formed Hoboken Steamboat Ferry Company.

He had long piles driven into the river bottom and added oak and hickory fenders. This design became the standard throughout most of the world. Stevens' innovative pattern especially simplified docking double-ended crafts at ferry landings in strong Hudson River tides.⁴⁰⁰

In 1814, John Stevens also sold approximately 327 acres of undeveloped meadow and salt marsh within Hoboken to Samuel and Robert Swartout. The brothers immediately set about reclaiming the land by erecting permanent dikes and opening ditches.⁴⁰¹

These sea walls or dikes were traditionally built by digging a trench four feet wide and two "spits" (estimated as measuring 18 inches each) deep to remove the sod and grass roots, and to provide

³⁹⁷ Shaw 1884, 1210; Winfield 1895, 36; Elise A. Baranowski, *Hoboken Piers Headhouse, HAER-NJ-63*, accessed March 10, 2016, <u>http://www.loc.gov/pictures/collection/hh/item/nj1014/</u>, 1988; Elan Zingman, *Background to Preservation: Hoboken New Jersey: A Physical and Social History*, Vol XX, 1978; Daniel Van Winkle, *Old Bergen: History of Hudson County and of the Old Village of Bergen* (Jersey City: The Trust Company of New Jersey) 1921.

³⁹⁸ Raber Associates (Raber), Assessment of Cultural Resources in the Lincoln Harbor Development Site, Township of Weehawken and City of Hoboken, Hudson County, New Jersey (On file, Trenton: NJHPO) 1986, 8.

³⁹⁹ Shaw 1884, 1210; Zingman 1978.

⁴⁰⁰ Jim Hans, *100 Hoboken Firsts* (Hoboken: Hoboken Historical Museum) 2005, 15.

⁴⁰¹ Winfield 1874, 320.

a firm foundation for the wall. Next, a ditch measuring 12 feet wide and three spits deep was dug on the water side of the trench to supply the necessary earth. The earth excavated from the ditch was cut and fit into the dike, in a fashion similar to laying a stone wall. When well-packed and kept moist, the dike formed a strong and durable wall.⁴⁰²

By 1819, Samuel Swartout pastured around 100 cattle and raised some crops in the reclaimed marsh; however, he quickly abandoned this venture as it was not profitable. "The most prominent of the sea walls...ran through the marshes at the head of Weehawken Cove" and eventually became a part of the River Walk along the western banks of the Hudson River.⁴⁰³ This wall appears to have been located parallel to the toll road north of 17th Street, within the northern portion of the Study Area. The sea wall is depicted on both the 1844 U.S. Coastal Survey Map and on an 1865 *Map of the Hudson River and Bay of New York and of Lands Adjacent Thereto* (Figure 16).⁴⁰⁴ From the toll road, the wall extended in a southeastern direction to the east of the toll road, east of the terminal ends of 17th through 15th streets. The wall appeared to terminate at the shore to the southeast of 15th Street. The seawall may have been removed or filled in by the 1870s as streets and lots are depicted in the vicinity of 17th Street on the 1873 Hopkins & Co. map.⁴⁰⁵

David Burr's 1832 *Map of the City and County of New York* shows the state of development within Hoboken (Figure 17). Two ferry lines were in operation from the southeastern extent of Hoboken–a ferry to Canal Street and a ferry to Barclay Street. Two piers were depicted as the Hoboken landing for the ferries. An L-shaped pier is located to the north of these piers. The nucleus of development within Hoboken was located to the west of this pier. Two additional inverted L-shaped piers were located farther to the north. There also appeared to be a small inlet or slip into the shoreline on the southern extent of Steven's Point. An L-shaped pier was also located to the north of Weehawken Cove and may represent the eighteenth century Weehawken Ferry slip. Burr identifies a Weihawken (incorrectly spelled) Ferry as a T-shaped pier located farther north and outside of the Study Area–this may represent the ferry location, or it may represent a second attempted ferry operation. The only other development within Hoboken consisted of two roadways, a southern roadway which extended to the southwest, the Turnpike to Newark, and a north-south oriented roadway, the historic Hackensack/Bergen Turnpike, which extended up to Weehawken, and then proceeded to the northwest. The majority of Hoboken consisted of meadowlands fed, in part, by the Hoboken Creek. The area to the immediate north and west of the Weehawken Cove also consisted of meadowlands fed by a small V-shaped drainage.⁴⁰⁶ In July 1836, John Stevens introduced a Christopher Street Ferry line to replace the former Spring Street landing.⁴⁰⁷

⁴⁰² THE Partnership, *THE Project Documentary Analysis Report: Hoboken Fan Plant/Construction Access Shaft Site C8 Palisades Tunnels, City of Hoboken, Hudson County, New Jersey* (On file, Trenton: NJHPO) 2009, 2-2.

⁴⁰³ THE Partnership 2009, 2-2.

⁴⁰⁴ United States Coastal Survey, *Map of New-York Bay and Harbor and the Environs*, (United States Coast Survey) 1844; Mallory, F.W. and W.M. Miller, *Section No. 5 Map Showing the Survey of Lands Lying Under the Waters of the Hudson River & Bay of New York and Lands Adjacent Thereto, to Accompany Report of the Commissioners to the Legislature of State of New Jersey* (On file, Trenton: New Jersey State Archives) 1865.

⁴⁰⁵ THE Partnership 2009, Figures 2.3, 2.6.

⁴⁰⁶ Burr 1832.

⁴⁰⁷ Shaw 1884, 1210; Zingman 1978.








As previously noted, the Hudson Land and Improvement Company was formed in 1838. Among the powers bestowed to the company by the New Jersey State Legislature was the authorization to purchase, occupy, fill up, and possess land covered with water fronting and adjoining lands that they already owned. In 1851, the Wharf Act required owners with land on tidewater waterfronts to build wharfs; the wharfs could not be sold independent of the attached land. Owners had a five-year window within which to construct their wharfs. While the Hoboken Land and Improvement Company's charter granted them permission to fill submerged lands, New Jersey's "inherent claims to such lands in the 1860s forced the HL&I to secure a lease to riparian rights in 1885."⁴⁰⁸

Douglass' 1841 *Topographical Map of Jersey City, Hoboken, and Adjacent Country* indicates the proposed grid layout for Hoboken (see Figure 9). While streets from Hudson on the east to Marshall on the west, and from 1st Street on the south to 15th Street on the north, were depicted on Douglass' map, it appears that the majority of these streets were proposed as they were located within undeveloped meadowlands. The map indicates that the southern portions of River Road had been created; however, the northern portions of the road south of Steven's Point were proposed along a submerged portion of the shoreline. Douglass' map indicates the presence of a basin along River Road due south of 2nd Street. Two lines were depicted along the eastern shoreline—the more western line represents "Solid Filling as Established by the Riparian Commissioners," the eastern line represents "Exterior Line for Piers as Established by the Riparian Commissioners." Around Weehawken Cove, Douglass' map indicates that at least one small road may have been constructed from an outlet on the Hackensack/Bergen Turnpike. This road extended to the seawall, which was also depicted within the meadows around the Weehawken Cove. The map also indicates that a creek extended from 4th Street north of 19th Street to the southwest draining into the cove.⁴⁰⁹

During the 1840s, the Stevens family began leveling off the 50-foot high hill which started at the Hudson and extended to present-day Hudson Street. The hill had been completely removed ca. 1847.⁴¹⁰ The leveling of the hill may have been associated with quarrying activities at the serpentine bluffs on Castle Point. Stone from the bluffs was used to create the 6th Street gatehouse for the Stevens Estate and a former gate at Hudson Street near 9th Street circa 1857. The quarried stone was also used for the retaining wall under Castle Point lookout which may date to this same period.⁴¹¹

Dripps' 1855 map reflects continued development along the Hoboken waterfront. The majority of River Street south of the Elysian Fields appears to have been created by this time. Portions of present-day FSD (historic River Road) were in existence to the immediate south of the Elysian Fields; the majority of the road appears to have been proposed along the submerged shoreline. Dripps' map indicates that there were three ferries to New York City departing from a pier along Ferry Street. An L-shaped pier was also located near 1st Street. A basin/inlet was located between 1st and 2nd streets. Four potential slips or small piers were also located between Newark and 3rd streets. A Steamboat Landing was also depicted off the shoreline of the Elysian Fields. It is unclear from Dripps' map to what

⁴⁰⁸ Hayden 2005; Richard Grubb & Associates, Inc. (RGA), *Archaeological Assessment Sybil's Cave Frank Sinatra Drive, City of Hoboken, New Jersey*, accessed March 10, 2016, http://hoboken.pastperfect-online.com/32340cgi/mweb.exe?request=record:id=92EB43A8-FBAE-4756-4531-211419374180:type=301, 2012.

⁴⁰⁹ L.F. Douglass, *Topographical Map of Jersey City, Hoboken, and the Adjacent Country* (Jersey City: Douglas) 1841.

⁴¹⁰ Hans 2005, 115.

⁴¹¹ Mary Delaney Krugman Associates, Inc. and William Sandy, *Preliminary Cultural Resource Study (Existing Conditions) for the Frank Sinatra Drive Visioning and Conceptual Design Plan*, (On file, Trenton: NJHPO) 2014.

extent the western portions of Hoboken may have been filled. The map appears to reflect the proposed city grid as depicted on the earlier Douglass map.⁴¹²

Shaw indicated that the meadow streets within Hoboken were generally graded and then filled to the height of two feet above high water in the mid-nineteenth century. In 1890, the Mayor of Hoboken and City Council adopted a grade map for all new streets within the meadows. This map indicated that any new streets would be installed at an elevation of five feet above the high water line with undeveloped meadows being situated at two feet below this same datum.⁴¹³ Landfilling within the southern portion of Hoboken was directly related to the construction and extension of railroads in the mid-nineteenth century.⁴¹⁴ (Railroad development will be discussed in the Transportation section below.)

Attempts to regulate the Hudson River waterfront did not occur until 1869 with the creation of the Riparian Commission. This commission established pier head and bulkhead lines. The Riparian Commission was replaced by the federally established New York Harbor Line Board. In 1899, the River and Harbor Act was enacted establishing that no building or filling could occur without the approval of the Secretary of War.⁴¹⁵

During the mid-nineteenth century, several transatlantic shipping companies established themselves within Hoboken. The North German Lloyd Line was initially established in New York City in 1857. In 1861, the company acquired a landing site in Hoboken; its piers were open in 1863. By 1870, the North German Lloyd company had several buildings on their property at the eastern extent of 2nd through 4th streets. The company also had three piers extending from their property into the Hudson. The first two piers were labeled Bremen Docks, as ships from these piers were from Hamburg and Bremen, Germany. The three piers "were wood platforms on pilings, each about 600 feet long with a shed superstructure."⁴¹⁶

The Hamburg-American Line was also established in Hoboken in 1863. The Hamburg-American line initially shared the Bremen Docks with the North German Lloyd line. Eventually, it purchased land from the Hoboken Land and Improvement Company, and constructed its own terminal and wood piers south of the North German Lloyd buildings at the foot of Newark and 1st streets. The Hamburg-American facility was designed by Lederle and Company, a New York City-based engineering firm. The Hamburg-American facility was completed by 1883 and consisted of a U-shaped terminal with two piers. The terminal provided sheltered passenger and cargo circulation between the two piers. The architectural style of the terminal and piers reflected a German Renaissance influence.⁴¹⁷

The North German Lloyd and the Hamburg-American lines owned the world's largest and fastest passenger vessels. Most of their business was bringing passengers from Europe to the United

⁴¹² Dripps 1855.

⁴¹³ Shaw 1884, 1210; Hoboken Board of Trade, *History of Hoboken* (Hoboken: Hoboken Board of Trade) 1907, 23.

⁴¹⁴ Heritage Studies, *Preliminary Case Report: Columbian Tower Housing for the Elderly and Handicapped HUD Project #NJ39-T811-0212/031-EH083* (On file, Trenton: NJHPO) 1982, 20-23.

⁴¹⁵ RGA, Stage IB Cultural Resources Investigation/Paleoenvironmental Analysis Combined Sewer Overflow Planning Study Planning Areas IA and III, North Bergen Township, Hudson County, New Jersey (On file, Trenton: NJHPO) 1998, 3-7-3-8.

⁴¹⁶ Baranowski 1988, 6.

⁴¹⁷ Baranowski 1988, 6.

States...The lines provided jobs for laborers and businessmen, who lived in the city to be near their work. Many German immigrants settled in Hoboken, and the city became a center of German culture.⁴¹⁸

In addition to these shipping lines, by 1860, the Venango Oil Company's Storage House and Wharf had been established along the southeastern waterfront in Weehawken. A rail line appeared to terminate at the Venango Storage House.⁴¹⁹ Additional shipping lines opened in Hoboken in the 1870s through 1890s. These companies included: The Netherlands America Steam Navigation Company in 1872, the Thingralla Steamship Company (Scandinavian) in 1873, the Wilson Line and the Scandinavian American Line in the 1880s, and the Holland America Line in 1897.⁴²⁰

G.M. Hopkins & Co.'s 1873 map of Hoboken reflects the development of transatlantic shipping piers along the waterfront. Two ferries were depicted departing from Ferry Street-the Christopher Street and the Barclay Street ferries. At least four piers, including the New Pier of the Hamburg Transatlantic Navigation Company, were located between Newark and 2nd streets. Three piers were located to the north of 2nd Street including one attributed to the Bremen U.S. Mail Steamer and one attributed to the Hamburg Steamship Line. Buildings associated with the Hoboken Land and Improvement Company were located on created land to the west of these piers. Land and buildings lots had been laid out to the east of River Street between 3rd and 4th and 5th and 6th streets. A pier associated with the Baltic Lloyd Steamship Company was located to the immediate south of 4th Street; a boat house was located at the foot of 4th Street. Another pier and wharf with several office buildings was located between 5th and 6th streets to the east of River Road. A T-shaped pier was also depicted off the east coast of the Stevens Estate in the vicinity of 12th Street. The wharf and docks associated with the Venango Oil Works were also located on the northern edge of Weehawken Cove. This property consisted of a long southern pier and an E-shaped dock with a long central pier. Several buildings and circular tanks were depicted within the wharf, which extended into the Hudson River. A large parcel belonging to the Hoboken Land and Improvement Company was located to the west, on the opposite side of the New York and Fort Lee Railroad. Several buildings were scattered throughout the Hoboken Land and Improvement Company's parcel. Much, if not all, of the development to the north of Weehawken Cove appears to have been constructed on built land.421

By the early 1870s, Venango Oil had been purchased by Standard Oil. Standard Oil bought the Weehawken terminal facilities in 1874 and operated them under a lease until 1890.⁴²² Construction of Erie Railroad property along the waterfront in Weehawken began after the company's reorganization as the New York, Lake Erie, and Western Railroad in 1878. By this time, the railroad had outgrown its Jersey City terminal and required additional waterfront freight facilities. This terminal for the transshipment of coal, grain, and petroleum was built adjacent to the Venango Oil works in Weehawken. Construction of the terminal began in 1881 and by 1885 the terminal consisted of two

⁴¹⁸ Baranowski 1988, 7.

