4.2 Cultural Resources

Regulatory Setting

This section describes the effects on historic properties, both archaeological and historic architectural resources that may result from the construction of the Build Alternatives. Analysis and documentation has been prepared in accordance with Section 106 of the National Historic Preservation Act (NHPA), as amended [16 U.S.C. 470f; 54 U.S.C. 300108, 2015], and its implementing regulations [36 CFR 800.4(a) (1) and 36 CFR 800.4(b) (1)]. This document represents an integrated approach to Section 106 of the NHPA [36 CFR 800.8(a)] and the National Environmental Policy Act of 1969 [42 U.S.C. 4321] and its implementing regulations under the Council on Environmental Quality (CEQ) [40 CFR 1500-1508] (CEQ and ACHP 2013). It has also been prepared in accordance with the New Jersey Register of Historic Places Act (NJRHPA) [N.J.S.A. 13:1B-15.128 et seq.] and the implementing regulations under the NJRHPA Rules [N.J.A.C. 7:4].

Section 106 requires consideration of the effect(s) of any federally funded, permitted, or licensed undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. Likewise, NEPA mandates that federal agencies assess the environmental impacts of federal actions including impacts on historic and cultural resources. Section 106 also provides for identification of individuals and organizations that qualify as consulting parties and that allow for public involvement during the Section 106 consultation process and comment on historic properties. A historic property is 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) (NPS, 1990). Pursuant to Section 106, the analysis of effect of the three Build Alternatives on archaeological and architectural resources is being conducted in consultation with NJHPO and ACHP. Agency correspondence is included in Appendix B.

A study of historic and architectural resources that may be potentially affected by the project was conducted to assess the effects of the undertaking. On May 2, 2016, a Project Initiation Letter (PIL) was submitted to the NJHPO that outlined the Project and funding sources, indicated the Study Area and defined the Areas of Potential Effects (APE), outlined proposed public involvement and listed consulting and interested parties. Concurrence was issued by the NJHPO on June 2, 2016.

By definition, an APE is "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" (36 CFR 800.16d). 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 would be confined to the land designated for construction of the Resist and DSD elements only and would not encompass the entirety of the Study Area. The archaeological APE incorporates the footprints for all three Build Alternatives for Resist structures and encompasses the entirety of the DSD elements. The archaeological APE is shown on **Figure 4.25**. The depth of the APE for archaeological resources extends to bedrock along the Resist alignments and extends to a maximum depth of approximately 12 feet below the surface in areas of DSD infrastructure.

The APE for historic architectural resources includes areas that may contain historic properties that could be directly affected by construction of the Project or indirectly affected (i.e., either by changing the visual context of the historic resource or by affecting the resource from construction vibration). The historic architectural APE for this undertaking is defined as the limits of construction for the proposed Resist elements under consideration for the three Build Alternatives, plus one city block from those proposed elements to account for visual effects. The APE is inclusive of the limit of construction, plus a 90-foot buffer to account for the effects of vibration to historic properties. The historic architectural APE is shown on **Figure 4.26**. The NJHPO concurred with the proposed archaeological and historic architectural APEs on June 2, 2016.

After historic properties in the APE have been identified, Section 106 requires that the criteria of

> *"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..."*

adverse effect is applied. An adverse effect, as defined in 36 CFR 800.5 (a) (1), may occur when an undertaking alters, directly or indirectly, 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. Adverse effects include reasonably foreseeable effects that may occur later in time, be farther removed in distance, or be cumulative. Some examples of adverse effect are: physical destruction of or damage to all or part of the property; alteration of a property; change in the character of the property's use or of physical features within the property's setting that contribute to its historic significance; and introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.

Under the NJRHPA [N.J.S.A. 13:1B-15.128 et seq.], undertakings by state, county, municipality (or any agency or instrumentality thereof) that may encroach on NJRHPA (State Register) listed resources require authorization by the Commissioner of NJDEP. Seven historic resources in the APE are listed in the State

Figure 4.25 Archaeological APE

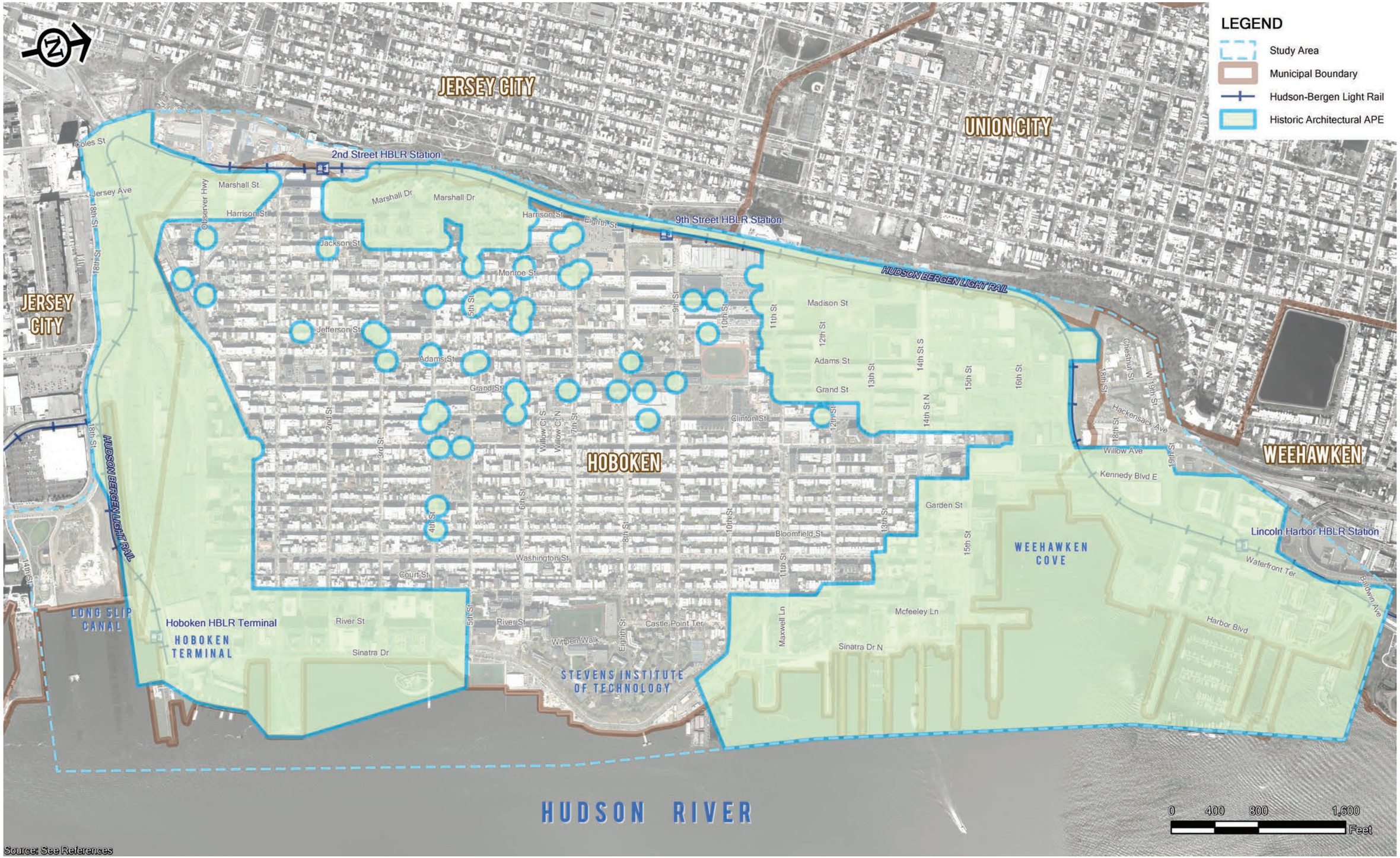


Figure 4.26 Historic Architectural APE

Register. NJHPO had determined that, based on the conceptual plans presented in the Cultural Resources Technical Environmental Study (TES) (Dewberry 2016) and subsequent meetings, the Project would not result in direct effects to State Register-listed historic properties. Should future Project design plans change, resulting in an encroachment (defined as undertakings which adversely affect State Register-listed properties) on one or more state-listed historic resources, then the Project would be subject to review under the NJRHPA and an application for project authorization would be required.

4.2.1 Methodology

As part of the cultural resource analysis, background research was conducted and a field investigation was performed. Results of this research are reported in detail in the Cultural Resources TES (Dewberry 2016).

4.2.1.1 Methodology for Phase IA Archaeological Assessment

As part of the cultural resource assessment, contextual overviews of prehistoric and historic resources were completed to establish a baseline upon which the significance of potentially important historic properties within the APE could 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 time–is 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," (National Park Service 1995).

In developing contextual studies for the archaeological assessment, 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 were used as reference guides (Historical Perspectives, Inc. and Louis Berger 2004; Transit Link Consultants 2008). The Hudson Yards Phase IA was used as a heuristic model for this assessment, 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 that may be evidenced by cultural resources within a large urbanized project area like the current Study Area. The Phase IA for the ARC project found that the subjective and ambiguous nature of National Register eligibility 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. Based on the history of development within the Study Area, the following larger contexts were identified to be important: (1) prehistory; (2) commercial; (3) residential, sewage, and water; (4) institutional; (5) industrial; (6) cemeteries and churches; (7) docks, wharves, and landfill; and (8) transportation.

For the prehistoric context study, a prehistoric overview and discussion of previously identified prehistoric archaeological sites within the Study Area was completed (Dewberry 2016). This analysis provided the basis for assessing the potential for encountering prehistoric archaeological resources within the Study Area. For the historic context studies, a historic overview of the development of each respective context within the Study Area was discussed. Case studies drawn from previously conducted cultural resource investigations were presented 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 on the mid-nineteenth through early-twentieth centuries–

Based on the history of development within the Study Area, the following larger contexts were identified to be important: (1) prehistory; (2) commercial; (3) residential, sewage, and water; (4) institutional; (5) industrial; (6) cemeteries and churches; (7) docks, wharves, and landfill; and (8) transportation.

the height 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 Archives in Trenton, examination of historic maps and histories 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

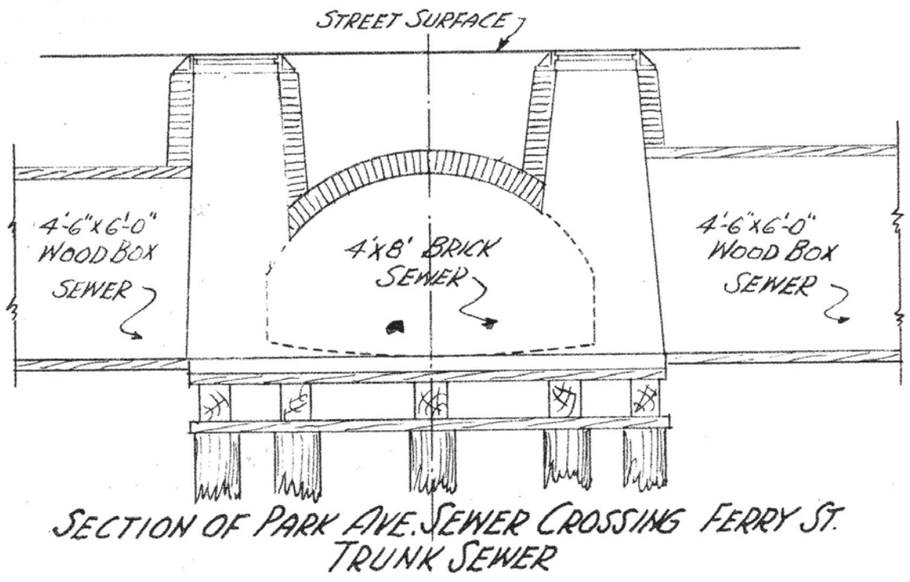


Figure 4.27 Plan and Profile of Sewer in Ferry St. from Hudson Street to Jefferson St.- Whittemore 1940

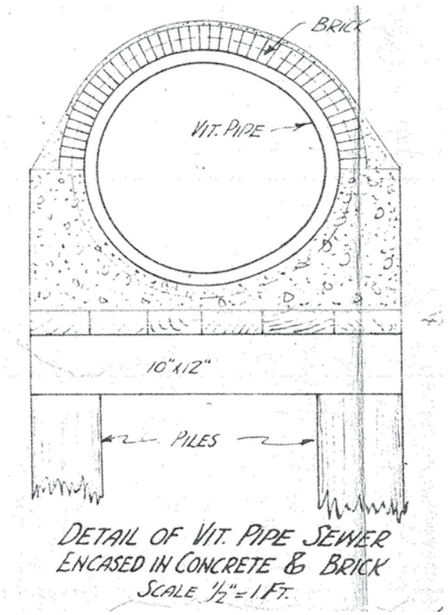


Figure 4.28 Detail of brick sewer in Newark St. from Park Ave. to Harrison St., Whittemore 1940.

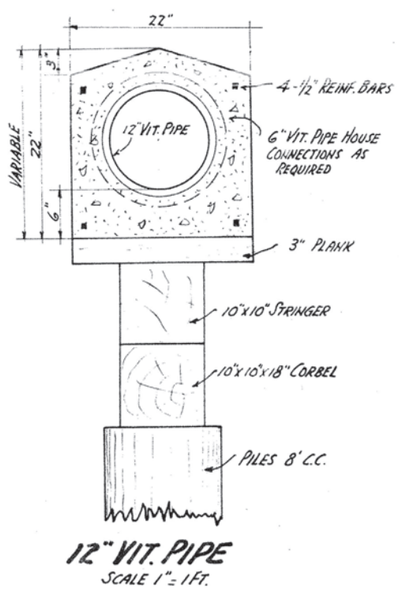


Figure 4.29 Detail of Adams St. sewer Between 13th & 17th St., Whittemore 1940

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 to reconstruct the pre-urbanization and pre-development 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. The NHSA also provided the 1940 As-Built plans for the Hoboken Sewer System (see **Figures 4.27 through 4.29)** and their contemporary GIS data (Whittemore 1940; NHSA 2016). The source material for their GIS data was unknown and 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. 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. 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 Build Alternative (including Resist and DSD), 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 effects to any identified areas of archaeological sensitivity; and
- recommend potential project mitigation measures, if necessary.

Ultimately, with respect to each Build 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 Build Alternative was conducted on June 24, 2015, March 24, March 30, April 5, and April 11, 2016. The site inspections were aimed at identifying any previously documented archaeological resources and locating surface indications that would suggest the presence of archaeological resources. 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 photodocument portions of each Resist element and each DSD location (see **Photograph 4.7** for location example and **Figure 4.30** for DSD schematic example). Photographs of the APE are contained in the Cultural Resource TES (Dewberry 2016).

4.2.1.2 Methodology for Historic Architectural Eligibility & Effects Survey

Once the APE was established, a list of previously known historic architectural properties and those resources eligible for or listed in the State/National Registers was complied. Additionally, a list of those properties that have potential to meet the eligibility criteria as historic properties was also compiled. 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 New Jersey 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 deed records at the Hudson County Register'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 (Zingman 1978). Additional background research included a review of relevant primary and secondary data including maps, historic accounts, and internet sources. NJHPO Architectural Survey Forms were completed for newly surveyed resources and submitted for review and comment (NJHPO correspondence October 28, 2016 and December 12, 2016; Marcopul 2016). The report and a copy of the survey forms are contained in Attachment 5. Section 4.2.1.4 contains a list of the known historic properties for the Project. Unless individually eligible or listed in the State and/or National Registers, properties within historic districts are not individually represented in the table. A brief overview of each historic property is provided under Existing Conditions.

Criteria for listing in the State and National Registers are found in 36 CFR 60.4. According to the criteria for evaluation, districts, sites, buildings, structures, and objects are eligible for the National Register if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and: 1) Are associated with historic events (Criterion A); 2) Are associated with significant people (Criterion B); 3) Embody distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic value; or are otherwise distinguished (Criterion C); or 4) May yield information important in prehistory or history (Criterion D). Properties that have achieved significance within the last 50 years are ordinarily not eligible. Opinions of eligibility are made by the NJHPO.

