AECOM Imagine it. Delivered.

South Battery Park City Resiliency Project

Environmental Impact Statement
Draft Phase 1A Archaeological Documentary Study Report

Battery Park City Authority

AECOM Project Number: 60579231

March 2021
Revised January 2022

Table of Contents

Tables

Figures (under separate cover)

Appendix

Executive Summary

Battery Park City Authority (BPCA), the lead agency for the South Battery Park City Resiliency (SBPCR) Project, has prepared a Draft Environmental Impact Statement (DEIS) for this proposed resiliency project in the Battery Park City neighborhood of Lower Manhattan. The DEIS addresses the requirements of the New York State Environmental Quality Review (SEQR) and the City Environmental Quality Review (CEQR) processes. The Proposed Action is subject to SEQR, as mandated in 6 NYCRR Part 617, and will follow the technical guidelines outlined in the *2020 CEQR Technical Manual* ("*CEQR Technical Manual*").

The Project's primary goal is to improve the resiliency of a portion of Lower Manhattan through integrated flood risk measures. This Project represents one part of the Lower Manhattan Coastal Resiliency (LMCR) Master Plan. The Project Area plays an important role in the overall flood risk reduction for Lower Manhattan because Lower Manhattan's lowest existing contours and elevations for coastal surge inundation are located at the north and south ends of Battery Park City.

The Project Area boundary for the flood alignment spans from First Place and the Museum of Jewish Heritage, through Robert F. Wagner Park (Wagner Park), across Pier A Plaza, and then along the north side of the Battery Bikeway in Battery Park (The Battery) to higher ground near the intersection of Battery Place and State Street.

AECOM, on behalf of BPCA, prepared a letter and information package to initiate consultation for the SBPCR Project under Section 106, SEQRA, and the New York City Environmental Quality Review (CEQR) processes. The consultation package was sent to the New York State Office of Parks, Recreation and Historic Preservation (SHPO) and the New York City Landmarks Preservation Commission (LPC) on March 22, 2020 for their review and guidance on next steps in the consultation process.

AECOM opined that the ground disturbing actions associated with Battery Park City, The Museum of Jewish Heritage and Wagner Park would have no effect on archaeological resources because they were constructed on 20th Century landfill with no archaeological potential. AECOM also opined that Pier A Plaza, The Battery, and the interior drainage improvement locations along the Hudson River Greenway/West Street may possess archaeological potential for encountering historic period resources.

Both review agencies concurred with the opinion that the three above mentioned portions of the SBPCR Project Area may possess archaeological potential and requested that a Phase IA archaeological documentary study be prepared to further research the three locations and develop a sensitivity assessment (Appendix A).

At the time of initial SHPO and LPC consultation in March 2020, construction of two interceptor gates and control buildings above Battery Place were the preferred method of addressing interior drainage improvements in this portion of the Project Area, working with the proposed flood alignment. However, in Spring 2021, the NYCDEP informed the BPCA and AECOM that the interceptor gates and control buildings were no longer the preferred solution, and requested the development of an alternate system to preclude coastal surge from entering the Project Area. As a result of this request, the Near Surface

Isolation System (NSI) was developed, which relies on specific improvements/adaptations to the existing subsurface infrastructure in the corridor above Battery Place, and works along with the flood alignment to protect the Project Area (**Figures 4 and 7**).

In compliance with AECOM's initial recommendations and SHPO and LPC concurrence, the Archaeological APE for this Phase IA survey was defined as the footprint of the flood alignment elements and associated project actions that will create subsurface disturbance across areas that have the potential to contain archaeological resources. The archaeology APE has been divided into three sections. These sections are Pier A Plaza, the northern portion of The Battery adjacent to Battery Place, and the proposed near surface isolation (NSI) interior drainage improvements locations above Battery Place. The three Archaeological APE sections are depicted on **Figures 5, 6 and 7**.

The Archaeological APE is concerned with direct effects to potential archaeological resources in previously undisturbed or minimally disturbed areas where subsurface disturbance is anticipated to occur as a result of project actions. The APE is composed of two parts: the horizontal APE, which is the footprint of anticipated subsurface disturbance, and the vertical APE, which is the depth to which subsurface disturbance is expected to occur. The anticipated depths of disturbance, or vertical APE, for the flood alignment and its associated project actions vary across the APE, which is a critical factor in the development of the sensitivity assessment. Documented prior subsurface disturbance is also a critical factor, as archaeological resources that have been directly impacted by prior actions are not expected to be intact, or retain stratigraphic integrity, or meet the eligibility criteria for listing in the National Register of Historic Places.

The flood alignment and related project actions across each Archaeological APE section have been assessed for archaeological potential. The results of the Phase IA research and conclusions regarding sensitivity are presented by APE section in the technical report. The following brief synopsis of the archaeological potential within the APE is taken from Chapter 6, Conclusions and Recommendations.

Pier A Plaza:

- The nuisance flood alignment area footprint in Pier A Plaza does not possess archaeological potential.
- The Pier A Plaza excavation/bulkhead improvement locations do not possess archaeological potential.
- The proposed tide gate location in Pier A Plaza does not possess archaeological potential.
- The flip-up deployable gate portion of the flood alignment in Pier A Plaza below the line of West Street and near the west boundary of The Battery possesses moderate potential for encountering the 1857 bulkhead wall. Phase IB archaeological monitoring during construction is recommended for this portion of the Project Area.
- The locations of proposed security measures in Pier A Plaza do not possess archaeological potential.

The Battery:

- There is no archaeological potential along the flip-up deployable gate portion of the flood alignment in The Battery.
- There is no archaeological potential along the proposed security measures locations in The Battery.
- There is no archaeological potential along the proposed fixed exposed floodwall over the Battery Park Underpass location in The Battery.
- There is no archaeological potential at the two isolation valve locations in The Battery, as they will be connected to existing mains which have already created subsurface disturbance.
- There is no archaeological potential along the proposed buried floodwall and earthen berm location in The Battery; prior archaeological testing to depths deeper than anticipated depths of current project did not encounter historic bulkhead or other resources.
- In summary, the proposed project actions in The Battery portion of the Archaeological APE would not impact potential archaeological resources. No further archaeological work is necessary in this portion of the APE.

NSI Interior Drainage Improvements:

Key sewer system components within the project area will require intervention to allow isolation of the streets and combined sewers from the surge driven flows.

The NSI System would consist of the installation of a gate within the existing regulator structures, M9, M8, and M7, which would be closed in a flood event to prevent the storm surge rising through the interceptor line from reaching the street level. In addition, four interceptor manholes (MH) along West Street between Battery Place and Albany Street would be pressure-proofed and retrofitted to receive a cover that can be sealed shut and locked during a flood event to resist the pressure resulting from the surge rising through the interceptor line and the piping connecting the manholes to the interceptor. It will also be necessary to pressure-proof and retrofit the existing sanitary emergency overflow chamber that is connected to the existing sanitary connector sewer chamber at MH #3.

It is anticipated that the extent of construction activities necessary to meet these project goals will be limited to the horizontal and vertical footprints of the original installation construction. However, a three-foot buffer surrounding each element is proposed as the construction footprint for the purposes of evaluating archaeological sensitivity.

It is likely that the historic bulkheads (1857 and/or 1871 bulkheads) lie fairly intact beneath the Hudson River Greenway and/or present-day West Street. There is also potential for encountering maritime infrastructure remains such as the substantial bases of piers, wharves, and/or associated buildings that fronted on the earlier bulkheads. The historic bulkheads in this area held the landfill in place and connected the man-made land with the original shore.

Given that the NSI System components are existing infrastructure connected to the South Interceptor Main, most, if not all, of this portion of the Archaeological APE has previously been extensively disturbed, effectively eliminating the potential for encountering intact archaeological resources. One exception to

this conclusion may be along the existing connector main between sanitary connection sewer chamber manhole #3 (MH #3) and the sanitary emergency overflow chamber to the west near West Thames Street. The route of the existing connector main would have breached the historic 1857 bulkhead heading west from MH#3 and possibly the 1871 bulkhead at the overflow chamber location when excavated in 2001. Intact portions of each bulkhead would exist to the north and south of the connector main, and the work undertaken to pressure-proof and retrofit the existing sanitary emergency overflow chamber that is connected to the existing sanitary connector sewer chamber at MH #3 may expose these portions of the bulkheads for documentation. Phase IB archaeological monitoring during construction is recommended for this portion of the Project Area.

Preparation of a Phase IB Archaeological Monitoring Plan (Plan) is recommended as the next step in the compliance process for the identification and documentation of archaeological resources. It is anticipated that the Plan would be developed through consultation with BPCA, SHPO, LPC, and other involved state and city agencies. The Plan would identify the sensitive portions of the Archaeological APE to monitor during construction and outline all protocols to be followed.

1 Introduction

Battery Park City Authority (BPCA), the lead agency for the South Battery Park City Resiliency (SBPCR) Project, has prepared a Draft Environmental Impact Statement (DEIS) for this proposed resiliency project in the Battery Park City neighborhood of Lower Manhattan. The DEIS addresses the requirements of the New York State Environmental Quality Review (SEQR) and the City Environmental Quality Review (CEQR) processes. The Proposed Action is subject to SEQR, as mandated in 6 NYCRR Part 617, and will follow the technical guidelines outlined in the 2020 CEQR Technical Manual ("CEQR Technical Manual").

The Project's primary goal is to improve the resiliency of a portion of Lower Manhattan through integrated flood risk measures. This Project represents one part of the Lower Manhattan Coastal Resiliency (LMCR) Master Plan. The Project Area plays an important role in the overall flood risk reduction for Lower Manhattan because Lower Manhattan's lowest existing contours and elevations for coastal surge inundation are located at the north and south ends of Battery Park City.

1.1 Location and Description of Project Area

During Superstorm Sandy, coastal surge inundated Lower Manhattan on its western side through low elevation points near Pier A and in other parts of Battery Park City, damaging, destroying and/or negatively impacting much of Lower Manhattan's critical and civic infrastructure. In an effort to address the vulnerabilities underscored by this event and the prospects of more extensive future storm and flood damage, the SBPCR Project has been developed as an integrated coastal flood risk management program for Battery Park City and other parts of Lower Manhattan (**Figure 1**). This Project represents one part of the Lower Manhattan Coastal Resiliency (LMCR) Master Plan. The Project Area plays an important role in the overall flood risk reduction for Lower Manhattan because Lower Manhattan's lowest existing contours and elevations for coastal surge inundation are located at the north and south ends of Battery Park City.

The Project Area boundary for the flood alignment spans from First Place and the Museum of Jewish Heritage, through Robert F. Wagner Park (Wagner Park), across Pier A Plaza, and then along the north side of the Battery Bikeway in Battery Park (The Battery) to higher ground near the intersection of Battery Place and State Street. Existing conditions are shown in **Figure 2**. The Design Flood Elevation (DFE) and Height of Intervention (HOI) varies across the Project's flood alignment (**Figure 3**). In addition, interior drainage improvements are required at the north and south ends of the project (**Figure 4**).

Battery Park City was planned and developed according to a Master Plan adopted in 1979 and is partially situated upon landfill generated by construction of the World Trade Center between the late 1960s and the early 1970s. Wagner Park was collaboratively designed by landscape architecture firm, Hanna/Olin; architecture firm, Machado and Silvetti; and public garden designer, Lynden Miller. It was built between 1994-1996 and offers panoramic views of the New York Harbor and the Statue of Liberty. It includes a pavilion, consisting of two structures connected by a rooftop walkway, two ornamental gardens, an esplanade, a central lawn, and various pieces of public art. The Museum of Jewish Heritage, which opened in Battery Park City in 1997, is located north of Wagner Park.

1.2 Regulatory Framework

BPCA, as Lead Agency, determined that the proposed SBPCR Project may have a significant impact on the environment and issued a Positive Declaration, requiring the development of an Environmental Impact Statement (EIS). This assessment has been prepared in accordance with SEQRA, Section 14.09 of the New York State Historic Preservation Act, and the CEQR *Technical Manual*.

In addition, because federal permits will be sought from the US Army Corps of Engineers (USACE), the assessment has also been undertaken in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended.

1.3 Description of Proposed Action

This section describes the key project actions across the five SBPCR Project segments, and associated drainage improvement areas. Ownership jurisdiction is also identified, including BPCA, New York City Department of Transportation (NYCDOT), New York City Department of Small Business Services (DSBS), the New York State Department of Transportation (NYSDOT), and the New York City Department of Environmental Protection (NYCDEP). **Figure 3** provides the type of flood alignment infrastructure proposed for each segment and identifies the DFEs.

1.3.1 First Place (BPCA and NYCDOT Jurisdiction)

The flood alignment begins on the north side of First Place, where it is tied into existing landscape elements along the southern lot boundary of the high-rise building at 50 Battery Place. It then extends south fully across First Place as a flip-up deployable gate, which would seal up against permanent columns when deployed (**Figure 3**). The design team does not intend to alter First Place in any significant way beyond the installation of the flip-up deployable gates in the street bed, with columns framing its edges. Grade changes to the street and right-of-way (ROW) would also be avoided. The DFE in this area is 18-feet, and the HOI is 7-feet.

The subsurface disturbance to First Place west of Battery Place would be taking place within the 20th Century landfill placed to construct Battery Park City and is not of archaeological concern.

1.3.2 Museum of Jewish Heritage (BPCA Jurisdiction)

At the south end of First Place, the flood alignment runs west across the north facing landscaped courtyard of the Museum of Jewish Heritage (**Figure 3**). The DFE is 18-feet, and the HOI ranges from 7 to 8-feet. A flip-up deployable is planned for this section of the alignment maintaining visual and physical access to the Museum and connecting to the flip-up deployable gate that spans First Place.

The alignment then extends south along the west side of the Museum. This portion of the flood alignment is composed of free-standing floodwalls that would be integrated into terraced landscape planters. The top of the floodwall would be constructed of flood-proof glass, set within a metal frame. The floodwall

continues around the western perimeter of the Museum, until the alignment connects with Wagner Park. Flip-up deployable gates would be used to maintain egress at the existing fire exit doors.

The subsurface disturbance created by the flood alignment components surrounding the Museum would be taking place within the 20th Century landfill placed to construct Battery Park City and is not of archaeological concern.

1.3.3 Wagner Park (BPCA Jurisdiction)

At its point of connection into Wagner Park, the free-standing floodwall associated with the Museum segment would connect to a buried floodwall (**Figure 3**). The DFE for this portion of the flood alignment is 19.8-feet, and the HOI is 7.8 to 9.8-feet. To meet projected DFEs for coastal surge, the park would be elevated 10 to 12-feet, and a buried floodwall would be constructed beneath the raised park, maximizing the amount of protected open space, while maintaining views to the waterfront. At the connection between Wagner Park and Pier A Plaza, the flood alignment would be resurfaced and exposed as a short segment of free-standing wall where it would meet the flip-up deployable gates being used through Pier A Plaza.

The subsurface disturbances across Wagner Park and the northern edge of the Pier A inlet would be taking place within the 20th Century landfill placed to construct Battery Park City and are not of archaeological concern.

1.3.4 Pier A Plaza (BPCA, DSBS and EDC Jurisdiction)

Pier A Plaza was constructed on landfill. However, the installation of the flood alignment, nuisance flooding alignment and site security components across Pier A Plaza have the potential to impact 19th Century historic piers, wharves, slips, and landfill retaining structures. These historic structures were filled during the 19th Century in association with the construction of the National Register-eligible Hudson River Bulkhead, and further filled during the 20th Century to enable construction of Battery Park City.

Flood Alignment

Pier A Plaza is the lowest elevation in the Project Area (**Figure 3**). The DFE in this area would be 18.5-feet, and the HOI would be approximately 8.5 to 11.5-feet. Flip-up deployable gates, sealing up against new permanent columns when deployed, would be utilized as the flood alignment crosses the newly raised Pier A Plaza. The plaza would allow for direct and universal access to the Pier A Harbor House, as well as maintaining the bicycle connection from The Battery to the Hudson River Greenway, outside the plaza.

The flood alignment across Pier A Plaza consists of a short section of free-standing floodwall and flip-up deployable gates. This would require the installation of approximately 516 linear feet of steel piles and battered steel piles to a depth of about 40-feet across Pier A Plaza to support the flood alignment. In addition, a seepage barrier would be installed utilizing jet grouting at an estimated depth of 20-feet.

Nuisance Flood Alignment

In order to address the greater flood vulnerability of the lower lying portions of Pier A Plaza that would be subject to daily tidal flooding in the future, the northern section of the plaza would be raised by approximately 4-feet, thereby reducing the required height of the flip-up deployables. In addition, the two-level plaza design would allow NYC's Battery Coastal Resilience Project, which traverses The Battery along the water's edge, to tie into the SBPCR Project. The Battery Coastal Resilience Project would be implemented by New York City Economic Development Corporation (NYCEDC) on behalf of NYC Parks, and would consist of rebuilding The Battery wharf to an elevation intended to address tidal flooding impacts associated with projected sea level rise. The tie-in point is being designed for future sea level rise and is depicted on **Figure 3** as the nuisance flooding alignment in Pier A Plaza.

Additional excavation will be required in the footprint of Pier A Plaza in association with the nuisance flooding alignment. An area along the existing bulkhead at Pier A inlet, from the flood alignment on the north to Pier A on the south, will be modified. The design plans call for the excavation and removal of the fill along the bulkhead to approximately 2-feet below existing grade to relieve pressure on the bulkhead and replace the excavated material with lightweight fill. The existing guardrail on the bulkhead will be removed and replaced. For the footprint of Pier A Plaza (to the east of the bulkhead excavation area, to The Battery), the plans indicate there will be general ground disturbance due to new work, such as removal of existing pavement and subgrade, and some specific excavations for light pole footings and stair footings (**Figures 4 and 5**).

Inlet Improvements

Pier A inlet, the body of water between Pier A and the southeast border of Wagner Park, will be modified as part of the SBPCR Project. Portions of the existing seawall on the north side of Pier A inlet will be removed. A new section of retaining wall/seawall will be constructed between Pier A inlet and the proposed flood alignment. The shorelines of the Pier A inlet would be converted into a living shoreline with intertidal, supratidal, and upland plantings, tide pools, the daylighting formerly closed structures, and the creation of a light penetrable deck for wildlife viewing and educational purposes. These actions are not of archaeological concern, as the inlet and its existing rip-rap seawall were constructed in landfill dating to the time of Battery Park City construction. The inlet is not part of the Archaeological APE (**Figures 4 and 5**).

Interior Drainage Upgrades

A tide gate would be installed at combined sewer overflow (CSO) NCM-070 in Pier A Plaza, to the southeast of Pier A (**Figures 4 and 5**). The CSO is an 84-inch line, running roughly north-south. The tide gate would be located within 250-feet from the existing discharge point, and measure approximately 20-feet by 20-feet. It is anticipated that the installation of the tide gate would not create ground disturbance in previously undisturbed soils **(Figures 4 and 5**).

Site Security Measures

To protect against accidental or intentional vehicle breaches of the pedestrian plaza, physical site security measures are planned for the northern perimeter of the Pier A Plaza, adjacent to the flood alignment. A

40-inch-high barrier is proposed along the southern sidewalk of Battery Place running from the end of the southern allée of trees in Wagner Park eastward along the northern line of Pier A Plaza, then continuing to run eastward into The Battery (**Figure 5**). This security barrier is to be supplemented with bollards at stairs and access points as needed. The exposed floodwall above the Battery Park Underpass is also anticipated to serve as a site security measure. Subsurface disturbances to 4-feet below grade are anticipated to facilitate construction of the bollards and 40-inch wall.

1.3.5 The Battery (NYC Parks Jurisdiction)

It is noted that the flood alignment across the northern portion of The Battery traverses multiple infrastructure corridors which have extensively disturbed the soils within their routes. It is also noted that the flood alignment traverses multiple historic battery and bulkhead lines which may retain integrity and could potentially be impacted by SBPCR Project actions.

Flood Alignment

As the flood alignment continues east out of Pier A Plaza, it extends into the Battery Bikeway on the north side of The Battery. In this segment, the DFE ranges from 18.5-feet down to 15-feet, and the HOI ranges from 9.5-feet to 0-feet (Figure 3). The flood alignment is comprised of a combination of flip-up deployable gates, exposed floodwall, and buried floodwall beneath a landscaped berm (**Figure 6**). This concept reconfigures the existing Battery Bikeway and requires the relocation of the Peter Caesar Alberti Marker (1958; rededicated 1985). The monument is currently situated along the south side of the Battery Place sidewalk. This monument would be relocated as close to the current location as possible to be consistent with the NYC Park's Monuments Plan.

Although the grades in this portion of the Project Area are being elevated to meet DFEs, the circulation, landscape architecture, use of the bikeway, and a landscaped public park edge would remain. As the flood alignment continues east towards State Street, which is on naturally higher ground, the DFEs start to descend, affected by existing contours and increased distance from the Hudson River shoreline. Once the flood alignment reaches the high point in the easternmost section of the Project Area, which naturally meets the DFE, it terminates (Figure 3). The design of the flood alignment that transitions from Pier A Plaza through the northern side of The Battery had to account for a range of existing and complex subsurface infrastructure conditions. These include The Battery Park Underpass of the FDR Drive, the Brooklyn Battery Tunnel, MTA subway lines for the #1 train, the Bowling Green Subway Station for the #4/5 subway line, as well as other subsurface utilities.

The flood alignment across the northern portion of The Battery from west to east consists of an exposed concrete floodwall over the Battery Park Underpass, a flip-up deployable gate, a partially exposed wall, and a buried floodwall beneath a landscaped berm (**Figure 6**). This section of flood alignment would require the installation of approximately 1,065 linear feet of steel piles and approximately 1,065 linear feet of battered steel piles to an estimated depth of 40-feet to support the flip-up deployable gates. No piles would be driven for the section of exposed concrete floodwall over the Battery Park Underpass. A seepage barrier would be installed on the west side of the underpass, entailing an excavation of

approximately 10-feet below grade. A seepage barrier would be installed on the east side of the underpass entailing an excavation of approximately 15-feet below grade.

Continuing eastward, the flood alignment employs a buried floodwall under a landscaped berm, which will require excavation to at least 4-feet below current grade. The construction of the earthen berm, which will be approximately 60-feet wide extending north and south of the flood alignment, will likely require the disturbance of 2- to 4-feet below current grade for its entire footprint. The reconfigured Battery Bikeway lanes will be 6-feet wide and located on either side of the berm (**Figure 6**). In addition, replacement tree plantings will involve ground disturbance of approximately 3-feet below current grade in various locations along the reconfigured bikeway.

Interior Drainage Upgrades

Two isolation valves would be installed in The Battery. One valve would be installed at the storm drain that collects runoff from The Battery, approximately 50-feet east of the Battery Park Underpass alignment. A sanitary sewer isolation valve would be installed just north of The Battery comfort station. The valves would require an excavation area of approximately 4-feet by 4-feet and be connected to their respective existing mains. These improvements are not anticipated to create new ground disturbance in previously undisturbed soils (**Figures 4 and 6**).

Site Security Measures

Review of the design documents has shown that site security measures are planned for the northern portion of The Battery, continuing the line of bollards and 40-inch high wall proposed for the northern line of Pier A Plaza. As noted above, the bollards and 40-inch wall proceeding eastward from Pier A Plaza continue past the fixed exposed floodwall over the Battery Park Underpass into The Battery. Eastward of the fixed floodwall, additional sections of 40-inch high wall to replace a section of existing Battery wall north of the Battery Bikeway are proposed, as the existing wall does not meet the site security requirements (**Figure 6**). The bollards and the 40-inch wall are anticipated to require subsurface disturbances to 4-feet below grade.

1.3.6 Interior Drainage Improvements (BPCA, NYSDOT, NYCDOT, and NYCDEP Jurisdiction)

Near Surface Isolation System (NSI)

The NSI System is designed to preclude surge from entering the protected area through the drainage system and handle concurrent rainfall. Key sewer system components within the project area would require intervention to allow isolation of the streets and combined sewers from the surge driven flows. The NSI System would involve pressure-proofing and replacing various near-surface sewer system elements connected to the existing South Interceptor main that runs north-south through this portion of the Project Area (**Figure 7**). The NSI System improvements are necessary because the interceptor also serves adjacent areas that will remain unprotected from coastal flooding in the near term.

The NSI System would consist of the installation of a gate within the existing regulator structures, M9, M8, and M7, which would be closed in a flood event to prevent the storm surge rising through the interceptor line from reaching the street level. In addition, four interceptor manholes (MH) along West Street between Battery Place and Albany Street would be pressure-proofed and retrofitted to receive a cover that can be sealed shut and locked during a flood event to resist the pressure resulting from the surge rising through the interceptor line and the piping connecting the manholes to the interceptor. It will also be necessary to pressure-proof and retrofit the existing sanitary emergency overflow chamber that is connected to the existing sanitary connector sewer chamber at MH #3.

Other Interior Drainage Improvements

Tide gates would be installed at two existing municipal separate storm sewer system (MS4) overflows:

- Newtown Creek Wastewater Treatment Plant Manhattan Side (NCM)-634 (First Place)
- NCM-628 (Rector Street).

A tide gate would also be installed at combined sewer overflow (CSO) NCM-070 (Pier A Plaza). This gate is described above in Subchapter 1.3.4. It is anticipated that the installation of tide gates would not create ground disturbance in undisturbed soils (**Figures 4 and 5**).

An isolation valve would also be installed at the storm drain that collects runoff from The Battery. A sanitary sewer isolation valve would be installed north of The Battery comfort station. These valves are described above in Subchapter 1.3.5. These improvements are not anticipated to create new ground disturbance in undisturbed soils (**Figures 4 and 6**).

1.4 Consultation History

AECOM, on behalf of BPCA, prepared a letter and information package to initiate consultation for the SBPCR Project under Section 106, SEQRA, and CEQR. The consultation package was sent to SHPO and LPC on March 22, 2020 for their review and guidance on next steps in the consultation process.

AECOM opined that the ground disturbing actions associated with the key project actions associated with Battery Park City, The Museum of Jewish Heritage and Wagner Park would have no effect on archaeological resources because they were constructed on 20th-century landfill with no archaeological potential. AECOM also opined that Pier A Plaza, The Battery, and interior drainage improvement areas north of Battery Place along the Hudson River Greenway/West Street did possess archaeological potential for historic period resources.

LPC responded on March 30, 2020 as follows: “The LPC concurs with the recommendations of AECOM in a letter dated March 22, 2020 to the NYSHPO that the following project areas may contain potentially significant archaeological resources: Pier A Plaza, the northern portion of The Battery adjacent to Battery Place, and the two proposed locations of the interceptor gate chambers and associated control buildings possess archaeological potential. Therefore, the LPC recommends that an archaeological documentary

study be completed to further assess this potential in compliance with the *Guidelines for Archaeological Work in New York City*, 2018." (**Appendix A**).

SHPO responded on April 23, 2020 as follows: "SHPO requests that a Phase IA archaeological background and sensitivity assessment report be prepared for this project. We concur that the First Place, Wagner Park, and Jewish Museum portions of the project area are not archaeologically sensitive. SHPO concurs with the proposed Area of Potential Effect." (**Appendix A**).

As noted above in the Executive Summary, the NYCDEP requested that an alternative to the interceptor gates and control buildings be developed to work along with the flood alignment to preclude any coastal surge from entering the Project Area. The NSI System was developed to accomplish this project goal and the footprint of the associated excavation is considered the APE for purposes of this assessment. Implementation of the NSI System will create far less subsurface disturbance because it is utilizing existing infrastructure, which has already impacted subsurface soils.

1.5 Phase IA Survey: Archaeological Area of Potential Effect

Archaeological resources are subject to direct effects caused by subsurface disturbances to previously undisturbed, or minimally disturbed soils associated with the execution of project actions. The Archaeological Area of Potential Effect (APE) includes two components: the horizontal APE, which is the footprint of proposed ground disturbance; and the vertical APE, which is considered as the depth to which the proposed ground disturbance is anticipated to extend.

In compliance with AECOM's initial recommendations and concurrence of SHPO and LPC with these recommendations, the Archaeological APE for this Phase IA survey is the footprint of the flood alignment elements and associated project actions that will create subsurface disturbance across areas that have the potential to contain archaeological resources. The archaeology APE has been divided into three sections. These sections are Pier A Plaza, the northern portion of The Battery adjacent to Battery Place, and the proposed locations for the NSI System interior drainage improvements above Battery Place. The three APE sections are depicted on **Figures 5, 6 and 7**.

1.6 Objectives and General Methodology

The main objectives of the Phase IA archaeological assessment are to determine the potential for encountering intact, potentially National Register-eligible archaeological resources that would be impacted by proposed Project Action, and to determine the extent of prior subsurface disturbances to the Project Area.

The assessment is developed through the review of previously identified archaeological sites on and in the vicinity of the APE to determine if previously unidentified archaeological sites in similar settings could be expected to be encountered within the APE, and through the development of a project site disturbance characterization that takes into account the extent of prior subsurface ground disturbance that has already directly impacted the APE. In general, archaeological resources that have been directly impacted

by prior actions are not expected to be intact, or retain stratigraphic integrity, or meet the eligibility criteria for listing in the National Register.

The completion of this Phase IA assessment involved archival, documentary, and cartographic research, a visual inspection of the project corridor, and analysis of all collected information.

2 Environmental Background

2.1 Geology

Manhattan Island lies within the Manhattan Hills subdivision of the New England Upland Physiographic Province. The Manhattan Hills, which include Manhattan and most of Westchester County, are low in elevation and developed on complex ancient rocks (Thompson 1977). More specifically, New York City lies at the extreme southerly tip of the Manhattan Prong, a northeast trending, deeply eroded sequence of metamorphosed rock that widens northeastward into New England (Mergeurian and Sanders 1991:5). The bedrock underlying Manhattan Island includes the Fordham Gneiss, Lowerre Quartzite, Inwood Marble and various schistose rocks formally included in the Manhattan Schist (Merguerian and Sanders 1991:15).

The surface of Manhattan Island was impacted by multiple glaciations including the Kansan, Illinoian, and Wisconsin. These events scoured, covered and eroded the land surface as they advanced and retreated. During the glacial periods, the amount of water that was locked up by the glaciers caused world-wide sea level to drop ca. 400-feet, essentially exposing Manhattan and much of the New York Metropolitan Area as dry land.

Before the final retreat of the Wisconsin ice sheet at the close of the Pleistocene Epoch, ca. 12,500 years before present (BP), the melting ice formed a number of lakes in the East, Hudson, and Hackensack Rivers, created by dams formed of ice and glacial moraines. Much of Manhattan Island was submerged beneath glacial Lake Flushing. Glacial Lake Flushing drained as melting continued and erosion breached the moraine dams. The release of meltwater due to the glacial retreat resulted in the worldwide rise of sea level from ca. 400-feet below current levels during the Late Pleistocene to about 10-feet below current levels between 4,000- and 2,600-years BP during the Holocene Epoch (Raber et al. 1984:10 in HPI 2007:4). This rapid rise of sea level during the Holocene has been named the Flandrian submergence (Mergeurian and Sanders 1991:53).

