

railroad development. The segment is also considered sensitive for industrial remains and structures associated with the railroad including an early-twentieth century freight house and a building associated with the Standard Oil Company. Such deposits would be anticipated at depths ranging from 0 to 14 feet below the surface.

Alternative 1–Southern Segment

The Southern segment of Alternative 1 is situated in the southern extent of Hoboken and the northeastern extent of Jersey City. The southern portion of the segment (Option 1) parallels the HBLR tracks which extend in an east-west and then a southwest-northeast trajectory towards Grove Street. At Grove Street, the Southern segment extends to the immediate north of a bridge associated with the former DLWRR (Plate 2). The northern portion of the segment parallels the southern frontage of Observer Highway from Clinton Street to Washington Street and then extends to the north along the eastern frontage of Washington Street (Option 2). A large warehouse building currently sits on the southern frontage of Observer Highway from Clinton Street on the west to just east of Garden Street on the east. Paved parking areas associated with the HBLR are located to the east of the warehouse. A black fence line currently separates the parking area from traffic on Observer Highway (Plate 3). The easternmost portion of Option 2 extends to Hudson Street and to the northern frontage of Observer Highway. On Washington Street, the Southern segment extends along the streetbed adjacent to paved parking areas and commercial storefronts (Plate 4). The far southern extent of the Southern segment includes a segment along Henderson Street which extends from a point south of the bridge of the former DLWRR to a bridge associated with the elevated HBLR track. The segment is located on the eastern frontage of Henderson Street and parallels the cement block and concrete footings for the railroad bridge and then extends to the west of a fenced electrical yard and the embankment to the HBLR elevated track (Plates 5 & 6). Semi-subsurface monitoring pipes and below ground grates were observed within the electrified yard. The Southern segment also contains an approximate 400-foot section along the northern frontage of 18th Street to the east of Henderson Street. This section parallels and crosses underneath the elevated HBLR tracks. The segment extends to the immediate south of the cement embankment and cement pillars/footing for the elevated rail line (Plates 7 & 8).

Historical Development

The Southern segment of Alternative 1 consisted of undeveloped meadows or submerged land prior to the mid-nineteenth century. Burr's 1832 map shows the lack of development within the area and suggests that portions of the Southern segment may have crossed the Hoboken Creek (see Figure 17).⁵⁴³ Dripps' 1855 map reflects initial development within the area. Ferry Street, present-day Observer Highway, between Hudson and Washington streets, had been created (see Figure 10). Several buildings had developed to the north and south of Ferry Street. Washington Street had also been laid out south of 1st Street. A long L-shaped building was located on the eastern frontage of Washington Street. The majority of the Southern segment was still undeveloped; portions appear to have been located under water to the west of the terminal extent of Ferry Street. Grove and Henderson streets were proposed by this time; it is unclear whether the roads had been laid out. The Grove Street portion of the Southern segment was located within an unnamed creek at the intersection of Grove and North 12th streets. The 18th Street portion of the segment was underwater.⁵⁴⁴

⁵⁴³ Burr 1832.

⁵⁴⁴ Dripps 1855.

APPENDIX A REPORT PLATES



Plate 1: Western Portion of the Southwestern Segment in Alternatives 1, 2, and 3. View Southwest. (TF 3/30/2016).



Plate 2: Location of Grove Street Gate. View South. (TF 3/30/2016).



Plate 3: Southern Frontage of Observer Highway, Looking at Option 2. View Southwest. (TF 3/30/2016).



Plate 4: Washington Street Portion of Southern Segment. View Southeast. (TF 4/5/2016).

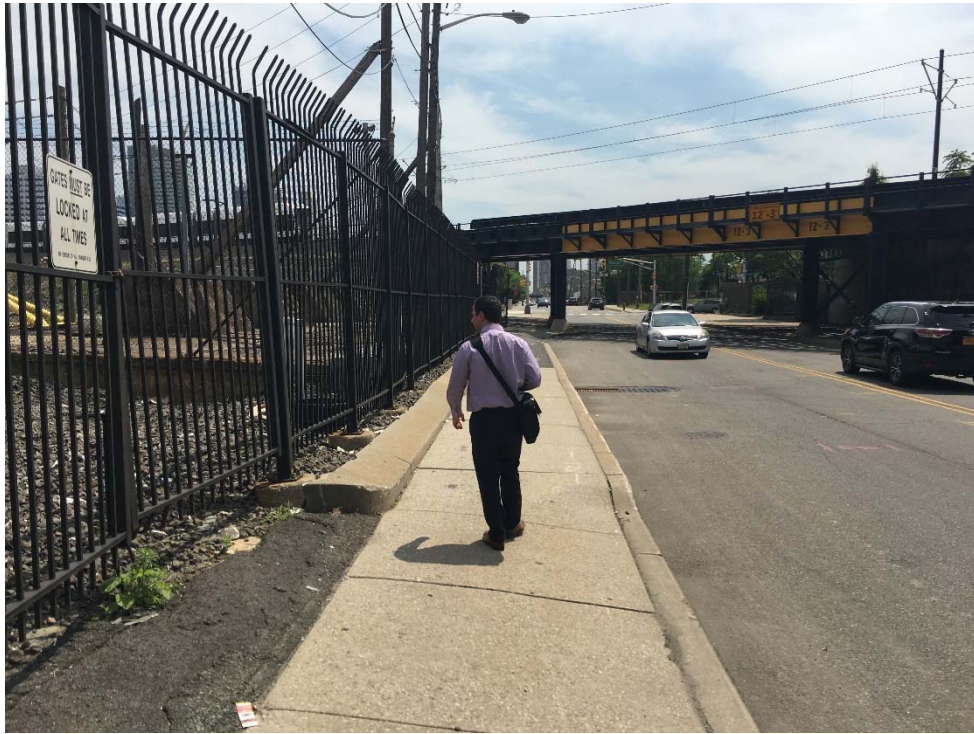


Plate 5: Henderson Street Portion of Southern Segment. View South. (WH 6/7/2016).

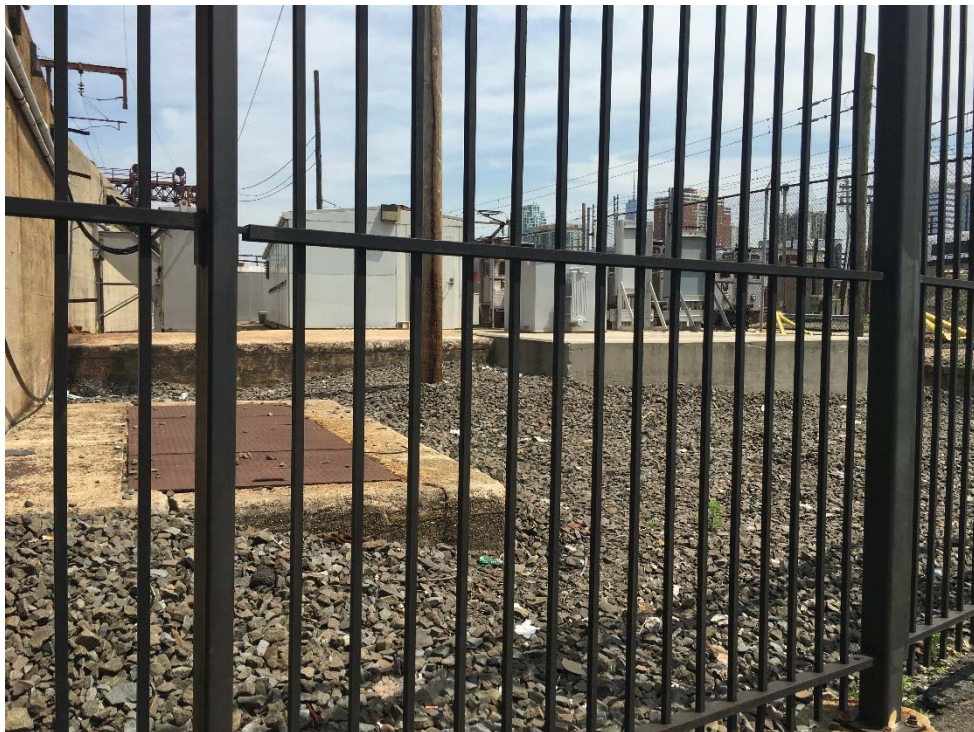


Plate 6: Electrified Yard East of Henderson Street. View East. (WH 6/7/2016).



Plate 7: Footings and Elevated HBLR Track and Viaduct on 18th Street. View Northeast. (WH 6/7/2016).

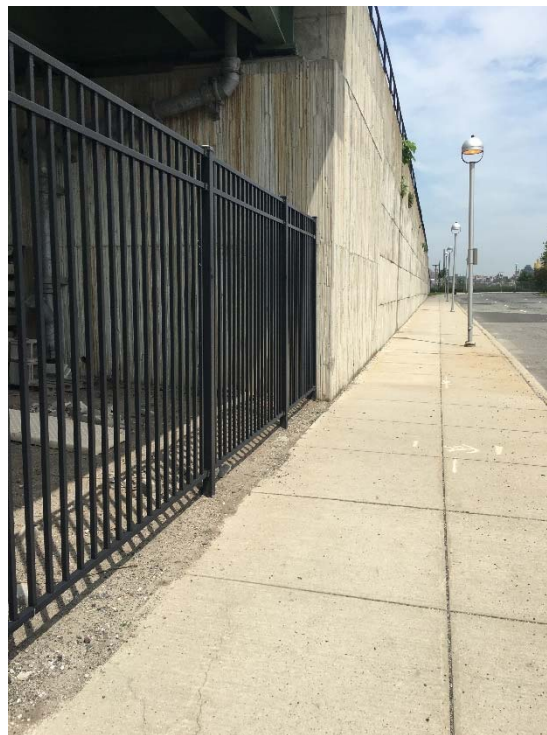


Plate 8: Foundation for HBLR Viaduct along 18th Street. View East. (WH 6/7/2016).

Minutes of the Common Council on file at the Hoboken City Clerk's Office indicated that Ferry Street was extended from Jefferson Street to the western boundary of the city ca. 1869. The minutes also indicated that a sewer line was present within at least a portion of Ferry Street by 1870. In this year, there was a petition to install a box sewer in Newark Street from the western boundary of the city to Ferry Street to connect with the Ferry Street sewer.⁵⁴⁵ G.M. Hopkins & Co.'s 1873 map reflects the extension of Ferry Street from Washington Street west to Newark Street. Hopkins' map indicates that a horse car line was located along Ferry and Washington streets (Figures 35 through 37). Extensive development had occurred along the eastern frontage of Washington Street which had been divided into distinct lots from Ferry Street to Newark Avenue. The map also indicates the development of the M&E Depot to the south of Ferry Street. The Southern segment, Option 1 extended through the M&E Depot and followed the railroad tracks to the west. Option 2 was located to the immediate north of the rail line within Ferry Street. The western extent of Option 2 extended across the train tracks and crossed undeveloped lots to the east of Henderson Street. Henderson Street north of 18th Street appears to have been created by this time. The portion of the Southern segment along Henderson Street extended to the immediate west of several properties—two buildings were associated with P.O. Neill to the north and two buildings including a large stable/garage were associated with S. & B.O. Storms to the south. The blocks to the north of the 18th Street segment appear to have been allotted; the blocks and lot were associated with the M&E. These lots were undeveloped aside from railroad tracks which extended through Block 160 and along the northern and southern frontage of 18th Street. The segment paralleled and crossed at least a portion of the tracks.⁵⁴⁶

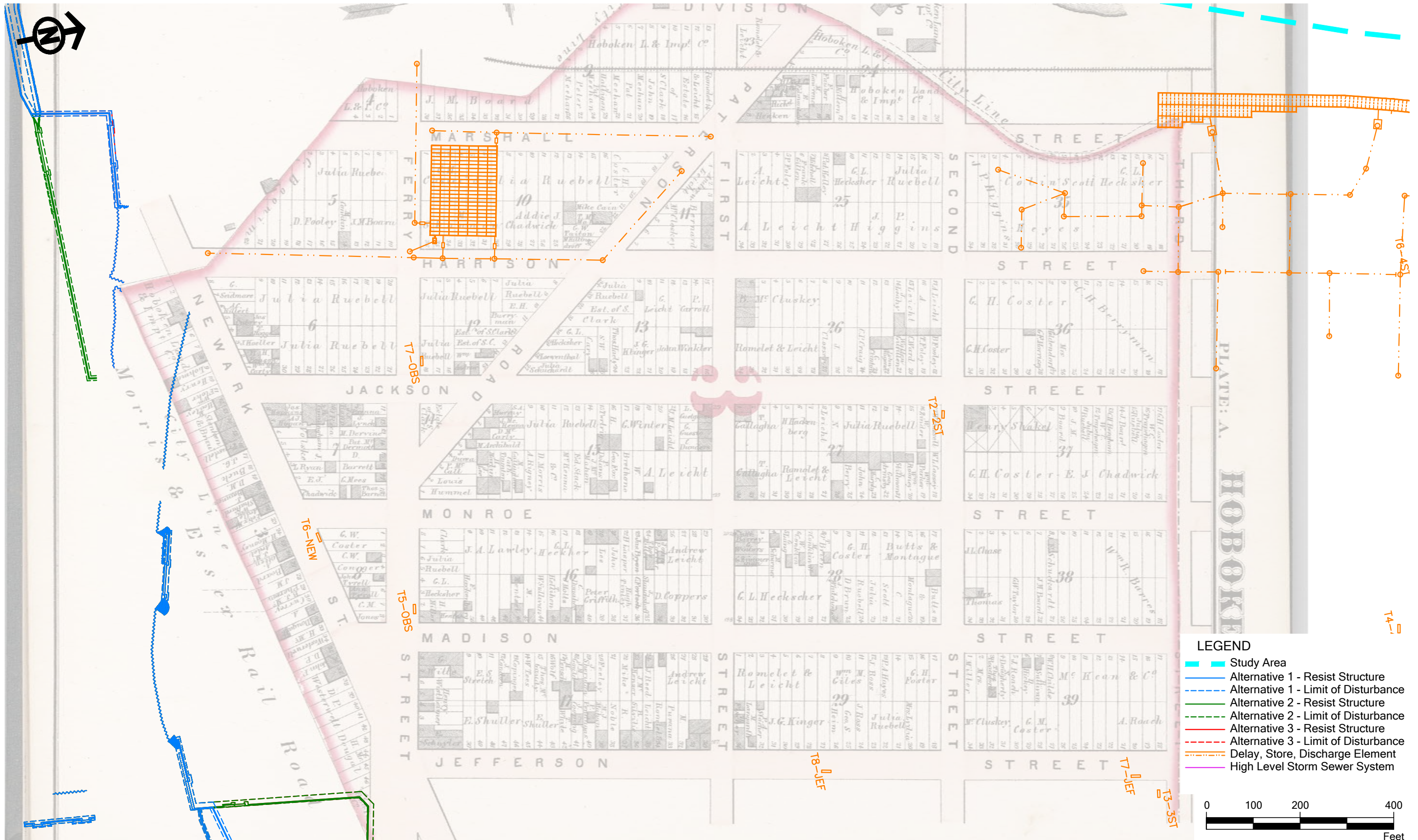
Speilmann and Brush's 1880 map indicates that the majority of Option 1 and Option 2 of the Southern segment were located in land that was reclaimed from the sea (see Figure 15). The southernmost portion of Washington Street was also reclaimed land. The 1880 map suggests that there was no sewer line within the portion of Washington Street located in the Southern segment. The Grove Street portion of the Southern segment was located in meadowland to the immediate south of an unnamed creek. The DLWRR railroad occupied the majority of Option 1. In a 2002 study, RGA found evidence indicating that a brick sewer was installed within Ferry Street in 1895 as part of a main outlet or outfall sewer. As-Built plans prepared by J.O. Whittemore, City Engineer, and on file with the NHSA, indicate that a brick trunk sewer line was installed within Ferry Street from Harrison Street to Bloomfield Street sometime prior to 1940.⁵⁴⁷

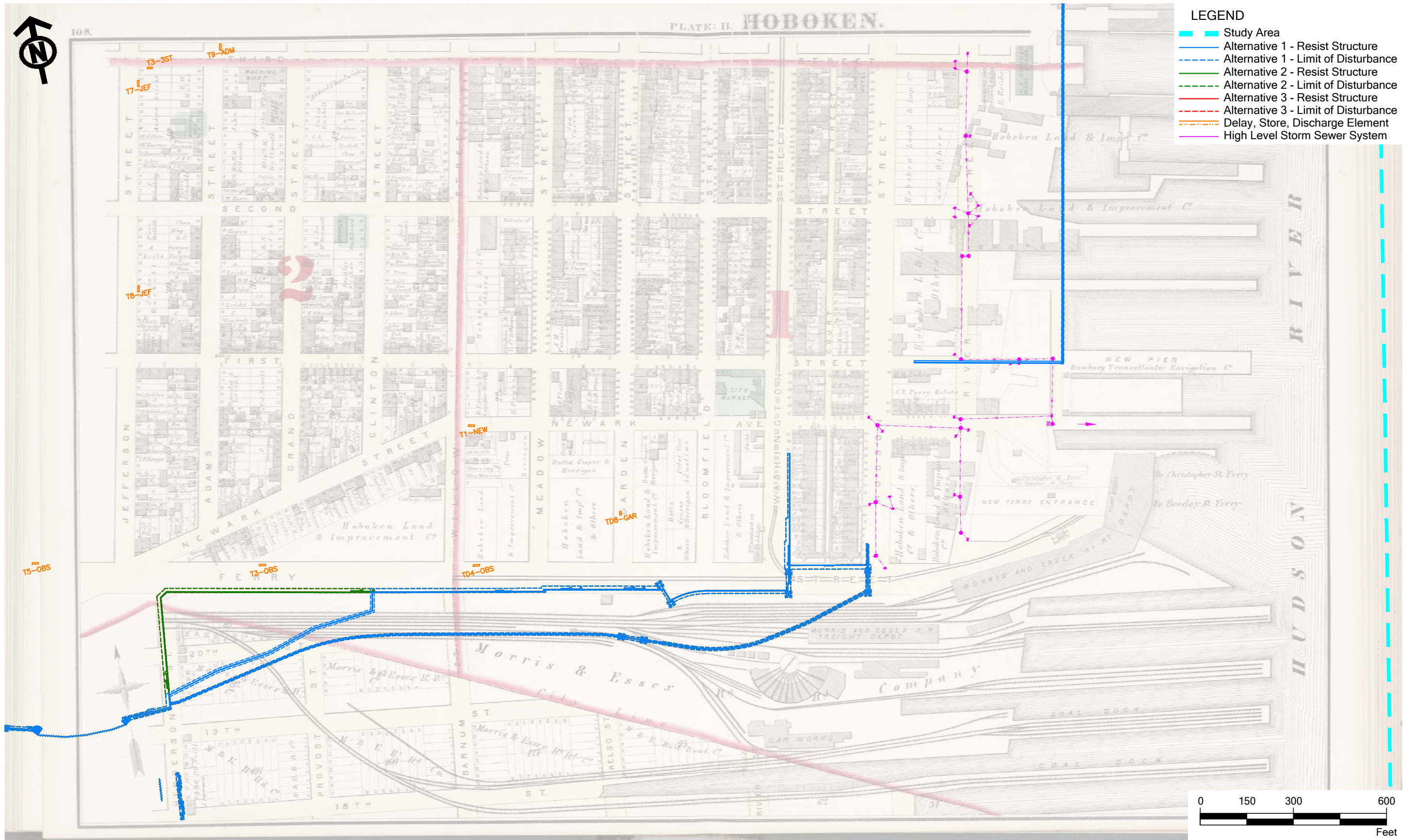
By the early 1900s, the Erie-Lackawanna Terminal on the eastern shore of Hoboken near Ferry Street and the H&M tunnel had been completed. G.M. Hopkins & Co.'s 1909 map indicates that the terminal and H&M tunnel were located to the immediate west of the Southern segment (Figures 37 through 39). The northeastern extent of Option 2 was located in the immediate vicinity of an elevated station associated with the NHCR elevated trolley line. The H&M tunnel extended from its terminal to the west under Ferry Street and then turned to the southwest and south to the west of Bloomfield Street. The H&M tunnel extended and crossed under both Options 1 and 2. The 1909 map also indicates the presence of a sewer line within Ferry Street that extended in a southeasterly trajectory through

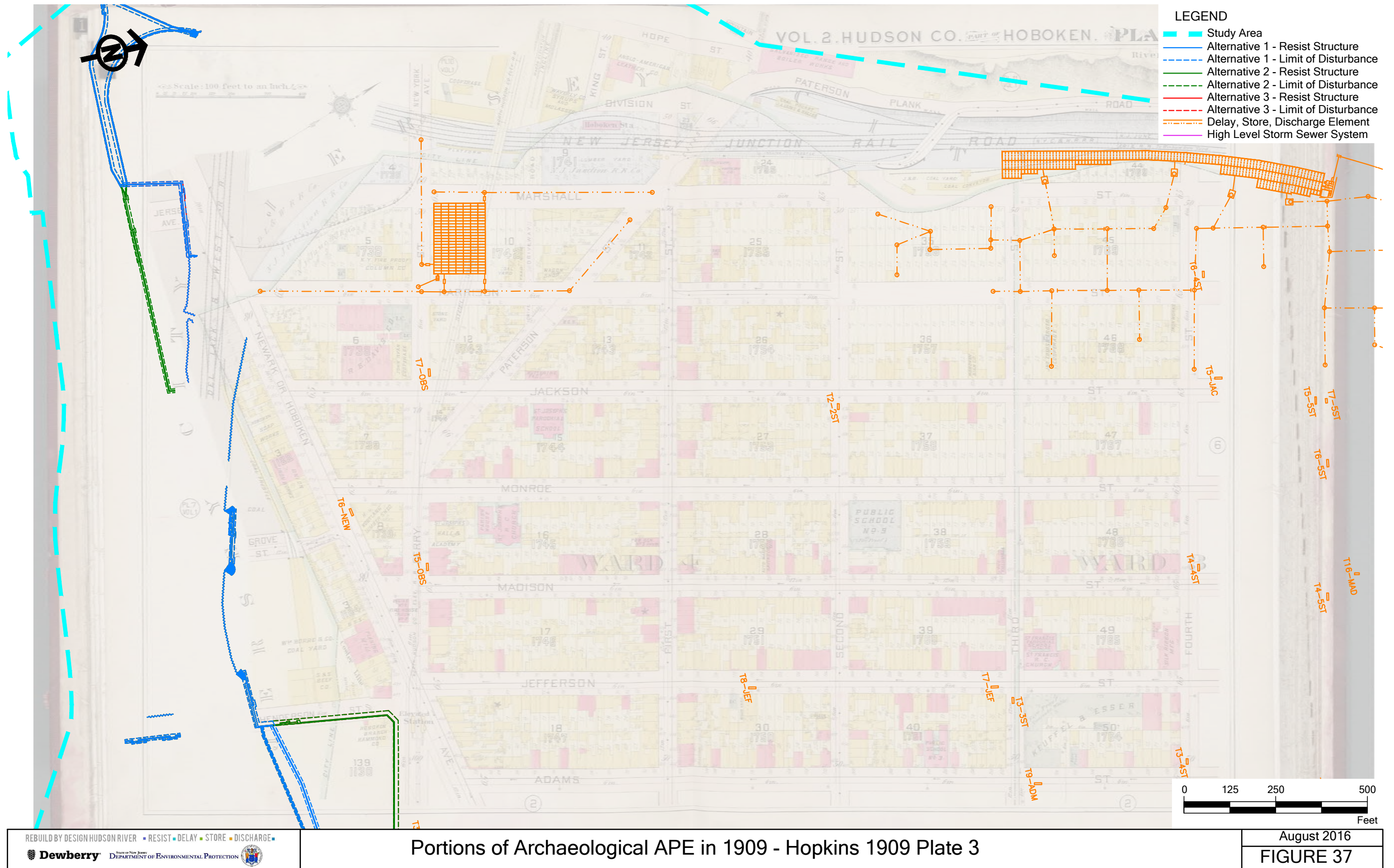
⁵⁴⁵ Hoboken Common Council, "Meeting Minutes of the Common Council," On file (Hoboken: City Clerk's Office) 1862-1871, 1875.

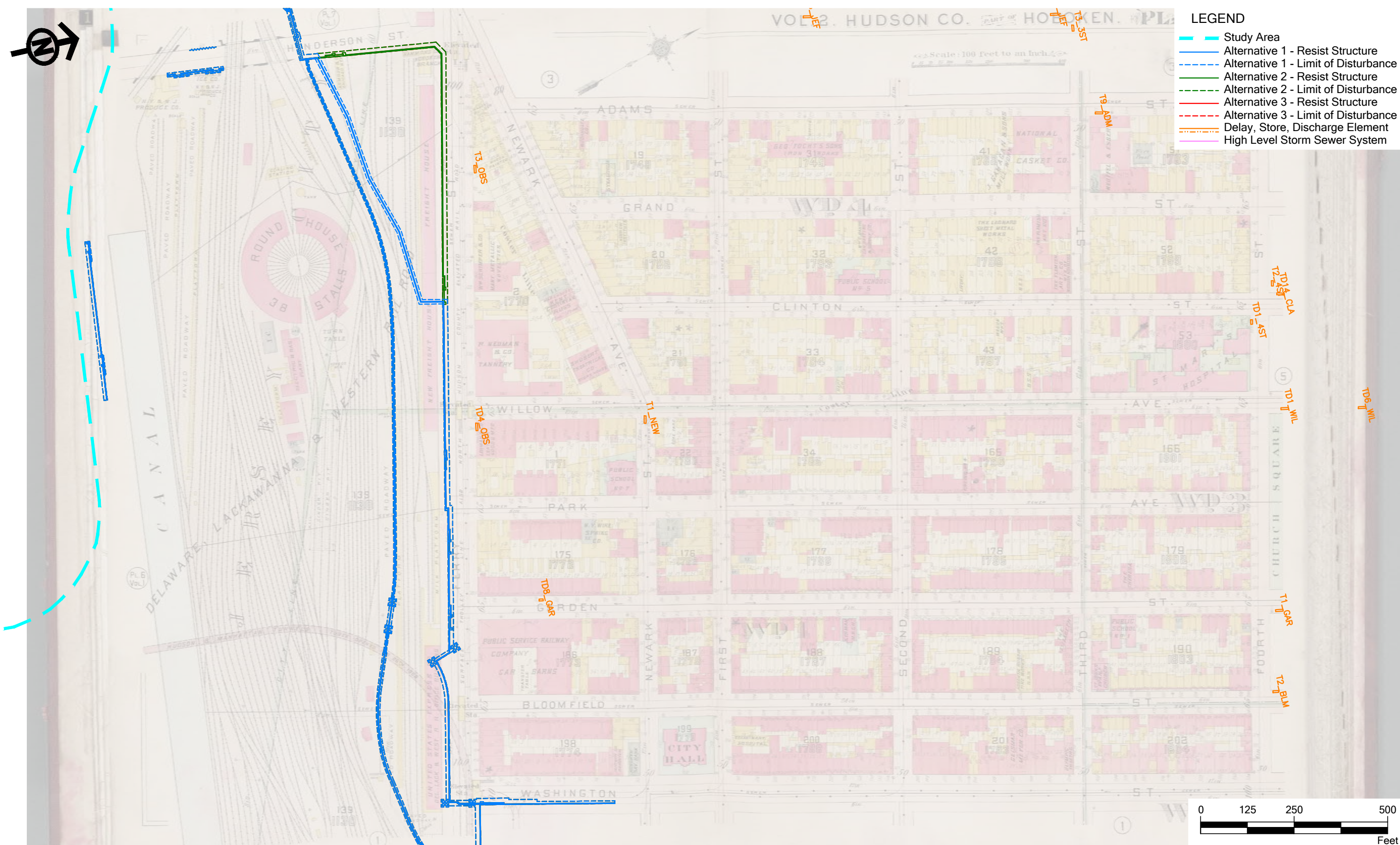
⁵⁴⁶ G.M. Hopkins & Co. 1873.

⁵⁴⁷ Speilmann and Brush 1880; RGA 2012, 3-1; Whittemore 1940.









the terminal to an outlet in the Hudson River. The majority of Option 2 appears to have extended in the immediate vicinity of (or to the immediate south of) the NHCR line; stations associated with the trolley were located at Bloomfield Street, Willow Street, and west of Adams Street. The map indicates that the Ferry Street sewer extended to the west along Ferry Street to Jackson Street. Option 1 extended through the DLWRR property, extending in the vicinity of the Round House Stalls, the Turn Table, an Electric and Gas Plant, a Coaling Station, and other railroad-related structures and features. The Long Slip Canal was located to the south of Option 1. The western portion of Option 2 extended across a Freight House on Ferry Street and then across the DLWRR rail lines to Henderson Street. The Grove Street gate appears to have been located to the immediate north of an elevated platform for the DLWRR. The western portion of the gate was located to the immediate south of a slaughterhouse and within a coal yard.⁵⁴⁸

The Henderson Street portion of the Southern segment appears to have extended in the vicinity of the footings for two elevated railroad bridges associated with the DLWRR. This section was also to the immediate west of buildings associated with the Mountain Ice Company and the N.Y. & N.J. Produce Company. The 18th Street portion of the segment was located within the DLWRR Terminal Yard. The section may have fallen within or to the immediate south of the western portion of the Long Slip Canal. It may have also extended along rail lines to the south of the slip.

G.M. Hopkins & Co.'s 1923 and 1928 maps reflect similar development in the vicinity of the Southern segment as in 1909. Public Service continued to maintain a station at the intersection of Washington Street and Ferry Street, with trolley lines extending on both streets. Elevated stations continued to be located at Bloomfield Street, Willow Street, and west of Adams Street along Ferry Street. The Grove Street gate was located to the north of the bridge associated with the DLWRR. Buildings associated with the Nagle Packing Company were located to the east of the gate on the eastern frontage of Grove Street. Unidentified frame structures were located on the western frontage of Grove Street near the western portion of the southern section. The 18th Street portion of the segment continued to extend through the DLWRR Terminal Yard. This section appeared to extend across rail lines, several small buildings, and into the western extent of the Long Slip Canal.⁵⁴⁹ By 1949, Public Service replaced the trolley lines with buses. The elevated trestle along Observer Highway and its associated stations were dismantled shortly thereafter.⁵⁵⁰

A review of the twentieth century Sanborn Insurance maps and historic aerial imagery indicates that the elevated trolley stations along Observer Highway were removed between 1951 and 1979. Structures associated with the DLWRR line were located to the north of the tracks for the majority of the twentieth century. Between 1997 and 2002, the brick New Jersey Transit building at the intersection of Marin Boulevard and Vezzetti Way was installed.⁵⁵¹ The Erie-Lackawanna Terminal was listed in the National Register in 1973; the terminal continues to service commuter rail and ferry traffic within New Jersey and between New Jersey and Manhattan.

⁵⁴⁸ G.M. Hopkins & Co. 1909.

⁵⁴⁹ G.M. Hopkins & Co. 1923; G.M. Hopkins & Co., *Plat Book of Jersey City, Hudson County, N.J.*, accessed online April 1, 2016, http://mapmaker.rutgers.edu/JCplat_book/Frontpage/index.htm.

⁵⁵⁰ Hans 2005, 54.

⁵⁵¹ Sanborn Insurance Library, LLC. 1937-2006; NETR 1931-2013.

Historic aerial imagery also indicates that the 18th Street portion of the segment was located within rail spur lines to the immediate south of the Long Slip Canal in the early to mid-twentieth century. Between 1979 and 1987, the spur lines had been removed and the area to the south of the canal had been extensively cleared. Between 1987 and 1994, 18th Street was established. By 2002, the current HBLR elevated tracks had been established paralleling 18th Street to the south, with branch lines crossing the street and heading to the southeast farther into Jersey City.⁵⁵² In 1997, the NJHPO determined that the Long Slip Canal was a contributing feature to the Old Main Delaware, Lackawanna, and Western Railroad Historic District.⁵⁵³ In 2002, the NJHPO also determined that the Hudson & Manhattan Railroad Transit System was eligible for listing in the National Register as a historic district. The system was considered eligible under Criterion A for the system's historic associations with the early-twentieth century urban and commercial development of New York and Jersey City; under Criterion B for its association with William McAdoo, the President of H&M who spearheaded the project and subsequently served as Secretary of the Treasury under President Woodrow Wilson; and under Criterion C for the system's significance as an early-twentieth century engineering accomplishment.⁵⁵⁴

Summary and Conclusions

The cartographic history of the Southern segment of Alternative 1 indicates that the area was submerged land or undeveloped marshlands through the mid-nineteenth century. Initial development within the area commenced along the eastern extent of Option 1 and 2 with the creation and development of portions of Ferry and Washington streets. The majority of the area had been filled by 1873, coinciding with the initial development of the M&E Railroad and Depot. By the early-twentieth century the southern section had witnessed extensive development associated with the DLWRR, the PATH tunnel, and the NHCR elevated trolley line. Several elevated trolley stations were located along or in the immediate vicinity of Option 2. Option 1 was located in the immediate vicinity of several structures and features associated with the Erie-Lackawanna Terminal. The Grove Street Gate and the Henderson Street portion of the segment were also located in the immediate vicinity of bridges/viaducts associated with the DLWRR. Portions of the proposed Grove Street Gate were also located in the vicinity of industrial and railroad-related development alongside the DLWRR tracks. The 18th Street portion of the segment was located within the DLWRR Terminal Yard from the late-nineteenth through the mid to later twentieth century. By the early-twentieth century, this area was located to the immediate south of the Long Slip Canal in an area of extensive rail spur lines. The rail spurs were removed between 1979 and 1987; 18th Street was extended in this vicinity by 1994. The elevated stations of the NHCR were dismantled during the mid-twentieth century.

In 2011, RGA conducted archaeological monitoring of the installation of two pipeline sections within Observer Highway from a point east of Washington Street to Hudson Street, within the easternmost portion of the Southern segment. RGA identified the extant 1895 brick sewer within Observer Highway. In addition to documenting the historic brick sewer, RGA also identified the brick tidal gate chamber, the sewer's trench, and documented the construction and filling sequence associated with the sewer installation. RGA's research in association with the

⁵⁵² NETR 1931-2013.

⁵⁵³ Geismar 2004.

⁵⁵⁴ NJHPO, "Hudson & Manhattan Railroad Transit System (PATH)," Historic Property File (On File, Trenton: NJHPO) 2002.

monitoring project determined that the exposed sewer line extended down Observer Highway (historic Ferry Street) from near Jefferson Street to Hudson Street.⁵⁵⁵ RGA's findings suggest that the historic brick sewer line may remain extant within portions of Option 2 to the east of Washington Street, east of RGA's Study Area.

Two other cultural resource studies have also been conducted in the vicinity of the Southern segment. In 2001, Joan Geismar conducted archaeological excavations on either side of the Long Slip Canal located to the south of Option 1 and to the immediate east of the 18th Street segment. These excavations revealed the log cribbing on the north side of the canal and the relatively clean fill used to fill the area and support the canal. While the cribbing was not intact on the southern extent of the canal, the cribbing and fill on its northern side appeared to be intact and provided details regarding the canal's construction. Geismar also compared the results of these excavations to other canal excavations and to other studies of waterfront-related landfill.⁵⁵⁶ CRMS conducted an archaeological survey of proposed Erie-Lackawanna Improvements. A portion of this Study Area was located in the immediate vicinity of the eastern portions of Option 1. During their pedestrian survey of the area, CRMS identified remnants of several historic features associated with the historic Erie-Lackawanna Terminal including the roundhouse, the turntable, bays, storage facilities, ties, and repair pits. Given the presence of these features, CRMS found that there was the potential for additional deposits relating to the Erie-Lackawanna Terminal, a National Register-listed property, within this area. CRMS further suggested that such deposits might inform upon the construction, filling history, and occupational history of the terminal.⁵⁵⁷

With respect to prehistoric archaeological sensitivity, the southern portion of Alternative 1 was historically submerged or within meadowlands. Dewberry has conducted a series of soil borings around the southern portion of Alternative 1 (see Appendix D). These borings generally reflected overlying fill deposits to a depth of at least 10 to 15 below the surface. Within many of the soil borings, an organic black silt was encountered beneath the fill deposits. Peat deposits were occasionally noted within the black silt matrix. Distinct brown peat layers were also encountered within many of the borings at a depth of approximately 20 feet below the surface. The organic and peat deposits generally terminated around 30 to 35 feet below the surface and were underlain by deposits of sand. The presence of an organic silt unlike the dark gray organic clayey silt observed within the soil boring excavated by Geismar and in Dewberry's soil borings to the west, alongside the identification of a distinct peat layer within many of the borings in the vicinity of the southern portion of the Southern segment suggests that there is the potential for a deeply buried, stable prehistoric surface within this area.

The discrepant soil profiles evidenced by the soil borings excavated by Geismar and Dewberry suggest that prehistoric conditions within the southern portion of Alternative 1 may have provided for a more favorable environmental setting for prehistoric occupation and/or settlement than within some of the marshlands to the north and west. In addition, this portion of the Study Area is located in near proximity to both the Ahasimus and the Hoboken creeks and was in a relatively level historic topographic situation. The presence of a potentially stable buried ground surface alongside the favorable environmental conditions, further suggests that this area may have

⁵⁵⁵ RGA 2012.

⁵⁵⁶ Geismar 2004.

⁵⁵⁷ CRMS n.d.

provided an attractive setting for prehistoric occupation. Therefore, the southern portion of Alternative 1 is considered sensitive for prehistoric deposits at a depth from approximately 15 to 35 feet below the surface.

Development of the majority of the Southern segment was associated with the extension of the M&E railroad and the subsequent expansion of the DLWRR. In particular, Option 1 and the 18th Street section are considered sensitive for historic deposits, including landfill, associated with the railroad development. Given the results of past archaeological excavations within the vicinity, it is unlikely that any railroad-related landfill deposits will be considered eligible for listing in the National Register.

Geismar's excavations in association with the Long Slip Canal indicated that intact cribbing and landfill associated with the construction of the Erie-Lackawanna Terminal and its operations may remain extant within Option 1 and the 18th Street section. Given the proximity of the 18th Street section to the Long Slip Canal, there is the potential for deposits associated with the canal and/or landfill associated with the rail spurs in this area. Furthermore, in light of CRMS' work, the eastern portions of Option 1 are also considered sensitive for late-nineteenth and early to mid-twentieth century remains associated with the operation of the Erie-Lackawanna Terminal. Furthermore, the Grove Street Gate area and the Henderson Street portion of the segment may have also been filled and developed in association with the rail line and are considered similarly sensitive for late-nineteenth through early-twentieth century railroad-related deposits. With respect to Option 2, elevated stations associated with the NHCR were located along several segments of Observer Highway. Option 2 is, therefore, considered sensitive for late-eighteenth and early to mid-nineteenth century deposits associated with the elevated trolley, including foundation piers for the trestle and stations. These deposits would be anticipated at depths ranging from 0 to 14 feet below the surface. The eastern portions of Option 2 and a segment of Option 1 between Garden and Bloomfield streets are also sensitive for historic deposits associated with the H&M/PATH Tunnel. This system has been determined eligible for listing in the National Register by the NJHPO. Deposits associated with the historic district would include the tunnel itself and any features or artifacts deposited in association with its construction. As the PATH Tunnel is situated at least 60 feet below the surface, deposits associated with the tunnel are anticipated at depths greater than 60 feet below the surface.⁵⁵⁸

In addition, RGA's archaeological work along the eastern portion of Option 2 identified an intact late-nineteenth century brick sewer. Whittemore's As-Built plans indicate that a brick trunk sewer line was installed within Ferry Street (Observer Highway) sometime prior to 1940. The As-Built plans indicate that the sewer line would be encountered at a depth of approximately 3.5 feet to 9 feet below the surface in the vicinity of Harrison Street and at a depth of approximately 7.5 to 12 feet in the vicinity of Washington Street. The As-Built plans also indicate that a cast-iron pipe is located along the eastern extent of Option 2.⁵⁵⁹ Additional data provided by the NHSA indicates that a brick sewer line was installed within Observer Highway from Marin Boulevard to Court Street prior to 1916. In light of RGA's findings and the data provided by NHSA it is highly likely that the western portions of the Observer Highway sewer line are extant within or in the immediate vicinity of Option 2 from east of Washington Street to Jefferson Street.

⁵⁵⁸ B. Klapouchy, "Hudson & Manhattan Railroad/Hudson Tubes," accessed online June 8, 2016 at <http://www.webring.org/l/rd?ring=001bus;id=266;url=http%3A%2F%2Fwww%2Ehudsoncity%2Eenet%2Ftubes%2Fgatewaytubepage%2Ehtml>.
⁵⁵⁹ Whittemore 1940.

Therefore, this portion of Option 2 is considered sensitive for historic deposits associated with the late-nineteenth to early-twentieth century brick trunk sewer. It is assumed that RGA's work along the eastern portion of Option 2 has compromised any pre-existing sewer deposits. Archaeological deposits associated with the trunk sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. Sewer deposits are anticipated at depths greater than 3.5 feet below the surface.

Alternative 1—Southeastern Segment

The entire Southeastern segment of Alternative 1 is located in Hoboken. The segment extends along the southern streetbed of 1st Street from a point to the east of its intersection with Hudson Street to its intersection with FSD. The segment then turns to the north and along the eastern frontage of FSD within paved pedestrian and jogging lanes to 4th Street (Plate 9). The far northern portion of the Southeastern segment extends to the northwest across a curved portion and traffic circle at FSD and 4th Street. Grass-covered islands are located to the east and west of the traffic circle; a public park is situated to the immediate northwest (Plate 10).

Historical Development

The majority of the Southeastern segment of Alternative 1 was undeveloped through most of the mid and late-nineteenth century. The 1844 U.S. Coast Guard map indicates that the majority of this segment was located underwater (see Figure 30). It appears that the southwestern portion of the segment on 1st Street was located within established land which may have been laid out as parkland or with a series of ornamental trees.⁵⁶⁰

G.M. Hopkins & Co.'s 1873 map shows increased development of the Southeastern segment (see Figure 36 & Figure 40). Land has been created to the east of River Street and 1st Street. An unidentified structure is located to the east of the intersection of 1st and River streets and in the path of the Southeastern segment. It appears that the southern portion of FSD may also have been filled by this point. Piers were located to the east of the roadway, including the new pier of the Hamburg Transatlantic Navigation Company. The Southeastern segment extended along the western edge of the piers to the north of a small structure. North of 1st Street, the Southeastern segment extended over submerged land and across the western extent of piers and a complex of shops at the terminal end of 2nd Street. To the north of 2nd Street, the Southeastern segment extended through filled land associated with the Hoboken Land and Improvement Company and along the western extent of several piers including one associated with the German U.S. Mail Steamer and in the vicinity of several small structures seemingly associated with the ocean liner piers. The far northern extent of the segment extended along the western extent of the Hamburg Steamship and the Baltic Lloyd Steamship Company pier and across a boat house at the terminal extent of 4th Street. The far northern extent of the Southeastern segment extended into Hudson Square.⁵⁶¹

Speilmann and Brush's 1880 map indicates that the 1st Street portion of the segment consisted of land reclaimed from the water (see Figure 15). The remaining portions of the Southeastern segment were located within similarly reclaimed land, along the western extents of piers, or underwater.⁵⁶² An examination of Bailey and Ward's 1887

⁵⁶⁰ U.S. Coast Guard 1844.

⁵⁶¹ G.M. Hopkins & Co. 1873.

⁵⁶² Speilmann and Brush 1880.



Plate 9: Frank Sinatra Drive and Waterfront within vicinity of Southeastern Segment of Alternative 1. View South. (TF 3/30/2016).



Plate 10: Frank Sinatra Drive at 4th Street. View Northwest. (TF 3/30/2016).

Birdseye View of Hoboken indicates that the FSD portion of the Southeastern segment may have extended within or in the immediate vicinity of buildings that had developed along the western extent of the piers at 1st Street, near 2nd Street, and between 2nd and 4th streets (Figure 41). In the vicinity of 3rd Street, the southern structures were associated with the North German Lloyd Steamship and the northern structures with the Hamburg American Packet Company. The northern portion of the segment appears to have been located in the vicinity of the Atlantic Boat Club House at the foot of 4th Street and into the Hudson Square Park.⁵⁶³

The 1887 Sanborn Fire Insurance map suggests that the southern portion of FSD, south of 2nd Street, may have been proposed. There is no indication of any development within this segment, which was located to the immediate west of a pier associated with the Hamburg American Packet Company. To the immediate south of 2nd Street, the Southeastern segment appears to have extended within or in the immediate vicinity of shops associated with the Camden & Amboy Railroad Company including a boiler shop. North of 2nd Street, it appears that the Southeastern segment extended along the bulkhead wall and/or the western extent of piers associated with the Wilson Steamship Company, the Lloyd Steamship Company, and the Thingvella Steamship Company. By 1891, Campbell & Company occupied a smaller pier and part of the Thingvella Steamship Company pier to the south of 4th Street.⁵⁶⁴

A fire along Hoboken's waterfront in 1900 destroyed the three piers and buildings of the North German Lloyd Company. Between 1901 and 1905, these piers were reconstructed; a new terminal building and headhouse were also built.