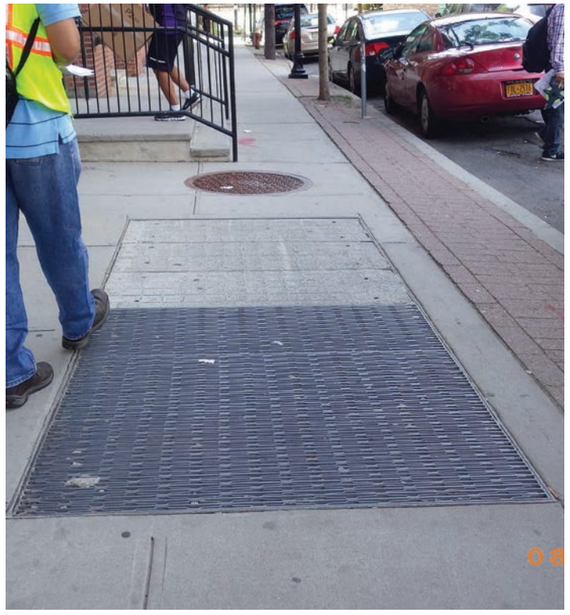
4.2.2 Existing Conditions

4.2.2.1 Previously Identified Archaeological Resources

Previous Cultural Resource Studies

Research conducted at the NJHPO revealed that nearly 100 cultural resource studies have been conducted within the Study Area and its vicinity. The majority of the previously conducted archaeological studies consist of Phase IA assessments.

Several past cultural resource investigations within the Study Area including archaeological assessments, monitoring reports, and soil borings have been conducted in association with the Hudson-Bergen Light Rail (HBLR). As a result of these investigations, the log cribbing and relatively clean landfill associated with the Long Slip Canal was exposed; the stratigraphic profile and history of marsh formation within the southwestern corner of the Study Area was identified; and at least one brick foundation pier associated with an historic elevated train line was documented (Geismar 2006, 2004a, 2004b). Other studies have identified intact historic wooden and



Photograph 4.7 Field reconnaissance for potential DSD location

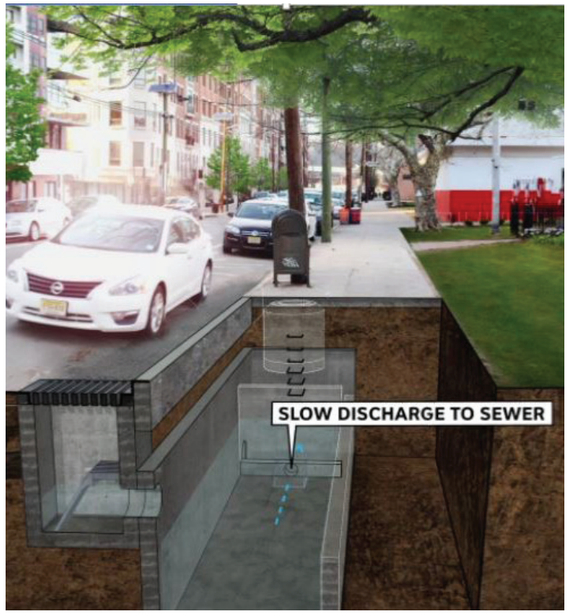


Figure 4.30 Small ROW tank location schematic

Table 4.12 Previously Identified Archaeological Sites within One Mile of the Study Area

SOURCE	SITE #	NAME	CHRONOLOGY/NOTES	LOCATION TO STUDY AREA
NJSM	28-Hd-008		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

Source: New Jersey State Museum. Archaeological Site Files. On file, Trenton: New Jersey State Museum, varies.

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. 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 (RGA 2015b, 2015a, 2006a, 2005a, 2005b, 2006d).

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 (see **Table 4.12**). None of these sites were located in or adjacent to the Study Area. Only one of the previously recorded sites, 28-Hd-008 (identified by Indian Site Surve), represented prehistoric archaeological resources, the remaining three sites dated to the mid- to late-nineteenth century. 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. No further description was provided for the site (New Jersey State Museum).

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 to be eligible for listing in the National Register.

4.2.2.2 Assessment of Archaeological Potential

Table 4.13 summarizes the potential for encountering archaeological resources for each of the three Build Alternatives. A detailed analysis of potential historic and prehistoric archaeological resources within the Study Area is contained in Section 9.0 of the Cultural Resources TES (Dewberry 2016). Due to the substantial amount of information synthesized in determining the archaeological potential, the Resist infrastructure for each alternative is divided into segments. These segments are depicted in **Figure 4.31**. Alternative 1 was divided into five segments: Weehawken, Northern, Southeastern, Southern, and Southwestern. Alternatives 2 and 3 were divided into four segments: Weehawken, Northern, Southwestern, and Southern. As **Table 4.13** reflects, there were several potential archaeological resource types identified within the archaeological APE–prehistoric, plank roads, historic sewers, residential, and industrial and waterfront-related deposits.

4.2.2.3 Archaeological Resource Types

Prehistoric

No previously identified prehistoric sites were identified within the archaeological APE. One previously identified prehistoric site is located approximately one mile to the southwest of the APE. 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. 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, Richard Grubb Associates (RGA) observed that the site may also contain an Archaic component (RGA 2005b).

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 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

Table 4.13 Assessment of Archaeological Sensitivity

ALT.	SEGMENT	ARCHAEOLOGICAL SENSITIVITY/POTENTIAL CULTURAL RESOURCES WITHIN HORIZONTAL AND VERTICAL APE (FEET BELOW SURFACE [FBS])	ACREAGE
1	Southwestern	Mid to late 19th to early 20th Century DLWRR Railroad and Industrial Deposits; early 20th Century Freight House and structure associated with Standard Oil Company (0-14 fbs)	1.15
1	Southern	Prehistoric deposits (15-35 fbs); Option 1: mid to late 19th to early 20th Century DLWRR Railroad & Erie-Lackawanna Terminal Deposits; Deposits associated with Long Slip Canal and railroad-related landfill (0-14 fbs); Option 2–late 19th to early 20th century sewer-related deposits (>3.5fbs); Portions of Options 1 & 2 sensitive for deposits associated with National Register eligible PATH Tunnel (>60fbs)	Option 1: 1.88 Option 2: 1.85
1	Southeastern	Mid to late 19th century residential remains; late 19th to early 20th century waterfront and landfill remains; late 19th to early 20th century sewer-related deposits; early 20th century stone retaining wall (>4 fbs)	0.88
1	Northern	Weehawken Cove sensitive for prehistoric deposits (>15fbs); mid to late 19th to early 20th century waterfront development between 10th and 12th Streets (0-15 fbs); 11th and 14th Street late 19th to early 20th century sewer line (4-8 fbs); waterfront/dry docks development around Weehawken Cove (0-15 fbs); potential for 17th to early 20th century shipwrecks within Weehawken Cove (>15 fbs)	3.13
1	Weehawken	Weehawken Cove and far northern portion sensitive for prehistoric remains (>15 fbs); potential 18th to early 19th century Weehawken Ferry (>15 fbs); mid-19th to early 20th century waterfront development associated with Erie Freight Terminal (0-15 fbs); and potential for 17th to early 20th century shipwrecks within Weehawken Cove (>15 fbs); possible 19th Street outlet sewer (4-8 fbs)	2.90
1 Sheeting		Prehistoric deposits within portions of the eastern sheeting (15-35 fbs); early to mid-20th century structures associated with meat packing industry, early 20th century Grain and Straw building, early to mid-20th century ice platform and ice house, railroad-related landfill within western sheeting (0-15 fbs); Early to late 20th century DLWRR signal tower in eastern sheeting (0-15 fbs)	0.10
1	DSD T7-OBS	Mid to Late 19th Century Brick Sewer Line within Observer Highway (3-7.5fbs)	0.002
1	DSD T5-OBS	Mid to Late 19th Century Brick Sewer Line within Observer Highway (2.5-8fbs)	0.002
1	DSD T3-OBS	Mid to Late 19th Century Brick Sewer Line within Observer Highway (3.5-9fbs)	0.002
1	DSD TD4-OBS	Mid to Late 19th Century Brick Sewer Line within Observer Highway (7-12fbs)	0.002
1	DSD TD8-GAR	Mid to Late 19th Century Circular Brick Sewer Line within Observer Highway (4-7fbs)	0.001
1	DSD T1-NEW	Mid to Late 19th Century Wood Sewer Line within Newark Avenue and Egg-Shaped Brick Sewer within Willow Avenue(2.5-8.5fbs)	0.002
1	DSD T3-3ST	Mid to Late 19th to Early 20th Century Wooden Sewer Line within 3rd Street (5.5-11fbs)	0.002
1	DSD T9-ADM	Late 19th to Early 20th Century Brick Sewer Line within Adams Street (3.7-5fbs)	0.002
1	DSD T5-JAC	Late 19th to Early 20th Century Brick Sewer Line within Jackson Street (8-17fbs)	0.002
1	DSD T4-4ST	Late 19th to Early 20th Century Brick Sewer Line within Madison Street (3.5-9fbs)	0.002
1	DSD T3-4ST	Late 19th to Early 20th Century Brick Sewer Line within Adams Street (3-7fbs)	0.002
1	DSD TD14-CLA	Mid to Late 19th Century Wood Sewer Line within Clinton Street (5-8.5fbs)	0.002
1	DSD TD1-WIL	Mid to Late 19th Century Brick Sewer Line within Willow Avenue (2.5-8.5fbs)	0.002
1	DSD TD6-WIL	Mid to Late 19th Century Brick Sewer Line within Willow Avenue (2.5-8.5fbs)	0.002
1	DSD T1-GAR	Mid to Late 19th Century Brick Sewer Line within Garden Street (5-9.5fbs)	0.002
1	DSD T2-BLM	Mid to Late 19th Century Brick Sewer Line within Bloomfield Street (4-6fbs)	0.002
1	DSD T16-MAD	Late 19th to Early 20th Century Brick Sewer Line within Madison Street (3.5-9fbs)	0.001
1	DSD T15-MAD	Late 19th to Early 20th Century Sewer Line within Madison Street (3.5-9fbs)	0.002
1	DSD T8-ADM	Late 19th to Early 20th Century Sewer Line within Adams Street (3-7fbs)	0.002
1	DSD T6-GND	Late 19th to early 20th Century wooden sewer line within Grand Street (3-7.5 fbs)	0.002
1	DSD TD23-CLA	Late 19th to Early 20th Century Brick Sewer Line within Clinton Street (5-8.5fbs)	0.002
1	DSD T7-MON	Late 19th to Early 20th Century Brick Sewer Line within Monroe Street (5-11fbs)	0.002
1	DSD T5-GND	Late 19th to Early 20th Century Brick Sewer Line within Grand Street (3.3-6.5fbs)	0.002
1	DSD T6-ADM	Early 20th Century Brick Sewer Line within Adams Street (2.5-6fbs)	0.001
1	DSD TD31-CLA	Late 19th to Early 20th Century Brick Sewer Line within Clinton Street (4-8fbs)	0.001
1	DSD Block 10	Mid-19th Century Paterson Plank Road (>4fbs)	0.29
1	DSD BASF Site (Pipe)	Early to mid-20th Century Dry Docks Development along Weehawken Cove	0.30
1		Total Acreage of Archaeological Potential	Option 1: 10.32 Option 2: 10.29

Table 4.13 Assessment of Archaeological Sensitivity (continued)

ALT.	SEGMENT	ARCHAEOLOGICAL SENSITIVITY/POTENTIAL CULTURAL RESOURCES WITHIN HORIZONTAL AND VERTICAL APE (FEET BELOW SURFACE [FBS])	ACREAGE
2	Southwestern	Portions overlap with Alternative 1: mid to late 19th to early 20th century DLWRR Railroad and Industrial Deposits (0-14 fbs); Eastern portion early to mid-20th century deposits associated with freight station and early 20th century poultry platform (4-10 fbs)	0.92
2	Southern	Portions overlap with Alternative 1: Prehistoric deposits (15-35 fbs); Option 1: mid to late 19th to early 20th century DLWRR Railroad & Erie-Lackawanna Terminal Deposits; Deposits associated with Long Slip Canal and railroad-related landfill (0-14 fbs); Western portion of Option 2–late 19th century brick sewer deposits (3-5 fbs); Portions of Options 1 & 2 sensitive for deposits associated with National Register eligible PATH Tunnel (>60 fbs)	Option 1: 1.88 Option 2: 1.99
2	Northern	Early 19th century seawall and mid-19th century historic structure (15-17 fbs); late 19th to early 20th century waterfront development and industrial development (>10 fbs); late 19th to early 20th century sewer line (5-8.5fbs) along Washington Street around 14th Street; around Weehawken Cove sensitive for prehistoric deposits below 9 fbs; potential for 17thto early 20th century shipwrecks within Weehawken Cove at depths greater than 15 fbs	1.51
2	Weehawken	Weehawken Cove and northern portion of segment sensitive for prehistoric deposits (>9 fbs); potential for 17th to early 20th century shipwrecks within Weehawken Cove (>15 fbs); mid-19th to early 20th century waterfront development associated with Erie Freight Terminal; possible 19th Street outlet sewer (4-8 fbs)	1.44
2 Sheeting		Same as Alternative 1	0.10
2 HLSS	South	Mid to late 19th century slip/basin along River Street between 1st and 3rd Streets (8-18 fbs); possible late19th to early 20th century brick sewer along Newark Street in vicinity of 3rd Street and River Street (~5fbs)	0.96
2 HLSS	North	Early 19th century seawall at Hudson Street around 13th Street and at the intersection of Washington and 14th streets (15-17 fbs); mid to late19th century structures in vicinity of Washington and 13th streets (15-17 fbs); early to mid-20th century waterfront development and industrial development, including Vanderbilt & Schill Lumber Yard and the Jagels & Bellis Coal Company, along northern portion of Washington and Bloomfield streets, north of 14th Street, and the 14th Street DLWRR Ferry House and pier (<10 fbs); late 19th-early 20th century sewer line around 14th Street (5-8.5 fbs)	1.56
2	DSD	Same as Alternative 1	See Above
2		Total Acreage of Archaeological Potential	Option 1: 8.96 Option 2: 9.07
3	Southwestern	Same as Alternative 1: mid to late 19th to early 20th Century DLWRR Railroad and Industrial Deposits (0-14 fbs)	1.15
3	Southern	Alternative 2: Portions overlap with Alternative 1: Prehistoric deposits (15-35 fbs); Option 1: mid to late 19th to early 20th century DLWRR Railroad & Erie-Lackawanna Terminal Deposits; Deposits associated with Long Slip Canal and railroad-related landfill (0-14 fbs); Western portion of Option 2–late 19th century brick sewer deposits (3-5 fbs); Portions of Options 1 & 2 sensitive for deposits associated with National Register eligible PATH Tunnel (>60 fbs)	Option 1: 1.88 Option 2: 1.99
3	Northern	Early 19th century seawall (15-17 fbs); mid to late 19th century structures (15-17 fbs); late 19th to early 20th century waterfront development and industrial development (>10 fbs); late 19th to early 20th century sewer line around 14th Street (5-8.5 fbs); around Weehawken Cove sensitive for prehistoric deposits (>9 fbs); potential for 17th to early 20th century shipwrecks within Weehawken Cove at depths (>15 fbs)	1.67
3	Weehawken	Majority of segment sensitive for prehistoric remains (>12 fbs); mid-19th to early 20th century waterfront development associated with Erie Freight Terminal; portion of segment sensitive for potential mid to late-nineteenth century historic structures associated with Hoboken Land & Improvement Company; possible 19th Street outlet sewer (4-8 fbs)	0.94
3 Sheeting		Same as Alternative 1	0.10
3 HLSS	South	Same as Alternative 2	0.96
3 HLSS	North	Same as Alternative 2	1.56
3	DSD	Same as Alternative 1	See Above
3		Total Acreage of Archaeological Potential	Option 1: 8.24 Option 2: 8.36
3	Weehawken	Majority of segment sensitive for prehistoric remains (>12 fbs); mid-19th to early 20th century waterfront development associated with Erie Freight Terminal; portion of segment sensitive for potential mid to late-nineteenth century historic structures associated with Hoboken Land & Improvement Company; possible 19th Street outlet sewer (4-8 fbs)	0.82
3 Sheeting		Same as Alternative 1	0.10
3 HLSS	South	Same as Alternative 2	0.96
3 HLSS	North	Same as Alternative 2	1.56
3	DSD	Total Acreage of Archaeological Potential	See Previous Page
3			Option 1: 14.7 Option 2: 14.8

