AECOM

South Battery Park City Resiliency Project

Draft Environmental Impact Statement

May 4, 2022

DRAFT

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A. 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. This 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 *2021 CEQR Technical Manual* (*CEQR Technical Manual*).

During Superstorm Sandy in 2012, coastal surge inundated Lower Manhattan on its western side through low elevation points near Pier A and in or adjacent to other parts of Battery Park City, damaging, destroying and/or negatively impacting significant components of Lower Manhattan's critical and civic infrastructure. In response to the devastating impact of Superstorm Sandy in Lower Manhattan and in anticipation of future severe storm activity related to global climate change, the SBPCR Project has been developed by the BPCA as an integrated coastal flood risk management project in Lower Manhattan. The SBPCR Project represents one of several projects within the overall Lower Manhattan Coastal Resiliency (LMCR) Master Plan (see **Figure ES-1**).

The SBPCR Project Area (Project Area), the area of direct physical disturbance, extends from 1st Place and the Museum of Jewish Heritage, through Robert F. Wagner Park (Wagner Park or the Park), across Pier A Plaza, and then along the north side of the Battery Bikeway in The Battery to higher ground near the intersection of Battery Place and State Street. The SBPCR Study Area (Study Area), which extends beyond the Project Area, varies by resource but is generally defined as the area within 400 feet of the SBPCR Project improvements (see **Figure ES-2**).

The SBPCR Project is being designed to provide flood risk reduction within the Project Area for the current 100-year flood, inclusive of increased intensity and frequency of rainfall, coastal surge, and predicted sea level rise. It is one of three resiliency projects being undertaken by BPCA to address flood risk reduction throughout Battery Park City's 92 acres. The other two projects are the Battery Park City Ball Fields and Community Center Resiliency Project, and the North/West BPC Resiliency Project. The SBPCR Project is also being designed with adaptability for the 2050 100-year storm event at such time as the North/West BPC Resiliency Project is completed and a tie-in between the two projects is created (see **Figure ES-3**).

The flood alignment is composed of multiple different integrated features such as flip-up deployable gates (flip-up deployables), glass-topped floodwalls, buried floodwalls underneath terraced slopes, exposed floodwalls, and bermed floodwalls. The term "flood alignment" is used to differentiate the combination of flood control measures represented by the SBPCR Project from a traditional freestanding flood wall for risk reduction. In addition, interior drainage improvements are proposed for the SBPCR Project, including the isolation of the existing underground sewer manholes and connected chambers (see Section 1.3 (Project Description) and **Figure ES-2**).

On a separate but related note, New York City's The Battery Coastal Resilience Project, the Financial District and Seaport Climate Resilience Project, the Brooklyn Bridge-Montgomery Coastal Resilience Project (BMCR) Project, and the East Side Coastal Resiliency (ESCR) Project are intended to individually and collectively reduce Lower Manhattan's flooding exposure (see **Figure ES-1**).

The SBPCR Project boundary for the flood alignment spans from 1st Place and the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and then along the north side of the Battery Bikeway in The Battery to higher ground near the intersection of Battery Place and State Street. The Design Flood Elevation (DFE) and Height of Intervention (HOI) vary across the flood alignment (see **Figure ES-4**). The DFE is defined as the elevation of the highest flood that a project is designed to protect against. The HOI for a project location is calculated by subtracting the elevation of the existing grade from the proposed DFE.

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 and 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 immediately north of Wagner Park.

BPCA has proactively guided the process for the design of the SBPCR Project, which, due to the need to elevate the topography of Wagner Park, has necessitated a significant redesign of the Park. The redesign of Wagner Park has retained as many aspects as possible of the original design intent and site organization for the Park. To this end, BPCA found that four of the original eight principles from the 1979 Master Plan remain relevant to the redesign of the Park, as well as certain additional portions of the Project Area and that they are pertinent to an understanding of BPCA's approach to the SBPCR Project design:

Principle 1: Battery Park City should not be a self-contained new-town-in town, but a part of Lower Manhattan;

Principle 2: The layout and orientation of Battery Park City should be an extension of Lower Manhattan's system streets and blocks;

Principle 3: Battery Park City should offer an active and varied set of waterfront amenities; and

Principle 5: Circulation should reemphasize the ground level.