2.2 Topography

Precontact topography of Manhattan Island would have included high and low hills, many watercourses and their valleys, coves, inlets, coastal and interior swamps, tidal marshes, and rocky coastal and beach areas. The island would have been for the most part forested, with wetland vegetation occurring in marginal areas bordering swampy tracts and marshes. The understory would have included brushy vegetation, bushes, and brambles. The 1865 Viele Map, Sanitary & Topographical Map of the City and Island of New York depicts the original Manhattan shoreline and topographic features of the Project Area prior to landfilling efforts, with the street grid superimposed (**Figure 8**). This map indicates that most of the Project Area is made land.

Historic maps produced by the Department of Docks indicate that the high-water mark (maximum extent of water at high tide) along the original shoreline was located along the eastern side of Greenwich Street in the vicinity of present-day Battery Place, and the low-water mark (level of water extent at low tide) was

located approximately midway between Greenwich and Washington Streets. Both the high and low water marks run through the eastern portion of The Battery, confirming that most of the Project Area has been created through landfilling activities (**Figure 21**).

Native American trails have been identified across the island, some connecting Lower Manhattan settlements and then continuing northward toward the settlements in the interior. These trails have been identified and mapped by Reginald Pelham Bolton in his 1920 monograph, *Indian Paths in the Great Metropolis Across the Five Boroughs*. The Native American trails would have followed the high ground, skirted obstructions, and utilized easily fordable locations to cross watercourses. Many of these trails would subsequently be used by European settlers as some of the first roadways on the island.

The fast land or upland Project Area vicinity was not known as a place where permanent Precontact settlements or villages had been established. According to Reginald Pelham Bolton, “The narrow space and the rugged character of the lower part of the Island of Manhattan lent itself but poorly to the support of any considerable population, except in its trading facilities.” (Bolton 1922:41). It is likely that the Native American groups that had established settlements on other parts of Manhattan Island utilized the rocky Hudson River shore for the exploitation of the abundant marine resources available, such as shellfish.

“The southern extremity of the Island of Manhattan was known to the natives as Kapsee, which name was applied to the rocky upland and also to the rock islets off its shore. The extreme end of this tract, which was later named “ Schreyers Hoek," was a point extending south of Pearl street and Whitehall street, bounded on its shore-line by our present State Street, the curved portion of which has preserved for our observation the outline of the ancient promontory. This point formed on its east side a small cove, somewhat protected from the tides that swirled around the end of the island.” (Bolton 1922:51).

2.3 Existing Conditions

The surface of present-day Manhattan Island is characterized by low hills and is surrounded by estuaries and tidal straits. Historic development has altered much of the Precontact topography of the island, as forests were cut, swamps were filled, hills were leveled, streams were culverted or moved, and the shorelines were extended out into the rivers through land making efforts. As noted above, prior to the time of European colonization, most of the Project Area was part of the Hudson River. Intentional bulkheading and land making episodes beginning in the 17th century extended the shoreline by hundreds of feet by the early decades of the 20th century. The landfilling activities associated with the construction of Battery Park City beginning during the 1960s and continuing until the present time has again altered the Hudson River shoreline.

The Project Area is located within a dense urban neighborhood along a highly utilized waterfront, including the Esplanade, Wagner Park, the Museum of Jewish Heritage, playgrounds, a dedicated bicycle path, the Hudson River Promenade, other recreational spaces, historic and contemporary commercial buildings, and the contemporary high-rise residential and commercial buildings comprising 92-acre Battery Park City.

3 Survey Methods and Research Design

The completion of this Phase IA assessment to determine the archaeological potential within the Project Area involved a visual inspection of the project corridor, the synthesis of information derived from previous archaeological survey work completed for the project area and vicinity, additional archival, documentary, and cartographic research, communications with persons knowledgeable about the history of the area, and analysis of all collected information.

3.1 Visual Inspection

The visual inspection of the Project Area was conducted to determine existing conditions. Emphasis was placed on noting evidence of prior subsurface disturbance within the archaeology APE for the project. Project maps and design plans were utilized during the inspection and photographs were taken of existing conditions.

3.2 Synthesis of Previous Work

The Archaeological APE was subsequently researched in the SHPO's CRIS. The search area for historic archaeological resources surrounding the project area was a 0.25-mile-radius, and the search area for prehistoric (Precontact) archaeological resources surrounding the project area was a 0.5-mile-radius.

3.2.1 Previously Identified Sites

According to the CRIS search, a total of 16 historic archaeological sites lie within a 0.25-mile-radius of the SBPCR Project. No Precontact archaeological sites have been documented within a 0.5-mile-radius of the Project Area. The historic site forms were downloaded from the CRIS website for future reference.

The sites are identified and described in Subchapter 5.1 and Table 5-1 lists the sites, their locations relative to the project area, and relevant temporal and cultural attributes.

3.2.2 Previously Conducted Archaeological Surveys

According to the CRIS search, multiple cultural resources surveys have been previously conducted for part of, or in proximity to, the SBPCR Project. Some of the surveys were initially Phase IA archaeological documentary studies concerned with major projects such as the New South Ferry Terminal Project for the MTA and the Reconstruction of Battery Park and the Perimeter Bikeway Project for the NYC Department of Parks and Recreation. Both projects included a portion of the Project Area, and the Phase IA survey results led to additional archaeological survey work. Some of the other previously conducted surveys were concerned with block-specific commercial and residential development projects. Many of the Phase IA studies recommended Phase IB subsurface testing, archaeological monitoring during construction, and soil boring surveys.

All relevant reports were downloaded from the CRIS website or from the LPC archive of archaeological reports for reference. Relevant survey reports completed for portions of the current archaeology APE and its immediate vicinity are summarized in Subchapter 5.2.

3.3 Background Research

The current SBPCR Project Phase IA study is largely focused on the research and results of previously conducted surveys. Additional project specific research was conducted at the following repositories/online resources:

- CRIS search for archaeological resources and survey reports
- LPC archive of archaeological reports
- New York Public Library Digital Archive
- The Library of Congress Online Map Archive
- David Rumsey Online Map Archive
- The New-York Historical Society
- Other Project Specific Online Resources

3.4 Archaeological Sensitivity Evaluation

A major goal of the Phase IA documentary study is to determine the archaeological sensitivity of the APE. As stated in the New York Archaeological Council's (NYAC) *Standards for Cultural Resource Investigations and Curation of Archaeological Collections*, sensitivity assessments should be categorized as low, moderate, or high to reflect "the likelihood that cultural resources are present within the project area" (NYAC 1994:2). The Project Area was basically land underwater until repeated landfilling episodes pushed out the Hudson River shoreline to the extent we see today. However, some of the factors listed below are still relevant when determining the archaeological sensitivity, or potential of the project's three Archaeological APE sections.

According to the NYAC standards, factors to consider during the sensitivity assessment that affect the likelihood that Precontact and historic populations would have occupied a particular area within the APE include:

- The proximity to a permanent potable water source
- The presence of well-drained soils
- The availability of floral and faunal resources for subsistence purposes
- The availability of raw materials

- The documentation of transportation routes
- The density of known Precontact and historic sites documented for the general area
- The extent of documented prior subsurface disturbance within the APE

In consideration of the above listed factors, the Low, Moderate, and High archaeological sensitivity designations may be generally defined as follows:

Low Sensitivity

Areas of low sensitivity include those areas within the APE where the original topography suggests that Precontact sites would not be present (i.e., no potable water source or the presence of tidal marsh or swampy ground); areas where no historic occupation occurred prior to the advent of municipal water and sewer networks; and areas that have seen extensive subsurface disturbances that would preclude the presence of intact archaeological resources.

Moderate Sensitivity

Areas designated as possessing moderate sensitivity are those areas within the APE with topographical features that would suggest Precontact occupation and areas with documented historic activity that have seen some prior subsurface disturbance, but the disturbance was not extensive enough to completely eliminate the possibility for encountering intact archaeological resources.

High Sensitivity

Areas of high sensitivity include those areas within the APE with topographical features that would suggest Precontact occupation and areas with documented historic activity that have seen minimal or no prior subsurface disturbance.

It is noted that areas initially determined to possess a level of archaeological sensitivity based on background literature and cartographic research may in fact be areas proven through additional research to possess no sensitivity based on the extent of documented prior subsurface disturbance.

3.5 Research Design

The primary objective of the Phase IA documentary study is to determine whether potentially National Register-eligible archaeological resources may be located within the project APE.

The goals of the current Phase IA survey are as follows:

- Determine whether the APE was occupied during the precontact and historic periods.
- Chronicle the historic development across the APE.
- Identify categories of potential archaeological resources that may be located within the APE.

- Identify locations of potential archaeological resources that may be located within the APE.
- Document the prior subsurface disturbances that have occurred across the APE and determine whether these disturbances have affected the locations of potential archaeological resources.
- Determine whether additional archaeological work is necessary, either by additional research, Phase IB subsurface testing, or archaeological monitoring during construction.

4 Prehistoric and Historic Contexts

4.1 Prehistoric Context

4.1.1 Introduction

The Precontact period on Manhattan Island and the surrounding area is divided by archaeologists into four basic periods largely based on adaptations to changing environmental conditions reflected in the artifact assemblages associated with each. The basic cultural sequence and chronology for New York State is based on Ritchie (1994 [originally published 1965, revised 1969, 1980]). The basic periods are the Paleo-Indian, the Archaic, the Woodland, and the Contact. The Archaic and Woodland Periods may be further divided chronologically, as shown in Table 4-1. Many archaeologists in the Northeast subscribe to a Transitional Period between the Archaic and Woodland Periods.

Table 4-1: Cultural Sequence and Chronology

Cultural Period	Time Period	Geological Age
Paleo-Indian	Ca. 12,000 - 9,000 BP (Ca. 10,000 - 7,000 BC)	Late Pleistocene
Early Archaic	9,000 - 7,000 BP (7,000 - 5,000 BC)	Early Holocene
Middle Archaic	7,000 - 5,000 BP (5,000 - 3,000 BC)	
Late Archaic	5,000 - 3,000 BP (3,000 - 1,000 BC)	
Early Woodland	3,000 - 1,950 BP (1,000 BC – AD 1)	
Middle Woodland	1,950 - 950 BP (AD 1 - 1000)	
Late Woodland	950 - 450 BP (AD 1000 - 1500)	
Contact	450 - 300 BP (AD 1500-1650)	

The following subsections provide summary information on this chronology organized by the major prehistoric adaptive trends (Paleo-Indian, Archaic, and Woodland) as they pertain to the project vicinity. The Contact period, a period of increasing contact and conflict between the native populations and European settlers, is also briefly summarized below.

4.1.2 Paleo-Indian Period

The Late Pleistocene period in southern New York was characterized by a peri-glacial or boreal environment, dominated by open spruce woodlands and stands of birch, popular, and willow. This was

succeeded in the Early Holocene by closed canopy pine-birch-oak forests. Open woodland provided optimal grazing for fauna such as caribou, musk-oxen, mammoth, and horse, while the advent of closed-canopy forest created habitat for deer and small game. Paleo-Indian peoples in the New York City area would also have been able to exploit food sources such as shellfish along the shoreline. Archaeological evidence suggests that Paleo-Indian peoples were highly mobile hunters and gatherers who lived in small groups and did not maintain permanent settlements.

The distinctive artifact of the Paleo-Indian period is the fluted point, a clearly recognizable spear or projectile point type that is usually identified as having a deep flake or scar chipped vertically along the center section from the base. The diagnostic material culture of the Paleo-Indian period consists largely of projectile points, but also includes smaller numbers of knives, scrapers, flakes, choppers, and pounding tools. These tool kits indicate heavy dependence on hunting, probably of large game, and exploitation of local flint resources.

Of the few Paleo-Indian sites that have been identified in New York City, nearly all have been found on Staten Island. The most important Paleo-Indian sites were identified at Port Mobil. There is no evidence for Paleo-Indian occupation of the SBPCR APE, however, the presence of deeply buried sites, while highly unlikely, cannot be categorically ruled out. As mentioned in above sections, the Project Area would have been exposed dry land when sea levels were 400 feet below current levels as a result of glaciation. These dry areas would be available for exploitation by human populations until glacial meltwater brought the sea levels back to approximately 10 feet below current levels and flooded the Project Area.

4.1.3 Archaic Period

The period ca. 9000 BP saw intense rises in temperatures and drying, lowering water tables and shrinking post-glacial lakes, with the expansion of pines and birches at the expense of deciduous species. Another result of this short-term change, and the retreat of the glaciers in general was rising sea levels. The rising sea levels in turn resulted in the inundation of many former coastal environments. The Early and Middle Archaic environment of coastal Manhattan may have been less favorable to specialized hunting than before but offered a variety of marine resources and small game along the new coastal environment, which included swamps and inland waterways, and in mixed forests, especially along forest margins.

Archaic settlements consisted of small, multi-component sites located on tidal inlets, coves, bays, and freshwater inland ponds and streams. Archaic tool kits indicate that a wider variety of food resources were being systematically exploited than during the Paleo-Indian period. The Archaic period tool kits include plant processing implements and fishing related artifacts. Generalized hunter-gatherers characterize the Archaic period, exploiting not only large game but also a wide variety of fauna such as small mammals and birds and riverine resources.

Archaic period sites do not provide evidence that agriculture was practiced. However, technological innovations, such as the emergence of stone bowls (steatite), evidently of Southeastern derivation, were important pre-adaptive features for the development of agriculture during the Woodland period.

4.1.4 Woodland Period

Important developments of the Woodland period include the practice of agriculture and the emergence of larger social units, including the predecessors of historically recognized tribes. In technological terms, the Early Woodland period is marked by the emergence of pottery, however, additional technological advancements that arose during the Woodland period include smoking pipes, the bow and arrow, and a wide variety of chipped and ground stone artifacts.

Woodland period sites across the region indicate that there was an overall shift toward permanently settled villages and full-time agriculture. However, hunting of both large and small game and exploitation of marine resources continued to provide the bulk of the subsistence base during the period. Woodland sites are often found near lakes, streams, and rivers.

4.1.5 Contact Period

The Late Woodland Period ended with the arrival of the first Europeans during the early-16th century. Giovanni de Verrazano, the Italian born explorer who was sailing under the French flag, reached New York Harbor on April 17, 1524. Eighty-five years later, in 1609, Henry Hudson's voyage in search of the Northeast Passage to the Orient took place, whereupon he re-discovered New York Harbor and the river that now bears his name. Almost immediately thereafter Dutch traders in great numbers began flooding into the area in search of furs and other materials.

Once contact had been established with the Europeans, the Native American way of life was forever changed. The Native Americans quickly began to suffer from the effects of European contact in that disease, alcoholism, and warfare began to decimate the populations of native groups. The Native Americans at first continued to occupy the village sites they had established near water sources. However, as the European settlements grew and subsequently required more land, the conflicts with Native Americans escalated. This was especially prevalent during the 1640s when Director-General Kieft ordered many unprovoked attacks on the native groups.

Peter Stuyvesant replaced Kieft as Director-General in 1647 and the relations between the Native American groups and European colonists were somewhat improved. However, the "Peach War" of 1655 renewed the hostilities between the groups and led to increased violence. The Peach War was precipitated when Attorney General van Dyck shot and killed a Native American woman who was picking peaches in his orchard (Federal Writers' Project 1939). The Peach War hostilities ended in 1657.

4.1.6 Precontact Populations on Manhattan Island

Multiple sites have been identified on Manhattan Island, most of which were located across the upper part of the island in Harlem, Kingsbridge, Spuyten Duyvil, Marble Hill, Fort Tryon, and Inwood. Since many of these sites were discovered and reported by avocational archaeologists during the early-20th century, there is limited temporal and cultural affiliation information available.

There is also limited descriptive historical information available regarding the existing Native American settlements at the time of European contact. Reginald Pelham Bolton, an avocational archaeologist working during the early decades of the 20th Century, compiled much available information and wrote the monograph *New York City in Indian Possession for the Museum of the American Indian*, Heye Foundation in 1920. Bolton wrote in 1920 "The paucity of historical information regarding the aborigines who occupied the Island of Manhattan seems remarkable, in view of its being the earliest point of contact between the white and red races in our vicinity." (Bolton 1920:340).

In describing the Native American groups of Manhattan Island and vicinity, Bolton states, "From the fact that all the nearby islands in East River were owned by the Mareckawick group of the Canarsee, it seems probable that the southerly end of Manhattan may also have been occupied by the Indians of Mareckawick (or Brooklyn), which was much nearer and more accessible than the upper part of the island itself, reached only by a long tramp through a forest trail, or a long cruise over tidal waters." (Bolton 1920:342). Bolton continues to explain this rationale, "The Reckgawawanc Chieftaincy had distinct control and occupancy of the upper half of Manhattan and the westerly half of the Borough of the Bronx…There wasn't any important residential station in the middle part of the island – which coincides with the probability of its separate occupancy at each end, if not its complete division between two chieftaincies." (Bolton 1920:343).

There were two existing settlements in Lower Manhattan at the time of European contact located a considerable distance from the Project Area. Both sites were the locations of Precontact villages, first reported during the early-20th Century. The first, NYS Museum site #4059, also known as Shell Point or Werpoes was located north of City Hall Park and is depicted in CRIS as a very large polygon covering several square blocks. The area around this settlement is said to have been marked by extensive shell heaps, which suggests a settlement of some duration. Limited information is available for this site, which is described in the NYS Museum files as a Native American village and multiple shell middens. According to Bolton (1922), the native place name was noted in a grant from the Dutch government to Augustine Heermans in 1651, which described "the land called Werpoes" containing about 50 acres, extending from the north side of the Kolch Hoek, or the Collect Pond and its adjoining ponds. "According to Tooker, this name should have been more correctly written "Werpos", or "the thicket", a designation which describes the known conditions of the locality, the hillsides around the ponds being covered in bygone times with bushes and blackberry brambles." (Bolton 1922:43).

The second village site, NYS Museum site #4060, was identified by Bolton (1922) as Rechtauck or Rechtanck, and as Nechtanc by Grumet (1981). Bolton, in describing the Native American trails of Lower Manhattan, states that from the area of Bowery and Division Street, a branch pathway led to the neighboring village of Rechtauck or Rechtanck, which was situated on Corlears Hook. Bolton further describes a location near Jefferson Street where a brook fed a fresh water pond located on the block bounded by Jefferson, Henry, Clinton, and Madison Streets, which was likely the only source of fresh water in the area. The name of the village signifies "at the sandy town" or "sandy river" (Bolton 1922:57). This suggests that the village was likely located at Corlears Hook atop the sandy bluffs formerly located along the East River. During the Contact Period the site became a refuge for Native Americans from across the

area during the brutal wars with the Dutch during the 1640s. However, Native Americans who had taken refuge there were massacred during a nighttime attack by Dutch soldiers on the orders of Governor William Kieft in 1643 (Bolton 1922).

4.2 Historic Context

4.2.1 The Battery

Due to its geographic position at the southern tip of Manhattan Island with easy access to New York Harbor and the Hudson River, The Battery can be considered as the place where the history of New York City began. The area's strategic location was recognized by the initial small group of Dutch settlers, who called it Capske Hook (from Kapsee, a Native American term for rocky ledge). Near this point, the colonists of the Dutch West India Company founded the settlement of New Amsterdam in 1625, as part of the land claimed by the Dutch as New Netherland. As the colony grew and its commerce expanded, piers, wharves, and slips rose along the coastline (http://www.nycgovparks.org/parks/battery-park/history).

The Battery has a long development history dating from the 17th century founding of New Amsterdam by the Dutch and the subsequent takeover by the English in 1664. With its fine promenade along the Hudson River shore and magnificent vista of New York Harbor, The Battery became a popular place for New Yorkers to visit during the early-18th Century. Its ultimate development into a public park was made possible by successive episodes of landfilling and bulkhead construction, pushing the shoreline farther and farther out into the river.

Fort Amsterdam-Fort George

The Dutch constructed Fort Amsterdam on the Hudson River shoreline ca. 1626, which was composed of block houses surrounded by cedar palisades. Under Director Peter Minuit (1626-1631) a guardhouse and barracks for the Dutch West India Company soldiers were added. More changes to the fort occurred under Director Wouter van Twiller (1631-1635), who had the fort rebuilt. When completed, it was primarily an earthworks fortification with stone corners, and measured 300-feet long and 250-feet wide (Schenawolf 2020).

Fort Amsterdam apparently went through various stages of disrepair. In 1643, a visiting Jesuit priest noted that the fort's four bastions were constructed of stone with several cannons, but the walls were simply mounds of earth in bad condition. Despite its condition, the fort was the center of the Dutch settlement, was the administrator's residence, and garrison for the West India Company soldiers. Residents of the settlement took refuge within the fort during conflicts with the Native Americans (Schenawolf 2020). **Figure 9**, known as The Castello Plan, depicts the settlement of New Amsterdam in 1660, including Fort Amsterdam. This map indicates that the Battery has been somewhat filled in below the fort by this time, and the grounds include a windmill.

Between 1652 and 1674, the Dutch and English fought three naval wars, battling for supremacy in shipping and trade, which included control over the colony of New Netherland and its settlement of New

Amsterdam. In 1664, the English sent a fleet under the command of Colonel Richard Nicolls (or Nichols) to seize New Netherland, which surrendered without a fight. The English renamed the colony New York, after James, the Duke of York, who had received a charter to the territory from his brother, King Charles II. The Dutch briefly recaptured New Netherlands in 1673, but the colony was retaken by the English the next year.

In 1674, Fort Amsterdam had been renamed Fort James, after the Duke of York. The fort would undergo several name changes in the succeeding decades, reflecting the changes in the English monarchy, including Fort William (1688), the Queen's Fort (after Queen Anne in 1702), and ultimately, Fort George (1714), following the ascent of King George II to the throne.

The first documented episode of bulkhead construction and filling of the shoreline can be dated to 1693, when English Governor Benjamin Fletcher presented his design and plan to build a platform on which to install a battery below Fort James, incorporating the rocky outcrops in the tidal zone of the Hudson River. By 1694, the common council was ready to comply with the Governor's plan by proposing a tax to pay for the proposed battery and stockade "att the point of Rocks under the Fort." (Huey 2006:10).

Starting at the turn of the 18th Century and for the next fifty years, extensive changes took place to the fort and nearby batteries. Of importance to the current study is the "New Stone Battery" built in 1755 that stretched along the Hudson River shore under Fort George, which was intended to protect New York from attack by the French (Huey 2006). **Figure 10** depicts the plan of the City of New York in 1755. **Figure 11** depicts Fort George.

The rumblings of an American Revolution were beginning during the second half of the 18th Century. The riots that ensued in New York following the Stamp Act in November 1765 led the English to spike the cannon on the Battery and also the guns in the artillery yard. The fear was that the rioters would use the cannon to attack the fort. The English were determined to keep New York City under English control. To that end, the English began to restore the spiked cannon at Fort George and the Battery during April 1766 (Huey 2006) (**Figure 12**).

At the onset of the Revolutionary War (1776-1783), Fort George stood immediately above the "Grand Battery", and Whitehall Battery was immediately to the left of the Grand Battery (Huey 2006:19) (**Figure 13**). In late-1775, just prior to the start of the American Revolution, Fort George and the Grand Battery were captured by Patriot forces. In April 1776, General George Washington, Commander of the American forces, began to send troops to New York City in anticipation of an invasion by the English fleet (Schenawolf 2020). The Battery came under fire from two English ships, the HMS Phoenix and the HMS Rose, on July 12, 1776 as they attempted to run up the Hudson River (Roberts 1988). New York City was recaptured by English forces in 1776 and was held by the English throughout the duration of the Revolutionary War. During the seven-year occupation, the English made Fort George and the Grand Battery their headquarters (Roberts 1988).

At the conclusion of the American Revolution, the English evacuated New York City on November 25, 1783. The Americans were then in control of Fort George. There were no further repairs to the fort, nor did the

new American government rename the fort. As the army was drawn down to a fraction of its former size, it was decided that there was no need to retain the fort (Schenawolf 2020).

In 1789, the Common Council approved the funds for "the erection of the Wharf at the Battery." (Huey 2006:20). This construction would require additional landfill and bulkhead construction. The wharf at the battery was to be built out into the Hudson River below the fort and continue along the shoreline to the corner of the Battery at Whitehall Slip (Huey 2006:20). Fort George was torn down by 1790. The debris from its walls and interior buildings was dumped along the Hudson River shore and used as landfill to erect the wharf along the Battery (Schenawolf 2020) (**Figure 14**).

Once Fort George was torn down, the cleared land was designated for the construction of the 1790 Government House. New York City was the capitol of the United States from 1785 to 1790, and the Government House was intended to be the residence for newly elected President George Washington (**Figure 14**). However, before it was completed, the capitol was relocated to Philadelphia (Schenawolf 2020). A 1794 drawing in the collection of the Museum of the City of New York shows a large new building on the site of the former fort, with a single waterside bastion battery mounted with a cannon and a flag flanked on each side by a long quay wall (Huey 2006:20).

During June 1796, a visitor to New York commented "the most agreeable part of the town is in the neighborhood of the battery." He explained further, "when NY was in possession of the English, this battery consisted of two or more tiers of guns, one above the other; but it is now cut down, and affords a most charming walk; and, on a summer's evening, is crowded with people, as it is open to the breezes from the sea, which render it particularly agreeable at that season." (Huey 2006:20). It is interesting to note that The Battery was essentially a park by end of the 18th Century.

Following the relocation of the capitol to Philadelphia, the former fort site, now the Government House, became the state's governor's residence and the home of the American Academy of Arts who leased a portion to the New-York Historical Society. In 1813, the land was sold to the public, and the building was torn down in 1815. The site was developed into residences for wealthy New Yorkers (Schenawolf 2020; www.revolutionarywarjournal.com/fort-george).

New York Custom House

By the turn of the 20th Century, a new location for the New York Custom House was being sought, and the site of former Fort George was chosen. The residents were paid for their land and the demolition of buildings began in 1900. By 1902, the cornerstone of the new building had been laid. The chosen name for the new building was the Alexander Hamilton Custom House, as Hamilton had been the first U.S. Treasurer. The building was designed by renowned architect Cass Gilbert and completed in 1905. The building remained the custom house until 1973, when the service was moved. After twenty years, during which time most of the building was unoccupied, it became the George Gustav Heye Center, previously known as the Museum of the American Indian (Schenawolf 2020).

West Battery-Castle Clinton-Castle Garden

War ravaged Europe at the end of the 18th Century and the newly formed United States was becoming more involved. Due to trading partners with both the British and French, the U.S. was drawn into the dispute. When British ships started confiscating American ships, hostilities arose between the two nations. As relations with Great Britain were becoming increasingly strained prior to the War of 1812 (1812-1815), it became apparent that new fortifications were needed to guard American city harbors. In 1798, cannons were temporarily placed in hastily constructed defenses at the old Battery in Lower Manhattan. Four forts were planned to guard New York Harbor: Castle Williams on Governor's Island; Fort Wood on Bedloe's Island (today's Liberty Island); Fort Gibson on Ellis Island; and on Manhattan near former Fort George, the southwest battery, or West Battery (Schenawolf 2020).

West Battery was built during 1808-1811 to strengthen New York's sea defenses. The circular brownstone fort was built on a manmade island of stone in the Hudson River, approximately 200-feet off the "west head" of the Battery (**Figure 14**). The island fort was connected to The Battery by a wooden causeway and drawbridge (Milman and Weible 1984; 1985). The fort was armed with 28 cannons, 32-pounders which could lob a cannon ball a mile and a half distance. The first commanding officer, General Joseph Bloomfield, established his headquarters of all New York forts at the West Battery. Throughout the War of 1812 (1812-1815), the West Battery never fired a shot upon its enemies (Schenawolf 2020).

West Battery experienced five periods of use serving very different functions from its completion in 1811 until 1946. These periods are briefly discussed below.

Military Installation 1811-1823

The fort was known as the West Battery until 1815, when the name was changed to Castle Clinton, after New York's wartime mayor, Dewitt Clinton. Castle Clinton was ceded to the city in 1823. (http://www.nycgovparks.org/parks/battery-park/history).

Entertainment & Reception Center 1823-1854

Castle Clinton became Castle Garden when it was ceded to the city in 1823 and was transformed into an entertainment and reception center. It continued to function as such until 1854. Physical changes to the building were made to accommodate a theater, galleries, seating, etc. (Millman and Weible 1983; 1984). Physical changes were also continuing at the Battery, as landfilling efforts behind a new bulkhead were ongoing **(Figure 15**).

Immigration Depot 1855-1890

Castle Garden was transformed into an Immigration Center in 1855 and continued in that role until 1890. The landfilling and bulkhead construction project planned in 1848 and begun in 1853 was ongoing during the tenure of the immigration center.

Aquarium 1896-1941

In 1896, the building was turned into the New York Aquarium, which necessitated extensive interior changes such as the installation of multiple tanks. The building continued to house the aquarium until 1941 (Millman and Weible 1983; 1984).

National Monument and National Park Service Site 1946-present

In 1946, the structure was designated as a National Monument. In 1950, the structure was officially placed under the jurisdiction of the National Park Service (NPS). The NPS restored the structure to its original function as a military installation (1811-1823) during the 1960s and 1970s (Millman and Weible 1983; 1984).

20th Century Transportation Improvements

The eastern portion of The Battery was impacted by cut and cover subway tunnel construction beginning in 1904 by the modern IRT #4/5 line running through The Battery along State Street to Brooklyn, and the turn-around loop for IRT #5 trains terminating at the Bowling Green Station (LBG 2003:27).

In 1918, the IRT #1/9 line was configured through The Battery. The IRT #1/9 line ran on the existing (outer) loop constructed in 1904 for the IRT #4/5 line, and an inner loop was built for the IRT #5 trains as the turn-around track (LBG 2003:27).

The primarily north-south Brooklyn Battery Tunnel corridor cut through the middle of The Battery, and the partial cut and cover construction created massive disturbance along its route. The tunnel was begun in 1940 but construction was delayed by shortages caused by World War II (1941-1945). Construction resumed following the end of the war and was completed in 1950.

Another large transportation project that caused extensive impacts to The Battery was the construction of the Battery Park Underpass linking the West Side Highway with the FDR drive. This project, completed ca. 1950, involved cut and cover excavation across the length of The Battery.

Following the completion of the Brooklyn Battery Tunnel and the Battery Park Underpass, the entire Battery was completely re-landscaped and expanded by two acres. Subsequent alterations include the addition of Peter Minuit Plaza in 1955 and the dedication of the East Coast Memorial in 1963 (http://www.nycgovparks.org/parks/battery-park/history).

The most recent transportation project to impact The Battery was the completion of the New South Ferry Terminal alignment. The project was approximately 1,800 feet in length, measured along a line beginning at the intersection of Greenwich Street and Battery Place, running through the eastern portion of The Battery to Peter Minuit Plaza, and terminating immediately north of the Whitehall Ferry Terminal. The construction of the tunnels and station involved mostly cut and cover techniques through The Battery and Peter Minuit Plaza (LBG 2003:1).