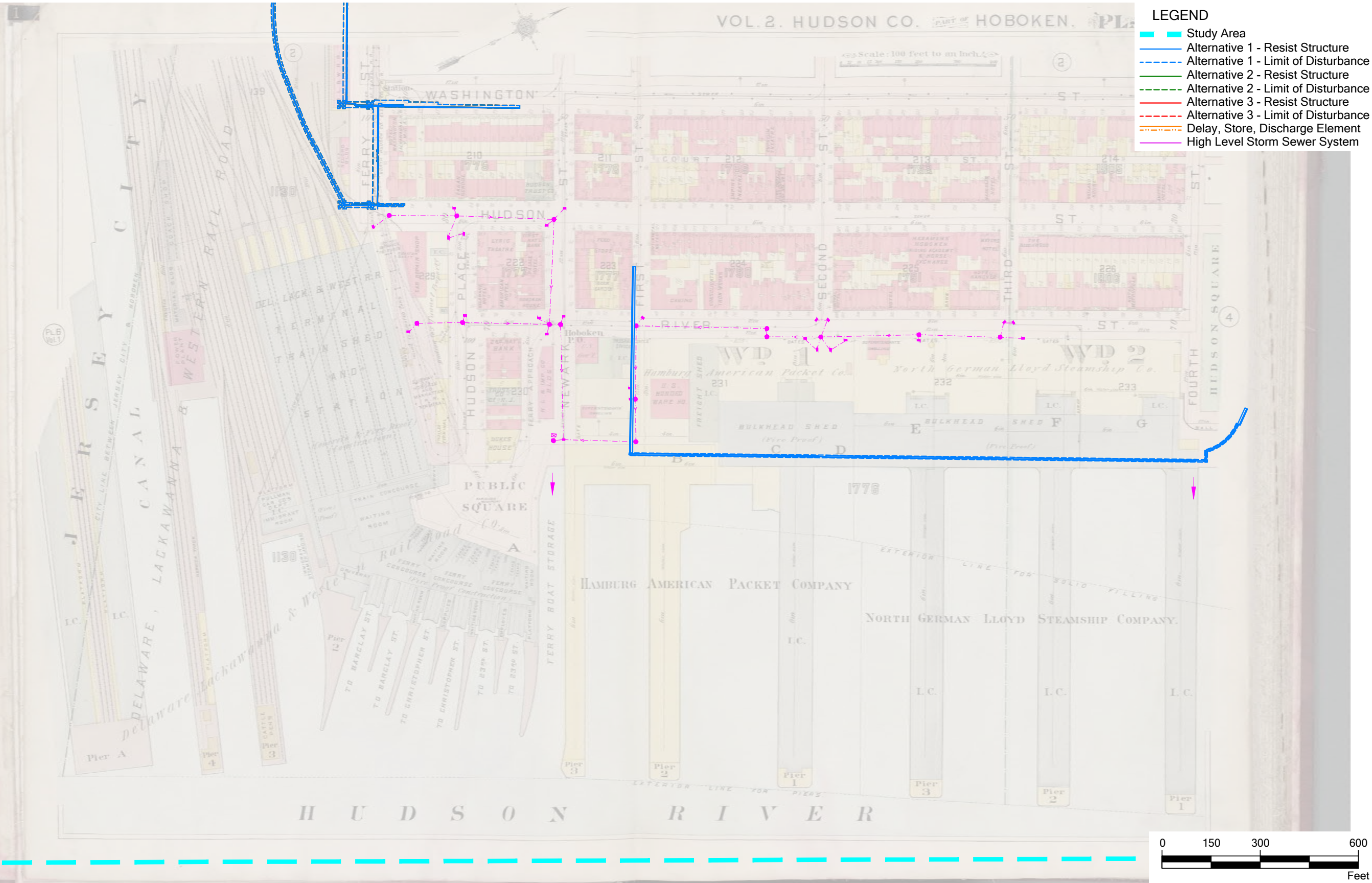
Hughes and Bailey's 1904 view of the city indicates that FSD had not yet been established. First Street had been laid out and developed to the terminals along the waterfront. It appears that the FSD portion of the Southeastern segment extended along the western portion of several pier lines and buildings that had developed along those piers. These developments, from south to north along the coast, consisted of: two piers associated with the Hamburg American Line and three piers associated with the North German Lloyd Company. In the vicinity of 4th Street, the Southeastern segment may have crossed the bulkhead along the coast and crossed the tracks of the Hoboken Manufacturers' Railroad before terminating in Hudson Square Park.⁵⁶⁵

G.M. Hopkins & Co.'s 1909 map indicates the presence of a six-inch pipeline below 1st Street (see Figure 39). To the east of River Street, this pipeline connected with a 12-inch pipeline which extended to the bulkhead; the 12-inch pipeline paralleled an eight-inch pipeline which also extended from River Street to the east. Gates were located on the eastern frontage of River Street. FSD was not laid out by this time. Rather, the majority of the Southeastern segment extended along the western extent of piers and the eastern extent of bulkhead sheds associated with the Hamburg American Packet Company (3) and the North German Lloyd Steamship Company (3). The Southeastern segment also crossed the 3rd Street sewer line which had an outlet into the Hudson River north of Pier F. At 4th Street, the segment extended across the terminal extent of the Hoboken Shore Railroad, an adjacent wall segment,

⁵⁶³ Bailey and Ward 1881.

⁵⁶⁴ Sanborn Library, LLC 1887, 1891.

⁵⁶⁵ Hughes and Bailey 1904.





Bird's Eye View of Southern Portions of Archaeological APE in 1881

and a 12-inch pipeline located within the 4th Street streetbed. The segment terminated within Hudson Square Park.⁵⁶⁶

G.M. Hopkins & Co.'s 1923 map reflects similar conditions to the 1909 map; FSD had yet to be laid out through the Southeastern segment. The piers and bulkhead sheds over which the segment extended were associated with different companies. From south to north, these companies consisted of the German Transatlantic Steam Navigation Company (former Hamburg American Packet Company), an unaffiliated pier (former Hamburg American Packet Company), the Munson S.S. Co. (former North German S.S. Co.), the Cosmopolitan S.S. Co. (former North German S.S. Co.), and the Panama R.R. S.S. Co. (former North German S.S. Co.). The northern portion of the Southeastern segment crossed the Hoboken Shore Railroad lines which serviced the North German Lloyd Dock Company, an adjacent wall, and a 12-inch pipe line before extending into Hanover Square Park.⁵⁶⁷

The As-Built plans for the sewer system indicate that a vitrified clay sewer pipe was located within the 1st Street portion of the Southeastern segment by 1940. The As-Built also indicate that a circular brick sewer line was located along 3rd Street with a terminus in the bulkhead wall along the Hudson River. Similarly, a wooden sewer line was located under the pier at the eastern terminus of 4th Street. Both of these sewer lines would be located within the Southeastern segment.⁵⁶⁸

The 1937 Sanborn Fire Insurance maps illustrate that present-day FSD had not yet been established south of 4th Street. The majority of the Southeastern segment continued to extend along the eastern bulkhead of 1st through 3rd streets or along the western extent of the piers in this area. The bulkhead buildings and piers within this area included from south to north: the Pan-Atlantic S.S. Corporation, a Star Line, the Triestina S.S. Line, and the America-France Lines. Bulkhead buildings located to the south of 4th Street were associated with Campbell's Stores. At 4th Street, the segment crossed a 12-inch water pipe and rail line before terminating.⁵⁶⁹

In the 1950s, the PANYNJ leased the piers and bulkhead buildings in the Southeastern segment. By the mid-1980s, the PANYNJ had vacated the piers and headhouse.

A review of the publically available historic aerial imagery indicates extensive alterations to the waterfront within the Southeastern segment from the 1930s through the present day. Much of these alterations were associated with the PANYNJ's occupancy. In 1931, five piers were located along the waterfront from Newark Avenue to 4th Street. The piers were located at Newark Avenue, at 2nd Street, between 2nd and 3rd streets, north of 3rd Street, and at 4th Street. By 1954, the Newark Avenue pier had been removed and a wider pier was established at 1st Street. The 2nd Street pier had also been removed. By 1966, the pier north of 3rd Street and the pier at 4th Street had both been demolished. A wider pier had been established from a point between 3rd and 4th streets to 4th Street. By 1994, the pier between 2nd and 3rd streets had been removed; the two wide piers were the only piers within the Southeastern segment. By

⁵⁶⁶ G.M. Hopkins & Co. 1909.

⁵⁶⁷ G.M. Hopkins & Co. 1923.

⁵⁶⁸ Whittemore 1950?.

⁵⁶⁹ Sanborn Library, LLC 1937.

2002, the pier at 1st Street was the only pier that remained. By 2009, the southern portion of the Hoboken waterfront resembled its present-day configuration with a wide pier at 1st Street and an offshore floating pier that supports a park and playground features being located to the east of 3rd and 4th streets, with pier entrances to the mainland at 3rd and 4th streets.⁵⁷⁰

A review of the mid to late-twentieth century Sanborn Fire Insurance maps indicates that FSD was formally established between 1988 and 2006. The 2006 maps indicate that FSD was established in the former location of a bulkhead building, east of the intersection of River and 2nd streets. The building was no longer extant in 2006; rather it had been replaced by a narrower apartment building and 2nd Street had been extended through to intersect with FSD. North of 2nd Street, FSD was installed along the western portion of a linear bulkhead building. In 2001, an apartment building was established on the southeast corner of 4th Street and FSD. The building was constructed in the previous location of the Hoboken Shore Railroad rail lines. FSD curved to the northwest at 4th Street. In 1988, a stone retaining wall was located within the center of 4th Street; a second stone retaining wall was located at the southeastern corner of present-day Stevens Park. The 2006 map indicates that the 4th Street wall had been removed but that the retaining wall at the park was still in place.⁵⁷¹ Today, FSD supports vehicular traffic, pedestrian and bike traffic. A wide brick walkway is located to the immediate east of paved lanes which support bicycling and jogging. Between 1st and 4th Street, the brick pathway borders the Hudson River or borders piers which jut out into the Hudson.

Summary and Conclusions

The cartographic history of the Southeastern segment of Alternative 1 indicates that the majority of the area was submerged land up until the late-nineteenth or early-twentieth century. Initial development of this segment occurred along 1st Street. The southwestern extent of the segment appears to have been filled and laid out by 1844; 1st Street was extended to River Street by 1873. A structure was located to the immediate east of the intersection of 1st and River streets and in the path or immediate vicinity of the Southeastern segment. The remaining portions of the segment were filled in between 1872 and 1909 to support the development of the waterfront, particularly piers associated with the late-nineteenth to early-twentieth century transatlantic ocean liners. By the early-twentieth century, the Hoboken Manufacturers Railroad (Hoboken Shore Line) had extended into the segment terminating to the south of 2nd Street. Sewer lines had also been installed along 1st Street, 4th Street, and onto the piers by 1909. As-Built plans for the sewer system indicate that the 1st Street sewer was a vitrified clay pipe. The As-Built indicate that a circular box sewer was located along 3rd Street, and a wooden sewer pipe was located along 4th Street; in addition, vitrified clay pipes were located within the bulkhead between 1st and 3rd streets.⁵⁷²

RGA monitored construction activities at two proposed locations of combined sewer overflows in 2003 to 2004. The sewer overflows were located on FSD to the north of the Southeastern segment. RGA observed fill deposits within the proposed sewer overflows at a depth of at least 17 feet below the surface. The water table was encountered at

⁵⁷⁰ NETR 1931-2009.

⁵⁷¹ Sanborn Library, LLC 1951-2006.

⁵⁷² Whittemore 1940.

approximately 14 feet below grade. There were no prehistoric deposits or historic features identified.⁵⁷³ In 2013, Hunter Research, Inc. (Hunter) conducted an archaeological assessment of the Hoboken Post Office to the immediate south of the Southeastern segment. Hunter's study investigated the potential for deeply buried prehistoric archaeological deposits along the shore of Hoboken; such deposits would be associated with lower sea levels during the Late Archaic period. Given that this area was underwater until the mid to late-nineteenth century, Hunter concluded that any prehistoric deposits would be located under the current water levels. They also noted that wave action associated with rising water levels and development of the waterfront may have impacted any existing prehistoric deposits. Hunter also found that there was little potential for historic bulkhead remains or piers within their project area given the development of the Hoboken Post Office and associated storm sewer and storage tank facilities. Despite these findings, Hunter noted that there was a possibility for deeply buried features, both prehistoric and historic, within this area. They recommended archaeological monitored geotechnical borings within the area to further evaluate the potential for deeply buried cultural-bearing strata.⁵⁷⁴

With respect to prehistoric archaeological sensitivity, the Southeastern segment of Alternative 1 was historically submerged aside from a small portion which was within meadowlands. Dewberry previously conducted two soil borings within the vicinity of the Southeastern segment—Boring B-1 at the southern extent and Boring B-4A at the northern extent (see Appendix D). Boring B-1 contained fill deposits consisting of dark brown and gray sand with wood and brick fragments to a depth of approximately 18 feet below the surface. The fill deposits were underlain by a black clayey silt and a black clay to a depth of approximately 40 feet below the surface. Dark gray clay deposits were found underneath the black clay to a depth of 68 feet below the surface beneath which light brown sand was encountered. At a depth of approximately 80 feet below the surface, gray and green gravel and serpentine chips were encountered. The boring was terminated in this deposit at a depth of 84 feet below the surface. Similarly within Boring B-4A, fill deposits extended to a depth of approximately 23 feet below the surface. A gray clay and light brown clayey silt underlain the fill deposits to a depth of approximately 38 feet below the surface. A light brown sand deposit underlain the clay matrix; Boring B-4A was terminated within the light brown sand at a depth of 51.8 feet below the surface.

The profile exposed within the soil borings lacked a distinctly defined organic layer or peat deposit. Rather, deep and consistent clay deposits were found underlying the fill. Sand and/or rock deposits were found underlying the clay suggesting that glacial till may have been reached. Given the lack of an organic deposit within the profiles and the fact that each boring appeared to reach glacially deposited materials, there does not appear to be an intact potential prehistoric occupation surface within this area. Given the profiles exposed within the soil borings, the Southeastern segment of Alternative 1 is considered to possess low potential for prehistoric deposits.

Development of the majority of the Southeastern segment was associated with the development of transatlantic oceanliners in the mid to late-nineteenth century. Bulkhead buildings and piers were located within the vicinity of the Southeastern segment from north of 1st Street to 4th Street. In particular, by the 1870s, the Southeastern segment

⁵⁷³ RGA, *Archaeological Monitoring North Hudson Sewerage Authority Solids/Floatables Removal Project Package 3A (H-3/H-4/HIS S/F Facility and HIS Consolidation Conduit) City of Hoboken, Hudson County, New Jersey* (On file, Trenton: NJHPO) 2004.

⁵⁷⁴ Hunter 2013.

from 1st Street to a point mid-way between 1st and 2nd streets witnessed development associated with the Hamburg Transatlantic Company; piers and shops associated with the Hoboken Land and Improvement Company were located between approximately 2nd and 3rd streets; and a terminal and pier associated with the German U.S. Mail Steamer were located between 3rd and 4th streets. In addition, an unidentified structure located to the immediate east of the intersection of 1st and River streets was located within or in the immediate vicinity of the 1st Street portion of the Southeastern segment. Additional pier and bulkhead development occurred between 1st and 4th streets throughout the twentieth century in association with fires, changes in ownership, and changes in occupancy from businesses serving passenger traffic and then containerization and cargo in the later twentieth century. It is unclear to what extent twentieth century development impacted the historic landfill, piers, and buildings along this portion of Hoboken's waterfront. Therefore, the portion of the Southeastern segment located along FSD from 1st to 4th streets is considered sensitive for historic deposits associated with the nineteenth century filling of the shore and the nineteenth through twentieth century development of the shoreline. Such deposits would be anticipated at depths from 0 to potentially 40 feet below the surface. In addition, a portion of the 1st alignment is considered sensitive for historic deposits associated with a mid to late-nineteenth century structure. Potential deposits associated with this structure might include shaft features, midden deposits, activity areas, and/or foundation remains. Such deposits would be anticipated at depths greater than five feet below the surface.

The early-twentieth century records also indicate the presence of sewer lines within 1st Street to the east, connecting with a six-inch sewer line along the bulkhead. A gate was also located at the eastern frontage of River and 1st streets; and a 12-inch sewer line was located within 4th Street. The As-Built plans indicate that the sewer lines along River Street, 1st Street, and the bulkhead were vitrified clay pipes. The As-Built also indicate the presence of a circular brick sewer line within the piers at 3rd Street and a wooden sewer line under the piers at 4th Street.

Given that the sewer line within the southern portion of the Southeastern segment consists of vitrified clay pipes, these deposits are not considered representative of the early technology within the Hoboken sewer system. Therefore, these sewer lines are not considered potentially significant resources. Conversely, the circular brick sewer line and the wooden sewer line along the waterfront in the vicinity of 3rd and 4th streets are considered representative of the early technology utilized by the nineteenth to early-twentieth century sewer system. Therefore, these portions of the Southeastern segment are considered sensitive for late-nineteenth to early-twentieth century sewer-related deposits. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. Sewer deposits within Hoboken have previously been exposed at depths ranging from four to eight feet below the surface. Therefore, sewer deposits along the waterfront are anticipated at depths greater than four feet below the surface.

The early-twentieth century maps also suggest the presence of a stone retaining wall along 4th Street to the immediate west of the waterfront and a second retaining wall at the southeastern corner of the park. Currently, this portion of the Study Area consists of paved surfaces and roadway islands. Several utilities including manholes and drainage grates are present suggesting past disturbance. However, the vertical and horizontal extent of this past disturbance is unclear. Therefore, the 4th Street portion of the Southeastern segment is considered sensitive for historic deposits associated with the stone walls. Archaeological remains associated with the retaining walls would

most likely consist of the walls themselves. Such deposits would be anticipated within or immediately below twentieth century fill deposits at depths greater than five feet below the surface. This segment is also considered sensitive for historic landfill deposits dating to the mid to late-nineteenth century associated with the extension of the waterfront and shoreline. Archaeological deposits associated with landfill could include cribbage, soil deposits, wooden supports, other foundational pieces, and/or riprack. These deposits would be anticipated at depths greater than five feet below the surface. As previously noted, in light of past cultural resource investigations within Hoboken, it is unlikely that any uncovered landfill deposits would be determined eligible for listing in the National Register.

Alternative 1–Northern Segment

The entire Northern segment of Alternative 1 is located in Hoboken. The segment extends from the intersection of FSD and Sinatra Drive North to the northeast along paved surfaces and intersects with a paved walkway that parallels the shoreline (Plate 11). The paved surfaces primarily consist of a patterned cobblestone including gray bricks, with patterned segments of red bricks. Pedestrian features including park benches, trash cans, and a black fence line along the waterfront, are located along the pathway. The exposed shoreline to the east of the Northern segment consists of large gray rip rap. Sand was observed to the east of the rip rack in a few locations. Several piers and remnants of piers are located to the east of the segment. Along the southern extent of the segment, a grass-covered peninsular juts into the Hudson River to the east of Sinatra Drive North. A one-story structure commemorating the New York Yacht Club is located on top of this peninsula (Plate 12). The northern portion of the Northern segment extends to the immediate north of residential property along 15th Street. The segment includes a rectangular parcel of exposed soil and shrub grass on the eastern frontage of Park Avenue. The parcel is surrounded by a chain link fence and contains several semi-subsurface pipes. Signage on the fence indicates that the parcel is currently undergoing environmental remediation (Plate 13). The shoreline at the far northern extent of the segment consists of large gray rip rap with exposed wood timbers at the base (Plate 14).

Historical Development

The 1844 U.S. Coast Guard survey map indicates that the majority of the Northern segment was underwater (see Figure 30).⁵⁷⁵ The only portion of the segment which was not underwater was the far northern extent which was located in meadows to the south and west of Weehawken Cove. The unsubmerged portions of the Northern segment were located to the east of an historic seawall. The seawall may have been constructed by Samuel and Robert Swartout ca. 1814 to 1819 in order to drain and reclaim the meadows. Aside from the historic seawall, initial development within the Northern segment appears to have been a T-shaped pier which was mapped off the coast of the Elysian Fields around 11th Street in 1873. The Northern segment appears to have extended across this pier; in 1873, the remaining portions of the segment continued to be underwater.⁵⁷⁶

The Northern segment was filled and increasingly developed throughout the late-nineteenth and early-twentieth century. By 1891, the 14th Street Ferry landing had been established.⁵⁷⁷ The Northern segment extended along a

⁵⁷⁵ US Coastal Survey 1844.

⁵⁷⁶ G.M. Hopkins & Co. 1873.

⁵⁷⁷ Julius Bien & Co., *Atlas of the Metropolitan District and Adjacent Country Comprising the Counties of New York, Kings, Richmond, Westchester and parts of Queens in the State of New York, The County of Hudson and parts of the Counties of Bergen, Passaic, Essex, and Union in the State Of New Jersey* (New York: Julius Bien & Co.) 1891.



Plate 11: Cobblestone Pathways to East of Frank Sinatra Drive along Waterfront within Northern Segment of Alternative 1. View Northwest. (TF 4/5/2016).



Plate 12: Cobblestone Pathways, Green Space, and Yacht Club Building in Vicinity of Northern Segment of Alternative 1. View Southwest. (TF 4/5/2016).



Plate 13: Site of Environmental Clean-up within Northern Segment of each Alternative. View East. (TF 4/5/2016).



Plate 14: Riprack and Wood Bulkhead to East of Weehawken Cove within Northern Segment of Alternative 1. View Southwest. (TF 4/5/2016).

portion of the ferry's pier. The 1887 Sanborn Fire Insurance map also indicates the presence of a T-shaped pier and associated smaller pier near 11th Street. Three boathouses were also located on the shore of the Elysian Fields around 10th Street. The southern portion of the Northern segment may have extended in the vicinity of these boathouses and the T-shaped pier.⁵⁷⁸

Hughes and Bailey's 1904 Birdseye view of the city indicates that the entirety of the Northern segment was filled by the early-twentieth century (Figure 42). The southern extent of the segment appears to have been in the immediate vicinity of the Hoboken Manufacturers Railroad. The segment then extended to the northeast and north along the eastern shore. From south to north, the segment extended over a wharf, building, and piers associated with the Savannah Line, a pier at 13th Street, the 14th Street Ferry pier and buildings, and a pier at 15th Street. Around 15th Street, the Northern segment turned to the west and cut inland across a bulkhead or pier on the southern extent of Weehawken Cove. The northern portion of the segment turned to the north and paralleled railroad tracks along a bulkhead on the western extent of the Weehawken Cove.⁵⁷⁹

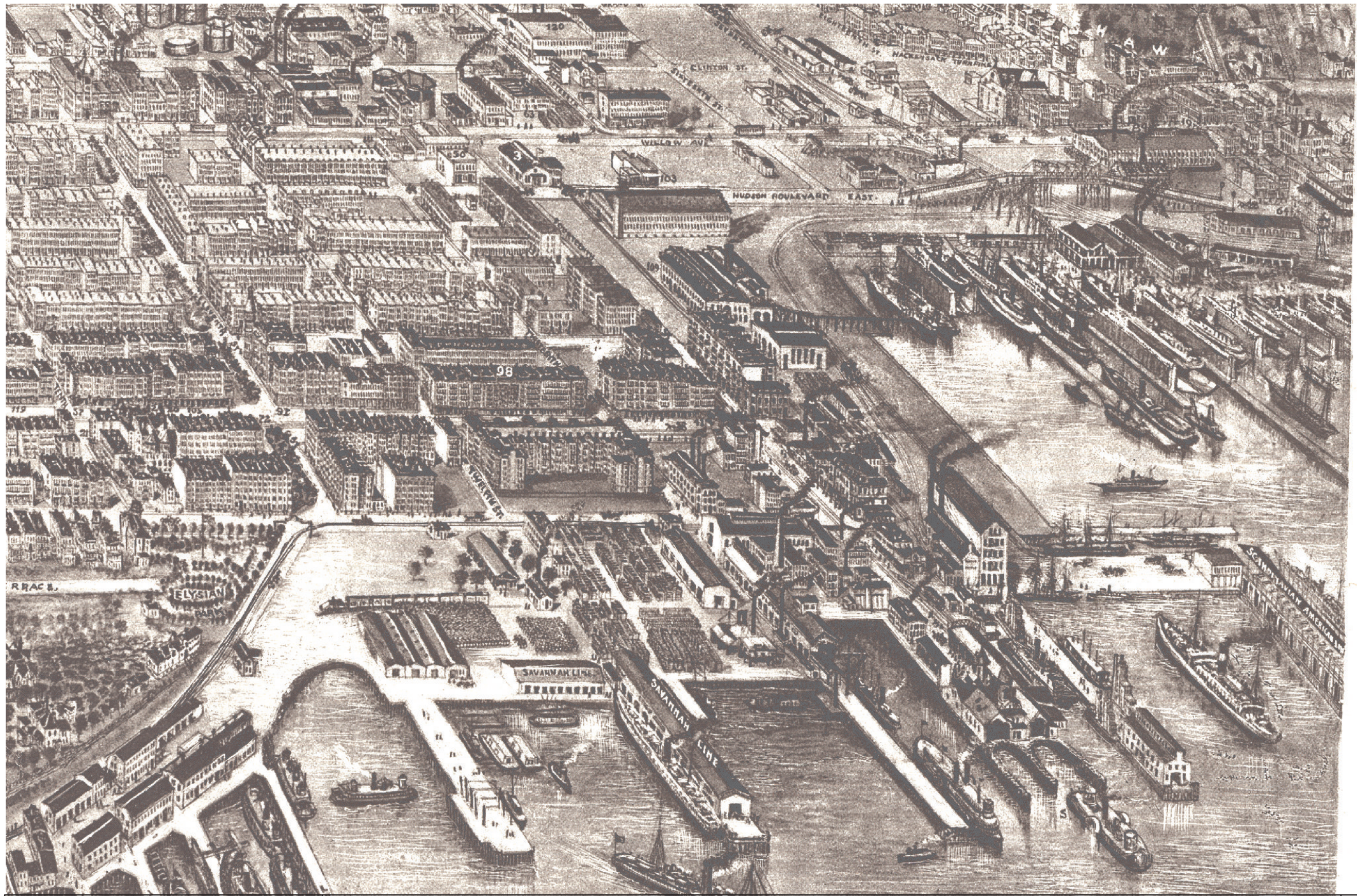
G.M. Hopkins & Co.'s 1909 map shows increased development within the Northern segment (Figure 43). The southern extent of the segment extended through property and intersected a structure associated with the American Warehouse and Trading Company and intersected with a pier belonging to the Pennsylvania Railroad near 11th Street. The segment then extended to the north crossing several piers. From south to north the segment intersected the south and north piers and associated buildings of the Ocean Steamship Company; a small pier associated with the American Warehouse and Trading Company; two piers associated with the W. & A. Fletcher Company Iron Works and Shipyard; the 14th Street Ferry pier and associated structures; and the Hoboken Land and Improvement Company's 15th Street pier. On the northern edge of the 15th Street pier, the Northern segment turned to the west across property associated with the Hoboken Land and Improvement Company, near a boathouse and across a yacht pier and to the immediate north of the Jagels & Bellis Coal Company. The segment then opened into a larger rectangle to the immediate east and parallel with the Hoboken Shore Railroad. This parcel occupied the southwestern portion of the Tietjen & Lang Dry Dock.⁵⁸⁰

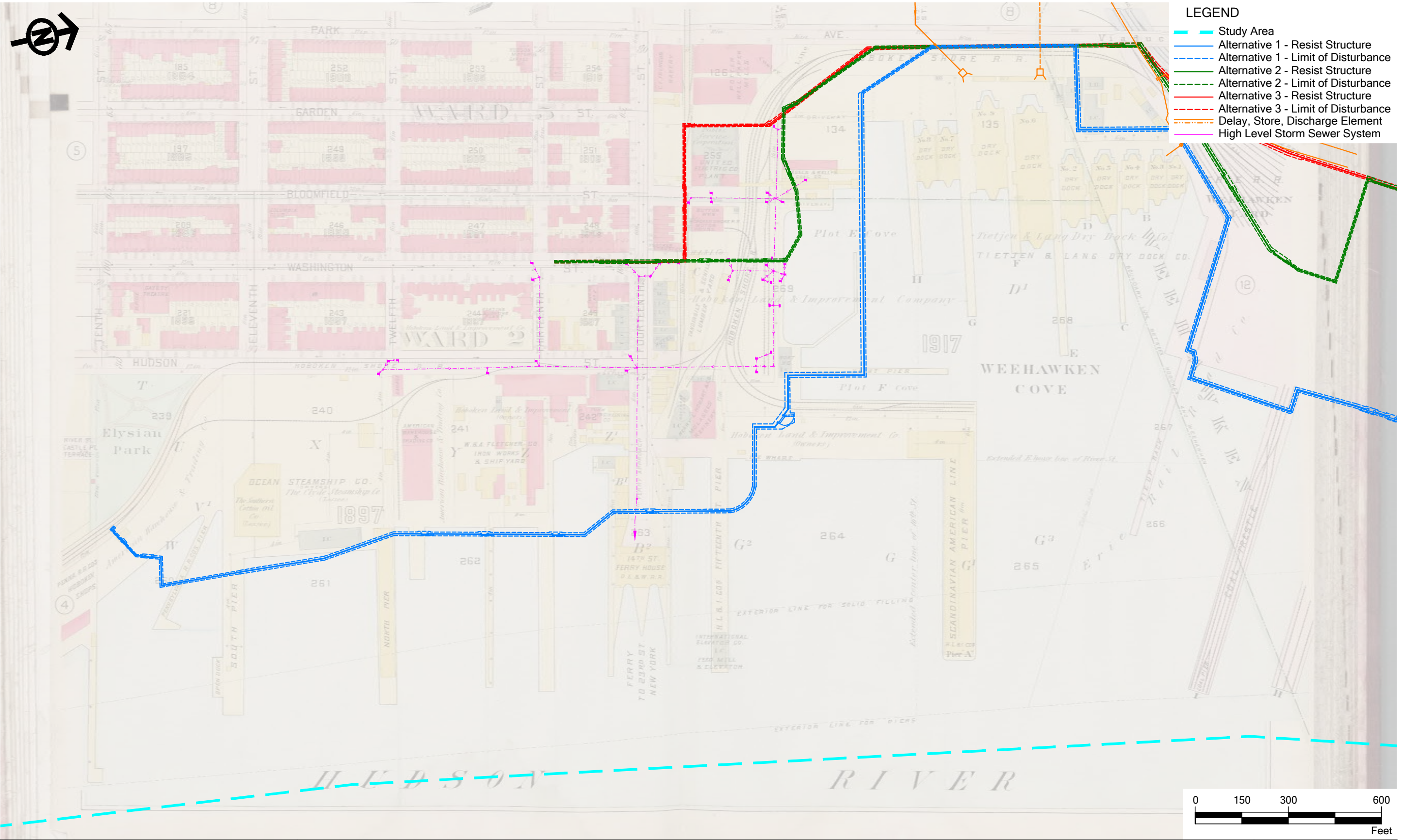
G.M. Hopkins & Co.'s 1923 map indicates that the United States War Department was the owner of the piers and waterfront development between 10th and 14th streets (Figure 44). The southern portion of the Northern segment extended in the vicinity of a frame building labeled "W" in the northeastern corner of the former Elysian Fields. From this point, the Northern segment extended to the north and crossed several piers: the South and North piers associated with the Elasticap Company, three piers and a dry dock associated with the W. & A. Fletcher Company, the pier and ferry house of the 14th Street Ferry, and an unidentified pier at 15th Street. Railroad spur lines and utilities served each of these piers. To the west of the 15th Street pier, the segment crossed a building associated with the Hoboken Land and Improvement Company and several spurs of the Hoboken Shore Railroad. The segment then extended to the west, immediately west of buildings associated with the Lipton Tea Company and the Jewel Tea Company, and across buildings associated with the Jagels & Bellis Coal Company. The rectangular segment

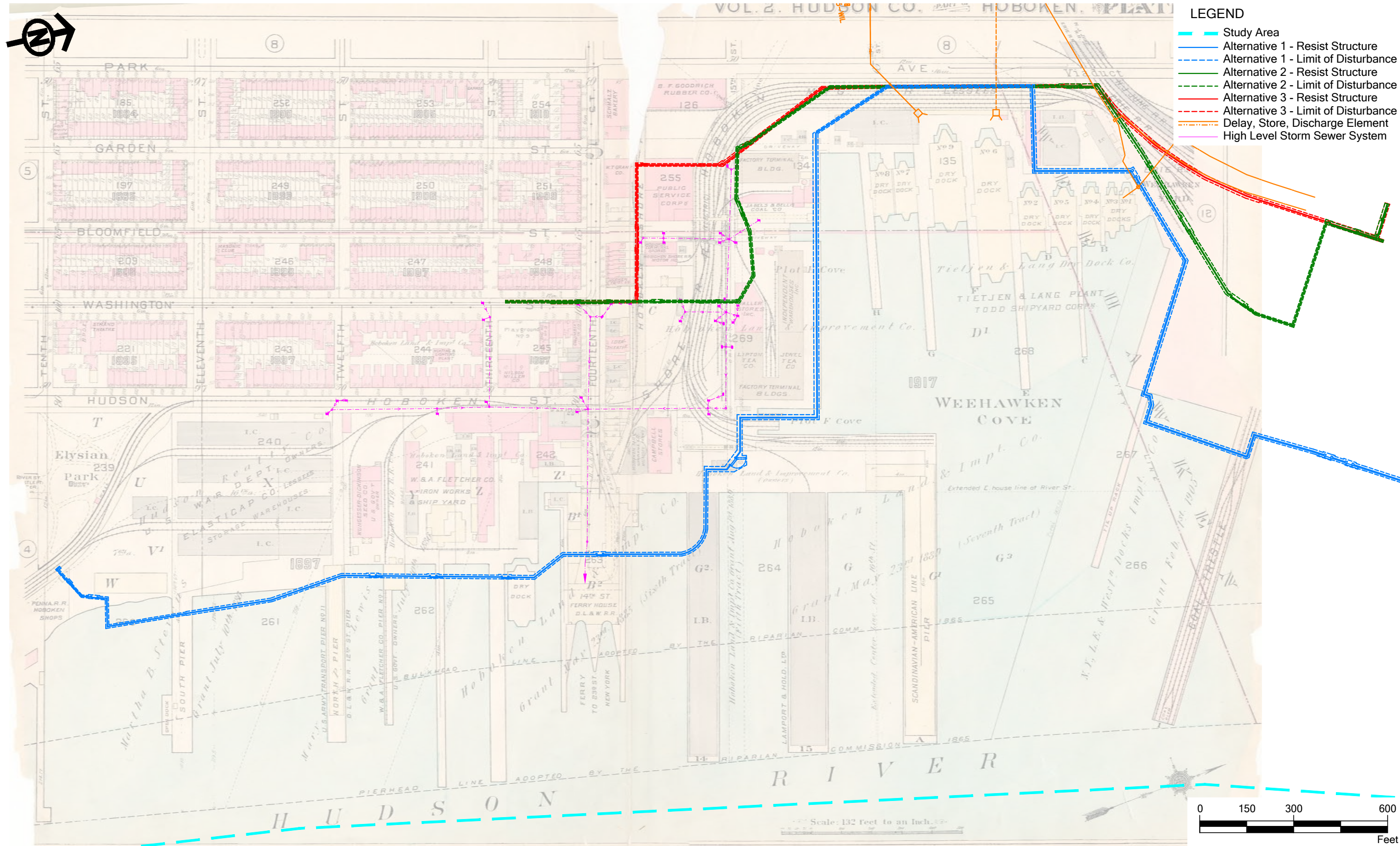
⁵⁷⁸ Sanborn Library, LLC 1887.

⁵⁷⁹ Hughes and Bailey 1904.

⁵⁸⁰ G.M. Hopkins & Co. 1909.







along the northern extent of the segment contained an iron clad building in the southwest corner of the Tietjen & Lang Plant. At Weehawken Cove, the far northern extent of the segment extended across the Hoboken Manufacturing rail line.⁵⁸¹

The 1937 Sanborn Insurance maps indicate that the southern extent of the Northern segment extended in the immediate vicinity of a wide L-shaped structure and associated square building to the east of the former Elysian Field (Figure 45 (index map) and Figure 46 through 48). These structures are not identified. Continuing to the north, the segment extended across an office building and the South and North piers associated with the Lackawanna Railroad, extended to the east of a building associated with the Hoboken Dock Company, extended in the vicinity of three piers and a steel floating dry dock associated with the United Ship Works, Inc. Fletcher Plant, crossed over the 14th Street pier and ferry house, and crossed the 15th Street pier to the immediate west of the Lamport & Holt Company, Ltd., Scandinavian American Line. On the northern frontage of the 15th Street pier, the segment turned to the west and intersected with the Steam Plant for Piers 14 and 15. The segment crossed rail lines and then extended to the immediate north of buildings associated with the Lipton Tea Company and the General Foods Corporation. The Northern segment then turned to the north; a boiler shop associated with the Tietjen & Lang Plant was located in the rectangular portion of the segment. The Northern segment terminated within the rail lines to the immediate north of shops and stores associated with the Todd Shipyard Corporation.⁵⁸²

The 1951 Sanborn Insurance maps indicate that the former Elasticap Company location, between 11th and 12th streets, was now occupied by the General Food Corporation (Maxwell House) (Figures 49 through 52). The Northern segment extended through the eastern portion of the General Food property in the vicinity of a miscellaneous building, an extraction building, and a storage building, in addition to two piers. Around 13th Street, the Northern segment extended through property associated with the Bethlehem Steel Shipbuilding Division, crossing in the vicinity of several outbuildings and across the western extent of three piers and a floating dock. The remaining portions of the Northern segment were unchanged from 1937 to 1951.⁵⁸³ The 1979 Sanborn Insurance maps reflect little change within the Northern segment. The Lipton Tea Buildings on the southern extent of Weehawken Cove were associated with Standard Brands, Inc. The Tietjen & Lang Plant building was no longer extant within the northern portion of the segment.⁵⁸⁴

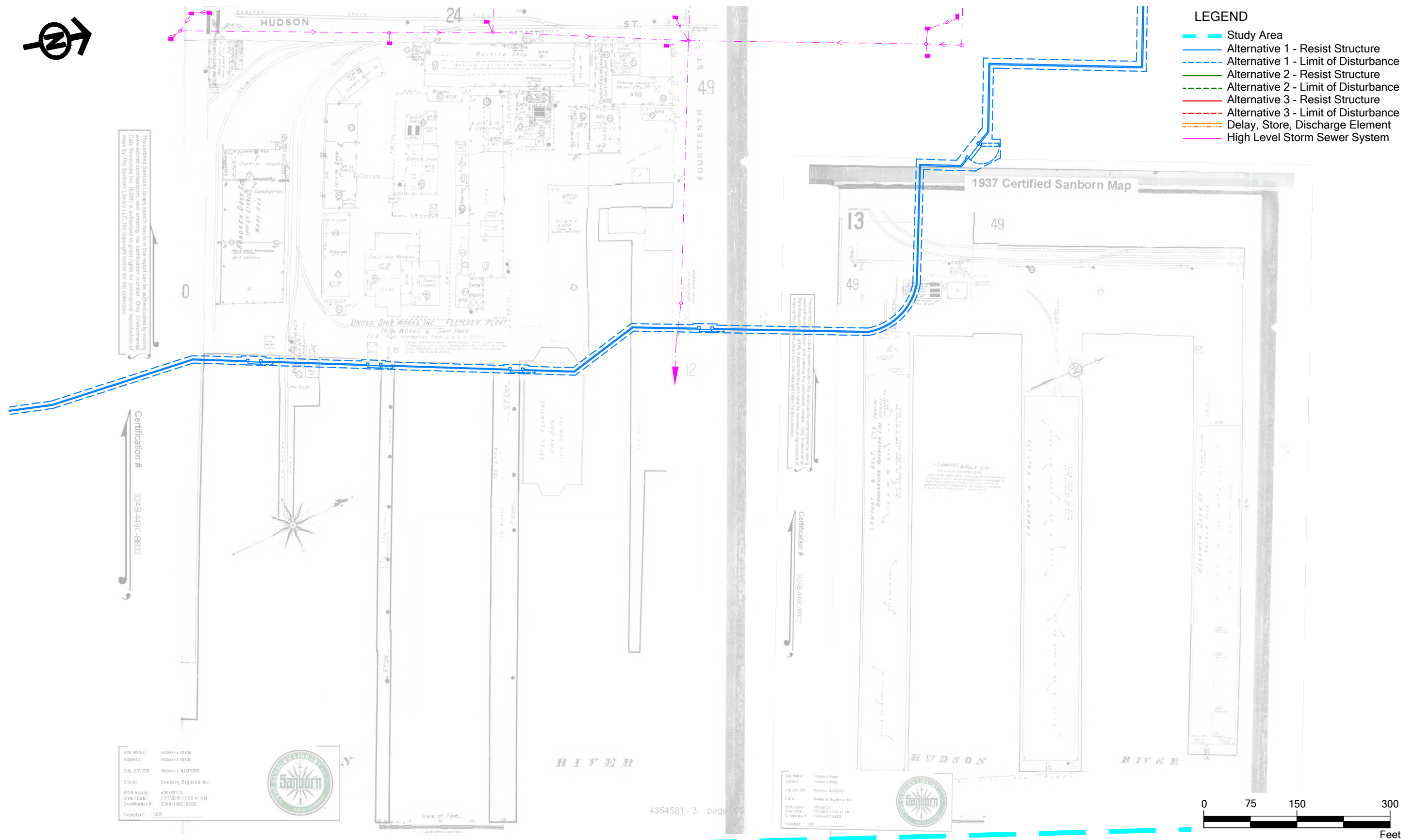
A review of the historic aerial imagery indicates changes along the waterfront between 1979 and the present day. By 1979, a peninsula had been built extending out from 11th Street to the south. A pier which had been previously located around 10th Street had been removed by this time. The aerial images also suggest that the Lipton Tea buildings had been removed and a C-shaped apartment building had been constructed. The boiler shop was no longer extant in 1979; two small buildings were located to the immediate east or in the eastern extent of the polygon portion of the alignment. These buildings consisted of an Auto Storage building and an Oils & Paint building. The structures had been removed by 1988. The historic aerial imagery suggests that this parcel was cleared ca. 1979

⁵⁸¹ G.M. Hopkins & Co. 1923.

⁵⁸² Sanborn Library, LLC 1937.

⁵⁸³ Sanborn Library, LLC 1950.