Source: Dewberry. 2015-2017

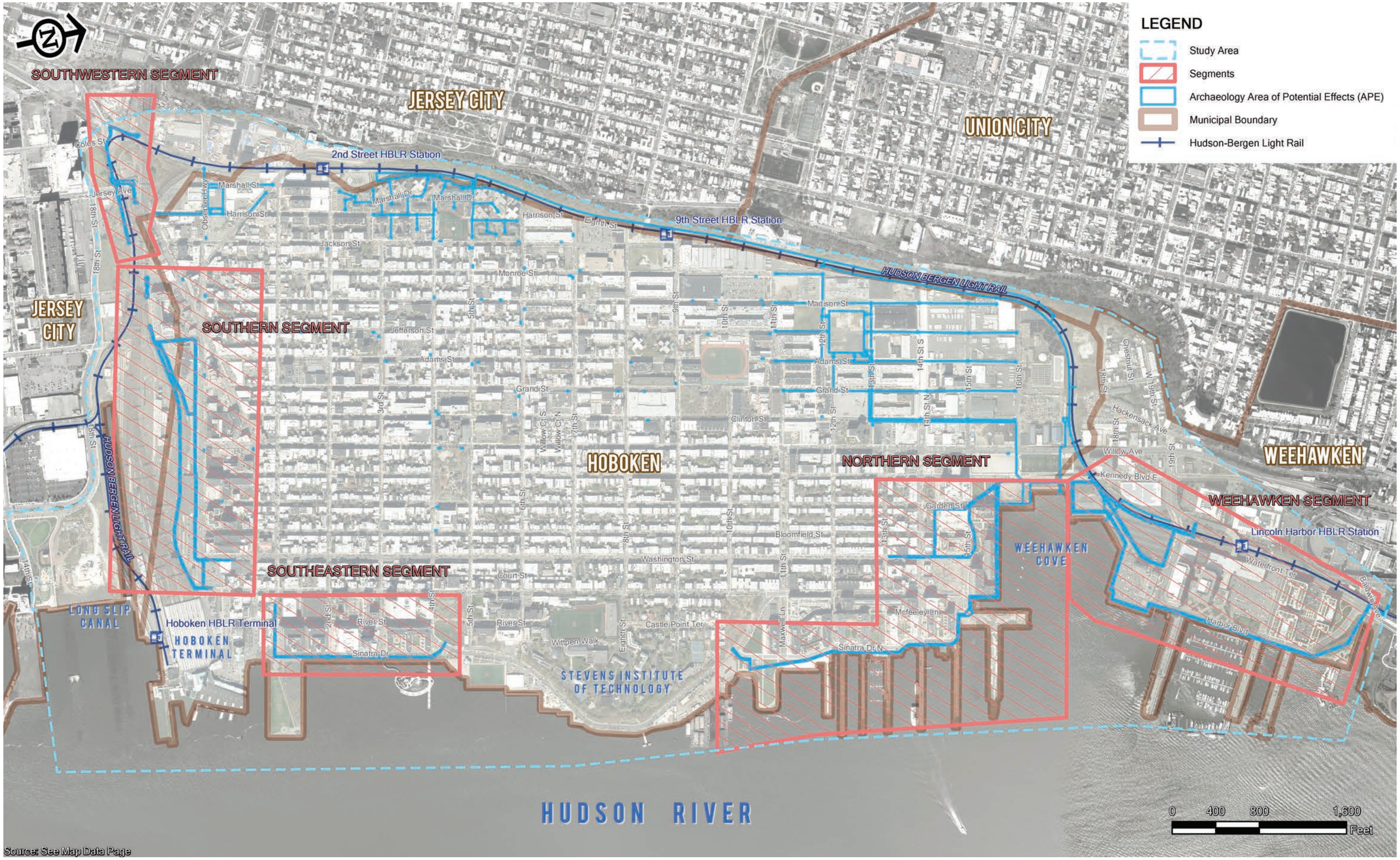


Figure 4.31 Segments of the Archaeological APE

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 (see **Figure 4.32**). 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 advance of construction for the Second 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 Second 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 (GRA 2008).

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

Figure 4.32 Reproduction of Bailey and Ward, City of Hoboken, 1881

harbor had moderate to high potential for preserving intact deposits pre-dating 6000 B.P. 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 archaeological APE, adjacent to Jersey Avenue and north of 18th Street in Jersey City. This profile illustrated the history of filling in the area and also provided 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.

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. 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 (Geismar 2006)."

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 portions of the archaeological APE 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 in Weehawken to the west of Port Imperial Boulevard suggest that the profile exposed by Geismar's boring may not be uniform throughout the archaeological APE. 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 (RGA 2002, 2006a).

Although RGA did not identify any prehistoric artifacts or features within the organic surfaces they exposed, they 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 and continuous deposit across the entire region. Rather there appears to have been diversity in past environmental and geomorphological processes within the area which may have resulted in the creation of attractive settings for prehistoric exploitation and occupation.

In Chapter 9 of the Cultural Resource TES (Dewberry 2016), available soil boring data for the archaeological APE was reviewed. This data, along with a review of land use history and predevelopment and historic topographic maps of the region, was used to create a picture of the potential Holocene conditions within the APE. These conditions were then assessed in light of the environmental variables that have been previously associated with known prehistoric settlements and/or occupations. Through this analysis, several locations were determined to have the potential to contain deeply buried landforms potentially sensitive for prehistoric deposits. If intact prehistoric occupation surfaces or deposits were identified within the archaeological APE, 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.

> *Geismar's work...suggests that portions of the archaeological APE have little to no sensitivity for prehistoric deposits .... However, RGA's archaeological investigations in the northern portion of Hoboken, suggests ...processes within the area ...may have resulted in the creation of attractive settings for prehistoric exploitation and occupation.*

Plank Roads

John Hills' 1781 Sketch Map of the Northern Parts of New Jersey indicates the presence of a historic toll road extending from the north to the southeast and terminating at Hoebuck (Hoboken). 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 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 Company in the early-nineteenth century (Van Winkle 1921). 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 archaeological APE and the Bergen Turnpike extending across the southeastern and central portions of Hoboken (Burr 1832) (see **Figure 4.33)**. The Bergen Turnpike extended to the west of the archaeological APE in Weehawken.

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 use of plank roads became unpopular by the 1860s. However, portions of the Bergen Turnpike/ Hackensack Plank Road maintained tolls for several more decades (see **Figure 4.34)**. Present-day Washington Street follows much of the historic alignment of the Bergen Turnpike (RGA 1998). Present-day Paterson Avenue is a remnant of the historical route of the Paterson Plank Road. 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 (Sypko 1980).

With respect to historic plank roads and turnpikes, portions of the Newark Turnpike, the Hackensack Plank Road, and the Paterson Plank Road are located within the archaeological APE. 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 Newark Turnpike was located in the vicinity of present-day Newark Street. On the basis of available soil boring data, it was determined that any deposits associated with Newark Turnpike or the Hackensack Plank Road would be located beneath the depth of disturbance associated with proposed DSD sites in these locations. Therefore, such DSD sites were not considered sensitive for historic roadway deposits. The Paterson Plank Road is currently an asphalt-surfaced street on the western extent of the city, Paterson Avenue. It is possible that portions of the Paterson Plank Road may remain

Figure 4.33 Map of the city and county of New York, Burr 1832; Red Arrow points to Paterson Planck Road

Figure 4.34 Plank Road Hoboken Meadows toll Plank Walk, 4th and Willow Avenue to foot of hill Between 7th and 8th Streets, circa 1890

extant beneath the current paved surface. Therefore, the northern portion of DSD location Block 10 is considered sensitive for deposits associated with the Paterson Plank Road.

Historic Sewers

The extensive meadowlands within Hoboken created drainage and sewage concerns with increasing settlement and development of the city in the mid-nineteenth century. As a result, the city adopted a tidal sewer system in 1860. The tidal sewer system was designed to work in concert with tidal cycles. The sewer outlets were constructed at an elevation 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 (RGA 2015b). 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 (RGA 2015b; McCann and Fteley 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 (presently Oberserver Highway) and 1st streets. 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 boxes (4 feet by 8 feet). In 1868, Hoboken's sewer commission also entered into agreement with the Morris & Essex Railroad "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." This sewer would allow for the meadows to drain to the south and into the railroad basin (RGA 2015b; New Jersey State Legislature 1868).

Soon after the installation of the tidal box sewer system within the meadows, the system was found to be inadequate and insufficient to meet the drainage needs of the meadowlands. At this time, 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 an 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 (Van Winkle 1921; RGA 2015b).

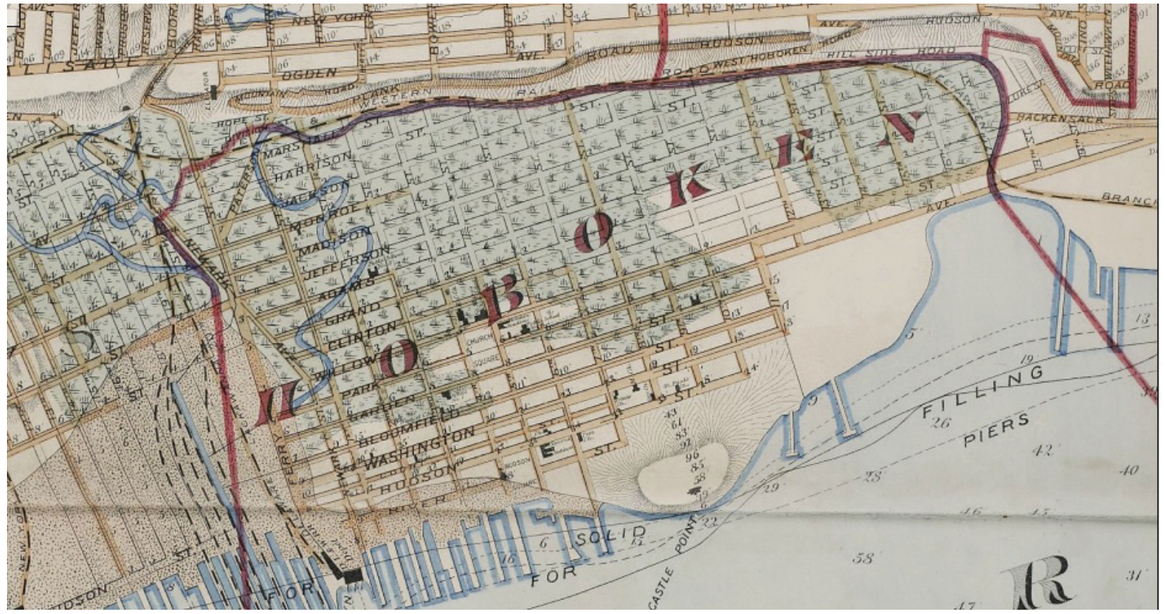


Figure 4.35 Topographical Map of Hoboken, Speilmann and Brush 1880

In 1880, Speilmann and Brush produced a topographical map in association with the Board of Health's sanitation study (see **Figure 4.35)**. 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 Delaware Lackawanna and Western Railroad (DLWRR) to the south (Speilmann and Brush 1880).

The sanitation study found 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 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" (RGA 2015b; New Jersey Board of Health 1880).

The Hoboken City Council commissioned several studies over the next three decades in hopes of

Photograph 4.8 Exposed Wood sewer, RGA 2015

solving the drainage issues within the meadows. Ultimately, despite critical assessments of the sewer system in 1890 and 1912, none of the proposals to fix the system with the installation of pump sewage systems were adopted and sewers continued to be built as before. By 1891, 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 (Van Winkle 1921; RGA 2015b).

Previous archaeological studies within the city have observed and documented intact portions of the historic sewer line, including both wooden and brick features (see **Photograph 4.8)**. The historic sewer line is considered a significant historic resource by the NJHPO. It is highly likely that additional components of this original sewer system remain extant within portions of the archaeological APE. Such features, if uncovered, should be photo documented and recorded as previous studies have done.

Residential

Hoboken experienced extensive residential development 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; as noted previously, it would ultimately develop in a piecemeal fashion to drain the meadows throughout the western and northern portions of the city. A historic account of the sewage system 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 archaeological APE. Potential nineteenth century residential buildings were identified in three locations within the archaeological APE–in the southeastern segment of Alternative 1 around 1st Street; within the location of the high level storm sewer in the vicinity of Washington and 13th Streets; and in the northern segment of Alternative 3, around Garden Street and the alley north of 14th Street. 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.

Industrial & Waterfront

The Cultural Resource TES (Dewberry 2016) provides a detailed discussion of the industrial and waterfront development within the area in the nineteenth through twentieth centuries. Hoboken was considered an important industrial, shipbuilding, and shipping city in the late-nineteenth through the early to mid-twentieth century. Prior to this industrial development, slips were built in the northeastern and southeastern extent of the Study Area to service eighteenth and early nineteenth century freight and passenger traffic.

During the mid-nineteenth century, several transatlantic shipping companies established themselves in Hoboken. 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. 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. This terminal, used to move coal, grain, and petroleum, was built adjacent to the Venango Oil Works in Weehawken. 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. 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" (Dolan Research, Inc. 1997).

G.M. Hopkins & Co.'s 1909 Map of Hoboken illustrates the extensive waterfront development by the early-twentieth century (see **Figure 4.36**). 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 serviced a ferry to 23rd Street in New York City. The Hudson Land and Improvement Company maintained the 15th Street Pier and the Scandinavian American Line Pier was located to the north.

A series of nine dry docks associated with the Tietjen & Lang Dry Dock Company occupied Weehawken Cove. 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 (Hoboken Historical Museum 2016) (see **Figure 4.37**). To the immediate north of the Tietjen docks was the Erie Freight Terminal, labeled as the Erie Rail Road Company Weehawken Yard. Several piers were associated with this complex, Piers A through I.

The industrial economy of Hoboken continued to expand throughout the twentieth century. From 1900 to World War I, more than 250 manufacturing plants were opened in Hoboken. Much of the industrial growth within Hoboken was concentrated on the western side of the city, along basically the entire north-south length of the city west of Clinton Street (Hoboken Planning Board 2004; Hughes and Bailey 1904). (see **Figure 4.38**).