Figure ES-1: Lower Manhattan Coastal Resiliency Projects

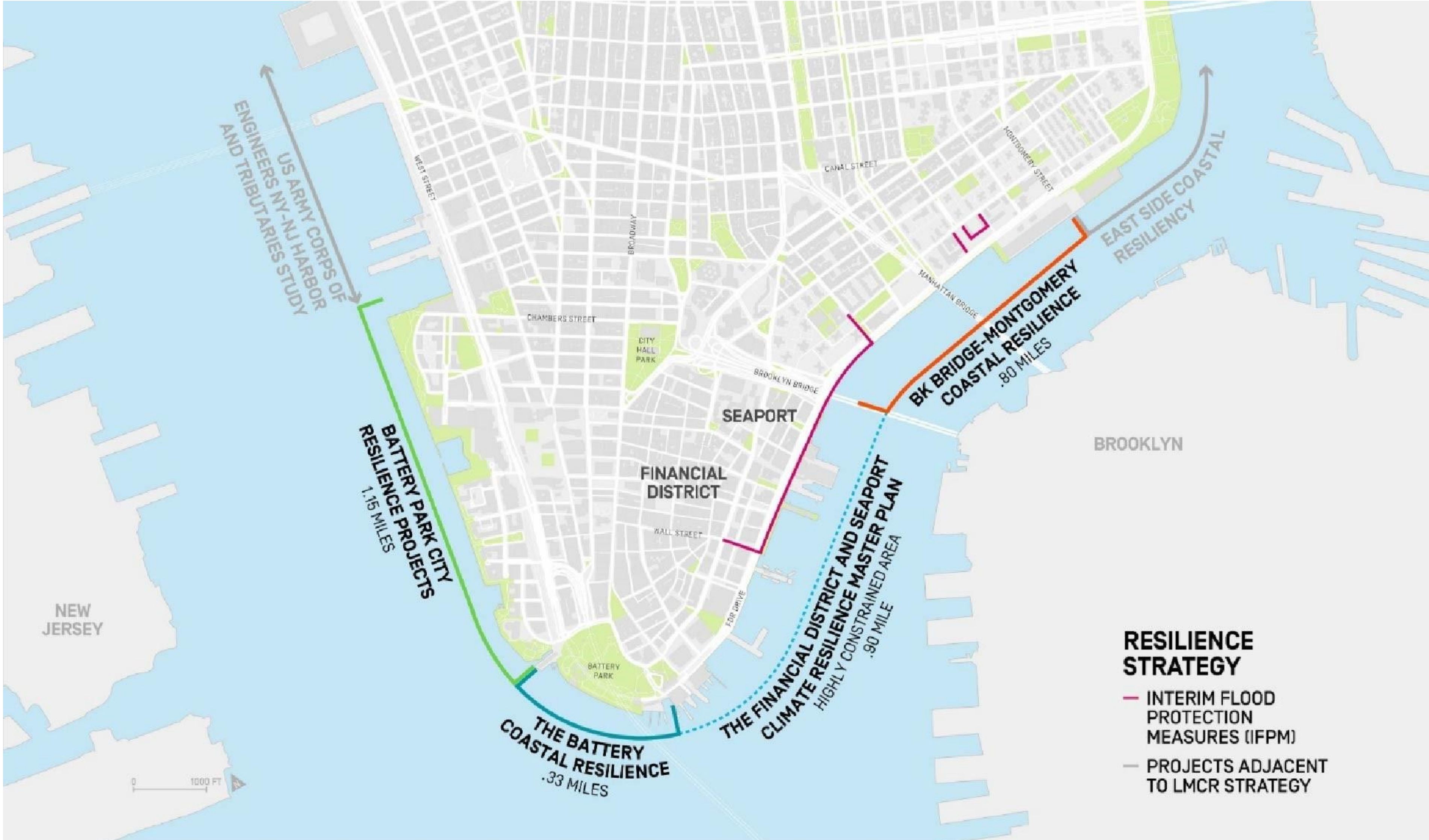


Figure ES-2: Project Area

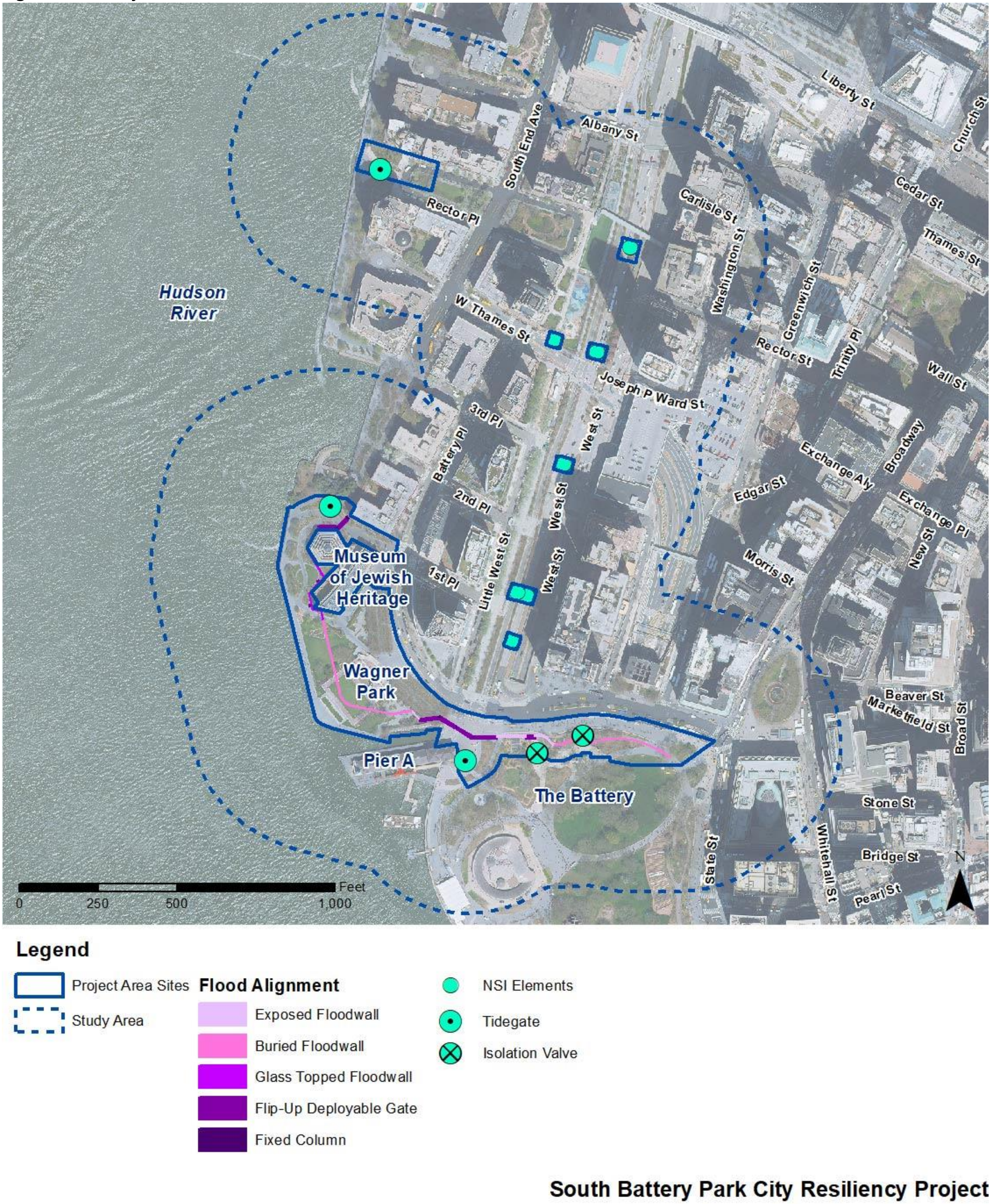


Figure ES-3: Battery Park City Resilience Projects

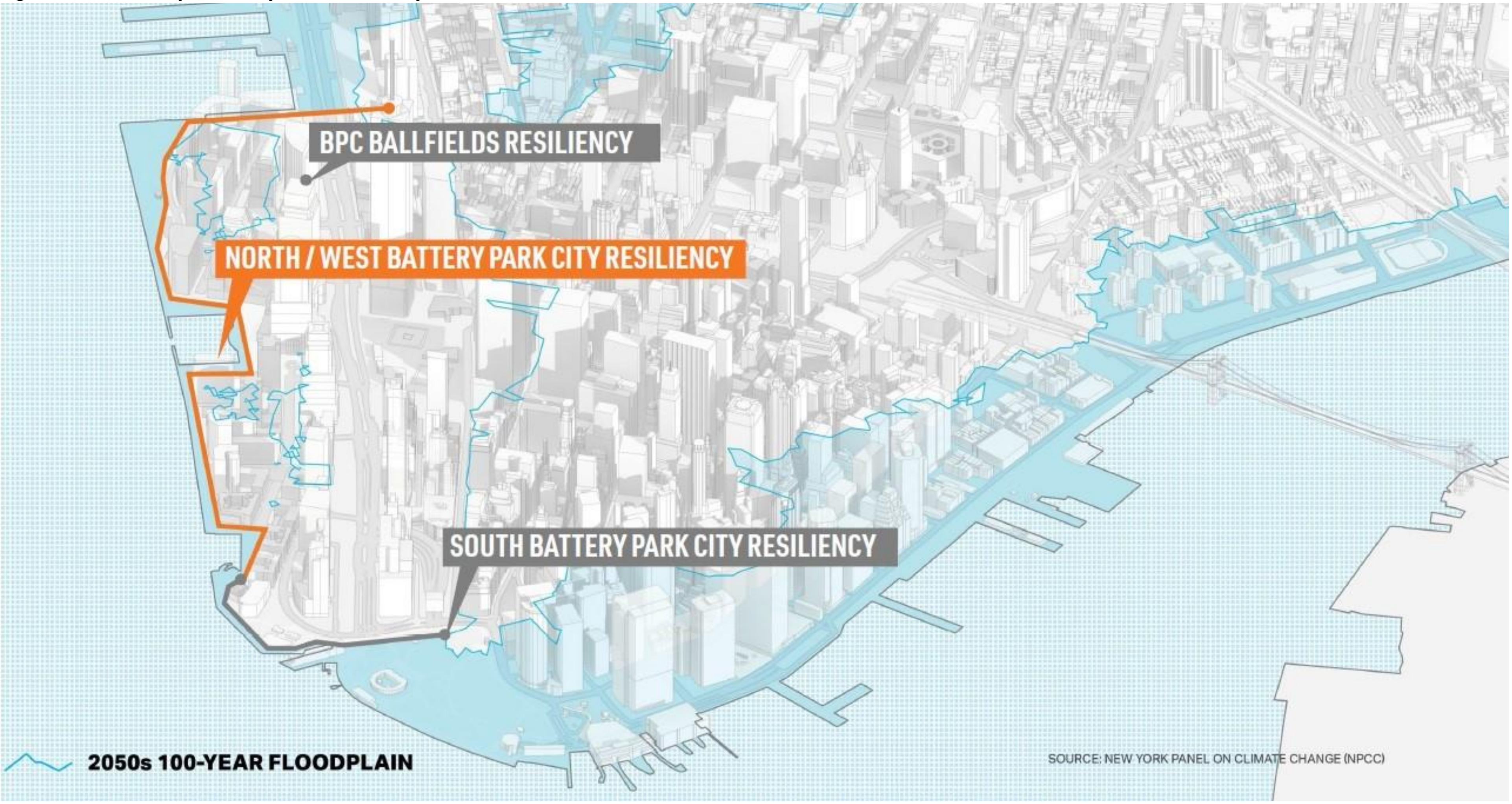
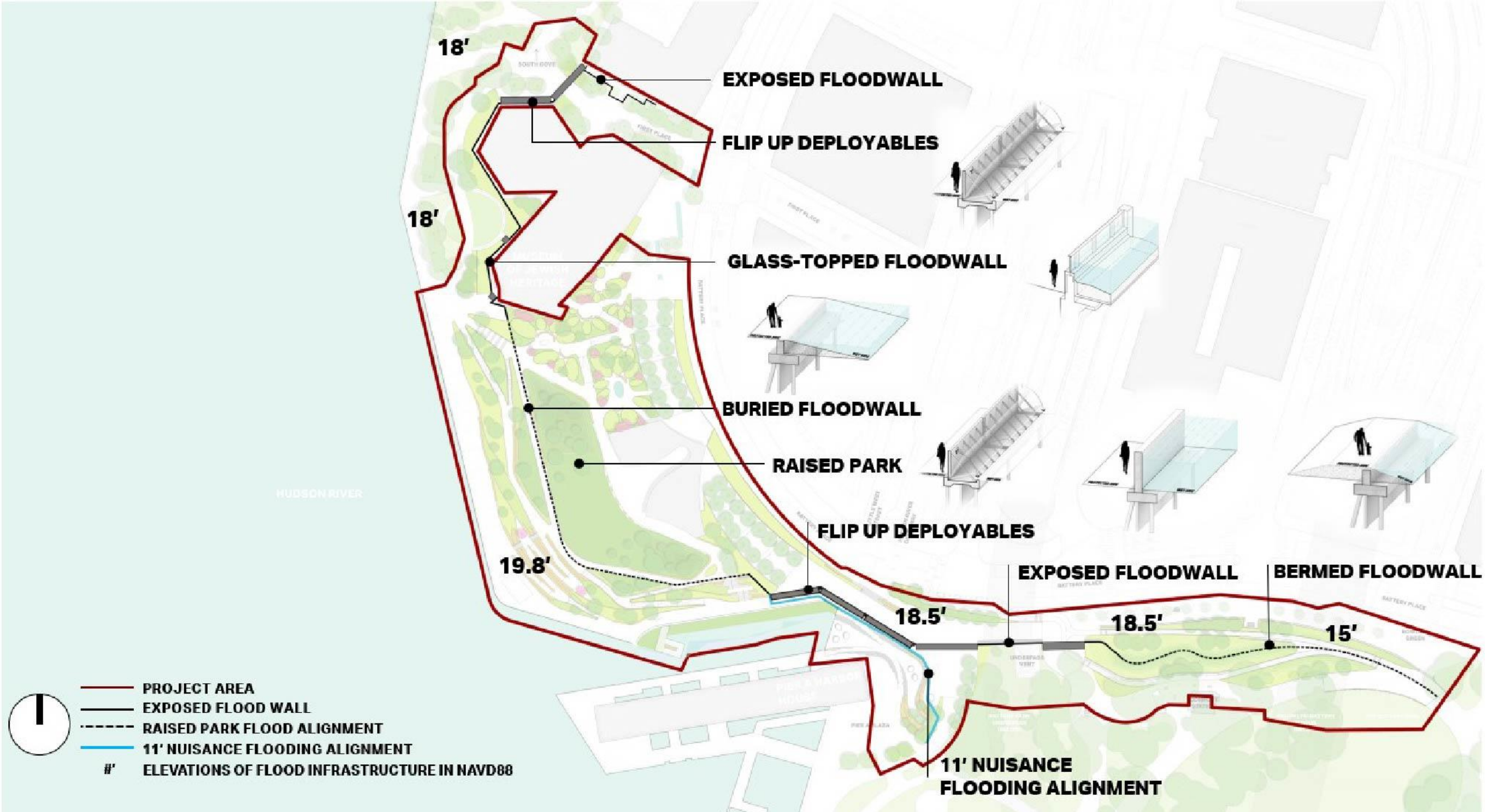


Figure ES-4: SBPCR Project Flood Alignment and DFEs



B. Purpose and Need

During Superstorm Sandy in 2012, storm and coastal surge inundated portions of Lower Manhattan on its western side through areas in or adjacent to northern Battery Park City and Pier A Plaza south of Wagner Park. Water also found its way onto One World Trade Center and the Hugh L. Carey Tunnel (formerly known as the Brooklyn-Battery Tunnel) and impacted much of Lower Manhattan's critical infrastructure.

The SBPCR Project's primary goal is risk reduction in the southern extremes of Battery Park City. This would be accomplished through implementation of integrated flood risk measures, while meeting the design criteria for a 100-year storm event, inclusive of increased intensity and frequency of rainfall, coastal surge and predicted sea level rise. While the SBPCR Project would provide immediate risk reduction for the 100-year storm, it would also provide ready adaptability to the DFE for the 2050 100-year storm at such time as the North/West BPC Resiliency Project is constructed and a tie-in between the systems is created. The SBPCR Project is expected to be accredited by the Federal Emergency Management Agency (FEMA). Accreditation requires a FEMA review of as-built plans and verification that the flood system meets all pertinent requirements and achieves acceptable risk reduction in practice.

The purpose of the SBPCR Project is to:

- Provide a reliable coastal flood control system to provide risk reduction to property, residents and assets within the vicinity of South Battery Park City in response to the design storm event;
- Protect and preserve to the maximum extent practicable, open space resources and opportunities to view and interact with the Manhattan waterfront, particularly in Wagner Park, Pier A Plaza and The Battery; and,
- Avoid or minimize disruption to existing below and above-ground infrastructure (i.e., water and sewer infrastructure, subways, tunnels, utilities, etc.) from flood events.

Specific objectives of the SBPCR Project are to:

- Provide a reliable coastal flood control system that minimizes risk and the need for operational interventions by relying primarily on passive flood control technology as opposed to mechanical "deployable" flood control technology;
- Construct and operate the project in an environmentally responsible manner;
- Preserve to the greatest extent practicable the character and design aesthetic of the community and its interface with the BPC waterfront and access to coastal viewsheds, particularly views of the harbor and Statue of Liberty; and
- Utilize cost-effective solutions to maximize capital investment over the lifespan of the SBPCR Project.

C. Alternatives Evaluated

Alternatives for the SBPCR Project were considered for the five segments of the Project Area, individually due to their differing characteristics, as well as interior drainage alternatives. These five segments are shown in **Figure 2.2-1** and include:

- 1st Place
- Museum of Jewish Heritage
- Wagner Park, including Pier A inlet
- Pier A Plaza
- The Battery

In addition to the No Action Condition, the Project Team evaluated options for each project segment as described in detail in Section 2.2.2 (Action Alternatives Considered). The selected approaches for each segment are described below as the Proposed Action.

No Action Condition

Under the No Action Condition, there would be no comprehensive flood alignment within the Study Area and Battery Park City would remain vulnerable to both low inundation flooding and the 100-year storm event. Without flood protection, the Study Area including the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery would be subject to storm damage from major and minor flood events.

The No Action Condition consists of other planned or ongoing projects within the Study Area. These projects are often referred to as the "No Action" projects and are assumed to be constructed whether the Proposed Action is constructed or not. The Battery Coastal Resilience Project is a New York City Economic Development Corporation (NYCEDC) project within the Study Area and would connect into the SBPCR Project at Pier A Plaza. The Battery Park Underpass and West Street Underpass Project is a New York City Department of Transportation (NYCDOT) project that would provide protection for the Battery Park and West Street underpasses from future sea level rise and flood damage. The No Action Project List is presented in **Table 2.2-1** of Section 2.2.1 (No Action Condition) of this DEIS.

Proposed Action

The Proposed Action is located in Lower Manhattan just west of the point where the Hudson River and East River diverge. The Project flood alignment spans an area from 1st Place and the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and then along the north side of the Battery Bikeway in The Battery to higher ground near the intersection of Battery Place and State Street as shown in **Figure ES-4**. In addition, the following interior drainage improvements are proposed: a near surface isolation (NSI) system along West Street between Battery Place and Albany Street; tidegates at 1st Place near the Museum of Jewish Heritage, Rector Place near the Hudson River, as well as in Pier A Plaza; and isolation valves in The Battery portion of the Project Area.

This section describes the elements of the flood alignment across five SBPCR Project segments, and associated interior drainage improvement areas, moving from west to east. The SBPCR Project segments are defined as 1st Place, Museum of Jewish Heritage, Wagner Park, Pier A Plaza and The Battery. In addition to the flood protection measures, an important element of the SBPCR Project is the inclusion of sustainable design measures. Construction is expected to begin in July 2022 and conclude in July 2024. **Figure ES-4** provides the type of flood alignment infrastructure proposed for each project segment and identifies the DFE. The DFEs and HOI vary across the Project's flood alignment. The HOI for a project location is calculated by subtracting the elevation of the existing grade from the proposed DFE.

1st Place

The flood alignment begins on the north side of 1st Place, where it ties into an existing, natural 11-foot flood contour at a point where the DFE required to achieve FEMA certification is also 11 feet. It then extends south across 1st Place as a flip-up deployable, which would seal against permanent columns when deployed. The flip-up deployable across 1st Place would be installed to lie flat when not in use. 1st Place would not be altered in any material way beyond the installation of flip-up deployables in the street bed, with columns framing their edges. Grade changes to the street and right-of-way (ROW) would be avoided. The DFE in this area is 18 feet, and the HOI is 7 feet. See Section 1.3.1 (1st Place) of this DEIS for more information about the flood alignment near 1st Place.

Museum of Jewish Heritage

At the southwest end of 1st Place, the flood alignment runs west across the north facing landscaped courtyard of the Museum of Jewish Heritage. The DFE in this location is 18 feet, and the HOI ranges from 7 to 8 feet. Flip-up deployables are planned for this section of the flood alignment, maintaining visual and physical access to the Museum and connecting to the flip-up deployables that span 1st Place. Existing landscape planters adjacent to the north façade of the Museum would be reconstructed and replaced after the installation of the flip-up deployables.

The flood alignment then extends southeast along the west side of the Museum. This portion of the flood alignment is composed of flood-proof glass-topped floodwalls that would be integrated into terraced landscape planters. The floodwall would be screened from the existing garden pathways and lawn by rebuilding terraced planters that match the existing aesthetic of the landscape. In order to minimize visual impact and maintain views from the first floor of the building to the Hudson River, the top of the floodwall would be constructed of flood-proof glass, set within a metal frame. The glass-topped floodwall continues around the western perimeter of the Museum, until the flood alignment connects with Wagner Park. Flip-up deployables would be used to maintain egress at the existing fire exit doors. See Section 1.3.2 (Museum of Jewish Heritage) of this DEIS for more information about the flood alignment near the Museum of Jewish Heritage.