4.2.2 Pier A and Pier A Plaza

Pier A is the oldest extant pier in New York City. It is also the only pier to be identified by a letter, as all the piers along the Hudson River to the north and along the East River are identified by a number. Pier A is a National Register-listed cultural resource (90NR00767; June 27, 1975) significant in areas of architecture and commerce between 1800-1899 and was designated a New York City Landmark (LP-00918) on July 12, 1977.

Pier A is located at the northern end of Battery Park at the Hudson River, extends 300-feet into New York Harbor, and features a 70-foot tall clock tower (https://bpca.ny.gov/community/walk-talk-the-history-of-pier-a/). The pier was expanded in 1900 and again in 1919, when a clock was installed in the Pier's tower as a memorial to 116,000 U.S. servicemen who passed away during World War I. The clock, a ship's clock, was donated by philanthropist Daniel G. Reid, a founder of United States Steel. It is said to be the first World War I memorial erected in the United States (https://gothamtogo.com/a-look-back-at-the-renovation-of-historic-pier-a-in-battery-park-city/; NYC LPC 1977).

Pier A was constructed during 1884 to 1886 by the New York City Department of Docks for its headquarters, with use shared by the New York City Police Department harbor patrol until the 1950s when it was taken over by the New York City Fire Department's marine division until 1992 (https://forgotten-ny.com/2014/08/pier-a-battery-park/). Post-1992, the Pier was left vacant in anticipation of its development into a public space. The redevelopment/renovation was delayed for many years, until the Battery Park City Authority took on the project in 2008, and opened it to the public in late 2014 (https://bpca.ny.gov/community/walk-talk-the-history-of-pier-a/).

The restoration of the three-story structure included the addition of a bar, restaurant, visitors center and public promenade, Pier A Plaza. Known today as the Pier A Harbor House, its address is 22 Battery Place, and it was opened to the public in November 2014 (https://gothamtogo.com/a-look-back-at-the-renovation-of-historic-pier-a-in-battery-park-city/).

4.2.3 Battery Park City

During the early 1960s, the decline in shipping activities along the Manhattan shore of the Hudson River and the growing importance of the financial industry in Lower Manhattan led to interest in revitalizing the waterfront. The waterfront piers that had lined the shoreline for decades were in various stages of deterioration. The eventual result of this revitalization goal was the construction of Battery Park City, a 92-acre development that was constructed on land reclaimed from the Hudson River from The Battery to Chambers Street, including Stuyvesant High School north of Chambers Street. In 1968, the Battery Park City Authority (BPCA) was created under the laws of the State of New York for the purpose of developing, constructing, maintaining, and operating the planned development of Battery Park City as a mixed commercial and residential community. A Master Plan for the development was presented in 1969, and the construction proceeded slowly.

The footprint of Battery Park City was created by land reclamation on the Hudson River using over 3 million cubic yards of soil and rock excavated during the construction of the World Trade Center, the New York City Water Tunnel, and certain other construction projects, as well as from sand dredged from New York Harbor off Staten Island (https://urbanareas.net/info/resources/neighborhoods-manhattan/battery-park-city-manhattanhistory/). By 1976, the 92-acre landfill on which Battery Park City rests was completed although the 1970's financial crisis delayed further development until late in 1979 (http://bpcparks.org/about-us/who-we-are/history/).

By the end of the 1970s, BPCA commissioned architects and planners to conceive a new master plan, which was completed in 1979. The 1979 Master Plan emphasized its connection to the waterfront open spaces in this new Manhattan neighborhood and accented the close relationship between the water and the land. The deteriorating piers along the shoreline north of Pier A were removed to facilitate the placement of the landfill and to provide a stable base for the construction of the buildings and parks (Mueser Rutledge Wentworth & Johnston 1971).

By 1980, Battery Park City's first residential development, Gateway Plaza, was under construction. As construction continued throughout the 1980s, Rector Park, a portion of the Esplanade, and the World Financial Center were completed and operational by the end of 1988. The 1990's witnessed an explosion of growth in Battery Park City, as schools, residential buildings, commercial buildings, parks, and public art installations filled in the once vacant landfill. Today, Battery Park City is home to over 13,000 residents and thousands more workers each day (http://bpcparks.org/about-us/who-we-are/history/).

Wagner Park, the approximately 3.3-acre parcel at the southern end of Battery Park City was built between 1994 and 1996. The concept for the park went through several iterations prior to adoption of the current configuration. The Museum of Jewish Heritage, which opened in Battery Park City in 1997, is located north of Wagner Park.

4.2.4 West Side Highway

The elevated West Side Highway was constructed on pillars over West Street and 12th Avenue and connected downtown Manhattan with the Henry Hudson Parkway uptown as part of the system of freeways created by New York's master builder Robert Moses. New York's West Side Highway was the first elevated highway to be built, with construction beginning in the 1920s. It was originally named the Julius Miller Highway for Manhattan's borough president at the time it opened (https://forgotten-ny.com/2015/08/west-side-highway/). It was also the first elevated highway to collapse. It was in such deteriorated condition that it had to be closed permanently in the 1970s (http://www.preservenet.com/freeways/FreewaysWestSide.html).

The stretch of highway between Canal St. and 72nd St. was built between 1929 and 1936, connecting at 72nd St. with Moses's Henry Hudson Parkway. Beginning in 1938, the highway was extended south of Canal St. to connect with the Battery, but construction of this stretch was interrupted by World War II (1941-1945) and was not completed until 1948. Finally, in 1950, the highway was connected with the new Brooklyn Battery Tunnel (http://www.preservenet.com/freeways/FreewaysWestSide.html).

In December 1973, a cement truck traveling to repair another part of the West Side Highway caused a 60-foot section of northbound roadway near Gansevoort St. to collapse. The highway was closed between the Battery and 57th St. while engineers determined whether this section could be repaired. The New York City Department of Transportation decided that the repair cost was too high and began planning the demolition of the elevated West Side Highway. Demolition of the elevated structure began in 1977 and was completed in 1989 (http://www.preservenet.com/freeways/FreewaysWestSide.html.

Before demolition was completed, a proposal for a new West Side Highway sunk under parkland along the same route, called Westway, was defeated primarily due to environmental concerns (https://forgotten-ny.com/2015/08/west-side-highway/).

In 1986, the city hired Volmer Associates to develop alternatives for the West Side Highway Replacement Project. Their four alternatives each involved improving the existing roadway and adding a park along the Hudson River. This project simply improved the existing West St., which had been the street under the elevated West Side Highway, by adding 19-foot wide landscaped medians, a bicycle path and landscaped park along the river, and urban design elements that emphasize the continuity of this street and park, such as decorative streetlights and granite paving details (http://www.preservenet.com/freeways/FreewaysWestSide.html).

4.2.5 Hudson River Park

By the 1980s, Manhattan's Hudson River waterfront was largely a derelict landscape of barbed wire, crumbling piers, parking lots and decaying warehouses. Following the sharp declines in maritime commerce in Manhattan and the defeat of the Westway plan to replace the West Side Highway, New Yorkers were presented with an opportunity to reimagine the city's post-industrial waterfront (https://hudsonriverpark.org/the-park/waterfront-transformation/). Today, there is a park, pedestrian promenade, and bicycle path along the Hudson River on Manhattan's west side on land that was once under the elevated West Side Highway.

Hudson River Park was created in 1998 by a New York State law as a partnership between New York State and New York City. The same law created the Hudson River Park Trust as a New York State public benefit corporation to design, construct, operate and maintain the 4-mile-long Park, with Board Members appointed by the Governor, Mayor and Manhattan Borough President. The Park runs from the Battery to West 59th Street (https://hudsonriverpark.org/visit/plan-your-visit/).

The park was built starting in the 1990s in conjunction with the construction of the surface-level West Side Highway. Work was completed over several stages through the 2010s. Along its 4-mile corridor, Hudson River Park connects many other recreational sites and landmarks (https://www.google.com/search?q=history+of+hudson+river+park).

5 Results of Survey

5.1 Previously Identified Sites

According to the CRIS search, a total of 16 historic archaeological sites lie within the 0.25-mile search radius around the Project Area. No previously identified prehistoric sites are located within the 0.5-mile search radius. As depicted in CRIS, the entire project area lies within an Area of Archaeological Sensitivity. **Table 5-1** presents the known archaeological sites.

Multiple sites were identified in the 18th Century landfill of the present-day Battery. These include the ca. 1755 18th Century Battery Wall, which was encountered in four locations within The Battery, along the New South Ferry Terminal Project alignment. Four sections of cut sandstone and schist stone wall were encountered, the shallowest at depths ranging from 4.4 feet to 8.2 feet below the present ground surface. Mid-18th Century artifacts were recovered in association. These remains have been determined National Register-eligible. Near the South Ferry Terminal location, a log cribbing and fill structure was identified during the archaeological work associated with the project. The fill associated with the cribbing yielded historic artifacts dating from the 17th to 19th centuries. The National Register status of this feature remains undetermined.

The archaeological survey for The Battery Playscape project identified a section of cut stone wall in the southeast portion of The Battery, west of Peter Minuit Place. This feature is likely another section of the 18th Century Battery Wall. Artifacts recovered in association included Dutch yellow brick and 17th - 18th Century ceramic sherds.

Sites that were excavated in land created through 17th Century landfill activities include 7 Hanover Square and the 64 Pearl Street. The 7 Hanover Square Site is unique in New York City in terms of its use of 17th Century landfill and building construction. The homes fronting Pearl Street were constructed during the late-17th Century on what was then the East River shoreline. The stone foundations served the dual purpose of anchoring the landfill and supporting the structures. These foundation walls were encountered during the excavation of the site and it was possible to identify the owners of the structures through the background research on the water lot grants purchased. The excavation yielded thousands of artifacts dating from the late-17th, 18th and 19th Century from multiple features and deposits encountered.

The 64 Pearl Street site is located on the Fraunces Tavern block across Pearl Street from the excavated fast-land Stadt Huys site, discussed below. The 1980 basement excavations yielded artifacts dating to the last quarter of the 17th Century.

Previously identified sites within the search radius include 18th and 19th Century infrastructure remains. The Whitehall Slip Site, located at the foot of Whitehall Street at the East River shoreline, dates to 1754 and was filled between 1824 and the 1850s. The slip was constructed of wooden timbers and cobbles and archaeological investigations yielded 18th and 19th Century artifacts. The Whitehall Ferry structure site was located off Whitehall Street and was constructed on cribbing and 18th Century landfill. Later 19th Century construction fill was also encountered. In the northern portion of the SBPCR project area, the Pier 7

Complex was identified at the southern end of West Thames Park, north of West Thames Street. This 19th - 20th Century complex includes a portion of the ca. 1903 Hudson River bulkhead and the ca. 1908 Baltimore & Ohio Railroad Pier 7 concrete foundation and shed. This site has been determined National Register-eligible.

The Hudson River Bulkhead, running from The Battery to 59th Street along the former Hudson River shoreline, is a National Register-eligible resource. Conceived in 1871 when the Department of Docks was established, this predominantly masonry-constructed bulkhead was completed in stages from 1871 to ca. 1960. Most of the construction occurred post-1880, and modifications and repairs have been made to portions of the bulkhead since that time, some of which have affected its integrity. Within the Project Area, south of Harrison Street, intact sections of the bulkhead were buried ca. 1970 behind fill used to create Battery Park City. As such, this portion of the buried bulkhead is an archaeological resource.

Sites that were excavated on fast land include the Stadt Huys Site, now 85 Broad Street, and the Broad Financial Center Site, now 33 Whitehall Street. The excavations on these two sites were mitigation strategies for the respective properties. Today, high-rise buildings occupy the blocks.

The Stadt Huys Site (NYSM #554, bounded by Broad Street, Pearl Street, Coenties Slip and South William Street was the site of the first State House (ca. 1640) under Dutch occupation, and of the adjacent Lovelace Tavern (ca. 1670) under English occupation. Multiple stone foundation wall sections, features and associated deposits dating from the 17th Century through the 19th Century were excavated, yielding hundreds of thousands of artifacts. The project de-mapped one block of Stone Street between Broad Street and Coenties Slip, and this former street alignment is memorialized in the alignment of the present-day 85 Broad Street building lobby.

The Broad Financial Center Site (06101.001282), bounded by Whitehall Street, Pearl Street and Bridge Street was the location of Augustine Heermann's warehouse and several houses during the 17th Century, including that of Dr. Hans Kierstede. The excavations identified foundation walls, the cobblestone warehouse floor and several features in the backyard areas of the former houses dating from the 17th Century through the 19th Century. Four 17th Century structures and six features were identified, and 43,318 artifacts were recovered.

Archaeological sites have also been designated by SHPO that are associated with National Register-listed structures / National Historic Landmarks. These sites include Federal Hall at 26 Wall Street (Site 06101.013876) and Castle Clinton, in Battery Park (Site 06101.000490).

The Liberty Street Pilings Site (06101.018121; NYSM #12321) is located at the median of the intersection of Liberty Street and West Street (Route 9A). The site is in a former commercial pier area that was developed before and after the construction of the Hudson River Bulkhead, adjacent to the former Liberty Street (Communipaw) Ferry Terminal. The site consists of large horizontally oriented square-cut wooden timbers over large round wooden pilings that were driven vertically into mud to support an unidentified former structure. The site is dated ca. 1857-1903.

The WTC Ship (06101.018000) was located on the blocks bounded by Liberty, West (Route 9A), Cedar, Washington, Albany, and Greenwich Streets. This resource was first discovered during archaeological monitoring activities associated with the excavations for the proposed underground WTC Vehicular Security Center covering Blocks 54 and 56, adjacent to the south side of the WTC site. Curved timbers of the hull of what proved to be the stern of a buried ship were uncovered in 2010. Shortly after discovery, the SHPO determined the remains to be eligible for listing in the National Register of Historic Places. Data recovery excavation and removal of the remains was completed in 2010 as mitigation of unavoidable adverse effect to this resource. Remnants of the bow were uncovered in the eastern portion of the project site in 2011. These remains were also documented and removed in 2011.

Subsequent research and analysis have revealed the ship to be a Hudson River Style Sloop, most likely constructed during the late 1770s to 1780s. The ship was incorporated as landfill during the 1790s, located in a former slip of the filled in former Hudson River shoreline commercial pier/wharf area. Built for river trade, possibly in Philadelphia, but shipworm analysis revealed that she plied much warmer waters, probably the Caribbean.

Table 5-1: Known Archaeological Sites Within 0.25-Mile Search Radius of Project Area

SHPO/NYSM SITE NUMBER	RESOURCE NAME	RESOURCE TYPE	LOCATION/ ADDRESS	DATE/TIME PERIOD	DESCRIPTION	NATIONAL REGISTER STATUS
06101.08120 NYSM 12322	Pier 7 Complex	Structures	South end of West Thames Park, north of West Thames Street	19th Century Historic	Includes portion of ca. 1903 Hudson River bulkhead, ca. 1908 Pier 7 of Baltimore & Ohio RR concrete foundation and shed	Eligible
06101.013876	Federal Hall Archaeological Site	Potential Site	26 Wall Street	Historic	2005 Phase IB monitoring report by Hartgen Archeological Associates for the NPS for sub-basement foundation repairs encountered 7 features, none of which were determined to be National Register eligible	Tested areas: Not eligible Potential areas: Undetermined
NYSM #554	Stadt Huys Site	Structures	Now 85 Broad Street	17th -19th Century Historic	Site of Dutch State House and English Lovelace Tavern; fast land block	Excavated
NYSM #624	7 Hanover Square Site	Structures	Now 7 Hanover Square	18th Century Historic	Part fast land/ part early landfill block of 18th Century residences	Excavated
06101.001272	64 Pearl Street Site	17th Century Landfill	64 Pearl Street	Late 17th Century Historic	Artifacts dating to the last quarter of the 17th Century	Excavated
06101.001282	Broad Financial Center (Ronson Project Site 33 Whitehall)	17th Century fast land site	Bounded by Pearl, Whitehall and Bridge Streets	17th-19th C Historic Occupations	Four 17th Century structures; 6 features identified; 43,318 artifacts recovered	Excavated

SHPO/NYSM SITE NUMBER	RESOURCE NAME	RESOURCE TYPE	LOCATION/ ADDRESS	DATE/TIME PERIOD	DESCRIPTION	NATIONAL REGISTER STATUS
06101.015768	18th Century Battery Wall	Structure	South Ferry Corridor in Battery Park	Ca. 1730-1789	4 sections of cut sandstone and schist stone wall; mid-18th C artifacts recovered	Eligible
06101.000491	Municipal Ferry Pier/Battery Maritime Building Site	Structure	Bounded by Water, Broad, South and Whitehall Streets	1909	Municipal Ferry	Listed, NHL
06101.015598	Whitehall Slip Site	Structure	Foot of Whitehall Street at shoreline	18th and 19th Century Historic	Created 1754; filled 1824-1850s. Slip composed of wood timbers and cobbles and contained many historic artifacts	Undetermined
06101.013334	Whitehall Ferry	Structure	Off Whitehall Street	18th and 19th Century landfill and cribbing	18th Century landfill; 19th Century construction fill	Undetermined
06101.016196	Log Cribbing & Fill	Structure	Battery Park near South Ferry Terminal	17th-19th C Historic Fill	Log cribbing and stone wall sections and associated historic artifacts from 17th to 19th Centuries	Undetermined
06101.000490	Form Missing – possibly Castle Clinton		In Battery Park adjacent to Castle Clinton			Listed, NHL
No Number	The Battery Playscape	Structure	Southeast portion of Battery Park, west of Peter Minuit Place	Probable section of 18th Century Battery Wall	Artifacts included Dutch yellow brick, 17th-18th Century ceramic sherds	Undetermined
06101.018121 NYSM# 12321	Liberty Street Pilings Site	Structure	At the median of the intersection of Liberty and West (Route 9A) Streets	Ca. 1857-1903	Large horizontal square cut timbers over large round wooden pilings; no artifacts collected. In former	Eligible

SHPO/NYSM SITE NUMBER	RESOURCE NAME	RESOURCE TYPE	LOCATION/ ADDRESS	DATE/TIME PERIOD	DESCRIPTION	NATIONAL REGISTER STATUS
					commercial pier area developed before and after Hudson River bulkhead construction. Adjacent to the Liberty Street (Communipaw) Ferry	
06101.018000	WTC Ship	Hudson River Style Sloop	Bounded by Liberty, West (Route 9A), Cedar, Washington, Albany, and Greenwich Streets	Constructed late-1770s to 1780s; Incorporated as landfill 1790s	Located in former slip of filled former Hudson River shoreline commercial pier/wharf area. Built for river trade, possibly in Philadelphia, but shipworm analysis revealed that she plied much warmer waters, probably the Caribbean	Determined Eligible upon discovery; data recovery excavation completed as mitigation of unavoidable adverse effect
06101.009182	Hudson River Bulkhead	Buried Structure	From The Battery to 59th Street	1871-ca.1960	Three types of construction: quarry-faced ashlar granite walls; pre-cast or cast-in-place concrete walls; and timber cribwork. Masonry bulkheads vary in foundation systems that reflect all the evolutionary stages of about 50 years of Dept. of Docks work. Intact sections south of Harrison Street were buried ca.1970 behind fill used to create Battery Park City.	Eligible

5.2 Previously Conducted Surveys

The Battery has a long development history dating to the 17th Century and the founding of New Amsterdam ca. 1625 by the Dutch, and the subsequent takeover by the English in 1664. The project area portion of The Battery was created through land reclamation efforts partially due to military or defensive concerns of the early settlers. Paul R. Huey, Scientist (Archaeology), now *Emeritus*, of the Bureau of Historic Sites, Division of Historic Preservation in the NYS Office of Parks, Recreation and Historic Preservation, compiled a narrative history of New York City's shoreline fortifications through extensive examination of documents and maps (Huey 2006). This compilation provides a comprehensive account of shoreline alterations and military installations that are located partially within or pass through the Archaeological APE for the SBPCR Project.

The New South Ferry Terminal Project included archaeological surveys from Phase IA through Data Recovery, or Phase 3 excavations. Beginning in 2003, the Louis Berger Group, Inc. prepared a Phase IA archaeological documentary study for the new South Ferry Terminal site, an 1,800-foot linear study area through The Battery. The Phase IA concluded that the terminal site was sensitive for historic archaeological resources, including 17th and 18th Century Dutch and British occupation deposits, 17th and 18th Century Dutch and British military fortifications, and late-19th and early-20th Century transportation elements, such as elevated railway structures and streetcar lines.

The 2003 Phase IA study noted that during the excavation for the Brooklyn-Battery Tunnel, volunteers from the New-York Historical Society identified 19th Century historic artifacts recovered from the fill of Battery Park. A catalogue of the recovered artifacts was found on the Society's Luce Center web page, and a search of the Society's museum records provided a summary of the artifacts from The Battery. During the Brooklyn-Battery Tunnel construction in 1948 through 1950, New-York Historical Society members recovered several intact bottles, 31 ceramic fragments, several bottle-glass, metal, and clay-pipe fragments, and a complete jackknife. Additional artifacts found in The Battery include: the tip to a piling for a pier/wharf between Greenwich and Washington streets, uncovered in 1947; a copper coin, dating to 1734, found in The Battery in 1911; and a cannonball imbedded in cinders, found during subway excavations (Louis Berger Group 2003:31). These artifacts are all housed at the New-York Historical Society.

Extensive archaeological investigations for the New South Ferry Terminal project continued as the project progressed, which resulted in the archaeological monitoring and testing of more than 80 percent of the project area. A final report of the Phase 1, Phase 2, and Phase 3 Data Recovery investigations was prepared by AKRF, URS Corporation, and Linda Stone in 2012. The archaeological investigations identified four truncated segments of the 18th Century battery wall that surrounded Fort George (the site of Fort Amsterdam under Dutch rule), remains of Whitehall Slip, landfill retaining structures such as log cribbing sections, and landfill deposits. It is noted that the segments of the 18th Century battery walls were encountered as shallow as 4.4 feet below ground surface. Human remains were also encountered during the investigations, which may have been associated with a chapel cemetery that was located within Fort George. It is equally possible that these remains were not *in situ* but incorporated into the landfill by alternate means.

A comprehensive history of the development of The Battery was compiled by Joan H. Geismar, Ph.D. in 2010 as part of a Phase IA archaeological assessment survey for the *Reconstruction of Battery Park and Perimeter Bikeway* for the NYC Department of Parks and Recreation, in partnership with the Battery Park Conservancy (Geismar 2010). Research for the Phase IA assessment was focused on three elements of the park's developmental history: military defenses; landfill features; and subsequent construction disturbances. The results of the Phase IA indicated that despite the extensive disturbance that has occurred across this portion of The Battery due to subway tunnel construction and transportation infrastructure projects, archaeological potential for encountering evidence of colonial fortifications and stone bulkheads related to land making episodes persists for areas in which no disturbance has been documented. The Phase IA recommended that an archaeological monitoring plan be developed for those portions of the Battery Bikeway project area that will create ground disturbance to depths greater than 3.5 feet below present ground surface.

During 2011, a Phase IB test pit survey for the Battery Bikeway project was conducted by Joan H. Geismar, Ph.D. for discrete areas in The Battery determined sensitive for archaeological resources through the 2010 Phase IA assessment survey. The vertical APE for the project was 3.5 feet below ground surface, as the project actions were not anticipated to create deep impacts. However, nine trenches were excavated to a maximum depth of 6 feet in discrete portions of the Battery Bikeway project area where prior disturbance could not be documented. Results of the testing revealed 20th Century fill deposits likely associated with utility construction. No significant archaeological resources were encountered in the tested areas, and no further testing was recommended for the proposed project area. The letter report concludes with a caveat regarding any future project impacts at greater depths than the Battery Bikeway project and recommends that an archaeological assessment should be made of any structural features that may be encountered.

During 2018, AKRF, Inc. conducted Phase IB subsurface testing for the Battery Playscape Project at the southern end of The Battery, adjacent to Peter Minuit Plaza. The project involved the rebuilding of the existing playground and comfort station originally constructed during the 1950s. The report, *The Battery Playscape Block 3, Part of Lot 1, Lower Manhattan, New York County, New York, Phase IB Archaeological Survey* was prepared for the Lower Manhattan Development Corporation. The site was determined sensitive for the presence of the Battery Wall, historic landfill, and landfill retaining structures. The testing involved the excavation of nine backhoe trenches to depths of six to seven feet below ground surface across the existing playground area.

Three of the nine trenches excavated encountered large semi-dressed stones likely associated with the Battery Wall. However, in two of the trenches, these stones were disarticulated, as they had been impacted by later construction. They were encountered at 2.5 feet (Trench 1) and 2.5-3.5 feet (Trench 3) below ground surface. In Trench 9 an intact section of dressed stone foundation was encountered at six feet below ground surface. Further investigation of this wall section was halted by ground water infiltration and slumping of the trench walls. However, the location of this wall section in relation to those sections documented during the New South Ferry Terminal Project, strongly suggests that this feature was part of the 18th Century Battery Wall.

The Phase IB report recommended that an archaeological monitoring plan be developed for use during the construction. The plan was to include provision and outline procedure for Data Recovery excavations, should significant resources be encountered.

Phase IA surveys were conducted in proximity to the Project Area during the late 1980s. In 1987, Joan H. Geismar, Ph.D. conducted a documentary study for the proposed Exchange Project at 10 Battery Place, Manhattan. The study was prepared for EEA, Inc. for review by the NYC Public Development Corporation. The project block is the site of the blower building for the Brooklyn-Battery Tunnel, bounded by Battery Place, Greenwich Street, Washington Street, and Morris Street. The proposed project actions included the installation of caissons and piles for foundation construction. The APE for the study included two, 25-foot by 110-foot strips of land on either side of the existing blower building, where foundation construction was proposed.

The research revealed that the project block was land underwater until filling began during the last decade of the 18th Century and continued until ca. 1821. The project block was partially impacted by the construction of the Ninth Avenue elevated railway from South Ferry to Greenwich Street during the 1860s, the IRT subway tunnel ca. 1918, and the approach, exit and blower building of the Brooklyn-Battery Tunnel in 1947. It was also revealed that in 1947, an unrecorded wharf cribbing structure was encountered during excavations for the blower building. The five soil borings conducted were inconclusive for archaeological strata. It is noted that the fill that was brought in to create this block during the late-18th and early-19th centuries was used in the 20th Century to extend The Battery and LaGuardia Airport (Geismar 1987:4).

The Exchange Project APE was determined sensitive for encountering stone retaining walls, wharves, piers, and possibly, shell middens. Archaeological monitoring during foundation construction was recommended. It is not known whether this monitoring was carried out.

5.3 Summary of Development History of the APE

5.3.1 The Battery

The SBPCR Project portion of The Battery was created through land reclamation efforts partially due to military or defense concerns of the early settlement of New York beginning during the 1730s. Paul R. Huey, Scientist (Archaeology), now Emeritus, of the Bureau of Historic Sites, Division of Historic Preservation, in the New York State Office of Parks, Recreation and Historic Preservation compiled a narrative history of New York City's shoreline fortifications through extensive examination of documents and maps (Huey 2006). This compilation provides a comprehensive account of shoreline alterations and military installations within the present-day Battery. One section of the Archaeological APE for the SBPCR Project lies across the northern portion of The Battery, adjacent to Battery Place.

Huey traces fortifications back to 1693, when English Governor Benjamin Fletcher reported to the assembly that he has "designed a platform on which I propose to mount a battery for the defence of this city, which is indeed for the safety of the Province…I have…guns for one tier; I have wrote for more." (Huey 2006:10). Later that year, Governor Fletcher wrote to the Committee of Trade asking for more

artillery and explaining his "design to make a Platforme on the Out most Rocks under the Fort and Erect a battery thereon." The Governor's plan included cutting 86 cords of 12-foot-long stockade posts for the construction of the battery (Huey 2006:10).

By 1694, the common council was ready to comply with the Governor's plan by proposing a tax to pay for the proposed battery and stockade "at the point of Rocks under the Fort." (Huey 2006:10). The plans incorporated natural features such as a "Flat Rock" near the fort. The plan was to extend the area waterward of the fort to create additional land upon which to erect the stockade and battery.

The phrase "rocks under the fort" likely was a reference to the Kapsee (also known as Capsee or Copsey) rocks, which according to Bolton (1922), was the name applied to the rocky upland and also the rocky islets off its shore. The designation Kapsee is of Native American origin and was probably applied to the rocks in the tideway of Manhattan island (Bolton 1922:220). The Lynn maps of 1728, 1730, and 1731 all depict the rocky islets in the Hudson River, immediately west of the battery and bulkhead (**Figure 16**).

Under English rule, the fort was strengthened, and the surrounding bulkhead pushed further out into the Hudson River. By 1756, 92 cannons were installed in the fort. The walls and bastions were all constructed of stone and mortar (Schenawolf 2020).

The following description of mid-18th Century Fort George was taken from pages 12 and 13 of the *1861 New York During the Revolution,* by the Mercantile Library Association: "Fort George embraced three bastions with connecting curtains, extending from Whitehall slip on the south east, to the line of the present Battery place on the north-west. The fort, a rectangular stone work, strengthened with bastions at angles, was elevated on an artificial mound, about fourteen feet in height, which had been thrown up "at an enormous expense;" and its gateway, which fronted "the Bowling Green," was defended by a raveling or covert-port which had been thrown out in front of the fort, toward the city." (Schenawolf 2020) (**Figures 11 through 14**).

Of particular relevance to the current study is the "New Stone Battery" built in 1755 that stretched along the Hudson River shore under Fort George, which was intended to protect New York from attack by the French. The construction of this new battery required a substantial new bulkhead and landfill that pushed the shoreline farther out into the Hudson River. By 1756, 92 cannons were installed in the fort (**Figure 10**). The walls and bastions were all constructed of stone and mortar (Schenawolf 2020).

Regarding the recently constructed New Stone Battery, a visitor reported in 1759, "Along the front of the headland they have constructed on outcrops of rock a wall 12-feet-thick, forming a retrenchment and low rampart to the citadel, in which there are 90 cannon, from 12 to 24 pounders, deployed as a battery. The gun platforms are all large flagstones." (Huey 2006:17). The battery wall incorporated three bastions, with "Flat Rock" located north of the middle bastion (Huey 2006:18) (**Figure 13**). Several sections of this battery wall were identified during the archaeological monitoring and testing conducted in 2003-2006 for the New South Ferry Terminal project and the Battery Playscape project completed in 2018.

There was concern about the conditions of the ordnance at Fort George and the battery, according to the Montresor journals in the collections of the New-York Historical Society. It was reported on April 19, 1766 "The Inhabitants by the Assistance of the ordnance Smith continue drilling the Cannon on the Battery which are scarce worth their trouble in their present situation. The Guns are mostly old and honeycomb, the carriages so rotten as scarce to be able to support the weight of metal, the Platforms so totally out of order as to admit the Trucks of the Carriages nearly to their axles. And the checks of the Embrasures choke 'em on every occasion, as the Log work is decayed and ill tired." (Huey 2006:18) (**Figure 12**).