During the early to mid-twentieth century, the primary industry in Hoboken was shipbuilding and ship repair. Despite shipbuilding's primacy, several other industries were pursued within the city. Industrial development along Hoboken's waterfront was spurred by the actions of the Hoboken Land and Improvement Company. From 1912 to 1913, the company constructed the initial structure of a complex of modern manufacturing loft buildings between 15th Street and Weehawken Cove. In total, the Hoboken Land and Improvement Company constructed a complex of six Factory Terminal Loft Buildings. By the

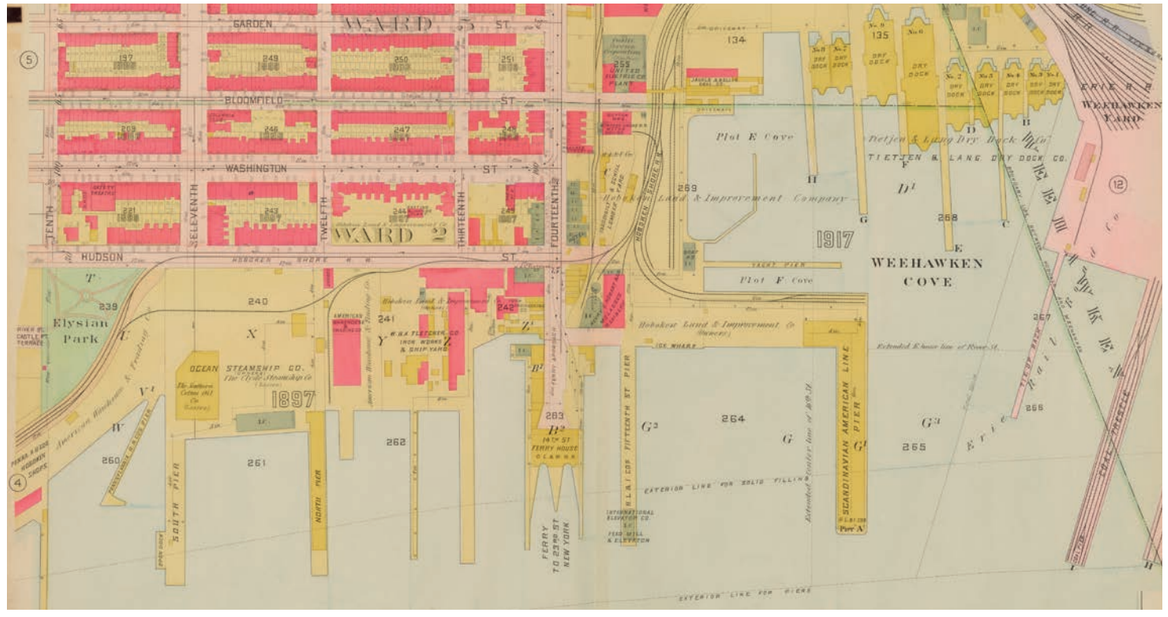


Figure 4.36 Waterfont Development, Hopkins, 1909

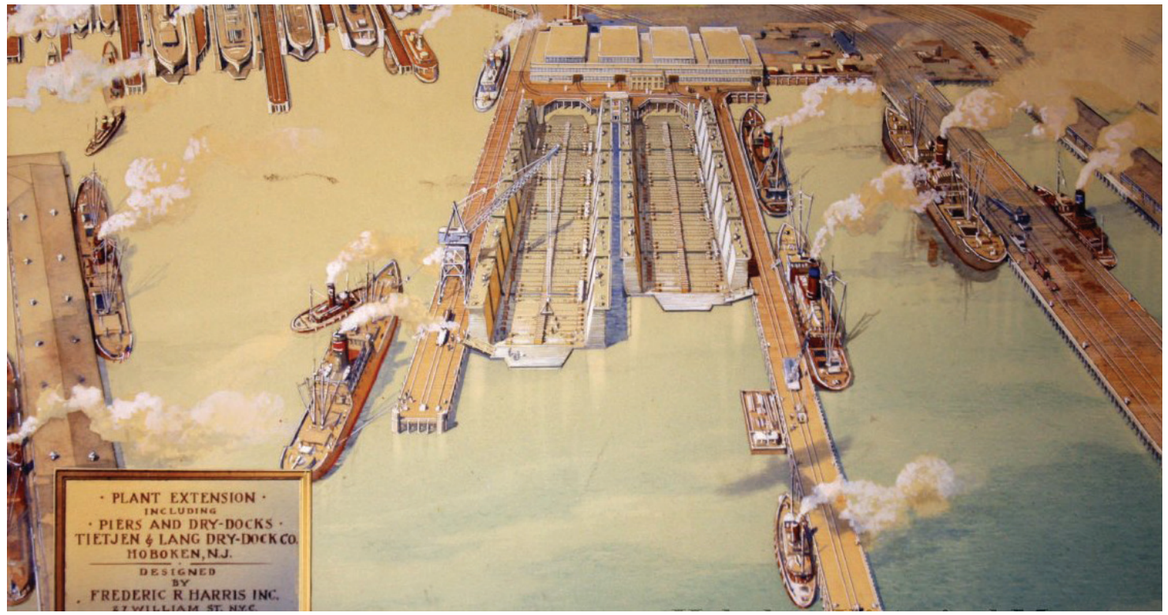


Figure 4.37 Image of Tietjen and Lang circa 1942

Figure 4.38 Artist depiction of expanding industry in city of Hoboken, Hughes and Bailey, 1904

1940s, Standard Brands had acquired Buildings D, E, and F and General Foods had acquired Building A. 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 in Hoboken to be built in a modernist Bauhaus style (Hoboken Board of Trade 1914; Garbarine 2000; Gabrielan 2010).

In the early and mid-twentieth century, the area in the vicinity of Henderson Street, Observer Highway (formerly 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 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. By 1951, the meat-packing plant of Ben Grunstein & Sons was located at 500-504 Observer Highway. These buildings were demolished by 1979 (Sanborn Insurance Maps 1891 and 1937; Zingman 1978).

Hoboken's shipyards positioned Bethlehem Steel to handle the demand for shipbuilding services resulting from the efforts of the federal government to build up the United States Navy around World War II. During World War II, Bethlehem Steel was the largest ship builder in the world and expanded its 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. By 1963, the former Fletcher shipyard was Bethlehem Steel's only remaining repair facility within New York (Porter et al 1994; Mitchell 1981).

During the nineteenth and twentieth centuries, multiple industries including bottleworks, chemical companies, clothing factories, confectioneries, shipyards, and ironworks were located in Hoboken and played a prominent role in its development. Within the archaeological APE, industrial development associated with the meat packing industry occurred in the southern portion of Hoboken; warehouse development occurred along the northeastern extent of the city; and shipyard development was concentrated in the northern portion of the city and along Weehawken Cove. In addition, 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 reflects a natural bay, there is a likelihood that this area was frequented by ship traffic prior to its mid- to late-nineteenth century development. Therefore, these portions of the archaeological APE have the potential for industrial and/or waterfront-related archaeological deposits.

With respect to shipyard deposits, previous archaeological studies have shown 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 (Moser 2011). Thus, it is possible that deposits associated with the historic W. & A. Fletcher & Company, the subsequent Bethlehem Steel Company, and the Todd Shipyard Corporation along the northern waterfront have been removed or seriously compromised by redevelopment

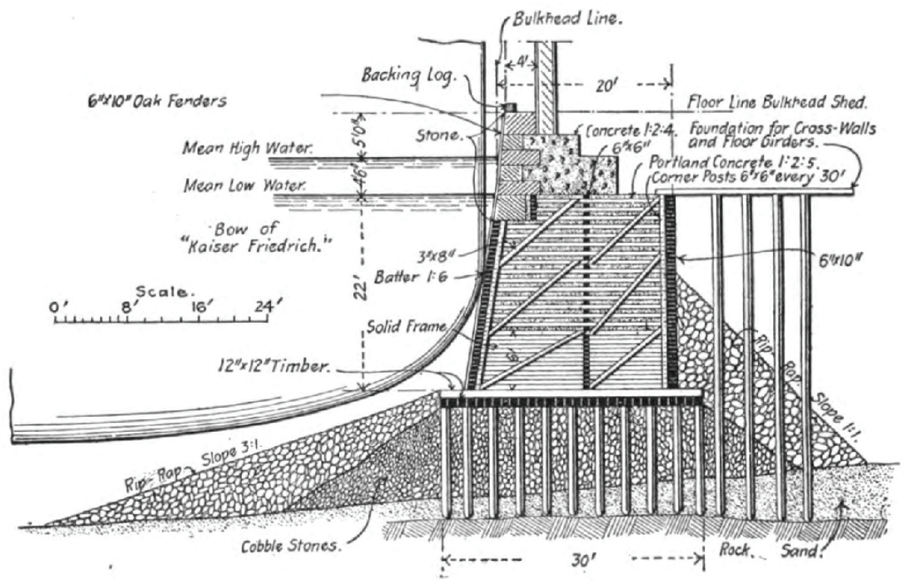


Figure 4.39 Historic Illustration of Crib Wall with Concrete Filling, North German Lloyd Co., Hoboken, NJ., 1917

of the shipyard sites. Similarly, recent development throughout the archaeological APE, 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 shipyards are extant, such remains could potentially reflect the infrastructure within the shipyard sites which enabled the construction and/or repair of vessels, piers, bulkheads, and dry docks upon which the shipyards were located, Such remains could also reveal the the complexity of activities that occurred on site, which may have required associated structures and facilities like a blacksmith shop (see **Figure 4.39**). With respect to industrial sites, archaeological deposits could include 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.

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

4.2.2.4 Known Historic Architectural Resources

Known historic properties are those properties listed in or that have an NJHPO Opinion of Eligibility for listing in the State and/or National Register. The inventory of known historic properties in the APE for Historic Architectural Resources identified 27 known historic properties (**Table 4.14; Figure 4.40**). Of the 27 known historic properties (prior to the issuance of the DEIS in February of 2017), 20 were previously identified historic properties. One property received a NJHPO Opinion (12/9/2016) under an unrelated project review, concurrent with the NJHPO review of the Cultural Resources TES (Dewberry 2016). Six properties received a NJHPO Opinion (12/12/2016) as eligible for State and National Register listing as part of the Section 106 Review of the Cultural Resources TES (Dewberry 2016). The Section 106 NJHPO review also resulted in a revised Opinion that expanded the boundaries of the previously known Hoboken Historic District, incorporating four other previously eligible historic districts, thus creating one historic district. Of the known historic properties, seven properties are listed in the State and National Registers.

1. **501 Adams Street (Public School No. 3) (Map ID No. 1)**

The building at 501 Adams Street, former Public School No. 3, is a Gothic Revival/Collegiate Gothic style public school of buff color brick and cast concrete. The building occupies seven blocks at the northeast corner of 5th Street, has four stories and a central bay of five stories with battlements and turrets. The property received a SHPO Opinion of Eligibility (8/20/1999) under Criterion C for its distinctive characteristics of a Gothic Revival public school building. By 1999, a fifth story addition had been constructed, partially concealed from street view by the parapet and setback. Communication equipment was also added, in a manner that does not detract from the stylistic features of the building and is not visible from the street. Contributing features to the property include the surviving historic exterior elements, such as crockets, finials and crenulation, towers, fenestration, gothic stone arch transoms and segmental arch transoms with gothic tracery, carved figures, and tracery. Historic interior elements include elements such as, marble foyer, gothic tracery, archways, and stairs (Guzzo 1999).

2. **Church of the Holy Innocents (Map ID No. 2)**

The Church of the Holy Innocents was entered in the State and National Registers for its high architectural qualities and characteristics and as a noteworthy example of the work of ecclesiastical architect, Edward Tuckerman Potter. Under the criteria for evaluation, “a church cannot be considered eligible for listing because of its importance as a religious institution, but must also derive ‘primary significance from architectural or artistic distinctions or historical importance.” The property was listed

Table 4.14 Summary of Anticipated Effects on Known Historic Properties

RES. #	RESOURCE	ADDRESS	NR ELIGIBILITY STATUS	AREAS OF POTENTIAL EFFECTS	EFFECTS ALTERNATIVE 1	EFFECTS ALTERNATIVE 2	EFFECTS ALTERNATIVE 3
1	501 Adams Street (Public School No. 3)**	501 Adams Street Hoboken City	SHPO Opinion 8/20/1999	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
2	Church of the Holy Innocents**	Willow Avenue & 6th Street Hoboken City	SR 2/4/1977 NR 5/24/1977	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
3	Church of Our Lady of Grace**	400 Willow Avenue Hoboken City	COE 12/15/1994 SR 4/10/1996 NR 5/31/1996	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
4	Engine Company #2 Firehouse** (Thematic Nomination of Hoboken Firehouses)	1313 Washington Street Hoboken City	SR 2/9/1984 NR 3/30/1984	Potential indirect visual effects and temporary vibration associated with installation of resist structure	No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
5	Engine Company #3, Truck #2 Firehouse** (Thematic Nomination of Hoboken Firehouses)	501 Observer HighwayHoboken City	SR 2/9/1984 NR 3/30/1984	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
6	Erie-Lackawanna Terminal**	Hudson Plaza Hoboken City	SR 6/16/1973, 12/7/2004 NR 7/24/1973, 2/17/2005	N/A	No Adverse Effect	No Adverse Effect	No Adverse Effect
7	Ferguson Brothers Manufacturing Company	730-732 Monroe Street Hoboken City	SHPO Opinion 10/16/1998	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
8	Hoboken Historic District*-Boundary Revisions December 2016	Observer Hwy, Hudson River, 14th and Clinton Streets Hoboken City	SHPO Opinion 12/23/2016, 3/5/1982, 5/12/1983 COE 1/26/2017	Adverse Effect: Option 1 and 2: Resist Structure has the potential to change the character of the properties' use and/or physical features within the properties' setting; Potential temporary effects from vibration-related impacts associated with installation of resist structures and DSD tank structures (Conditional no adverse effect)	Adverse Effect	Adverse Effect	Adverse Effect
9	Hoboken Land and Improvement Company Building**	1 Newark Street Hoboken City	SR 3/29/1979 NR 7/3/1979	Potential effects from vibration-related impacts associated with installation of high level storm sewer system	No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
10	Hoboken-North Hudson YMCA**	1301 Washington Street Hoboken City	SHPO Opinion 4/20/2007	Potential indirect visual effects; temporary construction-related vibration, etc. associated with installation of resist structure and high level sewer system	No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
11	Keuffel and Esser Manufacturing Complex	3rd, Adams & Grand Streets Hoboken City	SR 7/31/1985 NR 9/12/1985	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
12	Machine Shop (Bethlehem Steel Corp. Shipyard)**	1201-1321 Hudson Street Hoboken City	SHPO Opinion 5/2/1997	Potential effects from vibration-related impacts associated with installation of high level storm sewer system	No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect

Table 4.14 Summary of Effects on Known Historic Properties (continued)

RES. #	RESOURCE	ADDRESS	NR ELIGIBILITY STATUS	AREAS OF POTENTIAL EFFECTS	EFFECTS ALTERNATIVE 1	EFFECTS ALTERNATIVE 2	EFFECTS ALTERNATIVE 3
13	Old Main Delaware, Lackawanna and Western Railroad Historic District (Morris & Essex Railroad Right-of-Way to Delaware River)*	Hoboken and Jersey City	SHPO Opinion 9/24/1996	Potential permanent physical effects from construction of Resist structures, gates and sheeting within and/or along the DLWRR ROW; Temporary construction-related impacts to contributing elements.	Adverse Effect	Adverse Effect	Adverse Effect
14	Public School Number 7**	80 Park Avenue Hoboken City	SHPO Opinion 9/24/1996	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
15	Stevens Historic District	Castle Point Hoboken City	SHPO Opinion 2/28/1991	Permanent physical effects due to installation of Resist structure and connecting it to the wall surrounding the district.	Adverse Effect	No Adverse Effect	No Adverse Effect
16	Hudson and Manhattan Railroad Transit System (PATH) (Connects Exchange Place and Hoboken to New York City)	Hoboken and Jersey City	SHPO Opinion 3/4/2002	Potential effects from vibration-related impacts associated with installation of Resist structure in the vicinity of the PATH tunnel and the Hudson and Manhattan Railroad Repair Shops (contributing).	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
17	Grove Street Bridge (Old Main Delaware, Lackawanna and Western Railroad Historic District)	NJ Transit Morristown Line, M.P. 0.66 over Grove Street, Jersey City	SHPO Opinion 1/20/1999	Option 1: Permanent effect from installation of Resist structure at the bridge abutments and/or wing walls which will impact the fill adjacent to the resource resulting in a direct effect.	Adverse Effect	Adverse Effect	Adverse Effect
18	Holbrook Manufacturing Company	315 Coles Street, Jersey City	SHPO Opinion 2/28/1991	Potential indirect visual effects and temporary vibration associated with installation of Resist structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
19	North (Hudson) River Tunnels	Amtrak Northeast Corridor under Hudson River, Township Weehawken	SHPO Opinion 11/12/1998	N/A	No Adverse Effect	No Adverse Effect	No Adverse Effect
20	Pennsylvania Railroad New York to Philadelphia Historic District (Amtrak Northeast Corridor)	Weehawken Township	SHPO Opinion 10/2/2002	N/A	No Adverse Effect	No Adverse Effect	No Adverse Effect
21	R. Neumann & Co. Complex	Observer Highway and Willow Avenue, Hoboken City	SHPO Opinion 12/9/2016	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
22	509 Madison Street**	501 Madison Street Hoboken City	SHPO Opinion 12/12/2016	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
23	Factory Terminal Loft Buildings (Standard Brands & Lipton Tea Plant) (Terminal Distribution Warehouses of Hudson County, New Jersey, 1870-1945 MPS)	1500 Hudson Street Hoboken City	SHPO Opinion 12/12/2016	Potential permanent visual impacts from installation of a Resist structure along the building at the bulkhead (Adverse) Permanent effects due to property/easement acquisition (Adverse) Potential effects from vibration-related impacts associated with installation of high level storm sewer system (Conditional no adverse effect)	Adverse Effect	Adverse Effect	Conditional No Adverse Effect