Wagner Park

The flood alignment through Wagner Park would be constructed as a buried floodwall connecting to the glass-topped floodwall at the Museum of Jewish Heritage. 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, Wagner Park would be elevated 10 to 12 feet, and the buried floodwall would be constructed beneath the raised park, maximizing the amount of protected open space within the park, while maintaining views to the waterfront. The buried floodwall also allows users to fully occupy the lawn, garden, and public park, in contrast to a traditional floodwall design which would bisect the space. At the connection between Wagner Park and Pier A Plaza, the flood alignment would resurface and manifest as a short segment of exposed floodwall that would extend to meet the flip-up deployables being used through Pier A Plaza.

See Section 1.3.3 (Wagner Park) of this DEIS for more information about the flood alignment in Wagner Park.

Five design principles helped to guide the proposed plan for Wagner Park:

- Elevate the site to maximize the protected area;
- Organize the site around the central lawn and axis to the Statue of Liberty;
- Move the building closer to Battery Place to maximize continuous waterside lawn area;
- Align building and approach with allées and establish central connector space; and
- Provide universal access throughout the Park.

With the five principles shaping the redesign, key features of Wagner Park include ornamental gardens, a central lawn, a stormwater reuse cistern, an infiltration gallery underneath the Battery Park City Esplanade, and performative gardens along the waterfront pedestrian esplanade. The edges of Wagner Park would be gently sloped and terraced to allow for universal access to the raised park areas and the new Pavilion described below. Furthermore, the design of Wagner Park has been developed to comply with the Waterfront Edge Design Guidelines (WEDG) through innovative and integrated landscape, architectural, and engineering site planning. WEDG is a rating system and set of guidelines to create resilient, ecological, and accessible waterfronts. The plantings on the water side of the Wagner Park flood alignment would tolerate salt spray and temporary inundation, reduce maintenance costs and provide ecological benefits. Planting designs in some of the terraced planters that transition down to the Esplanade would serve as rain gardens for capturing and filtering precipitation. Stormwater from planters and hardscape would be routed to an infiltration gallery located underneath the Esplanade, to reduce the point source discharge of stormwater to the Hudson River. The layout reduces risk of coastal flood hazards while enhancing waterfront access and providing a newly continuous waterfront walkway experience that improves Battery Park City's connection to the Pier A Plaza and The Battery. On the "dry" side of the flood alignment, a reuse cistern would capture stormwater generated during rain events. Reuse measures include site washdown, drip irrigation, and Pavilion flush fixtures. Water captured by the cistern would be treated via a proprietary treatment system and distributed throughout the Park.

The SBPCR Project enhances Wagner Park's programmatic diversity and provides an opportunity for a new waterfront marine habitat educational area along the Pier A inlet. The Pier A inlet design converts a concrete relieving platform and rip-rap edge to a terraced condition that improves habitat opportunities. An observation deck is proposed along the Pier A inlet. The construction of the deck would remove a portion of the relieving platform and replace it with a metal grate platform, which would allow 50 percent of available light to pass through.

The location of the proposed Pavilion (the Pavilion) would be similar to the existing structure, but with a slightly smaller footprint elevated approximately 11 to 12 feet above ground level and set back closer to Battery Place. The new Pavilion would have three levels: a ground, first and second level. The ground level would include maintenance, programming and storage space for the BPCA Parks Department and a kitchen to support the restaurant operating at the first level. The first level (at the Park level) would include public bathrooms, a new community/educational center, and a restaurant with both indoor and outdoor seating. The second level (roof level) would feature a green roof and provide additional public open space, while also accommodating the storage of mechanical equipment. The total square footage of the building would be 18,235.

Pier A Plaza

Pier A Plaza (or the Plaza) is at the lowest elevation in the Project Area. The flood alignment would consist of a newly raised segment of Pier A Plaza in combination with flip-up deployables and a short section of exposed floodwall. The DFE in this area is 18.5 feet, and the HOI ranges from approximately 8.5 to 11.5 feet. Flip-up deployables would seal up against new permanent columns to be located on the upper level of the Plaza. The columns are designed to complement the materials of Pier A Plaza, and would be placed to accommodate views to the water, circulation (pedestrian, biking, and vehicular), and the programmed use of the plaza. The existing paving materials of Pier A Plaza would be retained, with new material added for seating and increased planting. The Plaza would allow for direct and universal access to Pier A and between the upper and lower levels of the Plaza, and would also maintain the bicycle connection from The Battery to the Hudson River Greenway, at the periphery of the Plaza. Provision of building-specific wet-waterproofing protection of Pier A has been previously addressed by BPCA and is not part of this Project scope.

To protect against accidental or intentional vehicle breaches of the pedestrian-oriented 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 turning south and terminating at the exposed floodwall above the Battery Park Underpass. This security barrier is to be supplemented with bollards at stairs and access points as needed. The exposed floodwall would also serve as a site security measure.

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 four feet, creating a bi-level Plaza and reducing the required height of the flip-up deployables. In addition, the two-level Plaza design would allow The 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 NYCEDC on behalf of New York City Department of Parks & Recreation (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. See Section 1.3.4 (Pier A Plaza) of this DEIS for more information about the flood alignment in Pier A Plaza.

The Battery

As the flood alignment continues east from Pier A Plaza, it extends into the Battery Bikeway on the north side of The Battery. This section of the flood alignment is comprised of a combination of flip-up deployables, an exposed floodwall, and a floodwall beneath a landscaped berm. In this segment, the DFE ranges from 15 to 18.5 feet, and the HOI decreases from 9.5 to 0 feet, as the alignment follows the increasing natural elevation at the east end of the Project alignment. This concept reconfigures the existing bikeway and requires the relocation of the Peter Caesar Alberti Marker monument 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 required 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 and HOIs start to descend, affected by existing contours and increased distance from the Hudson River shoreline. Once the flood alignment reaches high ground in the easternmost section of the Project Area, which naturally aligns with the DFE, it terminates.

The physical site security measures described in the Pier A Plaza section above would terminate in this segment of the SBPCR Project at the exposed floodwall above the Battery Park Underpass. This would include the 40-inch high barrier supplemented with bollards at stairs and access points as needed. See Section 1.3.5 (The Battery) of this DEIS for more information about the flood alignment in The Battery.

Interior Drainage Improvements

The existing sewer infrastructure crossing underneath the SBPCR Study Area would have to be isolated to preclude the coastal surge from entering the Study Area. To accomplish this, an interior drainage management system would be implemented that includes:

- Installation of tidegates: Tidegates would be installed at two existing separate municipal storm sewer (MS4) overflows - one at 1st Place and the second at Rector Street. A third tidegate would be installed on the combined sewer overflow (CSO) line at Pier A Plaza southeast of Pier A.
- Installation of isolation valves: Two isolation valves would be installed in The Battery. One isolation valve would be installed at the 12-inch diameter storm drain that collects runoff from The Battery, approximately 50-feet east of the Battery Park Underpass structure underneath The Battery. A sanitary sewer isolation valve would be installed just north of The Battery comfort station. The valves would be installed underground, connected to existing mains, and require an excavation area of approximately four feet by four feet. The valves would remain in the open position during non-coastal storm events. Only in advance of a major coastal storm event, the valves would be closed to prevent coastal waters from surging through the stormwater drain and the sanitary lines connected to the comfort station. The Battery and the comfort station would be closed to the public during such major coastal storm events.
- Near Surface Isolation: 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. Additionally, four interceptor manholes 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.

D. Environmental Impacts

The following section summarizes the principal conclusions from the analysis of potential environmental impacts disclosed in this DEIS. The DEIS documented the affected environment and environmental impacts for future conditions with and without the Proposed Action for the following technical resources: land use, zoning and public policy, socioeconomic conditions, community facilities, open space, shadows, historic and cultural resources, urban design and visual resources, neighborhood character, natural resources, hazardous materials, water and sewer, solid waste and sanitation services, energy transportation, air quality, greenhouse gas (GHG) emissions, noise and vibration, public health and construction. Both the operational and construction impacts were evaluated for each technical resource.

D.1 Operational Impacts

Of the technical analyses that were evaluated in the DEIS, socioeconomic conditions, community facilities and services, solid waste and sanitation services, and public health technical disciplines were screened out and did not require detailed analysis. The resources that were analyzed in the DEIS for long-term (operational) impacts are described in **Table ES-1**. Of these resources, the analysis concluded that the SBPCR Project would have no significant adverse impact on: land use, zoning and public policy, open space, shadows, neighborhood character, natural resources, water and sewer infrastructure, transportation, hazardous materials, energy, air quality, GHG emissions, noise and vibration. **Table ES-1** provides a brief summary of these conclusions. The analysis also concluded that the SBPCR Project would have significant adverse impacts on historical and cultural resources as well as urban design and visual resources as further described below.

Historic and Cultural Resources

The DEIS examined the potential for the Proposed Action to impact historical and cultural resources with the Study Area in accordance with the SEQR and Section 14.09 of the New York State Historic Preservation Act (SHPA) (Section 14.09). In addition, because a federal permit would be sought from the US Army Corps of Engineers (USACE), the project must also comply with Section 106 of the National Historic Preservation Act (NHPA). The USACE Section 106 review will be limited to the effects of the Pier A inlet improvements, while the Section 14.09 review will consider the entirety of the Proposed Action.

Section 106 requires the identification of the Area of Potential Effects (APE) which is defined as “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if such properties exist” (36 CFR § 800.16[d]). Section 14.09 refers to this as the project impact area; however, for purposes of this document, all such areas will be referred to as APEs. Archaeological and historic architectural APEs have been delineated to take into account potential direct effects of the Proposed Action on archaeological resources, and potential direct and indirect effects of the proposed flood control system on historic architectural resources.

Historic Architectural Resources

Based on research of the Historic Architectural APE and the National Register eligibility evaluation of Wagner Park undertaken for this project, identified 28 historic architectural resources. These include

National Historic Landmarks (NHLs), National Register-listed and eligible resources, buildings and districts designated by New York City Landmarks Preservation Commission (NYC LPC).

The impacts of the Proposed Action were analyzed in accordance with Section 14.09 on the 28 historic architectural resources in the Historic Architectural APE. The three potential findings include:

- No Impact – Undertaking would not impact National Register-listed or eligible resources.
- No Adverse Impact – Undertaking may have potential to directly or indirectly affect historic property, but would not alter characteristics that qualify it for inclusion in the National Register, and, if relevant, impacts could be reduced through design or other means prior to implementation.
- Adverse Impact – Undertaking would directly or indirectly alter characteristics that qualify a property for inclusion in the National Register.

As discussed above, implementation of the Pier A Inlet Living Shoreline would require a USACE permit and require review of the impacts of such work under Section 106. The proposed shoreline improvements would have No Adverse Effect, provided that a CPP for Pier A be prepared, as discussed below.

Under Section 14.09, the Proposed Action would have an Adverse Impact on one resource: Wagner Park. With respect to the remaining 27 resources, the project would result in No Adverse Impact on nine resources, and No Impact on 18 resources. Section 14.09 requires that adverse impacts to National Register-listed and/or eligible resources caused by implementation of the undertaking be resolved through mitigation. Therefore, a Letter of Resolution (LOR) would be drafted and executed between BPCA and SHPO to mitigate the Adverse Impact. Ultimately, mitigation recommendations that are agreeable to all parties would be incorporated into the LOR as stipulations. Potential mitigation could possibly include, but not be limited to:

- Historic American Landscape Survey (HALS) Documentation of Wagner Park prior to construction. Documentation would include a physical description, historic overview, statement of significance, project information, high-quality digital or large-format photographs, and reproduction of select original plans and historic photographs.
- Interpretive panels installed at the new Wagner Park; panels could describe the original park, and the reasons why it was deemed an exceptionally significant National Register-eligible resource.
- Website publicized on-site or QR codes that could be activated on-site, and direct user to a history of Wagner Park, and the reasons why it was deemed an exceptionally significant National Register-eligible resource; the content could be similar to the panels.

Archaeological Resources

Archaeological resources are subject to direct effects caused by subsurface disturbances to previously undisturbed soils or minimally disturbed soils associated with the execution of the Proposed Action. The Archaeological 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.

Archaeological resources are subject to direct effects of the Proposed Action. Subsurface disturbances associated with excavation for implementation of project components have the potential to directly impact known as well as potential archaeological resources. The Phase IA documentary study of the Project Area was requested by the NYC LPC and SHPO.

The SBPCR Project includes alterations to 1st Place, Wagner Park, Pier A Plaza, the area traversed by the Battery Bikeway in the northern portion of The Battery, and along West Street, namely through installation of the utility relocations and drainage improvements. The Proposed Action would create varying levels of ground disturbance, each of which could directly impact potential archaeological resources. The current Phase IA documentary study 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 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 (see **Figure 3.4-3**).
- 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 the 1857 and the 1871 bulkhead walls (see **Figure 3.4-5**). There is low to moderate potential that 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.

Preparation of a Phase IB Archaeological Monitoring Plan (Plan) is the next step in the compliance process for the consideration/protection of archaeological resources, as approved by SHPO in a letter dated January 28, 2022. Disruption of traffic flow and closing of public spaces during testing are important considerations when proposing Phase IB testing. As the Project Area lies within highly utilized public spaces, archaeological monitoring during construction would prove to be the most practical strategy. It is anticipated that the Plan would be developed through consultation with BPCA, SHPO, NYC 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.