The low rampart wall landward of the new stone battery was apparently held in place by wooden facing. In 1768 there was a report of a boy falling from the rampart to the rocks below, as the sod atop the rampart gave way. There were additional accidents reported on the ramparts "the wooden facing of which being now decayed the earth is apt to give way." (Huey 2006: 18).

The English did take measures to improve the condition of Fort George and the battery by 1775. "On February 15, 1775, Lieutenant Governor Cadwallader Colden presents to the assembly accounts for repairs at Fort George and the battery." On September 15, 1775, the common council releases to Governor Tryon an area "at the lower end of Pearl Street for the Purpose of Enlarging the Battery." (Huey 2006:19) (**Figures 11, 12 and 13**).

At the onset of the Revolutionary War (1776-1783), Fort George stood immediately above the "Grand Battery", and Whitehall Battery was immediately to the left of the Grand Battery (Huey 2006:19). The pre-Revolutionary War Grand Battery was established in 1766 as a large outerwork of Fort George. The Battery was constructed of stone and could accommodate 100 cannons, and it extended from the west side of Fort George completely around the southern tip of Manhattan Island (**Figure 13**). Both Fort George and the Grand Battery were taken over by the Patriot forces at the start of the Revolutionary War. At this time, extensive fortifications were erected throughout the city, which included improvements on the battery below Fort George, and the Fort's defenses (Schenawolf 2020). When General Washington arrived in New York City in 1776 the battery was armed with thirteen 32-pounders, one 24-pounder, three 18-pounders, two 2-pounders, one brass mortar and three iron mortars (Roberts 1988).

New York City was recaptured by English forces in the fall of 1776 and held by them until the English evacuation of New York City in 1783. The English made Fort George and the Grand Battery their headquarters for the duration of their occupation (Roberts 1988).

When the English evacuated New York City on November 25, 1783, control of the fort and the battery returned to the Patriot forces. The fort and the Grand Battery were abandoned as fortifications in 1783 (Roberts 1988). In 1789, the Common Council approved the funds for "the erection of the Wharf at the Battery." (Huey 2006:20).

By 1790, the Common Council decided to apply to the legislature for funds "to affect the complete removal of the Earth & Stone & leveling the Ground at the Fort & Battery so as to accommodate the Building to be erected there for the use of the Government and also to continue the Wharf or Bulkhead, in the river, to the corner of the Battery at Whitehall Slip." (Huey 2006:20). The remains of the walls and

interior buildings of the former Fort George were used as landfill to extend the shoreline further out into the Hudson River and expand the area of the battery. The 1796 Maverick *Plan of the City of New York* reveals that the fort, once facing Bowling Green is no longer standing. (**Figure 17**).

Following the demolition of the fort and leveling of the ground it stood upon, part of the area became a promenade while a large executive mansion was raised on the location. The 1811 Bridges Map, also known as The Commissioner's Map, depicts a large building on the site of the former fort (**Figure 18**). In 1813 the land was sold to the public and the building was demolished in 1815 (**Figure 19**).

At the turn of the 20th Century, the site was chosen for the construction of a new custom house. The building was completed in 1905 and stands to this day. The building remained the custom house until 1973, when the service was moved. At present the building houses the George Gustav Heye Center, formerly known as the Museum of the American Indian.

5.3.2 19th Century Landfill and the West Battery

West Battery was built during 1808-1811 to strengthen New York's sea defenses and is depicted on **Figures 14, 15, 18 and 19**. The circular brownstone fort, mounting 28 guns was built on a manmade island of stone in the Hudson River, approximately 200-feet off the "west head" of The Battery. The island fort was connected to The Battery by a wooden causeway and drawbridge (Milman and Weible 1984; 1985). This fort was known as the West Battery until 1815, when the name was changed to Castle Clinton, after New York's wartime mayor, Dewitt Clinton (**Figure 14**). Castle Clinton was ceded to the city in 1823, and its name was then changed to Castle Garden (**Figure 15**).

Figure 15 was first created for the 2010 *Phase IA Archaeological Assessment/Letter Report on The Reconstruction of Battery Park and Perimeter Bikeway* by Joan H. Geismar as 2010 Report Figure 5. This figure depicts the expansion of The Battery and the locations for the 1820, 1828 and 1848 bulkheads.

West Battery experienced five periods of very different function from 1811 until 1946, and continuing landfilling operations were increasing the overall acreage of The Battery during that same time frame.

Military Installation 1808-1823

During the period 1808 to 1811, a stone island was constructed atop rocks in the Hudson River 200 feet off the west side of the existing Battery. West Battery was connected to the mainland by a wooden causeway and drawbridge. By 1820, The Battery had been enlarged further by landfilling behind a new bulkhead to an area covering about 7-acres (**Figures 14 and 15**).

Documents associated with the park's proposed extension in 1848 indicate that the 1820s expansion had added a little over 3 acres and created 1,620 feet of shoreline.

Entertainment & Reception Center 1823-1854

By 1828, landfilling operations and the construction of a new bulkhead had enlarged The Battery grounds by approximately 3-acres; the Castle covered approximately 2-acres. The 10-acre Battery had a 1,620-foot waterfront, and the Castle was still connected to the mainland by causeway (**Figure 15**).

In 1848, a plan to again enlarge The Battery through landfill and bulkhead construction was proposed. The plan proposed to incorporate Castle Garden into The Battery grounds and would essentially double the size of The Battery by adding 11 acres of newly created land and extend the waterfront to 2,120 feet (**Figure 20**). In 1848, the footprint of Castle Garden covered one acre to the edge of the extant wharf, as noted on the Ewen 1848 map. The massive landfilling and bulkhead construction project got underway in 1853 (http://www.nycgovparks.org/parks/battery-park/history).

The 1848 enlargement was estimated to require 70,000 cubic yards of riprap wall, 1,280 cubic yards of parapet wall, 2,120 lineal "measure" of granite coping, and 212 granite posts (Board of Assistant Aldermen 1853a: 70-71 in Geismar 2010). This description suggests what the earlier bulkheads, such as those shown on the earlier maps, would be like. They were likely of substantial masonry construction, in order to function as landfill retaining structures. This suggests that the fill-retaining features that created the Battery Grounds were far more substantial than the log cribbing and sunken "blocks" or rafts associated with the 18th and early-19th Century land reclamation efforts. These have been documented archaeologically along the East River and elsewhere along the Hudson shore in the 1980s (e.g., Geismar 1983, 1986).

The mid-19th Century documents also estimate that 435,000 cubic yards of fill were needed for the enlargement. The fill was said to be available from demolished buildings and excavation sites in the "lower part of the city" and also from sewer construction, Russ pavement (blocks of granite set in stone and cement), street rubbish, and coal ashes (Board of Assistant Aldermen 1853a:68-78 in Geismar 2010).

At about the same time that the 1848 Battery expansion was proposed, increasing development and congestion in the area prompted the widening of Battery Place (once known as Kennedy Lane after Archibald Kennedy, a wealthy local landowner), a move that encroached on the northern part of the park (Board of Assistant Aldermen 1853b:142 in Geismar 2010).

Immigration Depot 1855-1890

The 1848 plan to add 11 acres to The Battery and incorporate Castle Garden was on-going at the time of the transition of the Castle from an entertainment and reception center to the immigration depot and was eventually completed in 1872. http://www.nycgovparks.org/parks/battery-park/history

Aquarium 1896-1941

During the tenure of the aquarium, more landfill was extended out into the Hudson River in order to completely surround the counterguard of the old fort (Grand Battery) with a grassy, tree-lined park (Millman and Weible 1983; 1984).

National Monument and National Park Service Site 1946-present

The NPS restored the Castle Garden structure to its period of military use as the West Battery. Today it lies in The Battery, at the southern end of the 92-acre development of Battery Park City.

5.3.3 Pier A Plaza

Pier A is a New York City Landmark, the oldest surviving pier in New York City and is listed on the National Register of Historic Places (**Figures 22 and 23**). Its Victorian-era pier building was constructed shortly after the Brooklyn Bridge (1884-1886) and was once one of the city's proudest points of entry. For decades the building sat in a ruinous state until it was recently renovated by the Battery Park City Authority for new and improved use (https://www.rogersarchitects.com/pier-a-plaza/).

Rogers Partners' work for Pier A Plaza in tandem with BPCA's renovation of Pier A resolved special access and circulation needs located at the nexus of bike routes, pedestrian promenades, and tourist activities. Site planning restored one of the last remaining waterfront sites on the Hudson River through careful consideration of resilience-oriented design measures, pedestrian circulation and flexibility for intensive programming. Pier A Plaza integrates robust planting, comfortable shaded seating, and distinctive paving that celebrates the history of this evolving shoreline (https://www.rogersarchitects.com/pier-a-plaza/).

The future Pier A Plaza location portion of the Archaeological APE was still underwater in 1848 (**Figure 20**). By 1873, West Street has been completed and runs south across Battery Place and ends at Castle Garden, as depicted on the Department of Docks map (**Figure 21**). The area of present-day Pier A Plaza has begun to emerge through the landfilling efforts associated with the laying out of West Street and the expansion of The Battery grounds. The section of the West Street corridor south of Battery Place depicted on this map is the future location of Pier A Plaza (**Figure 21**).

Further review of the 1873 Department of Docks map reveals that the 1857 bulkhead line runs across the eastern portion of present-day Pier A Plaza. It also indicates the location of the 1871 bulkhead line along the shoreline on the western boundary of present-day Pier A Plaza (**Figure 21**).

The current SBPCR Project's nuisance flood alignment lies across the 1857 bulkhead. The proposed tide gate in Pier A Plaza is in proximity to the 1857 bulkhead line and lies immediately east of the 1871 bulkhead line (**Figure 21**). The SBPCR Project actions of Pier A Plaza excavations/bulkhead improvements are in proximity to the 1871 bulkhead line.

The current Phase IA research included the review of the two-volume Mueser Rutledge Wentworth & Johnston study, the *Site Investigation and Preliminary Studies for Land Creation for Battery Park City* completed during 1971-1972 for the BPCA. Pier A is depicted on the existing conditions map and has an L-shaped masonry breakwater attached to its southern face, labeled "Heliport Pad". In addition, a "Sunken Tug Boat" is noted inboard of the breakwater, south of Pier A (**Figure 24**).

The 1971-1972 site investigation report noted that there has been prior work done along the 1871 bulkhead in Pier A Plaza. "A concrete and masonry gravity wall on a rock fill mound comprises the

bulkhead from south of Pier A to 80 feet north of Pier No. 1, where a masonry wall, supported on a low-level relieving platform starts and extends north through the area. The platform is supported on timber piles. During 1947, a low-level concrete relieving platform and bulkhead wall, supported on timber piles, was added to the existing gravity wall south of Pier A. The area between the two bulkhead walls was filled and paved. This construction was part of the rehabilitation of Battery Park and was planned and designed by the Department of Parks." (Mueser Rutledge Wentworth & Johnston 1971:19).

The 1971-1972 site investigation also noted that utility installations were planned in present-day Pier A Plaza in tandem with the build out of Battery Park City. "An 84-inch reinforced concrete sewer pipe is planned to be constructed in Area 1 [the current SBPCR project area] approximately 80 feet east and parallel to the bulkhead line. This is part of the sewer diversion project for Area 1 designed by TAMS-Gibb & Hill. As presently planned, this sewer is to exit at the southern tip of Area 1 [present-day Pier A Plaza]." (Mueser Rutledge Wentworth & Johnston 1971:19).

5.3.4 Hudson River Piers and Bulkhead Lines

The East River was the main port of entry into New Amsterdam / New York City from its initial 17th Century settlement up until the mid-19th Century. The East River offered a gently sloping shoreline that was sheltered from strong winds, and had an average channel depth of 50 feet, which was more than adequate for 17th through 18th Century ocean going vessels. As steam replaced sail and ships gradually grew larger during the 19th Century, the center of commerce shifted to the Hudson River. By the 20th Century, the vast majority of Manhattan's shipborne trade entered the City via the Hudson River (HPI 2007:10).

Cartographic review conducted for this study confirms that during the 17th and 18th centuries, commerce centered on shipping was focused along the East River shoreline. The Hudson River shoreline in the vicinity of the SBPCR Project was utilized for fortifications including the fort, bastions, and bulkheads. The 18th Century map depictions such as Maerschalk 1754 (**Figure 10**), Montresor 1766 (**Figure 12**), and Ratzer 1776 (**Figure 13**) confirm this distinction between the Hudson and East River shorelines. The 19th Century saw the emergence of the Hudson River shoreline as the center of maritime commerce for New York City. Eventually, the western shoreline of Manhattan was covered with commercial piers from The Battery northward to Spuyten Duyvil.

The 1817 Poppleton *Plan of the city of New-York* depicts a north-south oriented pier past the end of Washington Street, which at this time terminates at Marketfield Place (later Battery Place) (**Figure 19**). The pier extends into the Hudson River south of Marketfield Place. Between this pier and the bulkhead just outboard of Greenwich Street, a water route is labeled "Brunswick Steam Boat Line". North of Marketfield Street, the bulkhead line is along the west side of Washington Street. As seen on **Figure 19**, the current SBPCR Project Archaeological APE for The Battery portion of the flood alignment crosses the location of this north-south pier.

There are eight additional piers off Washington Street extending into the Hudson River between Marketfield Street and Rector Street. As seen on **Figure 19**, the current SBPCR Project Archaeological APE for the locations of the elements comprising the NSI System interior drainage improvements system are

still underwater, lying in the Hudson River, beyond the extent of these piers and the apparent pierhead line.

The 1824 Hooker *Hooker's new pocket plan of the city of New York* map depicts all piers extending into the Hudson River off Washington Street. By this time, Washington Street has been laid out to Marketfield Street and ends at the newly extended portion of The Battery grounds (**Figure 14**). The bulkhead line at this time is along the west side of Washington Street. There is no Pier 1 depicted, and the north-south oriented pier seen on the 1817 Poppleton map has been incorporated into the newly expanded Battery grounds. Eight additional piers are depicted north to Rector Street and all are labeled as to owner or lessee.

The 1848 Ewen *Proposed Enlargement of the Present Battery* map (**Figure 20**) shows that the proposed enlargement incorporates Castle Garden into the Battery grounds. West Street has been laid out to Battery Place, and the piers extend into the Hudson River from the new bulkhead along the west side of West Street. As seen on this figure, the locations of the elements comprising the NSI System interior drainage improvements are in areas out in the water, amidst existing piers. The future Pier A Plaza location is still underwater.

The 1873 Department of Docks map (**Figure 21**) shows the original grants of lands underwater, the high and low water marks in this portion of Lower Manhattan, and the succession of bulkhead and pierhead lines out into the Hudson River. The high-water line is depicted as running along the east side of Greenwich Street and through the east portion of The Battery below Battery Place. The low water mark is shown approximately midway between Greenwich and Washington Streets, and runs through the eastern portion of The Battery below Battery Place, to the west of the high-water line.

By 1873, West Street has been completed and runs south across Battery Place and ends at Castle Garden. The section of the corridor south of Battery Place is the future location of Pier A Plaza.

There are multiple piers depicted off West Street from below Battery Place to Rector Street, and the 1873 Department of Docks map (**Figure 21**) shows the existing and proposed pier numbers from 1 through 9. This map also provides the dimensions of the piers, including the extent of proposed extensions. It is seen that Wagner Park and the Museum of Jewish Heritage portions of the SBPCR Project lie within the location of five existing and proposed piers. These locations are not part of the Archaeological APE for this Phase IA study.

The bulkhead line of 1857 is depicted as running along the west side of the West Street corridor. It is labeled as the “Harbor Commissioner’s Bulk Head Line Established As Per Act 1857” and runs through the east side of what will become Pier A Plaza, and part of the Archaeological APE. Below Battery Place this bulkhead line turns at a 90-degree angle to the west and forms the southern boundary of the platform off the south face of Pier 1. The SBPCR Project’s nuisance flood alignment lies across the 1857 bulkhead, which is also a part of the Archaeological APE. The proposed tide gate in Pier A Plaza is in proximity to the 1857 bulkhead line. In addition, the locations of the elements comprising the NSI System interior drainage improvements are in proximity to the 1857 bulkhead line and are part of the Archaeological APE (**Figure 21**).

The 1871 bulkhead is also depicted outboard of the 1857 bulkhead line and is labeled "Bulk Head Line Established by the Department of Docks 1871." This bulkhead line is adjacent on the west to the locations of the elements comprising the NSI System interior drainage improvements, which are part of the Archaeological APE. The SBPCR Project actions of Pier A Plaza excavations/bulkhead improvements are in proximity to the 1871 bulkhead line. The nuisance flood alignment of the SBPCR project lies immediately east of the 1871 bulkhead line (**Figure 21**).

The 1873 pierhead line is depicted outboard of the 1871 bulkhead line. Outboard of the 1873 pierhead line, the "Exterior Line of Grants Under Water as per Act of the Legislature 1871" is depicted (**Figure 21**).

The 1891 Bromley Atlas of the City of New York depicts Pier A for the first time (**Figure 22**). This pier is situated at an angle to the 1871 bulkhead line, west of The Battery grounds, and is labeled "Dock Dept". Between the bulkhead line and The Battery is an open area that is known today as Pier A Plaza. Most of the present-day plaza within the SBPCR project boundary, which is part of the Archaeological APE, is shown as existing land; the extreme southern tip of this area, including part of the nuisance flood area within the Archaeological APE is still underwater in 1891.

The flood alignment corridor across the northern portion of The Battery appears as existing land, with few changes to the interior pathways depicted on the 1873 Department of Docks map (**Figure 21**). This corridor is part of the Archaeological APE.

The elements comprising the NSI System interior drainage improvements are located amid piers and pier platforms off West Street. The 1857 bulkhead line lies in proximity to the NSI element locations (**Figure 22**). There are nine piers shown off the 1857 bulkhead line. It appears that the 1871 bulkhead line has not been uniformly adopted north of Pier 1. The piers are numbered and labeled with the names of the owners/lessees.

The 1930 Bromley *Atlas of the City of New York* (**Figure 23**) depicts five existing piers in the Hudson River north of Pier A to Rector Street. Four piers have apparently been demolished since 1891. Pier 1 is located off present-day Pier A Plaza and is labeled "Iron Steamboat Co". Pier A is labeled "Dock Dept and Harbor Police". The masonry breakwater to the south of Pier A has been extended to form a sort of cove or protected area. To the south, beyond the breakwater, a "Fire Boat Station" is depicted along the bulkhead. Between the bulkhead line and The Battery grounds is present-day Pier A Plaza. Most of the present-day plaza within the SBPCR Project boundary, which is part of the Archaeological APE, is shown as existing land. The extreme southern tip of this area, including part of the nuisance flood area within the Archaeological APE is still underwater in 1930, lying within the protected area within the breakwater.

The flood alignment corridor portion of the Archaeological APE across the northern portion of The Battery appears as existing land, with few changes to the interior pathways depicted since 1891.

The locations of the elements comprising the NSI System interior drainage improvements in the segment of the Archaeological APE to the north of Battery Place are located primarily within Marginal/West Street in 1930. The 1857 bulkhead line is not depicted.

The development of Battery Park City has created a completely new shoreline along the Hudson River. The 19th Century piers are gone, and the bulkhead is now located along the former U.S. Pierhead Line of 1941. Today, Battery Park City is a 92-acre developed space along the Hudson River shoreline that includes residential and commercial buildings, roadways, art works, and public parks. The development history of Battery Park City is discussed above under Subchapter 4.2.3.

It is noted that the landfill used to create the footprint of Battery Park City was placed in the water out to the U.S. Pierhead line of 1941, which became the new bulkhead line when the development was completed. The extant piers between the bulkhead and pier line at the time of construction were demolished, likely down to the mudline to facilitate the placement of the landfill.

Multiple geotechnical studies were conducted during the 1960s and 1970s to identify existing conditions on the upland, shoreline and underwater portions of the planned development footprint of Battery Park City. Portions of the current SBPCR Project Area were included in these studies. One such study was completed by Mueser Rutledge Wentworth and Johnston (Mueser Rutledge) during 1971-1972 for the BPCA. Consisting of two volumes, the *Site Investigation and Preliminary Studies for Land Creation for Battery Park City* was reviewed for this study.

The Mueser Rutledge study divided the Battery Park City project area into five smaller areas for study. The portion of the overall project area included in the current SBPCR Project is Mueser Rutledge's 16-acre Area 1. Area 1 covers the shoreline from Pier A northward to the landfill area created from the excavations for the World Trade Center.

According to Volume 1, "At the start of the investigations, there were 11 existing piers and a landfill within the project area. The landfill had been placed by the Port of New York Authority under an agreement with the City of New York, and the fill is enclosed by a cellular steel sheet pile cofferdam on the north, west, and south sides and by the existing bulkhead on the U.S. Bulkhead Line at the east side. The western face of the cofferdam is located approximately 100 feet inboard of the U.S. Pierhead Line. The PATH tubes pass through the site beneath the river bottom at a point opposite the World Trade Center buildings." (Mueser Rutledge 1972:1). The referenced landfill was from the excavation of the World Trade Center Site during the 1960s and covered 24.7-acres.

A map of existing conditions at Area 1 created during the Mueser Rutledge study reveals that in 1971, in addition to Pier A, there were three extant piers located off (then) Marginal Street within the current Project Area (**Figure 24**). The map indicates that the U.S. Bulkhead Line of 1941 lies outboard of Marginal Street, and that the U.S. Pierhead Line of 1941 will be the new bulkhead line when the Battery Park City landfill is completed.

Pier No. 1 has a small platform attached to the southern face; Pier No. 2 has a rectangular platform running to Pier No. 3 to the north; and Pier No. 3 has a very narrow platform on its north face that ends at the World Trade Center landfill area (**Figure 24**). According to the 1971 study text, "the intervening slip spaces have been maintained by dredging to lower elevations." (Mueser Rutledge 1971:20).

Pier A is depicted on the existing conditions map and has an L-shaped masonry breakwater attached to its southern face, labeled "Heliport Pad". In addition, a "Sunken Tug Boat" is noted inboard of the breakwater, south of Pier A (**Figure 24**).

"Piers A and Nos. 1, 2 and 3, remaining within Area 1 before the start of the site construction work, incorporated various types of construction. Piers A and 1, which are the oldest, dating to 1886 and 1876, respectively, are founded on masonry piers extending to rock. Piers No. 2 and 3, built in 1925 and 1931, respectively, are supported on timber piles. The deck, piers and arches of Pier 1 are being demolished and removed under site preparation contract BPCA 71-7." (Mueser Rutledge 1971:19).

It is noted that the three extant piers in the SBPCR Project Area in 1971 had already replaced all the historic piers noted on the historic maps reviewed for this study.

According to the background text of the 1971 Mueser Rutledge study, "It was recommended to BPCA, that, except where otherwise dictated by considerations of safety and hazards to navigation, the piers be demolished in phase with the anticipated site preparation contracts." (Mueser Rutledge 1971:9).

The narrative is continued in a section of the study under Data on Pier Conditions. "In Area 1, at the present time, demolition of Piers 1, 2, and 3 decks is in progress. This work is part of Contract BPCA 71-7 for 'Bulkhead Construction, Landfill and Related Work, South 16 acres'. The demolition and removal of the pier sheds and bulkhead sheds for Piers 2 and 3 was done previously under Contract BPCA 70-5D." (Mueser Rutledge 1971: Section 10.9, P.7).

5.4 Prior Archaeological Testing in The Battery

As mentioned in above sections, a subsurface testing survey was conducted by Joan H. Geismar, Ph.D. in The Battery during 2011 in association with the *Reconstruction of Battery Park and the Perimeter Bikeway* project prepared for the New York City Department of Parks and Recreation. This subsurface testing survey included a portion of the SBPCR Project Archaeological APE. A figure showing the locations of the subsurface tests was taken from the 2011 Geismar report, and the georeferenced SBPCR Project boundary was superimposed (**Figure 25**). The figure from the 2011 report also includes the locations of the 1755 battery wall segments that were encountered during the 2003-2006 archaeological work for the New South Ferry Terminal project, also discussed above.

The 2011 survey consisted of the excavation of nine test pits that were actually test trenches that ranged in depth from 3.0 to 6.2 feet and in length from 4.7 to 27.5 feet. The testing was accomplished through a combination of hand and machine excavation. In cases where subsurface utilities were suspected to be present, the excavation was by hand to avoid impacts to the lines.

In general, the soils encountered were determined to be more recent fill introduced above landfill. The strata were compacted, often mottled, stony soils with some ash as well as sand. Generally, construction debris such as brick fragments, some oyster shell, and some modern debris were found intermixed throughout the tests. No significant archaeological deposits or features were identified in any of the nine tests.

Two of the test trenches were located within the Archaeological APE for the SBPCR Project and one was located adjacent to the SBPCR Project boundary on the south. All three locations were placed along the projected line of the 1828 bulkhead taken from the Ewen 1827-1830 maps (**Figure 15**). No remnants of this bulkhead were encountered.

Test Pit (TP 6) was located in the SBPCR Project Archaeological APE, near the middle of the proposed buried flood wall within the proposed berm area, approximately 26-feet north of the existing comfort station (**Figure 25**). This test trench measured 7.5-feet long, 5-feet wide, and 5.2-feet deep and was excavated by hand and by machine. The strata encountered were as follows: stony topsoil; stony fill; ash and brick layer; and fill with brick and stones. An asphalt layer was encountered at approximately 4.5-feet below the existing ground surface. Cultural material recovered consisted of one partially glazed whole brick.

TP 7 was located approximately 15-feet to the north of TP 6, south of Battery Place and within the SBPCR Project Archaeological APE (**Figure 25**). This trench measured 4.7-feet long, 2-feet wide, 3-feet deep, and was machine excavated. Its location within the SBPCR Project Archaeological APE is to the north of the proposed buried flood wall within the proposed berm area. Soils encountered consisted of mixed fill throughout. A 4-inch diameter cast iron pipe was noted.

TP 5 was located off the southeast corner of the existing comfort station, approximately 20-feet south of the SBPCR Project Archaeological APE and project boundary (**Figure 25**). This trench measured 6-feet long, 2 to 2.4-feet wide, 5-feet deep, and was hand and machine excavated. The strata encountered were as follows: topsoil; fill; ash layer at 3-feet below existing ground surface; and fill. The strata were identified as mixed, or 20th Century fill containing brick fragments, Belgian blocks, ash, and modern debris.

5.5 Prior Disturbance Summary

By the end of the first decade of the 20th Century, The Battery and Battery Place had seen significant changes to its landscape, most of which were related to transportation improvements. Historic atlas maps of the period document transportation facilities in and bordering the park: The Ninth Avenue El; the street-level trolley lines; the IRT 4/5 line, which ran in a loop under State Street and the park; and the express line to Brooklyn. At the northern edge of the park, at Battery Place and Greenwich Street, the Battery Place elevated railway station was located (LBG 2003:43).

The Battery was extensively impacted during the 1950s by cut and cover excavations for the Brooklyn-Battery Tunnel and the Battery Park Underpass. The eastern portion of the park was most recently impacted by the completion of the New South Ferry Terminal Project during the 2000s.

Street-level trolley lines have been documented on Battery Place and State Street, in proximity to The Battery. The 1941 maps of The Battery indicate that the streetcar tracks were removed while the underground yokes, ducts, and appurtenances were abandoned in place (LBG 2003:51). However, remains of these resources are not anticipated to be encountered within the SBPCR Project Phase IA Archaeological APE.

5.5.1 The Ninth Avenue Elevated Railway

In 1867, an experimental elevated cable-driven railway was constructed on Greenwich Street. The Ninth Avenue Elevated Railway (Ninth Avenue EI) originally began its run at Greenwich Street and Battery Place, but in February of 1876, the line was extended southward through Battery Park to South Ferry. Running along the eastern border of The Battery at State Street, stops were constructed at Battery Place (at the foot of Greenwich Street), at Battery Park (opposite Bridge Street) and at South Ferry. The Ninth Avenue El serviced passengers across New York City until its eventual closing in 1940, followed by the dismantling of the tracks in 1941 (LBG 2003:22-24).

According to the plans housed at the NYCT's archives, the footings that supported the elevated line consist of a 7x7-foot structure, composed of 9 ½ -feet of brick at the top, followed by 6 inches of blue slate stone at the base, creating a 10-foot-high structure (LBG 2003:55). The design of the elevated railway footings and their locations are well documented from the archived drawings and were encountered during the 1904 excavation for the IRT #4 and #5 subway tunnel (LBG 2003:28). It is possible that these footings remain intact in the northeastern portion of The Battery near Battery Place.

5.5.2 IRT # 4/5 Subway Line and Bowling Green Station; IRT #1/9 Subway Line

During the first decade of the 20th Century, transportation improvements were initiated when the Interborough Rapid Transit Company (IRT) opened their subway line on October 24, 1904. Initially, the line ran from City Hall northward to 145th Street on the Upper West Side. This line was extended southward from City Hall to South Ferry under a second contract on July 10, 1905. This extension is represented by the modern IRT #4/5 line running through The Battery along State Street to Brooklyn, and the turn-around loop for IRT #5 trains terminating at the Bowling Green Station (LBG 2003:27).

Along the east side of the park along State Street, the IRT line was constructed underneath the Ninth Avenue El supports. **Figure 25**, which was originally created for the 2010 Geismar Phase IA assessment, depicts this subway corridor. This method for constructing the subway under the existing elevated structures was a common approach applied in other places in the city. In some locations, the foundations for the elevated railway were completely exposed as the surrounding soil was excavated to create room for the subway line. In 1918, the IRT #1/9 line was configured through The Battery. The IRT #1/9 line ran on the existing (outer) loop constructed in 1904 for the IRT #4/5 line, and an inner loop was built for the IRT #5 trains as the turn-around track. The IRT #1/9 line ran down Greenwich Street and into the South Ferry Station, following the path of the Ninth Avenue El across The Battery (LBG 2003:27).

5.5.3 Brooklyn Battery Tunnel (Hugh L. Carey Tunnel)

The Brooklyn Battery Tunnel was first proposed in 1929, when city planners first became concerned about the increasing traffic on the Williamsburg, Manhattan, and Brooklyn Bridges. Construction was delayed due to a variety of economic and political reasons, notably the Great Depression of the 1930s. In 1940,

construction began, was again delayed in 1943 due to World War II-related steel and iron shortages. Following the end of the war in 1945, construction resumed, and the tunnel was opened in 1950 (Howe 2017).

The tunnel is composed of two parallel cast iron tubes, 31-feet in diameter, 15-feet apart, and 9,117-feet long between portals. The tunnel exhibits a maximum roadway depth of 115-feet below mean high water (Howe 2017). The top of the tunnel structure lies approximately 5-feet below current grade in The Battery portion of the Archaeological APE.