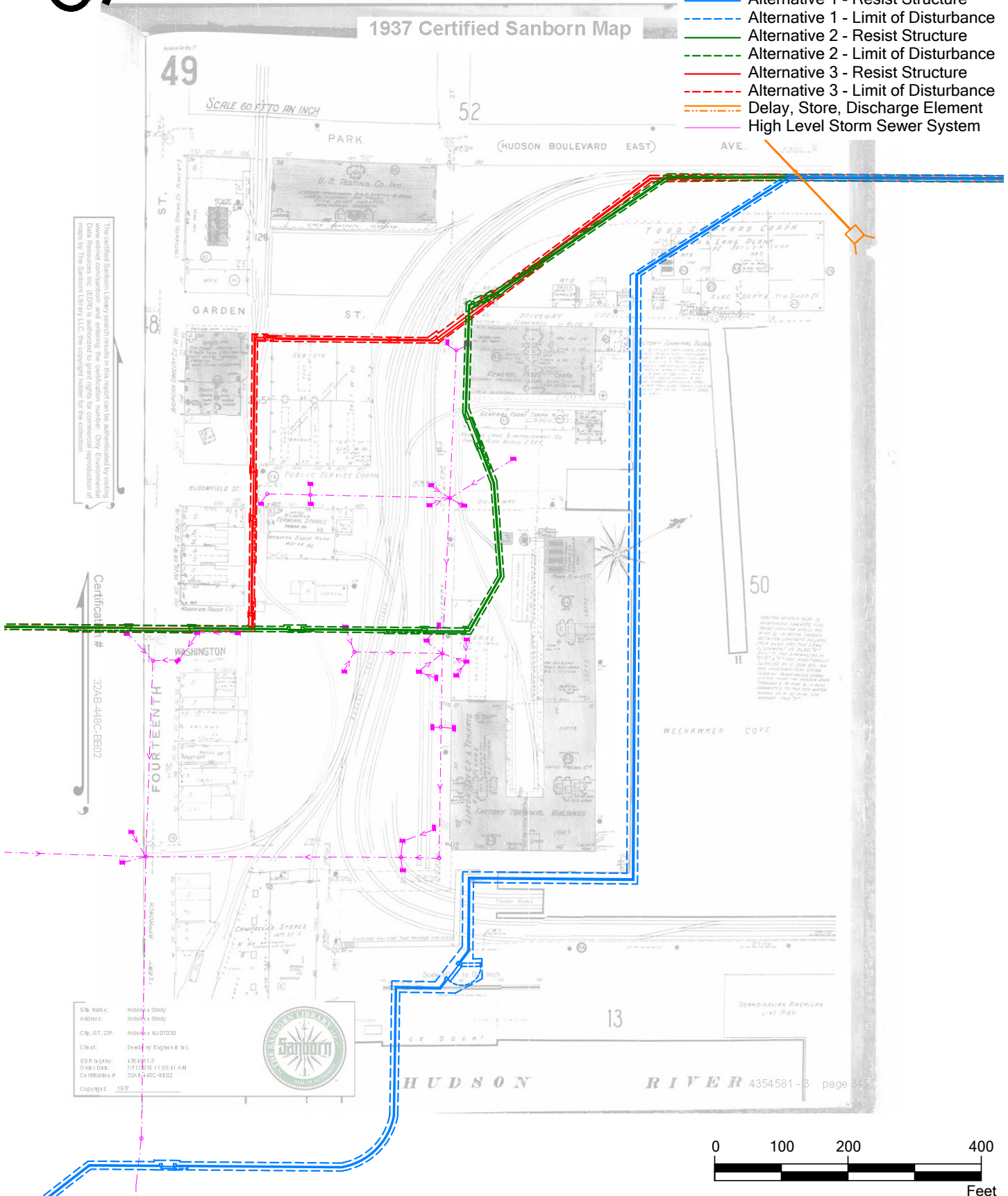
⁵⁸⁴ Sanborn Library, LLC 1979.

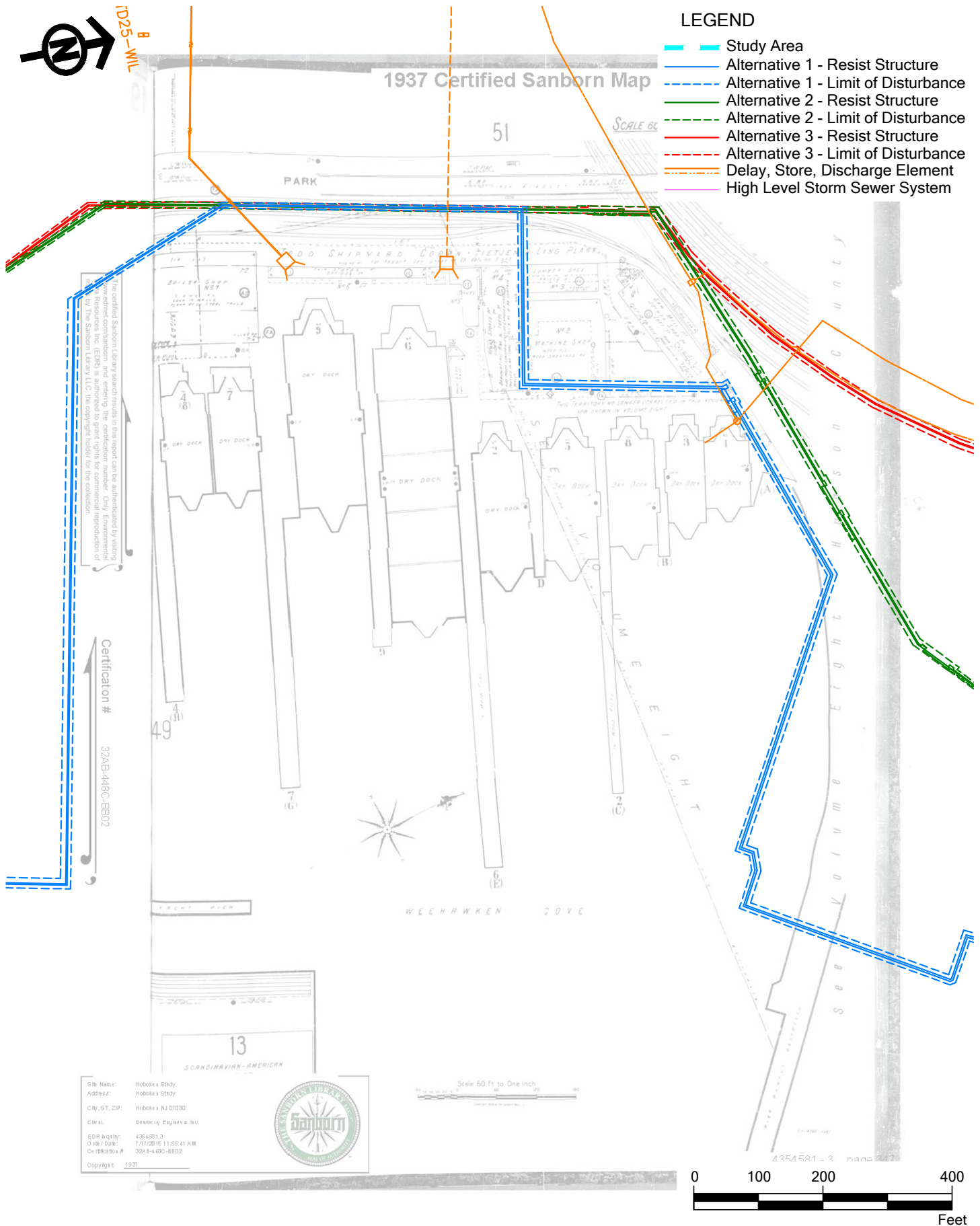


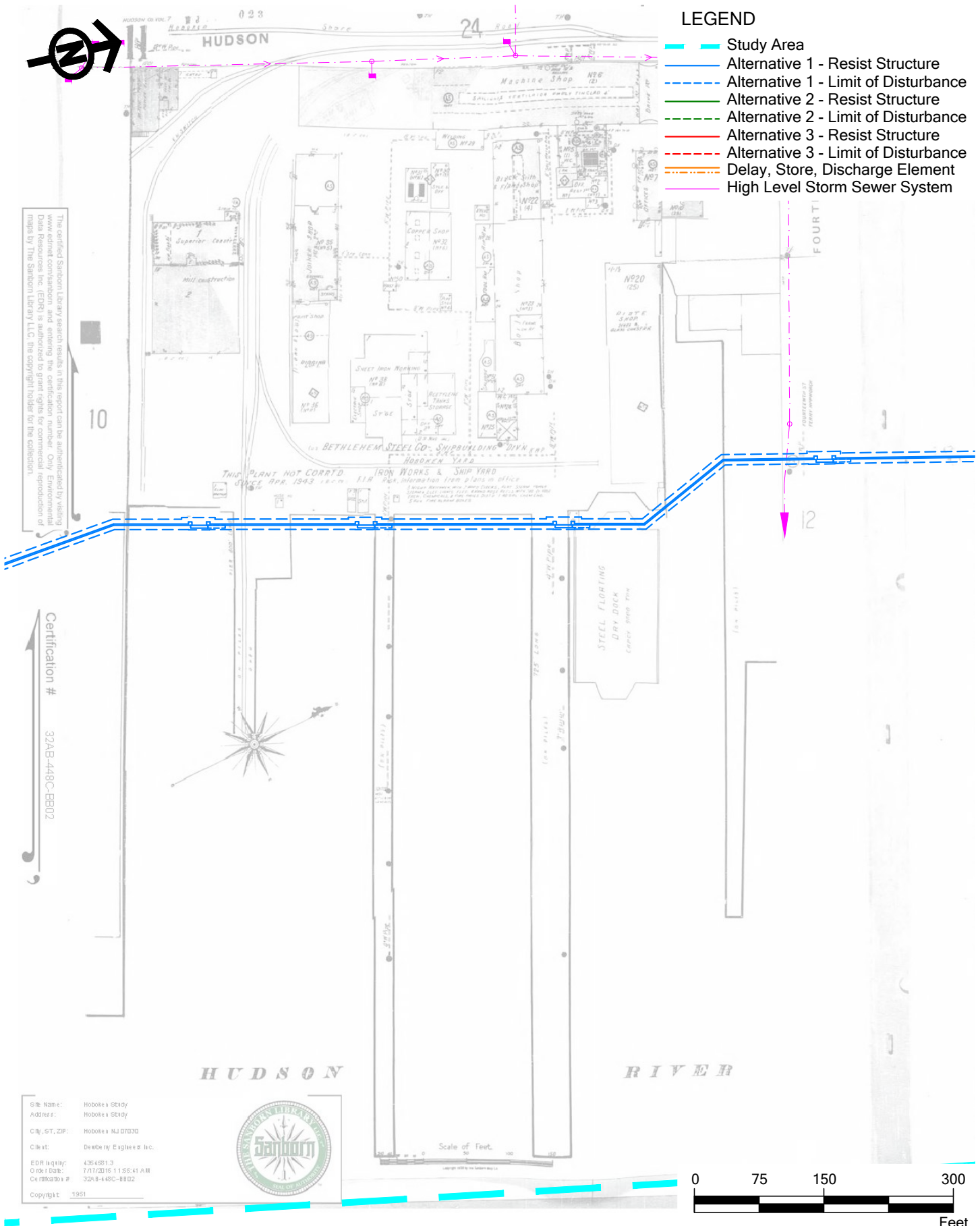


LEGEND

- Study Area
- Alternative 1 - Resist Structure
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Resist Structure
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Resist Structure
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System





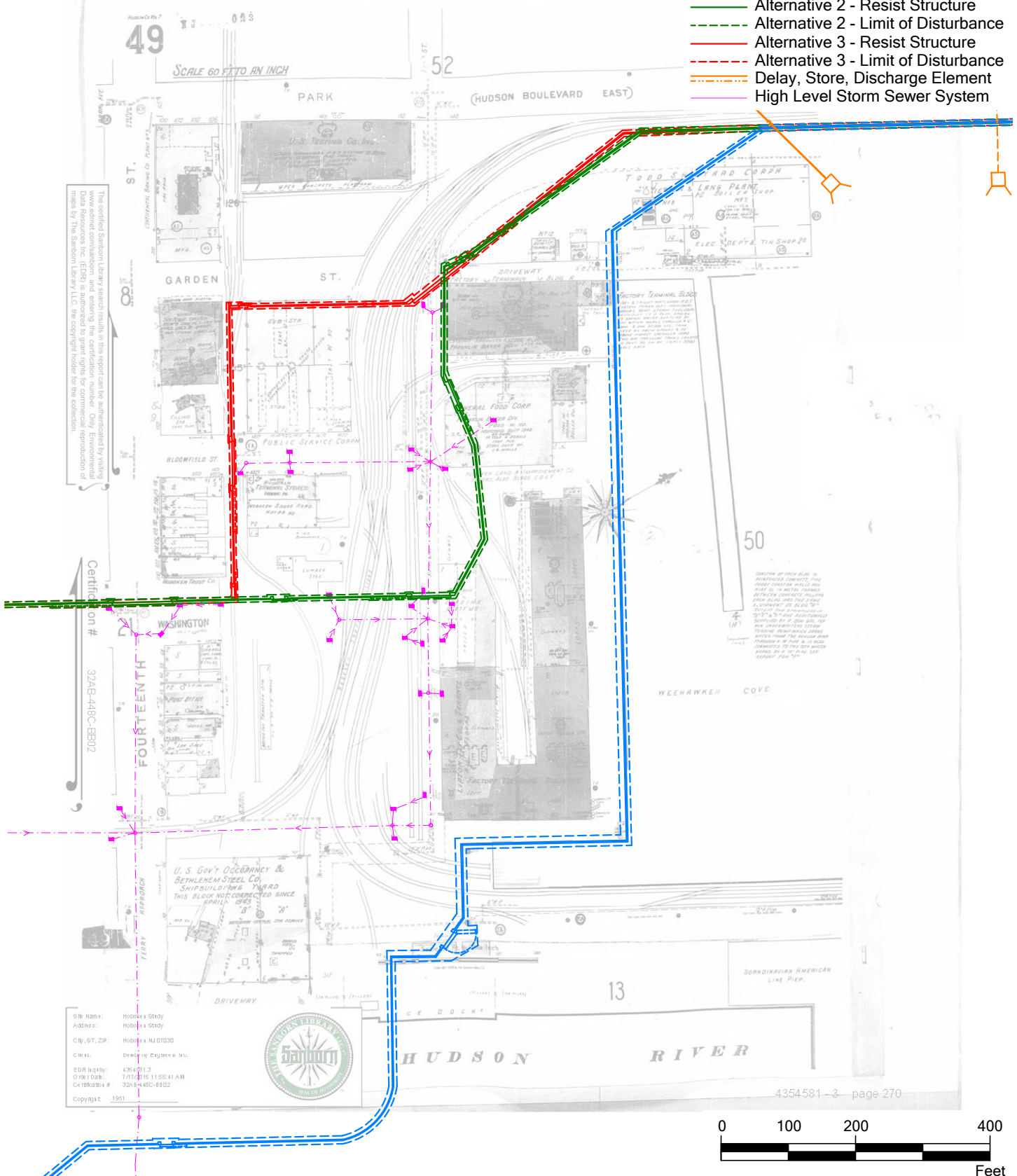




1951 Certified Sanborn Map

LEGEND

- Study Area
- Alternative 1 - Resist Structure
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Resist Structure
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Resist Structure
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System



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



Northeastern Portion of Archaeological APE in 1951
Sanborn 1951 (Plate 49)

August 2016
FIGURE 52

and subsequently overgrown with grass growth. By 2011, a pedestrian path had been installed to the immediate north and east of this parcel. By 1987, the dry docks and buildings associated with the Todd Shipyard had also been removed. An apartment building had also been established on the western frontage of Bloomfield Street, west of the C-shaped building. The northern extent of the Northern segment was cleared by this time. Between 2004 and 2006, the pier located at the base of 12th Street had been removed. By 2009, a new pier had been established in the former location of the 12th Street Pier.⁵⁸⁵

Summary and Conclusions

For much of the mid-nineteenth century the majority of the Northern segment was underwater; the northern portion of the segment was located in meadowlands around the Weehawken Cove. The earliest European development within this area appears to be the creation of a seawall within the meadowlands ca. 1814 to 1819. The seawall was designed to help drain and reclaim the meadows for agricultural purposes. The historic seawall appears to have been located to the west of the segment and outside of its limit of disturbance. A T-shaped pier was constructed off the coast of the Elysian Fields around 11th Street in 1873. The Northern segment most likely intersected this pier. By 1873, the seawall is no longer apparent on historic maps suggesting that it was removed or filled in with the extension of the city street grid. By the early-twentieth century, the eastern shore of Hoboken between 10th and 15th streets had been extensively developed. Much of this development was associated with transatlantic ocean lines, industrial developments, and the Hoboken Manufacturers Railroad. The 14th Street Ferry was also established within the Northern segment during the late-nineteenth century. Through the mid to late-twentieth century, the shoreline continued to be occupied by industrial and warehouse operations and the 14th Street Ferry. Beginning in the 1970s, the industrial and warehouse operations began vacating the shoreline. Residential occupations and public recreational spaces developed along the waterfront in the late-twentieth century.

Several previous cultural resource studies have been conducted in the immediate vicinity of the Northern segment. Specifically, in 2005, RGA conducted archaeological monitoring of the Maxwell House complex. RGA's Study Area overlapped with a portion of the Northern segment from north of 10th Street to 12th Street. RGA's monitoring included the mechanical excavation of several tests to a depth of approximately 9.3 feet below surface. These excavations were halted when the water table was encountered. The excavation documented extensive historic fill that extended to the water table. RGA documented intact rail line spurs within a portion of their project area. They also observed and documented an area of surviving bulkhead and a portion of the original shoreline. Their excavations found no evidence of the historic warehouse structure within the area; nor did they find intact pilings or pile caps *in situ*. RGA also documented the removal of the North Pier which had been damaged during a previous storm. They classified the pier as a Type 2a which contained cinder fill on top of a platform set upon timber piles.⁵⁸⁶

RGA also conducted two studies to the south of the Northern segment, along Shipyard Lane between 14th and 15th streets. In a 2002 study, RGA excavated a trench to a depth of 11.3 feet below the surface. Within this trench, RGA encountered an intact stone pavement at a depth of 2.5 to 3.9 feet below the surface. The pavement consisted of a sandstone block surface which included rectangular shaped blocks in a linear pattern. The blocks had been laid on

⁵⁸⁵ NETR 1979-2013.

⁵⁸⁶ RGA 2006b.

a thin layer of yellowish brown coarse sand which rested on top of a thin concrete/cement stratum, the bedding course. RGA concluded that the intact stone pavement dated to the 1920s or 1930s. In a 2006 study, RGA also exposed an intact brick sewer beneath 14th Street during the construction of a Junction Box. The sewer was an “egg-shaped” variety and dated to the late-nineteenth or early-twentieth century.⁵⁸⁷

In addition, in 1991, Parsons conducted an archaeological assessment of the Hudson River Waterfront. In this assessment, Parsons determined that a portion of the upland terrace located to the immediate northwest of the marshlands adjacent to Weehawken Cove were potentially sensitive for prehistoric archaeological deposits. These uplands are located to the immediate northwest of the Northern and Weehawken segments.⁵⁸⁸

With respect to prehistoric archaeological sensitivity, Dewberry previously conducted several soil borings within the vicinity of the Northern segment (see Appendix D). Soil Borings B-5 and B-6 were located along the southern portion of the segment. Boring B-5 contained an overlying deposit of brown sand which extended to a depth of approximately eight feet below the surface. A brown and gray clayey silt underlain the brown sand. Beneath the sand, wood and black sand were found to a depth of 18 feet below the surface. A dark gray clayey silt underlain the sand to a depth of approximately 23 feet below the surface under which a matrix of brown sand was uncovered. The boring terminated within the sand at a depth of 33.5 feet below the surface. Within Boring B-6, a gray clayey silt deposit extended from a depth of 23 to 28 feet below the surface. This deposit was overlain by fill deposits of sand underlain by wood. A brown sand matrix was found underlying the clayey silt; the boring terminated at approximately 55.3 feet below the surface within the brown sand matrix.

Several borings have also been conducted to the south of Weehawken Cove. Two of these borings, CM-1 and CM-2 contained overlying deposits of black and dark gray organic silty clay to a depth of 10 feet below the surface. Within CM-1, the silty clay was underlain by layers of clay and wood and clay to a depth of 25 feet below the surface. The clay was underlain by a brown silty sand which terminated at 30 feet below the surface in rocks. The boring was terminated within a rocky matrix at a depth of 45 feet below the surface. Beneath the clay/wood deposit in CM-2, a layer of silty sand and then sequential layers of brown gray sand extended to a depth of 30 feet below the surface. Glacial till and then rock were encountered beneath the sand; the boring terminated within rock at a depth of 43 feet below the surface. Boring B-10, which was located at the northern extent of Garden Street, contained an overlying deposit of sequential brown and tan sand layers to a depth of approximately 15 feet below the surface. At this depth, a black sand with a petroleum odor was encountered. The black sand extended to a depth of 23 feet below the surface and was underlain by a gray clayey silt to a depth of 28 feet below the surface. The clayey silt was underlain by brown sand with decomposing rock to a depth of 45 feet below the surface.

An additional boring, Boring B-11 was located along the Northern segment of Weehawken Cove. This boring contained approximately 33 feet of fill consisting of brown and black sand with gravel and concrete. A matrix of gray clayey silt underlain the fill deposits to a depth of 53 feet below the surface. A brown silt and then brown sand was

⁵⁸⁷ RGA 2002; RGA 2006a.

⁵⁸⁸ Parsons 1991.

found beneath the clayey silt. The boring was terminated within the sand matrix at a depth of approximately 70.75 feet below the surface.

The profiles exhibited by these five soil borings lacked a distinct organic deposit or peat layer (see Appendix D). Each of the borings contained a clayey silt or silty clay matrix beneath the overlying fill deposits; this clayey matrix was underlain by sand and glacial till. The lack of an organic deposit within the profiles suggests that there is little potential for an extant prehistoric occupation surface within these areas. Rather, it appears that these profiles reflect the consistent meadowland profile identified by Schuldenrein.⁵⁸⁹ Given the profiles exhibited by the soil borings, the majority of the Northern segment is considered to possess little to no sensitivity for prehistoric deposits. However, the portion of the Northern segment to the immediate west of Weehawken Cove is in the immediate vicinity of uplands previously identified as sensitive for prehistoric deposits. Given that Weehawken Cove was an historic cove and not a man-made landform, there is the potential that the cove was used as a docking location during prehistoric times. Furthermore, given the potential prehistoric usage of the cove and its relative proximity to the high ground at Stevens Point, a known prehistoric trading post, the segment of the Northern portion of Alternative 1 which is located to the immediate west of Weehawken Cove is considered sensitive for potential prehistoric deposits. In light of RGA's excavations along Shipyard Lane which identified potential prehistoric surfaces at depths of over nine feet below the surface, potential prehistoric deposits within this portion of the Northern segment would be anticipated at a similar or deeper depth.

With respect to historic archaeological sensitivity, the Northern segment was developed and filled during the late-nineteenth and early-twentieth century in association with the transatlantic ocean line industry and industrial operations. The segment is, therefore, considered sensitive for historic deposits associated with the late-nineteenth and early-twentieth century landfilling and waterfront development, including piers, wharves, and bulkheads. The segment is also considered sensitive for historic buildings associated with the ocean liners and the warehouse operations from the late-nineteenth into the mid-twentieth centuries including the W. & A. Fletcher Iron Works, the Henry L. Hobart Molasses Refinery, and the Tietjen & Lang Dry Docks. The majority of the Northern segment is also considered sensitive for railroad deposits associated with the Hoboken Manufacturers/Hoboken Shore Railroad. Given that previous archaeological excavations were conducted along the shoreline between 10th and 12th streets, including the North Pier at 12th Street, this area is not considered sensitive for intact historic deposits. It is possible that intact deposits may be located at depths greater than 9.3 feet below the surface along the shoreline between 10th and 12th streets; however, there appears to be little possibility for historic deposits associated with the North Pier.⁵⁹⁰

The 14th Street portion of the segment is considered sensitive for an historic sewer line previously exposed along Shipyard Lane. The As-Built sewer plans indicate that an abandoned sewer line is located along the waterfront at 11th Street. The plans also indicate that a wood box sewer is located at the waterfront around 14th Street. The 14th Street outlet appears to connect to the brick sewer line via a vitrified clay pipe. A cast-iron storm drain also appears to be located along the waterfront at 14th Street. The As-Built indicates the presence of a concrete sewer line along

⁵⁸⁹ Geismar 2006, 24.

⁵⁹⁰ RGA 2006b.

15th Street.⁵⁹¹ As the 11th and 14th Street sewer outlets represent early technological adaptations within the sewer system of Hoboken, these pipelines may be potentially National Register eligible historic resources. Therefore, the 11th and 14th Street portions of the Northern segment are considered sensitive for these historic sewer lines. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. Sewer deposits within Hoboken have previously been exposed at depths ranging from four to eight feet below the surface. Therefore, sewer deposits are anticipated at depths greater than four feet below the surface.

As Weehawken Cove is an historic cove which formerly contained an inlet to the Hudson River which fed or connected with the Hoboken Creek in the interior of the city, there is a high likelihood that this area was frequented or occasionally utilized as a natural docking station prior to its development by the Tietjen & Lang Dry Docks in the early to mid-twentieth century. Historical accounts indicated that Henry Hudson anchored his ship, the *Half Moon*, at Weehawken Cove in 1609.⁵⁹² It is possible that other historic ships or possibly prehistoric ships may have similarly anchored at the cove. Such usage may have resulted in a past shipwreck or ship abandonment. A search of the NJ Maritime Museum's Shipwreck Database revealed two nineteenth century known shipwrecks within Hoboken. An 1851 vessel associated with James Watt burned and sunk within Hoboken in August of 1870; a schooner named Sea Lark was burned and scuttled in July 1873. A wooden schooner named E C Hay was also lost in the Hudson River on June 28, 1906. This schooner was lost in a collision with a Tietjen vessel.⁵⁹³

Previously undocumented shipwrecks have also been uncovered in similar waterfront locations within New Jersey. In 2014, workers installing a steel wall along the coastline near Brick Township uncovered the remains of a maritime vessel buried in the sand. This vessel was nearly 75 percent intact and may have represented a mid-nineteenth century ship which sank near Seaside Heights.⁵⁹⁴ Given the known historic shipwrecks within Hoboken, and the fact that previously undocumented shipwrecks have been uncovered in similar waterfront locations, it is possible that such an unrecorded deposit or one of the known historic shipwrecks may also be located in the vicinity of Weehawken Cove. As such, the far northern extent of the Northern segment, around Weehawken Cove, is considered sensitive for historic deposits associated with past shipwrecks. Such deposits could be potentially significant as they might reflect previously undocumented historic usage of Weehawken Cove. In light of the soil borings conducted within the general area, these deposits would be anticipated at depths greater than 15 feet below the surface.

Alternative 1–Weehawken Segment

The far northern portion of Alternative 1 is located in Weehawken. The Weehawken segment parallels the Hudson shore from Weehawken Cove to the intersection of Baldwin Avenue and Harbor Boulevard. Along the northern extent of Weehawken Cove, the segment extends along a patterned cobblestone path. Blue rail fence lines are

⁵⁹¹ Whittemore 1940.

⁵⁹² "Short History of Hoboken," Hoboken Historical Museum; Winfield 1874; Marshall 1981.

⁵⁹³ NJ Maritime Museum, "Shipwreck Database," accessed online June 2, 2016 at <https://www.google.com/fusiontables/data?docid=1g5VYQIUhCX7bJU3S3DeRMXBu6VEEz6shhHQRWZnV#rows:id=1>.

⁵⁹⁴ Michael Kuhne, "Shipwreck Unearthed in New Jersey During Post-Sandy Sea Wall Construction," accessed online June 2, 2016 at <http://www.accuweather.com/en/weather-news/workers-in-coastal-new-jersey/36850421>.

located to the east and west as a small inlet is situated to the west of the path. To the west of the inlet, the shoreline consists of medium-sized rip rap (Plate 15). The Weehawken segment extends to the north and northeast around commercial property and paved parking surfaces. A residential property has developed along a pier to the north of 19th Street. Piers associated with ferry service and the NY Waterway are also located to the east of the segment. Where exposed, the shoreline within this segment appears to consist of medium to smaller sized rip rap supported and enforced by an iron supportwork/bulkhead (Plate 16). The segment continues to follow an existing brick path, paralleling Harbor Boulevard in its northern trajectory. The far northern extent of the Weehawken segment extends into a landscaped level grass surface to the east of the brick pathway. Young trees have been ornamentally situated within the grassed area. A drainage grate was also observed (Plate 17).

Historical Development

The earliest development within the vicinity of the Weehawken segment may have been the Weehawken Ferry which likely opened in the early-eighteenth century. Burr's 1832 map illustrates an L-shaped pier to the south of the "Weihaken Ferry" (see Figure 17). This pier may have been the original ferry landing which was abandoned in the early 1800s with the extension of the Hackensack Turnpike and the opening of the Hoboken Ferry. The L-shaped pier is located within the vicinity of the Weehawken segment. The T-shaped "Weihaken Ferry" may have also been located in the far northern extent of the segment. Aside from the ferry landings, the majority of the Weehawken segment appears to have been underwater in the early to mid-nineteenth century. The southern portion of the segment appears to have extended through undeveloped meadowlands associated with a drainage from the Hudson River.⁵⁹⁵ The 1844 Coastal Survey also indicates that the majority of the Weehawken segment was undeveloped and underwater (see Figure 30). The far southern extent of the segment was located in undeveloped meadowlands; the far northern extent of the segment was extended into a hillside.⁵⁹⁶

By 1860, much of the southern portion of the Weehawken segment had been filled in association with the Venango Oil Company's Storage House and Wharf.⁵⁹⁷ A railroad line had also been extended to the Venango property by this time. G.M. Hopkins and Co.'s 1873 map indicates the presence of several buildings, oil tanks, and four piers in association with the Venango Oil Works (Figure 53). The 1873 map also indicates that the southern portion of the Weehawken segment extended across several train lines and spurs associated with the New York and Fort Lee Railroad. The segment crossed the southern pier and the eastern portion of the Venango Wharf. The segment appears to have extended across or in the immediate vicinity of several structures on the wharf. Much of the Weehawken segment was located within the Hudson River. The far northern extent of the segment extended to the west and across the New York and Fort Lee Railroad before terminating to the east of an unidentified structure.⁵⁹⁸

Between 1881 and 1885, the Erie Railroad built a freight terminal which included two freight piers and a cold storage plant to the immediate north of the Venango Oil Works. Given that this area was previously underwater, landfilling activities predated the terminal construction. A *New York Times* article from 1869 reported that the Erie Railroad

⁵⁹⁵ Burr 1832.

⁵⁹⁶ U.S. Coast Guard 1844.

⁵⁹⁷ Taintor Brothers 1860.

⁵⁹⁸ G.M. Hopkins and Co. 1873.



Plate 15: Inlet and RipRack Bulkhead within Southern Portion of Weehawken Segment of Alternative 1. View South. (TF 4/5/2016).



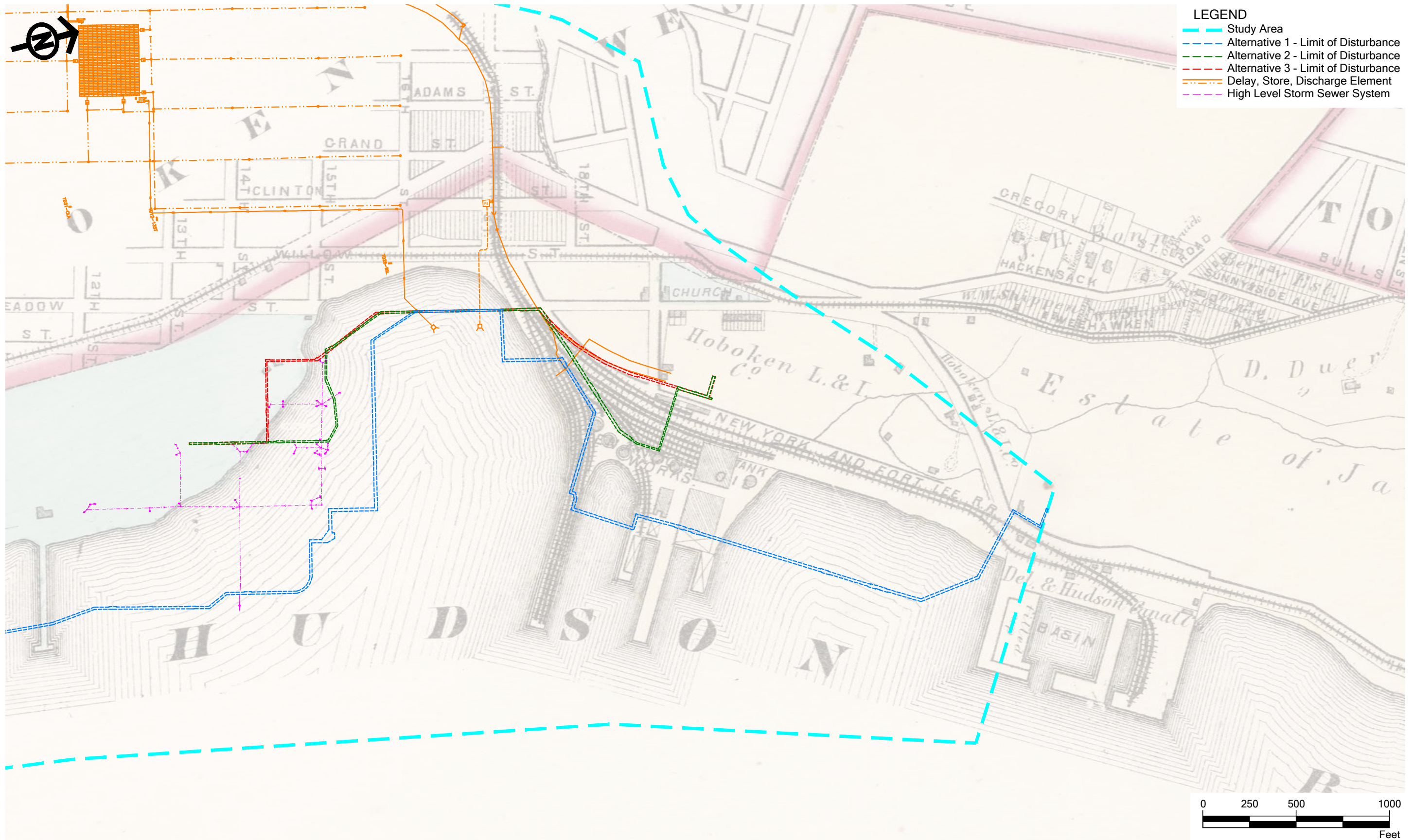
Plate 16: Cobblestone Paths and Riprack Bulkhead Enforced with Iron Bulkhead along Shoreline of Weehawken Segment of Alternative 1. View Southwest. (TF 4/5/2016).



Plate 17: Green Space and Cobblestone Pathway along Northern Extent of Weehawken Segment of Alternative 1. View East Southeast. (TF 4/5/2016).



Plate 18: From Jersey Avenue, Southwestern Segment of Alternative 2. View East. (TF 4/5/2016).



Company had begun construction of a freight depot at Weehawken Cove. The article also indicated that “the cove, which is in the form of a horseshoe is being rapidly filled in...a construction track has been laid to carry material to the ground.”⁵⁹⁹

Between 1897 and 1903, the Erie Railroad greatly expanded its Weehawken Terminal. G.M. Hopkins & Co.’s 1909 map reflects the expansion of the railroad terminal (Figure 54). By this time, the Weehawken Yard had approximately ten piers of differing widths and lengths; several of these piers housed warehouse buildings. Several buildings had also been constructed within the freight yard including an oil storage building, a warehouse, and cattle pens. The Weehawken segment was located along the eastern extent of the freight yard platform and the westernmost portions of the piers. Spur railroad lines serviced each of the piers; the segment crossed all of these lines. The segment also crossed the cattle pens and an associated frame causeway in its turn towards Baldwin Avenue. A three-inch pipe was also located in this area. The Tietjen & Lang Dry Dock Company was located to the immediate west of the Erie Terminal; the southern portion of the Weehawken segment crossed several buildings and the northern edge of the northernmost dry dock. At its northern terminus, the Weehawken segment paralleled and crossed rail lines associated with the DLWRR and the Junction RR.⁶⁰⁰

On the 1909 map it appears that portions of the segment may have crossed a sewer line which extended from Park Avenue and 19th Street to the northeast through the Weehawken Yard. The 19th Street sewer line may have been a component of the early-twentieth century shared combined sewer system of Union, Weehawken, and West Hoboken. This system discharged into the Hudson River at two outlets—one at the foot of 16th Street at the West Shore Freight Yards and one at 19th Street at the Erie Freight Yards. The Weehawken segment also crossed the terminal extent of a sewer line which extended from Shippen Street to the south and west terminating at the Hudson River within the Erie Freight Terminal.⁶⁰¹

Between 1904 and 1910, the Pennsylvania Railroad constructed a system of trackage and tunnels to extend their rail lines into Manhattan. The Pennsylvania Railroad tunnel was extended under the northern portion of the Weehawken Terminal. A portion of the Weehawken section extends over the tunnel location. The cast-iron and concrete tunnel was located approximately 50 to 85 feet beneath the surface of the Erie Terminal in 1903.⁶⁰²

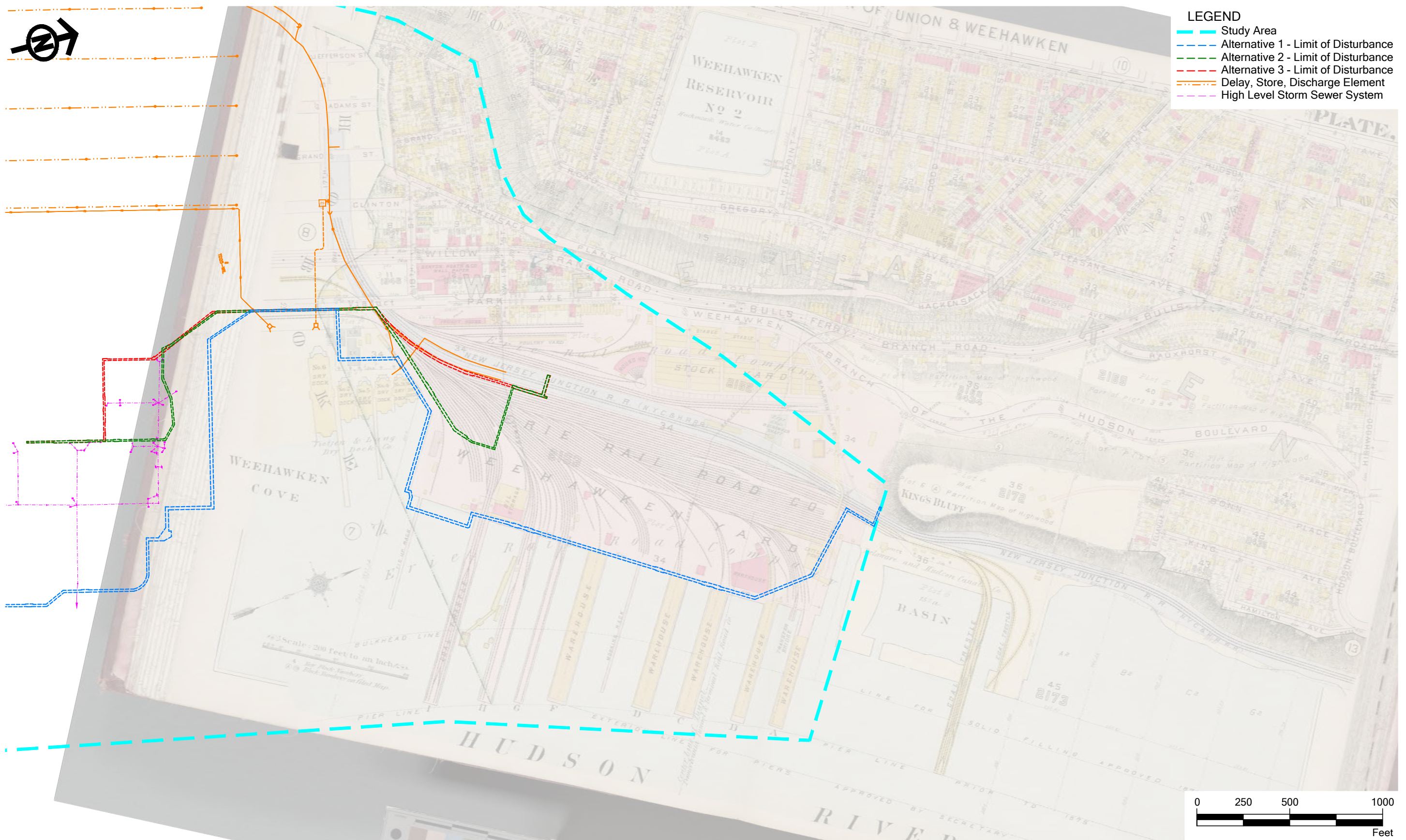
G.M. Hopkins & Co.’s 1923 map also reflects the extensive Erie Railroad Weehawken Yard within much of the Weehawken segment (Figure 55). The yard consisted of at least eight piers. Several buildings and tanks were located to the immediate west of the piers in addition to multiple railroad spur lines. The segment appears to have extended in the vicinity of the buildings and western extent of the piers. The segment was also located to the west of a building associated with the Phoenix Transit Company. Along Weehawken Cove, the segment intersected

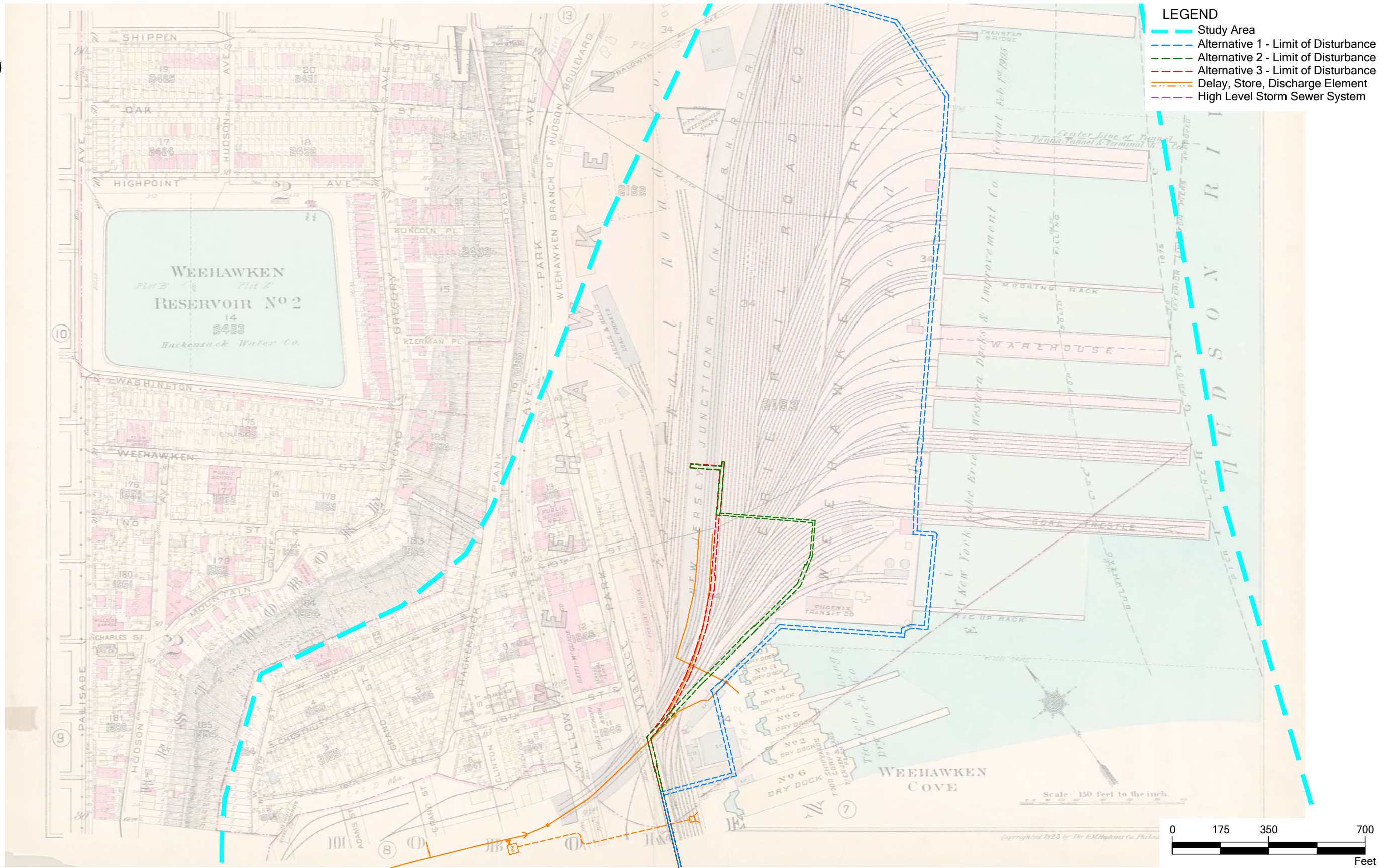
⁵⁹⁹ New York Times, “Weehawken Improvements,” June 4, 1869.

⁶⁰⁰ G.M. Hopkins and Co. 1909.

⁶⁰¹ RGA, *Stage 1A Cultural Resources Survey North Hudson Sewerage Authority System-Wide Combined Sewer Overflow Improvements Program Cities of Hoboken and Union City and Township of Weehawken, Hudson County, New Jersey*. (On file, Trenton: NJHPO) 2004, 4-16; New Jersey Board of Health, *Thirty-seventh Annual Report of the Board of Health of the State of New Jersey* (Paterson: New Printing Company) 1914.