⁴¹⁹ Taintor Brothers, *New Map of the Great Metropolis, Including the Cities of New York, Brooklyn, Jersey City, Hoboken, Etc.* (New York City: Taintor Brothers, Merrill & Co.) 1860.

⁴²⁰ Zingman 1978.

⁴²¹ G.M. Hopkins & Co. 1873.

⁴²² Raber 1986, 9.

freight piers with transit sheds and a cold storage plant. These early piers were the forerunners to Piers A and B. In their cultural resource study of the Hoboken-North Bergen, New Jersey Reach project, Raber suggested that these early piers were:

probably wooden pile supported piers, both of which joined the original shore via the northernmost pier (A) with the second pier a kind of elbowed projection from the first. The cold storage plant apparently stood on a projection of this irregular structure, south of both piers. This facility, using very limited space available on the original shore below King's Bluff, was a rather small transshipment point for the Erie.⁴²³

Speilmann and Brush's 1880 topographical map of Hoboken indicates that much of the southern and western portions of the city had not been filled. Their topographical map indicates that land to the east of Hudson Street and south of 4th Street had been reclaimed from the sea. The territory south of Newark Street and east of Grand Street was similarly labeled. The map also depicted extensive meadows within the city generally extending from Newark Street on the south to 10th Street on the north, west of Bloomfield Street; from 10th to 12th streets west of Grand Street; and, from 13th through 16th streets west of Park Avenue. The topographic map indicates the presence of at least 12 piers along the waterfront, including two T-shaped piers around 11th and 12th streets. The map also reflects the presence of the long linear pier and E-shaped dock to the north of Weehawken Cove. ⁴²⁴

Bailey and Ward's 1881 Birdseye View of *The City of Hoboken* also reflects extensive waterfront development by the late-nineteenth century. Four U-shaped boat basins were located south of Newark Street at the site of the New York City Ferries. A pier was located at the base of Newark Street; another is located just north of 1st Street. Two piers were also located south of 2nd Street. The German Lloyd piers and buildings were located between 2nd and 3rd streets. The Old Hamburg Line pier was located at 3rd Street and the Ocean Transit Company pier was located at 4th Street. Building, pier, and possible bulkhead construction were located between 4th and 5th streets. Piers were also located at the end of 5th and 6th streets. The Birdseye view also depicts the River Walk around Castle Point, and appears to show the bulkhead located to the immediate east of the walk. Two piers were located to the north of 10th Street. The map also indicates undeveloped meadows west of Monroe Street between 3rd and 5th streets and west of Adams Street between 6th and 14th streets.⁴²⁵

In 1872, the DLWRR constructed the Long Slip Canal between Piers 4 and 5 of the Hoboken Rail Yard, at the southeastern extent of Hoboken. The canal was created from a filled section of the shoreline.

During the nineteenth century, spoil from the navigational channels in the Hudson River was deposited along various places along the New Jersey shoreline, including Hoboken and Jersey City. The northern shore of Harsimus Cove, south of the Hoboken Ferry, was filled to accommodate

⁴²³ Raber Associates, *Cultural Resource Investigations Hoboken-North Bergen, New Jersey Reach, New York Harbor Collection and Removal of Drift Project* (On file, Trenton: NJHPO), 1984, 7.

⁴²⁴ Speilmann and Brush 1880.

⁴²⁵ Bailey and Ward 1881.

the construction of the Hoboken Freight Terminal. The man-made land from which the canal was created was conveyed from the State of New Jersey by riparian grants dated April 28, 1874 and April 14, 1888 to the Morris and Essex Railroad Company. The Morris and Essex Railroad Company had been leased to the Delaware Lackawanna & Western Railroad in 1868.426

The function of the Long Slip Canal in relation to the DLWRR will be discussed in greater detail in the Transportation Section. However, with respect to waterfront development, it should be noted that the canal and larger DLWRR terminal were constructed on an unstable fill installed to a depth of 20 feet "over nearly fluid silt underlying an old embayment of the Hudson River."427 In their archaeological assessment of the Long Slip Canal, Dolan Research, Inc. (Dolan) indicated that the canal consisted of a timber crib which extended to a depth of approximately 21 feet below mean low water. While Dolan could not find any primary documentation detailing the construction of the canal, they contended that its construction most likely consisted of a rock-filled timber crib. Such constructions were a typical form of retaining wall construction on the Hudson River shorelines in the nineteenth and twentieth centuries.

Typically, a channel would have been dredged through the fill to the design depth. A series of timber cribs would then have been floated to the site and sunken in place with stone ballast. The cribs would then be attached side by side. The back sides of the slip would have been backfilled to secure the structure.428

In 1930, a concrete gravity wall was installed within the Long Slip Canal. Active use of the canal discontinued after 1960.

The increasing commercial activity along Hoboken's waterfront had direct impacts on the Elysian Fields and the recreational facilities at Castle Point. Portions of the River Walk were significantly widened between 1885 and the 1890s. At this time, the River Walk was frequently referred to as River Road. By 1884, the majority of the Elysian Fields had been built over, with just a small park remaining along its northern extent. Also in 1884, the Hoboken Land and Improvement Company launched a new ferry service from Hoboken's 14th Street, and opened up shops between 9th and 10th streets to service ferries and other boats. Fill was added to River Road during the 1880s and 1890s to increase its overall width. The edge of the bank was reinforced with rip rap to prevent erosion. By the end of the nineteenth century, vehicular traffic had overtaken the earlier pedestrian usage of River Road. Initially carts, and, later automobiles accessed the waterfront from 4th and 5th streets via a graded entry with a masonry retaining wall.429

Bien's 1891 atlas map reflects the presence of approximately 21 piers/slips along the Hoboken waterfront. Several of these piers were located between 10th and 14th streets. Bien's map also indicates an expansion of developed/reclaimed land and a diminished area of meadows. The undeveloped meadows within the city were

⁴²⁶ Dolan Research, Inc., NJ Transit Long Slip Habitat Creation Project: Archaeological Assessment of the Long Slip Canal, Hoboken and Jersey City, Hudson County, New Jersey (On file, Trenton: NJHPO) 1997, 2.

⁴²⁷ Dolan Research, Inc. 1997, 2. 428 Dolan 1997, 2-3.

⁴²⁹ Mary Delaney Krugman Associates, Inc. and William Sandy 2014, 12-13.

located west of Monroe Street between 2nd and 4th streets, and west of Adams Street between 5th and 14th streets. Bien's map also depicts a sluice creek along the western extent of Hoboken, turning to the east and draining into the Weehawken Cove. The area to the immediate west, north, and south of the cove was primarily undeveloped wetlands. However, several rail lines extended through the meadows with spurs terminating at the piers to the north of the cove. Both Willow and Park Avenues were depicted extending from Hoboken across the meadows and the creek, and into Weehawken. Bridges may have been located along both roadways to allow for the creek and meadow crossings.⁴³⁰

On June 30, 1900, Hoboken's waterfront experienced one of the most destructive fires in the history of the lower Hudson ports. The fire killed close to 400 people and resulted in nearly four million dollars of damage. The three piers and buildings of the North German Lloyd company were destroyed. By April 1901, the company's southernmost pier had been rebuilt. Plans for a new headhouse and additional piers were commissioned, and construction was underway in 1901. The new terminal was designed by Walter F. Whittemore. The terminal was built in a "utilitarian, sparsely ornamented, Renaissance Revival style."⁴³¹ The new terminal and pier designs emphasized fire prevention and incorporated the most advanced fire prevention technology of the time. By 1903, construction of the terminal and piers was complete; the southern pier was dismantled in 1905, and reconstructed like the northern piers.

Between 1897 and 1903, the Erie Railroad expanded its Weehawken Terminal to nearly four times its original size.

Behind over 3000 feet of new timber bulkhead, the railroad created about 39 acres of filled or raised upland devoted largely to sidings and storage spaces. New waterfront structures included covered piers C, D, and F, each with a two-story wooden shed, and open piers G and H, the latter probably a building of the longest of the earlier oil works piers....the only upland structure built before about World War I was an oil storage or oil pumping structure between piers H and I, perhaps serving Standard Oil via the former pier. The Erie soon concentrated its lighterage of export and import freight here, keeping most of its car float traffic at Jersey City.⁴³²

Raber noted that the expansion of the Erie freight terminal most likely destroyed or filled the former Weehawken ferry site.⁴³³

Hughes and Bailey's 1904 Birdseye view of Hoboken illustrates the dense development along the city's waterfront. The ferry line piers continued to be located at the base of Ferry Street. Three piers associated with the Hamburg American Lines were located between Newark and 2nd streets. The terminal and three piers of the North German Lloyd company were located between 2nd and 4th streets. Much of the land to the west of the terminal building appeared to have been filled, but remained undeveloped at this time. A small slip associated with the Atlantic Boat

⁴³⁰ Bien 1891.

⁴³¹ Baranowski 1988, 7.

⁴³² Raber 1986, 10.

⁴³³ Raber 1984, 7.

Club was located to the east of Hudson Square; the Holland American Line pier was located at the base of 5th Street. A smaller pier was located to the north, and the Phoenix Line pier was located to the east of the Stevens Institute around 6th Street. A rail line and various buildings were located to the immediate east of Castle Point, jutting into the Hudson River. A complex of four piers and associated buildings were located to the southeast of Elysian Park. Additional filled land was located to the north of Elysian Park. A pier was located near the base of 11th Street; the Savannah Line buildings and pier were located at the base of 12th Street. A pier was also located at 13th Street; the 14th Street Ferry terminal with its two U-shaped docks was located at 14th Street. All of the meadowland within the city appeared to have been filled, although development had not extended to the far western limits of the city.⁴³⁴

Hughes and Bailey's 1904 map appears to indicate that the sluice creek which drained into the Weehawken Cove had been filled. An elevated walkway and bridge were depicted along Hudson Boulevard East (Park Avenue) to the immediate west of the Weehawken Cove. An elevated walkway appeared to lead from the Willow Avenue Bridge to the piers at the cove. Several piers and buildings were located at, and to the immediate north of, Weehawken Cove. The map associates this development with Tietjen & Lang, Dry Docks.⁴³⁵

Carleton Greene's 1917 study of *Wharves and Piers* described two features of Hoboken's waterfront in the earlytwentieth century. He described the construction of the piers of the North German Lloyd Steamship Company as consisting of cribwork which was founded on piles driven through mud to rock, and cut off at 22 feet below mean low water.

It was built of sawed lumber with pockets 10 feet square filled within 1:2:5: concrete deposited under water by means of a bottom opening bucket and was surmounted by a stone masonry wall with mass concrete backing. This method of construction permitted an excavation of the concrete, which was found to be sound and strong. Riprap was used in front and in rear of the cribwork to aid in resisting the thrust of the filling, and cobble was used to consolidate the mud and to give lateral support to the piles. Corner and diagonal braces were used in the pockets to prevent distortion of the cribwork while it was being filled.⁴³⁶

Figure 18 is reproduced from Greene's study and represents the construction of the North German Lloyd company's crib wall.

Greene also described a pier built by the DLWRR which consisted of a pier with wooden piles and a platform at lowwater level. He noted that the advantage of this type of pier over one with piles that extend up to the deck is that "no portion of the structure is subject to decay, and that it is free from fire risk" associated with cargo on deck, adjacent vessels, or burning objects floating under it. The described DLWRR pier was 100 feet wide and 600 feet long and was filled with cinders.

⁴³⁴ Hughes and Bailey 1904.

⁴³⁵ Hughes and Bailey 1904.

⁴³⁶ Carleton Greene, *Wharves and Piers: Their Design, Construction, and Equipment* (New York: McGraw-Hill Book Company, Inc.) 1917, 59.



Crib Wall with Concrete Filling, North German Lloyd Co., Hoboken, N. J.

The mud at this location was 185 feet deep and the piles were 85 feet to 95 feet long. They were driven 3 feet appear in transverse rows 5 feet apart and were designed for maximum loads of 12 tons. The depth of water at the sides of the pier varied from 20 to 30 feet.⁴³⁷

Figure 19 is a reproduction of the illustration that Greene provided for the DLWRR pier in Hoboken.

G.M. Hopkins & Co. 1909 map of Hoboken also illustrates the extensive waterfront development by the earlytwentieth century. The Ferry concourse at Ferry Street had six boat openings-two to Barclay Street, two to Christopher Street, and two to 23rd Street. The Hamburg American Packet Company maintained three piers from Newark to 2nd streets. The North German Lloyd Steamship Company was associated with Bulkhead Sheds C-G, and with three piers. A narrow pier extended to the east of Hudson Square and contained a public bath house and several boat houses. Between 5th and 6th streets, Pier 15 and Pier 17 were associated with the Holland American Line Pier; Pier 16 is the 6th Street Pier. A dock extended out from Castle Point supporting the Charles Schultz Sand and Gravel Dock. To the north of this outlet, there was a complex of piers and buildings associated with the Pennsylvania Railroad. The South Pier and the North Pier associated with the Ocean Steamship Company were located at 11th and 12th streets. Development associated with the American Warehouse and Trading Company and two piers associated with W. & A. Fletcher Co. Ironworks and Shipyard were located between 12th and 13th streets. The 14th Street Ferry House was located at the base of 14th Street. This ferry house was associated with the DLWRR and extended to 23rd Street in New York City. The Hudson Land and Improvement Company maintained the 15th Street Pier; the Scandinavian American Line Pier was located to the north.⁴³⁸

A series of nine dry docks associated with the Tietjen & Lang Dry Dock Company occupied the Weehawken Cove. To the immediate north of the Tietjen docks was the Erie Freight Terminal, labelled as the Erie Rail Road Company Weehawken Yard. Several piers were associated with this complex, Piers A through I. Five of these piers were labelled as Warehouses; the southernmost pier, Pier I, was labelled as a Coal Trestle. Several buildings and multiple rail spurs extended onto the wharf. A cattle pen structure was located on the far northern extent of the Erie Rail Road wharf. A stock yard, poultry yard, and roundhouse were located to the west of the wharf, on the opposite side of several railroads.⁴³⁹ As previously noted. in 1916, the Todd Shipyards Corporation was formed through the purchase and merger of several shipyards in the New York region, including the Tietjen & Lang Dry Dock Company. Todd Shipyards Corporation became a national company with shipyards in all major shipbuilding regions. The company had a significant role in shipbuilding and repair during World War II.⁴⁴⁰

Between the steam ferry service from New York City to Hoboken and the transatlantic steamship lines, a constant flow of immigrants and workers streamed into Hoboken. The influx of workers to the city enabled the growth of over 250 manufacturing plants in the city from 1900 to World War I. Prior to World War I, "nearly 92% of the country's

⁴³⁷ Greene 1917, 126-127.

⁴³⁸ G.M. Hopkins and Co., Atlas of Hudson County, New Jersey, Volume II (Philadelphia: G.M. Hopkins & Co.) 1909.

⁴³⁹ G.M. Hopkins and Co., Atlas of Hudson County, New Jersey, Volume II (Philadelphia: G.M. Hopkins & Co.) 1909.