Table 4.14 Summary of Effects on Known Historic Properties (continued)

RES. #	RESOURCE	ADDRESS	NR ELIGIBILITY STATUS	AREAS OF POTENTIAL EFFECTS	EFFECTS ALTERNATIVE 1	EFFECTS ALTERNATIVE 2	EFFECTS ALTERNATIVE 3
24	Hoboken High School**	800 Clinton Street Hoboken City	SHPO Opinion 12/12/2016	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
25	Christopher Columbus Gardens**	460 8th Street and 455 9th Street Hoboken City	SHPO Opinion 12/12/2016	N/A	No Adverse Effect	No Adverse Effect	No Adverse Effect
26	John Schmalz's Sons Model Bakery**	351 8th Street Hoboken City	SHPO Opinion 12/12/2016	Potential temporary effects from vibration associated with installation of DSD tank structure	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect
27	R.B. Davis Company Manufacturing Complex	38-56 Jackson Street Hoboken City	SHPO Opinion 1/31/2017	Potential temporary effects from vibration associated with installation of DSD tank structure and installation of sewers associated with Block 10	Conditional No Adverse Effect	Conditional No Adverse Effect	Conditional No Adverse Effect

Notes: 1 - *Individual properties in the Historic Districts are not individually listed. Effects to individual properties are reflected in the determination of Adverse or No Adverse Effect to the Historic District.
2 - **Located in the Hoboken Historic District

Source: Marcopul 2016, 2017

Photograph 4.9 501 Adams Street (Public School No. 3) (Map ID No. 1)

in the State Register (2/4/1977) and the National Register (5/24/1977) under Criteria Consideration A, for its distinctive High Victorian Gothic architectural characteristics. The designation includes the church, parish house, and rectory, all located on the south side of 6th Street and extending from Clinton Street to Willow Avenue (Marshall 1997). Character-defining features include existing interior and exterior historic elements such as stone work, multi-color arches, exterior cladding, doors, fenestration, and tile roofs. '

3. Church of Our Lady of Grace (Map ID No. 3)

The church property occupies the block bounded by 4th Street, Clinton Street, 5th Street, and Willow Avenue. This church complex has a New Jersey Certificate of Eligibility (12/15/1994), is listed in the State Register (4/10/1996), and is listed in the National Register (5/31/1996) under Criteria A and C, as well as Criteria Consideration A in the areas of religion and architecture. In emulation of cathedrals in Europe, the Church of Our Lady of Grace created a towering presence that reflected the "hopes and aspirations of the poor immigrant [Catholic] population of the City of Hoboken" (Carrington and Manogue 1995). The nomination includes the church, parochial residence, convent, and parochial school. Contributing features to the property include the surviving historic exterior elements, such as brickwork, fenestration, Gothic entrance surmounted by blind gothic carved arches and large wheel window, blind arches, towers, and tracery.

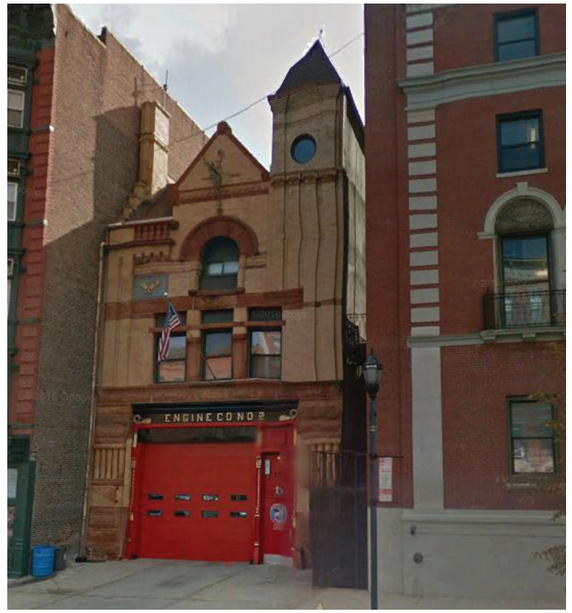
4. Engine Company #2 Firehouse (Map ID No. 4)

Engine Company No. 2 Firehouse is located near the top of Washington Street within three of Hoboken's overlapping historic districts. The firehouse is located

Photograph 4.10 Church of the Holy Innocents (Map ID No. 2)

Figure 4.40 Known Historic Properties

Photograph 4.11 Church of Our Lady of Grace (Map ID No. 3)



Photograph 4.12 Engine Company #2 Firehouse (Map ID No. 4)

Photograph 4.13 Engine Company #3, Truck #2 Firehouse (Map ID No. 5)

mid-block, has distinctive Romanesque Revival qualities, and is the work of French Dixon and DeSaldern. The Engine Company No. 2 Firehouse was entered in the State Register (2/9/1984) and the National Register (3/30/1984) as part of the Thematic Nomination of Hoboken Firehouses, as representative of a specific type of municipal structure that evolved from the 1870s to 1915. The firehouse is representative of design characteristics from 1890-1892 (Florio 1983). Contributing features to the property include the surviving historic exterior elements, such as brick work and corbelling, stone arches, stone lintel and sill courses, fenestration, and brick tower and chimney.

5. Engine Company #3, Truck #2 Firehouse (Map ID No. 5)

Engine Company No. 3, Truck No. 2 occupies a triangular lot bounded by Madison Street, Observer Highway, and Newark Street at the southern terminus of Jefferson Street. Representative of distinctive Romanesque Revival characteristics, the building was designed by noted Hoboken architect Charles Fall. The Engine Company No. 3, Truck No. 2 Firehouse was entered in the State Register (2/9/1984) and the National Register (3/30/1984) as part of the Thematic Nomination of Hoboken Firehouses as representative of a specific type of municipal structure that evolved from the 1870s to 1915. The firehouse is representative of design characteristics from 1890-1892 (Florio 1983). Contributing features to the property include the surviving historic exterior elements, such as random ashlar base, stone water table, brick work and corbelling, stone arches, stone lintels and sills, fenestration, curved wall, and brick tower and chimney.

6. Erie Lackawanna Terminal (Map ID No. 6)

Sited at the Hudson River, south of Hudson Place, at the southern boundary of Hoboken and Jersey City, the Erie-Lackawanna Terminal embodies distinctive design and construction characteristics. The property consists of the Ferry and Railroad Terminal, the Train Shed, the Baggage/YMCA Building, and the former Pullman Building and Immigrant Station. Significant in the areas of architecture, commerce, community planning and development, engineering, and transportation, the Terminal was entered in the State Register (6/16/1973, 12/7/2004) and the National Register (7/24/1973, 2/17/2005) for its architectural and historical importance. The terminal played a central role in rail and ferry transportation in the metropolitan region throughout the early decades of the twentieth century. This copper-sheathed steel and concrete structure and its train sheds became a model for later transportation terminals (Karschner 1973; Carmelich and Spies 2004).

7. Ferguson Brothers Manufacturing Company (Map ID No. 7)

A survivor from Hoboken's rich industrial past, the Ferguson Brothers Manufacturing Company is at the western fringes of the city. The facility consists of two, five-story industrial buildings that date from the early-twentieth century. The building at 732 Monroe Street is brick with casement windows and brick piers separating each bay; 720 Monroe has six-story tower ends with some Art Deco detailing. The property received a SHPO Opinion of Eligibility (10/16/1998) under Criterion C as excellent and intact examples of early-twentieth century industrial buildings (Guzzo 1998).

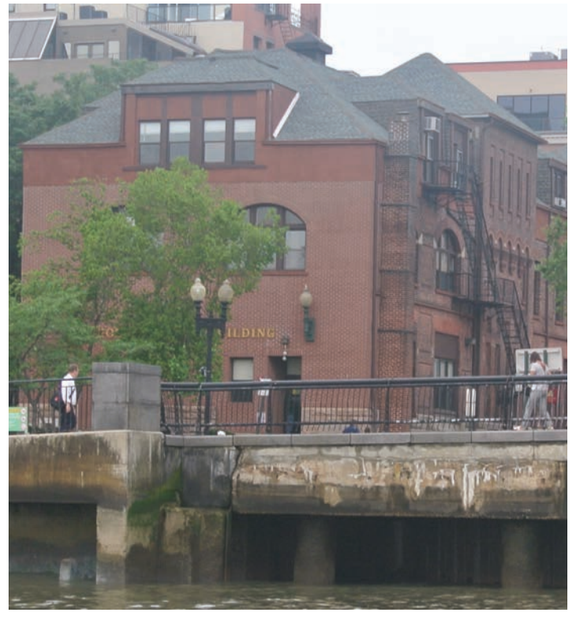
8. Hoboken Historic District (Map ID No. 8)

The Hoboken Historic District contains a collection of intact nineteenth century to early-twentieth century urban residential dwellings and commercial buildings that are similar in size, scale, and setback from the street. While there is a variety of ages and architectural styles, the buildings form a cohesive

Photograph 4.14 Erie Lackawanna Terminal (Map ID No. 6)

Photograph 4.15 Ferguson Brothers Manufacturing Company (Map ID No. 7)

Photograph 4.16 Hoboken Historic District (Map ID No. 8)



Photograph 4.17 Hoboken Land and Improvement Company Building (Map ID No. 9)

collection that reflects the development of Hoboken. The Hoboken Historic District boundaries have been expanded and incorporates four seperately designated historic districts: Central Hoboken Historic District, Northern Hoboken Historic District, Southern Hoboken Historic District and the Southern Hoboken Historic District Expansion, as well as the Hoboken Terminal. The district's new boundaries roughly extend to Observer Highway, the Hudson River, Monroe Street and 14th Street. The district received a SHPO Opinion of Eligibility (3/5/1982; 5/12/1983; 12/12/2016) under Criterion C for its distinctive characteristics (Marcopul, RBD, 2016).

9. Hoboken Land and Improvement Company Building (Map ID No. 9)

The Hoboken Land and Improvement Company Building is a three-story granite building of unique design, excellent craftsmanship, and detailing that defies stylistic classification. Significant primarily for its historic association with the commercial development of Hoboken and enterprises involving the development and expansion of transportation facilities, the Hoboken Land and Improvement Company Building was entered in the State Register (3/29/1979) and the National Register (7/3/1979) for its architectural and historical importance (Guitian 1978).

10. Hoboken –North Hudson YMCA (Map ID No. 10)

Rising four stories on a basement, the YMCA occupies a corner site and anchors the streetscape at the northern reaches of 14th Street. This red brick building has limestone details and flourishes, entrances read "Men's Department," "Women's Department," and "Boys Department." The property received a SHPO Opinion of Eligibility (4/20/2007) under Criterion A for its community services and for the role it played in the education of the community's citizens; it was also determined eligible under Criterion C for its architectural details, which are representative of a Georgian Revival style characteristic of many YMCA buildings constructed during the early-twentieth century (Guzzo 2007).

11. Keuffel and Esser Manufacturing Complex (Map ID No. 11)

The complex fronts on the northern side of 3rd Street, dominating the blocks from Jefferson Street to Grand Street. The earlier plant is located between Adams and Grand streets and forms a continuous red brick wall four stories high. This group of buildings has brick details and corbeling, oriel windows, brick segmental arches (east portion), and brownstone lintels and sills (west portion). Rising full height beginning at the second story above the corner entrance facing Grand Street, the projecting corner bay forms a tower with round-head windows. The plant known as the "Clock Tower Building" occupies most of the full block between Adams and Jefferson streets and is a reinforced concrete daylight building,

five stories tall with an L-plan. This early-twentieth century industrial building has bays demarcated by piers and its recognizable clock tower is located at the southeast corner of the building. The buildings were among the early examples of adaptive use of industrial buildings and have been converted to residential use. The Keuffel and Esser Manufacturing Complex was entered in the State Register (7/31/1985) and the National Register (9/12/1985) for its architectural importance and in terms of the architect/engineering profession. As framed by the National Register Nomination, the complex is significant architecturally as one of Hoboken's finest examples of nineteenth and early-twentieth century industrial architecture. The buildings are also important historically to the professions of architects and engineers because of the Keuffel and Esser association with the development of blueprint paper, precision instruments, and slide rules. These technological advancements revolutionized both the architectural and engineering professions (Wyatt 1984).

12. Machine Shop (Bethlehem Steel Corp. Shipyard (Map ID No. 12)

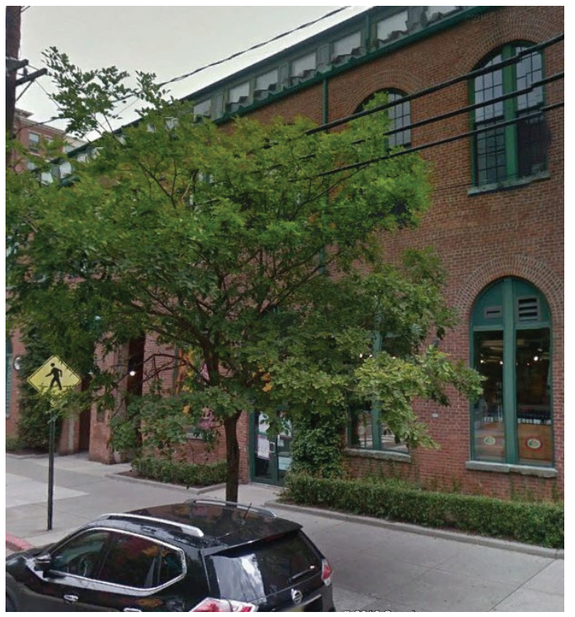
The Machine Shop is a long and narrow, two-story red brick building approximately 400 feet in length located along the east side of Hudson Street. The property received a SHPO Opinion of Eligibility (5/2/1997) for its historical importance in the development of steam engines and ship building. Originally the North River Iron Works and later the W. & A. Fletcher Company, this company was one of the most respected American builders of steamboats. The company was early in the adoption of the steam turbine when it was introduced in England. The Bethlehem Steel Company was the largest ship builder in the world during World War II. Battle-damaged ships were retrofitted and repaired and destroyer escorts were built at the Hoboken Yard. This building is the only remaining component of the former Hoboken facility (Guzzo 1997; Pfoutz 1993).

13. Old Main Delaware, Lackawanna, and Western Railroad Historic District (Map ID No. 13)

The Old Main Delaware, Lackawanna, and Western Railroad Historic District is located in the southern portion of the APE at the southern extent of Hoboken and its boundary with Jersey City. The historic district extends from its eastern terminus at the Hoboken Terminal (historically the Erie-Lackawanna Railroad and Ferry Terminal) in a westerly direction, across the state along the NJ TRANSIT Morristown Line (historically the Morris & Essex Railroad and later the DL&W Main Line) to Washington where it then follows the route of former Warren Railroad to its terminus at the Delaware River. The historic district received a SHPO Opinion of Eligibility (9/24/1996) under Criteria A and C and is eligible for its association with suburbanization, commuter and passenger traffic, freight traffic, engineering and architecture. The district includes the railroad ROW and associated railroad features dating from the mid-1850s to circa 1930 (Guzzo 1996; NJHPO).