Urban Design and Visual Resources

This section considers the potential of the Proposed Action's impact on urban design and visual resources. It has been prepared in accordance with the *CEQR Technical Manual* methodologies that define urban design as the totality of components that may affect a pedestrian's experience of public space, and visual resources as the connection from the public realm to significant natural or built features, including views of the waterfront, public parks, landmark structures or districts, or otherwise distinct buildings, and natural resources. This section has also been prepared in compliance with the

NYSDEC *Assessing and Mitigating Visual Impacts* (DEP-00-2, revised December 13, 2019), which provides guidance on assessing and mitigating effects on aesthetic and visual resources.

This analysis addresses the urban design and visual resources of the Study Area for existing conditions, the No Action Condition, and Proposed Action for the 2024 analysis year, when the SBPCR Project is expected to be completed.

In compliance with NYSDEC guidelines, aesthetic resources were identified, and a visual assessment was conducted. Utilizing visual modeling techniques, the conditions that would be present for the Proposed Action were assessed as to their relative visual effects from specific viewpoints and distances. This modeling was conducted to provide some indication as to whether any specific viewpoint might be associated with obvious positive or negative visual effects.

Viewer groups are defined as viewers from the Project Area (e.g., users of Wagner Park, Pier A Plaza, and The Battery) or viewers of the Project Area (e.g., residents, pedestrians and bicyclists on local streets, and motorists on local streets). Viewers are considered in the following three ways:

- The viewer's sensitivity and view duration, with residents considered among the most sensitive viewers, because they may view the proposed visual change from a stationary viewpoint for the most prolonged periods of time. Motorists on Battery Place and other local streets, on the other hand, could be less sensitive because they may only experience the proposed visual change for a short duration;
- The existing features in the Project Area that obstruct an observer's view of a visual resource; and,
- The distance of the observer from the visual change; as the distance increases, the ability of the viewer to see the details of an object decreases.

A detailed analysis was conducted for the Proposed Action due to the potential for significant adverse impacts on the urban design and aesthetic and visual resources in Wagner Park. According to the *CEQR Technical Manual*, a detailed analysis would be required if the preliminary assessment shows that changes to the pedestrian environment could be significant and adverse. This determination would happen if the following was determined:

- When the project partially or totally blocks a view corridor or a natural or built visual resource, and that resource is rare in the area or considered a defining feature of the neighborhood; or
- When the project changes urban design elements so that the context of a natural or built visual resource is altered.

The Proposed Action would block two existing views from the east side of Wagner Park adjacent to Battery Place through Wagner Park to the Hudson River Waterfront and the Statue of Liberty. The detailed analysis for Wagner Park includes the following additional elements from the preliminary assessment.

- Visualizations of each view showing the existing view compared to the view with the Proposed Action;
- Comparison of the proposed Wagner Park Pavilion to the existing Pavilion;
- Description of the program and use distribution in Wagner Park;
- A cross section and visualizations along Battery Place showing the elevated Wagner Park wall heights, setbacks, and entrances to the proposed Pavilion;
- Landscape plans and visualizations of the Proposed Action in Wagner Park showing paving, planting, and seating; and
- Sections through Battery Place and other pedestrian areas showing sidewalk widths, plantings, furnishings, and other elements of pedestrian streetscape for the Proposed Action in Wagner Park.

Although the detailed analysis is focused on the potential adverse impacts in Wagner Park, visualizations of existing views compared to the views with the Proposed Action are included to provide reference to the overall assessment.

The Proposed Action would have no significant adverse impact on aesthetic and visual resources in the vicinity of 1st Place, the Museum of Jewish Heritage or Wagner Park for viewpoints inside the park area, Pier A Plaza, and The Battery. However, the Proposed Action would have a significant adverse impact in Wagner Park for views along Battery Place towards the Hudson River Waterfront because of the proposed elevation of Wagner Park. In order to meet the SBPCR Project purpose and need, Wagner Park would be elevated and redesigned to maintain and enhance park programming and use. To minimize the adverse impacts on views from Battery Place to the Hudson River Waterfront and the Statue of Liberty, the Proposed Action would redesign Wagner Park between Battery Place and the Battery Park City Esplanade, construct a new Pavilion on the plateau of the elevated Wagner Park, recreate the framed and unobstructed view of the Hudson River Waterfront and Statue of Liberty through the new Pavilion, reconstruct and enhance the northern and southern entrances to Wagner Park, and improve the pedestrian experience on the walkway along Battery Place.

Table ES-1: Summary of Operational Impacts

Resource	No Action Condition	Proposed Action
Land Use, Zoning, and Public Policy	Land uses within the Study Area still subject to flooding both during minor and major storm events.	**No significant adverse impacts.** Would enhance access to the Hudson River waterfront and improve the amenities and recreational facilities within Wagner Park, Pier A Plaza, and The Battery.
Open Space	The Battery Park Underpass and West Street Underpass Project and The Battery Coastal Resilience Project would have no direct impact on open spaces in the Study Area. Open spaces within the Study Area still subject to flooding both during minor and major storm events.	**No significant adverse impacts.** Would have no direct impact on open space in the Project Area. Proposed Action would maintain open space in the Battery Park City Esplanade near the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery.
Shadows	No significant adverse shadow impacts. Wagner Park Pavilion would remain in its existing location, and its longest shadow cast is 159 feet covering portions of Wagner Park, a sunlight-sensitive resource. No Action Condition projects would not generate incremental shadows.	**No significant adverse impacts.** Because the existing and proposed Wagner Park Pavilion structures would be located in similar positions, and the proposed Pavilion would be constructed closer to Battery Place and further away from Wagner Park open space, both structures cast a similar shadow pattern on the same areas of Wagner Park.
Historic and Cultural Resources	Historic and cultural resources subject to flooding both during minor and major storm events. Historic architectural resources in Pier A and The Battery could be impacted by the construction of The Battery Coastal Resilience Project in The Battery.	**Phase IA identifies two discrete areas of low to moderate and moderate potential archaeological sensitivity.** Recommend Phase IB archaeological survey consisting of archaeological monitoring during construction for Pier A Plaza and NSI system. **Significant Adverse Impact on Wagner Park but no adverse impact or no effect on all other historic architectural resources.** Recommend executing a LOR between BPCA and SHPO and potential mitigation measures could include but not limited to: HALS documentation; Interpretive panels; Website publicized on-site or QR codes that could be activated on-site.

Resource	No Action Condition	Proposed Action
Urban Design and Visual Resources	No significant adverse impacts to urban design and visual resources. No changes to views or view corridors would occur. Urban open spaces and amenities in Study Area would still be subject to flooding both during minor and major storm events. The Battery Coastal Resilience Project would protect The Battery from sea level rise but not the surrounding neighborhood.	**Significant adverse impacts to views of the Hudson River Waterfront from Battery Place in the vicinity of the Wagner Park Pavilion and south of the Museum of Jewish Heritage. No significant adverse impacts to any other views or urban design.** Impacts minimized by reconstruction of Wagner Park Pavilion on elevated Wagner Park, replacement of the unobstructed view of the Statue of Liberty from the new pavilion, wayfinding signage at Wagner Park entrances, and pedestrian and visual enhancements along Battery Place walkway.
Neighborhood Character	Neighborhood within the Study Area would still be subject to flooding both during minor and major storm events. The Battery Coastal Resilience Project would enhance the waterfront esplanade in The Battery and therefore could have beneficial effects to neighborhood character.	**No significant adverse impacts.** Potential environmental impacts related to historic and cultural resources and urban design and visual resources in Wagner Park would occur, but these impacts would be mitigated to maintain the neighborhood character.
Natural Resources	Negligible impacts on the terrestrial ecosystem, and the existing vegetation and terrestrial natural resources would remain subject to storm events and sea level rise. Negligible beneficial impacts to aquatic ecosystem as additional habitat may be created, but increased storm activity may reduce any benefits due to increased sedimentation and displacement. No significant adverse impacts to threatened and endangered species.	**No significant adverse impacts to the terrestrial ecosystem.** To compensate for the removal of approximately 77 trees in The Battery, which is owned and maintained by NYC Parks, and within the NYCDOT ROW, 86 new trees would be planted, and three trees would be transplanted. The tree restitution, which is for trees on NYC Parks and NYCDOT property, is valued at approximately $5.2 million. **No significant adverse impacts to aquatic ecosystem.** Beneficial operational impacts of habitat improvements in Pier A inlet through increased sunlight, as well as the placement of intertidal and supratidal plantings to a habitat currently devoid of plants.

Resource	No Action Condition	Proposed Action
		No significant adverse impacts to threatened and endangered species.
Water and Sewer Infrastructure	Operation of No Action Condition projects would have negligible impacts on the CSS and the water infrastructure would remain unchanged. As a result, no changes the CSS and the water infrastructure would occur.	**No significant adverse impacts.** Proposed Action in an area entirely connected to sewer and water infrastructure and would not create any type of new development that would be associated with additional permanent water or sanitary sewer demands beyond those that would result from the reconstruction of the Wagner Park Pavilion, which, because it would only be slightly larger, would be negligible. Proposed Action would not create new outfalls nor result in increased impervious surfaces that would increase stormwater runoff.
Transportation	Infrastructure would continue to be subject to flooding.	**No significant adverse impacts.** Proposed Action would not generate any traffic, transit or pedestrian trips.
Hazardous Materials	No signficant adverse impact. No Action Condition projects have the potential to disturb contaminated materials and increase exposure. They would need to comply with all applicable regulatory requirements and health and safety protocols such that this potential is avoided.	**No significant adverse impacts.** Proposed Action would involve demolition and excavation activities and would have the potential to disturb hazardous materials in the subsurface and existing structures. However, with the implementation of appropriate protection measures. Proposed Action would also require import of a large volume of regulated clean fill that would include a final soil cover in accordance with a plan approved by NYCDEP as well as impervious cover (asphalt and/or concrete). This final soil/impervious cover would form a cap providing park users protection from pathways to exposure to any contaminants present below the project construction area.
Energy	No changes to energy consumption would occur.	**No significant adverse impacts.** Negligible energy consumption needed for the operation of the Proposed

Resource	No Action Condition	Proposed Action
		Action, particularly for the flip-up deployables and the net zero energy targets for the proposed pavilion.
Air Quality	No changes to air quality would occur.	**No significant adverse impacts.** The total proposed building size is smaller than the minimum distance screening threshold for a new building to have potential impacts to the nearest residential buildings
Greenhouse Gas Emissions and Climate Change	No changes to GHG emissions would occur.	**No significant adverse impacts.** Net zero emission targets of the proposed pavilion would result in an overall net reduction of GHG emissions compared to the current GHG emissions, in compliance with the City's sustainability goals and initiatives and the CLCPA. Design of the proposed Pavilion targets ILFI Zero Carbon certification which requires the reduction of operational and embodied carbon Design also calls for assessing all materials including existing site stone, wood, trench drains, trees, shrubs and plants for salvage. A select amount of materials have been targeted to be reused. Remaining materials would be recycled or reused offsite where possible.
Noise and Vibration	No significant adverse impacts. Future noise and vibration levels for the No Action Condition would be similar to existing conditions.	**No signficant adverse impacts.** No noise and vibration effects would result due to the operation of the flood alignment gates. Except during an emergency condition, the flip-up deployables would not operate. Additionally, maintenance testing is expected to occur once yearly to verify that the flip-up deployables and the underground hydraulic motors and pumps function properly.

D.2 Construction Impacts

An assessment of the construction activities on the following resources was conducted including a screening assessment of transportation, air quality, noise, open space, socioeconomic conditions, community facilities, land use and public policy, neighborhood character, historic and cultural resources, hazardous materials, natural resources, and water and sewer infrastructure. A preliminary assessment is conducted when construction activities are anticipated to be more than two years or when construction activities would directly impact a technical resource. The Proposed Action is anticipated to have a 24-month construction schedule and a preliminary assessment was conducted.

The assessment evaluated the Proposed Action's construction activities impact on the above-mentioned technical resources and is summarized below.

Transportation

Based on the Level 1 screening assessment described in Section 3.15.3.1 (Transportation), it was determined that the traffic volume threshold of 50 vehicles per hour (vph) would not be met or exceeded at any intersection during the AM peak arrival and PM peak departure hours during construction. As shown in **Table 3.15-8**, the highest number of vehicle trips (in pces) would be 38 trips during each of the AM and PM peak hours. In addition, all or most of the 35 daily construction worker vehicles would utilize public off-street parking facilities within and near the Project Area.

Therefore, in accordance with the *CEQR Technical Manual,* this screening assessment concludes that during construction of the proposed SBPCR Project*:*

- No further analysis of traffic is required.
- The thresholds for transit analyses (200 trips per hour) and pedestrian analyses (200 trips per hour) would not be met; therefore, no transit and pedestrian analysis are required.
- A parking shortfall would not occur; therefore, a detailed parking assessment is not required.

Based on the above assessment, no further transportation analyses during construction are required for the SBPCR Project.

Air Quality

The refined dispersion model (the USEPA/AMS AERMOD dispersion model) was used to predict the reasonable worst-case condition of PM, CO, and NO_2 concentrations during the construction period at the sensitive receptors located within the 400-foot radius impact area of the construction sites located within the Project Area.