⁴⁴⁰ Hoboken Historical Museum, "Todd Shipyards Corporation," accessed March 25, 2016,

http://hoboken.pastperfectonline.com/bysearchterm?keyword=Todd+Shipyards+Corporation&page=3#sthash.GedfJ25i.dpuf.



Pier with Platform at Low Water Level on Wooden Piles, D. L. & W. R. R., Hoboken, N. J.

REBUILD BY DESIGN HUDSON RIVER = RESIST = DELAY = STORE = DISCHARGE =

Illustration of Pier with Platform at Low Water Level on Wooden Piles, D.L.& W.R.R., Hoboken, NJ., 1917 August 2016 FIGURE 19 foreign trade was carried by ships from England, Germany, and other countries."⁴⁴¹ The outbreak of World War I disrupted the transatlantic trade, and awakened the United States to the need for an independent shipping industry. In 1916, Congress passed the Shipping Act which established the U.S. Shipping Board to oversee maritime issues. The following year, after the United States had entered the war, the government seized the piers and warehouses of German-owned shipping companies. The piers were then used as a point of embarkation for U.S. troops and supplies. The former shipping piers became the center of wartime activity and a major shipping port for food and military supplies.⁴⁴²

Following World War I, the U.S. Shipping Board retained the former German piers in Hoboken. The German steamship companies relocated their operations to New York City. A second major fire destroyed parts of the Hoboken waterfront in August 1921. The fire destroyed Piers 5 and 6 of the former Hamburg American line; Pier 4 remained as the only surviving Hamburg American pier. In the mid-1920s, several American steamship lines built luxury ships for transatlantic passenger routes and operated out of Hoboken. The federal government also leased at least a few of the four remaining Hoboken piers to government-subsidized shipping companies.

On November 3, 1921, a fire also destroyed Piers A, B, C, and D of the Erie Freight Terminal. The fire burned the wooden sheds and decks down to the waterline, and also destroyed the cold-storage warehouse. The Erie rebuilt Piers C and D between 1923 and 1930; they also rebuilt the two-story shed on Pier C. Between 1924 and 1935, the Erie shifted its terminal usage shifting automobile handling, assembly, and shipping to the north end of the terminal. They also reintroduced ferry service. Piers A and B were also rebuilt as uncovered all timber structures for lighterage. The Electric Ferry Company operated diesel electric auto ferries from the end of Pier A to West 23rd Street from 1926 to 1943. The outer extent of Pier B had a tugboat cooling station which was leased to Pattison & Bows from 1927 to about 1950. From 1930 to 1950, automobile-related activities occurred on both Piers A and B; during this time General Motors operated a parts assembly plant on Pier A.⁴⁴³

World War II witnessed increased activity along the waterfront, as the federal government used some of Hoboken's piers for military shipping activities. Improvements may have been made to the timber supports for River Road and the piers during this period.⁴⁴⁴

On August 12, 1944, there was a third fire on the Hoboken piers. This fire resulted in the destruction of Pier 4. Pier 3 and Pier 6 also sustained damage. In 1951, the federal government sold the piers to the City of Hoboken. The following year, Hoboken leased the property to the PANYNJ to rehabilitate the property as a site for break bulk cargo and a passenger terminal. The PANYNJ renovated and rehabilitated the remaining headhouse in the mid-1950s. The PANYNJ subleased the piers to private cargo and passenger shipping companies. The growing importance of air travel and the development of containerized cargo, necessitating deep water ports in the 1950s and 1960s undermined Hoboken's waterfront industry, resulting in a severe economic decline in the 1970s. By the mid-1980s,

⁴⁴¹ Baranowski 1988, 25.

⁴⁴² Baranowski 1988; Mary Delaney Krugman & Associates and William Sandy 2014; Hartman and Lewis 2016; Hoboken Planning Board 2014.

 ⁴⁴³ Raber 1986, 11.
⁴⁴⁴ Mary Delaney Krugman & Associates and William Sandy 2014: Bar

the PANYNJ had vacated the piers and headhouse. Since the 1990s, the City of Hoboken is currently pursuing redevelopment opportunities along the waterfront.⁴⁴⁵

During World War II, Todd Shipyards Corporation expanded its Hoboken facilities by taking over the marine repair yards at the southeastern corner of Erie's Weehawken freight terminal. By 1960, Todd Shipyards Corporation was facing increasingly diminished business. By September 1969, the company abandoned its property in Hoboken to the City of Hoboken.⁴⁴⁶ The Erie Railroad also vacated its freight terminal facility in 1960. In September 1968, the Erie terminal was sold to Seatrain Lines. Seatrain paved the yard complex for parking and storage, and converted the terminal for container shipment services, Port Seatrain. Seatrain also demolished all remaining upland structures and Piers F and H. They built a new Pier H to support 45-ton cranes for the movement of containerized cargo. Seatrain used covered Piers C and D for equipment storage; Piers A and B were left to deteriorate. Hertz acquired Port Seatrain in 1980 and began its own demolition and construction activities in 1983.⁴⁴⁷ In September 1984, the NJHPO concurred that Erie Railroad Pier D and Piershed within Weehawken were eligible for listing in the National Register based upon their unique and innovative material, design, and adaptive characters in the categories of Engineering and Transportation.⁴⁴⁸

8.7.2 Archaeological Case Studies

As previously noted, the review of previously conducted cultural resource studies within the Study Area identified several studies which involved potential waterfront-related and/or landfill-related archaeological deposits. The majority of these studies consisted of sensitivity assessments as opposed to subsurface investigations. The following discussion will summarize the field results from those previous investigations which involved subsurface testing. As urban waterfront development has been a primary research topic in past archaeological projects in Manhattan, several of these investigations will also be discussed.

As discussed in the Industrial section, from 2003 through 2006, RGA conducted several cultural resource studies in association with proposed construction activities at the former Maxwell House Site.⁴⁴⁹ RGA's 2003 cultural resources investigation of the Maxwell House Site determined that the site had the potential to contain several intact and significant historic archaeological features including the first railroad wharf with associated spurs, a masonry warehouse associated with the Ocean Steamship Company that operated in this area prior to General Foods, timber cribbing associated with the second railroad wharf, the North Pier, the South Pier, and features associated with the Maxwell House Site. RGA concluded that these features had the potential to yield information relating to the

⁴⁴⁵ Baranowski 1988; Hoboken Planning Board 2014; Hartman and Lewis 2016.

⁴⁴⁶ C. Bradford Mitchell, *Every Kind of Shipwork: A History of Todd Shipyards Corporation* (New York) 1981.

⁴⁴⁷ Raber 1986, 11; William H. Sheppard, *Tidewater Terminals of the Erie Lackawanna Railway* (Sheppard) 1976.

⁴⁴⁸ Russell W. Myers, "Review Letter–Hudson & Bergen Counties, New Jersey, Weehawken to Edgewater Reach New York Harbor Collection and Removal of Drift" (On file, Trenton: NJHPO) 1984.

⁴⁴⁹ RGA, *Cultural Resources Investigation Maxwell House Site, City of Hoboken, Hudson County, New Jersey* (On File, Trenton: NJHPO) 2003; Philip A. Hayden, *Historic American Buildings Survey Maxwell House Complex* (On File, Trenton: NJHPO) 2005; Philip Hayden and Glenn Modica, *Field to Factory: The Story of the Maxwell House Coffee Plant* (On File, Trenton: NJHPO) 2005; RGA, *Archaeological Monitoring of Demolition and Construction Activities Maxwell House Site, City of Hoboken, Hudson County, New Jersey* (On File, Trenton: NJHPO) 2006b.

development of Hoboken's waterfront, piers, bulkheads, and other structures, and wharf construction technology from 1880 to 1940.⁴⁵⁰

RGA's archaeological monitoring of demolition and construction activities at the site in 2006 did not identify any evidence of the Ocean Steamship Company warehouse that predated the Maxwell House occupation. Rather, it appears that construction of the present seawall and construction of the Maxwell House complex had completely destroyed any remnants of the former warehouse. RGA monitored the removal of the North Pier which had been badly damaged during a storm in 2004. During the demolition of the North Pier, RGA identified the pier as an earth-filled feature. RGA also inferred a construction sequence for the North Pier indicating that the pier predated the Maxwell House Complex's period of significance starting from 1939 to the 1970s. Given that the pier was reused by Maxwell House, the North Pier was considered a contributing element to the historic property. RGA also observed that other earth-filled piers may remain extant within Hoboken. For the most part, however, RGA's monitoring and background research determined that the majority of the wharves and bulkheads associated with the waterfront development on the site had been removed as a result of subsequent development. A few stray pilings and pile caps that were identified were either out of context or in a condition where their past function and/or context could not be interpreted. A small surviving bulkhead was also observed. RGA determined that this feature was similar to features documented elsewhere in the region. The bulkhead was recorded and preserved in place.⁴⁵¹

In 2003-2004, Joan Geismar conducted archaeological field testing in association with the installation of a permanent bridge and filling of the Long Slip Canal. Geismar's field investigations consisted of the mechanical excavations of two test pits—one on the north side of the canal, the other on the south side of the canal. Test Pit 1, on the north side of the canal, revealed large rocks (rip rap) and a wooden crib at approximately five feet below ground surface. The rocks were located within the exposed section of the cribbing. The crib measured approximately eight feet by six feet. The cribbing logs extended to a depth of at least 15 feet below ground surface and were mainly 12 inches in diameter. The fill contained brick and window glass fragments along with two terracotta sewer pipe fragments. No diagnostic artifacts were recovered. Test Pit 2, on the south side of the canal, contained an old railroad bed at a depth of one foot below ground surface. The test pit also contained two concrete slabs suggesting that the pit may have been in the vicinity of a former pier. The fill within Test Pit 2 contained large and small fragments of concrete and wood. This material may have represented railroad ballast. An intact post-1906 glass bottle was also recovered. Geismar noted that the fill within Test Pit 2 was generally laden with construction debris, though some household trash, including ceramic fragments and glass tableware, and railroad ballast were also present.⁴⁵²

Geismar compared the results of the Long Slip Canal excavations with findings from other landfill sites in New Jersey and New York City. She noted that the fill along both the north and south sides of the canal was relatively clean, containing very few artifacts and little to no organic material. One recovered artifact from the southern side of the canal confirmed that this landfill occurred at some point after 1872. Geismar observed that the well-preserved

⁴⁵⁰ RGA 2003.

⁴⁵¹ RGA 2006.

⁴⁵² Joan Geismar, *HBLR MOS-1 Long Slip, Jersey City-Hoboken, Hudson County, New Jersey, Field Testing and Data Recovery Report*, (On file, Trenton: NJHPO) 2004.

cribbing along the northern side of the canal was similar to the crib cells found at 175 Water Street in Manhattan, a site which was filled in the mid-eighteenth century, nearly 100 years before the filling of the Long Slip Canal. She further noted that the Long Slip Canal had no evidence of a pile-supported platform as seen within the fill at the Newport site to the south, of a block and bridge construction such as that found at Site 1 of the Washington Street Urban Renewal Area on Manhattan's west side, nor of wharf-grillage as documented at 175 Water Street. Geismar attributed the lack of such features with the differing conditions and anticipated usage of the various sites, "filling at both Manhattan sites was initiated to create dockage and to support future dense development, while Long Slip filling was solely to create a rail yard and canal."⁴⁵³

Geismar also contrasted the relatively clean nature of the uncovered fill with the garbage-laden soils found at the 175 Water Street Site and the presence of animal remains within the fill at Site 1. The presence of animal remains was in direct contradiction to nineteenth century sanitation laws in New York City. Ultimately, Geismar identified the cribbage and clean fill exposed at the Long Slip Canal site as:

another variant of waterfront fill. While generally similar to other fill sites, the details of the fill and its structures at Long Slip are a unique expression of an ancient engineering technique found in waterfronts worldwide, an expression that reflects projected use and local conditions as well as technology.⁴⁵⁴

In 1998, RGA also conducted a Stage IB cultural resource and paleoenvironmental analysis of five locations associated with a combined sewer overflow planning study. The Stage IB analysis consisted of the excavation of two backhoe trenches at one location considered sensitive for historic and prehistoric archaeological deposits and auger testing at six locations for potential prehistoric archaeological resources.⁴⁵⁵

Trench A revealed adjacent rail lines with a potential third rail line underlying the two parallel lines. Trench B revealed landfill with architectural debris overlying broken rock fill. Examination of historic maps indicated that the landfill within the former railway right-of-way dated from 1908 to 1934. RGA concluded that landfill documented in the eastern portion of the area dated between 1950 and 1966. There were no artifacts observed within the trenches. Given the modern nature of the landfill and the lack of associated artifacts, RGA concluded that the deposits in Trench A and Trench B were not eligible for listing in the National Register and recommended no additional archaeological investigations in this area.⁴⁵⁶

Archaeologists working in New York City have also uncovered evidence of both past waterfront development and landfill. Roselle Henn and Diana Wall found and documented eighteenth century cobb wharves at the Assay Site between Front and South streets in Lower Manhattan. At the Assay Site, archaeologists identified both north-south wharves and a former pier that once extended into the East River. The archaeologists identified two adjacent north-

⁴⁵³ Geismar 2004, 10.

⁴⁵⁴ Geismar 2004, 11.

⁴⁵⁵ RGA 1998.

⁴⁵⁶ RGA 1998.

south wharves which held the landfill on the west side of the marina in place. These wharves were 45 feet long and 15 feet high and consisted of a framework of heavy timbers. The framework formed a series of four to eight-foot long cells; each cell was filled with ballast consisting of field stones and large pieces of coral. The ballast sank the wharf and anchored it in place. Near the tops of the wharves there were a series of small platforms comprised of smaller logs. These platforms redistributed the weight of the ballast to keep the outer walls from collapsing.⁴⁵⁷

The archaeologists also identified a third wharf at the site consisting of two different structures. This wall formed the southern seawall of the 1790s. One of the structures consisted of a series of square blocks, about 20 feet on a side and set about 40 feet apart. Wooden bulkheads were located between the blocks which in combination with the blocks formed a solid seawall. Using historic and cartographic research, the archaeologists discerned that the dual structures within the third wharf represented an earlier block-and-bridge pier which was subsequently filled with simple bulkheads after the decision had been made to fill the area south of the pier.⁴⁵⁸

The discoveries at the Assay Site revealed aspects of waterfront development within New York City in the eighteenth and early-nineteenth century. The wharves uncovered on the site reflected changes in waterfront usage over this period. The composition of each wharf and its surrounding landfill also reflected construction techniques and historic technology with respect to waterfront features.⁴⁵⁹

With respect to landfill, archaeologists working in Manhattan have been able to address a variety of research questions including the nature and consistency of landfill in the eighteenth and nineteenth century, the technology of landfilling and technological steps to stabilize landfill and the structures built on top of filled land, and the potential for buried intact objects within and underneath landfill. Geismar's excavations at 175 Water Street in 1981 uncovered landfill dating to the mid-eighteenth century. Geismar's excavations at Site 1 of the Washington Street Urban Renewal Project identified landfill dating to the nineteenth century. In analyzing the landfill at each site, Geismar also examined the sanitation laws and practices in the eighteenth and nineteenth centuries. She observed that the Washington Street landfill practices and laws, the 175 Water Street landfill was laden with artifacts and organic remains, whereas minimal artifacts were recovered from the landfill at Site 1. Geismar found that the Site 1 landfill was not, however, devoid of artifacts and that this fill still contained some animal remains, in direct contrast to the sanitary regulations. Geismar further suggested that this lack of compliance with the sanitation laws "undoubtedly reflected local conditions, in this case, the presence of nearby butchers' stalls."⁴⁶⁰

With respect to stabilizing landfill and structures built on top of fill, archaeologists working at 7 Hanover Square in 1981 uncovered deeply buried stone walls within the landfill on site. These stone walls represented the foundation walls of the earliest buildings within the block, dating to the 1690s. These early foundation walls extended down through the landfill and rested on the original shore. Ultimately, the load of each of the seventeenth century buildings

⁴⁵⁷ Cantwell and diZerega Wall 2001, 230-233; Berger 2001.