Photograph 4.18 Hoboken -North Hudson YMCA (Map ID No. 10)

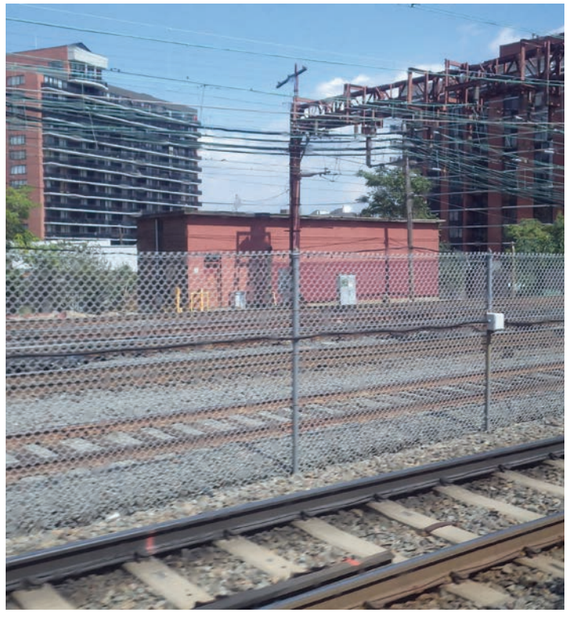
Photograph 4.19 Keuffel and Esser Manufacturing Complex (Map ID No. 11)



Photograph 4.20 Machine Shop (Bethlehem Steel Corp. Shipyard (Map ID No. 12)

14. Public School No. 7 (Map ID No. 14)

Occupying a prominent corner location, this former public school building has the distinctive qualities of late-nineteenth century school buildings, as well as characteristics of Italian Renaissance Revival. An early example of a public school designed to be both imposing and monumental, expressed architecturally through a revival style, the building stands four stories, has a central five-story Palladium motif tower, yellow roman brick, and windows with round arch transoms. The terra cotta relief and world globes above engaged pilasters at the entrance are impressive. Public School No. 7 received a SHPO Opinion of Eligibility (9/24/1996) under Criterion C as an excellent example of the Italian Renaissance Revival Style (Lynn Drobbin & Associates, Hudson-Bergen, 1995).



Photograph 4.21 Old Main Delaware, Lackawanna and Western Railroad Historic District (Map ID No. 13)

Photograph 4.22 Public School No. 7 (Map ID No. 14)

Photograph 4.23 Stevens Historic District (Map ID No. 15)

15. Stevens Historic District (NR Eligible, SHPO 1991) (Map ID No. 15)

The Stevens Historic District was found eligible for the National Register of Historic Places by SHPO opinion in 1991. The Stevens Historic District occupies the high ground developed by Col. John Stevens, the area within which his associates built their splendid homes. His son, Edwin provided for the establishment of a school in his will, the Stevens Institute, which is contained within the district. The district also includes the Elysian Fields, the location associated with the start of baseball. The district received a SHPO Opinion of Eligibility (2/28/1991) under Criteria A, B, and C for associations with the Stevens Institute, with members of the Stevens family, and for its intact turn-of-the-century mansions and academic buildings. The character defining features include, but are not limited to, red brick academic buildings ca. 1870 to 1940, mansions along Hudson Street (many now fraternity houses), the Stevens estate entrance gate with Tudor arch and castellated towers, and a Victorian Gothic brownstone designed by Richard Upjohn (Lynn Drobbin & Associates, Hudson-Bergen,1995). The district is also characterized by its setting on the campus of the original Stevens estate on a bluff overlooking the Hudson River. The river side is characterized by a fairly steep rise, rock outcroppings, mature foliage, and a retaining wall at Elysian Field Park. The east portion of the district is defined by Frank Sinatra Drive and the River Walk.

16. Hudson and Manhattan Railroad Transit System (PATH) (Map ID No. 16)

The Hudson and Manhattan (H&M) Railroad Transit System connects Exchange Place (Jersey City) and Hoboken to New York City. The district received a SHPO Opinion of Eligibility (3/4/2002) under Criterion A for the system's historic associations with early-twentieth century urban and commercial development in New York and Jersey City; under Criterion B for its associations with H&M president, William Gibbs McAdoo, who spearheaded the construction of the tunnel and later served as Secretary of the Treasury under President Woodrow Wilson; and under Criterion C for the system's significance as an ambitious engineering accomplishment in the early-twentieth century. Contributing resources include the Hudson River Tunnels, stations, and repair shops associated with the 1908-1909 transit system (Tranter 2002; Guzzo 2002).

17. Grove Street Bridge (NJ TRANSIT Morristown Line MP 0.66) (Map ID No. 17)

The Grove Street Bridge, NJ TRANSIT Morristown Line, Milepost 0.66 over Grove Street (Manila Avenue) is a single-span, through-girder and floor-beam bridge that carries seven tracks of the Morristown Line over Grove Street. The bridge has a SHPO Opinion of Eligibility (1/20/1999) as individually eligible and as a contributing resource to the eligible Old Main Delaware, Lackawanna, and Western Railroad Historic District (Guzzo 1998).

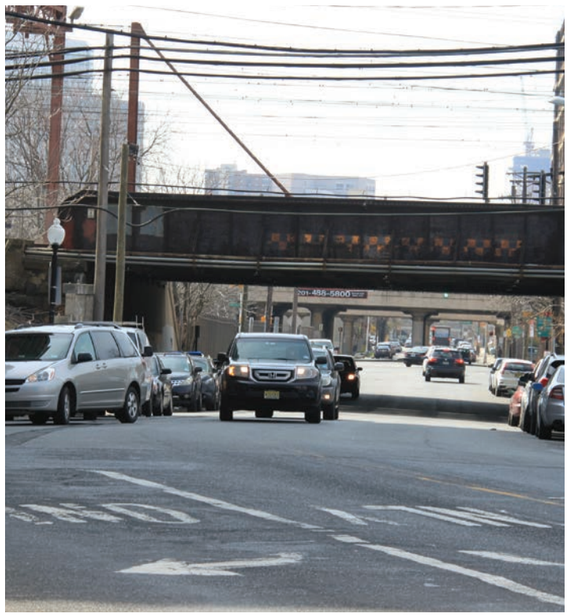
18. Holbrook Manufacturing Company (Map ID No. 18)

Located in the northernmost area of Jersey City near its boundary with Hoboken, the Holbrook Manufacturing Company is representative of utilitarian industrial buildings of the early twentieth century constructed in proximity to the railroad and waterfront areas of Jersey City. This factory received a SHPO Opinion of Eligibility (2/28/1991) under Criterion A (Guzzo 1991).

19. North (Hudson) River Tunnels (Map ID No.19)

The North (Hudson) River Tunnels, Milepost 3.0, Bergen Portal, Weehawken Township, to 10th Avenue Portal, Pennsylvania Station, New York City, New York, carry the Amtrak Northeast Corridor rail lines under the Hudson River between New Jersey and

Photograph 4.24 Hudson and Manhattan Railroad Transit System (PATH) (Map ID No. 16)



Photograph 4.25 Grove Street Bridge (NJ TRANSIT Morristown Line MP 0.66) (Map ID No. 17)

New York City. The North (Hudson) River Tunnels received a SHPO Opinion of Eligibility (11/12/1998) for listing in the National Register under Criterion C as intact and significant early-twentieth century railroad engineering structures, which combined advances in tunneling technology with developments in railroad electrification to form the first major direct railroad connection between New York and New Jersey. The tunnels are also eligible under Criterion A for their association with the Pennsylvania Railroad's New York Extension representing the continued expansion of the railroad, a component of overall improvements to the New York metropolitan corridor (Guzzo, Amtrak Signal Towers, 1998).

20. Pennsylvania Railroad New York to Philadelphia Historic District (Map ID No. 20)

The Pennsylvania Railroad New York to Philadelphia Historic District received a SHPO Opinion of Eligibility (10/2/2002) and is eligible for listing in the National Register under Criteria A and C for its significance in the areas of transportation and engineering. The district is significant because it forms a major transportation conduit connecting New York and Philadelphia and for providing an elevated (grade-separated) and electrified ROW between these two major cities. The contributing features of this historic district include the railroad ROW, the tracks and track bed, and all associated structures (Guzzo, Penns Neck, 2002).

21. R. Neumann & Co. Factory Complex (Map ID No. 21)

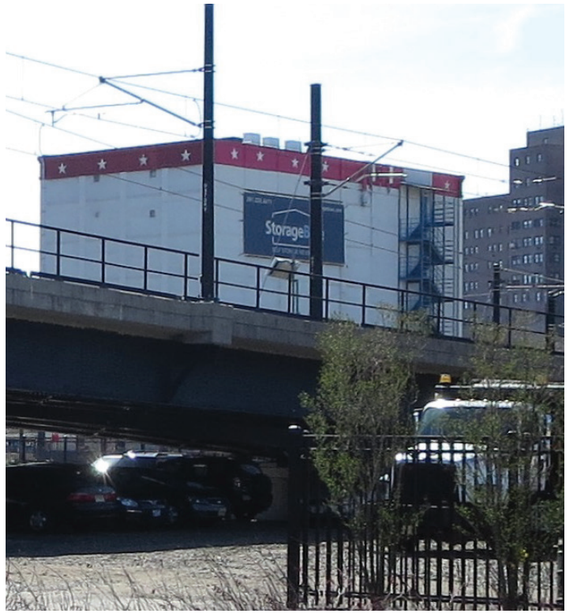
The R. Neumann & Co. Complex occupies a substantial portion of the block bounded by Observer Highway, Willow Avenue and Newark Street. The property received a SHPO Opinion of Eligibility (12/9/2016) under Criterion A for its association with early industrial development of Hoboken and under Criterion C as an example of industrial architecture. The period of significance extends from the initial construction through 1951 and includes those buildings and structures constructed during various building campaigns by R. Neumann & Co. and those acquired by the company (Marcopul, NJ TRANSIT Hoboken Yard, 2016).

22. 509 Madison Street (Map ID No. 22)

This five-story-brick tenement at 509 Madison Street features a manufactured sheet metal first-story façade and heavy iron cornice. The building incorporates alleyways and fire escapes, a requirement of the 1904 Tenement House Act of New Jersey. The building has a SHPO Opinion of Eligibility (12/12/2016) for listing in the State and National Registers under Criterion C as a highly intact brick tenement that dates to the turn of the twentieth century. In addition to the typical characteristics associated with a five-story building with heavy metal cornice, this building is also characterized by the highly intact and very good example of a tenement with a manufactured metal façade in Hoboken (Marcopul, RBD, 2016).

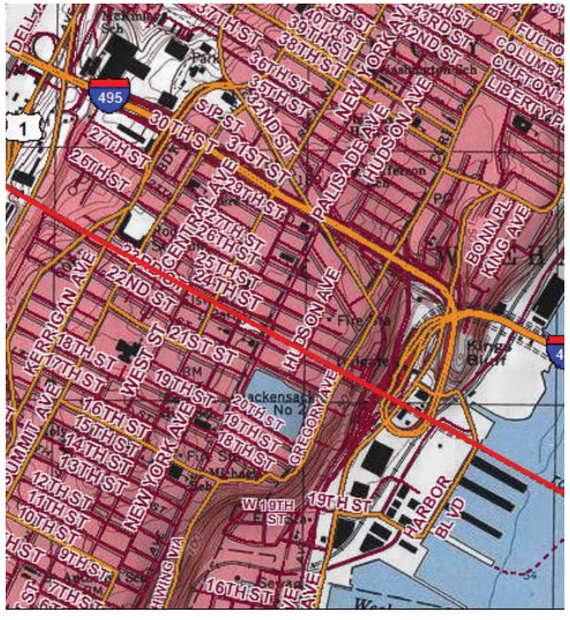
23. Factory Terminal Loft Buildings (Standard Brands & Lipton Tea Plant) (Map ID No. 23)

The Factory Terminal Loft Buildings (Standard



Photograph 4.26 Holbrook Manufacturing Company (Map ID No. 18)

Photograph 4.27 North (Hudson) River Tunnels (Map ID No. 19))



Photograph 4.28 Pennsylvania Railroad New York to Philadelphia Historic District (Map ID No. 20)

Photograph 4.29 R. Neumann & Co. Factory Complex (Map ID No. 21)

Brands & Lipton Tea Plant) has a SHPO Opinion of Eligibility for listing in the State and National Registers (12/12/2016) as a contributing resource to the Terminal Distribution Warehouses of Hudson County, Multiple Property Listing. The property consists of three, 12-story reinforced concrete buildings constructed as terminal loft buildings by the Hoboken Land & Improvement Company. The Terminal Loft Buildings were designed by Hoboken architect Charles Fall and were constructed by the Turner Construction Company, which was responsible for completion of other terminal distribution warehouses at the Port of New York, such as the Bush Terminal Warehouses. The period of significance for the Factory Terminal Loft Buildings dates from 1915, with construction of building D and extends to 1945, which represents when warehousing operations in the Port of New York began the shift to multi-modal facilities (Marcopul, RBD, 2016).

24. Hoboken High School (Map ID No. 24)

Designed by architect, William E. Lehman, Jr. and constructed in 1962, the Hoboken High School received a SHPO Opinion of Eligibility (12/12/2016) under Criterion C as an outstanding example of a Modern School employing curtain wall construction with colored spandrel panels. The SHPO opinion further indicates that although the panels and windows have been replaced, the school retains sufficient integrity of location, design, setting, feeling, and association to convey its historic and architectural significance (Marcopul, RBD, 2016).

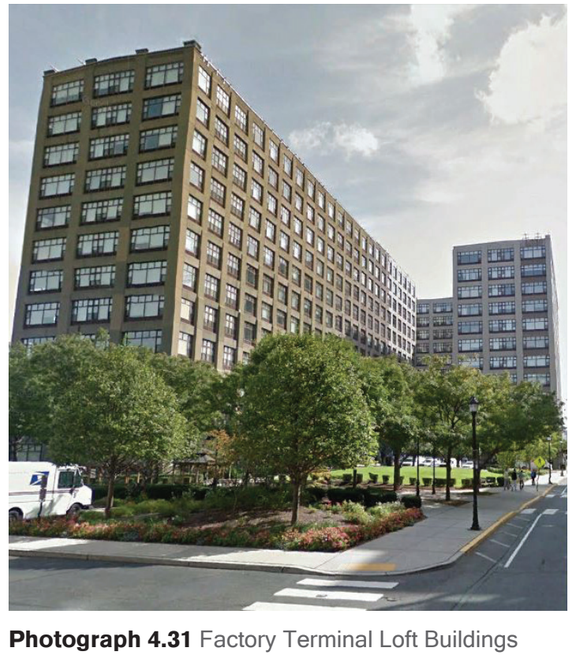
25. Christopher Columbus Gardens (Map ID No. 25)

Completed in 1952, Christopher Columbus Gardens is one of the first two public housing complexes built by the Hoboken Housing Authority. The other development, also completed at the time, is the Andrew Jackson Gardens. Designed by the architectural firm of Ricker and Axt of West New York, New Jersey, Christopher Columbus Gardens exemplifies the “tower in the park” form of high-rise public housing popular in the 1950s and 1960s. As such, this public housing complex has a SHPO Opinion of Eligibility (12/12/2016) under Criterion C. The complex is also eligible under Criterion A for its associations with public housing erected in response to the Federal Housing Act of 1949. The period of significance dates to its construction from 1950-1952 (Marcopul, RBD, 2016).