Challenges associated with ventilation of the tunnel were solved by the construction of four ventilation/blower buildings. The buildings are equipped with dozens of giant fans responsible for removing vehicle emissions and pumping fresh air in every 90 seconds (Howe 2017). One of the buildings is located within The Battery, one is located across Battery Place between Greenwich and Washington Streets, one is near the tunnel portal in Brooklyn, and one is on Governor's Island.

The primarily north-south Brooklyn Battery Tunnel corridor cuts through the middle of The Battery, and the partial cut and cover construction created massive disturbance along its route (**Figure 25**). However, it is possible that only minimal disturbance has occurred in the areas within the park to the east and west of the tunnel corridor.

When the tunnel construction began in 1940, the Ninth Avenue El was still in operation, but by 1941 the elevated railway had been dismantled. Locations of the footings for the elevated railway supports were plotted on the plans drawn by the Triborough Bridge and Tunnel Authority (TBTA) during the construction of the Brooklyn-Battery Tunnel (LBG 2003:43).

5.5.4 Battery Park Underpass

Another transportation project that caused extensive impacts to The Battery was the construction of the Battery Park Underpass linking West Street, now the West Side Highway, with South Street, now the FDR drive. This project, conducted ca. 1950, involved cut and cover excavation across the length of the park (**Figure 25**). Following this construction, the paths and green spaces within The Battery were revamped as paths were realigned and several monuments were moved. In 1952, Peter Minuit Plaza was created where the South Ferry elevated railway station had previously been located (LBG 2003:27).

5.5.5 IRT #1/9 New South Ferry Terminal Project

The most recent transportation project to impact The Battery was the completion of the New South Ferry Terminal alignment. The project was approximately 1,800 feet in length, measured along a line beginning at the intersection of Greenwich Street and Battery Place, through the eastern portion of The Battery to Peter Minuit Plaza, and terminating immediately north of the Whitehall Ferry Terminal (**Figure 25**). The construction of the tunnels and station involved mostly cut and cover techniques through The Battery and Peter Minuit Plaza (LBG 2003:1).

To the north of the SBPCR Project, the existing IRT #1/9 tracks were lowered to accommodate the new track grade. At Battery Place, a wide opening was constructed several hundred feet east of the Brooklyn-Battery Tunnel to transition the new IRT #1/9 track corridor west of the existing tracks. The tracks were enclosed in two concrete tunnels each approximately 18-feet-wide, with inverts ranging from 30 feet below grade to 50 feet below grade. The tunnels pass under the existing IRT #1/9 loop track and the IRT #4/5 Brooklyn-bound tunnel in the eastern portion of The Battery. East of Greenwich Street along Battery Place, a new fan plant was built within the Battery Place roadbed (LBG 2003:1). The area excavated for the construction of the new Terminal Station, tracks, and fan plant totaled 2.25 acres (LBG 2003:1).

5.5.6 Underground Utility Lines

According to the research conducted by the Louis Berger Group for the Phase IA study of the New South Ferry Terminal project, numerous utilities run through Battery Park, including electrical, sewer, water, gas, telephone, and a U.S. Treasury mail tube. The Treasury tube ran across the northeast corner of the park to the old U.S. Custom House at Bowling Green (LBG 2003:51).

Figure 26 was created for the current Phase IA study. It depicts the large-diameter mains that exist within the Project Area and cross all three sections of the Archaeological APE. It also depicts existing infrastructure associated with the sewer, storm water and combined sewer mains.

Pier A Plaza has been impacted by the 84-inch diameter CSO outfall pipe and the existing CSO outfall point in the bulkhead. The CSO main continues northward above Battery Place (Figure 26).

The existing CS Interceptor main runs through the extreme western edge of The Battery near the eastern boundary of Pier A Plaza. This large main also continues northward above Battery Place (Figure 26).

An existing Separated Stormwater Sewer main runs through The Battery. The proposed tide gate located within a pathway in the Battery will connect with this line to the south of the flood alignment and just southwest of the proposed berm area around the proposed buried flood wall (Figure 6).

These large diameter mains have likely created substantial subsurface disturbance along their corridors within all three portions of the SBPCR Project Archaeological APE. In addition, individual service connections to connect flanking buildings north of Battery Place with the large mains have created additional subsurface disturbance.

6 Conclusions and Recommendations

The Archaeological APE for the SBPCR Project is composed of three portions of the overall project area: Pier A Plaza (**Figure 5**), the flood alignment along the northern portion of The Battery (**Figure 6**), and the NSI System interior drainage improvement locations north of Battery Place (**Figure 7**). As discussed above in Chapter 1, the APE is concerned with direct effects to potential archaeological resources in previously undisturbed or minimally disturbed areas where subsurface disturbance is anticipated to occur as a result of project actions. The APE is composed of two parts: the horizontal APE, which is the footprint of anticipated subsurface disturbance, and the vertical APE, which is the depth to which subsurface disturbance is expected to occur.

The sensitivity assessment is conducted to determine the potential for encountering potentially National Register-eligible archaeological resources in the APE. In accordance with the New York Archaeological Council's (NYAC) *Standards for Cultural Resource Investigations and Curation of Archaeological Collections* (NYAC 1994), archaeological potential should be measured as low, moderate, or high.

6.1 Conclusions

6.1.1 Pier A Plaza Sensitivity Assessment

The SBPCR Project flood alignment is depicted on **Figure 3**. The Archaeological APE in Pier A Plaza is shown on **Figure 5**. Proposed actions that will incur subsurface disturbance in Pier A Plaza are: the flood alignment consisting of a short section of fixed wall leaving Wagner Park; flip-up deployable gates supported on deep piles; the nuisance flood alignment which entails excavation and bulkhead improvements; interior drainage improvements including the installation of a tide gate; and the construction of security measures in the form of a combination of bollards and 40-inch high walls along the northern boundary of the plaza.

Nuisance Flood Alignment

The current SBPCR Project's nuisance flood alignment lies across the depicted location of the 1857 bulkhead. Most of the proposed work associated with the nuisance flood alignment involves raising the level of Pier A Plaza in a terraced manner. The existing paving and pavement flags that depict the lines of historic piers will be removed and the substrate will likely be graded. Since the plaza will be terraced to accommodate the nuisance flooding elevation, the lines of the historic piers will be marked by using medallions with text inset into hexagonal paving stones. It is anticipated that the depth of disturbance will be approximately 2-feet across the plaza, with deeper excavation in discrete locations for lighting supports and stair supports. The addition of fill is not of archaeological concern. The minimal grading work will likely be within 2 feet of the existing plaza surface and is also not an archaeological concern. It is highly probable that Pier A Plaza has been disturbed to at least 2 feet below current grade when renovations were made within the past decade. In addition, intact archaeological resources below Pier A Plaza would likely be located at depths greater than 2 feet below grade.

The nuisance flood alignment area footprint in Pier A Plaza does not possess archaeological potential.

Excavation and Bulkhead Improvements

Excavation and bulkhead improvements are proposed in association with the implementation of the nuisance flood alignment (**Figure 5**). The proposed Pier A Plaza excavations/bulkhead improvements are in proximity to the 1871 bulkhead line. The proposed project actions include excavation in association with the existing bulkhead wall, and replacement of approximately two feet of fill.

The bulkhead consists of a concrete and masonry gravity wall on a rock fill mound that extends from south of Pier A to approximately 80-feet north of former Pier No. 1, where a masonry wall, supported on a low-level relieving platform begins, and extends north. The platform is supported on timber piles. According to the 1971-1972 Mueser Rutledge study, "During 1947, a low-level concrete relieving platform and bulkhead wall, supported on timber piles, was added outboard of the existing gravity wall south of Pier A. The area between the two bulkhead walls was filled and paved. This construction was part of the rehabilitation of Battery Park and was planned and designed by the Department of Parks." (Mueser Rutledge 1971:19).

It is unlikely that any intact archaeological resources would be impacted by this action, as the disturbance is minimal and will occur in previously disturbed landfill deposits. In addition, the 19th Century bulkhead along the Pier A Plaza shoreline has already been disturbed and/or modified.

The Pier A Plaza excavation/bulkhead improvement locations do not possess archaeological potential.

Interior Drainage Improvements

There is an 84-inch diameter CSO sewer pipe running north to south through the western portion of Pier A Plaza. This main is shown on **Figure 26**. This main connects to the CSO NC-070 outfall point at the bulkhead line on the west side of Pier A Plaza, south of Pier A. A new tide gate is proposed for the area off the southeast corner of Pier A in the plaza, to be connected to this CSO main. The proposed tide gate in Pier A Plaza is in proximity to the 1857 bulkhead line and lies immediately east of the 1871 bulkhead line (**Figure 21**).

The installation of this main likely dates to the 1970s, as: "An 84-inch reinforced concrete sewer pipe is planned to be constructed in Area 1, approximately 80-feet east and parallel to the Present Bulkhead Line. As presently planned, this sewer is to exit at the southern tip of Area 1." (Mueser Rutledge 1971:19). This line is the CSO outfall pipe depicted on **Figure 26**. The excavation trench for this large diameter main was likely over 10-feet deep and of unknown width. Accordingly, the excavation required for the proposed tide gate will not be impacting undisturbed soils or intact landfill deposits.

The proposed tide gate location in Pier A Plaza does not possess archaeological potential.

Flip-Up Deployable Gates

The flood alignment across the northern portion of Pier A Plaza consists of flip-up deployable gates that will rest on deep piles. The alignment will be constructed across landfill deposits dating to the 19th Century. However, the latest landfill episode, planned in 1848 to double the size of the Battery and incorporate Castle Garden, would have required the installation of a substantial masonry bulkhead to contain the fill

deposits (**Figure 15**). This landfill retaining bulkhead is likely the 1857 bulkhead depicted on the 1873 Department of Docks map (**Figure 21**) and may well be intact in the extreme northeastern portion of Pier A Plaza, in proximity to the west boundary of The Battery.

It has been determined that the flood alignment in Pier A Plaza crosses both the 1857 bulkhead and the 1871 bulkhead. It is likely that the 1871 bulkhead was impacted or replaced in this area during the 1940s when a relieving platform was added outboard of the bulkhead, according to the 1971-1972 Mueser Rutledge study for the creation of Battery Park City. The 1857 bulkhead may lie fairly intact below Pier A Plaza and would likely be impacted by the installation of the flip-up deployable gates and the deep piles upon which the gates will be supported.

The flip-up deployable gate portion of the flood alignment in Pier A Plaza below the line of West Street and near the west boundary of The Battery possesses moderate potential for encountering the 1857 bulkhead wall.

Security Measures

Security measures are planned across the northern portion of Pier A Plaza. A combination of bollards and a 40-inch-high wall is proposed along the southern sidewalk of Battery Place, running from the end of the allée of trees in Wagner Park southward, then eastward along the northern line of Pier A Plaza. Subsurface disturbances to 4 feet below grade are anticipated to facilitate construction of the bollards and 40-inch wall.

The installation of the security measures will entail excavation along the Battery Place/Pier A Plaza boundary. The corridor is on landfill that has been previously impacted and the anticipated 4-foot depth of disturbance is not of archaeological concern. Intact portions of deeply buried archaeological resources such as landfill retaining bulkheads would not be anticipated at such shallow depth in this portion of the project area.

The locations of proposed security measures in Pier A Plaza do not possess archaeological potential.

6.1.2 Historic Piers Sensitivity Assessment

It has been determined through review of the Mueser Rutledge study that the multiple piers noted on the historic maps consulted for this study had been replaced by the three extant piers by 1971, as shown on **Figure 24**. It was also noted that these three piers were demolished in order to create a suitable base for the landfill required by the Battery Park City buildout.

For example, “Pier No. 1 will be almost entirely removed to the bottom of its foundations in all schemes because its location and masonry construction will interfere with construction of the new bulkhead and foundations for future buildings.” (Mueser Rutledge 1971:22).

There is no potential for encountering intact remains of the historic piers in the Project Area in the Pier A Plaza section of the Archaeological APE.

6.1.3 The Battery Sensitivity Assessment

The Archaeological APE across the northern portion of The Battery is shown on **Figure 6**. The proposed actions from west to east include installation of flip-up deployable gates, sections of 40-inch-high security walls, a fixed exposed floodwall including flanking seepage barrier installation, construction of a buried floodwall, and the creation of a berm atop the buried floodwall.

As detailed in Subchapter 5.5, and depicted on **Figure 25**, there have been multiple areas of substantial subsurface disturbance along the flood alignment. The construction of the Ninth Avenue Elevated Railway, IRT #4/5 subway line, the IRT #1/9 subway line, the New South Ferry Terminal project updates to the IRT #1/9 line, the Brooklyn Battery Tunnel, and the Battery Park Underpass have all created substantial areas of disturbance. Many of the projects involved cut and cover construction, suggesting that the areas of disturbance associated with these projects covered a wider area than the finished footprints of the projects.

Flip-Up Deployable Gates

The proposed flip-up deployable gates in the far western portion of The Battery grounds will entail the installation of piles for subsurface support. These piles may be installed as deep as 40 feet. However, this area has been disturbed since it was created by landfilling episodes during the 19th Century. This section of the flood alignment is in proximity to the Battery Park Underpass and was likely disturbed during its construction c. 1950.

There is no archaeological potential along the flip-up deployable gate portion of the flood alignment in The Battery.

Security Measures

Security measures are planned for the northern portion of The Battery, continuing the line of bollards and 40-inch-high wall proposed for the northern line of Pier A Plaza **(Figure 6**). As noted above in Subchapter 1.3.5, the bollards and 40-inch wall proceed eastward from Pier A Plaza toward the fixed floodwall over the Battery Park Underpass. Eastward of the fixed floodwall there may be additional sections of 40-inch-high wall to replace a section of existing Battery wall north of the proposed buried floodwall and berm. Project engineers indicate that subsurface disturbances to 4 feet below grade are anticipated to facilitate construction of the security measures.

The security measure elements will be constructed in landfill that has been previously impacted several times, and the anticipated 4 foot depth of disturbance is not of archaeological concern. Intact portions of deeply buried archaeological resources such as landfill retaining bulkheads would not be anticipated at such shallow depth in this portion of the project area. In addition, the depths of the test trenches excavated in 2011 by Joan H. Geismar, Ph.D. exceeded the anticipated 4-foot depth of the 40-inch-high security wall. No significant archaeological resources were encountered during the 2011 testing.

There is no archaeological potential in the locations of the proposed security measures in The Battery.

Fixed Floodwall

A fixed exposed floodwall is proposed to cross the Battery Park Underpass. No piles will be utilized over the underpass. However, a seepage barrier would be installed on the west side of the fixed exposed floodwall, entailing an excavation of approximately 10 feet below grade. A seepage barrier would also be installed on the east side of the fixed exposed floodwall, entailing an excavation of approximately 15 feet below grade.

This area of the Battery Park Underpass, including the locations for the seepage barriers, has been severely impacted during the 20th Century by the initial cut and cover construction of the underpass and does not possess archaeological potential.

There is no archaeological potential along the proposed fixed floodwall over the Battery Park Underpass location in The Battery.

Buried Floodwall and Berm

The flood alignment continues eastward across The Battery as a bermed floodwall. A section of buried floodwall will be installed below the earthen berm. It is anticipated that the depth of disturbance associated with the buried floodwall will be 4 feet. Actions to construct the earthen berm around the buried floodwall are anticipated to involve subsurface disturbance from 2 to 4 feet below the existing ground surface.

The subsurface archaeological testing conducted in 2011 by Joan H. Geismar, Ph.D. included a portion of the SBPCR Project Archaeological APE. The testing in the SBPCR APE ranged in depth from 3 to 5.2 feet below existing ground surface and yielded a mix of fill deposits and ash. The tests were located along a documented 1828 bulkhead in order to locate that resource, if present (**Figure 25**). No evidence of that bulkhead or other significant archaeological resources was encountered.

In the locations of the 2011 tests, the depth of the test trenches was deeper than the anticipated depths of disturbance for the SBPCR Project actions involving the buried floodwall and earthen berm construction. It is unlikely that additional subsurface testing along the flood alignment in The Battery would yield significant archaeological resources.

There is no archaeological potential along the proposed buried floodwall and berm location in The Battery.

Interior Drainage Improvements

Two isolation valves would be installed in The Battery. The first would be located on the storm drain that collects runoff from The Battery, approximately 50 feet east of the Battery Park Underpass alignment. A sanitary sewer isolation valve would be installed just north of The Battery comfort station. The valves would require an excavation area of approximately 4 feet by 4 feet and be connected to existing mains.

Neither the tidegates nor the isolation valves would create ground disturbance in undisturbed soils. There is no archaeological potential at the valve locations in The Battery.

6.1.4 NSI System Interior Drainage Improvement Locations Sensitivity Assessment

The Archaeological APE for the interior drainage improvement locations associated with the NSI System north of Battery Place is shown on **Figure 7**. Implementation of the NSI System will require pressure-proofing and retrofitting of multiple existing infrastructure elements associated with the 84-inch South Interceptor Sewer Main. The NSI System locations north of Battery Place lie in proximity to and within the Hudson River Greenway and present-day West Street (Route 9A) (**Figure 7**). This transportation corridor has been impacted by the 20th Century construction of the elevated West Side Highway, the demolition of the elevated West Side Highway, and the transformation of the West Side Highway to a street level corridor.

Large diameter utility mains run northward from Battery Place, as discussed in Subchapter 5.5.6 and depicted on **Figure 26**. There are undoubtedly multiple smaller utility lines within these locations, such as individual service connections to buildings, and electric, water, gas, telephone, and telecommunications lines. It is unlikely that such utility lines would have impacted deeply buried archaeological resources such as historic bulkheads.

The historic 1857 bulkhead was depicted on an 1873 Department of Docks map (**Figure 21**) as running through or adjacent to several of the existing infrastructure elements that comprise the NSI System. The 1871 bulkhead was shown to be located outboard to the west.

It is possible that the historic bulkheads lie fairly intact beneath the NSI System interior drainage improvements segment of the SBPCR Project Archaeological APE. There is also potential for encountering maritime infrastructure remains such as the substantial bases of piers, wharves, and/or associated buildings that fronted on the earlier bulkheads that held the landfill in place.

Given that the NSI components are existing infrastructure connected to the South Interceptor Main, most, if not all, of this portion of the Archaeological APE has previously been extensively disturbed, effectively eliminating the potential for encountering intact archaeological resources. One exception to this conclusion may be along the existing connector main between sanitary connection sewer chamber manhole #3 (MH #3) and the sanitary emergency overflow chamber to the west near West Thames Street. The route of the existing connector main would have breached the historic 1857 bulkhead heading west from MH#3, and possibly the 1871 bulkhead at the overflow chamber location when excavated and installed in 2001. Intact portions of each bulkhead would exist to the north and south of the connector main, and project actions requiring excavation in this portion of the Archaeological APE may expose these portions of the bulkheads for documentation.

In addition, the sanitary emergency overflow chamber is in proximity to the previously identified National Register-eligible Pier 7 Complex archaeological site (06101.08120; NYSM 12322). This site, at the southern end of West Thames Park, and just north of West Thames Street, was identified as part of the 1903 Hudson River bulkhead and c. 1908 Pier 7 concrete foundation and shed of the Baltimore & Ohio Railroad (Lenardi 2002).

6.2 Recommendations

6.2.1 Pier A Plaza

The flip up deployable gate portion of the flood alignment in Pier A Plaza below the line of West Street and near the west boundary of The Battery possesses moderate potential for encountering the 1857 bulkhead wall.

A Phase IB archaeological survey consisting of archaeological monitoring during construction is recommended for this portion of the Project Area.

6.2.2 The Battery

The proposed project actions in The Battery portion of the Archaeological APE will not impact potential archaeological resources. No further archaeological work is necessary in this portion of the APE.

6.2.3 NSI System Interior Drainage Improvements Locations

There is low to moderate archaeological potential for encountering intact portions of the 1857 and 1871 bulkheads to the north and south of the connector main between MH#3 in West Street and the sanitary emergency overflow chamber to the west of the Hudson Greenway. The Pier 7 Complex was documented in proximity to the sanitary emergency overflow chamber location. Project actions associated with the NSI System requiring excavation in this portion of the Archaeological APE may expose these portions of the bulkheads and the Pier 7 Complex for documentation.

A Phase IB archaeological survey consisting of archaeological monitoring during construction is recommended for this portion of the Project Area.

6.3 Next Steps

The Phase IA documentary study has concluded that there are two discrete areas of low to moderate and moderate potential archaeological sensitivity across portions of the APE that may be impacted by the completion of the SBPCR Project.

The flip-up deployable gate portion of the flood alignment in Pier A Plaza below the line of West Street and near the west boundary of The Battery possesses moderate potential for encountering the 1857 bulkhead wall (Figure 5).

Project work associated with the NSI system along the existing connector main between sanitary connection sewer chamber manhole #3 (MH #3) and the sanitary emergency overflow chamber to the west near West Thames Street has the potential to impact archaeological resources (Figure 7). There is low to moderate potential that intact portions of each bulkhead would exist to the north and south of the connector main, as well as the previously identified Pier 7 Complex which was documented in proximity to the sanitary emergency overflow chamber. Project actions requiring excavation in this portion of the Archaeological APE may expose portions of these resources for documentation.

As the SBPCR Project lies within highly utilized public spaces, in order to minimize traffic disruptions and closures of public space, preparation of a Phase IB Archaeological Monitoring Plan (Plan) in consultation with BPCA, SHPO and LPC, is recommended.

Archaeological monitoring is an accepted Phase IB strategy for projects conducted in urban settings. For example, an Archaeological Monitoring Plan was developed through consultation with SHPO and LPC for the Brooklyn Bridge-Montgomery Coastal Resilience Project in November 2020.

7 References

7.1 Books and Reports

AKRF, Inc.
2018 *The Battery Playscape Block 3, Part of Lot 1, Lower Manhattan, New York County, New York, Phase IB Archaeological Survey Report.* Prepared for: The Lower Manhattan Development Corporation. November 2018.

2013 *World Trade Center Memorial and Development Plan: Data Recovery and Analysis of the WTC Ship Blocks 54, Lot 1 and Block 56, Lots 15, 20, and 21, New York, New York.* Prepared for: The Lower Manhattan Development Corporation. Prepared by: AKRF, Inc.

AKRF, Inc. et al
2010 *Revised Draft Report South Ferry Terminal Project.* Prepared for: MTA and Capitol Construction. Prepared by: AKRF, URS Corporation, and Linda Stone, RPA.

AKRF, Inc. and URS Corporation
2010 *Mitigation Report Fulton Street Transit Center Project, Unanticipated Discovery of Brick Feature Beneath the Corbin Building, 192 John Street, New York, New York.* Prepared for: MTA, FTA.

Bolton, Reginald Pelham
1922 *Indian Paths in the Great Metropolis*. Museum of the American Indian, Heye Foundation, New York.

1920 *New York City in Indian Possession.* Museum of the American Indian, Heye Foundation, New York.

City Environmental Quality Review (CEQR)
2014 *CEQR Technical Manual.* City of New York, Mayor's Office of Environmental Coordination.

Federal Writer's Project
1939 *The WPA Guide to New York City*. Reprinted 1982. Pantheon Books, New York.

Geismar, Joan H., Ph.D.
2011 *The Reconstruction of Battery Park and Perimeter Bikeway, Borough of Manhattan, County of New York, Test Pit Letter Report.* Prepared for: NYC Department of Parks and Recreation in Partnership with The Battery Park Conservancy through Quennell Rothschild & Partners, LLP.

2010 *The Reconstruction of Battery Park and Perimeter Bikeway, Borough of Manhattan, County of New York, IA Archaeological Assessment/Letter Report.* Prepared for: NYC Department of Parks and Recreation in Partnership with The Battery Park Conservancy through Quennell Rothschild & Partners, LLP.

1987 *Stage IA Archaeological Evaluation of the Exchange Project, 10 Battery Place, New York City*. Prepared for: EEA, Inc.

1986 *17 State Street, An Archaeological Evaluation, Phase I Documentation. CEQR 85-215M.* Prepared for: 17 Vista Associates through Webster & Sheffield.

Greenhouse Consultants Inc.
1985 *The Excavation of Augustine Heermans' Warehouse and Associated Dutch West India Company Deposits. Volumes A through D. (The Broad Financial Center at 33 Whitehall Street Site).* Prepared for: Fox & Fowle Architects, P.C. Prepared by: Joel W. Grossman, Ph.D. et al.

Grumet, Robert S.
1981 *Native American Place Names in New York City.* Museum of the City of New York, New York.

Howe, Kathy
2017 *Resource Evaluation and Determination of Eligibility, Brooklyn Battery Tunnel, 81 Washington Street, New York, NY.* Prepared by Kathy Howe, SHPO, April 20, 2017.

Huey, Paul R.
2006 *Narrative Notes from a Field Trip to Visit Excavations at the Battery, New York City*. Bureau of Historic Sites, New York State Office of Parks, Recreation and Historic Preservation, Peebles Island, Waterford, New York.

Lenardi, Michael J.
2011 *A Cultural Resource Survey Report, Archaeological Monitoring, Treatment, and Data Recovery of the New York City Hudson River Bulkhead and World Trade Center Site at Two Locations: Utility Trench at Southern End of West Thames Park and BIN 2-24549-0/Liberty Street Bridge Median at the Intersection of Liberty Street and NY Route 9A from West Thames Street to Chambers Street New York City (MCD #06101), New York County, New York. OPRHP Project Review 04PR00904.* Prepared by Michael J. Lenardi, New York State Museum Cultural Resource Survey Program.

Louis Berger & Associates, Inc.
2000 *Archaeological Test Pit Excavation, Whitehall Ferry Terminal Project, New York, New York.* Site Form 06101.013334 – Whitehall Ferry 18th-19th Century Landfill and Cribbing Site.

The Louis Berger Group, Inc.
2004 *Archaeological Resource Management Plan South Ferry Terminal Project, Lower Manhattan, New York, New York.* Prepared for: New York City Transit.

2003 *Proposed New South Ferry Terminal, Lower Manhattan, New York, New York, Phase IA Archaeological Assessment.* Prepared for: New York City Transit.

Merguerian, Charles and John E. Sanders
1991 *Section of Geological Sciences, 1990-91 Field Trips, Trip 16: Geology of Manhattan and the Bronx.* The New York Academy of Sciences, April 21, 1991.

Morin, Edward
2007 *Site Form 06101.016196 – Log Cribbing and Fill*. Found during monitoring of New South Ferry Terminal Project by Linda Stone, RPA for Dewberry under contract to MTA. Form prepared by Edward Morin, RPA of URS Corporation.

Moscow, Henry
1990 *The Street Book, An Encyclopedia of Manhattan's Street Names and Their Origins.* Fordham University Press, New York. Originally published 1978.

Mueser Rutledge Wentworth & Johnston
1972 *Site Investigation and Preliminary Studies for Land Creation for Battery Park City, Volume I.* Prepared for Battery Park City Authority.

New York Archaeological Council (NYAC)
1994 *Standards for Cultural Resources Investigations and the Curation of Archaeological Collections.*

NYC Landmarks Preservation Commission
2018 *Guidelines for Archaeological Work in New York City.* Amanda Sutphin, H. Arthur Bankoff, Jessica Striebel MacLean, and Carol S. Weed, authors.

Parker, Arthur Caswell
1922 The Archaeological History of New York. *New York State Museum Bulletin Nos. 235-238.* Albany, New York

Pickman, Arnold and Nan A. Rothschild
1981 *64 Pearl Street – An Excavation in 17th Century Landfill.* Prepared for: The New York Landmarks Conservancy.

Raber, Michael S.
1997 *NYS OPRHP Building-Structure Inventory Form, New York City's Hudson River Bulkhead from Battery Place to West 59th Street.* Prepared by Raber & Associates and AKRF, Inc. for the Hudson River Park Conservancy. February 20, 1997.

Roberts, Robert B.
1988 *Encyclopedia of Historic Forts: The Military, Pioneer, and Trading Posts of the United States.* MacMillan Publishing Company, London and New York.

Rothschild, Nan A. and Arnold Pickman
1990 *The Archaeological Evaluation of the Seven Hanover Square Block: A Final Report.*

Small, Edwin W.
1939 Wharf Building of a Century and More Ago. *The Regional Review.* Vol. III No. 6. Edwin W. Small, Superintendent, Salem Maritime National Historic Site, Massachusetts. December 1939.

Stone, Linda
2005 *Site Form 06101.015598 – Whitehall Slip Site.* Found during testing for South Ferry Subway Station, part of New South Ferry Terminal Project, by Linda Stone, RPA for Dewberry under contract to MTA.

7.2 Maps

Anderson, John A.
1796 *Plan of New York City*. Also known as "The Maverick Plan." Peter Maverick, Cartographer and Engraver. T. and J. Swords, New York. Retrieved from: https://digitalcollections.nypl.org/items/68da22a0-90bd-0135-d0b0-6f7e7adcc92d

Bridges, William (Also known as the Commissioner's Map)
1811 *Map of the city of New York and island of Manhattan, as laid out by the commissioners appointed by the legislature, April 3d, 1807.* New York: unknown. Retrieved from: https://digitalcollections.nypl.org/items/510d47d9-7a92-a3d9-e040-e00a18064a99

Bromley, George
1930 "Plate 1, Part of Section 1" and "Plate 2, Part of Section 1." *Land Book of the Borough of Manhattan, City of New York: Desk and Library Edition.* G.W. Bromley & Company, New York. Retrieved "Plate 1" from: https://digitalcollections.nypl.org/items/edc140d0-2178-0132-3559-58d385a7b928

1891 "Plate 1 [Map bounded by Liberty St., Maiden Lane, East River, Hudson River]." *Atlas of the City of New York, Manhattan Island, From Actual Surveys and Official Plans.* G.W. Bromley & Company, Philadelphia. Retrieved from: https://digitalcollections.nypl.org/items/a1ebc562-2b9f-5f02-e040-e00a18064811

Buckhout, I.C.
1860 *Maps of the Wharves and Piers from The Battery to 61st Street on the Hudson River and from The Battery to 41st Street on the East River, New York, Plates 16, 17 & 18.* I.C. Buckhout, City Surveyor, New York.

Colton, J.H.
1836 *Topographical Map of the City and County of New York and the Adjacent Country*. New York: J.H. Colton and Co. Retrieved from: https://www.davidrumsey.com/maps2268.html

Cortelyou, Jacques
1660 The Castello Plan (*Afbeeldinge van de Stadt Amsterdam in Nieuw Neederlandt*). Retrieved from: https://digitalcollections.nypl.org/items/510d47d9-7c0b-a3d9-e040-e00a18064a99

Department of Docks
1873 *High and Low Water Marks and the Original City Grants of Lands Under Water Made to Various Parties from 1686 to 1873, Extending from Battery to Fifty-First Street, Hudson, and East Rivers, New York City.*New York City Department of Docks, New York. Retrieved from: https://digitalcollections.nypl.org/items/5fd48a6d-072a-65e7-e040-e00a18060adf

Ewen, Daniel
1848 *Proposed Enlargement of the Present Battery.* Surveyed by Daniel Ewen, City Surveyor. September 1848. McSpeedon & Baker, New York.