⁴⁵⁸ Cantwell and diZerega Wall 2001, 230-233; Berger 2001.

⁴⁵⁹ Cantwell and diZerega Wall 2001, 233.

⁴⁶⁰ Geismar 2004, 10-11; Cantwell and diZerega Wall 2001, 236; Geismar 1983; Joan Geismar, *Archaeological Investigation of Site 1 of the Washington Street Urban Renewal Area, New York City* (On file, New York City: Landmarks Preservation Commission) 1987.

rested upon its foundation walls which, in turn, rested upon the original river shore beneath the fill. The natural shore provided a more stable surface than the landfill and, thus, bore the weight of the building, with the landfill being installed around the foundation walls. While this strategy of building foundation walls on the shoreline worked in the Pearl Street area, in other areas of the city where landfill was created in open water, alternate stability solutions had to be created.461

Cantwell and diZerega Wall indicated that the common solution to creating stable surfaces in landfill situations consisted of the installation of stone foundation walls on top of a wooden complex called a spread-footer. Spreadfooter complexes consisted of wooden planks laid down perpendicular to foundation walls and the installation of wooden beams on top of the planks; foundation walls were then installed upon the wooden beams. This complex of wooden beams and planks helped to distribute the weight of the building, creating a platform which enabled the building to float on top of the landfill. Guides for the installation of spread-footers indicated that wood should be installed below the water table so that it remains constantly wet and as such will not decay.⁴⁶²

In contrast to the typical spread-footer pattern, archaeologists working at the Assay Site uncovered a unique foundation system which has not been identified elsewhere within New York City. Specifically, the structures at the Assay Site rested upon pointed pilings which had been driven down through the landfill into the river bottom. Heavy wooden beams were laid on top of the pilings, with stone foundation walls being installed on top of the beams. Cantwell and diZerega Wall noted that this type of foundation complex would have required a greater investment of labor and economic resources than the typical spread-footer complex. They suggested that the builders may have employed this unusual technique because "the landfill in the basin had not been filled up to grade at the time the buildings were built, and the pilings in effect were stilts supporting the buildings."463

Archaeologists working in Manhattan have also found sunken ships and other objects within landfill and identified buried surfaces underlying fill. At the 175 Water Street Site, archaeologists identified a nearly intact sunken ship. The ship was determined to be a merchant vessel approximately 90 feet in length and 25 feet wide. Shipworms found within the vessel indicated that it had participated in the triangular trade, possibly having transported agricultural produce from New York to feed the enslaved plantations in the British West Indies and from there carrying rum, sugar, and molasses on the return trip to New York. The archaeologists determined that the ship had been stripped of all its hardware and then floated out to the river side of the historic water lots. The vessel was then tied to a wooden bulkhead and its hull was loaded with ballast of coralline sand, granite cobbles, and yellow brick clinkers which sunk the ship in place. The ship helped to fill and stabilize newly made land in the vicinity of presentday Front Street.464

At the 7 Hanover Street Site, archaeologists recovered a number of seventeenth century artifacts on top of the shore surface within which the foundation walls were installed. These artifacts (which included tobacco pipes and ceramic

⁴⁶¹ Rothschild and Pickman 1990; Cantwell and diZerega Wall 2001, 236-237.

 ⁴⁶² Cantwell and diZerega Wall 2001, 237-238.
⁴⁶³ Cantwell and diZerega Wall 2001, 239; Louis Berger 1991.

⁴⁶⁴ Cantwell and diZerega Wall 2001, 234; Geismar 1983.

sherds) suggested that the seventeenth century inhabitants of New York sometimes dumped their trash in the river.⁴⁶⁵

8.7.3 Discussion

Several past studies within Hoboken and the immediate vicinity have assessed the potential for waterfront features and/or landfill deposits. In 1986 and 1988 Raber conducted an assessment and supplementary assessment of cultural resources in the proposed Lincoln Harbor Development Site located immediately north of Weehawken Cove. Raber concluded that the proposed development site may contain deposits associated with the original eighteenth century Weehawken Ferry landing. Raber observed that piers within the port were generally block and bridge constructions up through the mid-nineteenth century and that timber cribwork remained the primary form of bulkhead construction into the twentieth century. While noting the standardization of much of this construction, Raber noted that "pre-industrial cribwork is far less documented, and probably featured considerable variety in timber construction."⁴⁶⁶ They further concluded that any remains of the Weehawken ferry landing:

could have potential significance as one of the oldest waterfront structures in New Jersey, and as an example of vernacular pre-industrial waterfront construction methods which remain badly documented. There were only a handful of such structures before the 19th century between present Jersey City and Fort Lee, none of which have ever been investigated and few of which probably survive with much integrity.⁴⁶⁷

Raber's study indicated that waterfront technology, in particular waterfront technology predating the industrial development in Hoboken, is a poorly documented resource. Therefore, those portions of the Hoboken waterfront from which the early ferries were launched and the early piers along the southern portion of the waterfront and to the east of Stevens Point, have the potential to contain early to mid-eighteenth century waterfront deposits including pier, bulkhead, and landfill deposits. Similarly, RGA's archaeological monitoring at the Maxwell House site documented the removal of the earth-filled North Pier. RGA concluded that other earth-filled piers may also be extant along Hoboken's waterfront. RGA's study also reflected the fact that despite extensive development along the waterfront, intact or partially intact historic deposits remain extant.⁴⁶⁸

In Louis Berger's study of the wharves documented at the Assay Site, they provided a comparative discussion of the uncovered wharves with waterfront data from seventeenth through nineteenth century sites in Portsmouth, Salem, Boston, New London, and Alexandria. Through this comparative study, Berger concluded that much of the construction techniques used to create historic wharves were fairly standardized, "which means that most wharf characteristics such as the type of fill and the treatment of timbers and fasteners, was more or less repeated up and down the eastern seaboard."⁴⁶⁹ Louis Berger identified joinery techniques as one variable which showed variation

⁴⁶⁵ Rothschild and Pickman 1990; Cantwell and diZerega Wall 2001, 239-240.

⁴⁶⁶ Raber 1986, 14.

⁴⁶⁷ Raber 1986, 14-15

⁴⁶⁸ RGA 2006b.

⁴⁶⁹ Louis Berger 1991; Historical Perspectives, Inc. and The Louis Berger Group, Inc. 2004, III G-4.

between the various wharves and suggested that future archaeologists examine this particular feature when documenting historic wharves. The Hudson Yards archaeological documentary study also noted that wharf technology changed in Manhattan with the adoption of the steam-driven pile driver in the mid-nineteenth century. The study further observed that wharves dating to the transition to the pile driven technology have not been well documented, leaving an information gap in the history of wharf construction. Any historic wharf or pier deposit within Hoboken could potentially inform upon these research questions—the joinery techniques employed in the construction and potentially the adoption of pile driven construction.⁴⁷⁰ These features could also provide additional comparative data with which to study the history of wharf construction along the Hudson River and within the northeastern United States.

Given that past archaeological studies along the waterfront in Hoboken and Weehawken have documented intact or partially intact waterfront-related features, despite the history of development in this area, the entire waterfront in the Study Area is considered sensitive for historic waterfront-related deposits. As such deposits may reflect standardized waterfront construction techniques from the nineteenth or early-twentieth centuries, these deposits may not be considered eligible for listing in the National Register, as they would not provide new insights into the historic development of the waterfront. Nonetheless, documentation and recording of any such resources (even if standardized) would contribute to the archaeological literature regarding historic waterfront development along the western Hudson River. Furthermore, particular locations along the far southeastern and northeastern extent of the Study Area have the potential for eighteenth century slip deposits. There is also the potential for buried ships or shipwrecks along the shore, particularly in the vicinity of Weehawken Cove. As historic maps indicate that Weehawken Cove was not created, but is rather an historic topographic feature, there is a likelihood that this area was frequented by ship traffic prior to its mid to late-nineteenth century development. If unusual or atvpical construction techniques or technologies, pre-industrial features, shipwrecks, or seventeenth century features are identified, such deposits may be eligible for listing in the National Register under Criteria A and D as they would provide insights into the early history and/or historic industrial development of Hoboken, a period of significance with respect to the development of the city.

Documentary studies conducted by THE Partnership for the C8 and C10 Palisades Tunnels portion of the Access to the Region's Core (ARC) Trans-Hudson Express Tunnel Project determined that there was the potential for remains associated with the early-nineteenth century seawall along the eastern coast of Weehawken and Hoboken. In particular, the area to the east of Weehawken Cove near the intersection of Willow Avenue and 17th Street to the eastern terminus of 15th Street at the Hudson River, was considered sensitive for the seawall. These studies also concluded that any such deposits would be identified approximately 10 to 15 feet below surface as extensive fill deposits are located throughout this area. As this area does not appear to have been extensively developed since THE Partnership studies, this portion of the APE is considered sensitive for deposits associated with the early-nineteenth century seawall.⁴⁷¹

⁴⁷⁰ Historical Perspectives, Inc. and The Louis Berger Group, Inc. 2004, III G-4-5.

⁴⁷¹ THE Partnership 2009; THE Partnership, *THE Project Documentary Analysis Report for Areas of Archaeological Sensitivity C10 Hudson River Tunnels, City of Hoboken, New Jersey and Manhattan Borough, New York County, New York* (On file, Trenton: NJHPO) 2010.

With respect to landfill, Heritage Studies' analysis of the proposed Columbian Tower construction in southwestern Hoboken indicated the presence of approximately 12 feet of landfill. The study noted that the origin of the landfill was unknown but attributes the activity with the development of the railroad in this portion of Hoboken. In Dolan's archaeological assessment of the Long Slip Canal, they noted that spoil from the navigational channels in the Hudson River was deposited in various locations along the New Jersey shoreline including Hoboken and Jersey City. Geismar's archaeological monitoring of the Long Slip Canal identified fill deposits on both the north and south side of the canal. While Geismar did not recommend the landfill associated with the Long Slip Canal as a resource potentially eligible for listing in the National Register, she nevertheless used the information drawn from the landfill in a comparative analysis of landfill deposits.⁴⁷²

The historical research and past archaeological studies of Hoboken indicate the presence of fill deposits along the eastern shoreline and throughout much of the western portion of the city. The majority of the landfill within both the western portion and the eastern shoreline of Hoboken and the southeastern shoreline of Weehawken occurred during the mid-nineteenth through early-twentieth century, and was tied to the industrial and waterfront development of the city (Figure 20). Figure 20 depicts the evolution of the shoreline of northern Jersey City, Hoboken, and southern Weehawken from 1844 to the present day, highlighting the shoreline in 1844, 1876, 1891, and 1926. The 1876 shoreline appears to be anomalous with Weehawken Cove appearing 720 feet to the west of its location in 1844. The 1876 location of Weehawken Cove is dramatically inconsistent with its location in 1844, 1891, 1926, or in the present day. This inconsistency most likely reflects inaccuracies in georeferencing historic maps to presentday coordinates as reference points and mapping technologies have changed over time.

Aside from the potential inaccuracy with respect to the 1876 shoreline, Figure 20 indicates that the previously submerged southern portions of Hoboken had been filled approximately 540 feet to the south by 1891. This expansion encompasses much of the historic DLWRR rail lines and Erie-Lackawanna Terminal. The shoreline along the southeastern portion of the Study Area had expanded approximately 360 feet to the east with piers extending out an additional 720 feet the east by 1891. The majority of the shoreline within the Study Area appears to have been extended between approximately 270 and 450 feet to the east from 1844 to 1926. Disregarding the 1876 location of Weehawken Cove, this area appears to have experienced the least amount of expansion, with its shoreline having expanded only approximately 90 to 180 feet to the east. The majority of the historic piers along the waterfront extended approximately 540 to 900 feet from the shoreline.

Given that the majority of the landfill along the waterfront and along the southern portion of Hoboken may be relatively devoid of cultural material like the Long Canal Slip landfill, or that it may be associated with dredging activities along the Hudson River, it is unlikely that such deposits would be eligible for listing in the National Register. Nevertheless, the recording and documentation of such deposits would provide additional comparative data for the archaeological literature of landfill. Moreover, if such deposits were identified in multiple locations throughout the city they would help to inform upon the development of the area and potential technological changes in fill-related activities or preferences for types of fill in certain locations or during certain periods. Therefore, the former meadows

⁴⁷² Heritage Studies 1982; Dolan Research, Inc. 1997; Geismar 2004.



along much of the western portion of Hoboken, and those portions of the Study Area located from Hudson Street to the east in Hoboken and from Waterfront Terrace to the east in Weehawken, are considered sensitive for landfillrelated deposits, including landfill and any supporting cribbage or timberwork.

8.8 Transportation

This contextual study provides an overview of the history of transportation development within the Study Area. Initially, ferries were the primary means of transportation into and out of Hoboken. By the mid to late-nineteenth centuries, railroad lines expanded into the region and contributed to its industrial development and economic growth. This section presents a brief history of the transportation developments within the Study Area. As ferry lines were discussed in the preceding waterfront discussion, they will only be briefly addressed in this section as they relate to railroad development. As transportation development within the Study Area includes multiple unique features, including roads and plank roads, railroads, trolley lines, and railroads, the following historical discussion will be organized according to each unique feature. The section also discusses the potential information that could be derived from archaeological deposits associated with transportation. A few archaeological case studies present past archaeological projects within Hoboken. Additional examples of transportation-related sites have been taken from previous work within New York City.