26. John Schmalz’s Sons Model Bakery (Map ID No. 26)

This bakery was designed by Pittsburgh architects C.M. Bartberger & Sons and was built by the Hennebique Construction Company, which was responsible for the building’s reinforced concrete and steel substructure. This reinforced concrete bakery was featured in contemporary engineering journals. The building continued in use as a bakery under several companies including the Continental Baking Company (later Delaware Company), makers of Wonder Bread. The John Schmaltz’s Sons Model Bakery has a SHPO Opinion of Eligibility for listing in the State and National Registers under Criterion C as

Photograph 4.30 509 Madison Street (Map ID No. 22)



Photograph 4.31 Factory Terminal Loft Buildings (Standard Brands & Lipton Tea Plant) (Map ID No. 23)

Photograph 4.32 Hoboken High School (Map ID No. 24)

Photograph 4.33 Christopher Columbus Gardens (Map ID No. 25)

Photograph 4.34 John Schmalz's Sons Model Bakery (Map ID No. 26)

Photograph 4.35 R.B. Davis Company Manufacturing Complex (Map ID No. 27)

a large example of a progressive construction method. The complex includes the bakery fronting on 8th Street, a two-story garage fronting on Clinton Street, and a three-story wagon house on Grand Street. Its period of significance begins with construction in 1909 and extends to 1956, when the Delaware Company sold the property (Marcopul, RBD, 2016).

27. R.B. Davis Company Manufacturing Complex (Map ID No. 27)

The Davis Manufacturing Complex is one of the largest and most intact of the food-related manufacturing complexes remaining in Hoboken. The plant, which occupies the block bounded by Observer Highway, Harrison, Newark, and Jackson streets, consists of industrial buildings that extend from the late nineteenth century through the 1950s. The R.B. Davis Company Manufacturing Complex has been evaluated by SHPO and is eligible for listing in the State and National Registers under Criterion C as an intact industrial complex representing various phases of construction (Marcopul 2017).

4.2.3 Potential Effects on Cultural Resources

4.2.3.1 Potential Effects on Archaeological Resources

The analysis of potential effects on archaeological resources involves an examination of the proposed vertical and horizontal limits of potential disturbance.

Alternative 1

A total of 10.32 acres of lands in Option 1 and 10.29 acres of lands in Option 2, which would be disturbed for construction of Resist and DSD infrastructure under Alternative 1, have potential to encounter prehistoric and/or historic archaeological resources. For the Resist structure, current design plans call for an excavation trench five feet deep. Along the Resist structure, piles would be driven to bedrock at six to eight foot intervals and sheeting would be installed between the piles to a depth of up to 20 feet below the depth of the excavated trench, unless bedrock is encountered first. The sheeting would either be driven or vibrated into place. For DSD infrastructure, the depth of construction would range from 6.67 feet below ground surface to 11.17 feet below ground surface. The nature of potential archaeological resources within the footprint of Alternative 1 is described in **Table 4.13** and mapped on **Figure 4.41.** Potential for archaeological resources is identified in the southwest, south, southeast, north, and Weehawken portions of the Resist structure in areas of proposed sheeting and at 27 DSD locations, including 25 tank sites. Given the depth of the proposed disturbance, there is no anticipated disturbance to potential prehistoric deposits associated with the DSD sites. However, portions of the Resist structure in Alternative 1 have the potential to effect previously unidentified prehistoric deposits. In addition, there is potential for disturbance of historic archaeological deposits along both the Resist and DSD infrastructure.

It is unknown whether any potentially identified prehistoric and/or historic archaeological resources

within the limit of disturbance for Alternative 1 would be eligible for listing in the National Register. Given the rarity of known prehistoric deposits within the Study Area, any such deposits, if encountered, would most likely be eligible for listing in the National Register. On the basis of current knowledge and lacking detailed soil boring data for the entire Project, particularly the entirety of the proposed Resist structure, the study must conclude that there is potential for prehistoric archaeological deposits that would be eligible for listing in the National Register within portions of Alternative 1. In addition, given the potential for a myriad of historic deposits within Alternative 1, including historic deposits which have not been previously identified within the Study Area such as mid-nineteenth century residential deposits and deposits associated with late-nineteenth to mid- to late-twentieth century industrial buildings, the potential exists to locate historic archaeological deposits eligible for listing in the National Register within the Study Area. An estimate of the potential effects of Alternative 1 to presently undiscovered historically significant archaeological resources cannot be calculated until archaeological investigations are executed. The mitigation measures to minimize or avoid archaeological resources outlined in the project's Programmatic Agreement (PA) provide steps to further ascertain the nature, type, and potential National Register eligibility of any extant cultural resources within Alternative 1.

Alternative 2

Depending on which option is selected in the southern portion of the Study Area, a total of 8.96 (Option 1) or 9.07 (Option 2) acres of lands that would be disturbed for construction of Resist and DSD infrastructure under Alternative 2 have potential to encounter prehistoric or historic archaeological resources. For the Resist structure, current design plans call for an excavation trench five feet deep. Along the Resist structure, piles would be driven to bedrock at six to eight foot intervals and sheeting would be installed between the piles to a depth of up to 20 feet below the depth of the excavated trench, unless bedrock is encountered first. The sheeting would either be driven or vibrated into place. The design depth of the high level storm sewer component of Alternative 2 is currently unknown, but given the shallow depth and nature of this piping system, it is expected to be no deeper than the DSD infrastructure. For the DSD infrastructure, the depth of construction would range from 6.67 feet below ground surface to 11.17 feet below ground surface. The nature of potential archaeological resources within the footprint of Alternative 2 is described in **Table 4.13** and mapped on **Figure 4.42**.

Potential for archaeological resources exists in the southwest, south, north, and Weehawken portions of the Resist structure; in portions of the high level storm sewer; in areas of sheeting; and at 27 DSD locations, including 25 tank sites. Due to the proposed construction depth, no prehistoric resources are expected to be disturbed at any of the DSD sites. However, portions of the Resist structure in Alternative 2 were determined to have the potential to effect deeply buried previously unidentified prehistoric deposits. Alternative 2 was also found to possess historic archaeological sensitivity for deposits associated with landfill and railroad-related development including features associated with the Erie-Lackawanna Terminal, the Long Slip Canal, and the PATH Tunnel along its southern portion; deposits associated with the development and expansion of the waterfront including industrial development and the transatlantic shipping and passenger lines along its eastern portion; and the potential for seventeenth through early-twentieth century shipwrecks within Weehawken Cove. Alternative 2 also exhibits sensitivity for historic sewer deposits. Alternative 2 is sensitive for early-nineteenth century historic seawall deposits in the vicinity of Hudson, Washington, 13th, and 15th streets. The southern portion of the alternative is sensitive for late-nineteenth to mid- to late-twentieth century resources associated with industrial development, including buildings associated with the meat packing industry in Hoboken. Portions of Alternative 2 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 northern portion of the alternative possesses the potential for historic deposits associated with the mid-nineteenth to twentieth century Tietjen & Lang Dry Docks and the Erie Freight Terminal in Weehawken.

As noted with Alternative 1, it is unknown whether any undocumented prehistoric and/or historic archaeological resources within Alternative 2 would be eligible for listing in the National Register. Given the limits of the study and the lack of detailed soil boring data for Alternative 2, an estimate of the potential effect of Alternative 2 to currently undiscovered historically significant archaeological resources is not known until archaeological investgations are implemented. The mitigation measures to minimize or avoid archaeological resources outlined in the project's PA provide steps by which to further ascertain the nature, type, and potential National Register eligibility of any extant cultural resources within Alternative 2.

Alternative 3

Depending on which option is selected in the southern portion of the Study Area, a total of 8.24 (Option 1) or 8.36 (Option 2) acres of lands, which would be disturbed for construction of Resist and DSD infrastructure under Alternative 3, have potential to encounter prehistoric or historic archaeological resources. For the Resist structure, current design plans call for an excavation trench five feet deep. Along the Resist structure, piles would be driven to bedrock at six to eight foot intervals and sheeting would be installed between the piles to a depth of up to 20 feet below the depth of the excavated trench, unless bedrock is encountered first. The sheeting would either be driven or vibrated into place. The design depth of the high level storm sewer component of Alternative 3 is currently unknown, but given the shallow depth and nature of this piping system, it is expected to be no deeper than the DSD infrastructure.

Figure 4.41 Area of Archaeological Potential to be Affected by the Project - Alternative 1

For the DSD infrastructure, the depth of construction would range from 6.67 feet below ground surface to 11.17 feet below ground surface. The nature of potential archaeological resources within the footprint of Alternative 3 is described in **Table 4.13** and mapped on **Figure 4.43**.

Archaeological resource potential exists in the south, north, and Weehawken portions of the Resist structure; in portions of the high level storm sewer; in areas of sheeting; and at 27 DSD locations, including 25 tank sites. As previously noted, due to the proposed construction depth, no prehistoric resources are expected to be disturbed at any of the DSD sites. However, portions of the Resist structure in Alternative 3 were determined to have the potential to effect deeply buried previously unidentified prehistoric deposits. Alternative 3 was found to possess historic archaeological sensitivity for deposits associated with landfill and railroad related development including features associated with the Erie-Lackawanna Terminal, the Long Slip Canal, and the PATH Tunnel along its southern portion; deposits associated with the development and expansion of the waterfront including industrial development and the transatlantic shipping and passenger lines along its eastern portion; and the potential for seventeenth through early-twentieth century shipwrecks in Weehawken Cove. Alternative 3 also exhibits sensitivity for historic sewer deposits. Alternative 3 is sensitive for early-nineteenth century historic seawall deposits in the vicinity of Hudson, Washington, 13th, and 15th streets. The southern portion of the alternative is sensitive for late-nineteenth to mid- to late-twentieth century resources associated with industrial development including buildings associated with the meat packing industry in Hoboken. Portions of Alternative 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 historic structures associated with the Hoboken Land and Improvement Company. The northern portion of the alternative possesses the potential for historic deposits associated with the mid-nineteenth to twentieth century Tietjen & Lang Dry Docks and the Erie Freight Terminal in Weehawken.

As noted with Alternative 1 and Alternative 2, it is unknown whether any potentially identified prehistoric and/or historic archaeological resources within Alternative 3 would be eligible for listing in the National Register. Given the limits of the study and the lack of detailed soil boring data for Alternative 3, an estimate of the potential effects of Alternative 3 to undiscovered historically significant archaeological resources is not known until archaeological investigations have been executed. The mitigation measures to minimize or avoid archaeological resources outlined in the project's PA provide steps to further ascertain the nature, type, and potential National Register eligibility of any extant cultural resources within Alternative 3.

No Action Alternative

No effects to archaeological resources are anticipated under the No Action Alternative. The No Action Alternative would result in a determination of no adverse effects under Section 106 of the National Historic Preservation Act.

Mitigation Measures and BMPs included in Alternatives 1, 2, and 3

Prior to the onset of Project activities and following the process outlined in the Project PA, mitigation measures for the Project would be developed in consultation with signatories to the PA, resulting in the implementation of the PA stipulations. In February of 2013, FEMA, in association with the NJHPO, the New Jersey State Office of Emergency Management, the ACHP, the Absentee Shawnee Tribe of Indians of Oklahoma, the Delaware Nation, the Delaware Tribe of Indians, the Shawnee Tribe of Oklahoma, and the Stockbridge Munsee Band of the Mohicans, executed a PA (the Sandy PA) which established procedures for undertakings associated with FEMA appropriated Hurricane Sandy funds and the potential effect of such undertakings on resources eligible for listing in the National Register (executed April 30, 2013 and amended May 1, 2015). However, given the scope and scale of the RBD project, it was determined that the existing Sandy PA did not adequately cover the potential cultural resource issues. Therefore, following Stipulation II.C.7.c of the Sandy PA (executed May 20, 2013 and amended May 1, 2015), NJHPO and the other consulting parties to this Project have developed a PA specific to RBD-HR, which outlines the procedures and mitigation measures with respect to Project effects to historic properties.

The Draft PA is included in Appendix G of the FEIS. The executed PA will be provided as an attachment to the project's Record of Decision (ROD). The PA outlines an approach to develop a Cultural Resource Management Protection Plan (CRMPP) to follow during final design of the Project. This CRMPP, to be developed by NJDEP in consultation with the final design consultant, will provide methods to complete the Section 106 process. The CRMPP will include methods to complete the identification of historic properties (36 CFR 800.4), assessment of project effects (36 CFR 800.5) and resolution of adverse effects (36 CFR 800.6). The identification of historic properties in advance of construction may include a soil boring program, additional documentary research, and field testing described in the following subsections. Following the PA, steps to complete the Section 106 process will be developed in consultation with the signatories to the PA, including consultation with the NJHPO. For archaeological resources, an archaeological field testing plan and, if necessary, an Archaeological Resource Management Plan, would be developed in advance of construction activities. The archaeological plans would take into account the varying construction activities and disturbances proposed within the Resist and DSD elements of the Project. The archaeological plans may include the following elements, which would be finalized during the Project Final Design and executed as stipulated in the Project's PA:

Source: See References

Figure 4.42 Area of Archaeological Potential to be Affected by the Project - Alternative 2

Soil Boring Program

For those portions of the archaeological APE determined to possess prehistoric sensitivity, specifically the Resist elements, a soil boring program may be established in consultation with NJHPO. The soil borings may be undertaken to establish geomorphological and environmental subsurface conditions within the identified areas of potential sensitivity, to determine the likelihood of an intact prehistoric ground surface within these areas, and to further refine the archaeological sensitivity analysis for the RBD. Soil boring data may also be used to inform upon the historic sensitivity of the tested areas as the soil boring data may reflect the presence of intact historic ground surfaces, historic fill deposits, and potential historic features.

Prioritize archaeologically sensitive areas for testing

NJDEP would commence this work during Final Design of the Project. It may include an assessment of site access and testing feasibility for all archaeologically-sensitive areas affected by the Project.

Additional Documentary Research

For areas sensitive for historic-period resources, NJDEP may undertake additional documentary research to document historic disturbance, refine archaeological sensitivity, and evaluate research potential to prioritize the sites for testing based on the site's potential to yield significant information and address meaningful research issues according to the Historic Properties criteria. The work would be undertaken per the procedures set forth in the Project PA and would be developed in consultation with NJHPO.

Field Testing Plan

Following the soil boring program, NJDEP may undertake field testing investigations to identify the presence or absence of potential Archaeological Resources. Field investigations may consist of testing well in advance of Project construction or testing just prior to construction. The method of field investigations selected would be based on site feasibility and testing appropriateness as determined by NJDEP in consultation with signatories to the Project PA.

Prior to commencing any field testing, NJDEP shall submit a Field Testing Plan outlining the proposed methodology for NJHPO's concurrence that the field evaluation and testing program would be conducted at a level sufficient to determine if the potential resource meets the criteria for listing in the State/National Registers.

For all field tested sites, NJDEP shall provide a report to NJHPO in which the criteria for listing in the State/National Registers have been applied to reach one of the following conclusions:

- The site does not meet the criteria, in which case no further action is required.
- The site does meet the criteria, in which case the site would be treated in accordance with the Project PA.

Design Modifications

The PA may also include procedures for the identification of additional archaeologically sensitive areas and an assessment of potential Project effects on those areas.

For any new project elements that would involve subsurface construction and for which the effects of such construction have not yet been analyzed as part of the EIS process, potential effects on archaeologically-sensitive areas within the RBD APE would be assessed by NJDEP, following the consultation requirements set forth in 36 CFR Part 800.

Unanticipated Discovery Plan

NJDEP, in consultation with NJHPO, would follow the Unanticipated Discoveries Plan as set forth in the Project PA in the event that any unanticipated archaeological resources and/or human remains are encountered during construction of the Project.

4.2.3.2 Evaluation Of Effects On Historic Architectural Resources

The Project would result in both direct and indirect effects on historic architectural resources. Direct effects include physical destruction, demolition, damage, or alteration of a historic property. Indirect effects include the introduction of visual, audible, or atmospheric elements to a historic property's setting or changes in accessibility. Effects may also be temporary, such as added noise, vibration, and dust during construction activities; temporary installation of fencing for shielding; and temporary change in traffic patterns.