Hooker, William
1824 *Hooker's new pocket plan of the city of New York*. William Hooker, New York. Retrieved from: https://digitalcollections.nypl.org/items/510d47dc-3b35-a3d9-e040-e00a18064a99

Lyne, James
1728 *"A Plan of New York City: From an Actual Survey."* Redrawn by G. Hayward, 1853. In Manual of the Common Council of the City of New York. DT Valentine, New York [1853]. Retrieved from: https://digitalcollections.nypl.org/items/510d47e0-d805-a3d9-e040-e00a18064a99

Maerschalck, Francis W.
1755 *A Plan of the City of New York from an actual Survey Anno Domini—MDCCLV*. Gerardus Duyckinck, New York.

Montresor, John
1766 *A plan of the city of New-York and its environs to Greenwich on the north or Hudson's River.* Retrieved from http://hdl.loc.gov/loc.gmd/g3804n.ar110401

Poppleton, Thomas H.
1817 *Plan of the city of New-York: the greater part from actual survey made expressly for the purpose (the rest from authentic documents)* Retrieved from: https://digitalcollections.nypl.org/items/510d47da-eeaa-a3d9-e040-e00a18064a99

Ratzer, Bernard
1776 *Plan of the City of New York in North America: surveyed in the years 1766 & 1767, B. Ratzer, lieut. In his Majesty's 60th or Royal American Regt.; Thos. Kitchin, sculpt., engraver to his Late Royal Highness, the Duke of York &c.* Jeffreys and Faden, London.

Sauthier, Claude Joseph
1773 *A Plan of Fort George at the City of New York.* Library of Congress Online Catalog: http://hdl.loc.gov/loc.gmd/g3804n.ar113900

Smith, Edward
1855 *Maps of the Wharves and Piers of the Hudson & East Rivers from The Battery to 13th Street, New York: Pier Line 21-40; Pier Line 41-19.* Edward Smith, City Surveyor, New York.

U.S. Army Corps of Engineers
1890 *Pierhead and bulkhead lines for the East Shore of the Hudson River and the North and West Shores of the East River Extending from East 81st Street to The Battery.*

Viele, Egbert Ludovicus
1865 *Sanitary & Topographical Map of the City and Island of New York*. Ferd. Mayer & Co., New York.

7.3 Online Resources

https://marvelarchitects.com/work/pier-a-plaza/85

https://www.rogersarchitects.com/pier-a-plaza/

www.nycsubway.org:IRT_East_Side_Line

www.nycgovparks.org/parks/battery-park

http://hdl.loc.gov/loc.gmd/g3804n.ar113900

North American Forts - Fort George (http://www.northamericanforts.com/East/nycity.html#george)

http://bpcparks.org/about-us/who-we-are/history/

https://urbanareas.net/info/resources/neighborhoods-manhattan/battery-park-city-manhattanhistory/

http://www.preservenet.com/freeways/FreewaysWestSide.html

https://forgotten-ny.com/2015/08/west-side-highway/

https://hudsonriverpark.org/the-park/waterfront-transformation/historic-hudson-river-park-bulkhead/

https://hudsonriverpark.org/the-park/waterfront-transformation/

https://hudsonriverpark.org/visit/plan-your-visit/

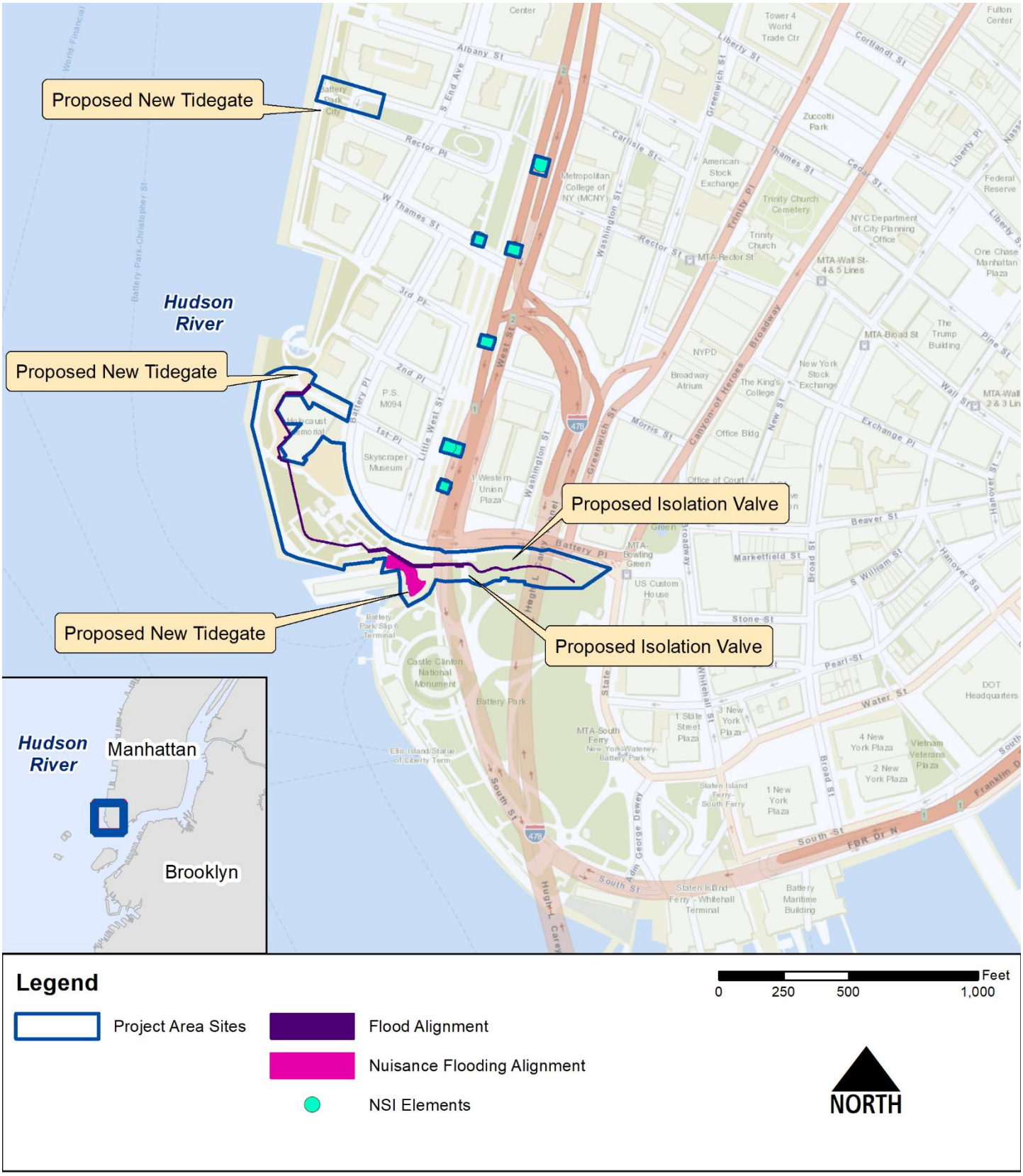
8 List of Preparers

Nancy A. Stehling, RPA, Principal Investigator, Primary Author: Over 40 years of experience in cultural resource management, including archival research, field survey, laboratory work, artifact analysis, and report preparation. Includes 20 years with AECOM (Earth Tech and TAMS). State University of New York, Potsdam, 1977, BA, Anthropology, BA, Geology; Rensselaer Polytechnic Institute, 1980, MS, Public Archaeology.

Michele Besson, Archaeologist, GIS and Graphics Preparation: Twenty years of experience in cultural resource management in New York City, the Northeast and Mid-Atlantic regions. Includes 20 years with AECOM (Earth Tech and TAMS). Experience includes archival research, field work, analysis of historic artifacts, and report preparation. Brooklyn College, City University of New York, 1999, BA, Anthropology and Archaeology.

Daniel Arnold, Transportation and Environmental Planner, GIS and Graphics Analyst: Has 4 years of experience with AECOM as a transportation and environmental planner in New York and North Carolina, working primarily on NEPA, SEQRA, and CEQR projects. Wheaton College, Illinois, 2008, BA; University of North Carolina-Chapel Hill, 2016, MA, City and Regional Planning.

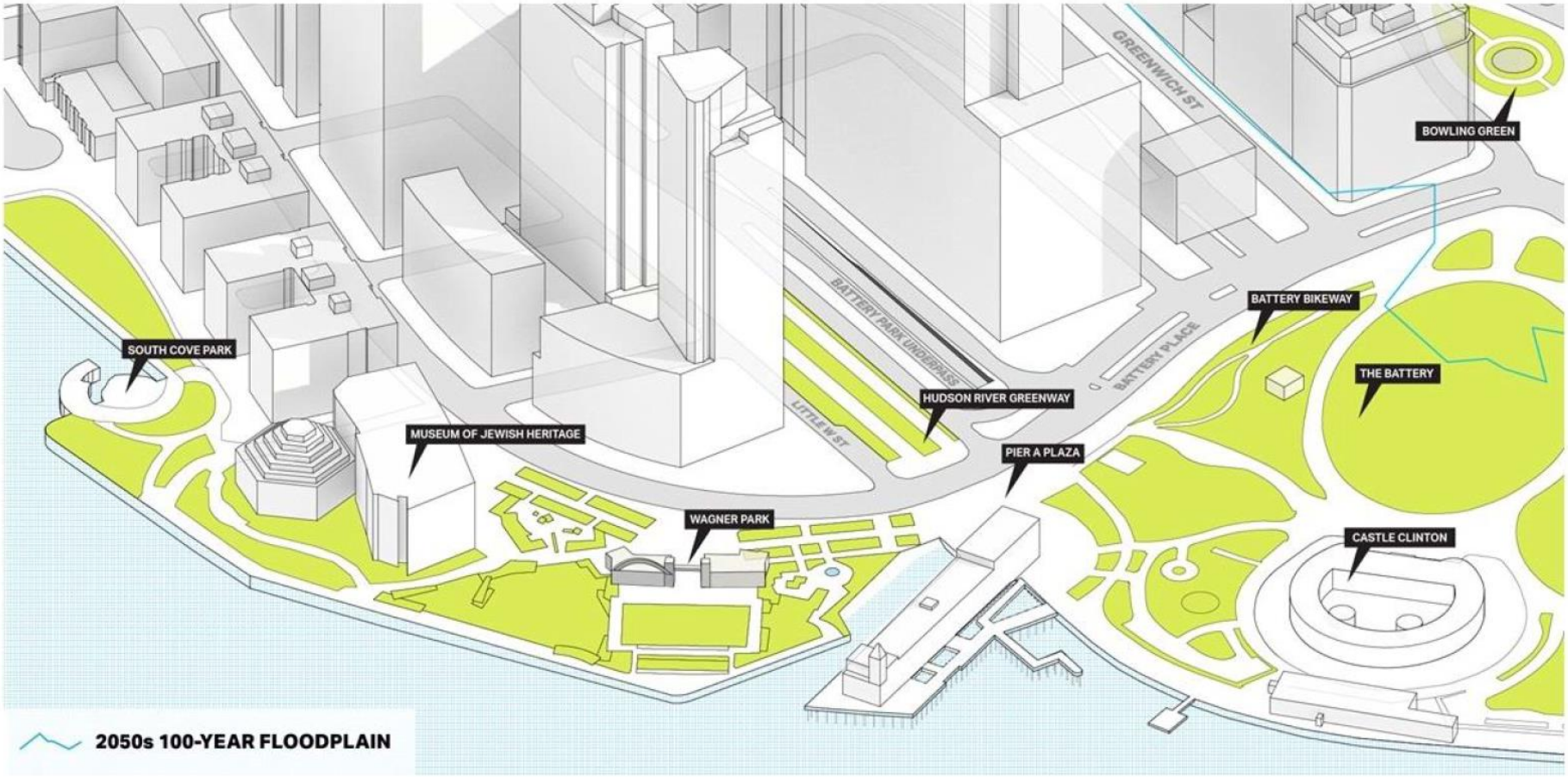
FIGURES 1-26



South Battery Park City Resiliency Project
Phase IA Archaeological Study

Project Location

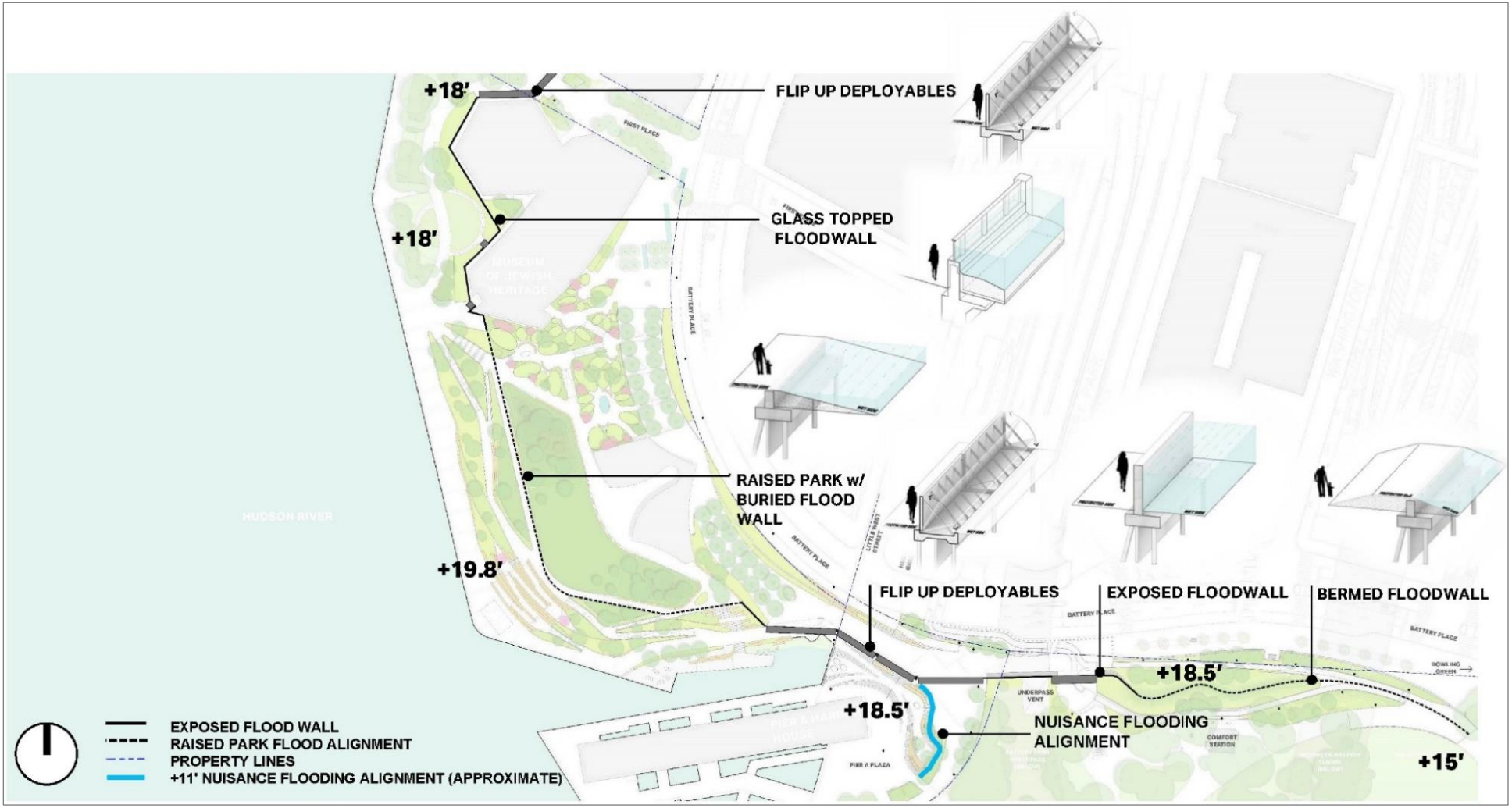
Figure 1



South Battery Park City Resiliency Project **Existing Conditions**

Phase IA Archaeological Study

Figure 2

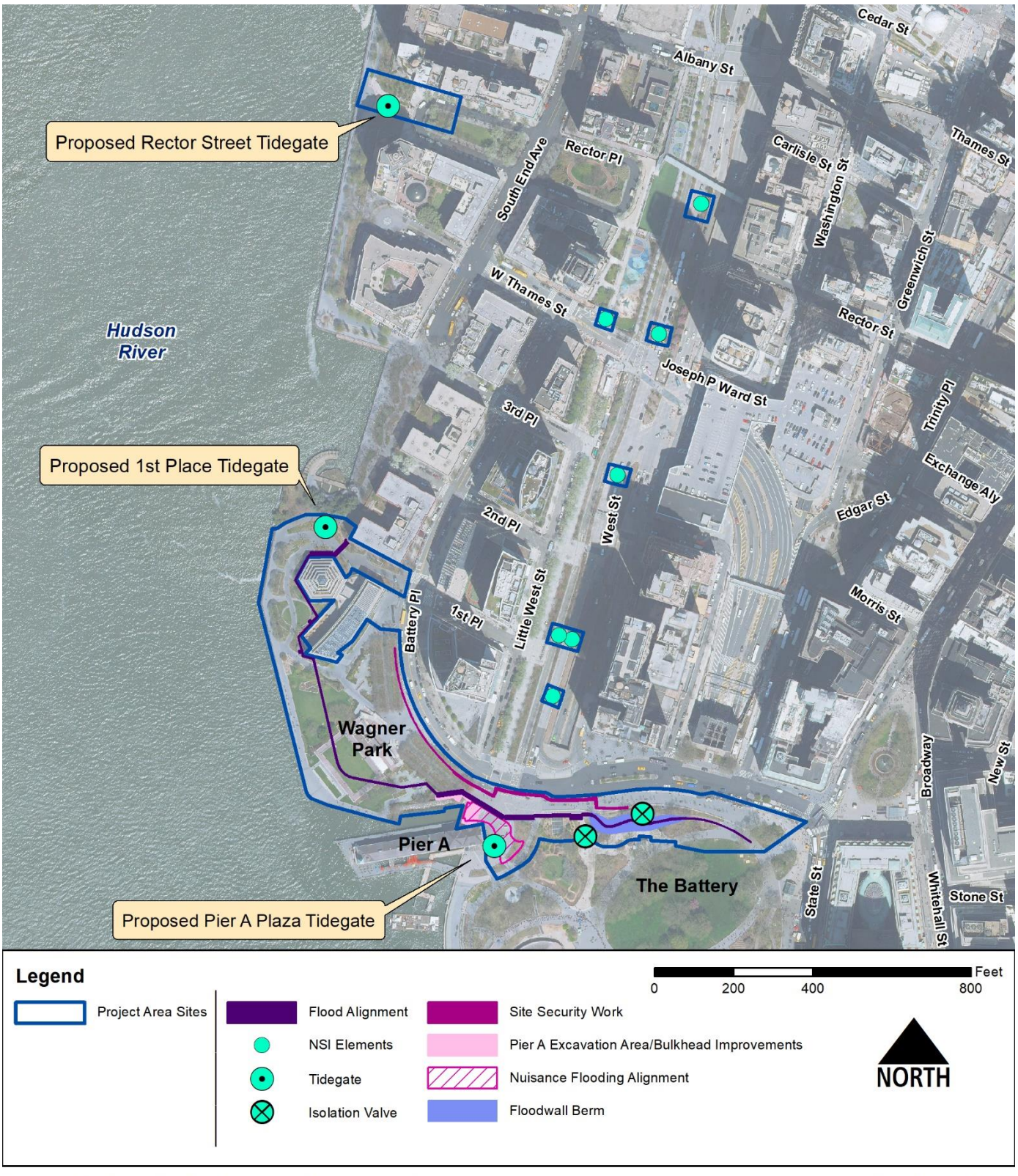


South Battery Park City Resiliency Project

Phase IA Archaeological Study

Project Flood Alignments + DFE

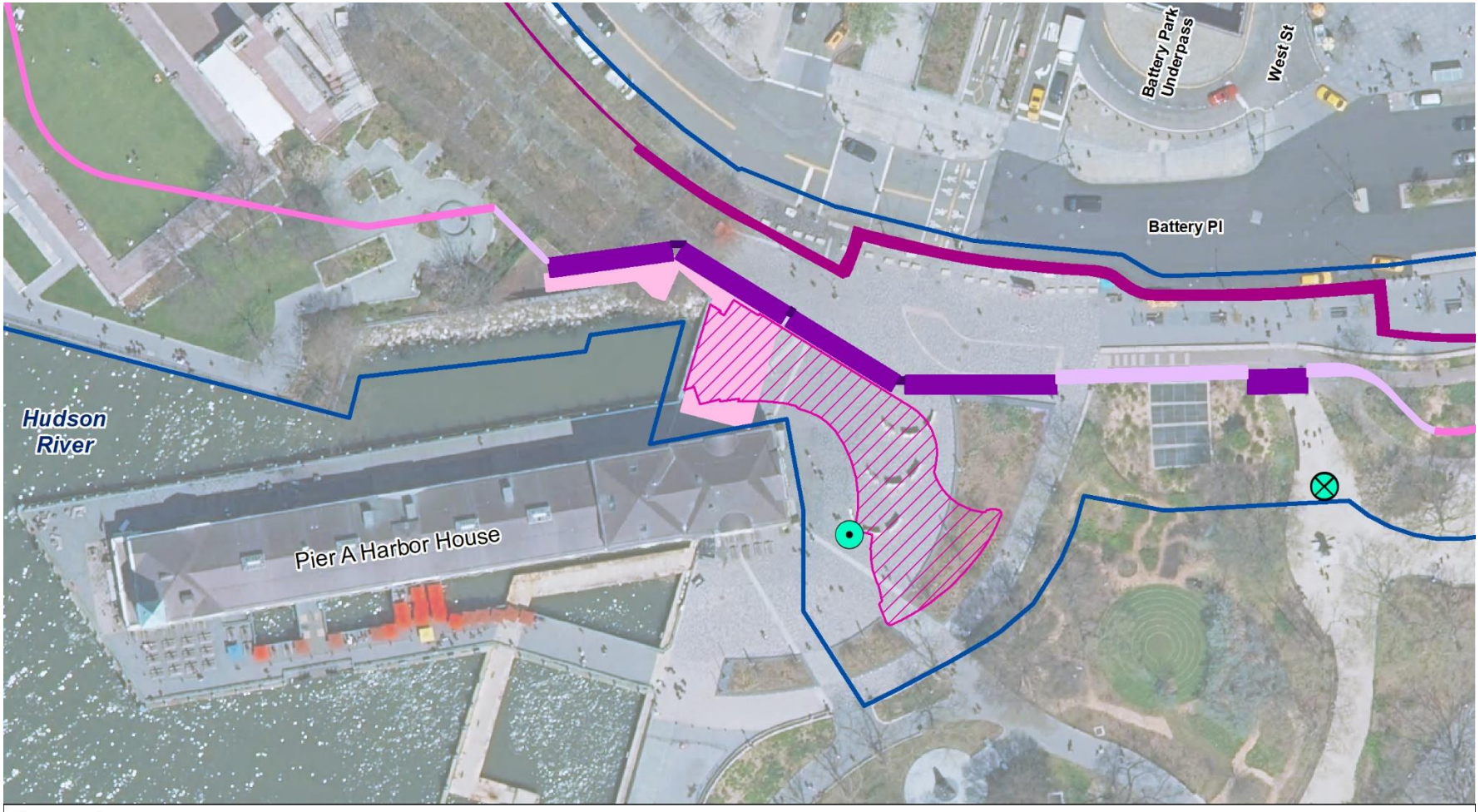
Figure 3



South Battery Park City Resiliency Project **Project Area**

Phase IA Archaeological Study

Figure 4



Legend

Archaeological APE

Flood Alignment

- Exposed Floodwall
- Buried Floodwall
- Flip-Up Deployable Gate
- Fixed Column
- Site Security Work
- Pier A Excavation Area/Bulkhead Improvements
- Nuisance Flooding
- Tidegate
- Isolation Valve
- Project Area