8.8.1 Historical Background

Road/Plank Roads

John Hills' 1781 *Sketch Map of the Northern Parts of New Jersey* indicates the presence of an historic toll road extending from the north to the southeast and terminating at *Hoebuck* (Hoboken) (Figure 21).⁴⁷³ This road may have been the historic Hackensack or Bergen Turnpike. By the mid-eighteenth century, rival stage coach lines from Paulus Hook to Hackensack were established along the Bergen Turnpike. In the early 1800s, this road was taken over by the Bergen Turnpike Company. The Bergen Turnpike Company was one of several companies established by the state to take over and maintain major roads at the turn of the nineteenth century.⁴⁷⁴ An eighteenth century road also extended from the Hoboken area to Newark. This road, which became the Newark Turnpike, extended over the meadows via a plank causeway in the vicinity of Mill Creek. This road was taken over by the Newark Turnpike. Stage lines were set up to use and connect the turnpikes to particular ferry companies.^{#476} Both the Bergen Turnpike and the Newark Turnpike were reflected on Burr's 1832 map, with the Newark Turnpike extending along the southern portion of the Study Area and the Bergen Turnpike extending across the southeastern and central portions of Hoboken (see Figure 17). The Bergen Turnpike extended to the west of the Study Area in Weehawken. A secondary road connected to the turnpike, and extended to the southwest terminating at the

⁴⁷³ John Hills, A Sketch of the Northern Parts of New Jersey, accessed March 16, 2016, \\paterson\Projects-

ENV\50074974\Adm\Reports\Cultural Resources\Research\Historic Maps\Hills 1781 A Sketch of the Northern Parts of New Jersey.jp2. ⁴⁷⁴ Wheaton Lane, *From Indian Trail to Iron Horse* (Princeton: Princeton University Press) 1939, 143-164; Edward Francis and George Walrath, "The North Hudson County Railway," *The Marker* Vol 5 (2), 1946.

⁴⁷⁵ Van Winkle 1902, 42.

⁴⁷⁶ RGA 1998, 3-6.



Weihawken Ferry to the north of the Study Area. As previously noted, this ferry may have been the second attempt at establishing a ferry from Weehawken to New York City.⁴⁷⁷

In the mid-nineteenth century, an attempt was made to revitalize the toll road companies by resurfacing many of the former turnpike roads as plank roads. Plank roads were floored with cedar and other hardwood planks, and were sometimes referred to as *Farmer's Railroads*. During this time, the Bergen Turnpike became the Hackensack Plank Road. The Paterson Plank Road was licensed by the New Jersey State Legislature on March 14, 1851. The Paterson Plank Road was opened by 1856, and consisted of the longest such road in New Jersey, extending from Paterson to Hoboken. The Paterson Plank Road was consistent with typical plank road construction in that it was greater than 8 feet in width and consisted of 3-5 inch thick planks laid crosswise to the road between three to five buried stringers which extended the length of the road. Ultimately, the plank roads were determined to be poor investments.

The weakness of the plank roads was their rate of depreciation. Builders at first believed that the planked surface would not have to be replaced oftener than once every ten years, but actually the period was rarely longer than five years. Heavily loaded wagons caused excessive wear, especially on grades, but the real menace was decay. The flooring, half-buried in the earth, was almost constantly damp, and in places whether there was little drainage it deteriorated rapidly.⁴⁷⁸

The use of plank roads was disfavored by the 1860s. However, portions of the Bergen Turnpike/Hackensack Plank Road maintained tolls for several more decades. Present day Washington Street follows much of the historic alignment of the Bergen Turnpike.⁴⁷⁹ A twentieth century cultural resource assessment of a portion of the former Paterson Plank Road indicated that the current road has an asphalt/macadam surface which overlies an earlier twentieth century surface of Belgian block paving stones.⁴⁸⁰

The River Walk along the eastern extent of Hoboken, present-day FSD, was also an early roadway within the city. As previously noted, John Stevens created the six-mile path along the Hudson in the 1820s as part of the development of the Elysian Fields and Steven's Point amusements. The width of River Walk was increased overtime. By the 1880s to 1890s, when the street was referred to as River Road, its width had been increased by the addition of fill. By the end of the nineteenth century, River Road was given over to vehicular, as opposed to pedestrian, traffic. In 1985, the road was renamed FSD after Frank Sinatra, who grew up in Hoboken.⁴⁸¹ Today, FSD consists of a two-lane roadway that provides for both northbound and southbound traffic and allows for parallel parking.⁴⁸²

⁴⁷⁷ Burr 1832.

⁴⁷⁸ Ihor J. Sypko, *A Cultural Resource Survey for the Proposed Plank Road-Grade Crossing Elimination Project, Jersey City and Hoboken New Jersey* (On file, Trenton: NJHPO) 1980, 9-10; Lane 1939.

⁴⁷⁹ RGA 1998, 3-8.

⁴⁸⁰ Sypko 1980, 10

⁴⁸¹ Mary Delaney Krugman Associates, Inc. and William Sandy 2014.

⁴⁸² Kimley Horn, Frank Sinatra Drive Visioning and Conceptual Design Plan Existing Conditions Report 2014.

Clerk & Bacot's 1854 Map of Hudson County indicates that present day Willow and Park avenues had been extended from Hoboken over the Hoboken Creek, and into present day Weehawken (Figure 22). As the creek had not been filled at this time, it appears that both roadways used bridges/viaducts to cross the creek. Early-twentieth century maps confirmed the presence of two bridges/viaducts along Park Avenue (Harbor Boulevard East) and Willow Avenue in Weehawken. These crossings initially allowed for road transport over the Hoboken Creek; by the late-nineteenth and twentieth centuries, viaducts along these roads also allowed for the extension of rail lines beneath the elevated portions of Park and Willow avenues.⁴⁸³

The 14th Street Viaduct was constructed ca. 1910. The east edge of the bridge is located at the intersection of 14th Street and Willow Avenue. The west edge of the bridge is in Jersey City at the intersection of 14th Street and Manhattan Avenue on the side of Bergen Hill. The 14th Street Viaduct was constructed to provide easier access from low-lying Hoboken to the Palisades. The bridge was constructed to follow the existing street grid and was required to span over existing rail and trolley lines. The completed 14th Street Viaduct had a steep incline and consisted of a 31-span steel deck girder and Warren deck truss bridge which could support four lanes of traffic. Construction of the 14th Street Viaduct required the creation of a new road, Manhattan Avenue, within Jersey City. The 14th Street Viaduct underwent major alterations in 1938, and again from 1990 to 1991. Additional repairs were performed in 1998 and 2002.⁴⁸⁴ Beginning in 2003, a scoping process was undertaken for the rebuilding of the 14th Street Viaduct. A new \$54 million replacement 14th Street Viaduct was opened on July 4, 2014. The new viaduct consists of an eight-span, 1,177-foot structure constructed entirely of multi-steel girders. The original viaduct was demolished in stages during the construction of the new structure—the south side of the bridge was completely demolished and rebuilt; the north side was subsequently demolished and replaced.

Horse Cars/Trolleys

The first horse stage line within Hoboken was operated by Nicholas Goetz in 1858. The line extended from the Hoboken Ferry to Union Hill, present-day Union City. The line was an immediate success and spurred the creation of the Hoboken and Weehawken Horse Car Railway in 1860. By December of that year, horse cars were operating over the railway's route. In 1859, the first horse railroad was chartered—the Hoboken and Hudson City Horse Railroad—and built a line from the Hoboken Ferry through Ferry Street and Hoboken Avenue to the intersection of Summit, Newark, and Hoboken avenues in Hudson City, present-day Jersey City. This route became active in 1860. The Hoboken and Hudson City Horse Railroad operated seven horse cars on five miles of track. Two additional horse railroads were opened between 1859 and 1861. The Jersey City and Hoboken Horse Railroad was organized in 1859; the Hoboken and West Hoboken Horse Car Railroad was organized in 1859; the Hoboken and West Hoboken Horse Car Railroad was organized in 1861. The Jersey City Ferry at Montgomery Street to the Hoboken Ferry. The Hoboken and West Hoboken Railroad built a line from a connection with the Hoboken and Hudson City railway at Hoboken Avenue over a steep grade road to Palisade Avenue and north to West Hoboken.⁴⁸⁵

⁴⁸³ Clerk & Bacot, *Topographical Map of Hudson County, New Jersey from Actual Surveys* (Jersey City: Wood) 1854; G.M. Hopkins & Co. 1909, Plate 12; Hughes and Bailey 1904.

⁴⁸⁴ Patrick Harshbarger, *Cultural Resources Identification and Effects Report for the 14th Street Viaduct*, accessed March 17, 2016, <u>http://www.14thstviaductreplacement.com/Final%20CR%20Identification%20and%20Effects%20Report.pdf</u>, 2007; NJHPO, "14th Street Viaduct Over Conrail River Line," Property File, (On File, Trenton: NJHPO) 1998.

⁴⁸⁵ Francis and Walrath 1946; Joseph Eid, "Street Cars to the Sky," *Hoboken History* Spring 1992: 10-17.



An 1860 map of the region shows a trolley line connecting to the M&E near Provost and 12th streets. The trolley line was shown extending to the north through the central portion of Hoboken in the vicinity of Willow Avenue and Clinton Street, and then extending to the southeast to the corner of Willow Avenue and 12th Street. At this intersection, the trolley line turned north and extended along Willow Avenue through the Elysian Fields and into Weehawken where it turned to the southeast and terminated at the Venango Oil Company's Storage House.⁴⁸⁶

In 1865, the Hoboken and West Hoboken Horse Car Railroad and the Hoboken and Hudson City Railroad were sold to the Hoboken and Weehawken Horse Car Railway to form the North Hudson County Railway Company (NHCR). In 1870, the NHCR acquired the Jersey City and Hoboken Road.⁴⁸⁷ With this consolidation, Hudson County contained two regional trolley lines—the Jersey City and Bergen Railroad which served Bayonne and Jersey City, and the NHCR "shared the northwestern portion of Jersey City...and had all of the rest of the sparsely settled Hudson County to itself."⁴⁸⁸

While operating the horse cars on level ground within Hoboken and Jersey City was fairly easy, the car lines had a difficult time traveling from Hoboken to the Jersey City Heights atop the Palisades. "The climb needed up to four horses per car, with a frequent change of horses. It took 20 minutes to reach the top of the hill from the ferry, a distance of only one mile."⁴⁸⁹ Given the inefficiencies in this system, in July 1874, the NHCR began construction of an elevator/incline plane to bring the cars up the cliffside. The elevator was completed in November of that year. This elevator was the first horse car elevator in the world and consisted of a 480-foot long inclined plane with a vertical rise of 102 feet in one minute's time. The elevator connected the horse car line from the foot of the Palisades at Driveway in Hoboken's southwestern corner to Palisade Avenue at the top of the ascent. Horse cars stopped using the elevator in 1886; however, freight wagons continued to use the elevator into the 1920s (Figure 23).⁴⁹⁰

In 1886, a viaduct was opened between the Hoboken Ferry to the top of the Palisades at Palisades Avenue. A cable railroad spanning the 1.13 miles from the ferry to the Palisades was built on top of the viaduct. The elevated railway was constructed to provide faster passenger service than the elevator route. Ten passenger cars ran on the Observer Highway elevated cable railway. The elevated road was nearly level for approximately half a mile from the ferry; from this point, it ascended at a rate of five feet to the hundred. The construction was almost entirely iron, aside from the wood used for cushion blocks upon which the rails rested. Initially cables were used to power the elevated rail (Figure 24). In 1892, the line was electrified and "electric trolley cars supplanted the cable cars on the trestle."⁴⁹¹

By 1884, the NHCR operated at least seven lines within Jersey City and Hoboken consisting of: the Jersey City and Hoboken Line, the Union Hill and Weehawken Line, the Union Hill and Guttenberg Line, the West Hoboken and

⁴⁸⁶ Taintor Brothers 1860.

⁴⁸⁷ Francis and Walrath 1946.

⁴⁸⁸ Eid 1992, 12.

⁴⁸⁹ Eid 1992, 12.

 ⁴⁹⁰ Francis and Walrath 1946; Eid 1992, 12; Edward Hamm, Jr., *The Public Service Trolley Lines in New Jersey* (Illinois: Transportation Trails) 1991.
⁴⁹¹ Hans 2005, 54; Eid 1992; Hamm 1991.





North Hudson County Railway Horse Elevator, circa 1904

August 2016 FIGURE 23





Electrified Trolley Car on the Elevated Cable Railway in Hoboken, circa 1907

August 2016 FIGURE 24 Jersey City Heights Line, the Central Avenue Line, the Court House and Oakland Avenue Line, and the Washington Street and 11th Street Line.⁴⁹² In November 1893, the NHCR opened a new connecting line between Hoboken and the heights of North Hudson. The line started at 15th Street in Hoboken with a trestle parallel with the Palisades for a distance of 900 feet, and then crossed the New York Central and the Erie Railroad on a steel bridge. The road then gradually ascended the Palisades by a series of curves which followed the contours of the hill. This alignment included two switchbacks—one switching directions south of Palisade Avenue, and the second switchback featured an iron bridge that carried the trolley line over several rail lines. This line met up with the existing routes at Palisade Avenue and Hoboken Street in West Hoboken. This trolley line was locally known as the Old Hillside Road Trolley Horseshoe Curve and the elevated trolley line (Figure 25). ⁴⁹⁴ The trolley line was abandoned in 1928, having become increasingly obsolete with the early-twentieth century construction of the 14th Street Viaduct.

In 1899, the Jersey City, Hoboken, and Paterson Street Railway Company (JCHPR) was organized through the consolidation of several railways in Passaic and Hudson Counties. In August 1901, the NHCR was merged with the JCHPR. Two years later, the Public Service Corporation (Public Service) acquired control of the JCHPR system. In 1907, the system became a part of the Public Service Railway. The Public Service Railway began retiring trolley cars in the early to mid-twentieth century. Service on the 15th Street Hoboken elevated line was discontinued in 1928. In 1949, Public Service replaced all of the trolley cars with buses. The elevated trestle along Observer Highway was dismantled shortly thereafter.⁴⁹⁵

On May 1, 1923, Public Service created a Weehawken Car line which extended from the 42nd Street Ferry in Weehawken to the Hudson Place Terminal in Hoboken. This trolley line originated in the vicinity of the northernmost extent of the Study Area, around the Lincoln Tunnel. The Weehawken Car Line was abandoned in 1937, and integrated into the West New York Car Line. In this same year, buses replaced trolleys along the West New York Car Line due to construction work in Weehawken.⁴⁹⁶

Railroads and Tunnels

In 1815, John Stevens acquired one of the first charters for the construction of a railroad within the United States. The charter was for a railroad that would extend from the Delaware River near Trenton to the Raritan River near New Brunswick. There is no evidence that this rail line or any such venture was pursued at this time; it appears that Stevens merely obtained the charter.⁴⁹⁷ Ten years later, John Stevens built the first steam railroad in the United States. This early steam locomotive was set up as a demonstration railroad near the Hoboken Hotel. The tracks for the rail were laid out in a circle with grade to demonstrate that the railroad did not require level ground to operate.

⁴⁹² Shaw 1884, 1047-1048.

⁴⁹³ Francis and Walrath 1946; Harshbarger 2007, 32.

⁴⁹⁴ G.M. Hopkins & Co. 1909.

⁴⁹⁵ Francis and Walrath 1946; Hans 2005, 54.

⁴⁹⁶ Hamm 1991, 221, 233.

⁴⁹⁷ Hans 2005, 14.