⁶⁰² Raber 1986, 16.





several buildings and the northern extent of the northernmost dry dock associated with the Todd Shipyard Corporation.⁶⁰³

The 1936 Sanborn Insurance Map indicates that the General Motors Export Company was leasing at least portions of the Weehawken Terminal (Figures 56 & 57). A building associated with the General Motors occupation was located along the northern extent of the terminal and may have been in the vicinity of the northeastern portion of the Weehawken segment. Approximately 11 piers of differing widths and lengths extended from the Weehawken Terminal; the western extent of these piers fell within the Weehawken segment. The segment was located in the vicinity of a marine repair depot at the southern extent of the terminal and was located to the east of several buildings and oil tanks. The southern portion of the segment extended through the Todd Shipyard Corporation property and across several buildings associated with ship repair and to the immediate northwest of the dry docks. The Sanborn map also indicates the presence of water lines to the immediate west of the piers. The 1950 Sanborn map indicates that the Todd Shipyard was unchanged; however, the structures and oil tanks located along the southern portion of the Weehawken Terminal were no longer extant. There appears to be little to no other change with the segment.⁶⁰⁴

In 1960, the Todd Shipyard Corporation acquired the former Erie Weehawken Terminal. In 1968, the Weehawken Terminal was sold to the Seatrain. The 1979 Sanborn map illustrates the Seatrain occupation with a building situated on the southwest corner of the terminal. Many of the railroad lines which had previously extended through the terminal and to the piers have been removed. Six piers were still associated with the former terminal. The 1987 historic aerial imagery indicates that the Todd Shipyard Corporation buildings had been removed. Three structures were now located within the former Erie Warehouse Yard including an L-shaped structure in the southeastern corner in the vicinity of the Weehawken segment. The remaining portions of the yard appear to have been converted into paved parking. Four piers were still associated with the former terminal; the northern portion of Harbor Boulevard had also been established.

In 1984, the NJHPO determined that Pier D of the former Erie Freight Terminal and an associated piershed were eligible for listing in the National Register.⁶⁰⁵ This pier is the northernmost pier feature in the 1987 aerial photograph. In 1981, Sydne Marshall described Pier D as a timber pile, concrete-decked pier; the piershed consisted of a two-story corrugated metal structure.⁶⁰⁶ The 1987 aerial indicates that a structure had developed on the far eastern extent of Pier D. It is unclear whether the piershed was removed with the installation of this building.

By 2002, Harbor Boulevard had been completed to Kennedy Boulevard. Commercial structures and paved parking areas had developed within the central portion of the former Warehouse Terminal. A paved surface was also located in the former location of the Todd Shipyard Corporation. By 2013, the Weehawken segment resembled its present day development and configuration.⁶⁰⁷

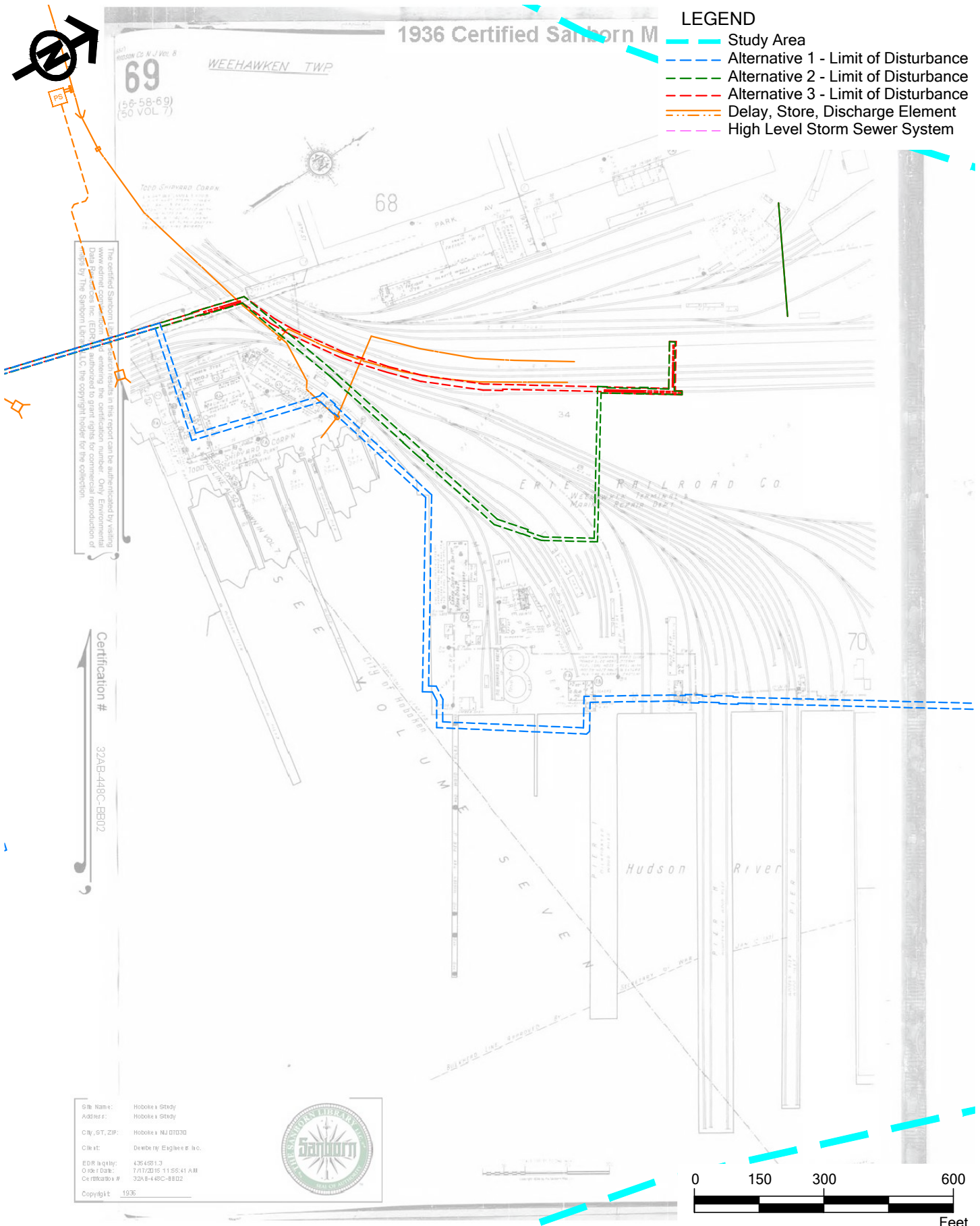
⁶⁰³ G.M. Hopkins and Co. 1923.

⁶⁰⁴ Sanborn Library, LLC 1936, 1950.

⁶⁰⁵ NJHPO, Historic Property File, "Erie Railroad Pier "D" and Piershed" (On file, Trenton: NJHPO) 2001.

⁶⁰⁶ Sydne Marshall, *Army Corps of Engineers New York Harbor District New York Harbor Collection and Removal of Drift Project, Cultural Resources Reconnaissance: Hoboken to North Bergen Reach* (On file, Trenton: NJHPO) 1981.

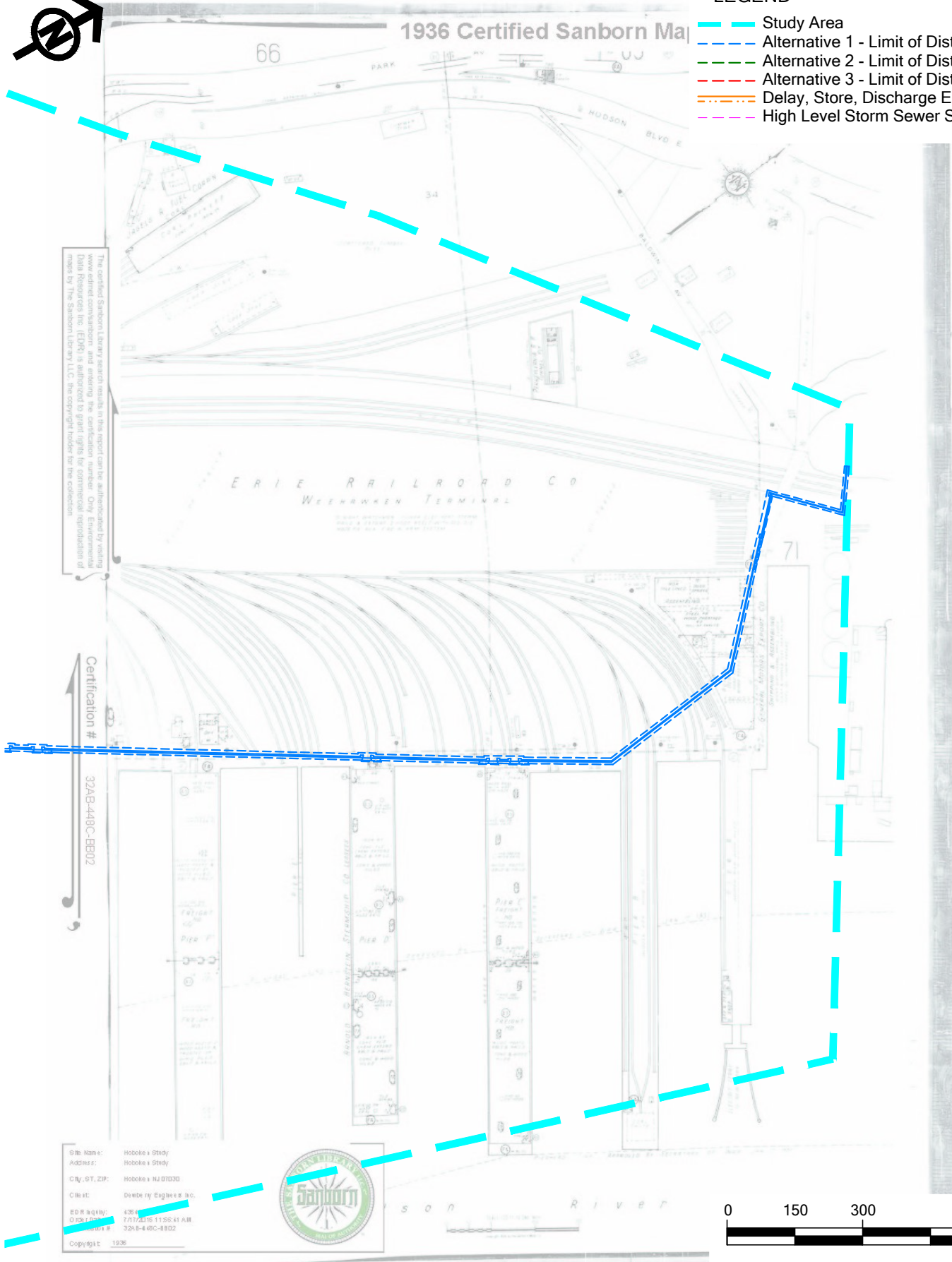
⁶⁰⁷ Sanborn Library, LLC 1979; NETR 1987-2013.





LEGEND

- Study Area
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System

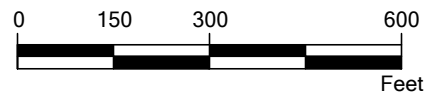


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32AB-448C-EB02

Site Name: Hoboken Study
Address: Hoboken Study
City, ST, ZIP: Hoboken, NJ 07030
Client: Dewberry Engineers & Inc.
EDR Inquiry: 435 448-1150
EDR Inquiry: 717-217-1150
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REBUILD BY DESIGN HUDSON RIVER ■ RESIST ■ DELAY ■ STORE ■ DISCHARGE ■



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Project Locations in Weehawken, 1936
Sanborn 1936 (Plate 70)

August 2016
FIGURE 57

Summary and Conclusions

Historic records suggest that the original eighteenth century Weehawken Ferry and a second nineteenth century ferry may have been located within the Weehawken segment. Aside from these early ferries, the mapped history of the Weehawken segment indicates that the majority of this area was underwater or in undeveloped marshlands up until 1860. By this time, the southern portion of the segment appears to have been filled in association with the Venango Oil Company. By 1873, the Venango Oil Works included four piers and several buildings. The New York and Fort Lee Railroad had also developed to the west of the segment and had several spur lines which serviced the oil works and extended into the Weehawken segment. During the 1880s, the Erie Railroad constructed a freight terminal to the north of the Venango property. By 1903, the Erie Railroad had an extensive warehouse and freight terminal which included ten piers, an oil storage building, a warehouse, and cattle pens. The Weehawken segment was located near the western extent of the piers and in the vicinity of various buildings within the freight yard. Multiple railroad spur lines also extended to the piers and fell within the Weehawken segment. Between 1904 and 1910, the Pennsylvania Railroad constructed a cast-iron and concrete tunnel which extended beneath the Erie Terminal and Weehawken segment at a depth of approximately 50 to 85 feet below the surface. The Weehawken segment also crossed two outlet sewer lines within the Erie Terminal—the 19th Street and the Shippen Street sewer lines. From the mid-twentieth century through the present day, the railroad spur lines have been removed; several of the piers and structures within the former oil works and freight yard have also been removed.

Several previous cultural resource investigations have been conducted in the vicinity of the Weehawken segment. In 2001, RGA monitored the mechanical excavation of two backhoe trenches to the west of the Weehawken segment. Trench A was excavated to a depth of approximately ten feet below grade. The exposed profile consisted of seven layers of fill including Stratum 5 which contained rail ties and track fragments in a disturbed context. Beneath the fill deposits, RGA identified an alluvial deposit consisting of a dark greenish gray silty sand mixed with very dark gray silty clay. Tree root fragments were observed within this matrix; no prehistoric artifacts were identified. Trench B was excavated to a depth of 15.6 feet below grade and contained similar fill deposits to Trench A without the railroad-related material. Two alluvial deposits were found beneath the fill to a depth of about 13 feet below grade; these strata were sterile. 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. This stratum was underlain by a very dark brown gley-like silt which overlay a gray gley-like silt. These silts were interpreted as a relict floor of the Hudson River. No prehistoric artifacts or potential features were identified within the alluvia, peat, or underlying marsh gley-like deposits.⁶⁰⁸

In 1986, Raber conducted a cultural resource assessment in association with the development of Lincoln Harbor. Raber's study area encompassed the Weehawken segment. Raber concluded that the greatest potential for prehistoric deposits within their project area consisted of uplands located to the north of the mid-nineteenth century marshlands. With respect to historic period archaeological resources, Raber concluded that the area was sensitive

⁶⁰⁸ RGA, *Stage 1B Cultural Resources Survey CSO W-5, Planning Area III North Hudson Sewerage Authority Long Term Solids & Floatables Plan Hoboken, Weehawken, Union City, West New York, Guttenberg, and North Bergen, Hudson County, New Jersey* (On file, Trenton: NJHPO) 2002.

for deposits relating to the Weehawken Ferry landing, potentially one of the oldest waterfront structures in this portion of New Jersey, and for deposits associated with the Erie Railroad Cold-Storage Warehouse.⁶⁰⁹

With respect to prehistoric archaeological sensitivity, RGA's excavations exposed deeply buried organic surfaces in the vicinity of the Weehawken segment. Unlike the majority of the Weehawken segment, however, RGA's excavations were conducted in an upland area to the west of Port Imperial Boulevard. Historically, the majority of the Weehawken segment was underwater or within undeveloped meadowlands. As previously noted, Dewberry excavated a soil boring to the immediate south of the Weehawken segment, Boring B-11 (see Appendix D). This boring contained fill deposits to a depth of approximately 33 feet below the surface. The fill was underlain by gray clayey silt which overlaid brown sand to a depth of 70.75 feet below the surface. This profile lacked a distinct organic deposit and appears to reflect a consistent and uniform meadowland stratum. Nevertheless, given that the southern portion of the Weehawken segment is immediately north of Weehawken Cove and in the immediate vicinity of uplands previously identified as sensitive for prehistoric deposits, this area is considered potentially sensitive for prehistoric deposits. In light of RGA's excavations along Shipyard Lane which identified potential prehistoric surfaces at depths of over nine feet below the surface, potential prehistoric deposits within the southern portion of the Weehawken segment would be anticipated at a similar or deeper depth. Similarly, the far northern extent of the segment, which was located in an upland hillside topographic context in the mid-nineteenth century, is also considered potentially sensitive for prehistoric deposits in light of RGA's excavations. Such deposits would also be anticipated at depths of over nine feet from the surface. The central portion of the Weehawken segment, in light of the profile exposed in Boring B-11, is considered to possess low prehistoric sensitivity.

Although the Weehawken segment has witnessed mid to late-twentieth century development which has removed the surface indications of the historic occupation, previous archaeological investigations within the area and within other urban contexts have shown that archaeological deposits may remain extant despite modern development. The majority of the Weehawken segment witnessed extensive growth in the late-nineteenth and early-twentieth centuries in association with the Venango Oil Works and the Erie Railroad. The central and northern portions of the segment were filled in the late-nineteenth century in association with the waterfront development. As such, this area is considered sensitive for landfill deposits dating from 1860 through 1910. In addition, the Weehawken segment which extends through the location of the former Venango Oil Works and the former Erie Freight Terminal are considered sensitive for deposits associated with the piers, wharves, and structures associated with these developments. With respect to the Erie Terminal, archaeological deposits reflect the evolving uses of the property, including its usage as a freight terminal, a work and assembly area for General Motors, and for the operations of the Seatrain. In addition, portions of the Weehawken segment are also considered sensitive for deposits associated with the eighteenth and early-nineteenth century Weehawken Ferry. The ferry landing would have been one of the earliest slips in this portion of New Jersey and would provide insights into the technology of the pre-industrial waterfront development.

⁶⁰⁹ Raber 1986.

The Weehawken segment also intersected two early-twentieth century historic sewer lines along 19th Street and Shippen Street. As the 19th Street sewer may have been a component of the early-twentieth century shared combined sewer system of Union, Weehawken, and West Hoboken, this sewer line is potentially a component within the early-twentieth century adaptation and technological advancements with respect to the sewer system in these municipalities. As such, it is a potentially significant historic resource. Therefore, the Weehawken segment is also considered sensitive for historic sewer deposits associated with the 19th Street and the Shippen Street sewers.

As previously discussed with respect to the Northern Segment, there is the potential for seventeenth through early-twentieth century historic shipwreck deposits within Weehawken Cove. As such, the far southern extent of the Weehawken segment, around Weehawken Cove, is considered sensitive for historic deposits associated with past shipwrecks. Such deposits could be potentially significant as they would reflect previously undocumented historic usage of Weehawken Cove. In light of the soil borings conducted within the vicinity, potential shipwreck deposits would be anticipated at depths greater than 15 feet below the surface.

9.1.2 Resist Structure—Alternative 2

For the purposes of the archaeological assessment, Alternative 2 was divided into four segments—the Weehawken segment which includes the alignment to the west of Lincoln Harbor Road, a small alignment along Lincoln Harbor Road west of Waterfront Terrace, and then a continuous alignment which extends from a point due west of the HBLR tracks and to the east of Lincoln Harbor Road and then turns to the west and intersects with 19th Street and continues to parallel the southern frontage of 19th Street and the western frontage of Harbor Boulevard; the Northern segment which overlaps portions of Alternative 1 and extends to the west of Weehawken Cove to intersect with 15th Street and then extends to the east along 15th Street to its intersection with Washington Avenue and then extends south along Washington Avenue to south of its intersection with 14th Street; the Southern segment which overlaps with Alternative 1 and extends from Hudson Street and Observer Highway to the west and encompasses both Option 1 and Option 2 and includes a small segment along Grove Street just north of the former DLWRR rail line, the Henderson Street section in Alternative 1, and the 18th Street section in Alternative 1; and the Southwestern segment which consists of a linear alignment south of the HBLR line and in-between Jersey Avenue and Grove Street and extends to the west terminating to the immediate west of the HBLR rail tracks and overlaps with Alternative 1. The following discussion will present the documentary review and archaeological assessment of each of these four segments starting from south to north within the Study Area. Portions of Alternative 2 overlap with portions of Alternative 1. Such areas of overlap will be noted in the following discussion. Alternative 2 also includes a High Level Storm Sewer System (HLSS). As the HLSS is a component within both Alternative 2 and Alternative 3, it will be discussed in Section 9.1.4, following the discussion of Alternative 3. As previously noted, the installation of sheeting in the southern portion of the Study Area is also a component of Alternative 2. The sheeting component will be discussed in Section 9.1.5,

Alternative 2—Southwestern Segment

The Southwestern segment of Alternative 2 is situated in the northeastern portion of Jersey City. The majority of the segment parallels the HBLR tracks which curve to the northeast to the immediate north of Coles Street in Jersey

City. The eastern portion of the Southwestern segment crosses Jersey Avenue and extends to the east into a lot surrounded by a chain link fence. The lot is located immediately southeast of the elevated HBLR tracks. The lot appears to be overgrown with shrub grass and small trees; trash also appears to have been discarded in the area (Plate 18). The western portion of this segment, west of Jersey Avenue, is identical to a portion of the Southwestern segment of Alternative 1. Therefore, the following discussion will focus upon the eastern portion of the Southwestern segment of Alternative 2; for a discussion of the remaining portions of the Southwestern segment the reader is directed to the discussion of the Southwestern segment of Alternative 1.

Historical Development

The Southwestern segment of Alternative 2 was undeveloped through most of the mid-nineteenth century. The 1844 U.S. Coast Guard map indicates that this segment was in undeveloped meadowlands to the south of an unnamed tributary of the Ahasimus Creek and west of the Ahasimus Creek (see Figure 30). The segment was also to the immediate south of the Newark Turnpike.⁶¹⁰ By 1876, the tracks for two railroads were located in the immediate vicinity of the Southwestern segment—the NY and Erie Railroad (eventual, DLWRR) and a sinuous track which terminated in Weehawken, the unidentified Junction RR. The Southwestern segment appears to have been located to the immediate south of these rail lines; the area may have remained undeveloped meadowlands.⁶¹¹

G.M. Hopkins & Co.'s 1873 map suggests that lots and streets had been at least proposed, but may not have been laid out within the Southwestern segment (see Figure 34). The segment fell within lands associated with the Estate of Traphagen and J.L. Caverly. No structures are depicted within the block south of 19th Street and east of Jersey Avenue. The 1873 map indicates that portions of an unnamed river extended through the Southwestern segment.⁶¹²

G.M. Hopkins & Co.'s 1909 map indicates that the meadowlands had been filled (see Figures 31 & 32). The map shows that the Southwestern segment was located within and to the immediate south of several railroad spurs.⁶¹³ G.M. Hopkins & Co.'s 1928 map indicates that the terminal extents of several railroad spurs extended through the Southwestern segment (see Figure 33). The segment intersected with a poultry platform located along one of the rail spur lines.⁶¹⁴

The 1937 Sanborn Insurance map indicates that spur lines of the Erie Railroad were located within the Southwestern parcel (Figure 58). At least one of these spur lines terminated adjacent to a long linear steel poultry shed. Portions of the shed may have been located within the Southwestern segment. By 1950, this poultry shed had been replaced by a stone Motor Freight Station and associated loading platform. The railroad tracks were located on the northern frontage of the freight station. The freight station appears to have fallen within or in the immediate vicinity of the Southwestern segment. Historic aerial imagery indicates that the freight station was enlarged to the west and east by 1979. Paved surfaces were located to the west and south of the freight station and a rail track continued to be

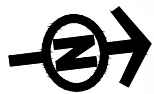
⁶¹⁰ U.S. Coast Guard 1844.

⁶¹¹ U.S. Coast Guard, *Pendulum Station, Coast Survey Map*, accessed online March 31, 2016, <https://historicalcharts.noaa.gov/>.

⁶¹² G.M. Hopkins & Co. 1873.

⁶¹³ G.M. Hopkins & Co. 1909.

⁶¹⁴ G.M. Hopkins & Co. 1928.



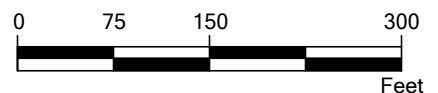
LEGEND

- Study Area
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System

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



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Southwestern Portion of Archaeological APE in 1937
Sanborn 1937 (Plate 40)

August 2016
FIGURE 58

located to its north. By 1987, the adjacent rail line had been removed. By 2006, the freight building had also been removed and the existing HBLR rail line had been installed to the immediate north of the Southwestern segment.⁶¹⁵

Summary and Conclusions

The cartographic history of the Southwestern segment of Alternative 2 indicates that the area was undeveloped marshlands through the mid-nineteenth century. Initial development within the area seems to have followed the development of Jersey Avenue and the extension of both the DLWRR and the Junction RR. Both the DLWRR and the Junction RR lines were initially laid over the meadowlands. The Southwestern segment does not appear to have been filled until the early-twentieth century. By 1909, the western portion of the Southwestern segment was occupied by a lumberyard which included several frame garages or stables and one smaller frame structure. The remaining portions of the segment were unoccupied and potentially undeveloped; 19th Street was only partially laid out. By 1923, the lumber yard had been removed and 19th Street east of Jersey Avenue had been vacated. Several rail spur lines were located within the Southwestern section. Many of the rail spurs were removed during the mid-twentieth century as a poultry shed and then a Motor Freight Station were installed. The freight station expanded in the 1970s. By 1987, the remaining rail line had been removed; by 2006, the freight station was removed and the HBLR alignment had been introduced.

As previously noted in the discussion of the Southwestern segment of Alternative 1, archaeological monitoring and geomorphological analysis was conducted of a soil boring excavated to the immediate south of the segment (see Appendix D). The geomorphological analysis determined that the meadows in this area exhibited little environmental differentiation suggesting a continuous sequence of marsh development into the early Holocene. As such, the area was not considered to have provided an attractive setting for prehistoric occupation or exploitation. Dewberry has also conducted a series of soil borings within this area; these borings were consistent with the profile exposed by Geismar's work. Given the results of Geismar's investigations in a portion of the Southwestern Segment and Dewberry's soil borings within this same vicinity, the Southwestern segment of Alternative 2 is not considered sensitive for prehistoric deposits.

It is unclear from the cartographic record as to whether the landfill and creation of the eastern portion of the Southwestern segment was directly associated with adjacent rail lines. Rather, it is possible that the area was filled by separate interests for commercial and/or industrial development. As the origins of the landfill in this area cannot be associated with a specific occupation, the landfill within the eastern portion of the Southwestern segment is not considered a significant historic resource which could potentially be eligible for listing in the National Register. However, the early to mid-twentieth century development of spur railroad lines and a freight station within this area reflect the importance of freight transportation in the twentieth century development of the Jersey City-Hoboken area. As such, the eastern portion of the Southwestern segment, east of Jersey Avenue, is considered sensitive for historic archaeological deposits from 1937 to 1987 in association with the railroad spur and the freight station occupation. Potential historic deposits within this area could include foundation walls, railroad spurs and ties, and activity areas associated with the freight operations. Archaeological deposits associated with the freight station and

⁶¹⁵ NETR 1931-2006; Sanborn Library, LLC 1950-1979.

railroad spurs would be considered relatively shallow deposits and are anticipated at depths of about 4 to 10 feet below the surface.

Alternative 2–Southern Segment

The Southern segment of Alternative 2 is situated in the southern extent of Hoboken and the northeastern extent of Jersey City. The southern portion of the segment (Option 1) parallels the HBLR tracks which extend in an east-west and then a southwest-northeast trajectory towards Grove Street. At Grove Street, the Southern segment extends to the immediate north of a bridge associated with the former DLWRR. The Henderson Street and 18th Street portions of Alternative 2 are identical to those sections in Alternative 1. In addition, the Southern segment of Alternative 1 with respect to Option 1 is identical to Option 1 within Alternative 2. The northern portion of the segment parallels the southern frontage of Observer Highway from Clinton to Washington streets and then extends to the north along the eastern frontage of Washington Street (Option 2). Unlike Option 2 within Alternative 1, within Alternative 2, Option 2 extends farther west intersecting with Marin Boulevard. At Marin Boulevard, Option 2 turns to the south and intersects with Option 1 along the eastern frontage of Marin Boulevard. A brick New Jersey Transit building is located at the southeast corner of Marin Boulevard and Observer Highway. Paved parking areas are located to the east and south of the New Jersey Transit building. A black metal fence line separates the building and parking areas from pedestrian and vehicular traffic on the adjacent sidewalks and roads. Storage and maintenance yards for the HBLR are located to the immediate south of the transit building on Marin Boulevard. A footing for the elevated bridge upon which the HBLR trains run is located on the eastern frontage of Marin Boulevard around the intersection of Options 1 and 2. The bridge and elevated tracks are supported by a trap rock inclined retaining wall supported by a poured cement foundation (Plate 19). The easternmost portion of Option 2 extends to Hudson Street and to the northern frontage of Observer Highway. On Washington Street, the Southern segment extends along the streetbed adjacent to paved parking areas and commercial stores.

The majority of the Southern segment within Alternative 2 is identical to the Southern segment of Alternative 1. The only difference between the segments consists of the western portion of Option 2. Therefore, the following discussion will focus upon the western portion of Option 2; for a discussion of the remaining portions of Option 2 the reader is directed to the discussion of the Southern segment of Alternative 1.

Historical Development

The western portion of Option 2 was undeveloped through most of the mid-nineteenth century. The 1844 U.S. Coast Guard map indicates that the option was in undeveloped meadowlands to the south and east of the Ahasimus Creek (see Figure 30). The option also crossed the creek and then extended into additional meadowlands to the north and south.⁶¹⁶ Dripps' 1855 map reflects initial development with the area. Ferry Street, present-day Observer Highway, between Hudson and Washington streets, had been planned out and possibly created (see Figure 10). There was no development depicted on Ferry Street west of Clinton Avenue. Prospect Street, in the location of present-day Marin Boulevard, was not complete and may have only been proposed up to a point south of Ferry Street. A river

⁶¹⁶ U.S. Coast Guard 1844.

cut through Jersey City from the Hudson River and extended through a portion of Option 2. There are no structures depicted within or in the vicinity of Option 2.⁶¹⁷

Minutes of the Common Council on file at the Hoboken City Clerk's Office indicated that Ferry Street was extended from Jefferson Street to the western boundary of the city ca. 1869. The minutes also indicated that a sewer line was present with at least a portion of Ferry Street by 1870. In this year, there was a petition to install a box sewer in Newark Street from the western boundary of the city to Ferry Street to connect with the Ferry Street sewer.⁶¹⁸ G.M. Hopkins & Co.'s 1873 map reflects the extension of Ferry Street from Washington Street west to Newark Street (see Figures 35 & 36). The map indicates the development of the M&E Depot to the south of Ferry Street. Option 2 was located to the immediate north of the rail lines; it crossed the rail lines and extended to the south along Henderson Street.⁶¹⁹

Speilmann and Brush's 1880 map indicates that portions of Option 2 were located in land that was reclaimed from the sea and that portions were in meadowlands (see Figure 15). The Henderson Street, present-day Marin Boulevard, portion of Option 2 was also located in previously submerged land. The southernmost portion of Washington Street was also reclaimed land. The 1880 map suggests that there was a sewer line within the streetbed of Ferry Street from the western boundary of the city to Jefferson Street where the line turned to the southeast and had an outlet with the DLWRR property. The DLWRR tracks were located to the south of Option 2.⁶²⁰ In a 2002 study, RGA found evidence indicating that a brick sewer was installed within Ferry Street in 1895 as part of a main outlet or outfall sewer. The 1940 As-Built plans indicate that a brick trunk sewer line was located within Ferry Street from Washington Street west to Marin Boulevard.⁶²¹

By the early 1900s, the Erie-Lackawanna Terminal on the eastern shore of Hoboken near Ferry Street and the H&M tunnel had been completed. G.M. Hopkins & Co.'s 1909 map indicates that the terminal for the H&M was located to the immediate east of the Southern segment. The H&M tunnel extended from the terminal to the southwest with both Options 1 and 2 having crossed the tunnel. The elevated NHCR line was located above Option 2. An elevated station for the NHCR was located to the north of the intersection of Adams Street and Ferry Street. Development associated with the Erie-Lackawanna Terminal was located to the south and east of Option 2. Along Henderson Street, present-day Marin Boulevard, Option 2 was adjacent to a Hammond Company Hoboken Branch building, an Armour & Company Chicago Beef building, and several footings associated with the elevated DLWRR lines (see Figures 38 and 39).⁶²²

The northeastern extent of Option 2 was located in the immediate vicinity of an elevated station associated with the NHCR elevated trolley line. The 1909 map also indicates the presence of a sewer line within Ferry Street that extended in a southeasterly trajectory through the terminal to an outlet in the Hudson River (see Figures 38 and 39).

⁶¹⁷ Dripps 1855.

⁶¹⁸ Hoboken Common Council, "Meeting Minutes of the Common Council," On file (Hoboken: City Clerk's Office) 1862-1871, 1875.

⁶¹⁹ G.M. Hopkins & Co. 1873.

⁶²⁰ Speilmann and Brush 1880.

⁶²¹ RGA 2012, 3-1; Whittemore 1940.

⁶²² G.M. Hopkins & Co. 1909.

The majority of Option 2 appears to have extended to the immediate south of the NHCR line; stations associated with the trolley were located at Bloomfield Street, Willow Street, and west of Adams Street. The map indicates that the Ferry Street sewer extended to the west along Ferry Street to Jackson Street. Option 1 extended through the DLWRR property, extending in the vicinity of the Round House Stalls, the Turn Table, an Electric and Gas Plant, a Coaling Station, and other railroad-related structures and features. The Long Slip Canal was located to the south of Option 1. The Grove Street gate appears to have been located to the immediate north of an elevated platform for the DLWRR. The western portion of the gate was located to the immediate south of a slaughterhouse and within a coal yard.⁶²³

G.M. Hopkins & Co.'s 1923 map reflects similar development in the vicinity of the Southern segment as in 1909 (Figures 59 & 60). Public Service continued to maintain a station at the intersection of Washington Street and Ferry Street, with trolley lines extending on both streets. Elevated stations continued to be located at Bloomfield Street, Willow Street, and west of Adams Street along Ferry Street. Along Henderson Street, Option 2 was located in the vicinity of a freight office and a few unnamed structures on its eastern frontage. Footings to support the elevated DLWRR lines were also located along Henderson Street.⁶²⁴ By 1949, Public Service replaced the trolley lines with buses. The elevated trestle along Observer Highway and its associated stations were dismantled shortly thereafter.⁶²⁵ The Erie-Lackawanna Terminal was listed in the National Register in 1973; the terminal continues to service commuter rail and ferry traffic within New Jersey and between New Jersey and Manhattan.

The 1937 Sanborn Insurance maps indicate that several linear buildings had developed along the southern frontage of Ferry Street (Figures 61 through 65). These businesses may have all been a part of the DLWRR Machine Shop. The structures included a plumbing department building, a building associated with the Hoboken Woodworking and Wood Flooring Corporation, a freight house, and an office building. Along Henderson Street, the only development appears to have been a portion of the freight house offices and the footings for the elevated DLWRR tracks. The 1954 aerial imagery reflects an arrangement of linear buildings along the eastern frontage of Ferry Street from Willow Avenue to Jefferson Street. An L-shaped building was located at the western extent of these structures and represented the freight office building which also fronted on Henderson Street. By 1987, the aligned structures were no longer extant; paved surfaces for parking were located on the southern frontage of Ferry Street and the eastern frontage of Henderson Street. In 2002, the current NJ Transit building at the corner of Marin Boulevard and Observer Highway was installed. Paved parking surfaces were located to the east and north of this building.⁶²⁶

Summary and Conclusions

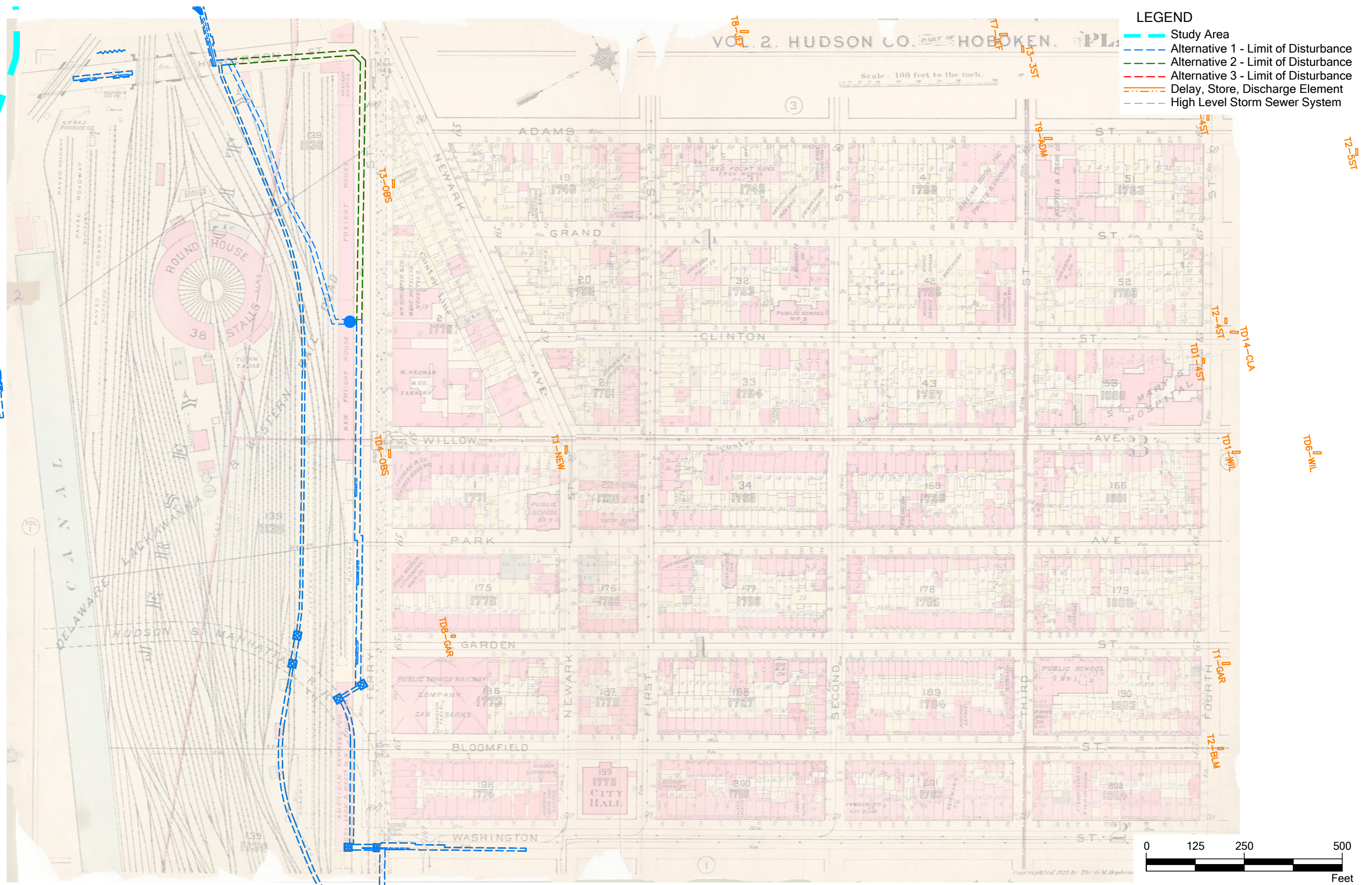
The cartographic history of the Southern segment of Alternative 2 indicates that the area was undeveloped marshlands through the mid-nineteenth century. Initial development within the area commenced along the eastern extent of Option 1 and 2 with the creation and development of portions of Ferry and Washington streets. The majority of the area had been filled by 1873, coinciding with the initial development of the M&E Railroad and Depot. By the

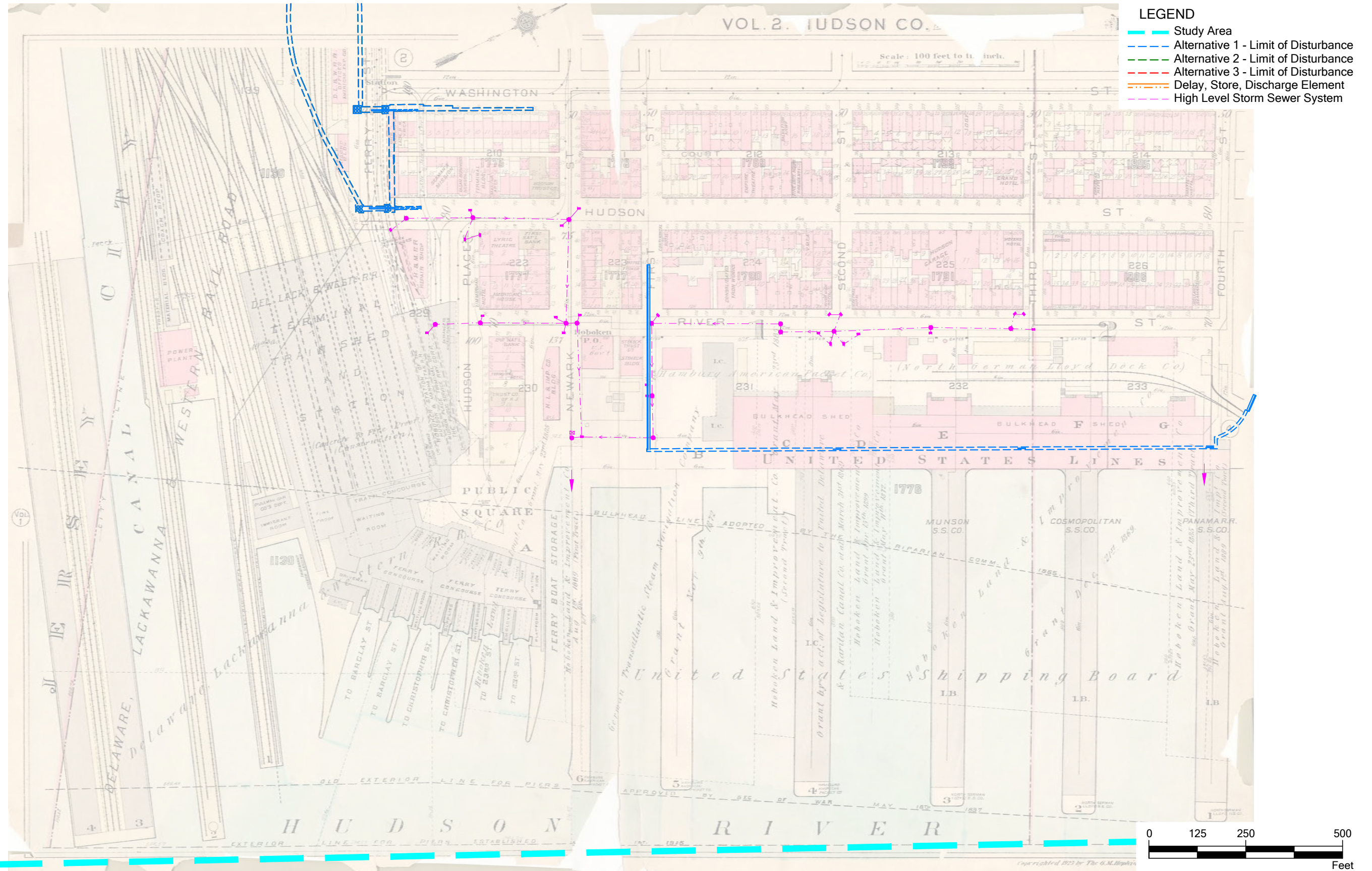
⁶²³ G.M. Hopkins & Co. 1909.

⁶²⁴ G.M. Hopkins & Co. 1923; G.M. Hopkins & Co., *Plat Book of Jersey City, Hudson County, N.J.*, accessed online April 1, 2016, http://mapmaker.rutgers.edu/JCplat_book/Frontpage/index.htm.

⁶²⁵ Hans 2005, 54.

⁶²⁶ Sanborn Library, LLC 1937; NETR 1931-2006.