All maximum predicted concentrations would occur at the residential units on the lowest floor in each residential building shown in **Figure 3.15-5**. Based on the dispersion modeling results presented in **Table 3.15-11**, the maximum predicted 24-hour average $PM_{2.5}$ incremental concentration of 4.57 µg/m^3 would be below the NYC *de minimis* criterion. However, from a total of 1,128 discrete ground and elevated receptors modeled, exceedances of the NYC annual $PM_{2.5}$ *de minimis* criterion were predicted to occur during the first 12-month rolling period at a total of 32 receptors at the ground floor of Buildings 1 and 5 shown in **Figure 3.15-5**. Since the exceedances of the NYC annual $PM_{2.5}$ *de minimis* criterion were predicted over the first 12-month rolling period, the second 12-month rolling period between July 2023 and July 2024 was considered in the dispersion modeling to determine the duration of such exceedances based on the construction schedule. Based on the modeling results, no exceedances of the NYC annual $PM_{2.5}$ *de minimis* criterion were predicted to occur during the second 12-month rolling period.

As described in **Table 3.15-9**, the annual average $PM_{2.5}$ NAAQS is based on a 3-year average. If Proposed Action activities do not occur for the entire duration of the 3-year period, the period of no or minimal activity would lower the three-year average level. Therefore, the duration and intensity of $PM_{2.5}$ exposure within the adjacent neighborhood of each localized activity area were considered.

New York City's Local Law 77, signed in 2003 requires that all nonroad diesel-powered equipment use ultra-low sulfur diesel fuel and utilize best available technology (BAT) for reducing emissions. The diesel particulate filters (DPFs) and Tier 4 engines constitute BAT for purposes of this law; therefore construction equipment would comply with the BAT requirement to the extent practicable that would further reduce the PM 2.5 impacts.

Given the use of BAT and the temporary nature of potential exceedances of the NYC annual $PM_{2.5}$ *de minimis* criterion predicted to occur at multiple ground floor receptors only during the first 12-month rolling period, the potential air quality impacts would be considered temporary and not significant. Furthermore, as shown in **Table 3.15-11**, the maximum predicted total concentrations of $PM_{2.5}$, PM_{10}, CO, and annual-average NO_2 for the peak periods are all below the applicable NAAQS. Therefore, the overall construction period air quality impacts would not be significant, and no mitigation measures are warranted.

Noise and Vibration

The noise assessment indicated that short-term noise impacts at receptors along Battery Place and Little West Street are predicted during peak construction activities. Noise exceedances are predicted from impact and pounding equipment, including pile drivers, hoe rams and clam shovels. Regarding vibration, no exceedances of the conservative damage criterion are predicted as a result of the proposed construction equipment. Although the potential for nuisance vibration effects is predicted at the building facades, these effects are temporary and would not to persist throughout the construction process. Additionally, the vibration levels were assessed at the exterior building façades and are, therefore, conservative as they do not reflect the building damping and attenuation effects.

Although temporary exceedances of the CEQR noise and vibration thresholds are predicted, they would not persist due to the widespread use of Best Management Practices (BMPs) and the temporary or sporadic duration of impact devices such as pile drivers and hoe rams. Construction BMPs include noise barriers, equipment enclosures and shrouds, effective mufflers, and operational modifications to limit exposure at sensitive receptors. During construction, acoustical curtains or other limp mass barriers hung from temporary trusses along Battery Place would minimize noise from construction activities for all residences north of the Park. Similarly, during the construction of NSI drainage improvements within the DEP sewer system along Little West Street and the installation of the tidegate at Rector Place, acoustical curtains applied to perimeter fencing would minimize temporary noise impacts. Finally, equipment enclosures or shrouds are used to eliminate or minimize noise from exposed stationary equipment. Vibration impacts from pile drivers would be minimized by substituting impact devices with less vibratory equipment such as augers. With the implementation of BMPs and the limited use of impact devices, there would be no significant adverse noise and vibration impacts during construction.

Historic and Cultural Resources

<u>Historic Architectural Resources</u>

Two resources for which the Proposed Action would have No Adverse Impact require coordination prior to construction as indicated in Section 3.4 (Historic and Cultural Resources). These resources include:

- Pier A
- Castle Clinton National Monument

Pier A is located within 90 feet of the flip-up deployable and nuisance flooding alignment slated for construction in Pier A Plaza. Therefore, it is recommended that a Construction Protection Plan (CPP) be prepared for Pier A in accordance with the New York City (NYCDOB) "*Technical Policy and Procedure Notice 10/88: Procedures for the Avoidance of Damage to Historic Structures Resulting from Adjacent Construction When Subject to Controlled Inspection by Section 27-724 and for Any Existing Structure Designated by the Commissioner*," which defines adjacent historic structures as resources that are located contiguous to or within a lateral distance of 90 feet from a lot under development or alteration (Polsky, June 6, 1988).

Because Castle Clinton National Monument is situated within The Battery (Block 3/Lot 1), contiguous to Pier A (Block 1/Lot 16), it is also recommended that a CPP be prepared for Castle Clinton. Although the resource is approximately 200 feet southeast of the Proposed Action in Pier A Plaza, the CPP would ensure that all measures are being undertaken to protect this National Monument during construction on the adjacent lot.

<u>Historic Archaeological Resources</u>

Archaeological resources are subject to direct effects of proposed project actions. Subsurface disturbances associated with excavation, pile driving, utility removal, replacement and installation, and multiple other construction activities necessary for implementation of the SBPCR Project flood alignment and NSI system have the potential to directly impact previously identified as well as potential archaeological resources.

A Phase IA archaeological documentary study of the Project Area was prepared as requested by SHPO and the NYC LPC to assess the potential for encountering National Register-eligible archaeological resources within the Archaeological APE. The results of the Phase IA archaeological assessment indicate that only two discrete areas across the three sections of the Archaeological APE retain archaeological potential:

<u>Pier A Plaza</u>

The flip-up deployable portion of the flood alignment in Pier A Plaza below the line of West Street and near the western 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.

<u>Near Surface Isolation System Locations</u>

Given that the NSI system components would be installed within existing infrastructure connected to the South Interceptor Main, most, if not all, of this section 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. As noted above, intact sections of the 1857 and 1871 bulkhead walls may be exposed for documentation during improvements to the existing connector main.

Preparation of a Phase IB Archaeological Monitoring Plan (Plan) is the next step in the compliance process for the consideration/protection of archaeological resources with concurrence from SHPO in their response letter of January 28, 2022. There are two locations within the Archaeological APE recommended for archaeological monitoring during construction:

- The flip-up deployable portion of the flood alignment in Pier A Plaza below the line of West Street and near the western boundary of The Battery.
- The route of the existing connector main between sanitary connection sewer chamber MH #3 and the sanitary emergency overflow chamber to the west near West Thames Street.

It is anticipated that the Plan would be developed through consultation with BPCA, SHPO, NYC LPC, and other involved state and city agencies. The Plan would identify and map onto the latest design plans the sensitive portions of the Archaeological APE recommended for monitoring during construction, and outline all protocols to be followed.

Hazardous Materials

Construction of the SBPCR Project would require both demolition and disturbance of existing structures within the Project Area and subsurface disturbance that could encounter contamination within soil and/or fill.

Given the results of the subsurface investigations, hazardous materials are likely to be encountered during construction of the SBPCR Project. Prior to disturbing soils in connection with the construction of the SBPCR Project, a Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) (see **Appendix D**) has been developed for implementation during construction activities. The RAP and CHASP propose measures to ensure that exposure to contamination both during and after construction is minimized , in order to protect construction workers, site employees and neighborhood residents.

Although hazardous materials are potentially present in the subsurface (related primarily to historic fill placed along the shoreline to create the property) with the implementation of a variety of measures prior to and during construction (including both testing and health and safety procedures), no significant adverse impacts related to hazardous materials would occur as a result of construction of the SBPCR Project.

Natural Resources

The SBPCR Project occurs at the mouth of the Hudson River close to its confluence with the East River and Upper New York Bay. The upland portions of the SBPCR Project within Wagner Park, Pier A Plaza, and The Battery support terrestrial ecosystems. The Proposed Action would remove approximately 114 trees within the Project Area, largely within Wagner Park, Pier A Plaza, and The Battery. A tree survey has been conducted, and all tree removal and replacement would be done in coordination with BPCA, NYC Parks, and The Battery Conservancy. To compensate for the removal of approximately 77 trees in The Battery, which is owned and maintained by NYC Parks, and within the NYCDOT ROW, 86 new trees would be planted, and three trees would be transplanted. The tree restitution, which is for trees on NYC Parks and NYCDOT property, is valued at approximately $5.2 million.

In total, approximately 114 trees would be removed, and 224 trees would be planted in the Study Area.

Construction related to naturalization of the existing rip-rap shoreline of the Pier A inlet as well as daylighting of the existing relieving platform in this area will be conducted in accordance with permits issued from the USACE and the New York State Department of Environmental Conservation (NYSDEC). Construction of the SBPCR Project would have no significant adverse impact on aquatic resources.

The proposed upland and in-water construction work would have no effect on any threatened and endangered species. Accordingly, construction of the SBPCR Project would have no significant adverse impact on natural resources.

Open Space

The SBPCR Project would have a temporary significant adverse impact on open space near the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery during construction. Portions of the Battery Park City Esplanade near the Museum of Jewish Heritage, entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery within the Project Area would be closed for the entire 24-month construction duration from July 2022 to July 2024.

To continue to provide public programs and events which have traditionally taken place at Wagner Park, BPCA would be temporarily relocating all of those programs and events to other parks and open space within Battery Park City for the duration of the Proposed Action's construction.

The following is a list of BPCA programs and events that would be relocated to parks and open spaces within Battery Park City during construction of the Proposed Action:

- Go Fish! (series of public fishing festivals) – relocating to South Cove and southern esplanade;
- Swedish Midsummer Festival – relocating to north lawn and north esplanade of Rockefeller Park;
- River & Blues (July concert series) – relocating to north esplanade and north lawn of Rockefeller Park;
- Silent Disco Dance Party (seasonal community dances) – relocating to Esplanade Plaza or Rockefeller Park;

- Sunset Singing Circle (community singing series) – relocating to park house area of Rockefeller Park;
- Public Art Tours – will feature public art installations in other locations of Battery Park City;
- The three art works currently installed in Wagner Park – *Resonating Bodies* by Tony Cragg, *Eyes* by Louise Bourgeois, and *Ape and Cat* by Jim Dine – would be relocated to alternative temporary sites within Battery Park City to keep them on public view;
- Elements of Nature Drawing (weekly adult art class) – relocating to various gardens in Rockefeller Park;
- Kindie Rock! (weekly live music performance series for toddlers) – relocating to park house area of Rockefeller Park;
- Sunset Yoga – weekly program relocating to south lawn of Rockefeller Park;
- Figure al Fresco (weekly adult figure drawing art program) – relocating to Rector Park East;
- Preschool Play (seasonal daily programs) – relocating to park house area of Rockefeller Park;
- Bird & Nature Walks series – will explore other parks and gardens of Battery Park City; and
- Marine education classroom visits- relocating to South Cove and Southern Esplanade.

However, even with this replacement programming, the impacts to open space during construction would not be fully mitigated. BPCA will continue to consider potential options to mitigate these temporary significant adverse impacts during construction. Should other mitigation options be identified, they will be included as part of the Final Environmental Impact Statement.

During construction in The Battery, the Battery Bikeway would remain in service; however, a portion of the existing Battery Bikeway would be rerouted to maintain connectivity along the City's bikeway network in Lower Manhattan. The Battery Bikeway would be rerouted along The Battery's northern boundary from State Street to West Street. The temporary bikeway would be located to the north of the fixed wall separating The Battery from the sidewalk along Battery Place. To provide separation and safety between bicyclists and pedestrians, water-filled barriers would be installed to the north of the temporary bikeway along the Battery Place sidewalk.

Socioeconomic Conditions

As the Proposed Action results in no residential, employee or business displacements, includes no retail development, does not create land uses markedly different from existing conditions and does not affect a specific industry, significant adverse impacts of construction activities on socioeconomic conditions would not occur.

Community Facilities

The Proposed Action would not physically impact or displace any community resources, nor result in any increases in resident population. It would not have any impact on public schools, healthcare facilities, publicly funded group early childhood programs, libraries or local police and fire facilities. Accordingly, significant adverse impacts of construction activities on community facilities would not occur.

Land Use, Public Policy, and Neighborhood Character

Construction activities related to the SBPCR Project would not result in the permanent change of the use of the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, or The Battery within the Study Area.

In terms of neighborhood character, construction activities would temporarily take place and impact the neighborhood in terms of visual resources, access to Wagner Park, Pier A Plaza, and The Battery, and a measurable, but temporary increase in vehicle traffic. However, overall, these activities would not result in a permanent change in the character of the neighborhood.

As the project components involve the installation and enhancement of several resilience measures, the overall project would provide a net positive benefit to the community. No significant adverse impacts to land use and neighborhood character from construction-related activities would occur.

Water and Sewer Infrastructure

The disruption of existing surface conditions and excavation/pile driving for NSI system construction would have the potential to affect underground infrastructure by direct physical impact. However, such effects would be avoided through BMPs that include One Call mark-outs just prior to construction as well as extensive utility survey and plotting during design. With the BMPs in place, detailed in Section 3.15.3.7 (Other Technical Areas – Water and Sewer Infrastructure), no significant adverse impacts to water and sewer infrastructure would occur during construction activities.