The early steam engine had four wheels and a boiler shaped like a tube. The engine could carry approximately six people at 12 miles per hour. A replica of this railroad was exhibited at the Philadelphia Society for Internal Improvement.498

The extension of railroad lines into Hoboken occurred in the mid-nineteenth century after a controversial and heated legislative battle. The M&E was first charted in January 1835. The M&E was incorporated to build a line from Morristown to a point on the New York Harbor. By 1835, the M&E provided service between Madison and Newark. By 1854, the M&E extended its line westward to Hackettstown; by 1866, the line reached the Delaware River at Phillipsburg. An 1860 map of the region shows a branch of the M&E railroad extending to the south of Ferry Street, and terminating at the Hoboken Ferry. The M&E experienced greater difficulties in attempting to expand its railroad interests further eastward. During this same period, the New Jersey Railroad, whose charter also authorized it to construct a line from near the Hackensack River to any ferry opposite New York, paid the Hoboken Ferry Company to not promote the creation of any railroad or branch from Newark and Hoboken. The New Jersey Railroad's charter also stipulated that if the railroad failed to establish the branch line that "the proprietor of the ferry might construct the line."499

Frustrated that a rail line had not been constructed to the Hoboken ferries, E.A. Stevens purchased a controlling interest in the M&E in the 1850s; the M&E obtained legislative authorization to extend a branch line from Newark to Hoboken. The New Jersey Railroad protested this authorization. Stevens then organized the Hoboken Land and Improvement Company to secure state authorization to construct a railroad from Hoboken to Newark. As a result, by 1862, an M&E rail line had been constructed between Newark and Hoboken. The M&E acquired additional lines within New Jersey in the late 1860s and 1870s.500

The Warren Railroad was authorized by the New Jersey Legislature in 1851. The 19-mile railroad was opened in May of 1856 and connected the DLWRR with the Central Railroad of New Jersey. In 1857, the DLWRR leased the Warren Railroad in perpetuity. The DLWRR also obtained a lease of the M&E lines in 1868.⁵⁰¹

The first terminal associated with the railroad and ferry lines in Hoboken was a shed assembled in 1862. A second station was built in 1868, and consisted of a 650-foot long train shed which accommodated 12 cars. This station was built on pilings which had been driven down to bedrock. The second station was destroyed by a fire in May of 1873, and quickly replaced with a temporary station. The temporary station was not replaced until 1885. The fourth Lackawanna depot consisted of an inexpensive wooden building which dwarfed in comparison to the more lavish terminals installed by rival railroad companies.502

⁴⁹⁸ Hans 2005, 16; Kenneth French, Railroads of Hoboken and Jersey City (Portsmouth: Arcadia Publishing) 2002; Lorett Treese, Railroads of New Jersey: Fragments of the Past in the Garden State Landscape (Mechanicsburg: Stackpole Books) 2006.

⁴⁹⁹ John Cunningham, Railroads in New Jersey: The Formative Years (Andover: Afton Publishing Co., Inc.) 1997, 362-363; Carl Condit, The *Port of New York* (Chicago: The University of Chicago Press) 1980, 67-68. ⁵⁰⁰ Cunningham 1997, 362-363; Condit 1980, 67-68.

⁵⁰¹ Julie Carmelich, Erie-Lackawanna Terminal, National Register of Historic Places Registration Form, 2005; NJHPO, "Old Main DL&W Railroad Historic District" (On file, Trenton: NJHPO) 1996.

⁵⁰² Cunningham 1997, 259.

G.M. Hopkins and Co.'s 1873 Map indicates the presence of the M&E rail lines to the south of Ferry Street, terminating with the ferry depots on the coast. The M&E railroad depot was located at the eastern extent of Ferry Street, and extended into the Hudson River. The M&E complex also included a freight depot, several coal docks, a car works, and several unidentified buildings. The Hopkins map also shows the New York and Fort Lee Railroad lines to the west of Hoboken, and crossing into Weehawken along 17th Street. Some branch lines of this railroad terminated at an ironworks along the eastern shore of Weehawken; portions of the line also continued to the northeast extending along the eastern shore of Weehawken.⁵⁰³

The New York and Fort Lee Railroad Company was chartered by New Jersey as the New York and Bull's Ferry Railroad Company in March of 1861. Its name was changed in March of 1862. The road was opened for traffic in 1870. G.M. Hopkins & Co.'s 1873 Map shows the New York and Fort Lee Railroad extending from the southwest and then extending easterly along 17th Street before turning to the northeast along the shoreline in Weehawken with spur lines terminating at the Venango Oil Works.⁵⁰⁴ On February 27, 1886, the New Jersey Junction Railroad (Junction RR) was incorporated. The Junction RR consisted of a transfer line from Weehawken to Jersey City, with a branch to Harsimus Cove, to join the West Shore rail lines. The Junction RR leased the portions of the New York and Fort Lee Railroad tracks, approximately 0.24 miles. The remaining portions of the New York and Fort Lee Railroad tracks. The New York and Central Hudson Railroad acquired the Junction RR on July 1, 1886 for a 100-year lease. The road was open to freight trains in May, and passenger service in June of 1887. "The short but vital five-mile multitrack line running down the west side of Bergen Hill was placed in service...to provide a connection with the Lackawanna at Hoboken and with the five remaining roads to Jersey City."⁵⁰⁵

The Hoboken Railroad Warehouse and Steamship Connecting Company was founded in 1895. In 1902, this company was incorporated as the Hoboken Manufacturers Railroad and joined the Lackawanna and Weehawken Branch of the Erie with the Hudson River piers. The railroad was built along the axis of historic River Road (present-day FSD) and ran down the center of the street on a street rail which was flush with the pavement. This rail line was the first New York line to operate by electric power, having started electrified service in 1898. In 1910, the company applied to the City of Hoboken to extend its line south from 5th Street. The southern portion of the line was known as the Hoboken Shore Line; by 1954, the entire rail line was renamed the Hoboken Shore Railroad. The railroad was bought by the federal government in 1917 for use during the World War I embarkation effort. The Hoboken Manufacturers Railroad ceased operating between 1977 and 1978.⁵⁰⁶ For much of its history:

The railroad operated about a mile and a half of track from a junction with the Erie Railroad at Weehawken, south to the Port of New York Authority Pier at First Street in Hoboken, with a yard at Sixth Street, and a car float bridge and associated yard at Eleventh Street.⁵⁰⁷

http://sh1.webring.com/people/bk/king5201/Railroad/NewJerseyJunction.html.

⁵⁰³ G.M. Hopkins & Co. 1873.

⁵⁰⁴ G.M. Hopkins & Co. 1873.

⁵⁰⁵ Condit 1980, 74; Ken Kinlock, "The New Jersey Junction Railroad," accessed March 16, 2016,

⁵⁰⁶ Condit 1980, 74; Hoboken Historical Museum, "Hoboken Manufacturers Railroad," accessed March 17, 2016,

http://hoboken.pastperfectonline.com/bysearchterm?keyword=Hoboken+Manufacturers+Railroad.

⁵⁰⁷ RGA 2012, 3-22-3-23.

In 1872, the DLWRR constructed the Long Slip Canal in association with its Hoboken Freight Terminal. The northern shore of Harsimus Cove, south of the Hoboken Ferry, was filled in to accommodate the construction of the Hoboken Freight Terminal. The terminal complex was built on unstable fill installed at a depth of approximately 20 feet over "nearly fluid silt underlying an old embayment of the Hudson River."⁵⁰⁸ The complex was built on top of filled material dredged from the Hudson River.

Initially the canal extended to a point just west of the line of Garden Street in Hoboken. By 1890, the canal was extended to a point in line with Provost Street in Jersey City.

The 2,000-foot long and 100-foot wide canal was built to accommodate the transfer of cargo between maritime lighter barges and railroad cars. Lighters, flat bottom barges with no means of propulsion, were brought to and from the canal by tugboats...Later after extensive renovations following major fires in 1904 and 1905, the DL&W evolved from a basically coal and local freight carrier to a large scale freight carrier shipping to coastal and international ports. Two large 60-to gantry cranes were operated alongside the canal slip to transfer a variety of heavy freight to and from lighters.⁵⁰⁹

The Long Slip Canal was actively used until about 1960. Changes in the shipping and container industries, along with changes in marine and railroad freight operations in New York, led to diminishing usage of the canal. The Long Slip Canal is currently owned by NJ Transit. The canal slip has been effectively abandoned and only serves as a discharge for stormwater and combined sewer overflows.⁵¹⁰

In May of 1851, the New York and Erie Railroad (Erie) opened the longest main line in the world. This line extended from Middletown, New York to Dunkirk on Lake Erie. The Erie was immediately successful and witnessed increasing freight and passenger traffic. Given this success the Erie looked to expand its reach into northern New Jersey.

The primary goal behind this ever expanding plan was to gain access to a terminal somewhere along the Jersey waterfront opposite the lower third of Manhattan Island, so that convenient trans-Hudson ferry and barge transfers could take the place of the intolerably long river voyage from Piermont to Duane Street.⁵¹¹

By 1861, the Erie had expanded into Jersey City with a tunnel through the Palisades and the establishment of a terminal complete with docks and freight yards. By 1868, the Erie was beginning to outgrow its Jersey City property and was looking to acquire additional waterfront freight facilities. In 1878, following its reorganization as the New York, Lake Erie and Western Railroad (Erie), the Erie began construction on a freight terminal in Weehawken next

⁵⁰⁸ Dolan Research, Inc. 1997, 2.

⁵⁰⁹ Dolan Research, Inc. 1997, 4.

⁵¹⁰ Dolan Research, Inc. 1997, 3.

⁵¹¹ Condit 1980, 60.

to the Venango Oil Works. By 1885, the terminal was open with two piers and several buildings; the Erie terminal continued to expand through 1920.⁵¹² G.M. Hopkins & Co.'s 1909 Map shows the Junction RR and the Erie rail lines along the western extent of Hoboken. These lines turned to the northeast immediately north of 17th Street, and extended under the Park Avenue Viaduct. After the viaduct, the rail lines turned to the north, extending along the shore of Weehawken. Several spurs were depicted terminating along the piers of the Erie Rail Road Company's Weehawken yard.⁵¹³ Rail service to the Erie Weehawken rail yard terminated in 1960.

As previously noted, the initial attempts at construction of a rail tunnel under the Hudson River, connecting Manhattan and Hoboken, began in 1873 with the founding of the Hudson Tunnel Railroad Company. Construction began in 1879 under the direction of Colonel DeWitt Clinton. In this year:

Workers entered the tunnel from the caisson through an airlock, waited until at least 12 pounds of air pressure developed inside, and then opened the tunnel door to begin digging. At the head of the tunnel, silt was dug out in steps, and when all sides of the shell were completed, bricklayers followed to lay at two-foot brick lining.⁵¹⁴

The first effort at construction of the tunnel was terminated in 1880 following a blowout of the pressurized digging chamber resulting in 20 deaths. In 1888, a second attempt at completing the tunnel was made employing a British invention called the Greathead Shield. The Greathead Shield helped to increase the safety and efficiency of the tunnel construction; however, the project was terminated before completion due to financial difficulties.⁵¹⁵

In the early 1900s, a third and final attempt was made at constructing the tunnel using the efforts of the previous two attempts—resuming work on the tunnel that was initially opened and using the Greathead Shield which had been abandoned in place by the second attempt. In this final phase, engineers used hydraulic jacks in their tunneling work; these jacks were able to work at 72 feet per day and enabled boring without the need to remove the excavated dirt, which was moved to either side of the tunnel. On February 25, 1908, a nine-car inaugural train was run along the completed H&M. The line extended for 6.2 miles from 19th Street and 6th Avenue in Manhattan to the ferry terminals in Hoboken. In this same year, the H&M constructed railroad repair shops in Hoboken near Hudson Street and Hudson Place. The H&M continued to expand in the 1910s and ultimately consisted of approximately 7.25 miles of track in New York and 11 miles in New Jersey, maintaining a total of 190 rail cars.⁵¹⁶

By 1900, nearly 100,000 passengers rode the DLWRR ferries daily. In 1905, the DLWRR's fourth terminal in Hoboken was destroyed by a fire. This same year, the company accepted plans for a fifth terminal by the classically trained architect Kenneth Murcheson. The building was constructed by Lincoln Bush, a civil engineer. The Erie-Lackawanna Terminal was completed in 1907. The Erie-Lackawanna Terminal was a hub for all of the DLWRR

⁵¹² Raber 1984, 5-8.

⁵¹³ G.M. Hopkins & Co. 1909.

⁵¹⁴ Hans 2005, 48-49.

⁵¹⁵ French 2002, 78; Joe Mysak, *Perpetual Motion: The Illustrated History of the Port Authority of New York and New Jersey* (Los Angeles: General Publishing Group, Inc.) 1997, 20; Lynn Drobbin, "Hudson & Manhattan Railroad Repair Shops," *Historic American Engineering Record* 1997, 7-8.

⁵¹⁶ Hans 2005, 48-49; Drobbin 1997, 7-8.
commuter rail lines and was also a hub for freight shipments. The terminal complex consisted of the joined Ferry and Railroad Terminal, the Train Shed, the Baggage/YMCA Building, and the former Pullman Building and Immigrant Station. The majority of the complex, aside from the Baggage Building/YMCA Building and the Train Shed, was constructed on a concrete platform which was supported by 80-foot to 90-foot yellow pine pilings set into the Hudson River. "The structurally flexible building is constructed to withstand and absorb the impact of the berthing ferry boats."⁵¹⁷

The Erie-Lackawanna Terminal was listed in the National Register on July 24, 1973 under Criterion A, for its association with the development of rail and ferry transportation, and under Criterion C, as an example of early-twentieth century terminal construction by a classically trained architect and a renowned civil engineer.

The Immigrant Station located to the south of the terminal served as a way station for immigrants arriving by ferry from Ellis Island. The DLWRR kept the immigrants separated from the daily commuters who filled the main terminal. The immigrant station had its own pier.⁵¹⁸

G.M. Hopkins and Co.'s 1909 map illustrates the completed Erie-Lackawanna Terminal complex. The map indicates that the rail lines and buildings to the south of Ferry Street were associated with the DLWRR. The map also indicates that the Junction RR lines extended in a north-south trajectory to the west of Marshall Street, at the base of the Palisades, and then in a northeasterly direction towards the Weehawken waterfront. The Junction RR appears to have been affiliated with the New York Central and Hudson Railroad (New York Central). The Hoboken Shore Railroad was also depicted along the eastern extent of Hoboken.⁵¹⁹

The New York Central began as a conglomerate of ten railroads linking Albany and Buffalo in 1853. By 1914, the railroad was reorganized with the Lake Shore and Michigan Southern and a number of small railroads as the New York Central Railroad (New York Central). At this time, the New York Central "became the largest trunk line in the East from the standpoint of mileage." The Pennsylvania Railroad was the only other system with greater revenues and greater freight density.⁵²⁰ The West Shore Railroad was operated as the New York Central's River Division, extending from Weehawken to Albany.

At the turn of the twentieth century, additional railroads that terminated in New Jersey across the river from New York City pursued the establishment of a direct link with Manhattan. The Pennsylvania Railroad was one such rail line; the Pennsylvania Railroad determined that constructing a tunnel under the river would be the most affordable means by which to connect to Manhattan. Between 1904 and 1910, the Pennsylvania Railroad constructed a system of trackage and tunnels, including a tunnel through Bergen Hill and a tunnel under the Hudson, to connect Manhattan with New Jersey and Long Island. All of the new trackage was electrified; the tunnels within New Jersey and under the Hudson are known as the North (Hudson) River Tunnels. A vent shaft for the North River Tunnels was

⁵¹⁷ Carmelich 2005, 7-2.