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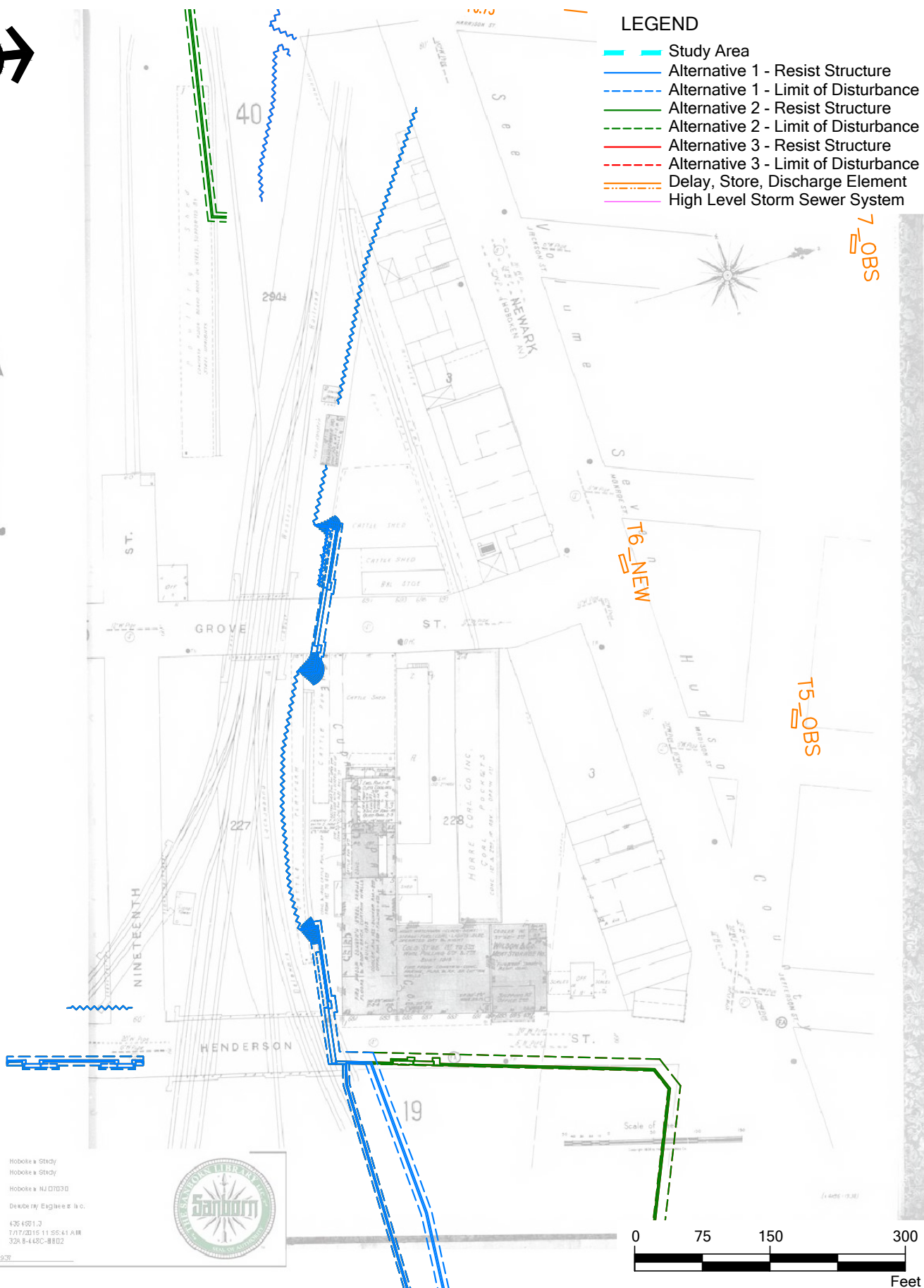
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LEGEND

- Study Area
- Alternative 1 - Resist Structure
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Resist Structure
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Resist Structure
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System



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

Dewberry

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Southern Portion of Alternatives 2 & 3 in 1937
Sanborn 1937 (Plate 26)

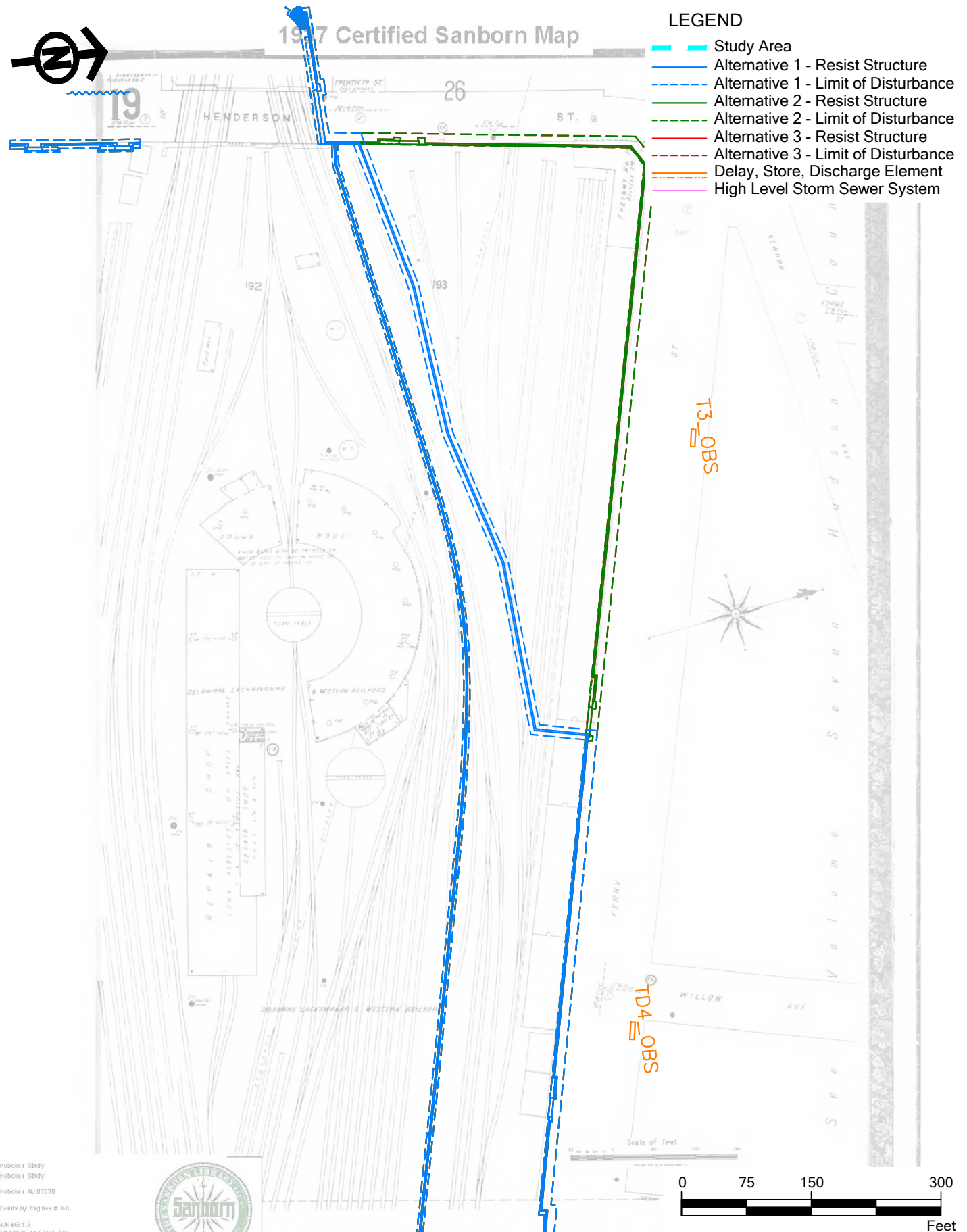
August 2016
FIGURE 61



1937 Certified Sanborn Map

LEGEND

- Study Area
- Alternative 1 - Resist Structure
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Resist Structure
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Resist Structure
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System



Hoboken Study
Hoboken Study
Hoboken NJ 07030
Dewberry Engineers Inc.
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7/17/2015 11:55:41 AM



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



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Southern Portion of Alternatives 2 & 3 in 1937
Sanborn 1937 (Plate 40)

August 2016
FIGURE 62



1937 Certified Sanborn Map

LEGEND

- Study Area
- Alternative 1 - Resist Structure
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Resist Structure
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Resist Structure
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System

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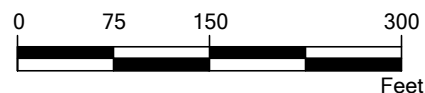
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State of New Jersey
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Southern Portions of Archaeological APE in 1937
Sanborn 1937 (Plate 24)

August 2016
FIGURE 63

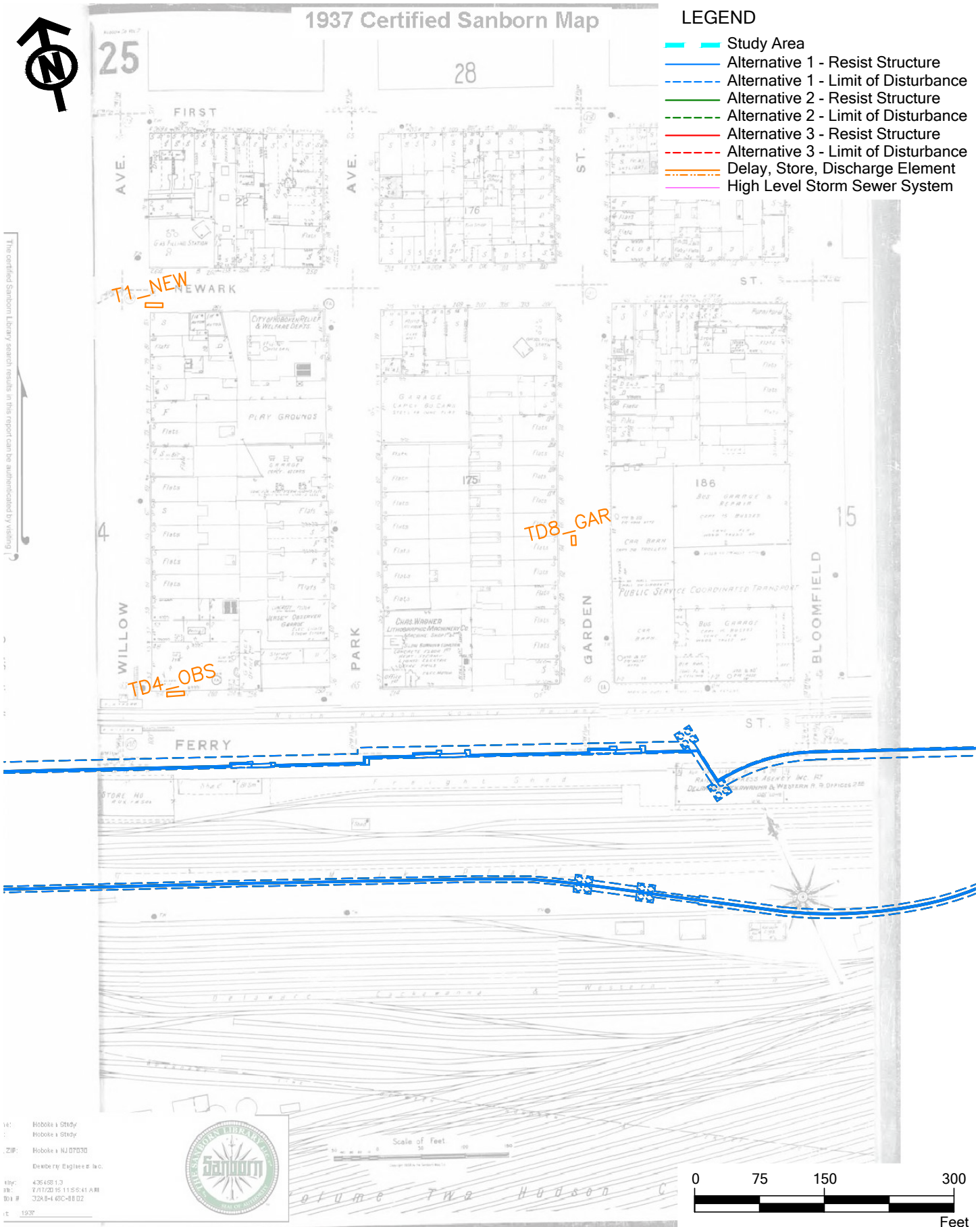


1937 Certified Sanborn Map

LEGEND

- Study Area
- Alternative 1 - Resist Structure
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Resist Structure
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Resist Structure
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System

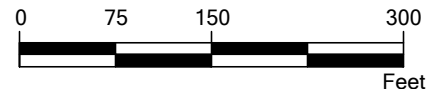
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1937



Scale of Feet
0 25 50 100 150 200 250 300



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



Southern Portions of Archaeological APE in 1937
Sanborn 1937 (Plate 25)

August 2016
FIGURE 64



1937 Certified Sanborn Map

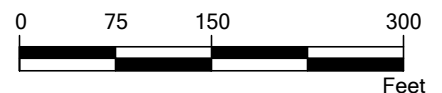
LEGEND

- Study Area
- Alternative 1 - Resist Structure
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Resist Structure
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Resist Structure
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System

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Southern Portions of Archaeological APE in 1937
Sanborn 1937 (Plate 15)

August 2016
FIGURE 65

early-twentieth century the southern section had witnessed extensive development associated with the DLWRR, the PATH tunnel, and the NHCR elevated trolley line. Several elevated trolley stations were located along or in the immediate vicinity of Option 2. The elevated stations of the NHCR were dismantled during the mid-twentieth century. From the mid to late-twentieth century, buildings associated with the DLWRR were located on the southern frontage of Ferry Street. Initial sewer lines were installed within portions of Ferry Street in the late 1800s.

As previously noted, RGA's past archaeological work along Observer Highway to the east of the Southern segment identified and recorded an intact 1895 brick sewer. The 1940 As-Built plans indicate the presence of a brick trunk sewer line along Observer Highway between Washington Street and Marin Boulevard to the west. It is highly likely that portions of the 1895 sewer or an earlier sewer line suggested by the Minutes of the Common Council may be located within Option 2, particularly the western portion between Clinton Street and Marin Boulevard.

With respect to prehistoric archaeological sensitivity, the Southern segment of Alternative 2 was historically submerged or within meadowlands. As previously discussed, Dewberry has conducted a series of soil borings in the vicinity of the Southern segment (see Appendix D). These borings evidenced a black organic silt and/or brown peat deposits at depths below 10 to 15 feet from the surface. The identification of a distinct peat layer and a black organic silt which frequently overlaid the peat layer within many of the borings suggests that there is the potential for a deeply buried prehistoric surface within the Southern segment of Alternative 2. Conditions within this portion of the city may have provided for a more favorable environmental setting than some of the marshlands to the north and west. In addition, this portion of the Study Area is located in near proximity to both the Ahasimus and the Hoboken creeks and was in a relatively level historic topographic situation. The presence of a potentially stable buried ground surface alongside the favorable environmental conditions, further suggests that this area may have provided an attractive setting for prehistoric occupation. The Southern segment of Alternative 2 is therefore considered sensitive for prehistoric deposits at a depth from approximately 15 to 35 feet below the surface.

Development of the majority of the Southern segment was associated with the extension of the M&E railroad and the subsequent expansion of the DLWRR. As previously discussed, Option 1, in particular, is considered sensitive for historic deposits, including landfill, associated with the railroad development. With respect to Option 2, elevated stations associated with the NHCR were located along several segments of Observer Highway. Option 2 is, therefore, considered sensitive for late-eighteenth and early to mid-nineteenth century deposits associated with the elevated trolley, including foundation piers for the trestle and stations. As Option 2 is located within the streetbed of Observer Highway, it seems unlikely that historic deposits associated with the twentieth century DLWRR office and machine shop buildings on the southern frontage of Ferry Street would be present. Therefore, provided that Option 2 is located in the streetbed and not to the south of Observer Highway, the option is not considered sensitive for historic deposits associated with the twentieth century occupation. The eastern portions of Option 2 and a segment of Option 1 between Garden and Bloomfield streets are also sensitive for historic deposits associated with the H&M/PATH Tunnel. This system has been determined eligible for listing in the National Register by the NJHPO. Deposits associated with the historic district would include the tunnel itself and any features or artifacts deposited

in association with its construction. As the PATH Tunnel is situated at least 60 feet below the surface, deposits associated with the tunnel are anticipated at depths circa 60 feet below the surface.⁶²⁷

In addition, RGA's archaeological work along the eastern portion of Option 2 identified an intact late-nineteenth century brick sewer. As-Built plans indicate the presence of a brick trunk sewer line within Observer Highway by 1940. Additional data provided by the NHSA indicates that a brick sewer line was installed within Observer Highway from Marin Boulevard to Court Street prior to 1916. In light of RGA's findings, the As-Built, and the data provided by NHSA, it is highly likely that the western portions of the Observer Highway sewer line are extant within or in the immediate vicinity of Option 2 from east of Washington Street to Jefferson Street. Therefore, this portion of Option 2 is considered sensitive for historic deposits associated with the late-nineteenth to early-twentieth century sewer system installation. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans suggest that the brick sewer line within the western segment of Option 2 is located at a depth of approximately 3.5 to 9 feet below the surface. Therefore, sewer deposits within the western portion of Option 2 are anticipated at depths greater than 3.5 feet below the surface.

Alternative 2—Northern Segment

The entire Northern segment of Alternative 2 is located in Hoboken. The segment extends along the western frontage of Washington Street starting from a point in-between 13th and 14th streets. The segment continues to the north to the intersection of Washington Street and 15th Street. This portion of Washington Street consists of a wide asphalt surface; commercial properties, residential buildings, and street parking (Plate 20). At the intersection of Washington and 15th streets, it turns to the west along the northern frontage of 15th Street to its intersection with Garden Street. At Garden Street, the segment turns to the north along a wide cement sidewalk and expands into a larger basin to the west of Weehawken Cove. This larger basin and the far northern extent of the Northern segment correspond with a portion of Alternative 1 consisting of a cleared parcel currently undergoing an environmental cleanup investigation (see Plate 13).

Given that the northern portion of the Northern segment, to the west of Weehawken Cove, is identical to a segment of Alternative 1, the following discussion will focus upon the Washington Street, 15th Street, and Garden Street portions of Alternative 2. For a discussion of the remaining portions of the Northern segment of Alternative 2, the reader is directed to the discussion of the Northern segment of Alternative 1.

Historical Development

The majority of the Northern segment of Alternative 2 was undeveloped through most of the mid-nineteenth century. The 1844 U.S. Coast Guard map indicates that the segment was within undeveloped meadowlands; a portion of the segment was also underwater (see Figure 30). The 15th Street portion of the segment appears to have extended in the immediate vicinity of the historic seawall. A portion of the segment also paralleled or extended into the seawall from 15th to 16th streets. The Washington Street portion of the segment crossed the historic seawall; the far southern

⁶²⁷ B. Klapouchy, "Hudson & Manhattan Railroad/Hudson Tubes," accessed online June 8, 2016 at <http://www.webring.org/l/rd?ring=001bus;id=266;url=http%3A%2F%2Fwww%2Ehudsoncity%2Eenet%2Ftubes%2Fgatewaytubepage%2Ehtml>.



Plate 19: Railroad Bridge over Marin Boulevard Crossed by Northern Segment (Option 2) of Alternatives 2 and 3. View Southeast. (TF 3/30/2016).



Plate 20: Washington Street South of 15th Street, within Northern Segment of Alternative 2. View South. (TF 4/5/2016).

terminus also terminated in the immediate vicinity of an unidentified structure.⁶²⁸ G.M. Hopkins & Co.'s 1873 map indicates that the majority of the Northern segment was submerged (see Figure 53). The only portion of the segment which was not underwater consisted of the far southern extent along Washington Street. This portion of the segment was located within an undeveloped portion of the Elysian Fields. The seawall is no longer depicted suggesting that it may have been removed or filled over by this time.⁶²⁹ Speilmann and Brush's 1880 map indicates that streets had yet to be laid out within the Northern portion and that the Garden Street portion and the eastern portion of 15th Street were underwater (see Figure 15).⁶³⁰

Hughes and Bailey's 1904 Birdseye view of the city indicates that the Northern segment had been filled (see Figure 42). While 15th Street had not been laid out to the east of Park Avenue, waterfront development and infilling had occurred to the south of Weehawken Cove, including the Northern segment. G.M. Hopkins and Co.'s 1909 map indicates that this filling was in part associated with the Hoboken Shore Railroad lines which extended through present-day 15th Street and the Northern segment (see Figure 43). The Garden Street portion of the segment appears to have extended along a driveway overlying a six-inch pipeline. In the vicinity of present-day 15th Street, the segment extended along several spurs of the Hoboken Shore Railroad; as it extended to the west, the segment crossed several structures associated with the Jagels & Bellis Coal Company. At Washington Street, which had not yet been extended to 15th Street, the segment crossed several rail lines, a ten-inch pipeline, and buildings associated with the Vanderbilt & Schill Lumber Yard. The segment also crossed a 12-inch pipeline beneath Washington Street. The far northern extent of the segment paralleled and overlaid the Hoboken Shore Railroad to the west of the dry docks.⁶³¹

G.M. Hopkins & Co.'s 1923 map illustrates similar development within the segment as seen in 1909 (see Figure 44). Fifteenth (15th) Street had not been extended to the east, nor had Washington Street been extended to the north. A driveway bordered by several small iron clad buildings was located in the northern extent of the segment. The segment also extended over the rail lines of the Hoboken Manufacturers Railroad within the vicinity of present-day 15th Street. Along 15th Street, the segment crossed several buildings including a factory terminal building associated with the Jagels & Bellis Coal Company. In turning towards Washington Street, the segment crossed additional lines and a brick structure associated with Waller Stores, Inc. The remaining portions of the segment were developed as they were in 1909.⁶³²

A review of the historic Sanborn Insurance maps and aerial photography shows that the area remained relatively unchanged into the mid-twentieth century. The Sanborn maps indicate that the former location of the Jagels & Bellis Coal Company was associated with the General Food Corporation by 1937. The segment appears to have extended over terminal rail lines associated with the General Foods building. By 1987, all of the railroad tracks had been removed from the area and replaced by paved surfaces for parking. The majority of the Northern segment was

⁶²⁸ U.S. Coast Guard 1844.

⁶²⁹ G.M. Hopkins & Co. 1873.

⁶³⁰ Speilmann and Brush 1880.

⁶³¹ Hughes and Bailey 1904; G.M. Hopkins 1909.

⁶³² G.M. Hopkins & Co. 1923.

located within these paved surfaces. By 2002, 15th, Garden, Bloomfield, and Washington streets had been extended to their present-day alignment.⁶³³

The 1940 As-Built plans indicate that a vitrified clay pipe was located within Washington Street from 11th to 14th streets. The Northern segment would intersect and cross a brick sewer line and cast-iron drainage pipe located along 14th Street. A concrete sewer pipe was located along 15th Street from the bulkhead to Park Avenue.⁶³⁴

Summary and Conclusions

For much of the mid-nineteenth century the majority of the Northern segment of Alternative 2 was undeveloped meadowlands or underwater. The earliest European development within this area appears to have been the creation of a seawall within the meadowlands ca. 1814 to 1819. The seawall was designed to help drain and reclaim the meadows for agricultural purposes. A mid-nineteenth century structure was also located within the meadowlands to the immediate southwest of the seawall and in the vicinity of the southern terminus of the Northern segment. The Washington Street portion of the Northern segment crossed the historic seawall; between Garden Street and Park Avenue, between 15th and 16th streets, the segment also appeared to closely parallel the historic seawall. By 1873, much of the segment continued to be underwater, the remaining portions of the segment were located within the Elysian Fields. The seawall appears to have been removed or filled in by this time; two structures were also located in the vicinity of the segment. By the early-twentieth century, the entire segment had been filled. This development appears to be directly related to the extension of the Hoboken Shore Railroad/Hoboken Manufacturers Railroad. Sewer lines had been extended through the development on the southern edge of Weehawken Cove and through Washington Street. Industrial development was located to the north and south of the segment around Weehawken Cove including a lumber yard to the south and a coal company to the north. Features associated with both occupations may have been located within the segment. By the late-twentieth century, the rail lines had been removed; by 2002, the present streets had been extended through the area.

As previously discussed, several cultural resource studies have been conducted in the vicinity of the Northern segment. These studies found intact rail line deposits and documented a Type 2A pier and portions of the surviving bulkhead along the shore.⁶³⁵ An intact late-nineteenth to early-twentieth century brick sewer line was also found between 14th and 15th streets on Shipyard Lane.⁶³⁶ The As-Built plans indicate that a vitrified clay pipe and concrete sewer were located within Washington Street and 15th Street, respectively. The Northern segment would intersect with a brick sewer line and cast-iron drainage pipe along 14th Street. Additional data provided by the NHSA indicates that a brick sewer line was installed within 14th Street between Garden Street and Hudson Street prior to 1916.⁶³⁷

With respect to prehistoric archaeological sensitivity, the majority of the Northern segment consisted of meadowlands to the west and south of Weehawken Cove. Previous archaeological assessments have indicated that the uplands to the northwest of these meadows were sensitive for prehistoric deposits. Dewberry has conducted

⁶³³ Sanborn Library, LLC 1939-2006; NETR 1931-2006.

⁶³⁴ Whittemore 1940.

⁶³⁵ RGA 2006b.

⁶³⁶ RGA 2002; RGA 2006a.

⁶³⁷ Whittemore 1940; NHSA 2016.

a soil boring within a portion of Alternative 2, Boring B-10 (see Appendix D). Boring B-10 was located approximately in the southeast corner of the larger polygon within the Northern Segment north of 15th Street. An examination of the historic topographic location of Boring B-10 suggests that this boring was located in undeveloped meadowlands to the east of the seawall along the eastern shoreline of Hoboken. Boring B-10 contained an overlying deposit of sequential brown and tan sand layers which extended to a depth of 12 feet below the surface. At a depth of 15 feet below the surface a layer of black sand with a petroleum odor was encountered. The black sand terminated at a depth of 23 feet below the surface overlying a gray clay and silt. Brown sand with decomposing rock was encountered at a depth of approximately 28 feet below the surface. Boring B-10 was terminated within this matrix at a depth of 45 feet below the surface. There was no indication of an organic surface within the soil profile. It is unclear whether past subsurface disturbance may have removed any pre-existing organic deposits within the area. Additionally, the presence of decomposing shale within the lower depths of the profile suggest that the boring may have terminated near glacial deposits.

Given the location of the boring and the relative historic topographic setting of the area, it is assumed that the Northern portion of Alternative 2 would have a similar soil profile lacking organic deposits. The lack of distinguishable organic deposits suggests that there is little likelihood for an intact prehistoric occupation surface within the area. As such, this area is considered to possess little to no prehistoric archaeological sensitivity.

With respect to historic archaeological sensitivity, the earliest development within the Northern segment consists of a seawall constructed in the 1810s. The Northern segment appears to have crossed or been in the immediate vicinity of the seawall—in the vicinity of Garden Street and Park Avenue between 15th and 16th streets, and along Washington Street in the vicinity of 14th Street. These portions of the Northern segment are considered sensitive for the historic seawall. In addition, an unidentified mid-nineteenth century structure was located in the immediate vicinity of the southern extent of the segment. Therefore, these portions of the Northern segment are also considered sensitive for mid-nineteenth century historic deposits. Soil borings conducted to the northwest of the Northern segment indicated that fill deposits extended to a depth of 15 to 17 feet below the surface.⁶³⁸ Similarly, Boring B-10 suggests that historic deposits may be located at a depth below 15 feet from the surface, the depth at which petroleum smelling soils were uncovered. The data from the borings indicates that any potential historic seawall or mid-nineteenth century deposits within the segment would most likely be encountered approximately 15 feet below the surface; though the depth and extent of landfill may also vary across the area.

The Northern segment to the south of Weehawken Cove was developed and filled during the late-nineteenth and early-twentieth century in association with Hoboken Shore Railroad/Hoboken Manufacturers Railroad and associated industrial development. This portion of the segment is, therefore, considered sensitive for historic deposits associated with the late-nineteenth and early-twentieth century landfilling and waterfront development, including piers, wharves, and bulkheads. The segment is also considered sensitive for historic buildings associated with the early-twentieth century lumber yard to the east of present-day Washington Street and the coal company and subsequent General Foods Corporation warehouse to the west of Washington Street. The majority of the

⁶³⁸ THE Partnership 2009.

Northern segment is also considered sensitive for railroad deposits associated with the Hoboken Manufacturers/Hoboken Shore Railroad. Deposits associated with the twentieth century buildings and rail lines would be anticipated at relatively shallow depths. The historic landfill deposits would be anticipated below the historic occupation most likely at depths greater than 15 feet below the surface.

With respect to sewer lines, given the cartographic data, the previously conducted cultural resource studies, the As-Built plans, and the data provided by NHSA, the Washington Street portion of the segment in the vicinity of 14th Street is considered sensitive for an historic brick sewer line dating to the late-nineteenth to early-twentieth century. As these sewers were associated with the expansion of Hoboken's municipal system during its industrial growth in the late-nineteenth to early-twentieth century, they are potentially significant historic resources. Given that the As-Built plans indicate that a vitrified clay pipe was located along 14th Street and that a concrete pipe was installed within 15th Street, these sewers are not considered potentially sensitive historic resources as they do not reflect the city's early sewer-related technological adaptations. Archaeological deposits associated with the 14th Street sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the 14th Street sewer line was located approximately 5 to 8.5 feet below the surface. Therefore, sewer deposits within the area are anticipated at depths greater than five feet below the surface.

Alternative 2—Weehawken Segment

The far northern portion of Alternative 2 is located in Weehawken. The far northern extent of the segment consists of a discontinuous section to the east of Lincoln Harbor Road. This alignment extends along a grassed berm between two corporate business parks. A gas pipeline was observed with the eastern portion of the berm (Plate 21). To the south of this discontinuous section, the Weehawken segment extends along the western frontage of Harbor Boulevard from its intersection with Kennedy Boulevard East to its intersection with 19th Street. A chain link fence line is situated to the immediate west of the roadway (Plate 22). A small grass berm with trees sits to the west of the fence line and borders an adjacent parking area with asphalt and gravel. The segment extends along the southern frontage of 19th Street. A wide paved sidewalk is located to the west of 19th Street; a grass median with ornamental plantings forms the border between the sidewalk and the parking area to the southwest. The segment extends to the west across the intersection of 19th Street and Waterfront Terrace and then turns to the north along the northern frontage of the HBLR track. The segment then crosses the tracks and terminates to the immediate south of a retaining wall and footing for the elevated Lincoln Harbor Road (Plate 23). A narrow area of short grass growth and trees is located between the tracks and the retaining wall. The northern portion of the Weehawken segment is a small alignment located to the east of the main segment. This northern portion is located along the eastern frontage of Lincoln Harbor Road which it parallels to the north before turning to the west. This portion of Lincoln Harbor Road could not be accessed during the pedestrian reconnaissance of the Study Area. From current aerial imagery, it appears that this portion of the Weehawken segment is located in a landscaped area of maintained grass and ornamental tree planting and paved parking surfaces within two adjacent business parks. The Weehawken segment of Alternative 2 does not overlap with any portion of Alternative 1.

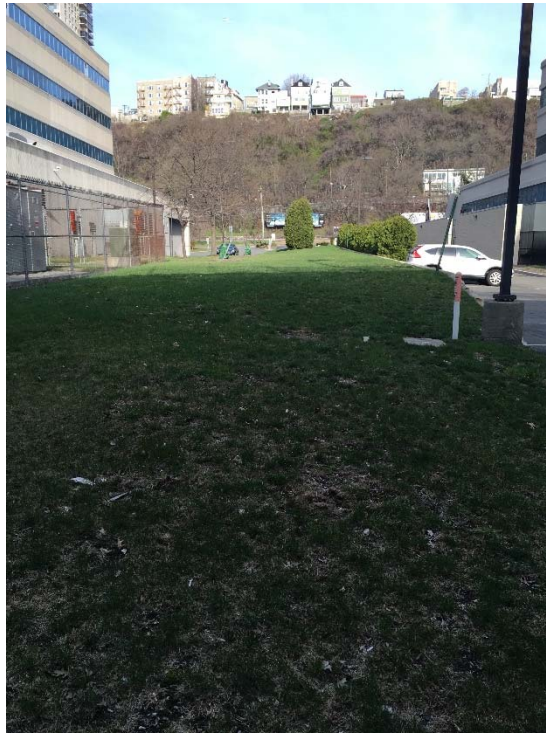


Plate 21: Northern Extent of Weehawken Segment of Alternative 2. View West. (WH 6/7/2016).



Plate 22: Weehawken Segment of Alternative 2 along Harbor Boulevard. View Southwest. (TF 4/11/2016).



Plate 23: Northern Terminus of Alternative 2 in Weehawken. View West. (TF 4/11/2016).



Plate 24: Cobblestone Pathway (Garden Mews) along Garden Street between 14th and 15th Streets. View Northeast. (TF 4/5/2016).

Historical Development

Historic maps indicate that the Weehawken segment was undeveloped through the mid-nineteenth century. The 1844 U.S. Coastal Survey indicates that the majority of the segment was located in undeveloped meadowlands to the northwest of Weehawken Cove (see Figure 30). However, the far northern extent of the segment was located in cleared and seemingly dry uplands to the north of the meadowlands.⁶³⁹

By 1860, much of the Weehawken segment had been filled in association with the Venango Oil Company's Storage House and Wharf.⁶⁴⁰ A railroad line had also been extended to the Venango property by this time. G.M. Hopkins and Co.'s 1873 map indicates that the southern portion of the segment was submerged (see Figure 53). Multiple rail lines associated with the New York and Fort Lee Railroad were located within the segment to the north of Weehawken Cove. Several oil tanks and buildings associated with the Venango Oil Works were located in the vicinity of the segment. The northern extent of the segment was located within railroad tracks associated with the oil works. The far northern extent of the segment terminated within undeveloped land associated with the Hoboken Land and Improvement Company.⁶⁴¹

Between 1881 and 1885, the Erie Railroad built a freight terminal which included two freight piers and a cold storage plant to the immediate north of the Venango Oil Works. Given that this area was previously underwater, landfilling activities must have predated the terminal construction. Between 1897 and 1903, the Erie Railroad greatly expanded its Weehawken Terminal. G.M. Hopkins & Co.'s 1909 map reflects the expansion of the railroad terminal (see Figure 54). By this time, the Weehawken Yard had approximately ten piers of differing widths and lengths; several of these piers housed warehouse buildings. Several buildings had also been constructed within the freight yard including an oil storage building, a warehouse, and cattle pens. The Weehawken segment was located within the western portion of the freight yard. The segment was situated to the immediate east of the 17th Street Viaduct. The entire segment appears to have been filled by this time with the Harbor Boulevard and 19th Street portions of the segment being located across the extensive rail lines of the Weehawken Yard. Portions of the segment appear to have crossed a sewer line which extended from Park Avenue and 19th Street to the northeast through the Weehawken Yard.⁶⁴² The 19th Street sewer line may have been a component of the early-twentieth century shared combined sewer system of Union, Weehawken, and West Hoboken. This system discharged into the Hudson River at two outlets—one at the foot of 16th Street at the West Shore Freight Yards and one at 19th Street at the Erie Freight Yards. The far northern extent of the segment was located within rail spur lines in the vicinity of the Round House.⁶⁴³

Between 1904 and 1910, the Pennsylvania Railroad constructed a system of trackage and tunnels to extend their rail lines into Manhattan. The Pennsylvania Railroad tunnel was extended under the northern portion of the

⁶³⁹ U.S. Coast Survey 1844.

⁶⁴⁰ Taintor Brothers 1860.

⁶⁴¹ G.M. Hopkins and Co. 1873.

⁶⁴² G.M. Hopkins and Co. 1909.

⁶⁴³ RGA, *Stage 1A Cultural Resources Survey North Hudson Sewerage Authority System-Wide Combined Sewer Overflow Improvements Program Cities of Hoboken and Union City and Township of Weehawken, Hudson County, New Jersey*. (On file, Trenton: NJHPO) 2004, 4-16; New Jersey Board of Health, *Thirty-seventh Annual Report of the Board of Health of the State of New Jersey* (Paterson: New Printing Company) 1914.

Weehawken Terminal to the north of the Weehawken segment. The cast-iron and concrete tunnel is located approximately 50 to 85 feet beneath the surface of the Erie Terminal in 1903.⁶⁴⁴

A review of the Sanborn Insurance maps and historic aerial imagery indicates that development within the Weehawken segment remained relatively unchanged until the mid-twentieth century. Between 1950 and 1953, the rail spur lines which had been located within the far northern extent were removed and a large iron building was installed to the immediate northeast of the segment. Between 1966 and 1979, the remaining extensive train tracks within the Weehawken Yard were removed. The majority of the former yard was developed into a paved parking and storage area by 1979. A single structure had developed to the immediate east of present day 19th Street. Portions of Harbor Boulevard may have also been established. The 1979 Sanborn Insurance map indicates that the structure was associated with the Seatrain. By 1987, two buildings were located between 19th Street and present day Harbor Boulevard. By this time 19th Street had been extended to the east towards the Hudson River. Harbor Boulevard had also been established. The iron building which had been located to the northeast of the northern extent had been removed. Ca. 1995, Lincoln Harbor Road appears to have been established in the northern portion of the Weehawken segment. By 2002, the two current buildings located to the north and south of the northern extent and the driveway within this portion of the Weehawken segment had been installed. Between 2014 and 2015, the two structures located to the east of 19th Street had been removed and replaced with a paved parking surface.⁶⁴⁵

Summary and Conclusions

Historic records suggest that the earliest development within the Weehawken segment occurred in the mid-eighteenth century with the development of two structures to the immediate northeast of the segment. The northernmost portion of the segment was located in uplands to the north of the meadows which occupied the majority of the segment until the 1860s. While the southern portions of the Weehawken segment remained submerged or undeveloped through the 1860s and 1870s, the central and 19th Street portions of the segment were developed in association with the Venango Oil Works and the extension of the New York and Fort Lee Railroad. By the early-twentieth century, the entire segment had developed and was occupied by the Erie Weehawken Freight Yard. The segment was situated in the extensive trackage system within the yard. The far northern extent was located near the Round House. In the mid-twentieth century, the railroad tracks were removed. By 1987, 19th Street and Harbor Boulevard had been established as they are today. Lincoln Harbor Road was installed ca. 1995; the current development within this portion of the segment had developed by 2002.

Several previous cultural resource investigations have been conducted in the vicinity of the Weehawken segment. In 2004, RGA conducted a cultural resource assessment of several sewer overflow improvements in Weehawken, Hoboken, and Union City. One of these locations, the 18th Street Pumping Station, was located within Weehawken to the west of the Weehawken segment. RGA determined that the pumping station was sensitive for historic archaeological deposits associated with a 48-inch diameter brick sewer in Park Avenue. RGA recommended

⁶⁴⁴ Raber 1986, 16.

⁶⁴⁵ Sanborn Library, LLC 1950-2006; NETR 1953-2013.

additional historical research to ascertain the date and potential significance of the sewer line and further suggested archaeological monitoring and documentation of the resource if it was found to be significant.⁶⁴⁶

As previously noted, RGA also conducted mechanical excavation of two backhoe trenches to the north of the Weehawken segment in 2001. These excavations revealed the presence of alluvial deposits within both trenches and a peat layer within one. The alluvium and peat deposits were found at a depth of approximately 13 feet below grade within one of the trenches. Both trenches contained extensive fill deposits. No prehistoric artifacts or potential features were identified within the alluvia, peat, or underlying marsh gley-like deposits.⁶⁴⁷ Raber also conducted a cultural resource assessment to the northeast of the Weehawken segment in 1986. Raber concluded that the greatest potential for prehistoric deposits within their project area consisted of uplands located to the north of the mid-nineteenth century marshlands. With respect to historic period archaeological resources, Raber concluded that the area was sensitive for deposits relating to the Weehawken Ferry landing, potentially one of the oldest waterfront structures in this portion of New Jersey, and for deposits associated with the Erie Railroad Cold-Storage Warehouse.⁶⁴⁸

With respect to prehistoric archaeological sensitivity, RGA's excavations exposed deeply buried organic surfaces in the vicinity of the Weehawken segment. However, unlike the majority of the Weehawken segment, RGA's excavations were conducted in an upland area to the west of Port Imperial Boulevard. Historically, the majority of the Weehawken segment was underwater or within undeveloped meadowlands; however, the far northern extent of the segment appears to have been within an historically dry location. The northern extent of the segment has witnessed extensive historic railroad-related development and road construction. The depth of this disturbance in addition to the potential history of filling within this area is uncertain. Therefore, the northern extent of the segment is considered sensitive for prehistoric archaeological deposits. Such deposits would be anticipated at depths greater than nine feet below the surface. In addition, given that Weehawken Cove was an historic cove and its relative proximity to the high ground at Stevens Point, a known prehistoric trading post, the portion of the Weehawken segment of Alternative 2 which is located to the immediate north of Weehawken Cove is considered sensitive for potential prehistoric deposits.

With respect to the historically submerged portions of the segment, Dewberry previously excavated a soil boring within the vicinity of the southern portion of the Weehawken segment, Boring B-11 (see Appendix D). Boring B-11 contained approximately 33 feet of overlying fill, consisting of layers of brown and black sand and brown gravel with sand. Beneath the fill deposits, the boring contained a gray clayey silt which extended from 33 to 53 feet below the surface. The grey silt overlain a layer of brown silt which, in turn, overlaid a deposit of brown sand with little silt and gravel. The sand matrix extended from 60 to 70.75 feet below the surface. Decomposing rock was encountered at 70.75 feet below the surface (the depth at which the boring excavation was halted). This profile evidenced an extensive and uniform clayey silt matrix beneath overlying fill deposits and a potential historic ground surface; there was no indication of an organic or peat layer within the profile. This uniform soil matrix suggests a lack of past

⁶⁴⁶ RGA 2004.

⁶⁴⁷ RGA 2002.

⁶⁴⁸ Raber 1986.

environmental diversification and, thus, unattractive environmental conditions during prehistoric times. Given the previously submerged location of Boring B-11 and the historic topographic location of the southern portion of the Weehawken segment, the profile within the boring is considered to be representative of the profile within these previously submerged locations. Therefore, the southern portion of the Weehawken segment is considered to possess little potential for a buried prehistoric surface and, thus, is considered to possess little potential for prehistoric deposits.

Although the Weehawken segment has witnessed mid to late-twentieth century development which has removed the surface indications of its historic occupation, previous archaeological investigations within the area and within other urban contexts has shown that archaeological deposits may remain extant despite modern development. The majority of the Weehawken segment witnessed extensive growth in the late-nineteenth and early-twentieth centuries in association with the Venango Oil Works and the Erie Railroad. The majority of the segment appears to have been filled in the late-nineteenth century in association with the waterfront development. As such, this area is considered sensitive for landfill deposits associated with the waterfront development dating from 1860 through 1910. In addition, the Weehawken segment which extends through the location of the former Venango Oil Works and the former Erie Freight Terminal is considered sensitive for deposits associated with the piers, wharves, railroad lines, features and structures associated with these developments. In addition, the segment is also considered sensitive for a late-nineteenth to early-twentieth century sewer line which extended from 19th Street to the northeast through the Weehawken Yard. This sewer line may be one of the two outlets for the early-twentieth century combined Union, Weehawken, and West Hoboken sewer system. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. Sewer deposits within Hoboken have previously been exposed at depths ranging from four to eight feet below the surface. Therefore, sewer deposits within the Weehawken segment of Alternative 2 are anticipated at depths greater than four feet below the surface.

As previously discussed with respect to the Northern segment, there is the potential for seventeenth through early-twentieth century historic shipwreck deposits within Weehawken Cove. As such, the far southern extent of the Weehawken segment, around Weehawken Cove, is considered sensitive for historic deposits associated with past shipwrecks. Such deposits could be potentially significant as they might reflect previously undocumented historic usage of Weehawken Cove. In light of the soil borings conducted within the area, these deposits would be anticipated at depths greater than 15 feet below the surface.

9.1.3 Resist Structure—Alternative 3

For the purposes of the archaeological assessment, Alternative 3 was divided into four segments—the Weehawken segment which extends from the intersection of Kennedy Boulevard and Harbor Boulevard in Weehawken to the north along the eastern frontage of the HBLR tracks to a point due north of 19th Street and includes a small alignment on Lincoln Harbor Road, this segment includes an approximate 270-foot alignment to the immediate west of Lincoln Harbor Road; the Northern segment which extends from the west side of Weehawken Cove traveling south opening into a rectangular polygon to the west of Weehawken Cove and east of Park Avenue and 16th Street and then turning

to the southeast to a point on Washington Street between 13th and 14th streets; the Southern segment which extends from Hudson Street and Observer Highway to the west and encompasses both Option 1 and Option 2 and includes a small segment along Grove Street just north of the former DLWRR rail line; and the Southwestern segment which extends from Newark Street and Jersey Avenue to the west terminating to the immediate west of the HBLR rail tracks. Alternative 3 also includes sections along Henderson Street and 18th Street as described in Alternative 1. The following discussion will present the documentary review and archaeological assessment of each of the four segments starting from north to south within the Study Area. Portions of Alternative 3 overlap with portions of Alternatives 1 and 2. Such areas of overlap will be noted in the following discussion. As previously noted, Alternative 3 also includes the HLSS. As the HLSS is a component of Alternative 2 and Alternative 3, it will be discussed in Section 9.1.4. The installation of sheeting in the southern portion of the Study Area is also a component of Alternative 3. The sheeting component will be discussed in Section 9.1.5,

Alternative 3—Southwestern Segment

The Southwestern segment of Alternative 3 is situated in the northeastern portion of Jersey City. This portion of Alternative 3 is nearly identical with the Southwestern segment of Alternative 1, sitting only slightly to the south of Alternative 1. Given this immediate proximity, the historical and sensitivity discussion for the Southwestern segment of Alternative 3 is identical to the discussion of the Southwestern segment of Alternative 1. Therefore, for an assessment of the Southwestern section of Alternative 3 see the earlier discussion of the Southwestern segment of Alternative 1.