D.3 Unavoidable Significant Adverse Impacts

SEQR requires that an Environmental Impact Statement (EIS) include the identification and assessment of impacts that cannot be avoided or adequately mitigated. Unavoidable significant adverse impacts resulting from the Proposed Action have been identified in the areas of analysis under operational conditions: historic architectural resources, urban design and visual resources, and under construction conditions: open space.

1 Background and Project Description

1.1 Introduction

BPCA, the lead agency for the SBPCR Project, has prepared a DEIS for this proposed resiliency project in the Battery Park City neighborhood of Lower Manhattan. This DEIS addresses the requirements of SEQR and the 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 *2021 CEQR Technical Manual* (*CEQR Technical Manual*).

During Superstorm Sandy in 2012, coastal surge inundated Lower Manhattan on its western side through low elevation points near Pier A and in or adjacent to other parts of Battery Park City, damaging, destroying and/or negatively impacting significant components of Lower Manhattan's critical and civic infrastructure. In response to the devastating impact of Superstorm Sandy in Lower Manhattan and in anticipation of future severe storm activity related to global climate change, the SBPCR Project has been developed by BPCA as an integrated coastal flood risk management project in Lower Manhattan (see **Figure 1.1-1**). The SBPCR Project represents one of several projects within the overall LMCR Master Plan.

The Project Area , the area of direct physical disturbance, extends from 1st Place and the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and then along the north side of the Battery Bikeway in The Battery to higher ground near the intersection of Battery Place and State Street. The Study Area, which extends beyond the Project Area, varies by resource but is generally defined as the area within 400 feet of the SBPCR Project improvements, (see **Figure 1.1-1**).

The SBPCR Project is being designed to provide flood risk reduction within the Project Area for the current 100-year flood, inclusive of increased intensity and frequency of rainfall, coastal surge, and predicted sea level rise. It is one of three resiliency projects being undertaken by BPCA to address flood risk reduction throughout Battery Park City's 92 acres. The other two projects are the Battery Park City Ball Fields and Community Center Resiliency Project, and the North/West BPC Resiliency Project (see **Figure 1.1-2**). The SBPCR Project is also being designed with adaptability for the 2050 100-year storm event at such time as the North/West BPC Resiliency Project is completed and a tie-in between the two projects is created (see **Figure 1.1-2**).

The flood alignment is composed of multiple different integrated features such as flip-up deployable gates (flip-up deployables), glass-topped floodwalls, buried floodwalls underneath terraced slopes, exposed floodwalls, and bermed floodwalls. The term "flood alignment" is used to differentiate the combination of flood control measures represented by the SBPCR Project from a traditional freestanding flood wall for risk reduction. In addition, interior drainage improvements are proposed for the SBPCR Project, including the isolation of the existing underground sewer manholes and connected chambers. For more information on these improvements, see Section 1.3 (Project Description) and **Figure 1.1-1**.

On a separate but related note, New York City's The Battery Coastal Resilience Project, the Financial District and Seaport Climate Resilience Project, the BMCR Project, and the ESCR Project are intended to individually and collectively serve to reduce Lower Manhattan's flooding exposure (see **Figure 1.1-3**).

The SBPCR Project boundary for the flood alignment spans from 1st Place and the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and then along the north side of the Battery Bikeway in The Battery to higher ground near the intersection of Battery Place and State Street. The DFE and HOI vary across the flood alignment (see **Figure 1.1-1** and **Figure 1.3-1**). The DFE is defined as the elevation of the highest flood that a project is designed to protect against. The HOI for a project location is calculated by subtracting the elevation of the existing grade from the proposed DFE.

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 and 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 immediately north of Wagner Park.

BPCA has proactively guided the process for the design of the SPBCR Project, which, due to the need to elevate the topography of Wagner Park, has necessitated a significant redesign of the Park. The redesign of Wagner Park has retained as many aspects as possible of the original design intent and site organization for the Park. To this end, BPCA found that four of the original eight principles from the 1979 Master Plan remain relevant to the redesign of the Park, as well as certain additional portions of the Project Area and that they are pertinent to an understanding of BPCA's approach to the SBPCR Project design:

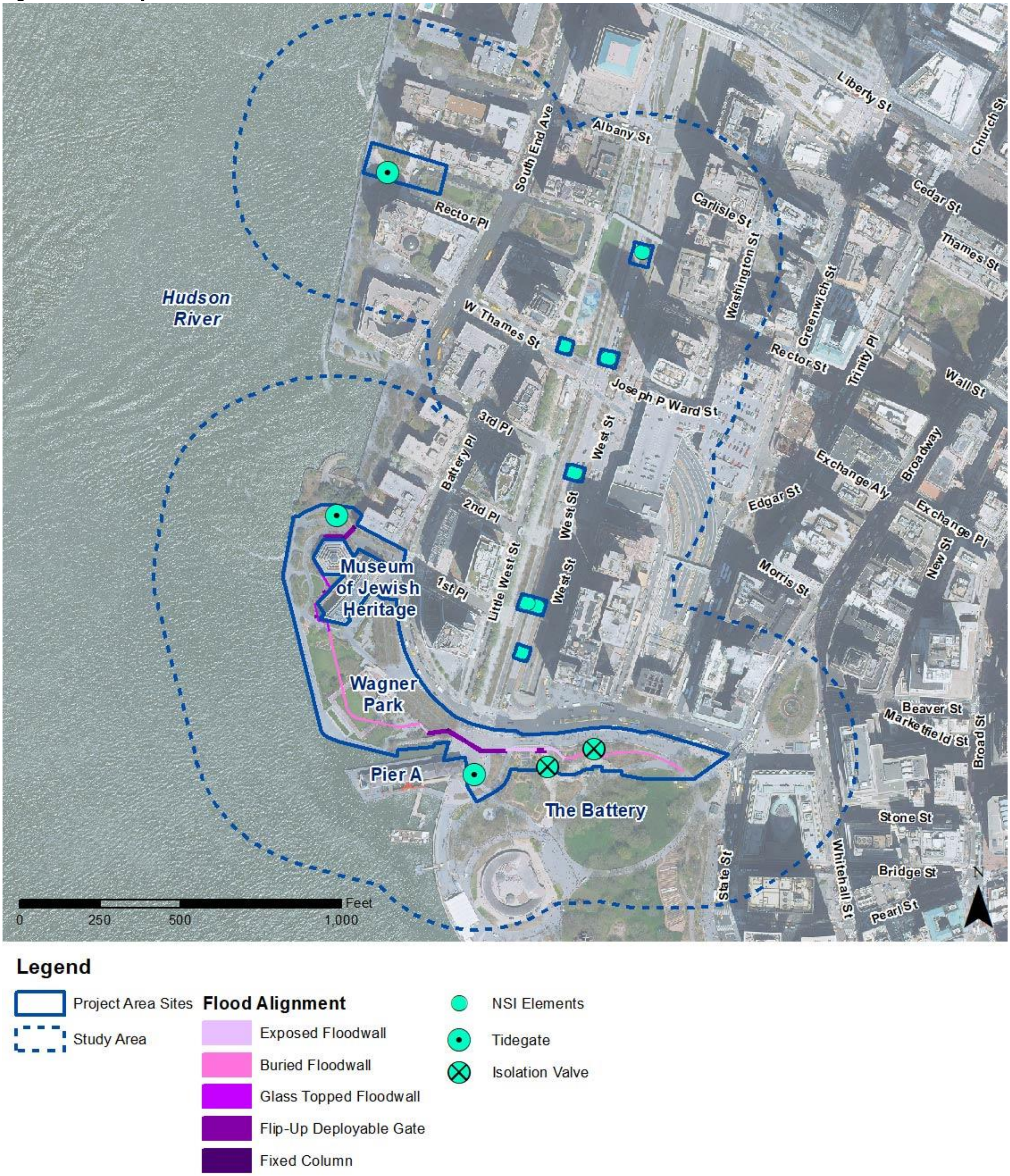
Principle 1: Battery Park City should not be a self-contained new-town-in town, but a part of Lower Manhattan;

Principle 2: The layout and orientation of Battery Park City should be an extension of Lower Manhattan's system streets and blocks;

Principle 3: Battery Park City should offer an active and varied set of waterfront amenities; and

Principle 5: Circulation should reemphasize the ground level.

Figure 1.1-1: Project Area



South Battery Park City Resiliency Project

Figure 1.1-2: Battery Park City Resilience Projects

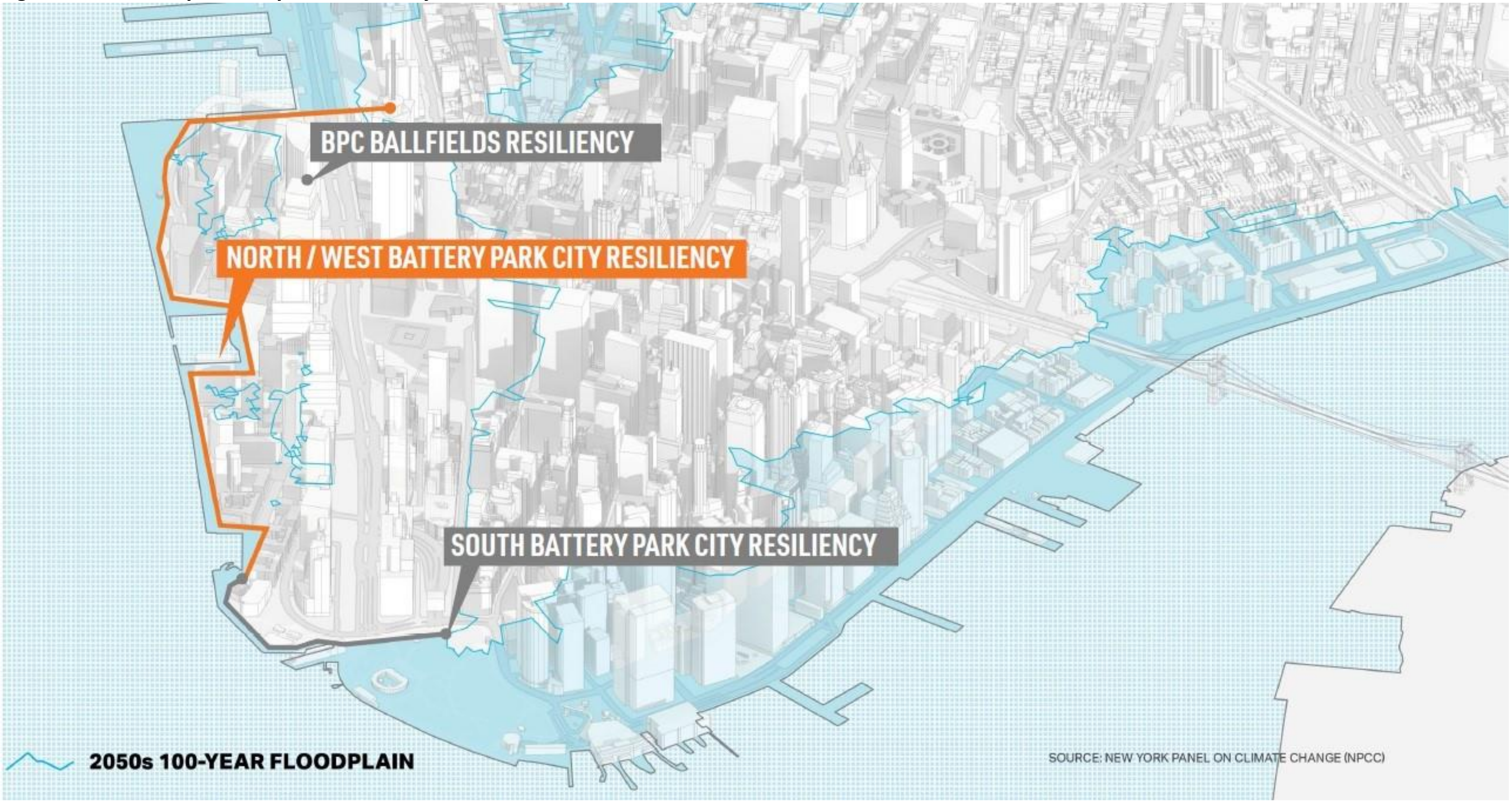
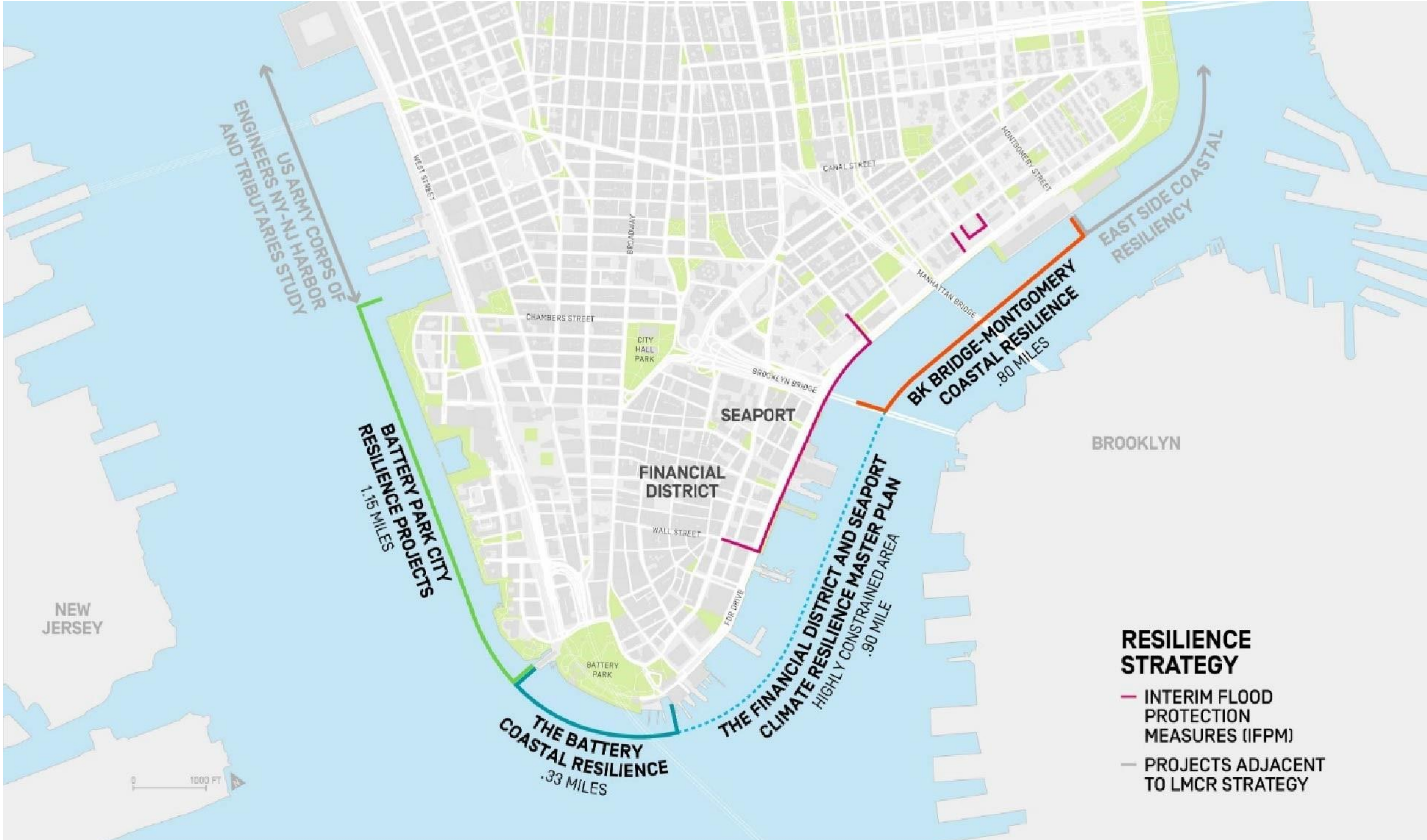