⁵¹⁸ Carmelich 2005, 8-8.

⁵¹⁹ G.M. Hopkin & Co. 1909.

⁵²⁰ Thomas Crawford and Frederick Kramer, *Rails Along the Hudson: New York Central System,* (New York: Quadrant Press, Inc.,) 1979.

established in Weehawken between the east end of the river tunnel and the beginning of the west end of the Bergen Hill Tunnel within the vicinity of the Study Area. The vent shaft originally consisted of a man-made open well with a 115-foot by 55-foot opening at an elevation of 50 to 60 feet below grade. The well was covered ca. 1943 with a 4'6" thick concrete slab and then backfilled up to the surrounding grade. Four headhouses were built over the vent (Figure 26).⁵²¹

In 1928, the new president of the DLWRR, John M. Davis, undertook electrification of its suburban commuter lines. At this time, approximately 60,000 passengers were commuting daily on the DLWRR M&E line. The electrification process entailed the erection of 1,108 catenary structures and the installation of 11 sub-stations and tie stations. Ultimately, the project cost the railroad \$16,946,034 including approximately \$5,534,158 for new cars. The process was completed within two years; the first official run of the new electric lines from Hoboken to Newark occurred on September 3, 1930.⁵²²

In the early 1930s the PANYNJ initiated plans to build a Midtown Hudson Tunnel, similar to the recently completed Holland Tunnel. Construction of the tunnel began in 1934 with crews working simultaneously from the New Jersey side in Weehawken, and from the New York outlet between 31st and 32nd streets. The first "hole through" was achieved on August 3, 1935. The center tube of the Lincoln Tunnel was opened for traffic on December 22, 1937. The north tube was opened on February 1, 1945; the south tube was opened on May 25, 1957.⁵²³

In association with the opening of the Lincoln Tunnel, the PANYNJ constructed a curved viaduct known as the Helix (Figure 27). The Helix is a component of an approximately 2.8-mile long road artery constructed between 1938 and 1939 to serve as the main New Jersey-approach to the Lincoln Tunnel. The roadway, historic Route 3, present day Route 495, was designed to carry the roadway from the low meadows west of Bergen Hill up to the open-cut in Bergen Hill and then back down to the tunnel entrance east of Bergen Hill. Numerous bridges had to be built along the roadway and in association with pre-existing local streets which had to be extended over the cut. A bridge was also built for the crossing of Hudson Boulevard. The viaduct is composed of a series of concrete girders and four longer spans of deep Warren deck trusses on the outside matched with haunched deck girders on the inside. The viaduct was widened in 1957. Portions of the Helix and Route 495 approach are located within the northern extent of the Study Area. The NJHPO has determined that a portion of the Helix, the NJ 495 Viaduct over Baldwin Avenue and Conrail, is eligible for listing in the National Register under Criterion C as an innovative engineering solution to building a highway with limited access and through a congested area.⁵²⁴

The Depression era heralded a decline in rail use as vehicular traffic became the preferred mode of commuter and freight transport. Given continuing declines in ridership, in 1954, the DLWRR combined with the Erie Railroad

⁵²¹ NJHPO, "North River Tunnels: Amtrak Northeast Corridor under Hudson River, Bergen Portal to 10th Ave. Portal, NY," Property File (Trenton: NJHPO) 1998; Condit 1980, 272-273.

⁵²² Carmelich 2005, 8-7; Wes Coates, *50th Anniversary 1931-1981: Suburban Electrification Delaware, Lackawanna, & Western R.R.* (Jersey Central Chapter National Railway Historical Society) 1981.

⁵²³ Mysak and Schiffer 1997, 82-87; Port Authority, "Lincoln Tunnel: History," accessed March 28, 2016, http://www.panynj.gov/bridgestunnels/lincoln-tunnel-history.html.

⁵²⁴ NJHPO, "NJ 495 Viaduct over Baldwin Avenue and Conrail," Property File (Trenton: NJHPO) 1995.



Lincoln Tunnel Vent Headhouses in Weehawken, circa 1944





REBUILD BY DESIGN HUDSON RIVER = RESIST = DELAY = STORE = DISCHARGE =

Lincoln Tunnel Aerial View, circa 1965



Company. In 1968, the Erie-Lackawanna Railroad merged with a new company, Doreco. By 1972, the railroad merged with Conrail. By the end of the 1970s, the railroad was under the control of its current owner, NJ Transit.

With commuters increasingly using automobiles, and the construction of the Hudson Tunnel, the Lincoln Tunnel, and the George Washington Bridge easing vehicular access to Manhattan, ridership of the H&M also declined. In the 1950s, the H&M fell into bankruptcy but continued to operate. PATH was formed in 1962 as a subsidiary of the PANYNJ. PATH assumed control of the H&M and continues to maintain and operate the system.⁵²⁵

The HBLR was opened in April 2000. The 20-mile system consists of 48 Kinki Shrayo articulated low-floor LRVs powered by overhead catenary. The system uses former railroad ROWs at its northern and southern ends and has a newly built ROW between Liberty State Park and the Hoboken Terminal. Within Weehawken and Hoboken, the HBLR repurposes ROWs previously built by the Junction RR and by the New York Central Railroad. In 2004, a branch line was opened from Hoboken Terminal to Lincoln Harbor, extending from Hoboken Terminal to the west and then north along an existing ROW at the base of the Palisades. This line then turns to the northeast around 17th Street and extends into Weehawken to the west of Waterfront Terrace. In 2006, the Weehawken Tunnel was opened enabling two branch lines to operate through Hoboken–one to the Hoboken Terminal and one to West Side Avenue. The HBLR system is a vital component within the daily commuter traffic network.⁵²⁶

8.8.2 Archaeological Case Studies

The review of previously conducted cultural resource studies within the Study Area identified four projects which uncovered and/or discussed transportation-related archaeological resources. These will be discussed below. In addition, two case studies from Manhattan will also be discussed as they relate to transportation-related deposits.

In their 2005 monitoring of the Maxwell House Site, RGA identified railroad-related remains along the northern edge of Block A of their study area, north of FSD and west of the South Pier. These deposits were observed near the ground surface and consisted of *in situ* ties, tie plates, and rails. As the context of the railroad deposits necessitated that they could not be examined in place, the rails were removed and samples were recorded. The recovered rails weighed between 80 and 100 pounds per yard and would have been at the lighter end of the range of rails that supported heavily trafficked routes in the early-twentieth century. The lower train speeds within the yard would have allowed for the lighter rail. RGA also noted that a tie that had been used without tie plates indicated that the rails had a standard gage configuration of 4' 8.5". RGA concluded that the:

railroad spurs were probably the remnants of the spurs that ran north and south across the center of the property between circa 1900 and 1939...The portions of the spurs to the north of this area were destroyed by the construction of the plant in 1939. The portions to the south were apparently

⁵²⁵ Drobbin 1997, 8; Port Authority of NY & NJ, "PATH: History," accessed March 17, 2016, http://www.panynj.gov/path/history.html. ⁵²⁶ Jeremiah Cox, "New Jersey Transit's Hudson-Bergen Light Rail," accessed April 13, 2016 at http://subwaynut.com/hblr/index.php.

removed when Maxwell House purchased the rail yards there in 1957 and converted them to parking lots.⁵²⁷

RGA did not recommend the railroad spurs or any features identified by their monitoring of the Maxwell House plant as potentially eligible for listing in the National Register. In conclusion, RGA recommended no additional archaeological investigations in association with the project as it was designed.⁵²⁸

Geismar's 2004 excavations in association with the construction of HBLR in the vicinity of the Long Slip Canal uncovered an old railroad bed on the south side of the canal at approximately one foot below ground surface. Small stones were found within the fill material on the south side of the canal and were interpreted as railroad ballast. Geismar's report offered no further interpretation or discussion of the railroad bed. The study concluded that no further archaeological investigations were required in association with the proposed construction indicating that Geismar did not view the railroad bed as a significant deposit.⁵²⁹

Geismar also conducted archaeological field testing in association with the proposed HBLR Transit System at the 2nd Street Station in Hoboken. These investigations were located to the west of the intersection of Marshall and 2nd streets. Mechanical backhoe trenches partially uncovered a cement-faced brick foundation pier. The exposed portions of this pier measured 5.35 feet in width and 1.5 feet in height and extended to the west under the nearby curb. Geismar noted that this foundation may have been related to the elevated trolley trestle in this area. A second feature was identified approximately 16 feet to the northeast of the foundation pier. This feature was coated with creosote on its underside; it measured 6.5 feet by 4 feet and was 1.2-feet thick. Given its irregular size and the creosote coating, Geismar concluded that this may have been another foundation pier which had been flipped over. Large boulders and stones were found in the vicinity of the second feature suggesting past fill and dumping episodes. Both features were photographed, measured, and mapped in place. Geismar observed that the feature indicated that the inclined track was supported by cement-faced brick piers. Geismar concluded that no additional information could be gleaned from either feature and recommended no additional fieldwork in association with the light rail installation in this area.⁵³⁰

In 1978, Cultural Resource Management Services (CRMS) conducted an archaeology survey for the proposed Erie-Lackawanna Improvement project.⁵³¹ Within Hoboken, this project proposed alterations to the Erie-Lackawanna Terminal. CRMS noted that the Hoboken train yards was then in the process of being nominated for inclusion in the National Register. CRMS noted that the proposed expansion of a maintenance yard within the terminal facility had the potential to impact a nineteenth century roundhouse and associated structures. Conditions at the terminal prohibited shovel test pit excavations. However, CRMS conducted a pedestrian reconnaissance and

⁵²⁷ RGA 2005, 6-15.

⁵²⁸ RGA 2005.

⁵²⁹ Geismar 2004.

⁵³⁰ Joan Geismar, *HBLR MOS-2, 2nd Street Station, Hoboken, Hudson County, New Jersey, Memo Report of Archaeological Field Testing* (On file, Trenton: NJHPO) 2004b.

⁵³¹ Cultural Resource Management Services (CRMS), *An Archaeological Survey for the Erie-Lackawanna Project* (On file, Trenton: NJHPO) 1978.

photodocumentation of the site and identified remains of the roundhouse, bunk houses or storage facilities, and ties and tracks over filled-in repair pits. Given that features associated with the terminal were observed, CRMS recommended a mechanical Stage II archaeological survey of the site to determine whether the site had sufficient integrity to contribute to the National Register property. CRMS further concluded that:

Documentary research may reveal construction details as well as information regarding the fill material. Subsurface investigations will reveal information about the nature of the fill, the architectural and construction details of the roundhouse, as well as tools and steam locomotive parts. Secondary testing should be conducted on the site of the former electric and gas plant east of the roundhouse, although the site appears heavily disturbed by railroad tracks.⁵³²

CRMS concluded that any intact and integral transportation-related deposits found within the terminal site would contribute to a greater understanding of the development of the Erie-Lackawanna Terminal and the development of Hoboken's waterfront in the late-nineteenth and twentieth centuries.

In 1995, Geismar conducted archaeological field testing at the Manhattan West Site on the west side of West End Avenue between West 61st and West 64th streets in Manhattan. The field investigations were conducted to locate, identify, and document "fill constructions erected by the Hudson River Railroad Company to maintain a straight road bed and run its line partly off shore through a Hudson River lagoon."⁵³³ These constructions were built between 1847 and 1851. Mechanical excavations within the Manhattan West Site revealed two soil-filled platforms enforced by approximately three-foot think mortared stone walls. The platforms measured over 100 feet north to south and approximately 50 feet east to west; they were separated by a 21-foot gap. Gesimar concluded that these platforms were the surviving remnants of the Hudson River Railroad embankment. The platforms did not have eastern walls suggesting that the platforms were incorporated into the filled shoreline.

Geismar noted that the exposed construction of the platforms was in contrast to expectations as documentary records indicated that the platforms had stone walls and stone fill. Geismar suggested that the presence of earth fill may have reflected practical decisions made at the time of construction by local contractors. Geismar also noted the unusual and unexpected arched passage which cut through the embankment. At the time of the study, Geismar could not identify a reason for the passage. Ultimately, Geismar concluded that no additional field investigations were warranted in the Manhattan West Site as the field testing had documented the railroad embankment and its associated fill. The study did not offer any recommendations regarding the potential eligibility or ineligibility of the site.⁵³⁴

In 1988, Thomas Flagg evaluated the industrial archaeological potential of the PANYNJ's Hunter's Point Waterfront project area in Long Island City, Queens. Flagg noted that there were two notable industrial aspects to the Hunter's

⁵³² CRMS 1978, 63.

⁵³³ Joan Geismar, *Manhattan West Field Testing: The Hudson River Railroad Platforms* (On file, New York: Landmarks Preservation Commission) 1995, 1.

⁵³⁴ Geismar 1995.

Point waterfront development—as a rail terminal important for the transfer of freight from rail to water in the midnineteenth and into the twentieth century and as an industrial area for oil refining and varnish manufacture. With respect to railroad related features, Flagg observed that all of the rails had been removed and that most of the buildings had been removed or altered. He concluded that the freight terminal lacked integrity. With respect to potentially intact features related to the railroad freight operations, Flagg noted that original lifting machinery may remain intact within portions of the transfer bridges. Flagg recommended that this machinery, as elements of it were potentially unique to the Hunter's Point operations, should be recorded to HAER standards prior to any construction activities within the Hunter's Point Waterfront project area.⁵³⁵

8.8.3 Discussion

The archaeological case studies presented above primarily reflect a consistent treatment of uncovered transportation-related resources. Specifically, in Geismar's work, the features were documented, but no additional work was recommended, nor were any sites recommended as potentially National Register-eligible. These results reflect the fact that the discovery of railroad tracks, trolley tracks, and other transportation related features may yield limited data particularly in light of historic documentation and maps of these features. Unless such features reflect unusual construction techniques or unmapped routes, they tend to confirm recorded information and/or provide limited additional details regarding past construction activities. Even in those instances where the exposed feature contrasts to historic descriptions, the recording and photo documentation of the feature is sufficient for gleaning any new information. Therefore, the majority of the transportation-related features that may be extant within the Study Area are most likely ineligible for listing in the National Register as they will not yield significant data regarding the historical development of the area.

With respect to historic plank roads, portions of the Hackensack Plank Road and the Paterson Plank Road are located within the Study Area. The Hackensack Plank Road was located in the vicinity of present-day Washington Street up to 8th Street and then extended to the northwest towards the present-day intersection of 16th and Grand streets. The Paterson Plank Road is currently an asphalt-surfaced street on the western extent of the city. It is possible that portions of the Hackensack Plank Road were buried under landfill in the creation of land along the eastern portion of the city. It is also possible that portions of the Paterson Plank Road may remain extant beneath the current paved surface. A detailed map and building analysis of development in these areas should be used to further refine the potential sensitivity for intact plank road deposits.