Alternative 3—Southern Segment

The Southern segment of Alternative 3 is situated in the southern extent of Hoboken and the northeastern extent of Jersey City. This segment encompasses both Option 1 and Option 2 and is identical to the Southern segment of Alternative 2 and to a portion of the Southern segment of Alternative 1. Therefore, for a discussion of the Southern segment of Alternative 3 the reader is directed to the discussion of the Southern segment of Alternative 2 and the Southern segment of Alternative 1.

Alternative 3—Northern Segment

The entire Northern segment of Alternative 3 is located in Hoboken. The segment extends along the western frontage of Washington Street starting from a point between 13th and 14th streets to the north to a point between 14th and 15th streets. At this point, the segment turns to the west and extends along an alleyway to its intersection with Garden Street. The eastern portion of the alleyway consists of a red brick pathway with ornamental tree plantings; the western portion of the alleyway consists of a cobblestone pedestrian path. The cobblestone pedestrian walk continues along Garden Street from 14th Street to the north (Plate 24). This portion of Garden Street is known as the Garden Street Mews and was opened in 2011 as the first pedestrian street in Hoboken.⁶⁴⁹ At Garden Street, the segment turns to the north and extends along the eastern frontage of Garden Street to a cement sidewalk north of 15th Street. The segment then expands into a larger basin to the west of Weehawken Cove and then narrows into a

⁶⁴⁹ Hoboken, NJ, "Pedestrian Mall, Second in New Jersey," accessed April 13, 2016 at <http://www.hobokennj.org/2011/11/garden-street-mews-opens-public/>.

thinner alignment along the western edge of Weehawken Cove. The southern and northern portions of this segment are identical to portions of the Northern segment of Alternative 2.

Given that the northern portion of the Northern segment, to the west of Weehawken Cove, is identical to a portion of Alternative 2, the following discussion will focus upon those portions of the Northern segment located to the south of 15th Street. For a discussion of the remaining portions of the Northern segment of Alternative 3, the reader is directed to the discussion of the Northern segment of Alternative 2.

Historical Development

The earliest development within the Northern segment of Alternative 3 appears to have been the early-nineteenth century seawall constructed by Samuel Swartout. The 1844 U.S. Coastal Survey map indicates that the majority of the southern portion of the segment was located within or in the immediate vicinity of the seawall (see Figure 30). As previously noted, such seawalls were historically used to drain meadowlands through a combination of trenching and the construction of an earthen wall. Historical accounts indicate that Samuel and Robert Swartout constructed such walls within the meadows of Hoboken ca. 1814 to 1819.⁶⁵⁰ The far southern terminus of the Northern segment was also located to the immediate west of an unidentified structure on the 1844 map. The remaining portions of the segment were located in undeveloped meadowlands to the immediate west of Weehawken Cove.⁶⁵¹

G.M. Hopkins & Co.'s 1873 map indicates that the southern portion of the Northern segment was located within the Elysian Fields (see Figure 53). None of the present-day streets within the segment were laid out by this time. Two unidentified historic structures were located within the segment along present-day Garden Street and the alleyway between present-day Garden and Washington streets. The remaining portions of the segment appear to have been undeveloped or underwater. The seawall is no longer depicted suggesting that it may have been removed or filled.⁶⁵² Speilmann and Brush's 1880 map indicates that streets had yet to be laid out within the southern portion of the Northern segment.⁶⁵³

Hughes and Bailey's 1904 Birdseye view of the city indicates that the Northern segment had been laid out (see Figure 42). While 15th Street had not been laid out to the east of Park Avenue, waterfront development and infilling had occurred to the south of Weehawken Cove. In addition, 14th Street, Washington Street, and Garden Street had all been extended. Widespread development had occurred in the vicinity of the Northern segment. G.M. Hopkins and Co.'s 1909 map indicates that much of the development north of 14th Street was in part associated with the Hoboken Shore Railroad lines which extended through present-day 15th Street and the Northern segment (see Figure 43). A spur line of the railroad was also located within the present-day alleyway between Washington and Garden streets. The alleyway portion of the segment was located to the immediate north of several industrial buildings. These structures, from east to west, consisted of: the Vanderbilt & Schill Lumber Yard, the Hoboken Shore Railroad Motor House, a Button works, and the United Electric Company Plant of the Public Service

⁶⁵⁰ THE Partnership 2009, 2-2.

⁶⁵¹ U.S. Coastal Survey 1844.

⁶⁵² G.M. Hopkins & Co. 1873.

⁶⁵³ Speilmann and Brush 1880.

Corporation. The segment turned to the north and extended through undeveloped space to the immediate west of the Public Service building before extending into a driveway to the north and meeting up with the Northern segment of Alternative 2. The segment crossed a 12-inch pipeline and a sewer line beneath Washington Street; it also crossed a six-inch pipeline and sewer line along 14th Street; and the segment also intersected with a 16-inch pipeline under the rail tracks to the south of the lumber yard. A portion of the segment also ran along the trolley tracks on Washington Street.⁶⁵⁴

G.M. Hopkins & Co.'s 1923 map illustrates similar development within the segment as seen in 1909 (see Figure 44). Fifteenth Street (15th) had not been extended to the east. The lumber yard is no longer extant. The alleyway portion of the segment continued to extend over spur lines of the Hoboken Shore Railroad to the south of buildings associated with Hoboken Shore Railroad, a motor house and terminal stores, and a building associated with Public Service. The segment continued to the north within undeveloped space to the west of the Public Service building. The segment appears to have crossed the western portion of the brick Public Service building. The segment crossed the electrified lines of the Hoboken Manufacturers Railroad within the present day intersection of Garden and 15th streets. A driveway bordered by several small iron clad buildings was located in the northern extent of the segment. The segment also extended over the rail lines of the Hoboken Manufacturers Railroad within present-day 15th Street.⁶⁵⁵

A review of the historic Sanborn Insurance maps and aerial photography shows that the area remained relatively unchanged into the late-twentieth century. The trolley line along Washington Street had been removed by 1937. By 1987, all the railroad tracks were removed and replaced by paved parking surfaces. By 2002, the Public Service building had been removed and 15th Street had been extended to its present-day alignment. The 2006 Sanborn Insurance maps indicate that the alleyway portion of the segment was occupied by designated parking areas.⁶⁵⁶ In 2011, the Garden Street Mews, a cobblestone pedestrian path, was opened along Garden Street between 14th and 15th streets.

As previously noted, the 1940 As-Built plans indicate that a vitrified clay pipe was located within Washington Street from 11th to 14th streets. The Northern segment of Alternative 3 would intersect and cross a brick sewer line and cast-iron drainage pipe located along 14th Street. A concrete sewer pipe was located along 15th Street from the bulkhead to Park Avenue.⁶⁵⁷

Summary and Conclusions

The earliest European development within the vicinity of the Northern segment of Alternative 3 appears to have been the creation of a seawall within the meadowlands ca. 1814 to 1819. The seawall was designed to help drain and reclaim the meadows for agricultural purposes. Much of the southern portion of the segment appears to overlap or be in the immediate vicinity of the seawall. In addition, a mid-nineteenth century structure was also located within

⁶⁵⁴ Hughes and Bailey 1904; G.M. Hopkins 1909.

⁶⁵⁵ G.M. Hopkins & Co. 1923.

⁶⁵⁶ Sanborn Library, LLC 1939-2006; NETR 1931-2006.

⁶⁵⁷ Whittemore 1940.

the meadowlands to the immediate southwest of the seawall and in the vicinity of the southern terminus of the Northern segment. By 1873, the southern portion of the segment was located within the Elysian Fields; two unidentified historic structures were located within the vicinity of present day Garden Street and the alleyway north of 14th Street. The seawall appears to have been removed or filled in by this time. By the early-twentieth century, there was extensive development in and around the segment. The majority of this development appears to be directly related to the extension of the Hoboken Shore Railroad/Hoboken Manufacturers Railroad. Sewer lines had been extended through Washington Street, 14th Street, and a portion of the alleyway, beneath railroad spur lines. Industrial development was located to the north of the segment around Weehawken Cove including a lumber yard, buildings associated with the railroad, and a Public Service building. By the late-twentieth century, the rail lines had been removed; by 2002, the present streets had been extended through the area.

As previously discussed, several cultural resource studies have been conducted in the vicinity of the Northern segment. These studies found intact rail line deposits and documented a Type 2A pier, containing cinder fill on top of a platform set upon timber piles, and portions of the surviving bulkhead along the Hudson shore.⁶⁵⁸ An intact late-nineteenth to early-twentieth century brick sewer line was also found between 14th and 15th streets on Shipyard Lane. The As-Built plans indicate that a brick sewer line and cast-iron pipe were located within 14th Street. A vitrified clay pipe was located within Washington Street; a concrete sewer pipe was located within 15th Street.⁶⁵⁹

With respect to prehistoric archaeological sensitivity, the majority of the Northern segment consisted of meadowlands to the west and south of Weehawken Cove. Previous archaeological assessments have indicated that the uplands to the northwest of these meadows were sensitive for prehistoric deposits. Dewberry has conducted a soil boring within the southeast corner of the polygon in the Northern segment, Boring B-10 (see Appendix D). An examination of the historic topographic location of Boring B-10 suggests that this boring was located in undeveloped meadowlands to the east of the seawall along the eastern shoreline of Hoboken. Boring B-10 contained an overlying deposit of sequential brown and tan sand layers which extended to a depth of 12 feet below the surface. At a depth of 15 feet below the surface a layer of black sand with a petroleum odor was encountered. The black sand terminated at a depth of 23 feet below the surface overlying a gray clay and silt. Brown sand with decomposing rock was encountered at a depth of approximately 28 feet below the surface. Boring B-10 was terminated within this matrix at a depth of 45 feet below the surface. There was no indication of an organic surface within the soil profile. It is unclear whether past subsurface disturbance may have removed any preexisting organic deposits within the area. Additionally, the presence of decomposing shale within the lower depths of the profile suggest that the boring may have terminated near glacial deposits.

Given the relative proximity of the boring to the alternative and the relative historic topographic setting of the areas, it is assumed that the Northern portion of Alternative 3 would have a similar soil profile lacking organic deposits. The lack of distinguishable organic deposits suggests that there is little likelihood for an intact prehistoric occupation surface within the area. As such, this area is considered to possess little to no prehistoric archaeological sensitivity.

⁶⁵⁸ RGA 2006b.

⁶⁵⁹ RGA 2002; RGA 2006a; Whittemore 1940.

With respect to historic archaeological sensitivity, the earliest development within the Northern segment consists of a seawall constructed in the 1810s. Much of the Northern segment appears to have crossed or been in the immediate vicinity of the seawall including the portions along Washington Street, the alleyway between Washington Street and Garden Street, and between Garden Street and Park Avenue from 15th to 16th streets. These portions of the Northern segment are considered sensitive for the historic seawall. In addition, an unidentified mid-nineteenth century structure was located in the immediate vicinity of the southern extent of the segment; two mid to late-nineteenth century structures were also located in the vicinity of the alleyway and Garden Street. Therefore, these portions of the Northern segment are also considered sensitive for mid to late-nineteenth century historic deposits. Soil borings conducted to the northwest of the Northern segment indicated that fill deposits extended to a depth of 15 to 17 feet below the surface.⁶⁶⁰ This suggests that any potential historic seawall or mid-nineteenth century deposits within the segment would most likely be encountered approximately 15 feet below the surface; though the depth and extent of landfill may also vary across the area.

The Northern segment to the south of Weehawken Cove was developed and filled during the late-nineteenth and early-twentieth century in association with Hoboken Shore Railroad/Hoboken Manufacturers Railroad and associated industrial development. This portion of the segment is, therefore, considered sensitive for historic deposits associated with the late-nineteenth and early-twentieth century landfilling and waterfront development, including piers, wharves, and bulkheads. The majority of the Northern segment is also considered sensitive for railroad deposits associated with the Hoboken Manufacturers/Hoboken Shore Railroad. Deposits associated with the twentieth century buildings and rail lines would be anticipated at relatively shallow depths. The historic landfill deposits would be anticipated below the historic occupation most likely at depths greater than 15 feet below the surface.

With respect to sewer lines, the cartographic research suggests that a sewer line was extant within 14th Street in the vicinity of Alternative 3 by 1909. The As-Built plans indicate that a brick sewer line and cast-iron pipe were installed within 14th Street. The plans also indicate that a vitrified clay pipe was installed within Washington Street between 13th and 14th streets. Additional data provided by the NHSA indicates that a brick sewer was installed within 14th Street between Garden and Hudson streets before 1916. Given the cartographic data and the data provided by NHSA, the portion of the segment which intersects 14th Street is considered sensitive for late-nineteenth to early-twentieth century brick sewer line deposits. The Washington Street portion of the segment is not considered sensitive for potentially significant sewer deposits in light of the type of pipe which was installed within this street bed and the likely 1920s or later installation. The 14th Street sewer is a potentially significant historic resource as it was associated with expansion of Hoboken's municipal system during its industrial growth in the late-nineteenth to early-twentieth century. Archaeological deposits associated with the sewers might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the 14th Street sewer line was located approximately 5 to 8.5 feet below the surface. Therefore, sewer deposits within the area are anticipated at depths greater than five feet below the surface.

⁶⁶⁰ THE Partnership 2009.

An early-twentieth century trolley line also operated along Washington Street in the immediate vicinity of Alternative 3. By 1937, the trolley tracks were no longer extant. This trolley line was not an elevated track, therefore, archaeological deposits associated with the trolley line would most likely consist of the rail tracks. Such tracks would be anticipated near the surface. Given that the route of the early-twentieth century trolley lines are known through cartographic and documentary records, any track remnants would provide little additional information regarding the history or nature of this resource. As such any deposits associated with the trolley line would not constitute a significant resource eligible for listing in the National Register. Therefore, this portion of Alternative 3 is not considered sensitive for significant historic resources associated with the early-twentieth century Washington Street trolley line.

Alternative 3—Weehawken Segment

The far northern portion of Alternative 3 is located in Weehawken. The far northern extent of the Weehawken segment is identical to the northern extent of Alternative 2. To the southeast of this section, the Weehawken segment extends from the intersection of Harbor Boulevard and the HBLR tracks to the north along the eastern frontage of the HBLR line (Plate 25). To the east of the intersection of the HBLR line with 19th Street the segment turns to the north and crosses the rail line; Alternative 3 and Alternative 2 overlap in this area. There is a smaller northern alignment within the Weehawken segment located along Lincoln Harbor Road. This alignment is also located within the Weehawken segment of Alternative 2. Given that the northern portion of the Weehawken segment is identical to a portion of Alternative 2, the following discussion will focus upon the HBLR portion of the Weehawken segment. For a discussion of the remaining portions of the Weehawken segment of Alternative 3 the reader is directed to the discussion of the Weehawken segment of Alternative 2.

Historical Development

Historic maps indicate that the Weehawken segment was undeveloped through the mid-nineteenth century. The 1844 U.S. Coastal Survey indicates that the HBLR portion of the segment was located in undeveloped meadowlands to the northwest of Weehawken Cove (see Figure 30). The far northern edge of the HBLR portion was located to the immediate south of drier upland terrain.⁶⁶¹ G.M. Hopkins and Co.'s 1873 map indicates that the HBLR portion of the segment was located along the northwestern extent of tracks associated with the New York and Fort Lee Railroad (see Figure 53). The northern portion of the segment deviated from the tracks and extended through land associated with the Hoboken Land and Improvement Company; this portion of the segment was within the immediate vicinity of two structures at the southeastern corner of the Hoboken Land and Improvement Company's property. The Venango Oil Works was located to the immediate southeast of the HBLR portion of the segment.⁶⁶²

As previously noted, the Erie Railroad began erecting its Weehawken Freight Terminal to the north of the Venango Oil Works between 1881 and 1885. Between 1897 and 1903, the Erie Railroad greatly expanded its Weehawken Terminal. G.M. Hopkins & Co.'s 1909 map reflects the expansion of the railroad terminal. By this time, the Weehawken Yard had approximately ten piers of differing widths and lengths; several of these piers housed warehouse buildings (see Figure 54). Several buildings had also been constructed within the freight yard including

⁶⁶¹ U.S. Coast Survey 1844.

⁶⁶² G.M. Hopkins and Co. 1873.



Plate 25: HBLR Lines within Weehawken Segment of Alternative 3. View Northeast. (TF 4/11/2016).



Plate 26: Location of T6-NEW, Newark Avenue and Grove Street. View Northeast. (ZE 5/23/2016).

an oil storage building, a warehouse, and cattle pens. The Weehawken segment was located along the westernmost rail lines of the Erie Railroad and the Junction RR. The segment was situated to the immediate east of the 17th Street Viaduct. Portions of the segment appear to have crossed a sewer line which extended from Park Avenue and 19th Street to the northeast through the Weehawken Yard.⁶⁶³

As previously noted, the 19th Street sewer line may have been a component of the early-twentieth century shared combined sewer system of Union, Weehawken, and West Hoboken. This system discharged into the Hudson River at two outlets—one at the foot of 16th Street at the West Shore Freight Yards and one at 19th Street at the Erie Freight Yards.⁶⁶⁴ Between 1904 and 1910, the Pennsylvania Railroad constructed a system of trackage and tunnels to extend their rail lines into Manhattan. The Pennsylvania Railroad tunnel was extended under the northern portion of the Weehawken Terminal to the north of the Weehawken segment. The cast-iron and concrete tunnel is located approximately 50 to 85 feet beneath the surface of the Erie Terminal in 1903.⁶⁶⁵

A review of the Sanborn Insurance maps and historic aerial imagery indicates that development within the HBLR portion of the Weehawken segment has remained relatively unchanged. This area has been maintained as a railroad corridor from the late-nineteenth century through the present day. While the extensive train tracks within the Erie Weehawken Yard were removed between 1966 and 1979, tracks remained within the HBLR portion of the segment. By 1987, 19th Street had been extended to the east towards the Hudson River and Harbor Boulevard had also been established.⁶⁶⁶ The HBLR was opened in April 2000. The system uses former railroad ROWs at its northern and southern ends. Within Weehawken and Hoboken, the HBLR repurposes ROWs previously built by the Junction RR and by the New York Central Railroad. In 2004, a branch line was opened from Hoboken Terminal to Lincoln Harbor. In 2006, the Weehawken Tunnel was opened enabling two branch lines to operate through Hoboken—one to the Hoboken Terminal and one to West Side Avenue. The rail lines within the HBLR portion of the Weehawken segment were repurposed circa 2004.⁶⁶⁷

Summary and Conclusions

Historic records suggest that the earliest development within the Weehawken segment occurred in the mid-eighteenth century with the development of two structures within or to the immediate north of the segment. The northernmost portion of the segment, shared with Alternative 2, was located to the immediate south of uplands bordering the meadows. The HBLR portion of the Weehawken segment remained undeveloped meadowlands through the 1860s and 1870s, and appear to have been developed in association with the extension of the New York and Fort Lee Railroad. By the early-twentieth century, the HBLR portion was included within the extensive track network associated with the Erie Weehawken Freight Yard including the Junction RR. Since its initial

⁶⁶³ G.M. Hopkins and Co. 1909.

⁶⁶⁴ RGA, *Stage 1A Cultural Resources Survey North Hudson Sewerage Authority System-Wide Combined Sewer Overflow Improvements Program Cities of Hoboken and Union City and Township of Weehawken, Hudson County, New Jersey*. (On file, Trenton: NJHPO) 2004, 4-16; New Jersey Board of Health, *Thirty-seventh Annual Report of the Board of Health of the State of New Jersey* (Paterson: New Printing Company) 1914.

⁶⁶⁵ Raber 1986, 16.

⁶⁶⁶ Sanborn Library, LLC 1950-2006; NETR 1953-2013.

⁶⁶⁷ Jeremiah Cox, "New Jersey Transit's Hudson-Bergen Light Rail," accessed April 13, 2016 at <http://subwaynut.com/hblr/index.php>.

development, the HBLR portion of the segment has remained a railroad ROW. Currently, it is used by the HBLR system.

As previously noted, several previous cultural resource investigations have been conducted in the vicinity of the Weehawken segment. In 2004, RGA conducted a cultural resource assessment of several sewer overflow improvements in Weehawken, Hoboken, and Union City. One of these locations, the 18th Street Pumping Station, was located within Weehawken to the west of the Weehawken segment. RGA determined that the pumping station was sensitive for historic archaeological deposits associated with a 48-inch diameter brick sewer in Park Avenue. RGA recommended additional historical research to ascertain the date and potential significance of the sewer line and further suggested archaeological monitoring and documentation of the resource if it was found to be significant.⁶⁶⁸

RGA also conducted mechanical excavation of two backhoe trenches to the north of the Weehawken segment in 2001. These excavations revealed the presence of alluvial deposits within both trenches and a peat layer within one. The alluvium and peat deposits were found at a depth of approximately 13 feet below grade within one of the trenches. Both trenches contained extensive fill deposits. No prehistoric artifacts or potential features were identified within the alluvia, peat, or underlying marsh gley-like deposits.⁶⁶⁹ Raber also conducted a cultural resource assessment to the northeast of the Weehawken segment in 1986. Raber concluded that the greatest potential for prehistoric deposits within their project area consisted of uplands located to the north of the mid-nineteenth century marshlands.⁶⁷⁰

With respect to prehistoric archaeological sensitivity, RGA's excavations exposed deeply buried organic surfaces in the vicinity of the Weehawken segment. Unlike the Weehawken segment, however, RGA's excavations were conducted in an upland area to the west of Port Imperial Boulevard. Historically, the majority of the Weehawken segment was within undeveloped meadowlands; however, the far northern extent of the segment appears to have been within a historically dry location. The northern extent of the segment has witnessed extensive historic railroad-related development and road construction. The depth of this disturbance in addition to the potential history of filling within this area is uncertain. Therefore, the northern extent of the segment is considered sensitive for prehistoric archaeological deposits. Such deposits would be anticipated at depths greater than 12 feet below the surface.

With respect to the historic meadowland portions of the segment, there is no available data regarding the potential time depth of the meadows. In addition, RGA's excavations in the vicinity of the Weehawken segment suggest that there may be extensive fill deposits within this area extending to a depth of approximately 13 feet below the surface. Thus, an intact meadow soil profile may be extant beneath extensive fill deposits. Given the close proximity of the Hudson River and the potential for environmental differentiation within the soil profile of the historic marshland, the meadowland portion of the Weehawken segment is considered sensitive for prehistoric deposits. Such deposits would be anticipated at depths greater than 12 feet below the surface.

⁶⁶⁸ RGA 2004.

⁶⁶⁹ RGA 2002.

⁶⁷⁰ Raber 1986.

Although this area has witnessed railroad development and adjacent roadway development from the late-nineteenth to the late-twentieth century, previous archaeological investigations within the area and within other urban contexts has shown that archaeological deposits may remain extant despite modern development. The majority of the Weehawken segment witnessed extensive development in the late-nineteenth and early-twentieth centuries in association with the New York and Fort Lee Railroad followed by the Erie Railroad and its freight yard. The HBLR portion of the segment is considered sensitive for landfill deposits and railroad-related features associated with the late-nineteenth to early-twentieth century development of the area. A portion of the northern extent of the Weehawken segment is also considered sensitive for historic deposits associated with two mid to late-nineteenth century historic structures associated within the Hoboken Land and Improvement Company. Such deposits would be anticipated at depths greater than four feet below the ground surface.

In addition, the segment is also considered sensitive for a late-nineteenth to early-twentieth century sewer line which extended from 19th Street to the northeast through the Weehawken Yard. This sewer line may be one of the two outlets for the early-twentieth century combined Union, Weehawken, and West Hoboken sewer system. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. Sewer deposits within Hoboken have previously been exposed at depths ranging from four to eight feet below the surface. Therefore, sewer deposits within the Weehawken segment of Alternative 3 are anticipated at depths greater than four feet below the surface.

9.1.4 High Level Storm Sewer (HLSS) — Alternatives 2 & 3

As previously noted, the design of Alternative 2 and Alternative 3 might leave a portion of the city streets and existing sewer system unprotected in the event of a storm surge event. This vulnerability could result in excess water on the wet side of the Resist structure which would overwhelm the existing combined sewer system and result in flooding. The HLSS has been designed to prevent sewer backflow during such a storm surge event and, as such, would provide a distinct storm water collection system and reinforce the existing combined sewer collection system.

The HLSS will consist of a series of linear pipes and manholes. The system will be located within the streetbed and will consist of below ground features and surface manholes. The HLSS will be located in an area of mixed commercial and modern residential space and public areas along the southern and northern waterfront. The HLSS consists of two discontinuous components—a southern component near the Hoboken Terminal and a northern component west and south of Weehawken Cove (see Figures 11 & 14). Both components will be discussed below; a small portion of the southern component would be located in the same area as a portion of the Southeastern Segment of Alternative 1.

The southern portion of the HLSS would begin at the western extent of Options 1 and 2 around Observer Highway and extend to the north along the streetbed of Hudson Street from Observer Highway to Newark Street. At Newark Street, the system would turn to the east and extend along Newark Street to FSD. Piping would also extend along River Street from Hudson Place to Newark Street. At FSD, the system would turn to the north and extend along FSD to its intersection with 1st Street. The piping would then extend turn to the north and extend along 1st Street to

its intersection with River Street. At River Street, the HLSS would turn to the north and terminate at its intersection with 3rd Street. The southern portion of the HLSS would have two outfall pipes into the Hudson River—one at the terminal extent of Newark Street and one at the terminal extent of 4th Street.

The northern portion of the HLSS would extend along Hudson Street from 12th Street to 15th Street. Piping would extend from Hudson Street to the west along 13th and 14th streets to their respective intersections with Washington Street. At 15th Street, piping would extend to the west and terminate at the intersection of 15th and Garden streets. Additional piping would extend from 15th Street to the south and north on Bloomfield Street and to the south on Washington Street. The piping along 14th Street would also extend from Hudson Street to the east, terminating with an outfall pipe into the Hudson River at 14th Street.

Historical Development

Portions of the HLSS appear to have been developed as early as 1844. The 1844 U.S. Coastal Survey map indicates that the majority of the southern portion of the HLSS was located along the partially developed waterfront (see Figure 30). It appears that two parallel rows of possible wood posts or trees were located in this area. A structure was located to the immediate south of these features and was situated at or near the southern extent of the HLSS. The northern portion of the HLSS intersected with the early-nineteenth century seawall along Hudson Street, near the intersection of Hudson Street and 13th Street, and near the intersection of Washington Street and 14th Street. Along Hudson Street, the HLSS extended into the Elysian Fields, appearing to terminate before pathways within the park. The 13th Street portion of the HLSS was located in the vicinity of an unidentified structure within the Elysian Fields to the west of the seawall. Portions of the 14th Street segment within the HLSS were submerged at this time.⁶⁷¹

By 1855, there was additional development within the southern portion of the HLSS. Along River Street, the HLSS extended in the vicinity of several buildings associated with a slip or basin to the south of 2nd Street and then extended across the slip/basin (see Figure 10). Between 2nd and 3rd streets along River Street, the HLSS appeared to extend through the streetbed to the immediate west of two unidentified structures. The majority of the northern portion of the HLSS was located within the Elysian Fields. The Hudson Street portion of the HLSS appears to have crossed a pathway within the Elysian Fields. The far eastern extent of 14th Street was submerged.⁶⁷²

G.M. Hopkins & Co.'s 1873 map indicates that the southern portion of the HLSS was located within the vicinity of relatively dense development along the waterfront. The River Street portion of the HLSS extended through several buildings (see Figure 35). To the west of Newark Avenue, this portion of the HLSS intersected with multiple buildings associated with the Hoboken Land and Improvement Company and Others. To the north of 1st Street, the HLSS also intersected with a structure and shops associated with the Hoboken Land and Improvement Company and Others. To the north of 2nd Street, the HLSS intersected several buildings that aligned with the former orientation of River Street. The Hopkins map indicates that the majority of the northern portion of the HLSS was submerged (see Figure 53).⁶⁷³ Speilmann and Brush's 1880 map indicates that the southern portion of the HLSS was located in

⁶⁷¹ U.S. Coastal Survey 1844.

⁶⁷² Dripps 1855.

⁶⁷³ G.M. Hopkins & Co. 1873.

reclaimed land (see Figure 15). The northern portion of the HLSS was located in an undeveloped parcel to the south of Weehawken Cove; streets had yet to be laid out within this area. There is no indication of any sewer lines within the HLSS.⁶⁷⁴

G.M. Hopkins and Co.'s 1909 map indicates dense development to the east and west of the southern portion of the HLSS (see Figure 39). Commercial development was located to the west of the southern HLSS; waterfront development including a series of bulkheads associated with the Hamburg American Packet Company and the North German Lloyd Steamship Company were located to the east. The 1909 map indicates six-inch and 12-inch water lines within River Street and a six-inch water line within Hudson Street. Sewer lines were located along Newark Street and 3rd Street. By 1909, roads had been established within the northern portion of the HLSS (see Figure 43). The Hudson Street portion of the HLSS extended across rail-lines associated with the Hoboken Shore Railroad. To the north of 14th Street, the HLSS crossed several spur lines associated with the Hoboken Shore Railroad and extended to the immediate east of an unidentified frame building. The northern portion of the Washington Street segment also crossed spur rail-lines and intersected with buildings associated with the Vanderbilt & Schill Lumber Yard. The eastern portion of the 14th Street segment extended across the 14th Street pier and in the vicinity of the DLWRR's 14th Street Ferry House. Water lines were located within Hudson Street, 13th Street, 14th Street, Washington Street, and Bloomfield Street. A sewer line was located within 14th Street. Portions of the HLSS also intersected with the trolley lines on 14th Street and Washington Street.⁶⁷⁵

G.M. Hopkins & Co.'s 1923 map illustrates similar development within the HLSS as seen in 1909 (see Figures 44 and 61). Along Hudson Street, the northern portion of the HLSS appeared to cross an L-shaped frame structure to the north of 14th Street. The 15th Street portion of the HLSS extended through a driveway to the north of the Hoboken Shore Railroad and crossed an iron bridge in the vicinity of Bloomfield Street. This portion of the HLSS also crossed a frame platform associated with the Jagels & Bellis Coal Company to the north. Fifteenth Street (15th) had not been extended to the east. Along Washington Street, the HLSS crossed an iron-clad structure between rail-lines associated with the Hoboken Shore Railroad. Trolley lines were still located within the Washington Street and 14th Street portions of the HLSS. The HLSS also intersected with several spur lines associated with the Hoboken Shore Railroad.⁶⁷⁶

A review of the historic Sanborn Insurance maps and aerial photography shows that the southern portion of the HLSS remained relatively unchanged into the late-twentieth century. By this time, the area surrounding the HLSS witnessed changes in commercial and residential development along with changes along the waterfront. By 2004, two large residential buildings had developed to the east of River Street between 1st and 2nd streets.

The northern portion of the HLSS witnessed more changes during the twentieth century. By 1937, the trolley lines had been removed from Washington and 14th streets. Between 1937 and 1953, the 14th Street Ferry House appears to have been removed. The Ferry House and pier were replaced by several piers that may have been associated

⁶⁷⁴ Speilmann and Brush 1880.

⁶⁷⁵ Hughes and Bailey 1904; G.M. Hopkins 1909.

⁶⁷⁶ G.M. Hopkins & Co. 1923.

with Bethlehem Steel. Historic aerial imagery indicates that between 1954 and 1980 a small structure was located within the vicinity of the HLSS along Washington Street to the north of 14th Street. This structure does not appear on the 1951, 1979, or 1988 Sanborn maps suggesting that it may have been a temporary or impermanent feature. By 1987, the historic aerial imagery indicates that the Hoboken Shore Railroad tracks had been removed. Also by 1987, the multiple piers within the former 14th Street Ferry House location had been replaced by a single long narrow pier. Residential and commercial development increased in the vicinity of the northern portion of the HLSS throughout the late-twentieth century.⁶⁷⁷

A review of the 1940 As-Built plans indicate vitrified clay pipes were located within the Hudson Street, River Street, Washington Street, and Bloomfield Street portions of the HLSS. The As-Built also indicate that an egg-shaped brick sewer was located within Newark Street; that a six-inch circular brick sewer was located within 3rd Street; and that, a brick sewer and a cast-iron storm sewer were located within 14th Street. The plans also indicate that a concrete box sewer was located within 15th Street from the bulkhead to Park Avenue.⁶⁷⁸

Summary and Conclusions

The earliest European development within the vicinity of the HLSS appears to have been the creation of a seawall in the northeastern portion of Hoboken circa 1814 to 1819. The seawall was designed to help drain and reclaim the meadows for agricultural purposes. The northern portion of the HLSS appears to have crossed the seawall in several locations—around Hudson Street, at the intersection of Hudson and 13th streets, and near Washington and 14th streets. In addition, a mid-nineteenth century structure was also located to the west of the seawall in the vicinity of 13th and Washington streets. Also, in the mid-nineteenth century, there appeared to be a structure within or to the immediate south of the southern portion of the HLSS. Dripps' 1855 map indicates several structures and a slip within the River Street portion of the HLSS. By 1873, several buildings were also located within or in the immediate vicinity of the southern portion of the HLSS along River Street. The seawall appears to have been removed or filled in by this time. The northern portion of the HLSS was either submerged or within primarily undeveloped land through the majority of the nineteenth century.

By the early-twentieth century, there was extensive development to the east and west of the southern portion of the HLSS. Sewer lines were located along Newark and 3rd streets. Along the northern portion of the HLSS, the Hoboken Shore Railroad had developed. Rail lines were located along Hudson Street and to the north of 14th Street. To the east of 14th Street, the HLSS was located in the vicinity of and crossed buildings associated with the Vanderbilt & Schill Lumber Yard. Trolley lines operated on Washington and 14th streets. A sewer line was located along 14th Street. The eastern portion of the HLSS extended across the 14th Street pier and in the vicinity of the DLWRR 14th Street Ferry House. By 1923, sections of the northern portion of the HLSS crossed an L-shaped frame structure, an iron bridge, and a frame platform associated with the Jagels & Bellis Coal Company, all to the north of 14th Street. Along Washington Street, the HLSS also crossed an iron-clad structure. Spur lines and the main line of the Hoboken Shore Railroad were located within and in the immediate vicinity of the northern portion of the HLSS. In the mid-twentieth century, the 14th Street Ferry House was removed and replaced with other piers; the trolley lines were also

⁶⁷⁷ Sanborn Library, LLC 1939-2006; NETR 1931-2006.

⁶⁷⁸ Whittemore 1940.

removed. By the late-twentieth century, the Hoboken Shore Railroad lines had been removed. Residential, commercial, and public space has developed in the vicinity of the HLSS through the late-twentieth century into the present day.

As previously discussed, several cultural resource studies have been conducted in the vicinity of the northern portion of the HLSS. In one such study, RGA identified an intact late-nineteenth to early-twentieth century brick sewer line between 14th and 15th streets on Shipyard Lane.⁶⁷⁹ The As-Built plans indicate that a brick sewer line and cast-iron pipe were located within 14th Street. The As-Built plans also indicate that an egg-shaped brick sewer line was located within Newark Street and a six-inch circular brick sewer was located within 3rd Street. The historic maps suggest that these sewer lines were installed prior to 1909, within the late-nineteenth or early-twentieth centuries. Vitrified clay pipes were located within Hudson, River, Washington, and Bloomfield streets; a concrete sewer pipe was located within 15th Street.⁶⁸⁰

With respect to prehistoric archaeological sensitivity, segments of the southern portion of the HLSS were historically submerged. Dewberry previously conducted a soil boring, Boring B-1, at the eastern terminal extent of Newark Street near the southeastern extent of the HLSS (see Appendix D). As previously discussed, Boring B-1 contained fill deposits consisting of dark brown and gray sand with wood and brick fragments to a depth of approximately 18 feet below the surface. The fill deposits were underlain by a black clayey silt and a black clay to a depth of approximately 40 feet below the surface. Dark gray clay deposits were found underneath the black clay to a depth of 68 feet below the surface beneath which light brown sand was encountered. At a depth of approximately 80 feet below the surface, gray and green gravel and serpentine chips were encountered. The boring was terminated in this deposit at a depth of 84 feet below the surface. The profile exposed within the soil boring lacked a distinctly defined organic layer or peat deposit. Rather, deep and consistent clay deposits were found underlying the fill. Sand and/or rock deposits were found underlying the clay suggesting that glacial till may have been reached. Given the lack of an organic deposit within the soil boring profile and the fact that the boring appeared to reach glacially deposited materials, there does not appear to be an intact potential prehistoric occupation surface within this area. Given the profile exposed within Boring B-1 and its proximity to the southern portion of the HLSS, the southern potential of the HLSS is considered to possess little to no potential for prehistoric deposits.

With respect to prehistoric archaeological sensitivity, the majority of the northern portion of the HLSS was submerged or in undeveloped meadowlands within the Elysian Fields for much of the nineteenth century. Previous archaeological assessments have indicated that the uplands to the northwest of these meadows were sensitive for prehistoric deposits. Dewberry has conducted soil borings to the north, Boring B-10, and to the southeast, Boring B-6, of the northern portion of the HLSS. An examination of the historic topographic location of Boring B-10 suggests that this boring was located in undeveloped meadowlands to the east of the seawall along the eastern shoreline of Hoboken. Boring B-10 contained an overlying deposit of sequential brown and tan sand layers which extended to a depth of 12 feet below the surface. At a depth of 15 feet below the surface a layer of black sand with a petroleum odor was encountered. The black sand terminated at a depth of 23 feet below the surface overlying a gray clay and

⁶⁷⁹ RGA 2002; RGA 2006a.

⁶⁸⁰ Whittemore 1940.

silt. Brown sand with decomposing rock was encountered at a depth of approximately 28 feet below the surface. Boring B-10 was terminated within this matrix at a depth of 45 feet below the surface. Similarly, Boring B-6 contained overlying layers of dark brown and gray sand to a depth of 15 feet below the surface. Wood was encountered within the boring from 15 to 20 feet below the surface. The wood was underlain by gray sand and then gray clayey silt to a depth of 30 feet below the surface. The gray silt was underlain by brown sand; the boring was terminated with the sand matrix at a depth of 33.5 feet below the surface. There was no indication of an organic surface within either of the two soil profiles. It is unclear whether past subsurface disturbance may have removed any preexisting organic deposits within these area. Additionally, the presence of brown sand and brown sand with decomposing shale within the lower depths of the profiles suggests that these borings were terminated near glacial deposits.

Given the relative proximity of the two borings to the northern portion of the HLSS and the similarity of profiles within the two borings, it is assumed that the HLSS would also have a similar soil profile lacking organic deposits. The lack of distinguishable organic deposits suggests that there is little likelihood for an intact prehistoric occupation surface within the area. As such, this area is considered to possess little to no prehistoric archaeological sensitivity.

With respect to historic archaeological sensitivity, the earliest development within the HLSS consisted of a seawall constructed in the 1810s. Several segments of the HLSS appear to have crossed or been in the immediate vicinity of the seawall. These areas consist of the segment of Hudson Street around 13th Street and the intersection of Washington and 14th streets. These portions of the HLSS are considered sensitive for the historic seawall. In addition, an unidentified mid-nineteenth century structure was located in the immediate vicinity of the southern extent of the HLSS on Hudson Street; an unidentified mid-nineteenth century structure was also located in the vicinity of Washington and 13th streets. Furthermore, the River Street portion of the HLSS was located in the vicinity of several mid to late-nineteenth century buildings and a slip or basin between 1st and 3rd streets. Therefore, these portions of the HLSS are also considered sensitive for mid to late-nineteenth century historic deposits. With respect to the southern portion of the HLSS it appears that the current River Street surface was overlaid on top of many of the mid to late-nineteenth century structures. It is unclear to what extent this area has been raised and filled in association with the road. Sewer lines have been previously identified at depths ranging from four to eight feet below the surface. Assuming that the vitrified clay pipe within River Street is located around a similar depth and therefore resulted in subsurface disturbance up to at least eight feet below the surface, historic deposits associated with the mid to late-nineteenth structures along River Street would be anticipated at depths ranging from 8 to 18 feet below the surface.

With respect to the historic seawall and structure near the northern portion of the HLSS, soil borings excavated in the vicinity have suggested that fill deposits extended to a depth of 15 to 17 feet below the surface. This fill was most likely deposited in association with the late-nineteenth century development of the northeastern portion of Hoboken. This suggests that any potential historic seawall or mid-nineteenth century deposits within the segment would most likely be encountered beneath the fill deposit, approximately 15 feet below the surface; though the depth and extent of landfill may also vary across the area.

Segments of the northern portion of the HLSS were located in the vicinity of early to mid-twentieth century development to the south of Weehawken Cove. The HLSS intersected with rail-lines of the Hoboken Shore Railroad along Hudson Street and the northern extent of Washington and Bloomfield streets. The HLSS also crossed in the vicinity of early-twentieth century industrial development, including the Vanderbilt & Schill Lumber Yard and the Jagels & Bellis Coal Company, along the northern portion of Washington and Bloomfield streets, north of 14th Street. Furthermore, the eastern extent of the 14th Street portion of the HLSS was located within the pier and ferry house of the DLWRR. These portions of the HLSS are therefore considered sensitive for early to mid-twentieth century deposits associated with the Hoboken Shore Railroad, the industrial development to the south of Weehawken Cove, and the 14th Street DLWRR Ferry House. The eastern portion of the 14th Street segment of the HLSS is also sensitive for historic deposits associated with the twentieth century Bethlehem Steel occupation. Such deposits, if present, could potentially offer insights into the daily operations and activities which took place within the Bethlehem Steel Hoboken Yard. Deposits associated with the twentieth century buildings and rail lines would be anticipated at relatively shallow depths. It should be noted that the history of pier building and demolition, including the Bethlehem Steel occupation, in the vicinity of the 14th Street DLWRR Ferry House may have compromised or removed any deposits associated with the early-nineteenth century ferry operation.

With respect to sewer lines, the cartographic research suggests that sewer lines were installed within Newark Street, within 3rd Street, and within 14th Street by 1909. The As-Built plans indicate that a brick sewer line and cast-iron pipe were installed within 14th Street. The plans also indicate that an egg-shaped brick sewer line and a six-inch circular brick sewer were installed within Newark Street and 3rd Street, respectively. Additional data provided by the NHTSA indicates that each of these brick sewers were installed before 1916. Given the cartographic data and the data provided by NHTSA, the HLSS along Newark Street, in the vicinity of 3rd Street and River Street, and along 14th Street is considered sensitive for late-nineteenth to early-twentieth century brick sewer line deposits. Given that vitrified clay pipes and concrete sewers were installed within the remaining portions of the HLSS, these areas are not considered sensitive for potentially significant sewer deposits in light of the types of pipes which were installed and the post-1920 installation date. The Newark Street, the 3rd Street, and the 14th Street sewers, as they were associated with the expansion of Hoboken's municipal system during its industrial growth in the late-nineteenth to early-twentieth century, are potentially significant historic resources. Archaeological deposits associated with the sewers might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the 14th Street sewer line was located approximately 5 to 8.5 feet below the surface. The 3rd Street sewer appears to have been located approximately 5 to 5.5 feet below the surface; the depth of the Newark Street sewer cannot be determined from the available As-Built plans. Therefore, sewer deposits within these portions of the HLSS are anticipated at depths greater than five feet below the surface.

An early-twentieth century trolley line also operated along Washington and 14th streets. By 1937, the trolley tracks were no longer extant. These trolley lines were not elevated lines, therefore, archaeological deposits associated with them would most likely consist of the rail tracks. Such tracks would be anticipated near the surface. Given that the route of the early-twentieth century trolley lines are known through cartographic and documentary records, any track remnants would provide little additional information regarding the history or nature of these resources. As

such, any deposits associated with these trolley lines would not constitute a significant resource eligible for listing in the National Register. Therefore, these portions of the HLSS are not considered sensitive for significant historic resources associated with the early-twentieth century Washington Street and 14th Street trolley lines.