Figure 1.1-3: Lower Manhattan Coastal Resiliency Projects



1.2 Purpose and Need for the Proposed Action

During Superstorm Sandy in 2012, storm and coastal surge inundated portions of Lower Manhattan on its western side through areas in or adjacent to northern Battery Park City and Pier A Plaza south of Wagner Park. Water also found its way onto One World Trade Center and the Hugh L. Carey Tunnel (formerly known as the Brooklyn-Battery Tunnel) and impacted much of Lower Manhattan's critical infrastructure.

The SBPCR Project's primary goal is risk reduction in the southern extremes of Battery Park City. This would be accomplished through implementation of integrated flood risk measures, while meeting the design criteria for a 100-year storm event, inclusive of increased intensity and frequency of rainfall, coastal surge and predicted sea level rise. While the SBPCR Project would provide immediate risk reduction for the 100-year storm, it would also provide ready adaptability to the DFE for the 2050 100-year storm at such time as the North/West BPC Resiliency Project is constructed and a tie-in between the two systems is created. The SBPCR Project is expected to be accredited by the FEMA. Accreditation requires a FEMA review of as-built plans and verification that the flood system meets all pertinent requirements and achieves acceptable risk reduction in practice.

The purpose of the SBPCR Project is to:

- Provide a reliable coastal flood control system to provide risk reduction to property, residents and assets within the vicinity of South Battery Park City in response to the design storm event;
- Protect and preserve to the maximum extent practicable, open space resources and opportunities to view and interact with the Manhattan waterfront, particularly in Wagner Park, Pier A Plaza and The Battery; and,
- Avoid or minimize disruption to existing below and above-ground infrastructure (i.e., water and sewer infrastructure, subways, tunnels, utilities, etc.) from flood events.

Specific objectives of the SBPCR Project are to:

- Provide a reliable coastal flood control system that minimizes risk and the need for operational interventions by relying primarily on passive flood control technology as opposed to mechanical "deployable" flood control technology;
- Construct and operate the project in an environmentally responsible manner;
- Preserve to the greatest extent practicable the character and design aesthetic of the community and its interface with the BPC waterfront and access to coastal viewsheds, particularly views of the harbor and Statue of Liberty; and
- Utilize cost-effective solutions to maximize capital investment over the lifespan of the SBPCR Project.

1.3 Project Description

The Proposed Action is located in Lower Manhattan just west of the point where the Hudson River and East River diverge. The Project flood alignment spans an area from 1st Place and the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and then along the north side of the Battery

Bikeway in The Battery to higher ground near the intersection of Battery Place and State Street as shown in **Figure 1.3-1**. In addition, the following interior drainage improvements are proposed: a NSI system along West Street between Battery Place and Albany Street; tidegates at 1st Place near the Museum of Jewish Heritage, Rector Place near the Hudson River, as well as in Pier A Plaza; and two isolation valves in The Battery portion of the Project Area.

This section describes the elements of the flood alignment across five SBPCR Project segments, and associated interior drainage improvement areas, moving from west to east. The SBPCR Project segments are defined as 1st Place, Museum of Jewish Heritage, Wagner Park, Pier A Plaza and The Battery. In addition to the flood protection measures, an important element of the SBPCR Project is the inclusion of sustainable design measures. Construction is expected to begin in July 2022 and conclude in July 2024. **Figure 1.3-1** provides the type of flood alignment infrastructure proposed for each project segment and identifies the DFE. **Figure 1.3-2** shows the factors used to calculate the DFE for the SBPCR Project including the design storm, sea level rise, wave action and freeboard. The DFEs and HOI vary across the Project's flood alignment. The HOI for a project location is calculated by subtracting the elevation of the existing grade from the proposed DFE.

Figure 1.3-1: SBPCR Project Flood Alignment

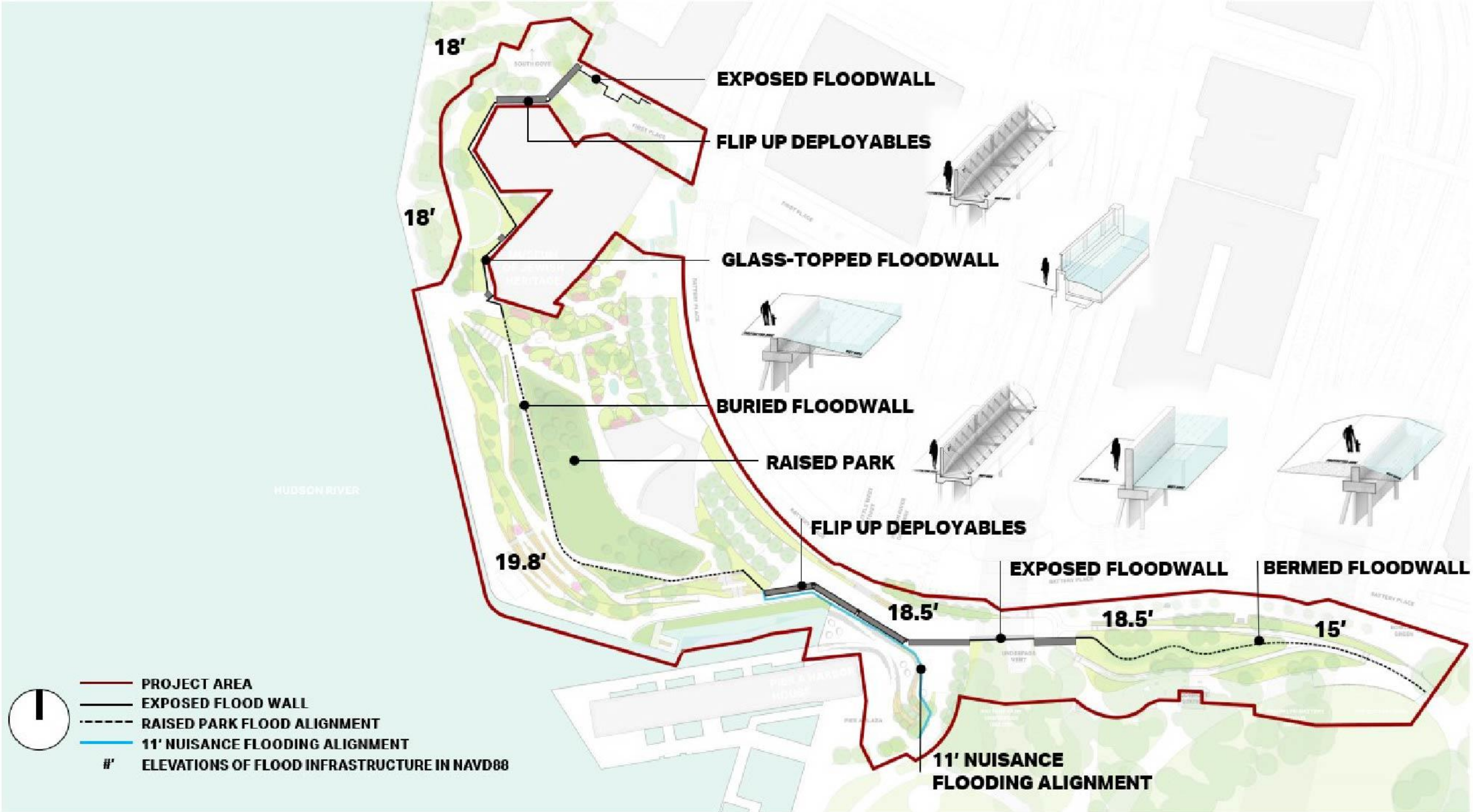
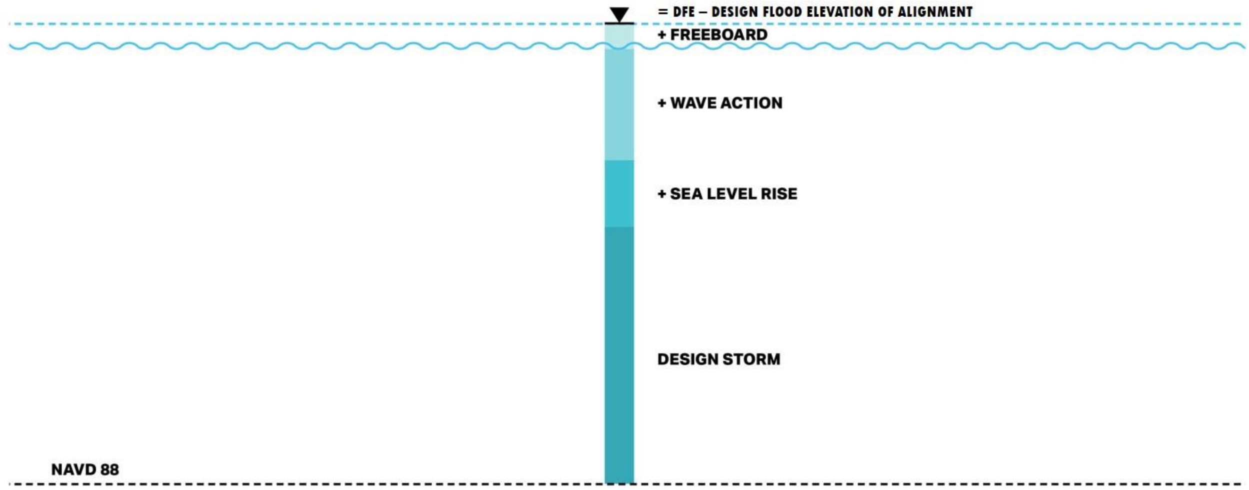


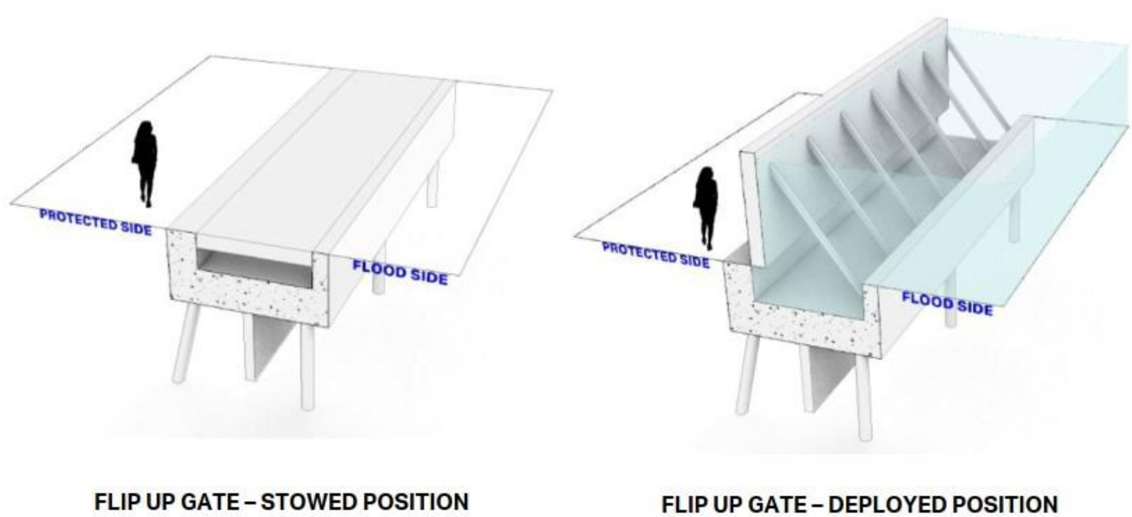
Figure 1.3-2: Design Flood Elevation



1.3.1 1st Place

The flood alignment begins on the north side of 1st Place, where it ties into an existing, natural 11-foot flood contour at a point where the DFE required to achieve FEMA certification is also 11 feet. It then extends south across 1st Place as a flip-up deployable, which would seal against permanent columns when deployed. The flip-up deployable across 1st Place would be installed to lie flat when not in use, as shown in **Figure 1.3-3**. 1st Place would not be altered in any material way beyond the installation of flip-up deployables in the street bed, with columns framing their edges. Grade changes to the street and ROW would be avoided. The DFE in this area is 18 feet, and the HOI is 7 feet.