The NJHPO has indicated in correspondence (Marcopul, RBD, October 28, 2016 and December 12, 2016) that they cannot issue concurrence on Determination of Effects pursuant to Section 106, either adverse or otherwise, because additional design plans and documentation are required**. Table 4.14** lists all of the known historic architectural properties and the anticipated effects to historic properties for all components associated with each alternative such as the Resist structures, high level storm sewers, the BASF site, Block 10 site, NJ TRANSIT site, and DSD ROW locations. For effects to historic districts, an effect to any contributing property would result in an effect to the district; therefore, only those individually eligible or listed historic properties are referenced in the table. As currently defined, the Project would result in no direct effects to State-listed historic resources and would not be subject to review under NJRHPA.

As noted previously, construction and implementation of the Project would result in temporary construction-related anticipated effects, such as vibration. The APE includes a distance of 90 feet to account for effects of vibration to historic properties. The Advisory Council on Historic Preservation recognizes "conditional no adverse effect determinations" under 36 CFR 800.5 (b) when conditions are implemented in consultation with the SHPO (ACHP 2004, 36 CFR 800; HUD). A Historic Resource Construction Protection Plan would be developed to prevent accidental and unforeseen

Figure 4.43 Area of Archaeological Potential to be Affected by the Project - Alternative 3

adverse effects resulting from construction of Resist features.

Alternative 1

Anticipated effects on historic architectural resources under Alternative 1 are depicted on **Figure 4.44** and have been summarized in **Table 4.14**. This alternative includes two options proposed in the vicinity of Observer Highway. Both options involve the Hoboken Historic District and the Old Main Delaware, Lackawanna and Western Railroad Historic District.

Stevens Historic District: Anticipated direct effects would result from construction of a flood structure that would tie into the existing concrete retaining wall around Elysian Field Park along the north side of the district. As the plans have not be finalized, the degree of alteration at this location cannot be fully assessed. As this alternative would result in a physical change to a feature associated with the historic district, Alternative 1 would result in an anticipated adverse effect to the Stevens Historic District.

Factory Terminal Loft Buildings (Standard Brands & Lipton Tea Plant): The Resist structure would wrap around the waterfront at the southeast corner of Weehawken Cove, where the waterfront is edged with a bulkhead. The size and length of the structure proposed in Alternative 1, especially around the Factory Terminal Loft Buildings, would be approximately 15 feet in height. Due to the size of the structure and its close proximity to the building, this alternative would introduce visual elements that would detract from the character-defining features, such as the materials, scale, and setting of the buildings and their association with the waterfront. The proposed structure would be designed in a manner to include amenities that enhance the perimeter walkway; however, the anticipated visual effects of the Resist structure would be an adverse effect.

Hoboken Historic District: Certain streets, such as 1st Street, are relatively narrow in the southern part of Hoboken. They tend to allow for traffic in only one direction to enable on-the-street parking and they also have narrow sidewalks. Buildings in this portion of the Hoboken Historic District have low or no stoops with the first story at or near ground level. Installation of a permanent structure along 1st Street and Hudson Street would encroach on the streetscape and possibly interfere with the relationship between building to building and building to street. The streetscape, setbacks, scale, massing, and materials are characteristics that define the buildings in the district. Specific design concepts for the Resist structure in this area have not been fully developed; therefore, effects to historic properties cannot be fully characterized. However, the proposed action would result in some level of change to the character of the property's use or of physical features within the property's setting that contribute to its historic significance and would introduce visual elements that diminish the integrity of the property's significant historic features. Therefore, the action would result in an anticipated adverse effect to these historic properties.

Old Main Delaware Lackawanna and Western Railroad Historic District: Both Option 1 and Option 2 would alter the bridge abutments and/or wing walls at the Henderson Street Bridge and the adjacent fill resulting in an anticipated adverse effect to the Old Main Delaware, Lackawanna, and Western Railroad Historic District. Option 1 would install a physical structure between the historic DLWRR Records Building and the rest of the rail yard, creating a change in the character of the property's use or physical features within the property's setting that contribute to its historic significance. Option 1 would also require changes to the tracks through the yard. Therefore, Option 1 would result in an adverse effect to the Old Main Delaware Lackawanna and Western Railroad Historic District and its contributing features, the Henderson Street Bridge and the DLWRR Records Building.

Grove Street Bridge: Gates are proposed at Grove Street, adjacent to the railroad ROW on the north side of the Grove Street Bridge(s). The gate rails would be located west of the bridge and extend toward the Grove Street Tie Station. The proposed gate would introduce a new and relatively large visual element at the bridge. Grove Street is at grade at this location and the bridge carries the DLWRR over the street. The approaches are fill that allow the tracks to rise to the height of the bridge and, as a result, the bridge, abutments, and approach frame the road, limiting the physical and visual space. Installation of the gates and their supports would be located at the fill and possibly require grading and/or changes to the wing walls. Although the gate would be moveable and utilized as needed, the structure for the gate would be permanent. The Project would physically impact the bridge and the adjacent fill and this component of Alternative 1 would result in an adverse effect to the Grove Street Bridge, which is also a contributing element to the Old Main Delaware, Lackawanna, and Western Railroad Historic District.

It is not expected that the proposed DSD or Block 10 infrastructure would result in significant changes to historic properties, many of which are located in the Hoboken Historic District. Neither the NJ TRANSIT Site nor BASF Site would affect historic properties. The Project would not alter use of historic properties or create visual changes to the surrounding landscape. The DSD locations would generally involve ground penetration and excavation to install the containment structures. A finding of conditional no adverse effect has been assigned to 28 DSD sites where the Project would be located underground and in close proximity (within 90 feet) to a historic property. The individually eligible and/or listed historic properties located in the Hoboken Historic District are noted on the Summary of Effects to Historic Properties, **Table 4.14.**

In summary, Alternative 1 would have anticipated adverse effects on five historic properties for Option 1 and four historic properties under Option 2. A conditional no adverse effect determination was made for 14 individual properties within 90 feet of DSD, Block 10, and/or Resist structure construction due to vibration effects. A Historic Resource Construction

Figure 4.44 Potential Effects on Known Historic Properties - Alternative 1

Protection Plan would be developed in accordance with the PA and in consultation with the NJHPO to make sure that there would be no adverse effect to those properties. Alternative 1 does not pose an adverse effect on the eight remaining historic properties within the APE. The majority of the adverse effects are permanent effects that arise from introduction of new Resist structures into the historic setting.

Alternative 2

Anticipated effects on historic architectural resources under Alternative 2 are depicted in **Figure 4.45** and have been summarized in **Table 4.14**. This alternative includes two options proposed in the vicinity of Observer Highway. Both options involve the Hoboken Historic District and the Old Main Delaware, Lackawanna, and Western Railroad Historic District.

Hoboken Historic District: Construction of resist structures to include flood structures, gates, and planter/seating structures in the vicinity of the 1300 block of Washington Street, north to 15th Street would introduce new visual elements to the district. The Resist structure would detract from the district or its individual components. The area is characterized by cohesive streetscapes, scale, and massing; a repetition of forms; and use materials and decorative elements, specific to the period of construction and stylistic considerations. The relationship of the buildings to the street, as well as the pedestrian scale of the buildings and surroundings, are integral to the integrity of the historic district. The Resist structure, as envisioned, would take an undulating form and add amenities such as street plazas, seating, stepped structures, and playground areas that would function as viewing platforms. The Project would be carefully designed and implemented in a manner that retains the characteristics of scale, urban setting, form, setback, and materials of the existing buildings in the historic districts, This alternative would permanently change the character of the properties' use and/or the physical features within the properties' setting that contribute to their significance because of the proximity and size of the structure, especially those buildings on the west side of Washington Street. Thus Alternative 2 would result in an anticipated adverse effect to the Hoboken Historic District.

Factory Terminal Loft Buildings (Standard Brands & Lipton Tea Plant): At 15th Street, the Resist structure would consist of a berm-like structure, eight feet tall, on the north side of the street. This structure would most likely include terracing and grading of the grounds between the National Brands & Lipton Tea Plant (Hudson Tea Building) and 15th Street. Although this alternative would not create physical changes to the Factory Terminal Loft Buildings and does not appear to result in a substantive visual impact to this building, it would result in a change to the size of the property through an easement or other device and would result in an anticipated adverse effect.

Old Main Delaware Lackawanna and Western Railroad Historic District: As described for Alternative 1, both Option 1 and Option 2 would alter the bridge abutments and/or wing walls at the Henderson Street Bridge and the adjacent fill resulting in an anticipated adverse effect to the Old Main Delaware, Lackawanna, and Western Railroad Historic District. Option 1 would install a physical structure between the historic DLWRR Records Building and the rest of the rail yard creating a change in the character of the property's use or physical features within the property's setting that contribute to its historic significance. Option 1 would also require changes to the tracks through the yard. Therefore, Option 1 would result in an anticipated adverse effect to the Old Main Delaware Lackawanna and Western Railroad Historic District and its contributing features, the Henderson Street Bridge and the DLWRR Records Building.

Grove Street Bridge: As described for Alternative 1, gates are proposed at Grove Street, adjacent to the railroad ROW on the north side of the Grove Street Bridge(s). The gate rails would be located west of the bridge and extend toward the Grove Street Tie Station. The proposed gate would introduce a new and relatively large visual element at the bridge. Grove Street is at grade at this location and the bridge carries the DLWRR over the street. The approaches are fill that allow the tracks to rise to the height of the bridge and, as a result, the bridge, abutments, and approach frame the road, limiting the physical and visual space. Installation of the gates and their supports would be located at the fill and possibly require grading and/or changes to the wing walls. Although the gate would be moveable and utilized as needed, the structure for the gate would be permanent. The proposed Project would physically impact the bridge and the adjacent fill; therefore, this component of Alternative 1 would result in an anticipated adverse effect to the Grove Street Bridge, which is also a contributing element to the Old Main Delaware, Lackawanna, and Western Railroad Historic District.

It is not expected that the proposed DSD, Block 10, or high level Sewer infrastructure would result in significant changes to historic properties, many of which are located in the Hoboken Historic District. Neither the NJ TRANSIT Site nor BASF Site would affect historic properties. The Project would not alter use of historic properties or create visual changes to the surrounding landscape. The DSD locations would generally involve ground penetration and excavation to install the containment structures. A finding of conditional no adverse effect has been assigned to 28 DSD sites where the Project would be located underground and in close proximity (within 90 feet) to a historic property. The individually eligible and/or listed historic properties located in the Hoboken Historic District are noted on the Summary of Effects to Historic Properties, **Table 4.14.**

In summary, Alternative 2 would have anticipated adverse effects on four historic properties for Option 1 and three historic properties under Option 2. A conditional no adverse effect determination was made for 18 individual historic properties within 90 feet of DSD or Resist structure construction due to vibration effects. A Historic Resource Construction Protection Plan would be developed in accordance with the PA

Figure 4.45 Potential Effects on Known Historic Properties - Alternative 2

and in consultation with the NJHPO to make sure that there would be no adverse effect to those properties. Alternative 2 would not pose an adverse effect to the five remaining historic properties within the APE. The majority of the adverse effects are permanent effects that arise from introduction of the new resist structures into the historic setting.

Alternative 3

Anticipated effects on historic architectural resources under Alternative 3 are depicted on **Figure 4.46** and have been summarized in **Table 4.14**. This alternative includes two options proposed in the vicinity of Observer Highway. Both Options involve the Hoboken Historic District and the Old Main Delaware, Lackawanna, and Western Railroad Historic District. The southern alignments for Alternative 3 are the same as for Alternative 2 and have the same two options. For an analysis of the anticipated effects of Options 1 and 2 on historic properties, (see Alternative 2).

Hoboken Historic District: Construction of Resist structures including flood structures, gates, and planter/seating structures in the vicinity of the 1300 block of Washington Street, Washington and 14th streets, and the alleyway mid-block behind (north) the 14th Street buildings would introduce new visual elements to the district. The Resist structures would detract from the district or its individual components. The area is characterized by cohesive streetscapes, scale, and massing; a repetition of forms; and use of materials and decorative elements, specific to the period of construction and stylistic considerations. The relationship of the buildings to the street, as well as the pedestrian scale of the buildings and surroundings, are integral to the integrity of the historic district. The proposed Resist structure, as envisioned, would take an undulating form and add amenities such as street plazas, seating, stepped structures, and playground areas that would function as viewing platforms. The Project would be carefully designed and implemented in a manner that retains the characteristics of scale, urban setting, form, setback, and materials of the existing buildings in the historic districts. This alternative would permanently change the character of the properties' use and/or the physical features within the properties' setting that contribute to their significance because of the proximity and size of the structure, especially those buildings on the west side of Washington Street. Therefore, Alternative 3 would result in an anticipated adverse effect to the Hoboken Historic District.

It is not expected that the proposed DSD, Block 10, or the High Level Sewer infrastructure would result in significant changes to historic properties, many of which are located in the Hoboken Historic District. Neither the NJ TRANSIT Site nor BASF Site would affect historic properties. The Project would not alter use of historic properties or create visual changes to the surrounding landscape. The DSD locations would generally involve ground penetration and excavation to install the proposed containment structures. A finding of conditional no adverse effect has been assigned to 28 DSD sites where the Project would be located underground and in close proximity (within 90 feet) to a historic property. The individually eligible and/or listed historic properties located in the Hoboken Historic District are noted on the Summary of Anticipated Effects to Historic Properties, **Table 4.14**.

Alternative 3 would result in the fewest anticipated effects to historic properties. Overall, Alternative 3 would result in an anticipated adverse effect for three historic properties for Option 1 and for two historic properties under Option 2. A conditional no adverse effect determination was made for 19 individual historic properties within 90 feet of DSD or Resist construction due to vibration effects. Following the steps outlined in the project PA, adverse effects would be mitigated using treatment measures developed in coordination with signatories to the Project's PA. As part of the CRMPP, mitigation measures can include the development of Historic Resource Construction Protection Plans that would identify adversely affected historic properties, provide mitigation measures specific to those properties in order to avoid unforeseen and accidental damage during construction. Alternative 3 would not create anticipated adverse effects to the five remaining historic properties within the APE. The majority of these anticipated adverse effects arise from the introduction of the new Resist features into a historic setting.

No Action Alternative

There would be no effect to historic buildings under the No Action Alternative. Implementation of this alternative would result in a no adverse effect determination under the National Historic Preservation Act.

Mitigation Measures and BMPs included in Alternatives 1, 2, and 3

Additional consultation with the signatories to the Project PA will provide recommended actions to minimize and/or mitigate adverse effects that are expected to result from the Project and be finalized as set forth in the Project's executed PA. Such actions may include the following.

Historic Resource Construction Protection Plans may be developed for the protection of historic properties and to avoid unforeseen and accidental damage during construction. The Historic Resource Construction Protection Plans should be relevant to the Resist and DSD schemes and address likely scenarios. They would provide mitigation measures to avoid adverse effects to those properties for which the Project would result in a conditional no adverse effect.

Design considerations for proposed above-ground Resist structures, including materials and color, may be developed in consultation with the signatories to the Project PA to minimize visual impacts to historic districts.

Interpretive signage could be placed in appropriate and accessible location(s) determined through consultation. Such signage could incorporate imagery of Hoboken's history as it relates to the former

Figure 4.46 Potential Effects on Known Historic Properties - Alternative 3

Hoboken Creek, development in former wetlands, and history of flooding in Hoboken.

As aspects of the Project may or may not be implemented, additional historic properties could be identified. There are architectural resources in the project area at or approaching the age for National Register eligibility consideration and as the Project design proceeds or if new elements are added to the project, any previously unevaluated historic resources in newly affected areas would be identified and evaluated for listing in the National Register. The Project PA also outlines the processes to follow in the event that new project elements are introduced and would require evaluation of Project effects to historic properties prior to construction, in consultation with the NJHPO and in accordance with the Section 106 process. The preparation of supplemental documentation on eligibility and effects assessments for newly identified properties would be carried out in accordance with measures stipulated in the PA.