9.1.5 Sheeting

A component of the Resist elements associated with each alternative will be the installation of sheeting within the southern portion of the Study Area. Sheeting will be installed in the vicinity of the Southwestern and Southern segments of each alternative. The sheeting component is consistent between the three alternatives.

Current design plans propose the installation of sheeting to the immediate east of the eastern extent of the Southwestern Segment of Alternative 1 (see Figures 3-5). The sheeting will extend approximately 365.6 feet to the east southeast of the Southwestern Segment, to the immediate south and parallel to the HBLR. The sheeting will terminate to the north of the eastern extent of the Southwestern Segment of Alternative 2.

A second alignment of sheeting will be installed approximately 190 feet to the north of the western sheeting. The sheeting will be located to the immediate north and parallel to the historic DLWRR rail lines and to the west of the terminal extent of Jackson Street. The sheeting will then curve to the north and roughly parallel to the DLWRR tracks for a distance of approximately 900 feet. The sheeting will terminate at the western extent of the Southern Segment of Option 2 in Alternatives 2 and 3.

Historical Development

The proposed sheeting was located in undeveloped meadowlands through most of the mid-nineteenth century. The 1844 U.S. Coast Guard map indicates that the sheeting was primarily in undeveloped meadowlands to the south of the Newark Turnpike and west of the Ahasimus Creek (see Figure 30). A portion of the sheeting crossed the Ahasimus Creek and extended into the meadowlands to its east. A portion of the sheeting also crossed the creek and then extended into additional meadowlands to the north and south.⁶⁸¹

The 1873 Hopkins map indicates that the eastern alignment of sheeting was located to the south of development along the southern frontage of Newark Street (see Figure 34). This development included structures associated with the Hoboken Land and Improvement Company and multiple private owners. The majority of these structures were located in the front portion of their lots; however, a few buildings associated with Henry Lohman, William Florhr, Felix Ardle, and Douglass were located in the rear of their respective lots. According to the Hopkins map, the sheeting was located within property associated with the M&E to the south of the structures on Newark Street.⁶⁸²

G.M. Hopkins & Co.'s 1909 map indicates that the area within which the sheeting will be located had been filled and developed in association with the DLWRR (see Figures 31 & 32). The western portion of the sheeting extended in the immediate vicinity of structures associated with Grain and Straw buildings to the south of the DLWRR and east

⁶⁸¹ U.S. Coast Guard 1844.

⁶⁸² G.M. Hopkins & Co. 1873.

of Jersey Avenue. The sheeting then extended across several rail spurs to the immediate east of a frame platform. The western sheeting was located to the immediate south of development along Hoboken Avenue and to the north of the DLWRR. The sheeting may have intersected with a frame coal trestle and rail spur lines and extended to the immediate north of a railroad bridge and signal tower near Grove Street; the sheeting crossed the Grove Street trolley line. To the west of Henderson Street, the sheeting may have also crossed iron-clad buildings located to the north of the signal tower and frame structures associated with the Payne Beef Company.⁶⁸³

G.M. Hopkins & Co.'s 1928 map reflects similar development in the vicinity of the proposed sheeting (see Figure 33). Several small frame buildings and rail spur lines were located within the western sheeting alignment. The Grain and Straw buildings appear to have been removed. The eastern sheeting alignment crossed a rail spur line associated with a coal trestle that was associated with the Horre Coal Company. The sheeting extended to the immediate north of the DLWRR railroad bridge on Grove Street. To the west of Grove Street, the sheeting appears to have intersected several large frame buildings and associated rail spurs. It is unclear whether these frame structures were associated with the Nagle Packing Company which had a brick building complex to the north of the DLWRR and north of the proposed sheeting.⁶⁸⁴

The 1937 Sanborn Insurance maps indicate that the western portion of the sheeting extended to the immediate north of an ice platform and ice house located in a triangular parcel in-between the tracks of the DLWRR (see Figures 58 & 61). The eastern portion of the sheeting extended across the western extent of a coal trestle associated with the Horre Coal Company and in the immediate vicinity of a signal tower and Transformer House. To the west of Grove Street, the sheeting was also located near the southern extent of a cattle shed. To the east of Grove Street, the sheeting was located to the north of the DLWRR Grove Street Bridge and extended in the vicinity of a Cattle Platform and Cattle Pen associated with the Cudahy Packing Company. The sheeting also extended over rail spur lines adjacent to the Cattle Platform.⁶⁸⁵

The Transformer House located in the immediate vicinity of the sheeting has been identified as the Grove Street Tie Station. The Grove Street Tie Station was one of six tie stations constructed between 1930 and 1931 by the DLWRR as a component within their Northern New Jersey Electrification Project. Tie stations were also constructed in Harrison, Montclair, South Orange, and Dover. The tie stations

were built of concrete block with brick veneer on concrete foundations, the average size measured 27'-0" long by 18'-0" wide and 15'-2" high (the Grove Street Tie Station is 52'-0" long)...

Tie stations, or "Circuit Breaker Houses," housed extra circuit breakers to protect electrical catenary circuits, provided more catenary sectionalization and helped "tie" together power distributed by the substations.⁶⁸⁶

⁶⁸³ G.M. Hopkins & Co. 1909.

⁶⁸⁴ G.M. Hopkins & Co. 1928.

⁶⁸⁵ Sanborn Library, LLC 1937.

⁶⁸⁶ Drobbin & Associates 1998a, 28.

The Grove Street Tie Station is an extant structure; in 1997, it was one of four remaining tie stations. In 1998, Lynn Drobbin & Associates recommended the Grove Street Tie Station as potentially eligible for listing in the National Register as a contributing resource to the DLWRR Historic District.⁶⁸⁷

The Cudahy Packing Company originally organized in 1887 as The Armour-Cudahy Packing Company. The company was started by the Cudahy brothers who operated a series of small packing plants in Chicago prior to their partnership with Philip Armour. In 1887, they opened the Armour-Cudahy packing plant in Omaha, Nebraska. In 1890, the Cudahy Packing Company was created when Michael Cudahy purchased Armour's interests. Over the next 30 years the company, grew adding branches throughout the United States. By the 1910s, the company was one of the largest packing house concerns in the country and "operated plants in South Omaha, Kansas City, Sioux City, Wichita, Memphis, East Chicago, Salt Lake City, and Los Angeles, and distributing branch houses in 97 of the principal cities in the United States."⁶⁸⁸ By the mid-1920s, the Cudahy Packing Company was one of the leading food companies within the nation, with over 200 million dollars in annual sales and 13,000 employees around the country.⁶⁸⁹

An examination of the historic city directories for Hoboken and Jersey City indicated that the Cudahy Packing Company was located at 396 Henderson Street from at least 1915 through 1925. The company was not listed in the city directory in 1910; city directories post-1925 were not reviewed.⁶⁹⁰ The 1937 Sanborn Insurance Map indicates that additional structures associated with the Cudahy Packing Company, to the north of the sheeting, included a large L-shaped building with cold storage rooms, cattle runs, an offal room, and a killing room on the fourth floor (see Figure 61).

The 1950 Sanborn Insurance map indicates relatively little change within the areas of the proposed sheeting. Additional ice related features were installed within the vicinity of the western sheeting. The former Cudahy Packing Company property was now associated with the American Packing Corporation. The buildings appear to have been unchanged. It is unclear if there was any relationship between the Cudahy Packing Company and the American Packing Corporation. The Cudahy Packing Company suffered serious losses during the Depression suggesting that the American Packing Corporation may have been a distinct business unrelated to the earlier occupation. Historic aerial imagery indicates that between 1966 and 1979 the American Packing Corporation complex had been removed. By 1979, the ice-related structures had been removed from the vicinity of the western sheeting; the meat-related structures were no longer associated with the American Packing Corporation and the Cattle Platform and Cattle Pen were no longer extant. The 1988 Sanborn Insurance Maps indicate that the buildings to the north of the eastern sheeting in the former location of the American Packing Corporation were vacant. By this time a Conrail substation was installed near the western sheeting. The 2006 Sanborn Insurance Maps indicate that an apartment building had been installed in the former location of the meat packing buildings; much of the former meat packing

⁶⁸⁷ Drobbin & Associates 1998a, 29.

⁶⁸⁸ *The Milwaukee Sentinel*, "The Cudahy Packing Company," March 2, 1922, accessed July 20, 2016, https://news.google.com/newspapers?id=0dU_AAAAIBAJ&sjid=qwoEAAAAIBAJ&pg=3914,4255857&dq=cudahy+packing+company&hl=en.

⁶⁸⁹ Electronic Encyclopedia of Chicago, "Cudahy Packing Co.," accessed July 20, 2016, <http://www.encyclopedia.chicagohistory.org/pages/2635.html>.

⁶⁹⁰ Ancestry.com, "U.S. City Directories, 1822-1995," accessed July 20, 2016 at <http://search.ancestry.com/search/db.aspx?dbid=2469>.

complex had been removed. The Signal Tower located in the vicinity of the Transformer House to the west of Grove Street appears to have been removed sometime after 2006.⁶⁹¹

Summary and Conclusions

The cartographic history of the proposed sheeting indicates that the area was undeveloped marshlands through the mid-nineteenth century. Initial development coincided with the development of the M&E in the 1860s. By the early-twentieth century there was development associated with the rail lines and associated industry in the immediate vicinity of the proposed sheeting. This development included Grain and Straw buildings near the western sheeting and a coal trestle and meat packing-related structures in the vicinity of the eastern sheeting. A Cattle Platform and Cattle Pen were located in the immediate vicinity of the eastern sheeting through the mid-twentieth century. The coal trestle was associated with the Horre Coal Company. The sheeting also intersected the Grove Street trolley line in the early through mid-twentieth century. A tie station and signal tower had also developed in the vicinity of the sheeting by the early 1930s. The Grove Street Tie Station is still extant; the signal tower appears to have been removed sometime after 2006. Ice-related buildings and rail spurs were located in the vicinity of the western sheeting from the 1930s through the 1970s.

With respect to prehistoric archaeological sensitivity, the sheeting was primarily located in the historic meadowlands to the west and east of the Ahasimus Creek. The eastern portion of the sheeting intersected and crossed the creek in the vicinity of Grove Street. As previously noted, Dewberry has conducted a series of soil borings in the immediate vicinity of the western sheeting and to the south of the eastern sheeting (see Appendix D). Dewberry excavated Borings 432W-71 through 432W-77, to the east of Jersey Avenue in the vicinity of an electrical substation. These borings exposed a soil profile similar to the profile exposed by Geismar. Specifically, these borings had approximately 15 feet of overlying fill which was underlain by a deep deposit of dark gray fibrous organic clayey silt to a depth of approximately 55 feet below the surface. Tan or dark gray sand deposits were found beneath the dark gray clayey silt. Given the results of Geismar's investigations and Dewberry's soil borings within this same vicinity, the western sheeting segment is not considered sensitive for prehistoric deposits.

Dewberry also conducted a series of borings within and to the south of the DLWRR tracks, to the immediate east and south of the eastern sheeting. These borings generally reflected overlying fill deposits to a depth of at least 10 to 15 below the surface. Within many of the soil borings, an organic black silt was encountered beneath the fill deposits. Peat deposits were occasionally noted within the black silt matrix. Distinct brown peat layers were also encountered within many of the borings at a depth of approximately 20 feet below the surface. The organic and peat deposits generally terminated around 30 to 35 feet below the surface and were underlain by deposits of sand. The presence of an organic silt unlike the dark gray organic clayey silt observed within soil borings to the west and the identification of a distinct peat layer within many of the borings in the vicinity of the eastern sheeting suggests that there is the potential for a deeply buried, stable prehistoric surface in this area.

⁶⁹¹ Sanborn Library, LLC 1937; NETR 1931-2006.

An examination of the historic topographic conditions within the eastern sheeting indicates that the eastern portion of this area was located in the immediate vicinity and crossed the Ahasimus Creek. It is assumed that topographic conditions within the meadowlands to the immediate west and east of the creek may have been different than in areas at a further distance from the creek. As such, it is further assumed that the topographic conditions within the western portion of the eastern sheeting may have been similar to the conditions within the western sheeting and that the soil profile within this segment would be similar to those exposed by the soil borings in its vicinity. Therefore, the western portion of the eastern sheeting is considered to have low potential for prehistoric archaeological deposits. However, given the location of the Ahasimus Creek with respect to the eastern portion of the eastern sheeting and in light of the soil profiles exposed by the soil borings excavated to the east of the sheeting, the eastern portion of the eastern sheeting is considered potentially sensitive for stable prehistoric surfaces and prehistoric archaeological deposits. Potential prehistoric archaeological resources are anticipated at depths from approximately 15 to 35 feet below the surface.

Development of the area of the proposed sheeting was associated with the extension of the M&E railroad, the subsequent expansion of the DLWRR, and the industrial development associated with the railroad. The western sheeting is located within the immediate vicinity of early-twentieth century Grain and Straw buildings and rail spurs associated with the DLWRR. This portion of the proposed sheeting was also located within the vicinity of an ice platform and ice houses during the early to mid-twentieth century. As such, the western sheeting is considered sensitive for early to mid-twentieth century deposits associated with the Grain and Straw building and the ice-related structures; this portion of the sheeting is also potentially sensitive for deposits associated with the railroad-related filling of the area. Such deposits would be anticipated at depths less than 15 feet below the surface.

The eastern sheeting to the west of Grove Street was located in the vicinity of an early to mid-twentieth century coal trestle and the 1930s signal tower and Grove Street Tie Station. Lynn Drobbin & Associates, Inc. previously evaluated the Horre Coal Company Trestle and Coal Pockets as part of a background study associated with the HBLR. Drobbin & Associates concluded that the coal trestle and coal pockets were not eligible for listing in the National Register due to their lack of integrity. These structures were also not considered contributing elements to the DLWRR as they were not owned or operated by the DLWRR. Given Drobbin & Associates' recommendations along with the fact that the coal trestle appears on multiple early and mid-twentieth century maps, it does not appear that archaeological deposits associated with the trestle would provide any significant insights that would render the trestle potentially eligible for listing in the National Register. As such, the western portion of the eastern sheeting is not considered sensitive for significant historic deposits associated with the coal trestle. As previously noted, the Grove Street Tie Station is an extant structure which Drobbin & Associates have recommended eligible for listing in the National Register. However, the early to late-twentieth century signal tower which was historically adjacent to the tie station appears to have been removed. This signal tower was associated with the DLWRR. As such, archaeological deposits associated with the tower could be potentially eligible for listing in the National Register as a contributing resource to the DLWRR historic district. Thus, a portion of the proposed sheeting is considered sensitive for historic deposits associated with the signal tower. Archaeological remains associated with the signal tower are anticipated at depths above 10 to 15 feet from the surface.

The eastern sheeting also crossed the early-nineteenth century Grove Street trolley line. The trolley line along Grove Street appears to have been removed by 1937. This trolley line was not an elevated track, therefore, archaeological deposits associated with the trolley line would most likely consist of the rail tracks. Such tracks would be anticipated near the surface. Given that the route of the early-twentieth century trolley lines are known through cartographic and documentary records, any track remnants would provide little additional information regarding the history or nature of this resource. As such, any deposits associated with the trolley line would not constitute a significant resource eligible for listing in the National Register. Therefore, the sheeting is not considered sensitive for significant historic resources associated with the early-twentieth century Grove Street trolley line.

The eastern extent of the proposed sheeting was located within the immediate vicinity of structures associated with the meat packing industry during the early to mid-twentieth century. In particular, historic records and cartographic sources suggest that the sheeting intersected with a Cattle Pen and Cattle Platform associated with the Cudahy Packing Company and then the American Packing Corporation from the 1920s through the 1960s. The 1937 and 1950 Sanborn Insurance Maps indicate that the buildings to the immediate north of the proposed sheeting included cooler rooms, cattle runs, and a butchering space. Given its proximity to the meat packing complex, the eastern extent of the proposed sheeting is considered to be highly sensitive for historic deposits associated with the early to mid-twentieth century meat packing industry. Archaeological deposits associated with this industry might include faunal remains; structural remains associated with the pens, platforms, and other buildings; activity areas associated with the daily operations; and tools. As the meat packing occupation post-dated the filling of this area, any industrial deposits associated with the industry are anticipated at depths above 10 to 15 feet from the surface.

9.1.6 Delay, Store, Discharge Locations (DSD)

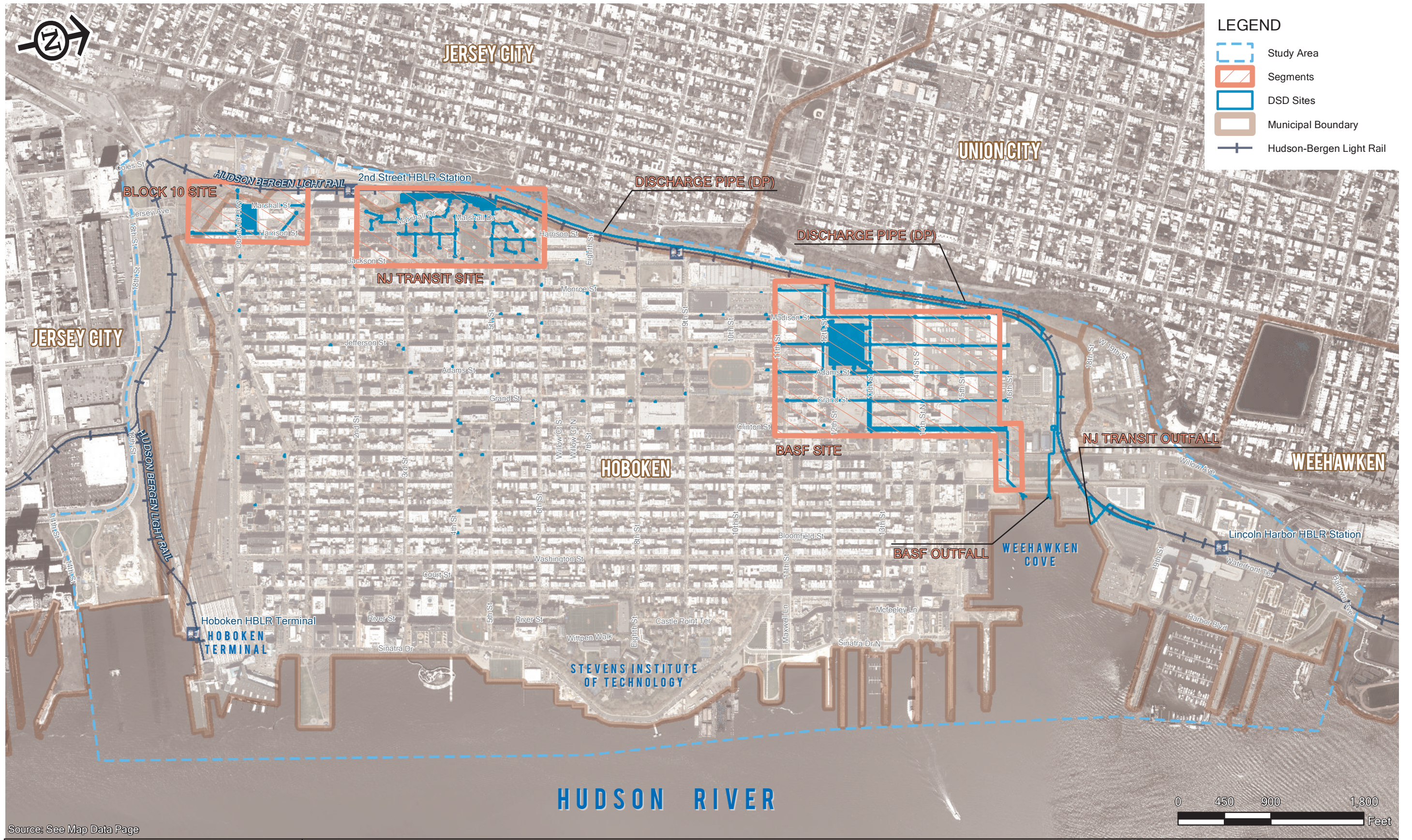
The project's DSD includes approximately 61 sites with new and/or improved stormwater management techniques (Figure 66). As previously discussed, in addition to the individual DSD sites, several large-scale sites are also proposed. These sites consist of the BASF Site, the New Jersey Transit Site (NJ Transit Site), the Block 10 Site, and the Discharge Component sites.

The following discussion will first analyze each individual DSD location from the southwest to northeast within the Study Area. Following the individual discussions, the larger DSD sites will be evaluated. These sites will also be evaluated from southwest to northeast within the Study Area beginning with Block 10 and ending with the discharge components.

9.1.7 DSD Sites

T6-NEW (Newark Avenue and Monroe Street) (Plate 26)

Proposed Tank T6-NEW will be located on the northern frontage of Newark Avenue to the north of its intersection with Grove Street and east of its intersection with Monroe Street. The proposed tank will be located in the public right-of-way (ROW) and includes the paved road surface and the adjacent cement and brick sidewalk. The tank would be located in the immediate vicinity of the front entry of The Skyline apartment building at 551 Newark Street.



Source: See Map Data Page

DSD Sites

Utilities including a traffic light, manholes, wooden transmission poles, and grates are located within or in the immediate vicinity of Tank T6-NEW.

The tank will measure approximately 20 feet in length and 5 feet in width. The tank will have an overall depth of 4.5 feet below the surface. Installation of the tank will require excavation to a depth of approximately 7.17 feet below the surface. The limit of disturbance associated with Tank T6-NEW is approximately 100 square feet to an approximate depth of 7.17 feet. This limit of disturbance encompasses the approximate footprint of the tank. Current design plans do not include staging areas or any other areas of disturbance associated with the tank installation.

Historical Development

The earliest development within the vicinity of T6-NEW was the Turnpike to Newark. This road was initially laid out in the late-eighteenth to early-nineteenth century and extended from Paulus Hook to the bridge over the Hackensack River. 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.⁶⁹² Present Newark Avenue follows much of the route of the historic roadway which is illustrated on Burr's 1832 map (see Figure 17). Tank T6-NEW may have been located within the historic roadway. Aside from the road, the vicinity of the tank consisted of undeveloped meadowlands in the immediate vicinity of the Ahasimus Creek.⁶⁹³ The 1844 US Coastal Survey map also indicates that the only development within the vicinity of the tank was the historic road which was located to its immediate north (see Figure 30). The 1844 map suggests that the tank may have been located to the immediate north of a narrow tributary of the Ahasimus Creek.⁶⁹⁴

G.M. Hopkins & Co.'s 1873 map indicates that Monroe Street had been proposed and that the blocks surrounding Tank T6-NEW had been allotted (see Figure 37). Several structures were located to the northeast of the tank. Two of these structures were located on the rear of the lots closer to Ferry Street, being associated with C.W. Conoger and John Tyrell from west to east. A structure associated with Ann Tyrell was located on the northern frontage of Newark Street to the northeast of the tank site. Speilmann and Brush's 1880 map suggests that the tank site was partially on the established Newark Avenue and partially on undeveloped meadowlands (see Figure 15). The tank site was located to the immediate north of Ahasimus Creek and previously submerged land. The DWLRR had developed to the south of the tank site. The 1880 map also indicates that a sewer line was located along Newark Avenue from the Hudson River to Jersey Avenue. A sewer line was also located on Monroe Street from Newark to 2nd streets. Meeting Minutes from the Common Council of Hoboken suggested that sewer lines were installed within Monroe Street and Newark Avenue ca. 1870. The Meeting Minutes did not indicate the type of sewer which was installed within these streets.⁶⁹⁵

Bailey and Ward's 1881 Map of Hoboken indicates the density of development that had occurred within the southwestern extent of Hoboken (see Figure 41). It is unclear whether Monroe Street had been extended all the

⁶⁹² Van Winkle 1902, 42.

⁶⁹³ Burr 1832.

⁶⁹⁴ US Coastal Survey 1844.

⁶⁹⁵ G.M. Hopkins & Co. 1873; Speilmann and Brush 1880; Common Council of Hoboken 1870.

way to Newark Avenue; however, structures were located throughout the block which would be formed by Newark Avenue, 1st Street, Madison and Monroe streets. Several of the structures on the northern extent of Newark Avenue are depicted nearly flush with the roadway suggesting that portions of these buildings may have extended into the current sidewalk.⁶⁹⁶ Bien's 1891 Map indicates that Monroe Street had been extended to meet Newark Avenue. The meadows along Monroe Street also appear to have been filled from Newark to 2nd Street.⁶⁹⁷

G.M. Hopkins & Co.'s 1909 map indicates that H. Kobtlang Lumber Shed had developed in the northeast corner of Monroe Street and Newark Avenue (see Figure 37). The tank site appears to have fallen within this parcel. The parcel appears to have been occupied by an extensive frame building which encompassed four lots. A trolley line was located to the immediate east of the tank site along Newark Avenue. A 12-inch pipeline was located on Newark Avenue and a six-inch pipeline line was located along Monroe Street.⁶⁹⁸ By 1923, Union Iron Works Plant No. 2 had developed within the former lumber shed location. There were no other changes within the vicinity of the tank site.⁶⁹⁹

The 1937 Sanborn Insurance maps indicate that the iron works plant was now occupied by a Seaboard Marine Company building with an attached office (Figure 67). Three pipes lines were located within Newark Avenue—a 16-inch, a 24-inch, and a 12-inch pipe. A six-inch pipe was also located along Monroe Avenue. A fire hydrant was located to the immediate east of the tank site. By 1951, the marine company building was associated with the W.M. Rebuth, Inc. Steel Warehouse. A portion of the warehouse extended to the west into the Monroe Street streetbed. There were no other changes within the vicinity of the tank site. By 1979, the Rebuth building was associated with Auto & Boat Sales. The pipeline along Monroe Avenue was labelled as an eight-inch as opposed to a six-inch line. Between 1979 and 1987, the warehouse building on the northeast corner of Newark Avenue and Monroe Street had been replaced by a large apartment building which occupied the entirety of the block. This apartment complex continues to occupy the block to the immediate north of the tank site.

The 1940 As-Built plans indicate that a vitrified clay pipe was located within Newark Avenue in the vicinity of the tank site. The plans also indicate that a brick sewer line had been installed within Monroe Street from Ferry Street to 2nd Street prior to 1940.⁷⁰⁰

Summary and Conclusions

Tank T6-NEW is located along Newark Avenue. Present-day Newark Avenue appears to follow the route of a late-eighteenth to early-nineteenth century turnpike to Newark. This roadway was in existence by 1832 and extended over the meadowlands within the southwestern portion of Hoboken. Early configuration of the roadway most likely included wood planks and other features to allow for passage over the saturated meadows. A sewer line was installed within the Newark Avenue roadbed ca. 1870. The As-Built plans and additional data provided by the NHSA indicate that a vitrified clay pipe was installed within this portion of Newark Avenue after 1923. This information contrasts with details recorded in the Council Minutes and with the 1880 topographic map.

⁶⁹⁶ Bailey and Ward 1884.

⁶⁹⁷ Bien 1891.

⁶⁹⁸ G.M. Hopkins & Co. 1909.

⁶⁹⁹ G.M. Hopkins & Co. 1923.

⁷⁰⁰ Whittemore 1940.



1937 Certified Sanborn Map

LEGEND

- Study Area
- Alternative 1 - Resist Structure
- Alternative 1 - Limit of Disturbance
- Alternative 2 - Resist Structure
- Alternative 2 - Limit of Disturbance
- Alternative 3 - Resist Structure
- Alternative 3 - Limit of Disturbance
- Delay, Store, Discharge Element
- High Level Storm Sewer System

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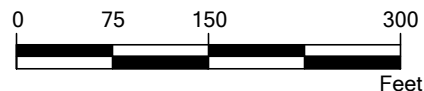
Certification #

32AB-448C-EB02

Site Name: Hoboken Study
Address: Hoboken Study
City, ST, ZIP: Hoboken, NJ 07030
Client: Dewberry Engineers & Inc.
EDR Inquiry: 4354813
Order Date: 1/17/2016 11:55:41 AM
Contractor #: 32AB-448C-EB02



Volume Two Hudson County.



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



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Location of Tank T6-NEW and Tank T5-OBS, 1937
Sanborn 1937 (Plate 23)

August 2016
FIGURE 67

Monroe Street does not appear to have been extended to Newark Avenue until the late 1880s or early 1890s. However, development along the northern frontage of Newark Avenue to the east of Monroe Street had occurred by 1884. During the early-twentieth century, a lumber shed had developed along the northeast corner of Monroe Street and Newark Avenue. The lumber shed was followed by a series of industrial and commercial operations—an iron plant, a marine company, a steel warehouse, and an auto and boat sales business. None of these buildings appeared to extend into the roadbed of Newark Avenue. Between 1979 and 1987, the contemporary apartment building was installed within the block formed by Newark Avenue, Observer Highway, Monroe Street, and Madison Street.

Dewberry has conducted a series of soil borings to the northwest of the tank site (see Appendix D). The majority of these borings were only conducted to a maximal depth of 20 feet below the surface. The soil borings suggest that historic fill deposits to the west of the tank site extend to a depth of at least 10 feet below the surface. The fill deposit is underlain by a stratum of black clayey silt. Given the relatively shallow depth of the borings, it is unclear what underlies this matrix. Additional borings have been conducted to the southeast of the tank site on both the east and west sides of Jersey Avenue south of the HBLR rail line. Soil profiles were available for seven soil borings conducted on the east side of Jersey Avenue. These soil borings reflected that historic fill deposits within this area extend to a depth of approximately 12 to 15 feet below the surface. Within six of the seven borings, the fill deposits were underlain by deposits of dark gray organic silt/clayey silt which extended from a depth of 15 to at least 40 feet below the surface. Shell deposits were noted within this matrix in some of the borings. Within Boring 432W-71 a small layer of peat was observed between 12 and 15 feet below the surface. Within the majority of the borings, a matrix of tan sand with gravel was encountered at depths greater than 45 feet below the surface; the borings were terminated at depths ranging from 51.5 to 72.7 feet below the surface. Geismar also conducted a soil boring to the west of Jersey Avenue. The profile exposed in this boring reflected approximately 10 feet of historic fill which overlain an extensive deposit of gray organic silt which extended from 10 to 60 feet below the surface. This matrix was underlain by degrading gray sandstone layers to a depth of 95 feet below the surface.

A geomorphological analysis of the boring, R15-V4, monitored by Geismar determined that the soil profile reflected a uniform marsh profile indicating that there was little environmental change within the meadowlands during the Holocene. In his analysis of the boring profile, Schuldenrein concluded that the lack of evident environmental diversification suggests that this area would not have provided an attractive setting for prehistoric occupation or exploitation.⁷⁰¹ As such, he determined that there was little to no potential for prehistoric deposits to the west of Jersey Avenue. The borings excavated to the east of Jersey Avenue reflected a very similar profile to that exposed within R15-V4, specifically a deep uniform gray organic silt deposit. Only one soil boring, 432W-71, contained a relatively narrow deposit of peat. The lack of the peat layer within the adjacent soil borings suggest that this was not a continuous surface and most likely represented a localized deposit.

⁷⁰¹ Geismar 2006, 24.

Given the proximity of Tank T6-NEW to the soil borings excavated around Jersey Avenue, and given that topographic maps suggest similarities in the settings of these areas, in meadowlands adjacent to the Ahasimus Creek, it is highly likely that the soil profile of the tank site is similar to the profile reflected by the borings. Specifically, it seems highly probable that the meadow profile within the proposed tank site consists of a deep and uniform organic matrix reflective of environmental continuity within the Holocene. As such, Tank T6-NEW is considered to possess little to no prehistoric archaeological sensitivity.

Historic development within Tank T6-NEW consisted of the late-eighteenth to early-nineteenth century turnpike to Newark and mid-nineteenth century sewer installation. Current Newark Avenue appears to follow the route of the historic turnpike. It is unclear to what extent past urbanization and utility development may have impacted remnants of the historic turnpike. Thus, Tank T6-NEW is considered sensitive for historic deposits associated with the turnpike to Newark. Deposits associated with the historic road might include wood planks and other features which enabled the roadway to extend over the meadows. Such deposits would predate filling activities within the area suggesting that any archaeological remains would most likely be found at depths greater than 10 feet below the surface.

The As-Built plans indicate that a vitrified clay pipe was installed within Newark Avenue in the vicinity of Monroe Street. While this information differs from the 1880 Speilman and Brush map, the As-Built is considered the most accurate record of the current sewer system. As such, it seems highly likely a vitrified clay sewer line is located in the immediate vicinity of Tank T6-NEW. Given that this type of sewer represents a later technological advancement within the Hoboken sewer system, and that the pipeline was most likely installed post-1923, the sewer is not considered a significant historic resource. Therefore, Tank T6-NEW is not considered sensitive for potentially significant historic resources associated with the Hoboken sewer system.

T7-OBS (Observer Highway and Jackson Street) (Plate 27)

Proposed Tank T7-OBS will be located on the northern frontage of Observer Highway to the immediate west of its intersection with Jackson Street. The proposed tank will be located in the public right-of-way and includes the paved road surface and the adjacent cement sidewalk. The tank would be located to the immediate south of a paved chain-link fenced parking area with an adjacent grass surface. Utilities within the vicinity of the proposed tank site include wooden transmission poles, road signs, and a drainage grate.

The tank will measure approximately 20 feet in length and 5 feet in width. The tank will have an overall depth of 4.5 feet below the surface. Installation of the tank will require excavation to a depth of approximately 7.17 feet below the surface. The limit of disturbance associated with Tank T7-OBS is approximately 100 square feet to an approximate depth of 7.17 feet. This limit of disturbance encompasses the approximate footprint of the tank. Current design plans do not include staging areas or any other areas of disturbance associated with the tank installation.

Historical Development

The 1844 U.S. Coastal Survey map suggests that T7-OBS was located in undeveloped meadowland to the north of the Newark Turnpike and south of the Hoboken Creek (see Figure 30). This area appears to have remained undeveloped through the mid to late-nineteenth century. G.M. Hopkins & Co's 1873 map indicates that Ferry Street



Plate 27: Location of T7-OBS, Observer Highway and Jackson Street. View East. (ZE 5/23/2016).



Plate 28: Location of T5-OBS, Observer Highway and Madison Street. View Northwest. (DVS 3/24/2016).

(historic Observer Highway) had been proposed to the western extent of the city and that Jackson and Harrison streets had been proposed to their intersections with Newark Avenue (see Figure 37). While lots also appear to have been proposed within the street blocks, the only development within the vicinity of the tank site is located along the southern frontage of the Paterson Plank Road to the north.

Speilmann and Brush's 1880 map indicates that a sewer line was installed with the western portion of Ferry Street from Jefferson Street to the western edge of the city (see Figure 15). Sewer lines were also located along Jackson Street between 1st and Ferry streets. Historic records suggest that a box-type brick sewer was installed within Ferry Street from the western extent of the city to Newark Avenue between 1866 and 1869. Kraft has suggested that the Jackson Street sewer may have been a wooden construction.⁷⁰² The As-Built plans indicate that a wooden box sewer was located within Jackson Street from Newark Avenue to 2nd Street. The plans also indicate that a 12-inch vitrified clay pipe was located within Ferry Street from Jackson to Marshall streets.⁷⁰³

The 1880 map suggests that the western portion of Ferry Street had been constructed; it is unclear whether the eastern portion of the road from Adams Street to the Hudson River was extant. A portion of Jackson Street had also been created from Ferry Street to 1st Street. The surrounding blocks are depicted as undeveloped meadowland.⁷⁰⁴

G.M. Hopkins & Co.'s 1909 map indicates that Jackson and Harrison streets have been extended to Newark Avenue and that the block formed by Ferry Street, Paterson Street, Jackson Street, and Harrison Street had been partially developed (see Figure 37). A six-inch pipeline was located within the Ferry Street roadbed. This pipeline did not extend to the west of Harrison Street. The steel trestle of the NHCR elevated line was located to the immediate north of Tank T7-OBS. A frame building and stone yard was located to the west of the tank site. The 1923 Hopkins map indicates that the lots adjacent to the tank site had been acquired by Public Service. No other changes are evident within or adjacent to the tank site.⁷⁰⁵

An examination of the twentieth century Sanborn Insurance maps and the publically available aerial imagery indicates that there was limited development in the vicinity of tank T7-OBS from the 1930s through the present day. By 1951, Ferry Street was renamed Observer Highway. Between 1951 and 1954, the NHCR elevated rail lines to the north of the tank site had been removed. The lots adjacent to the tank site have remained vacant throughout this period and were used for vehicular and container storage and as a parking area. The lots appear to have been paved during the 1980s.⁷⁰⁶

Summary and Conclusions

The earliest development within the vicinity of Tank T7-OBS appears to have been the extension of historic Ferry Street to the western extent of Hoboken ca. 1880. The As-Built plans indicate that a wooden box sewer was located along Jackson Street in the vicinity of Ferry Street; a vitrified clay pipe was located within Ferry Street in the vicinity

⁷⁰² US Coastal Survey 1844; G.M. Hopkins & Co. 1873; Spielmann and Brush 1880; RGA 2015b, 3-3; Kraft 1978.

⁷⁰³ Whittemore 1940.

⁷⁰⁴ US Coastal Survey 1844; G.M. Hopkins & Co. 1873; Spielmann and Brush 1880.

⁷⁰⁵ G.M. Hopkins & Co. 1909; G.M. Hopkins & Co. 1923.

⁷⁰⁶ Sanborn Library, LLC 1937-2006; NETR 1931-2013.

of Jackson Street. By the early-twentieth century, the block to the north of the tank site had been filled and the elevated track lines of the NHCR had been built to the north. The lots to the immediate north of the tank site appear to have remained undeveloped through the twentieth century having been used for the storage of vehicles and containers. By the late 1980s, the lot was paved and converted to a parking area.

In 2006, RGA conducted a cultural resource survey in association with proposed sewer rehabilitation along portions of Grand Street, Newark Street/Observer Highway, and Jackson Street. Their project area along Jackson Street was located to the immediate east of Tank T7-OBS, extending from Newark Avenue to 1st Street. RGA determined that there was the potential for an intact mid-nineteenth century sewer line within the project area. This sewer would date between 1869 and 1880. RGA determined that there was no potential for prehistoric or other historic archaeological resources within the Jackson Street project area and recommended documentation, sampling, and archaeological monitoring of the wooden sewer line prior to its removal or rehabilitation.⁷⁰⁷

As previously noted, Dewberry has conducted a series of soil borings in the immediate vicinity of Tank T7-OBS; a total of eight soil borings were excavated within the block between Jackson and Harrison streets and between Observer Highway and Paterson Avenue (see Appendix D). All of these borings were quite shallow, extending to a maximum depth of 20 feet below the surface. The exposed profiles indicated that historic fill deposits within the block extend to a depth of at least ten feet below the surface. The fill deposit was underlain by a stratum of black clayey silt. Given the relatively shallow depth of the borings, it is unclear what underlies this matrix. Additional borings have also been excavated to the southwest of the tank site in the vicinity of Jersey Avenue. As previously discussed, these borings revealed a deep gray organic silt/silty clay matrix which extended beneath the fill deposit for at least 25 feet. Analysis of this matrix has determined that it reflects a lack of past environmental diversification suggesting an unattractive Holocene environment for prehistoric occupation or exploitation.

Given the relative proximity of Tank T7-OBS to the soil borings excavated around Jersey Avenue, and given that topographic maps suggest similarities in the settings of these areas, in meadowlands near the Ahasimus and Hoboken creeks, it is highly likely that the soil profile of the tank site is similar to the profile reflected by these borings. Specifically, it seems highly probable that the meadow profile within the proposed tank site consists of a deep and uniform organic matrix reflective of environmental continuity within the Holocene. As such, Tank T7-OBS is considered to possess little to no prehistoric archaeological sensitivity.

Historic development within Tank T7-OBS consisted of the extension of Ferry Street in the mid to late-nineteenth century and the mid to late-nineteenth century installation of a wooden box-type sewer within Jackson Street. This wooden sewer line would have been a component within the early sewer system of Hoboken and, as such, is a potentially significant historic resource reflective of the city's nineteenth century growth and attempts to address the municipal problems accompanied by the city's expansion. The vitrified clay sewer within Observer Highway represents a later form of sewer line and, as such, is not considered a significant historic resource. Archaeological deposits associated with the wooden box-type sewer might include the sewer line, a builder's trench associated

⁷⁰⁷ RGA 2006, *Stage IA Cultural Resources Survey North Hudson Sewerage Authority Collections System, Combined Sewer Rehabilitation Wood Sewers, City of Hoboken, Hudson County, New Jersey*.

with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the Jackson Street sewer was located approximately 3 to 7.5 feet below the surface. Therefore, sewer deposits within the tank site are anticipated at depths greater than three feet below the surface. Tank T7-OBS is not considered sensitive for any other historic deposits.

T5-OBS (Observer Highway and Madison Street) (Plate 28)

Proposed Tank T5-OBS will be located on the northern frontage of Observer Highway to the immediate west of its intersection with Madison Street. The proposed tank will be located in the public ROW and includes the paved road surface and the adjacent gray brick sidewalk. The tank would be located to the immediate south of a mixed residential and commercial building. Utilities within the vicinity of the proposed tank site include wooden transmission poles and a drainage grate.

The tank will measure approximately 20 feet in length and 5 feet in width. The tank will have an overall depth of 5.5 feet below the surface. Installation of the tank will require excavation to a depth of approximately 8.17 feet below the surface. The limit of disturbance associated with Tank T5-OBS is approximately 100 square feet to an approximate depth of 8.17 feet. This limit of disturbance encompasses the approximate footprint of the tank. Current design plans do not include staging areas or any other areas of disturbance associated with the tank installation.

Historical Development

The 1844 U.S. Coastal Survey map suggests that T5-OBS was located in undeveloped meadowland to the north of the Newark Turnpike, north of the Ahasimus Creek, and south of the Hoboken Creek (see Figure 30). This area appears to have remained undeveloped through the mid to late-nineteenth century. G.M. Hopkins & Co's 1873 map indicates that Ferry Street (historic Observer Highway) had been proposed to the western extent of the city and that Monroe Street had been proposed to its intersection with Newark Avenue (see Figure 35). Lots appear to have been proposed within the block bounded by Madison and Monroe streets and Ferry Street and 1st Street, and development has appeared along the western frontage of Madison Street and the eastern frontage of Monroe Street. Within the vicinity of the tank site a structure was depicted at the northeast intersection of Ferry Street and Madison Street. This structure appears to have been associated with Henklin (sp).

Speilmann and Brush's 1880 map indicates that a sewer line was installed within Ferry and Madison streets within the vicinity of the tank site. Historic records suggest that a box-type brick sewer was installed within Madison Street between 1st Street and Newark Avenue between 1869 and 1871 (see Figure 15).⁷⁰⁸ The 1880 map suggests that the portions of Ferry Street and Madison Street within the vicinity of the tank site had been constructed. The surrounding blocks are depicted as undeveloped meadowland.⁷⁰⁹ The As-Built plans indicate that a brick sewer line was located within Madison Street between Observer Highway and 2nd Street. A brick sewer was also located within Observer Highway to the east of Madison Street.⁷¹⁰

⁷⁰⁸ US Coastal Survey 1844; G.M. Hopkins & Co. 1873; Spielmann and Brush 1880; Hoboken Common Council 1869-1871.

⁷⁰⁹ US Coastal Survey 1844; G.M. Hopkins & Co. 1873; Spielmann and Brush 1880.

⁷¹⁰ Whittemore 1940.

G.M. Hopkins & Co.'s 1909 map indicates dense development within the block adjacent to tank T5-OBS (see Figure 37). By this time the NHCR elevated track line had been extended along Ferry Street and ran across the proposed tank site. Three adjacent brick structures were located in the corner lots at the northwest intersection of Madison Street and Ferry Street. The St. Joseph's Hall and Academy was located to the immediate west of the brick structures. A six-inch pipeline was located down the streetbed of both Ferry and Madison streets. There were no evident changes within or adjacent to the tank site by 1923.⁷¹¹

An examination of the twentieth century Sanborn Insurance maps and the publically available aerial imagery indicates that there was limited development in the vicinity of tank T5-OBS from the 1930s through the present day. By 1937, the St. Joseph's Hall to the north of the tank site had been removed (see Figure 67). By 1951, Ferry Street was renamed Observer Highway and one of the apartment buildings to the north of the tank site had been removed. Between 1951 and 1954, the NHCR elevated rail lines had been removed. By 1979, a meat packing building was located on the northwestern corner of Madison Street and Observer Highway. Between 2002 and 2006, the meat packing building was replaced by the contemporary apartment building at the corner.⁷¹²

Summary and Conclusions

The Newark Turnpike, a late-eighteenth to early-nineteenth century historic road, was the earliest development within the vicinity of Tank T5-OBS. The turnpike appears to have been located to the south of the tank site and outside of its limit of potential disturbance. The immediate development in the vicinity of Tank T5-OBS appears to have been the extension of historic Ferry Street to the western extent of Hoboken ca. 1880. Sewer lines were installed within Ferry Street and Madison Street in the vicinity of the tank site prior to 1880. The Madison Street sewer may have been a box-type brick sewer line installed between 1869 and 1871. The As-Built plans indicate the presence of a brick sewer within both Madison Street and Observer Highway in the vicinity of Tank T5-OBS. By the early-twentieth century, the elevated track lines of the NHCR had been extended through Ferry Street in the immediate vicinity of the tank site. This line was removed between 1951 and 1954. The lots to the immediate north of the tank site consisted of adjacent apartment buildings in the early-twentieth century. A meat packing building replaced two of these apartment buildings during the mid-twentieth century. This structure was replaced by the current mixed residential and commercial building between 2002 and 2006.