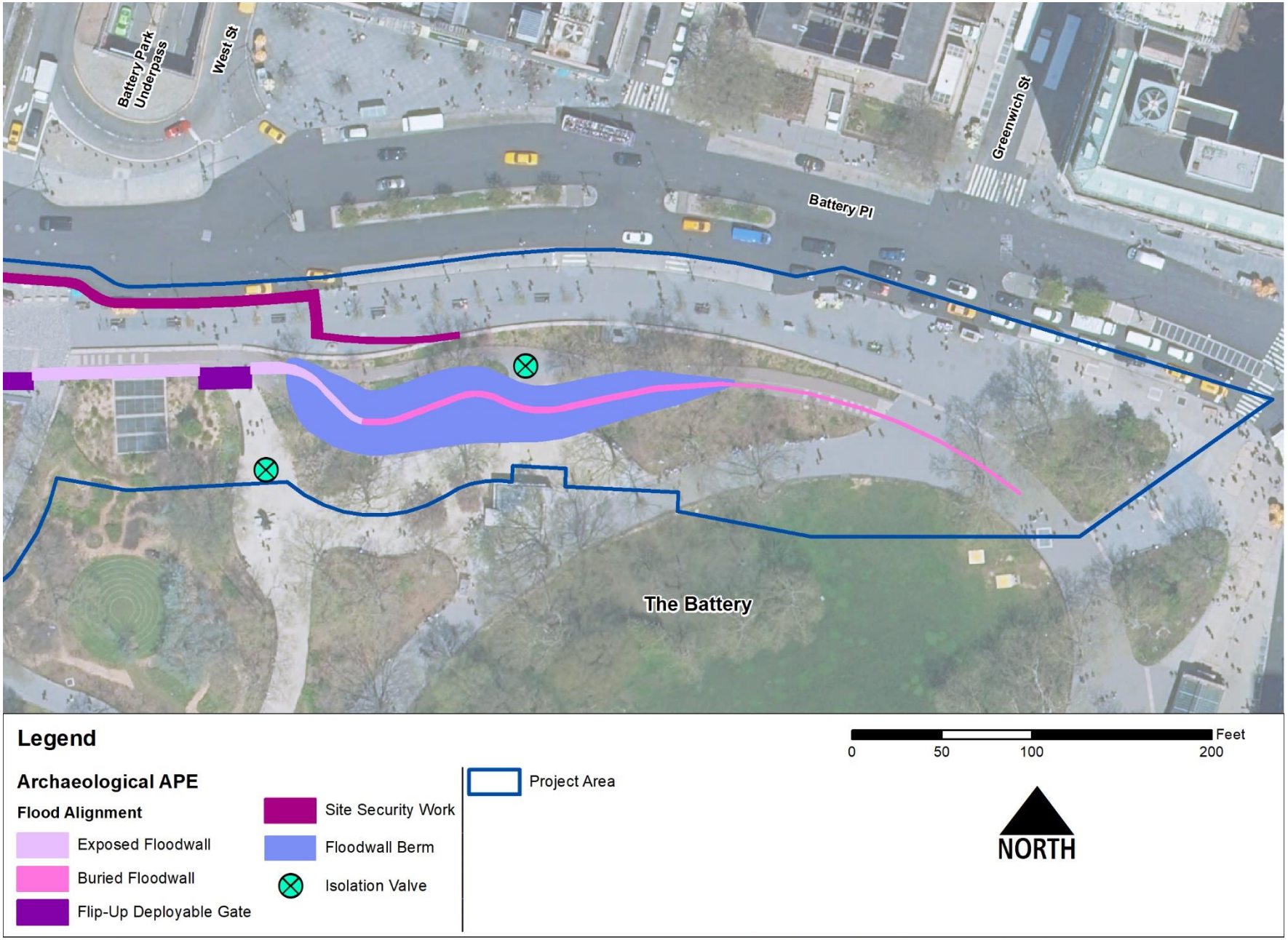
0 50 100 200 Feet

NORTH

South Battery Park City Resiliency Project
Phase IA Archaeological Study

Archaeology APE: Project Actions in the Vicinity of Pier A Plaza

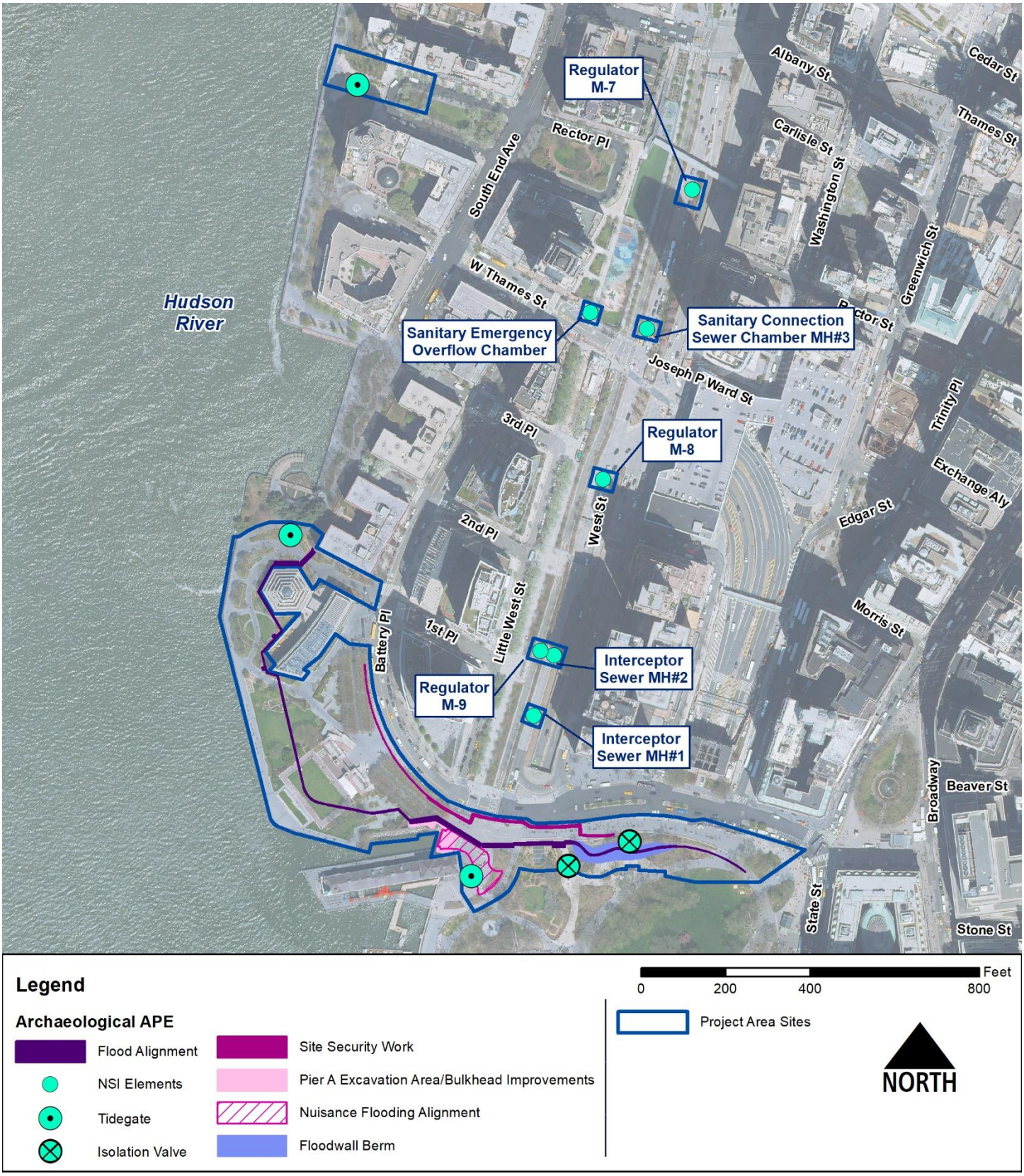
Figure 5



South Battery Park City Resiliency Project
Phase IA Archaeological Study

Archaeology APE: Project Actions in the Vicinity of The Battery

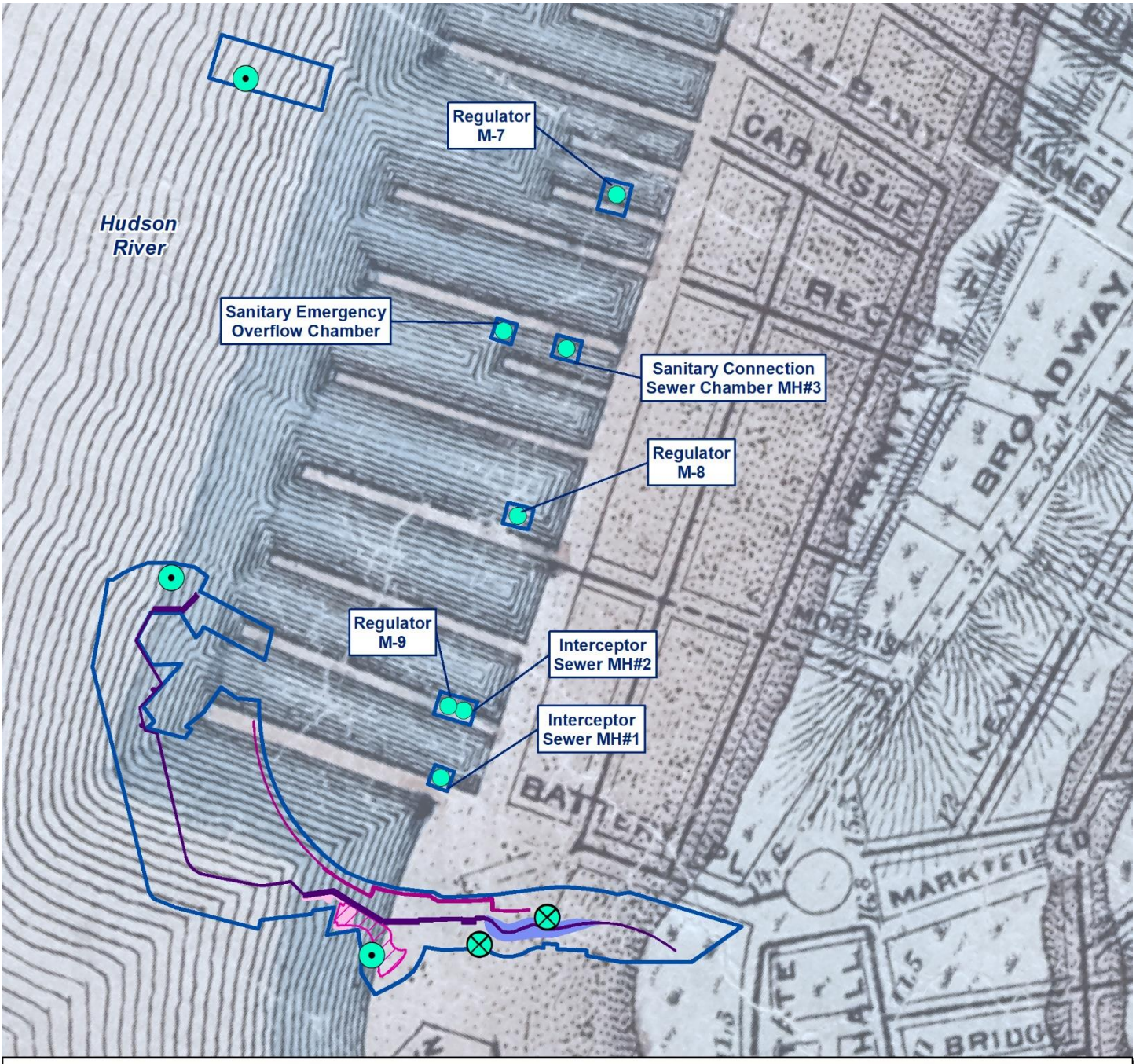
Figure 6



South Battery Park City Resiliency Project
Phase IA Archaeological Study

Archaeology APE: NSI Project Actions

Figure 7



South Battery Park City Resiliency Project

Phase IA Archaeological Study

Sanitary & Topographical Map of the City and Island of New York

Source: Viele 1865

Figure 8

South Battery Park City Resiliency Project
Phase IA Archaeological Study

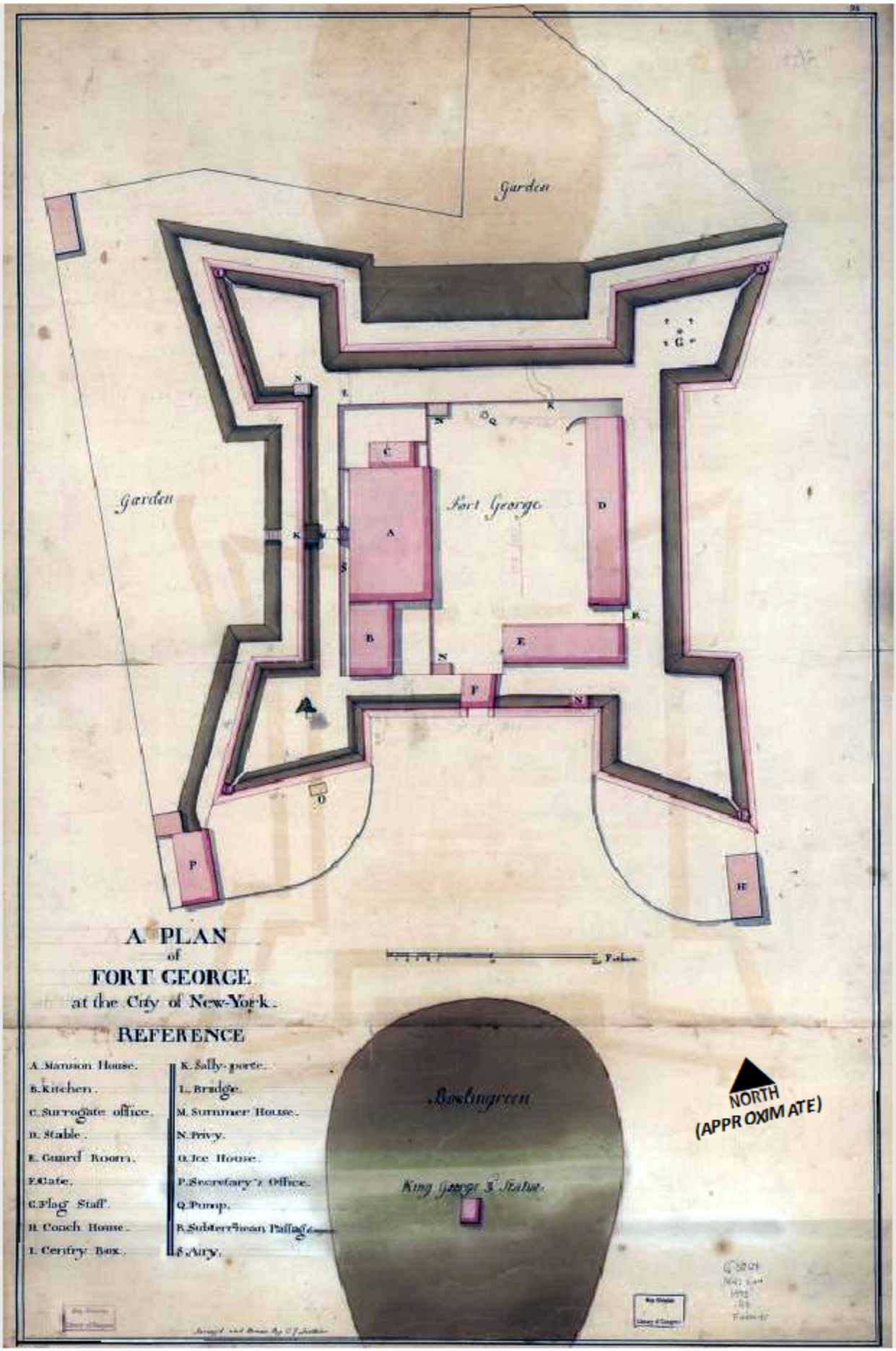
The Castello Plan
Source: Cortelyou 1660

Figure 9

South Battery Park City Resiliency Project
Phase IA Archaeological Study

Plan of the city of New York
Source: Maerschalk 1755

FIgure 10



South Battery Park City Resiliency Project
Phase IA Archaeological Study

Fort George at the City of New York
Source: Sauthier 1773

Figure 11

Legend

A. Fort George

B. Batteries

C. Military Hospital

NORTH (APPROXIMATE)

South Battery Park City Resiliency Project
Phase IA Archaeological Study

A Plan of the City of New York & its Environs
Source: Montresor 1766

Figure 12

South Battery Park City Resiliency Project
Phase IA Archaeological Study

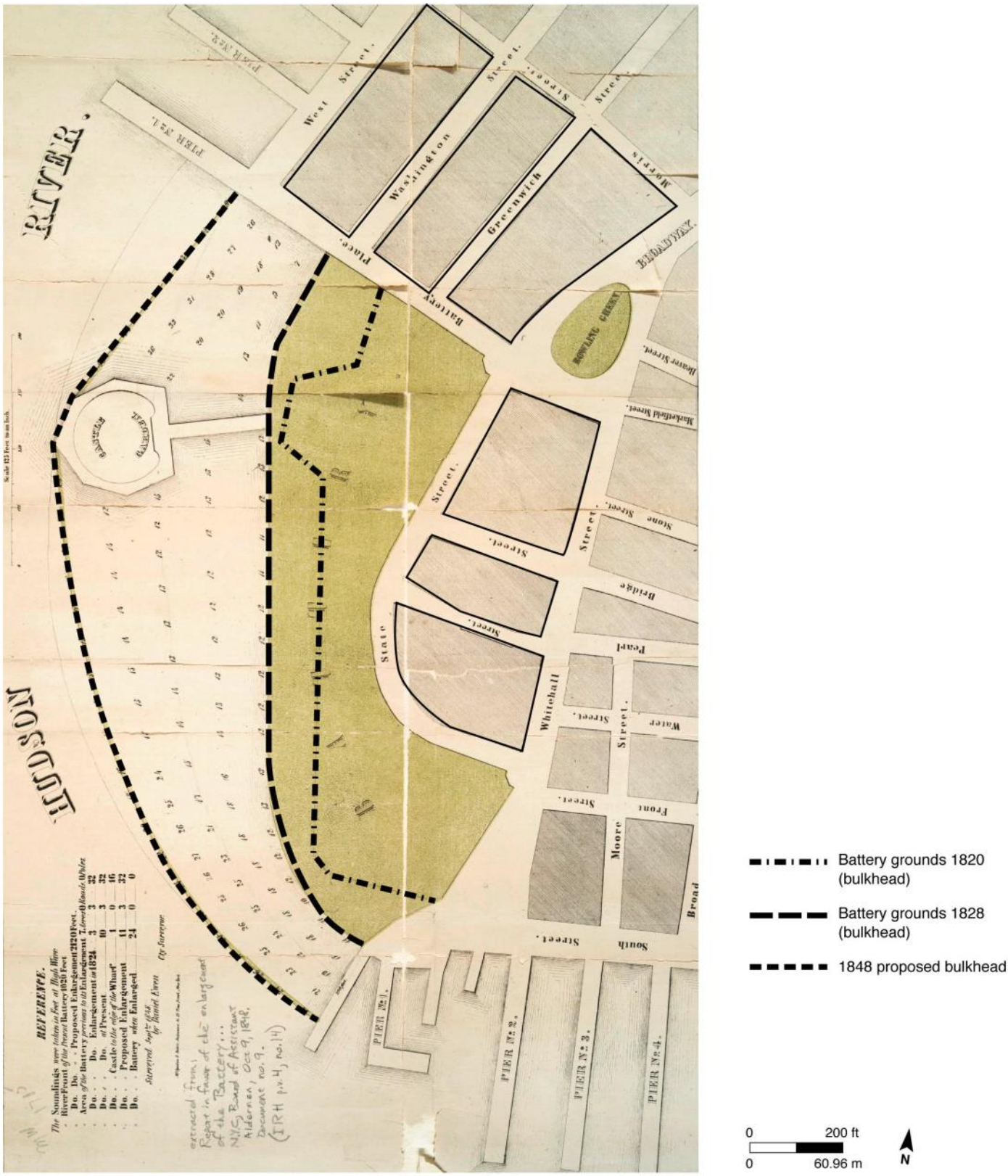
Plan of the city of New York in North America
Surveyed in 1766 & 1767
Source: Ratzer 1776

Figure 13

South Battery Park City Resiliency Project
Phase IA Archaeological Study

Hooker's New Pocket Plan of the City of New York
Source: Hooker 1824

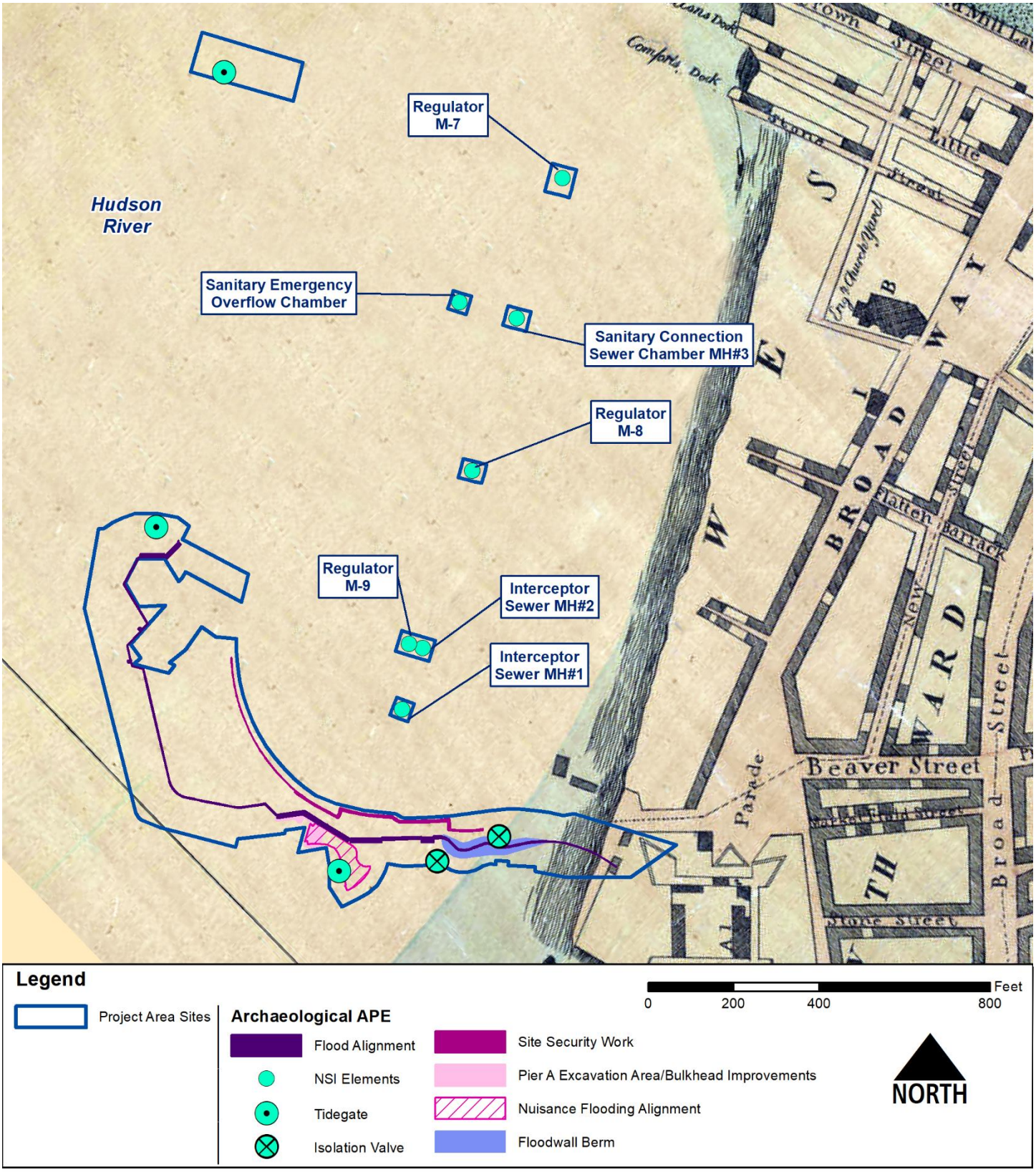
Figure 14



South Battery Park Resiliency Project **Bulkhead Alignments 1820 to 1848, on Ewen 1848**