With respect to trolley lines, during the late-nineteenth century, the NHCR controlled numerous trolley lines within the city of Hoboken. It is possible that the now defunct trolley lines have been buried within the modern street bed. While such features, if uncovered, should be documented, they are most likely ineligible for listing in the National Register. Other features associated with the trolley line system in Hoboken include the elevated lines along Observer Highway and in the vicinity of 15th Street. As Geismar's work at 2nd Street and Marshall Street reflected, there is the potential for foundation piers associated with the incline routes to remain extant along the former routes.

⁵³⁵ Thomas Flagg, *Hunter's Point Industrial Archeology* (On file, New York: Landmarks Preservation Commission) 1988.

Therefore, the former location of these lines has the potential to contain deposits associated with the elevated tracks. Depending on the nature of any such features and the context within which they might be identified, it is possible, though probably unlikely, that they may be eligible for listing in the National Register.

Of particular note with respect to the trolley in Hoboken was the horse and freight elevator located in the southwestern corner of the city. Archaeological deposits associated with this feature could potentially provide insights on the construction, function, and use of the elevator. The elevator was an important element in the development of the trolley line and an important technological innovation in dealing with the topographic challenges faced by the trolleys in the mid to late-nineteenth century. As such, any deposits associated with the elevator could be potentially eligible for listing in the National Register. Therefore, the southwestern portion of the Study Area in the vicinity of Observer Highway is considered sensitive for resources associated with the late-nineteenth through early-twentieth century elevator. Similarly, features associated with the Old Hillside Road Trolley Horseshoe Curve may remain extant in the vicinity of 14th through 16th streets west of Madison Street. As this trolley line, which included a wooden trestle, iron trestle, and two constructed switchbacks also represents an attempt at addressing the topographic issues faced by the trolleys prior to the creation of the 14th Street Viaduct, archaeological deposits associated with the Old Hillside Road Trolley ling in the National Register.

In terms of railroads, several of the major rail lines within Hoboken and Weehawken are still used. The NJ Transit rail line, PATH trains, and Erie-Lackawanna Terminal along the southern extent of the Study Area are important elements within the daily commuter routes of the tri-state area. Railroads also continue to run along the former Junction RR lines on the western extent of the city. Despite their current usage, these portions of the Study Area are considered potentially sensitive for deposits associated with the railroad development including landfill and foundations/platforms associated with the initial installation of the rail lines. The Hoboken Shore Railroad which extended along the eastern seaboard of Hoboken is no longer extant. This railroad serviced the commercial and industrial developments along the waterfront, with terminal lines extending from the main line to the piers and docks. It is possible that portions of the main railroad or terminal lines associated with the waterfront businesses may remain extant along the eastern extent of the Study Area. It is unclear what if any other features may be associated with the operation of the Hoboken Shore Railroad. Therefore, the eastern portion of the Study Area, particularly FSD and its vicinity, is considered sensitive for deposits associated with the Hoboken Shore Railroad. Depending on the nature of any such deposits, it is possible, though unlikely, that they may eligible for listing in the National Register.

Several rail spurs were associated with the Venango Oil Works and subsequent oil works and industrial occupations on the northern extent of Weehawken Cove. Extensive development including spur lines, assorted buildings and warehouses, and freight-related technological features, occurred within the Erie Freight Terminal in Weehawken. While the late-twentieth century occupations of this area resulted in the demolition of standing structures and the paving of the area, it is possible that foundation remains, freight-related features, or other deposits associated with the Erie Freight occupation have remained extant. Furthermore, architectural features and other deposits associated with the construction of the North (Hudson) River Tunnels, particularly relating to the vent shafts, may also remain extant within the far northeastern corner of the Study Area. Such deposits could potentially provide additional details and data regarding the late-nineteenth and early-twentieth century transportation developments within southern Weehawken. Depending on the nature and integrity of any such deposits, they could be potentially eligible for listing in the National Register.

9.0 ARCHAEOLOGICAL RESOURCES

9.1 Assessment of Archaeological Potential

This section provides an archaeological assessment of the APE, including the three Resist structures and the DSD locations. Figure 28 is a map keyed to the plates referenced in the following discussion. All of the plates referenced in the report are located in Appendix A. Given that the Resist structures consist of discontinuous segments, for ease of discussion, each segment will be defined and discussed (see Figures 3-5; Figure 29). The discussion of the DSD locations will be presented in Section 9.1.7. Based on the proximity of certain DSD locations, the assessment of these locations will be grouped and jointly discussed.

9.1.1 Resist Structure - Alternative 1

For the purposes of the archaeological assessment, Alternative 1 was divided into five segments—the Weehawken segment which extends from the intersection of Baldwin Avenue and Harbor Boulevard to the southeast and then southerly paralleling Harbor Boulevard and along the shoreline to the boundary of Weehawken and Hoboken; the Northern Segment which extends from the boundary of Weehawken and Hoboken in a southerly and southeasterly trajectory around Weehawken Cove and then along the waterfront to the intersection of 10th Street and FSD; the Southeastern Segment which extends from 4th Street and FSD to 1st Street between River and Hudson streets; the Southern Segment which extends from Hudson Street and Observer Highway to the west and encompasses both Option 1 and Option 2 and includes a small segment along Grove Street just north of the former DLWRR rail line and segments on Henderson Street and 18th Street in Jersey City; and the Southwestern Segment which consists of a sinuous alignment which extends from Newark Street and Jersey Avenue to the west terminating to the immediate west of the HBLR rail tracks. The following discussion will present the documentary review and archaeological assessment of each of these five segments starting from south to north within the Study Area. A component of each of the sheeting is consistent between the three alternatives, it will be discussed in Section 9.1.5, following the discussion of each of the alternatives.

Alternative 1–Southwestern Segment

The Southwestern Segment of Alternative 1 is situated in the northeastern portion of Jersey City. Current design plans for this segment propose two alternative alignments. The majority of the western alignment parallels the HBLR tracks which curve to the northeast immediately north of Coles Street in Jersey City. The eastern alignment is located to the east of the easternmost HBLR tracks and curves to the east and parallel to the HBLR tracks. The alternate alignments conjoin where the track lines meet up. To the west of Jersey Avenue, the western alignment extends through a cleared railroad staging area to the immediate north of a pedestrian pathway to the HBLRR. The eastern alignment also extends through a fenced railroad staging area with ornamental shrub plantings to the immediate west of a pedestrian park. Where the alignments converge, the Southwestern segment extends through the portions of a landscaped pedestrian park and crosses Jersey Avenue. The park includes an ornamental tile









walkway and two areas of shrub grass and trap rock. Ornamental tree plantings are located to the south of the pathway. Subsurface utilities including one manhole are present within the park; a storage and activity yard for the HBLR is located to the immediate west of the park (Plate 1). To the east of Jersey Avenue, the Southwestern Segment parallels and extends to the immediate south of the existing HBLR elevated track bridge over Jersey Avenue. The segment terminates in the northern extent of an electrical substation on the eastern frontage of Jersey Avenue.

Historical Development

The Southwestern Segment of Alternative 1 was undeveloped through most of the mid-nineteenth century. The 1844 U.S. Coast Guard map indicates that this segment was in undeveloped meadowlands to the south and north of an unnamed tributary of the Ahasimus Creek (Figure 30). The segment was predominantly located to the south of the Newark Turnpike; portions of the western extent of the segment, including both alternative routes, segment crossed the turnpike.⁵³⁶ By 1891, the tracks for two railroads were located in the immediate vicinity of the Southwestern Segment–the DLWRR which extended in a north-south direction south of Newark Avenue and a sinuous track which terminated in Weehawken, a branch of the Pennsylvania Railroad. The Southwestern Segment may have intersected both of these rail lines; both alternatives of the western extent of the segment may have extended parallel to the Pennsylvania Railroad and crossed the railroad tracks in the vicinity of Newark Avenue. The western portion of the segment appears to have extended to the immediate north and parallel to or within the northern extent of the DLWRR. Aside from the rail line developments, the majority of this area appears to have remained undeveloped meadowlands.⁵³⁷

G.M. Hopkins & Co.'s 1909 map indicates that the meadowlands had been filled (Figures 31 & 32). The map shows that the eastern edge of the Southwestern Segment intersected with Grain and Straw Buildings located to the immediate south of the DLWRR and on the eastern frontage of Jersey Avenue. On the western frontage of Jersey Avenue, the segment intersected with spur lines of the DLWRR and a Freight House. Both alternatives of the segment then crossed Hoboken Avenue and intersected with the Junction RR, terminating to the immediate south of the DLWRR. The western alternative paralleled the Junction RR for a longer extent than the eastern alternative. The DLWRR was on an elevated track over the Junction RR; footings for the bridge carrying the DLWRR were in the immediate vicinity of the Southwestern Segment. Buildings associated with the Jersey City Branch of the Standard Oil Company were located to the west of the segment.⁵³⁸

G.M. Hopkins & Co.'s 1928 map also indicates that the eastern portion of the Southwestern Segment was located in the vicinity of several outbuildings on the southern frontage of Newark Avenue; this section crossed several spur lines of the DLWRR (Figure 33). The segment then crossed Jersey Avenue to the immediate north of a building associated with the Hoboken Manufacturing Company. The segment then crossed Hoboken Avenue and the Junction RR. The western extent of the segment, to the immediate west and parallel with the Junction RR, was located near a brick structure associated with the Standard Oil Company. Both alternatives of the segment

⁵³⁶ U.S. Coast Guard 1844.

⁵³⁷ Bien 1891.

⁵³⁸ G.M. Hopkins & Co. 1909.











💻 💻 Study Area
— Alternative 1 - Resist Structure
Alternative 1 - Limit of Disturbance
— Alternative 2 - Resist Structure
Alternative 2 - Limit of Disturbance
— Alternative 3 - Resist Structure
Alternative 3 - Limit of Disturbance
Delay, Store, Discharge Element
——— High Level Storm Sewer System

terminated to the immediate south of the DLWRR; the DLWRR train line was located on an elevated platform extending over the Weehawken line of the Junction RR; the footings for a bridge supporting the elevated line were also located in the immediate vicinity of the Southwestern Segment.⁵³⁹

A review of available historic aerial imagery of the region indicates that in 1931, the Southwestern Segment fell within a vicinity of dense development associated with the two rail lines and Newark Avenue. The eastern alternative within the western section of the Southwestern Segment extended through the small triangular area between the rail lines and Newark Avenue; this area appears to have been a cleared work area. In 1954, the area appears relatively unchanged. Aside from the rail lines and Newark Avenue, the Southwestern segment appears to fall within storage yards associated with the railroads or industrial occupations in the area. Structures were located to the southwest of the western portion of the segment through the twentieth century. In 2002, the current motorcycle shop located near the northwestern extent of the segment had been installed. In 2006, the portion of Newark Avenue within the segment had been removed. The DLWRR tracks have been reoriented and curve to the northwest in the former location of Newark Avenue and connected to the former Junction RR. The rail lines were converted for the contemporary HBLR system.⁵⁴⁰

Summary and Conclusions

The cartographic history of the Southwestern Segment of Alternative 1 indicates that the area was undeveloped marshlands through the mid-nineteenth century. Initial development within the area coincided with the development of Jersey Avenue and the extension of both the DLWRR and the Junction RR. Both the DLWRR and the Junction RR lines were initially laid over the meadowlands. The Southwestern Segment does not appear to have been filled until the early-twentieth century. During the early-twentieth century, the eastern portions of the Southwestern Segment were located in the vicinity of grain buildings and other outbuildings associated with industrial and railroad operations; the western alternative of the western portion of the segment was located near a small structure associated with the Standard Oil Company. The segment was also located in the immediate vicinity of several rail spurs and footings to a bridge within the elevated DLWRR track. By 2006, portions of Jersey Avenue had been removed and the railroad tracks of the DLWRR and Junction RR had been rearranged to create the current HBLR system. Aside from railroad features, no other standing structures are currently located within the Southwestern Segment.

In 2000, Joan Geismar conducted archaeological monitoring of a soil boring located in the immediate vicinity of the eastern portion of the Southwestern Segment (Appendix D). The soil boring was conducted so as to provide a profile of the depositional history of the area. This profile would inform upon the fill history and would provide information regarding the geomorphology of the prefilled meadowlands. The soil boring revealed a profile consisting of four layers:

⁵³⁹ G.M. Hopkins & Co. 1928.

⁵⁴⁰ Nationwide Environmental Tile Research, LLC (NETR), *Historic Aerial Imagery*, accessed online March 31, 2016, http://www.historicaerials.com/.

- 1. At a depth of 0-14 feet, historic fill dating to the nineteenth and twentieth centuries;
- 2. At a depth of 14-60 feet, organic silts and find sands associated with the Upper Middle and Late Holocene;
- 3. At a depth of 60-62 feet, Early Holocene fibrous and matted peats; and
- 4. At a depth of 62-68 feet, Late Pleistocene Rahway Till.

The geomorphological analysis of the exposed profile found that the boring reflected a "near uniform sequence of mud flat deposits" with little potential for archaeological deposits.⁵⁴¹

Schuldenrein further noted that:

Archaeological evidence the length of the northeast Atlantic coast converges on the acceleration of differentiated riverine and estuarine site utilization by the onset of the Late Archaic times (after 5000 B.P.)...Such mixed estuarine, brackish, and riverine settings became increasingly attractive during the Woodland period of subsistence specialization. Settlement around coves and along inter-tidal marshes intensified even more around 3000 B.P. as rates of sedimentation finally exceeded rates of submergence of tidal waters.⁵⁴²

The geomorphological analysis found no evidence for such environmental differentiation within the exposed profile. Thus, the area was considered to be an unattractive setting for prehistoric occupation or exploitation and determined to have little to no prehistoric archaeological potential.

Dewberry has also conducted a series of soil borings in the immediate vicinity of the Southwestern Segment (see Appendix D). Borings 432W-71 through 432W-77, located to the east of Jersey Avenue in the vicinity of an electrical substation to the immediate south of the southwestern portions of Alternatives 1-3, reflected a similar profile to that exposed by Geismar. Specifically, these borings had approximately 15 feet of overlying fill which was underlain by a deep deposit of dark gray fibrous organic clayey silt to a depth of approximately 55 feet below the surface. Tan or dark gray sand deposits were found beneath the dark gray clayey silt.

Given the results of Geismar's investigations in a portion of the Southwestern Segment and Dewberry's soil borings within this same vicinity, the segment is not considered sensitive for prehistoric deposits. With respect to historic deposits, the soil boring revealed an overlying fill deposit with landfill and deposits reflecting urban habitation, in addition to foundation and construction debris. Near the surface of the boring, railroad ties and Belgian block were also encountered. The cartographic history of the segment indicates that development of the area was directly tied to the mid to late-nineteenth and early-twentieth century railroad developments. The soil boring profile indicates that landfill, potentially abandoned rail spurs, foundation remains, and railroad-associated activity areas remain extant and potentially intact within the segment. As such deposits could yield information relating to the historic railroad-related landfill and to the historic rail lines within Jersey City and Hoboken, the Southwestern Segment is considered sensitive for historic archaeological deposits associated with the mid to late-nineteenth and early-twentieth century

⁵⁴¹ Geismar 2006, 23-24.

⁵⁴² Geismar 2006, 24.