As previously discussed, in 2006, RGA conducted a cultural resource survey in association with proposed sewer rehabilitation along portions of Grand Street, Newark Street/Observer Highway, and Jackson Street. Their project area along Observer Highway terminated to the immediate east of the tank site. RGA determined that there was the potential for an intact mid-nineteenth century wooden sewer line within Observer Highway from Willow Avenue to Jefferson Street. This sewer would date between 1869 and 1880. The As-Built plans indicate that the wooden sewer line within Observer Highway terminated to the east of Madison Street; from this intersection to the west, a brick sewer line was located within Observer Highway. RGA determined that there was no potential for prehistoric or other historic archaeological resources within the Observer Highway project area and recommended

⁷¹¹ G.M. Hopkins & Co. 1909; G.M. Hopkins & Co. 1923.

⁷¹² Sanborn Library, LLC 1937-2006; NETR 1931-2013.

documentation, sampling, and archaeological monitoring of the wooden sewer line prior to its removal or rehabilitation.⁷¹³

There was no available soil boring data in the immediate vicinity of Tank T5-OBS. However, as previously noted, Dewberry has conducted a series of soil borings to the west of the tank site; soil borings have also been conducted to the southwest of the tank site (see Appendix D). These borings indicated that fill deposits within this area extended to a maximum depth of 20 feet below the surface. These fill deposits were underlain by a minimum 25-foot thick layer of gray organic silt/silty clay. The depth and continuity of the organic silt matrix has been interpreted as representative of a uniform and stable meadow environment throughout the Holocene. Given the relative proximity of Tank T5-OBS to these soil borings, and in light of the similarities in the settings of these areas during the mid-nineteenth century, in meadowlands near the Ahasimus and Hoboken creeks, it is highly likely that the soil profile of the tank site is similar to the profile reflected by the borings. Specifically, it seems highly probable that the meadow profile within the proposed tank site consists of a deep and uniform organic matrix reflective of environmental continuity within the Holocene. As such, Tank T5-OBS is considered to possess little to no prehistoric archaeological sensitivity.

Historic development within Tank T5-OBS consisted of the extension of Ferry Street in the mid to late-nineteenth century, the mid-nineteenth century installation of a sewer line within Ferry Street and Madison Street, and the NHCR elevated trolley line in the early to mid-twentieth century. The historic research and available utility data indicates that a mid to late-nineteenth century brick sewer line had been installed within the vicinity of the tank site along Observer Highway. Although a brick sewer line also appears to have been installed within Jackson Street, this sewer appears to be to the east of the proposed tank site.

The brick sewer line within Observer Highway would have been a component within the early sewer system of Hoboken and, as such, is a potentially significant historic resource reflective of the city's nineteenth century growth and attempts to address the municipal problems accompanied by the city's expansion. Tank T5-OBS is considered sensitive for historic deposits associated with the mid to late-nineteenth century sewer. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the sewer line was installed at a depth ranging from 2.5 to 8 feet below the surface. Therefore, sewer deposits within the tank site are anticipated at depths greater than 2.5 feet below the surface.

Tank T5-OBS is also considered sensitive for transportation-related deposits associated with the NHCR elevated trolley line. Archaeological deposits associated with the trolley line would most likely consist of foundational piers or supports for the elevated track line. Such deposits would be anticipated at depths above eight feet below the surface.

⁷¹³ RGA 2006, *Stage IA Cultural Resources Survey North Hudson Sewerage Authority Collections System, Combined Sewer Rehabilitation Wood Sewers, City of Hoboken, Hudson County, New Jersey*.

T3-OBS (Observer Highway south of Grand Street) (Plate 29)

Proposed Tank T3-OBS will be located on the northern frontage of Observer Highway to the southeast of the terminal extent of Adams Street. The proposed tank will be located in the public ROW and includes the paved road surface and the adjacent cement sidewalk. The tank would be located to the immediate south of a large apartment building. Utilities within the vicinity of the proposed tank site include wooden transmission poles, drainage grates, and a fire hydrant.

The tank will measure approximately 20 feet in length and 5 feet in width. The tank will have an overall depth of 4.5 feet below the surface. Installation of the tank will require excavation to a depth of approximately 7.17 feet below the surface. The limit of disturbance associated with Tank T3-OBS is approximately 100 square feet to an approximate depth of 7.17 feet. This limit of disturbance encompasses the approximate footprint of the tank. Current design plans do not include staging areas or any other areas of disturbance associated with the tank installation.

Historical Development

Tank T3-OBS appears to have been in undeveloped meadowlands through the mid-nineteenth century. The 1844 U.S. Coastal Survey map indicates that the tank site was located to the south of the Newark Turnpike and to the north of the Ahasimus Creek (see Figure 30). G.M. Hopkins & Co's 1873 map indicates that Ferry Street (historic Observer Highway) had been proposed to the western extent of the city (see Figure 36). Development has appeared along the southern extent of Newark Street to the immediate north of Ferry Street. This development includes a structure on the rear of a Newark Street lot associated with H. Stirman to the north of the tank site. The DLWRR tracks were located to the immediate south of Ferry Street. Spielmann and Brush's 1880 map does not indicate whether sewer lines were present within this portion of Ferry Street (see Figure 15). The map suggests that the tank site was located in an area to the immediate west of land which had been submerged. Bailey and Ward's 1881 map of Hoboken indicates that Ferry Street had been extended through the tank site to the west of Madison Street. Extensive development is located along the northern frontage of Ferry Street (see Figure 41).⁷¹⁴

G.M. Hopkins & Co.'s 1909 map indicates dense development within the block adjacent to tank T3-OBS (see Figure 39). By this time, the NHCR elevated track line had been extended along Ferry Street and ran across the proposed tank site. Several frame buildings associated with a wagon builder and a wagon painter were located to the immediate north of the tank site. Two pipelines were located along Ferry Avenue—a 16-inch pipeline and an outlet sewer line. Both pipelines were located in the immediate vicinity of the tank site. The Erie-Lackawanna Terminal had also developed and expanded to the south of the tank site. This complex included a roundhouse, turntable, freight houses, and a freight office. By 1923, the wagon-related businesses were no longer extant to the north of the tank site. Several frame buildings and a commercial garage were located to its north. There are no other evident changes within the vicinity of the tank site. The As-Built plans indicate that a brick sewer line was installed within Observer Highway between Washington Street and Marin Boulevard sometime prior to 1940.⁷¹⁵

⁷¹⁴ US Coastal Survey 1844; G.M. Hopkins & Co. 1873; Spielmann and Brush 1880; Hoboken Common Council 1869-1871.

⁷¹⁵ Whittemore 1940.



Plate 29: Location of T3-OBS, Observer Highway East of Adams Street. View West. (ZE 5/23/2016).



Plate 30: Location of TD4-OBS, Observer Highway and Willow Avenue. View East. (ZE 5/23/2016).

By 1937, several commercial and industrial buildings were located to the north of T3-OBS. These occupations included live poultry, private trucks, a cooper shop, and a painting business. By 1951, the majority of these buildings had been removed; freight houses and a woodworking and wood flooring business were located to the south of the tank site, adjacent to the DLWRR rail lines. Between 1951 and 1954, the NHCR elevated lines had been removed from Observer Highway. By 1979, the parcels to the immediate north of the tank site had been converted to a parking area. Between 1988 and 2002, the current apartment complex to the north of the tank site had been installed.⁷¹⁶

Summary and Conclusions

The earliest development within the vicinity of Tank T3-OBS appears to have been the extension of the DLWRR railroad in the 1870s and the extension of historic Ferry Street to the western extent of Hoboken ca. 1880. The Erie Lackawanna Terminal had also developed to the south of the tank site during the late-nineteenth and early-twentieth century. By the early-twentieth century a sewer line had been installed within the Ferry Street streetbed. Utility information from NHSA indicates that the sewer line within this portion of Observer Highway consisted of a brick sewer installed before 1916; the 1909 map indicates that this sewer line had been installed. The NHCR elevated track line had also been installed along historic Ferry Street by 1909. This line was removed between 1951 and 1954. The lots to the immediate north of the tank site consisted of industrial and commercial buildings followed by designated parking areas. Around 2002, the current apartment complex to the north of the tank site was installed. Structures associated with the adjacent DLWRR track lines were located to the south of the tank site throughout the twentieth century.

As previously discussed, in 2006, RGA concluded that there was the potential for an intact wooden sewer line within Observer Highway from Willow Avenue to Jefferson Street. This sewer would date between 1869 and 1880. Notably, RGA's conclusions differ from the As-Built plans which indicate that a brick sewer line was installed within Observer Highway between Washington Street and Marin Boulevard sometime prior to 1940. Additional data provided by the NHSA suggests that this brick sewer line was installed prior to 1916.⁷¹⁷

There was no available soil boring data for the immediate vicinity of Tank T3-OBS. However, Dewberry has conducted a series of soil borings to the southwest and southeast of the tank site in addition to one soil boring to the northeast of the site (see Appendix D). The closest soil borings to the tank site were located to the southwest near Marin Boulevard. These borings contained organic silt layers with little peat deposits at depths ranging from 5 to 13 feet below the surface. Both borings were terminated at a depth of 13 feet below the surface. Thus, it is unclear what soils may underlie the organic silt in this area. The soil borings to the southeast of T3-OBS contained approximately ten feet of overlying fill deposits. These deposits were underlain by a black organic silt with a trace of reeds/fibers which extended to a depth of 20 to 25 feet below the surface. The organic layer was underlain by sequential layers of brown and reddish brown sand. The soil boring to the northeast of Tank T3-OBS contained fill deposits to a depth of approximately five to eight feet below the surface. The fill was underlain by sequential layers of black and dark gray clay. The boring was terminated at a depth of 20 feet below the surface within the dark gray clay matrix.

⁷¹⁶ Sanborn Library, LLC 1937-2006; NETR 1931-2013.

⁷¹⁷ Whittemore 1940; NHSA 2016.

These soil borings suggest that the soil profiles differ between the area to the south and to the north of the tank site. The historical location of T3-OBS was to the north of the Ahasimus Creek, in a similar topographic position to soil Boring GW-10 located to its northeast. Conversely, the soil borings located to the south of the tank site were to the south of or in the immediate vicinity of the creek. The historic topographic setting suggests that the soil profile within GW-10 may be similar to the profile within the vicinity of T3-OBS. Soil Boring GW-10 contained a black to dark gray clay deposit from 8 to 20 feet below the surface. The uniformity of this deposit and the lack of organic material within it suggest that it may represent the historic meadow surface as described by Schuldenrein.⁷¹⁸ Specifically, the boring suggests that this portion of Hoboken remained a relatively stable meadowland with little to no environmental diversification during the Holocene. Given the historic topographic setting of GW-10 and T3-OBS and their relative proximity, Tank T3-OBS is considered to possess little to no prehistoric archaeological sensitivity.

Historic development within Tank T3-OBS consisted of the extension of Ferry Street in the mid to late-nineteenth century, the late-nineteenth to early-twentieth century installation of a brick sewer line within the Ferry Street roadbed, and the NHCR elevated trolley line in the early to mid-twentieth century. The historic research and available utility data suggest that a brick sewer line was installed within Observer Highway in the vicinity of the tank site. This sewer line would have been a component within the early sewer system of Hoboken and, as such, is a potentially significant historic resource reflective of the city's nineteenth and early-twentieth century growth and attempts to address the municipal problems accompanied by the city's expansion. Tank T3-OBS is considered sensitive for historic deposits associated with the late-nineteenth to early-twentieth century sewer. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the brick sewer within the vicinity of Tank T3-OBS would be located at a depth of 3.5 to 9 feet below the surface. Therefore, sewer deposits within the tank site are anticipated at depths greater than 3.5 feet below the surface.

Tank T3-OBS is also considered sensitive for transportation-related deposits associated with the NHCR elevated trolley line. Archaeological deposits associated with the trolley line would most likely consist of foundational piers or supports for the elevated track line. Such deposits would be anticipated at depths above eight feet below the surface.

TD4-OBS (Observer Highway and Willow Street) (Plate 30)

Proposed Tank TD4-OBS will be located on the northern frontage of Observer Highway to the east of its intersection with Willow Street. The proposed tank will be located in the public ROW and includes the paved road surface and the adjacent cement sidewalk and ornamental tree plantings. The tank would be located to the immediate south of a storage building. Utilities within the vicinity of the proposed tank site include a traffic signal, drainage grates, and road signs.

The tank will measure approximately 20 feet in length and 5 feet in width. The tank will have an overall depth of seven feet below the surface. Installation of the tank will require excavation to a depth of approximately 9.67 feet

⁷¹⁸ Geismar 2006, 24.

below the surface. The limit of disturbance associated with Tank TD4-OBS is approximately 100 square feet to an approximate depth of 9.67 feet. This limit of disturbance encompasses the approximate footprint of the tank. Current design plans do not include staging areas or any other areas of disturbance associated with the tank installation.

Historical Development

The 1844 U.S. Coastal Survey map indicates that TD4-OBS was located to the south of the Ahasimus Creek near the convergence of the Ahasimus and Hoboken creeks (see Figure 30). G.M. Hopkins & Co.'s 1873 map indicates that Ferry Street (historic Observer Highway) had been proposed to the western extent of the city (see Figure 36). A trolley line had been extended down a portion of Ferry Street which terminated in the vicinity of the tank site around Willow Street. The DLWRR tracks were located to the south of Ferry Street by this time. Spielmann and Brush's 1880 map indicates that the tank site was in a portion of the city which was previously underwater (see Figure 15). The Spielmann and Brush map suggests that a sewer line had not been placed within Ferry Street by 1880. Bailey and Ward's 1881 map of Hoboken indicates that development had occurred to the west of Willow Street; however, the northern frontage of Ferry Street to the east of Willow was not developed (see Figure 41).⁷¹⁹

G.M. Hopkins & Co.'s 1909 map indicates that an elevated station associated with the NHCR elevated track line had been constructed at the intersection of Willow and Ferry streets in the immediate vicinity of the tank site (see Figure 39). The block to the north of the tank site had also been developed and included the Lehman & Company Leather Goods Manufacturing business at the northwest corner of Willow and Ferry streets. The 1909 map also indicates the presence of two pipelines along Ferry Avenue—a 16-inch pipeline and an outlet sewer line. Both pipelines were located in the immediate vicinity of the tank site. A 12-inch pipeline was also located along the Willow Street roadbed. The Erie-Lackawanna Terminal had also developed and expanded to the south of the tank site. There appeared to be little changes to the immediate vicinity of the tank site by 1923. The As-Built plans indicated that a brick trunk sewer line was located in Observer Highway in the vicinity of the tank site.⁷²⁰

The 1937 Sanborn Insurance map indicates the presence of platforms associated with the NHCR rail lines within the Ferry Street roadbed in the immediate vicinity of the tank site. A vacant lot was located at the northeast corner of Willow and Ferry streets. A storehouse and shed building associated with the DLWRR rail lines were located to the south. By 1951, a machine repair shop and warehouse had been established in the northeast corner of Willow and Ferry streets. By 1988, a municipal garage had been established at the northwest corner of Park Street and Observer Highway.⁷²¹

Summary and Conclusions

The earliest development within the vicinity of Tank TD4-OBS appears to have been the extension of the DLWRR railroad in the 1870s, the presence of trolley tracks along Ferry Street by 1873, and the extension of historic Ferry Street to the western extent of Hoboken ca. 1880. The Erie Lackawanna Terminal had also developed to the south of the tank site during the late-nineteenth and early-twentieth century. By the early-twentieth century a sewer line

⁷¹⁹ US Coastal Survey 1844; G.M. Hopkins & Co. 1873; Spielmann and Brush 1880; Hoboken Common Council 1869-1871.

⁷²⁰ Whittemore 1940.

⁷²¹ Sanborn Library, LLC 1937-2006; NETR 1931-2013.

had been installed within the Ferry Street streetbed and within the Willow Street streetbed. The As-Built plans indicate that a brick truck sewer was located within Observer Highway. Additional data provided by the NHSA indicates that the sewer lines within this portion of Observer Highway and within Willow Street consisted of brick sewer lines installed before 1916; the 1909 map suggests that the Observer Highway sewer line had been installed. The NHCR elevated track lines had also been installed along historic Ferry Street by 1909. A platform associated with the rail line appears to have been in the immediate vicinity of the tank site. The platforms and the elevated rail track were removed between 1951 and 1954. Limited development occurred to the north of the tank site throughout the twentieth century. Around 1979, the current apartment complex to the north of the tank site was installed. Structures associated with the adjacent DLWRR track lines have been located to the south of the tank site throughout the twentieth century.

As previously discussed, in 2006, RGA concluded that there was the potential for an intact wood sewer line within Observer Highway from Willow Avenue to Jefferson Street. This sewer would date between 1869 and 1880. Notably, RGA's conclusions differ from the As-Built plans and data currently available from the NHSA which indicates that a brick sewer line was installed within Observer Highway prior to 1916.⁷²²

Dewberry has conducted a series of soil borings to the southeast of the tank site in addition to one soil boring to the northeast of the site (see Appendix D). The soil borings to the southeast of TD4-OBS contained approximately ten feet of overlying fill deposits. These deposits were underlain by a black organic silt with a trace of reeds/fibers which extended to a depth of 20 to 25 feet below the surface. The organic layer was underlain by sequential layers of brown and reddish brown sand. The soil boring to the northeast of Tank TD4-OBS contained fill deposits to a depth of approximately five to eight feet below the surface. The fill was underlain by sequential layers of black and dark gray clay. The boring was terminated at a depth of 20 feet below the surface within the dark gray clay matrix.

These soil borings suggest that the soil profiles differ between the area to the south and to the north of the tank site. The historical location of TD4-OBS was within or in the immediate vicinity of the southern portion of the Hoboken Creek. This setting is similar to that of the southeastern soil borings which were located in the immediate vicinity of the Ahasimus Creek, near its convergence with the Hoboken Creek. The historic topographic setting suggests that the soil profile within the southeastern borings may be similar to the profile within the vicinity of TD4-OBS. These borings exhibited a black organic silt deposit with fibers and reeds which ranged from a depth of 10 to 30 feet below the surface. Given the historic setting of this region, within proximity to two known creeks and in light of the organic layers within the exposed soil profile, TD4-OBS is considered potentially sensitive for prehistoric deposits within this organic silt deposit from a depth of approximately 10 to 30 feet below the surface.

Historic development of Tank TD4-OBS consisted of the extension of Ferry Street in the mid to late-nineteenth century, the late-nineteenth to early-twentieth century installation of a brick sewer line within the Ferry Street roadbed; and the NHCR elevated trolley line and associated elevated platforms in the early to mid-twentieth century. The historic research and current utility information suggest that a brick sewer line was installed within Observer

⁷²² RGA 2006, *Stage IA Cultural Resources Survey North Hudson Sewerage Authority Collections System, Combined Sewer Rehabilitation Wood Sewers, City of Hoboken, Hudson County, New Jersey*; Whittemore 1940; NHSA 2016.

Highway before 1916. This sewer line would have been a component within the early sewer system of Hoboken and, as such, is a potentially significant historic resource reflective of the city's nineteenth and early-twentieth century growth and attempts to address the municipal problems accompanied by the city's expansion. Tank TD4-OBS is considered sensitive for historic deposits associated with the late-nineteenth to early-twentieth century brick trunk sewer within Observer Highway. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the trunk sewer line was located at a depth of approximately 7.5 to 12 feet below the surface. Therefore, sewer deposits within the tank site are anticipated at depths greater than seven feet below the surface.

Tank TD4-OBS is also considered sensitive for transportation-related deposits associated with the NHCR elevated trolley line and elevated platforms. Archaeological deposits associated with the trolley line would most likely consist of foundational piers or supports for the elevated track line and for the elevated platforms. Such deposits would be anticipated at depths less than eight feet below the surface.

TD8-GAR (Garden Street between Observer Highway and Newark Avenue) (Plate 31)

Proposed Tank TD8-GAR will be located on the western frontage of Garden Street to the north of its intersection with Observer Highway. The proposed tank will be located in the public ROW and includes the paved road surface and the adjacent cement sidewalk and ornamental tree plantings. The tank would be located to the immediate east of an apartment building with an attached parking garage; an alleyway is located to the immediate north. Utilities within the vicinity of the proposed tank site include a manhole and road signs.

The tank will measure approximately 11 feet in length and 5 feet in width. The tank will have an overall depth of five feet below the surface. Installation of the tank will require excavation to a depth of approximately 7.67 feet below the surface. The limit of disturbance associated with Tank TD4-OBS is approximately 55 square feet to an approximate depth of 7.67 feet. This limit of disturbance encompasses the approximate footprint of the tank. Current design plans do not include staging areas or any other areas of disturbance associated with the tank installation.

Historical Development

The 1844 U.S. Coastal Survey map indicates that TD8-GAR was located in undeveloped meadowlands to the east of the Hoboken Creek (see Figure 30). Dripps 1855 map of the area indicates that the tank site and the southern portion of Garden Street were underwater (see Figure 10). G.M. Hopkins & Co.'s 1873 map indicates that Garden Street had been proposed to its intersection with Ferry Street (see Figure 36). The tank site was located to the immediate east of a parcel associated with the Hoboken Land and Improvement Company and Others. There was no development within the immediate vicinity of the tank site. Speilmann and Brush's 1880 map indicates that the tank site was in a portion of the city which was either previously underwater or in meadowlands adjacent to water (see Figure 15). The 1880 map also indicates that a sewer line had been laid down within Garden Street from Ferry Street to 11th Street by 1880. Bailey and Ward's 1881 map of Hoboken indicates Garden Street had yet to be fully extended to Ferry Street.. Nevertheless development had occurred along the eastern and western frontages of



Plate 31: Location of TD8-GAR, Garden Street North of Observer Highway. View North. (ZE 5/23/2016).

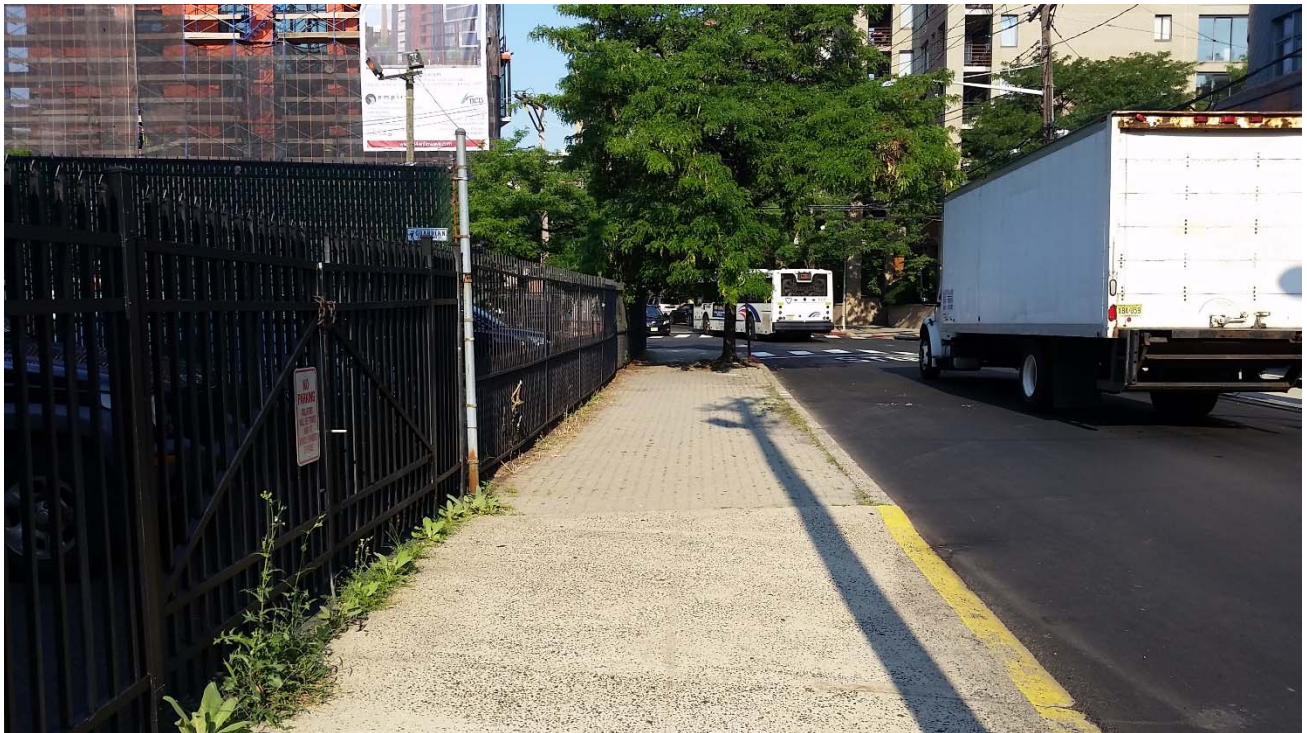


Plate 32: Location of T1-NEW, Newark Avenue and Willow Avenue. View West. (ZE 5/23/2016).

Garden Street including a building associated with the NHCR Offices, Stables, and Car Elevator. However, no structures were located in the immediate vicinity of the tank site.⁷²³

G.M. Hopkins & Co.'s 1909 map indicates that a six-inch pipeline was located within the Garden Street roadbed (see Figure 37). A row of brick apartment buildings had developed to the immediate west of the proposed tank site. There is no indication of any other development within the vicinity of the tank site. There appeared to be little changes to the immediate vicinity of the tank site by 1923.⁷²⁴ The As-Built plans indicate that a circular brick sewer line had been installed within Garden Street between Observer Highway and 2nd Street by 1940.⁷²⁵

By 1979, the apartment buildings previously located to the north of the tank site had been removed. By 1988, the cleared parcels had been developed into a playground and adjacent parking area. Between 2004 and 2006, the current building was erected adjacent to Tank TD8-GAR.⁷²⁶

Summary and Conclusions

The earliest development within the vicinity of Tank TD8-GAR appears to have been the extension of Garden Street in the late-nineteenth century and the extension of a sewer line within the roadbed of Garden Street by 1880. Utility information from NHSA indicates that a brick sewer line was installed within the southern portion of Garden Street prior to 1916. Residential apartment development occurred to the north of the tank site during the early to mid-twentieth century. These early developments were replaced by an apartment complex in the early 2000s.

As previously discussed, Dewberry has conducted a series of soil borings to the south, southeast, and southwest of the tank site (see Appendix D). The soil borings to the south of Tank TD8-GAR contained approximately ten feet of overlying fill deposits. These deposits were underlain by a black organic silt with a trace of reeds/fibers which extended to a depth of 25 to 30 feet below the surface. The organic layer was underlain by sequential layers of brown, reddish brown, and gray sand. Peat deposits were observed within the organic layer of two of the nearby soil borings. These deposits were uncovered at a depth of 25 to 26.5 feet below the surface and at a depth of 29.5 to 30.5 feet below the surface.

The soil borings to the south and southeast of the tank site suggest the presence of a black organic silt deposit beneath the overlying fill. This organic deposit extends to a depth of 25 to 30 feet below the surface and may contain discontinuous peat lenses. The presence of peat within some of the soil borings suggests that there may have been past environmental diversification within this portion of the meadowlands. Such diversification may have provided an attractive environment for prehistoric exploitation and/or settlement. In addition, this tank site is located in near proximity to both the Ahasimus and the Hoboken creeks and was in a relatively level historic topographic situation. The presence of a potentially stable buried ground surface alongside the favorable environmental conditions, further suggests that this area may have provided an attractive setting for prehistoric occupation. Given the relative

⁷²³ US Coastal Survey 1844; G.M. Hopkins & Co. 1873; Spielmann and Brush 1880; Hoboken Common Council 1869-1871.

⁷²⁴ G.M. Hopkins & Co. 1909; G.M. Hopkins & Co. 1923.

⁷²⁵ Whittemore 1940.

⁷²⁶ Sanborn Library, LLC 1937-2006; NETR 1931-2013.

proximity of Tank TD8-GAR to these southern soil borings and the relatively favorable environmental conditions, the tank site is considered potentially sensitive for prehistoric deposits within the organic silt deposit from a depth of approximately 10 to 30 feet below the surface, particularly from 25 to 30 feet below the surface where peat deposits were observed.

Historic development of Tank TD8-GAR consisted of the extension of Garden Street in the late-nineteenth century and the late-nineteenth installation of a sewer line within the Garden Street roadbed. The As-Built plans indicate that a circular brick sewer line had been installed with Garden Street. Additional data provided by the NHSA suggests that a brick sewer line was installed within Garden Street before 1916. The Garden Street sewer line would have been a component within the early sewer system of Hoboken and, as such, is a potentially significant historic resource reflective of the city's nineteenth and early-twentieth century growth and attempts to address the municipal problems accompanied by the city's expansion. Tank TD8-GAR is considered sensitive for historic deposits associated with the late-nineteenth century sewer. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the Garden Street sewer line was located approximately four to seven feet below the surface. Therefore, sewer deposits within the tank site are anticipated at depths greater than four feet below the surface. As there was no other historic development within the tank site, the site is not considered sensitive for any additional historic resources.

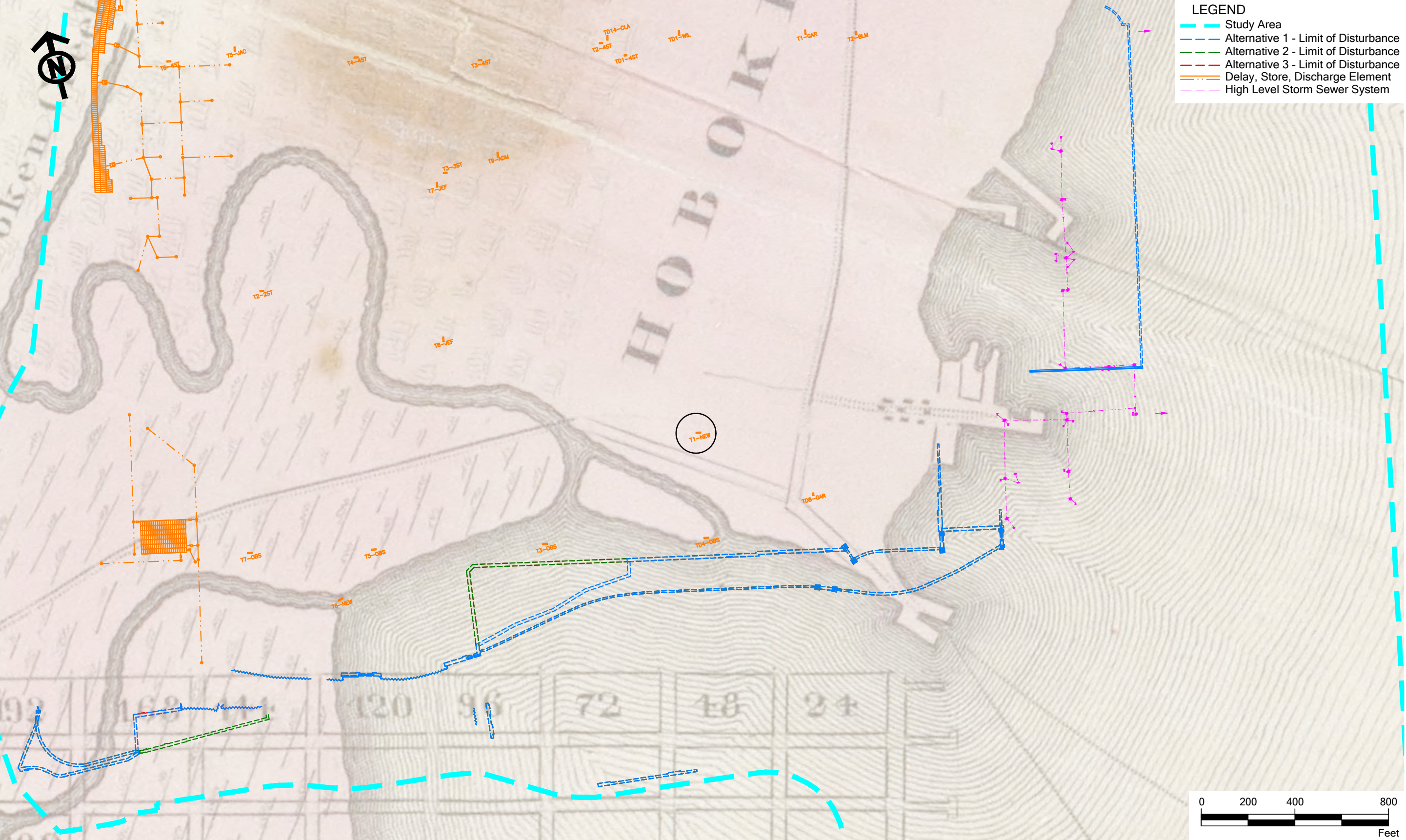
T1-NEW (Newark Avenue and Willow Street) (Plate 32)

Proposed Tank T1-NEW will be located on the southern frontage of Newark Avenue to the east of its intersection with Willow Street. The proposed tank will be located in the public ROW and includes the paved road surface and the adjacent brick cobblestone sidewalk. The tank would be located to the immediate west of an asphalt paved parking surface. Utilities within the vicinity of the proposed tank site include a drainage grate, a manhole, and road signs.

The tank will measure approximately 20 feet in length and 5 feet in width. The tank will have an overall depth of six feet below the surface. Installation of the tank will require excavation to a depth of approximately 8.67 feet below the surface. The limit of disturbance associated with Tank T1-NEW is approximately 100 square feet to an approximate depth of 8.67 feet. This limit of disturbance encompasses the approximate footprint of the tank. Current design plans do not include staging areas or any other areas of disturbance associated with the tank installation.

Historical Development

The earliest historic development within the vicinity of T1-NEW was the late-eighteenth century to early-nineteenth century Newark Turnpike. The Newark Turnpike is depicted on Burr's 1832 map of the region (Figure 69). The tank site would have been located in the vicinity of the bend in the roadway. This segment of the turnpike was also located at a conjunction point along the southern portion of the Hoboken Creek. Undeveloped meadowlands were also located to the immediate west of the tank site. The 1844 Coastal Survey map situates the tank site within the Newark Turnpike to the immediate west of the Hoboken Creek. G.M. Hopkins & Co.'s 1873 map indicates that Willow Street had been proposed to its intersection with Ferry Street (see Figure 36). Development appears to have



occurred to the immediate east of the tank site. Structures associated with Joseph Harrison and H.M. Smith were located at the southeast corner of Willow Street and Newark Street. Spielmann and Brush's 1880 map indicates that the tank site was in meadowlands to the immediate south of the Hoboken Creek (see Figure 15). The 1880 map also indicates that a sewer line had been installed within Willow Street from Newark Street to 12th Street by 1880.⁷²⁷

G.M. Hopkins & Co.'s 1909 map indicates that a 12-inch pipeline and a sewer line were located within the Willow Street and Newark Avenue roadbeds in the immediate vicinity of the tank site. Several frame buildings had developed immediately east of the proposed tank site. There is no indication of any other development within the vicinity of T1-NEW (see Figure 39). There appeared to be little changes to the immediate vicinity of the tank site by 1923.⁷²⁸ The 1940 As-Builts indicate that a wooden box sewer was located within Newark Avenue in the vicinity of the tank site. A brick egg-shaped sewer was located within Willow Avenue from Observer Highway to 2nd Street.⁷²⁹

Commercial and residential buildings were located to the immediate east of the tank site throughout the early to mid-twentieth century. By 1951, a carpenter's shop was located at the southeast corner of Willow Street and Newark Avenue. By 1979, an office and shop were located at this corner; a mill works was situated to the immediate south. Between 1979 and 1987, the lots to the east of the tank site had been cleared and converted into a paved parking surface.⁷³⁰

Summary and Conclusions

The earliest development within the vicinity of Tank T1-NEW was the late-eighteenth to early-nineteenth century Newark Turnpike. During the mid to late-nineteenth century, Willow Street was extended to Ferry Street. Sewer lines were installed within Willow Street and Newark Avenue by 1880. Utility information from NHTSA indicates that a brick sewer line was installed within Willow Street prior to 1916. Commercial and residential development occurred to the east of the tank site during the early to mid-twentieth century.

Dewberry previously excavated a soil boring, GW-10, approximately 125 feet to the southeast of Tank T1-NEW (see Appendix D). The profile within GW-10 consisted of approximately eight feet of fill deposits which were underlain by black clay. The black clay/clayey silt extended to a depth of 14 feet below the surface and was underlain by a dark gray clay. The boring was terminated at a depth of 20 feet below the surface within the dark gray clay matrix. In light of a previous geomorphological analysis of a portion of the historic Hoboken meadowlands, the uniform clay matrix within Boring GW-10 from 8 to at least 20 feet below the surface suggests that this area may contain a deep uniform clay matrix associated with the historic meadows. Such a matrix has been interpreted as indicative of a lack of past environmental diversification creating a setting unattractive for prehistoric settlement and/or occupation. Given the profile exhibited by GW-10 and its proximity to the tank site, and the past geomorphological analysis of a meadow profile, Tank T1-NEW is considered to possess little to no prehistoric archaeological sensitivity.

⁷²⁷ Burr 1832; US Coastal Survey 1844; G.M. Hopkins & Co. 1873; Spielmann and Brush 1880.

⁷²⁸ G.M. Hopkins & Co. 1909; G.M. Hopkins & Co. 1923.

⁷²⁹ Whittemore 1940.

⁷³⁰ Sanborn Library, LLC 1937-2006; NETR 1931-2013.

Historic development within Tank T1-NEW consisted of the late-eighteenth to early-nineteenth century turnpike to Newark and mid to late-nineteenth century sewer installation. Current Newark Avenue appears to follow the route of the historic turnpike. It is unclear to what extent past urbanization and utility development may have impacted remnants of the historic turnpike. Thus, Tank T1-NEW is considered sensitive for historic deposits associated with the Newark Turnpike. Deposits associated with the historic road might include wood planks and other features which enabled the roadway to extend over the meadows. Such deposits would predate filling activities within the area suggesting that any archaeological remains would most likely be found at depths greater than ten feet below the surface.

The historic research and available utility information indicates that a wooden box sewer was installed within Newark Avenue and an egg-shaped brick sewer line was installed within Willow Avenue in the vicinity of Tank T1-NEW. Both sewer lines were installed in the late-nineteenth to early-twentieth century. Given the technological forms of both the Newark Avenue and the Willow Avenue sewer lines and their early date of installation, each would have been a component within the early sewer system of Hoboken and, as such, is a potentially significant historic resource reflective of the city's nineteenth and early-twentieth century growth and attempts to address the municipal problems accompanied by the city's expansion. Tank T1-NEW is considered sensitive for historic deposits associated with the late-nineteenth century sewer lines on Newark Avenue and Willow Avenue. Archaeological deposits associated with the sewer might include the sewer line, a builder's trench associated with utility installation, and/or wood planks and other support features for the pipe. The As-Built plans indicate that the sewer lines were located approximately 2.5 to 8.5 feet below the surface. Therefore, sewer deposits within the tank site are anticipated at depths greater than 2.5 feet below the surface.

T8-JEF (Jefferson Street between 1st and 2nd streets) (Plate 33)

Proposed Tank T8-JEF will be located on the eastern frontage of Jefferson Street between its intersection with 1st and 2nd streets. The proposed tank will be located in the public ROW and includes the paved road surface and the adjacent cement sidewalk and ornamental tree plantings. The tank would be located to the immediate west of the Jerry Molloy Youth Center. Utilities within the vicinity of the proposed tank site include a fire hydrant, traffic signs, and wooden utility poles.

The tank will measure approximately 20 feet in length and 5 feet in width. The tank will have an overall depth of 4.5 feet below the surface. Installation of the tank will require excavation to a depth of approximately 7.17 feet below the surface. The limit of disturbance associated with Tank TD4-OBS is approximately 100 square feet to an approximate depth of 7.17 feet. This limit of disturbance encompasses the approximate footprint of the tank. Current design plans do not include staging areas or any other areas of disturbance associated with the tank installation.

Historical Development

The 1844 U.S. Coastal Survey map indicates that T8-JEF was located in undeveloped meadowlands to the north of the Newark Turnpike and south of the Hoboken Creek (see Figure 30). G.M. Hopkins & Co.'s 1873 map indicates that Jefferson Street had been proposed and most likely established to its intersection with Newark Street (see Figure 35). Development had occurred along the eastern frontage of Jefferson Street between Newark and 1st



Plate 33: Location of T8-JEF, East Side of Jefferson Street North of 1st Street. View Southeast. (DVS 3/24/2016).

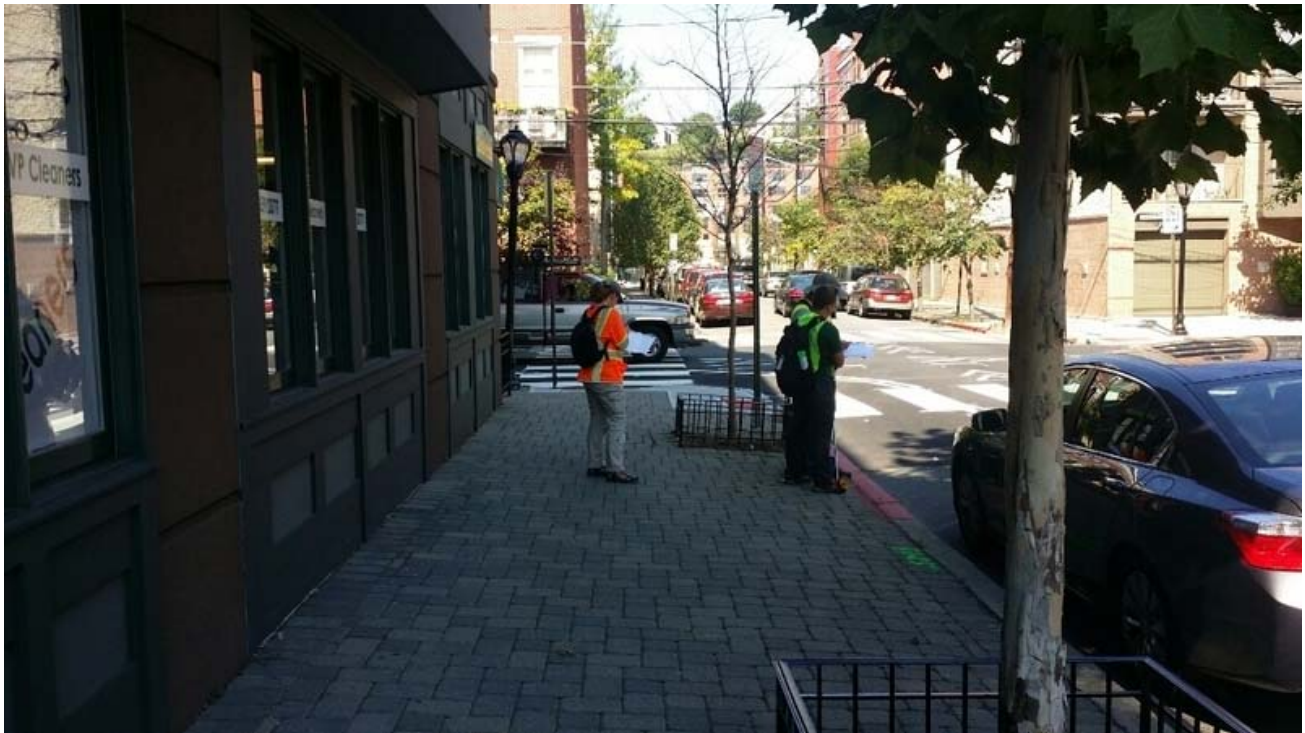


Plate 34: Location of T2-2ST, South Side of 2nd Street, east of Jackson Street. View West. (ZE 5/23/2016).