Phase IA Archaeological Study **Source: Geismar 2010**

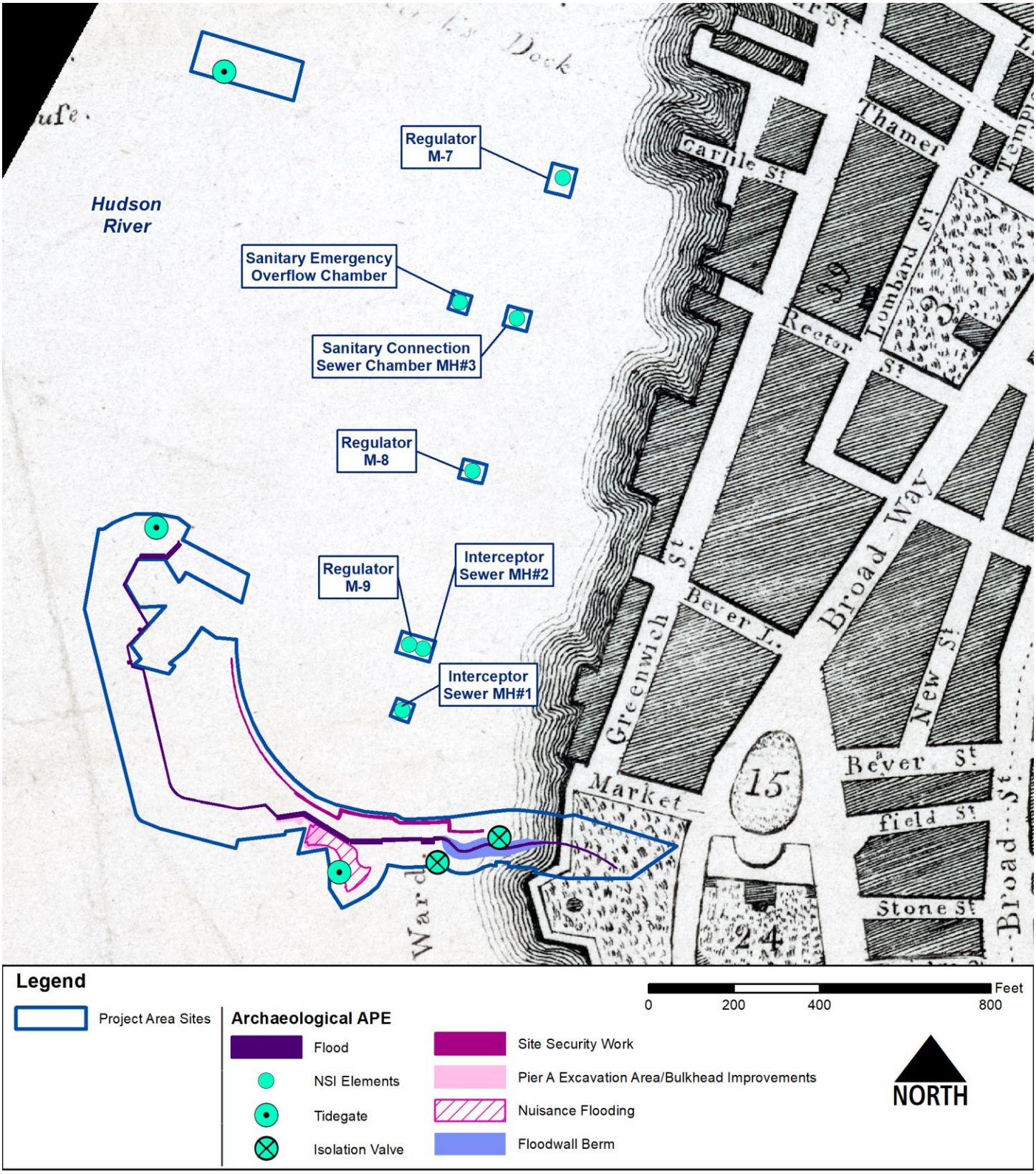
Figure 15



South Battery Park City Resiliency Project
Phase IA Archaeological Study

A Plan of the City of New York
Source: Lyne 1728

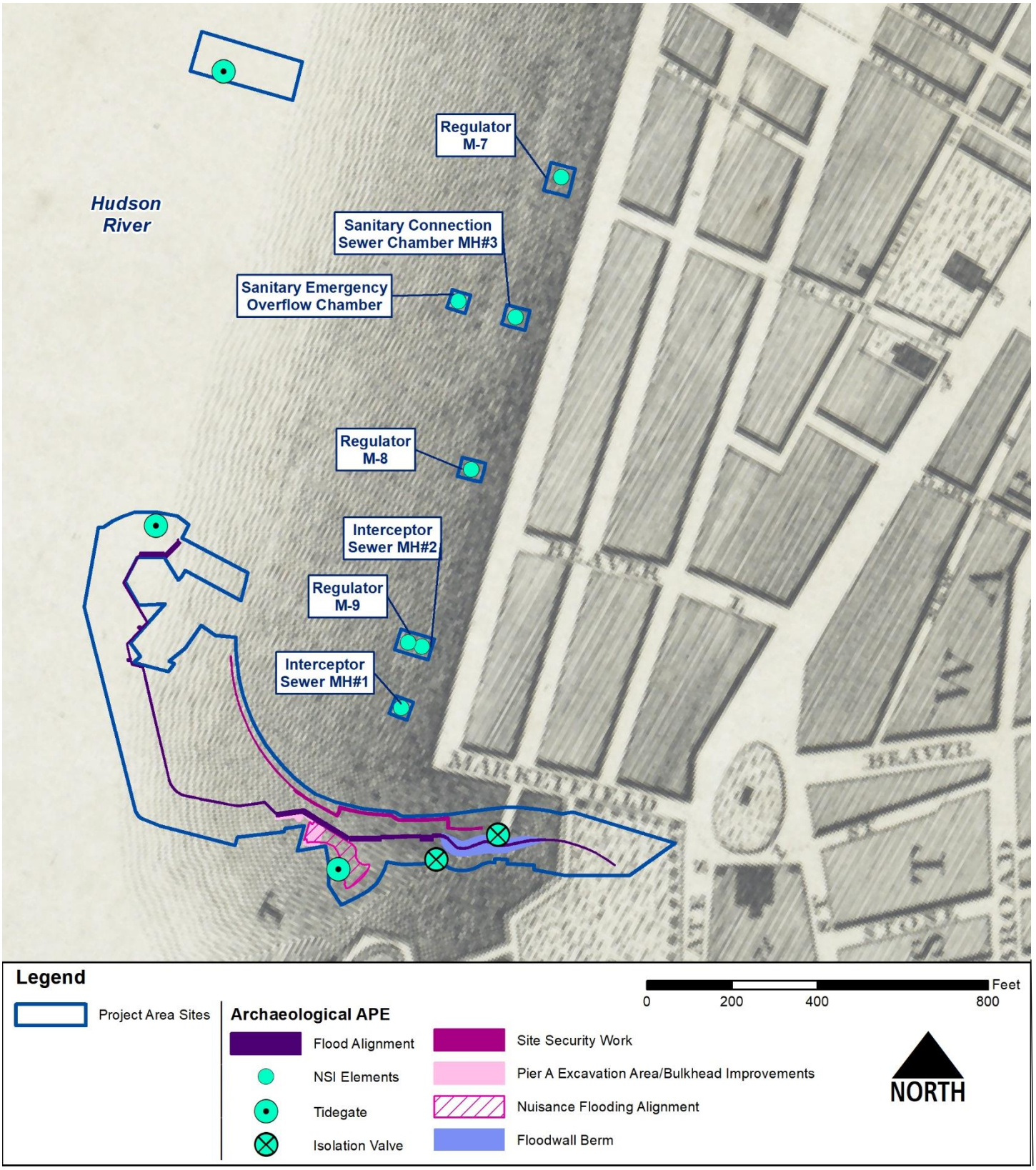
Figure 16



South Battery Park City Resiliency Project
Phase IA Archaeological Study

A Plan of the City of New York
Source: Maverick 1796

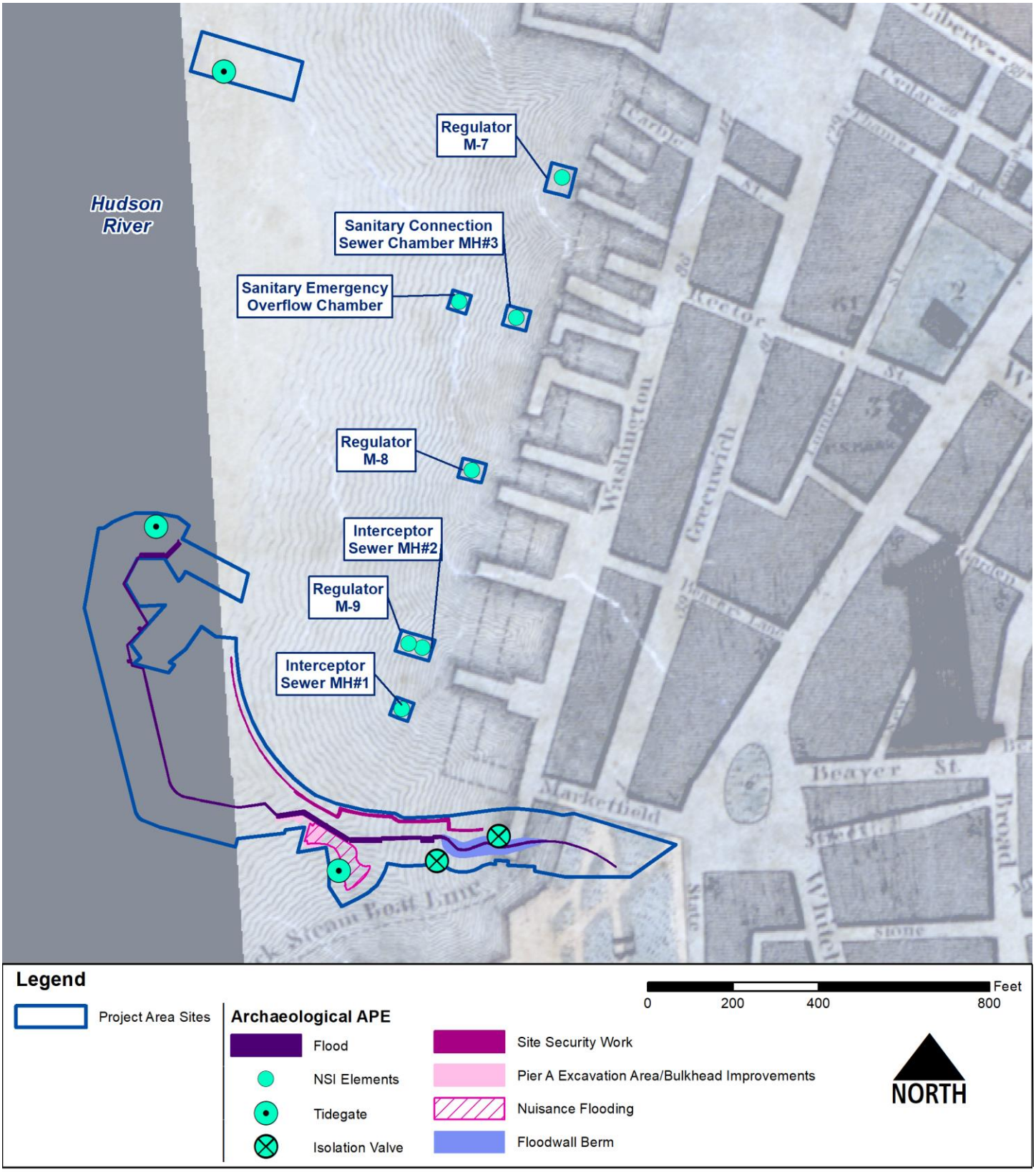
Figure 17



South Battery Park City Resiliency Project
Phase IA Archaeological Study

The Commissioner's Map
Source: Bridges 1811

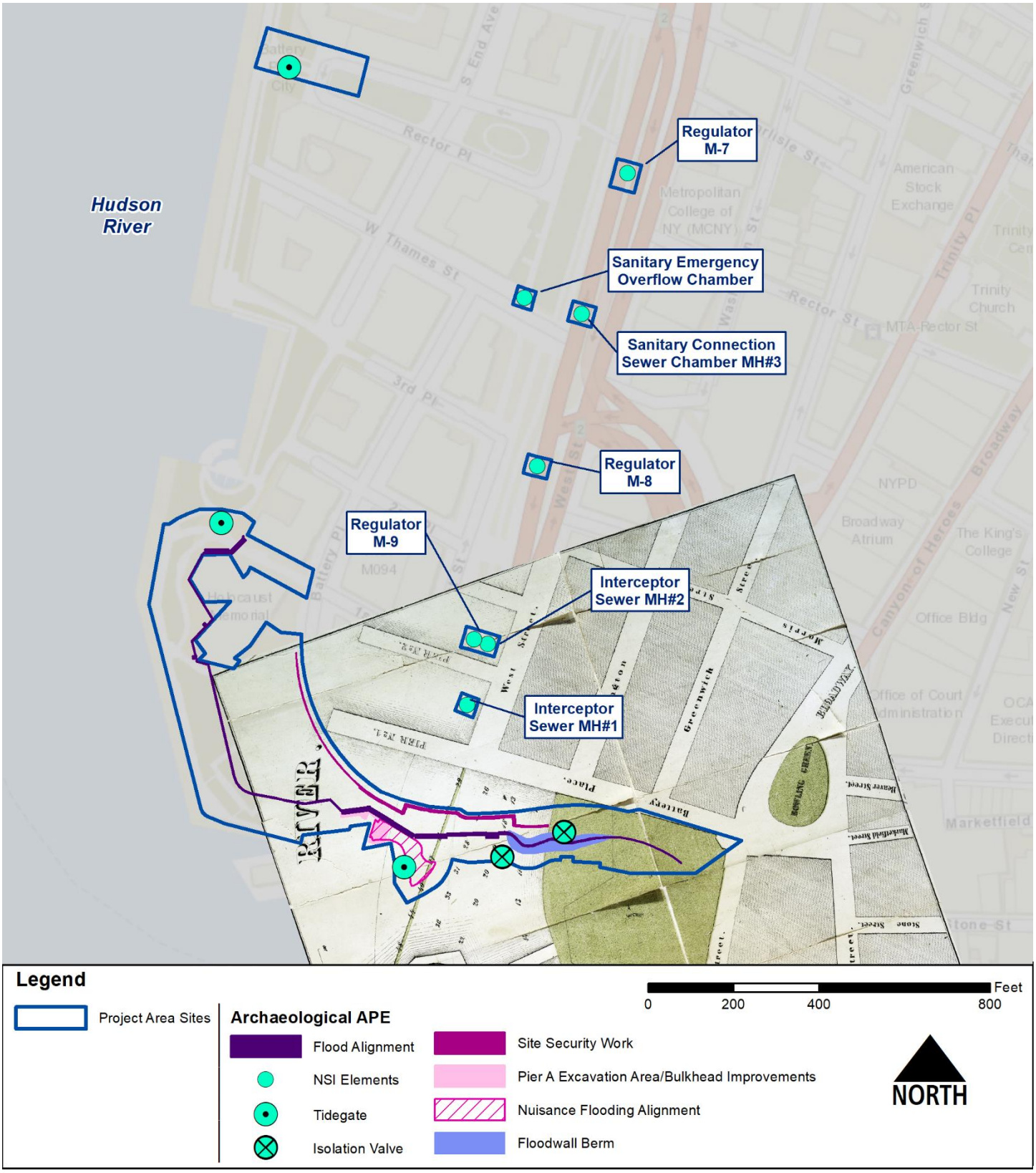
Figure 18



South Battery Park City Resiliency Project
Phase IA Archaeological Study

Plan of the City of New York
Source: Poppleton 1817

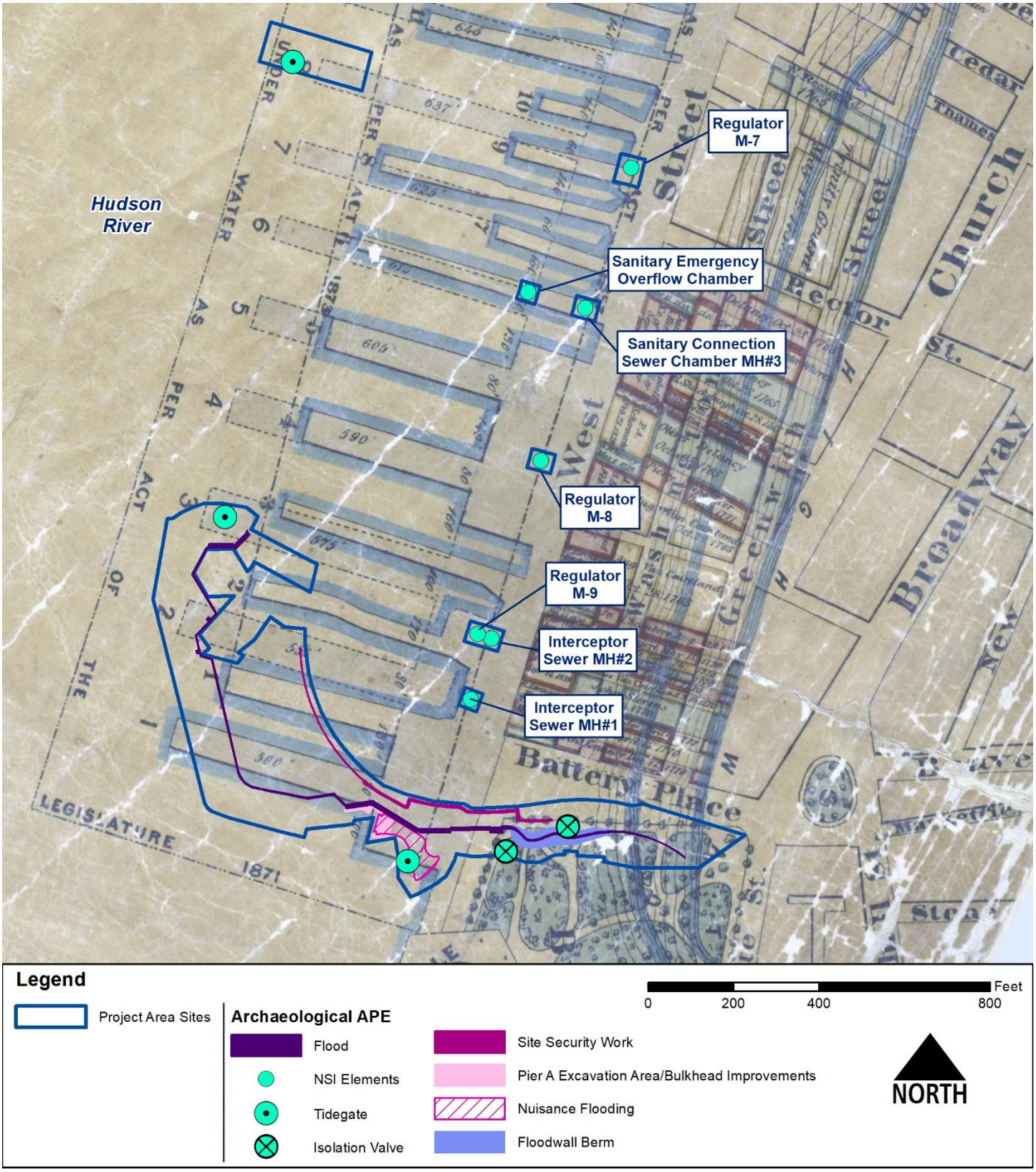
Figure 19



South Battery Park City Resiliency Project
Phase IA Archaeological Study

Proposed Enlargement of the Present Battery
Source: Ewen 1848

Figure 20



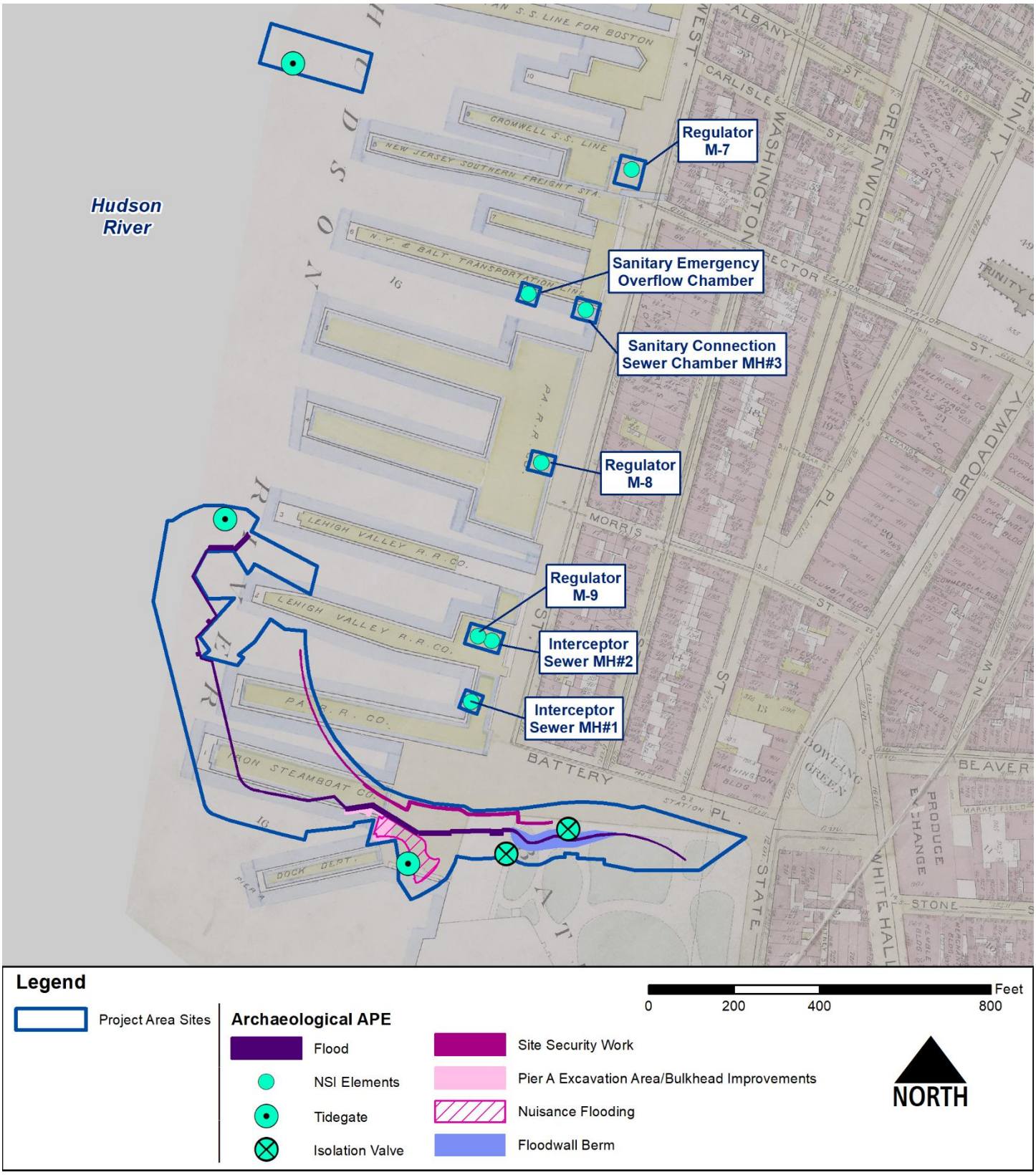
South Battery Park City Resiliency Project

Phase IA Archaeological Study

High and Lower Water Marks and the Original City Grants of Lands Under Water

Source: Department of Docks 1873

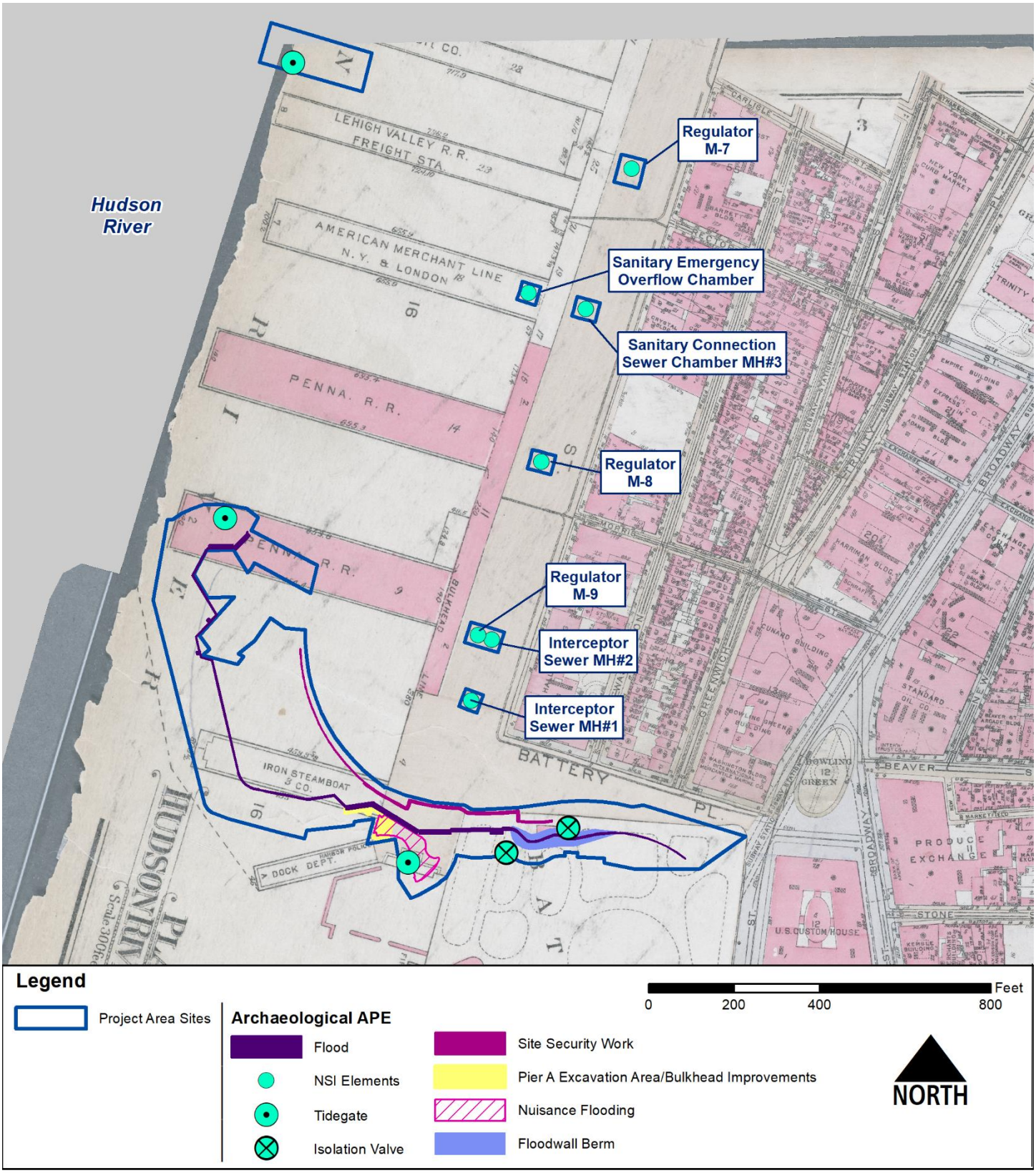
Figure 21



South Battery Park City Resiliency Project
Phase IA Archaeological Study

Atlas of the City of New York
Source: Bromley 1891

Figure 22



South Battery Park City Resiliency Project
Phase IA Archaeological Study

Atlas of the City of New York
Source: Bromley 1930

Figure 23

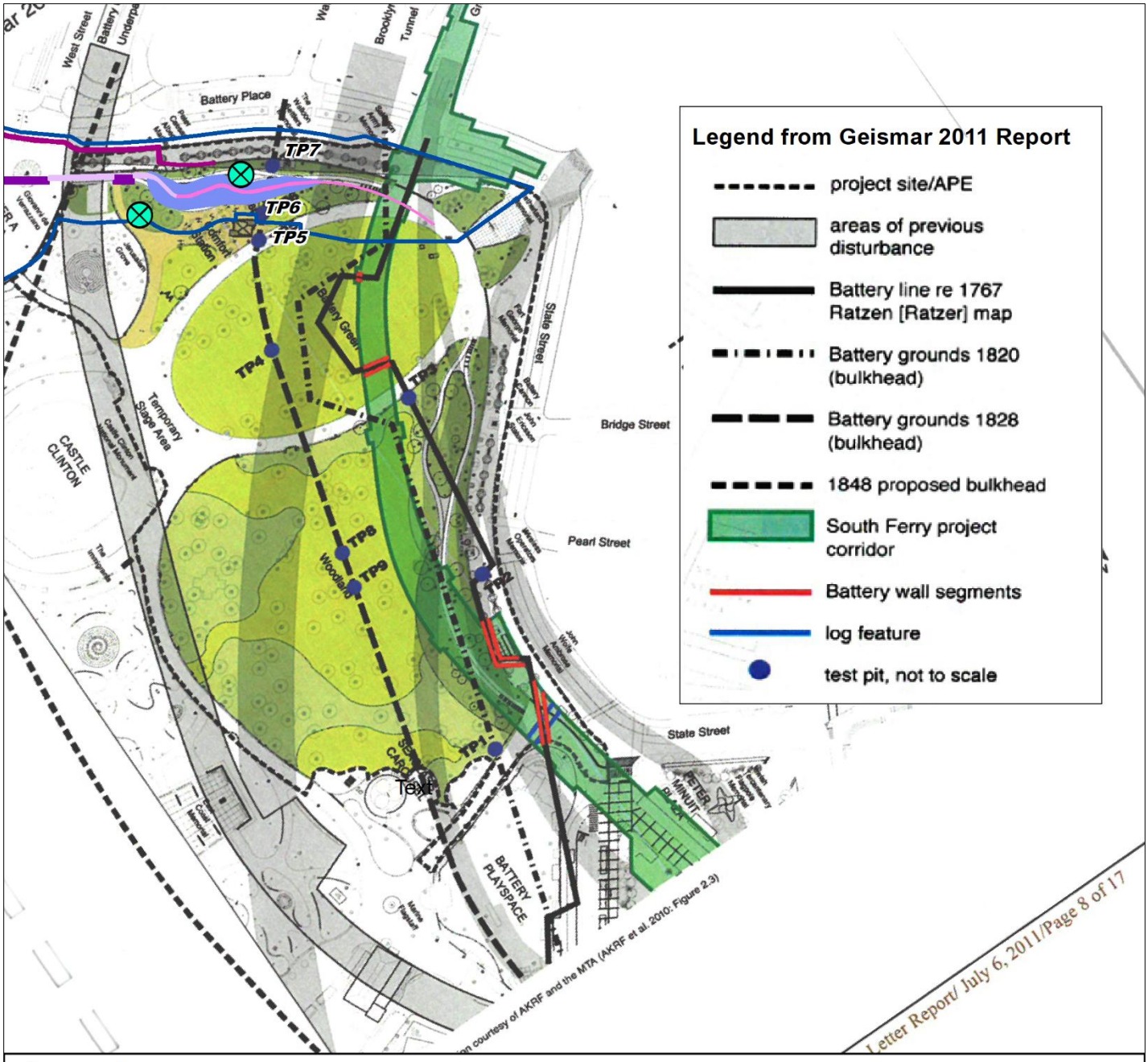
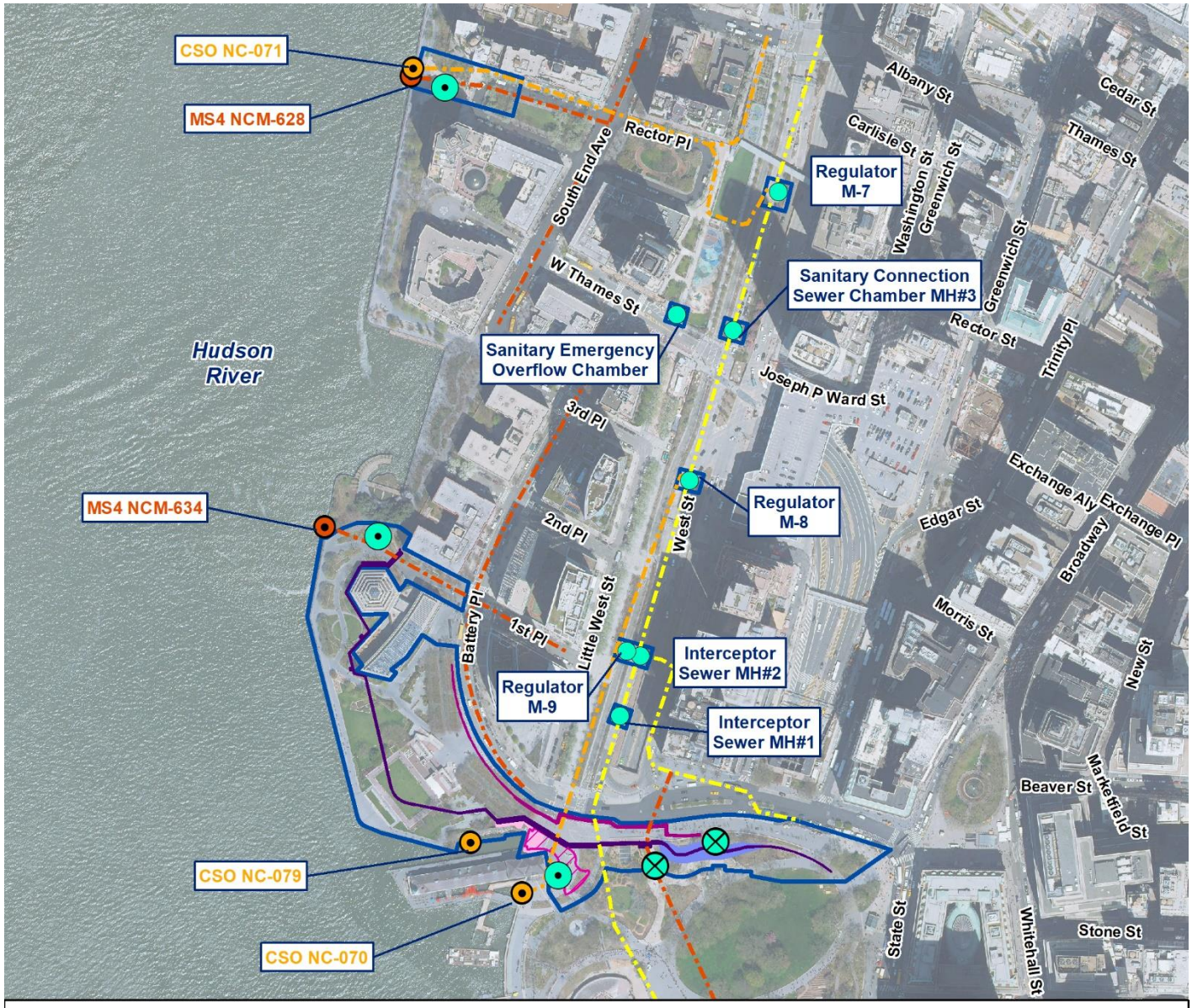

Legend from Geismar 2011 Report
project site/APE
areas of previous disturbance
Battery line re 1767 Ratzen [Ratzer] map
Battery grounds 1820 (bulkhead)
Battery grounds 1828 (bulkhead)
1848 proposed bulkhead
South Ferry project corridor
Battery wall segments
log feature
test pit, not to scale
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
Battery Place
State Street
Bridge Street
Pearl Street
CASTLE CLINTON
BATTERY PLAYSPACE
Temporary Slurry Area
Text
Letter Report/ July 6, 2011/Page 8 of 17
Legend
Project Area
Archaeological APE
Flood Alignment
Exposed Floodwall
Buried Floodwall
Flip-Up Deployable Gate
Isolation Valve
Floodwall Berm
Site Security Work
Feet
0
125
250
500
NORTH
South Battery Park City Resiliency Project
Phase IA Archaeological Study
Historic Disturbance and Features in the Vicinity of the Battery
Source: Geismar 2011

Figure 25



Legend

Feet: 0 200 400 800

NORTH

- Project Area Sites

Existing Sewer Lines

- Interceptor
- CSO Outfall Pipe
- Separated Stormwater Sewer
- Sewer Line Segment
- CSO Outfall Point
- MS4 Outfall Point

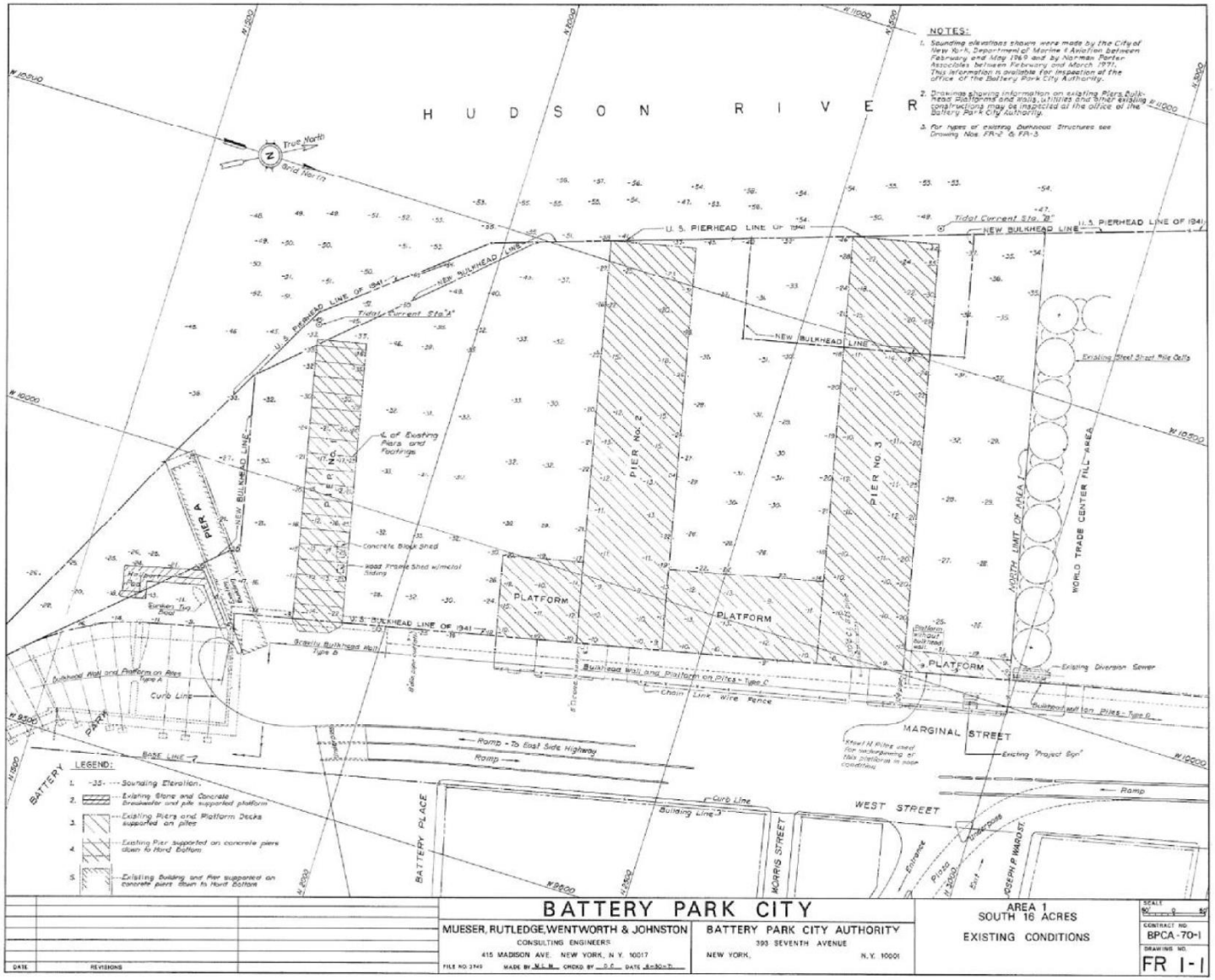
Archaeological APE

- Flood Alignment
- NSI Elements
- Tidegate
- Isolation Valve
- Site Security Work
- Pier A Excavation Area/Bulkhead Improvements
- Nuisance Flooding Alignment
- Floodwall Berm

South Battery Park City Resiliency Project
Phase IA Archaeological Study

Existing Sewer Lines
Source: AECOM 2020

Figure 26



South Battery Park City Resiliency Project

Phase IA Archaeological Study

Existing Conditions at Waterfront in 1971

Source: Mueser Rutledge Wentworth & Johnston 1971

Figure 24

APPENDIX A

Agency Correspondence

APPENDIX A

Agency Correspondence

This page intentionally left blank

Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ARCHAEOLOGY

Project number: (BPCA)
Project: South Battery Park City Resiliency Project
Address: **BBL:**
Date Received: 3/30/2020

This document only contains Archaeological review findings. If your request also requires Architecture review, the findings from that review will come in a separate document.

[ ] No archaeological significance

[ ] Designated New York City Landmark or Within Designated Historic District

[ ] Listed on National Register of Historic Places

[ ] Appears to be eligible for National Register Listing and/or New York City Landmark Designation

[X] May be archaeologically significant; requesting additional materials

Comments: The LPC concurs with the recommendations of AECOM in a letter dated March 22, 2020 to the NYSHPO that the following project areas may contain potentially significant archaeological resources: Pier A Plaza, the northern portion of The Battery adjacent to Battery Place, and the two proposed locations of the interceptor gate chambers and associated control buildings possess archaeological potential. Therefore, the LPC recommends that an archaeological documentary study be completed to further assess this potential in compliance with the Guidelines for Archaeological Work in New York City, 2018 which may be found here: https://www1.nyc.gov/assets/lpc/downloads/pdf/2018_Guidelines%20for%20Archaeology_Final_high%20res.pdf

Cc: NYSHPO

4/10/2020

SIGNATURE DATE
Amanda Sutphin, Director of Archaeology

File Name: 34900_FSO_ALS_04102020.docx

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

April 23, 2020

Gwen Dawson
Vice President of Real Property
Battery Park City Authority
200 Liberty Street, 24th Floor
New York, NY 10281

Re: BPCA
South Battery Park City Resiliency Project
Borough of Manhattan, New York County, NY
20PR02168

Dear Ms. Dawson:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the provided documentation in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project.

We have reviewed the consultation initiation letter and supporting documentation that was provided to our office on March 30th, 2020. Based upon our review, we offer the following comments:

1. Working with Charles Birnbaum, President and Chief Executive Officer of The Cultural Landscape Foundation, SHPO recommends that AECOM and BPCA evaluate the Battery Park City development for National Register eligibility with Wagner Park as a possible contributing feature. Please provide a narrative description and historic development context for Battery Park City and provide documentation and analysis of Wagner Park so SHPO can determine whether the overall development meets the National Register Criteria. Key questions for Wagner Park are: did the design of this park influence others? What impact has it had on landscape design, public park design, waterfront park design? How was it received by experts in the landscape design field upon its completion? Please submit the evaluation and recommendations via CRIS.
2. SHPO requests that a Phase IA archaeological background and sensitivity assessment report be prepared for this project. We concur that the First Place, Wagner Park, and Jewish Museum portions of the project area are not archaeologically sensitive.
3. SHPO concurs with the proposed Area of Potential Effect.

We would appreciate if the requested information could be provided via our Cultural Resource Information System (CRIS) at https://cris.parks.ny.gov/ on the CRIS site, you can log in as a guest and choose "submit" at the very top menu. Next choose "submit new information for an

existing project" at the very bottom of the page. You will need this project number and your e-mail address. If you have any questions, I can be reached at (518) 268-2182.

Sincerely,

Olivia Brazee
Historic Site Restoration Coordinator
olivia.brazee@parks.ny.gov

via e-mail only

cc: R. Pinzon, USACE
S. Rahman, FEMA
B. Koper, FEMA
G. Santucci and A. Sutphin, LPC
J. Dudgeon, BPCA
A. Rachleff, AECOM
N. Stehling, AECOM
R. Dencker, AECOM
A. AbiDargham, AECOM
C. Tiernan, AECOM