Figure 1.3-3: Flip-Up Deployable Gates in Stowed and Deployed Position



1.3.2 Museum of Jewish Heritage

At the southwest end of 1st Place, the flood alignment runs west across the north facing landscaped courtyard of the Museum of Jewish Heritage (see **Figure 1.3-4**). The DFE in this location is 18 feet, and the HOI ranges from 7 to 8 feet. Flip-up deployables are planned for this section of the flood alignment, maintaining visual and physical access to the Museum and connecting to the flip-up deployables that span 1st Place. Existing landscape planters adjacent to the north façade of the Museum would be reconstructed and replaced after the installation of the flip-up deployables.

The flood alignment then extends southeast along the west side of the Museum. This portion of the flood alignment is composed of flood-proof glass-topped floodwalls that would be integrated into terraced landscape planters (see **Figure 1.3-5**). The floodwall would be screened from the existing garden pathways and lawn by rebuilding terraced planters that match the existing aesthetic of the landscape. In order to minimize visual impact and maintain views from the first floor of the building to the Hudson River, the top of the floodwall would be constructed of flood-proof glass, set within a metal frame. The glass-topped floodwall continues around the western perimeter of the Museum, until the flood alignment connects with Wagner Park. Flip-up deployables would be used to maintain egress at the existing fire exit doors.

Figure 1.3-4: Museum of Jewish Heritage Flood Alignment

Figure 1.3-5: Museum of Jewish Heritage Glass-topped Floodwall

1.3.3 Wagner Park

The flood alignment through Wagner Park would be constructed as a buried floodwall connecting to the glass-topped floodwall at the Museum of Jewish Heritage. The DFE for this portion of the flood alignment is +19.8 feet, and the HOI is 7.8 to 9.8 feet (see **Figure 1.3-1**). To meet projected DFEs for coastal surge, Wagner Park would be elevated 10 to 12 feet, and the buried floodwall would be constructed beneath the raised park, maximizing the amount of protected open space within the park, while maintaining views to the waterfront, as shown in **Figure 1.3-6**. The buried floodwall also allows users to fully occupy the lawn, garden, and public park, in contrast to a traditional floodwall design which would bisect the space. At the connection between Wagner Park and Pier A Plaza, the flood alignment would resurface and manifest as a short segment of exposed floodwall that would extend to meet the flip-up deployables being used through Pier A Plaza.

Five design principles helped to guide the proposed plan for Wagner Park:

- Elevate the site to maximize the protected area;
- Organize the site around the central lawn and axis to the Statue of Liberty;
- Move the building closer to Battery Place to maximize continuous waterside lawn area;
- Align building and approach with allées and establish central connector space; and
- Provide universal access throughout the Park.

With the five principles shaping the redesign, key features of Wagner Park include ornamental gardens, a central lawn, a stormwater reuse cistern, an infiltration gallery underneath the Battery Park City Esplanade, and performative gardens along the waterfront pedestrian esplanade (see **Figure 1.3-7**). The edges of Wagner Park would be gently sloped and terraced to allow for universal access to the raised park areas and the new Pavilion described below (see **Figure 1.3-8**). Furthermore, the design of Wagner Park has been developed to comply with the WEDG through innovative and integrated landscape, architectural, and engineering site planning. WEDG is a rating system and set of guidelines to create resilient, ecological, and accessible waterfronts. The plantings on the water side of the Wagner Park flood alignment would tolerate salt spray and temporary inundation, reduce maintenance costs and provide ecological benefits. Planting designs in some of the terraced planters that transition down to the Esplanade would serve as rain gardens for capturing and filtering precipitation. Stormwater from planters and hardscape would be routed to an infiltration gallery located underneath the Esplanade, to reduce the point source discharge of stormwater to the Hudson River. The layout reduces risk of coastal flood hazards while enhancing waterfront access and providing a newly continuous waterfront walkway experience that improves Battery Park City's connection to the Pier A Plaza and The Battery. On the "dry" side of the flood alignment, a reuse cistern would capture stormwater generated during rain events. Reuse measures include site washdown, drip irrigation, and pavilion flush fixtures. Water captured by the cistern would be treated via a proprietary treatment system and distributed throughout the Park.

The SBPCR Project enhances Wagner Park's programmatic diversity and provides an opportunity for a new waterfront marine habitat educational area along the Pier A inlet. The Pier A inlet design converts a concrete relieving platform and rip-rap edge to a terraced condition that improves habitat opportunities. An observation deck is proposed along the Pier A inlet as shown in **Figure 1.3-9**. The construction of the deck would remove a portion of the relieving platform and replace it with a metal grate platform, which would allow 50 percent of available light to pass through.

The SBPCR Project's design also calls for assessing all materials including existing site stone, wood, trench drains, trees, shrubs and plants for salvage. A select amount of materials has been targeted to be reused within the SBPCR Project site. The remaining materials would be recycled or reused offsite where possible. Paving color and material selections are carefully calibrated to increase the parks solar reflectance index (SRI) reducing the park's urban heat island contribution. Site lighting carefully follows dark sky principles to reduce glare and enhance nighttime viewing of the New York Harbor and Statue of Liberty. Wagner Park's carefully designed planting plan is organized around four regional plant communities including tidal estuary, maritime meadow, maritime forest, and upland woodland. The landscape's design use of native plants reduces water consumption and reduces maintenance labor while significantly boosting local biodiversity and habitat support. The SBPCR Project's turfgrass areas make use of subsurface irrigation to reduce water consumption by more than 30 percent.

Following the Wagner Park design principles, the north and south allées of trees along Battery Place would be recreated along two ramps which connect the northern and southern arrival points of Wagner Park with the raised park and the new Pavilion. Based in part on the South BPC Study and conclusions, along with the Project Team's own analysis, the Team concurred that the existing Pavilion building was in need of major repair; more importantly, it is below the DFE. It was concluded that moving the existing Pavilion presented a variety of risks related to engineering, safety, and cost as detailed in the January 18, 2022, letter responding to SHPO's October 19, 2021, letter requesting further information and evaluation (included in **Appendix B**). Accordingly, the Project Team proposed a new Pavilion on the raised park. To accommodate the buried floodwall, as well as accessibility and functionality issues related to the elevation of the park, the existing Pavilion would be replaced with a new Pavilion in a manner that is sensitive to, and in overall harmony with, the elements of the 1995 Wagner Park design.

The design of the proposed pavilion targets International Living Future Institute (ILFI) Zero Carbon certification which requires reduction of operational and embodied carbon. In addition, the SBPCR Project is being designed to exceed the ILFI target of 25 percent reduction of energy use intensity (EUI). The SBPCR Project would exceed this target with energy reduction of 38 percent and 25 percent over the baseline via a geothermal loop and a Variable Refrigerant Flow (VRF) heat recovery system, respectively and many other energy conservation measures in selection of building systems. Highly efficient, low carbon insulation, high recycled content rebar, low carbon concrete, low emitting materials, triple glazing with low-E coating and bird deterrence are among the many sustainable features of the design.

The location of the proposed pavilion (the Pavilion) would be similar to the existing structure, but with a slightly smaller footprint and elevated approximately 11 to 12 feet above ground level, and set back closer to Battery Place, as shown in **Figure 1.3-8**. The Pavilion would have three (3) levels: a ground, first and second level. The ground level would include maintenance, programming and storage space for the BPCA Parks Department and a kitchen to support the restaurant operating at the first level. The first level (at the Park level) would include public bathrooms, a new community/educational center, and a restaurant with both indoor and outdoor seating. The second level would feature a green roof and provide additional public open space, while also accommodating the storage of mechanical equipment, include public space and contain green roof features (plantings, solar panels etc.). The total square footage of the building would be 18,235.

Figure 1.3-6: Buried Floodwall under Wagner Park

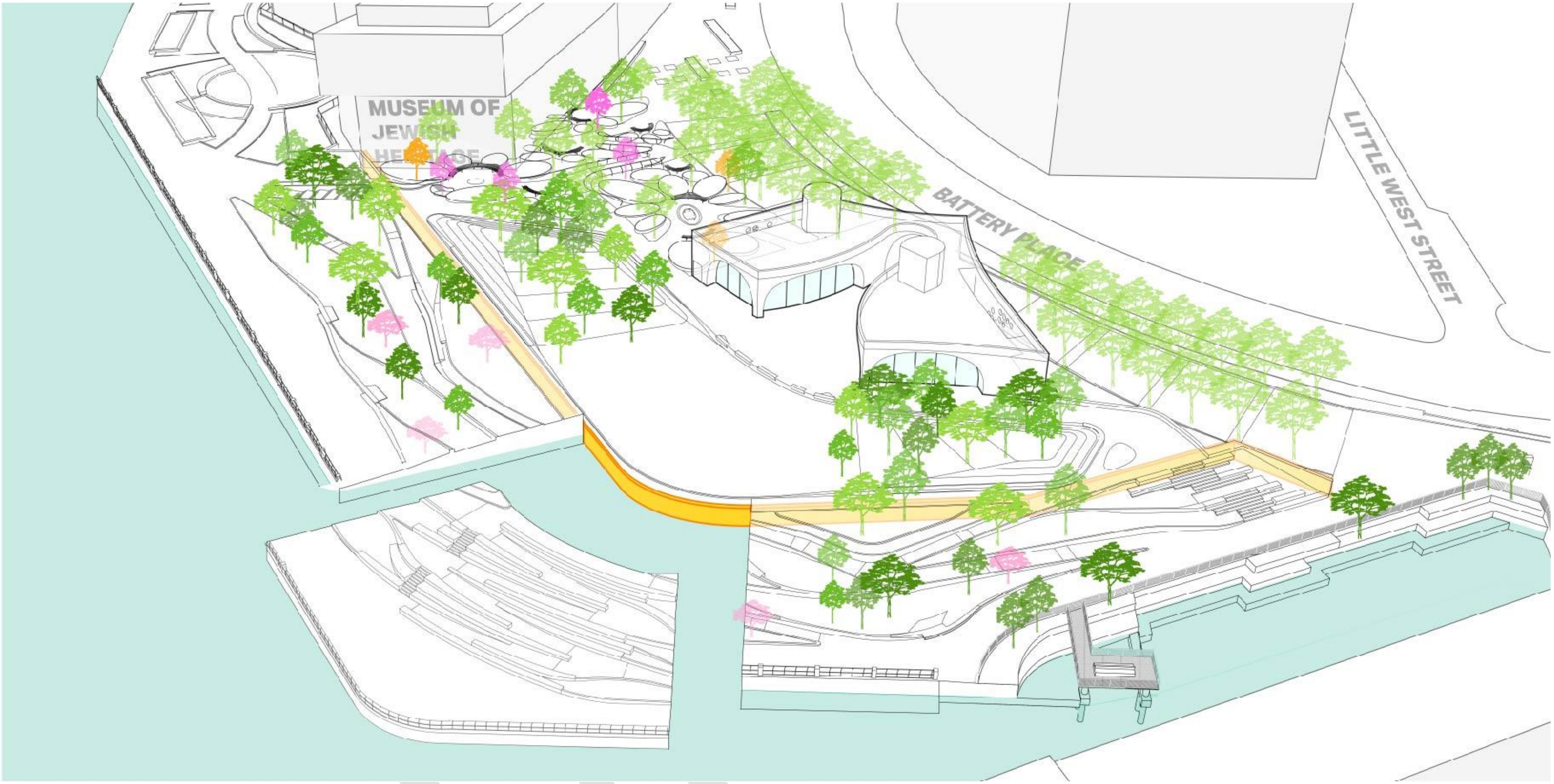


Figure 1.3-7: Wagner Park Proposed Design

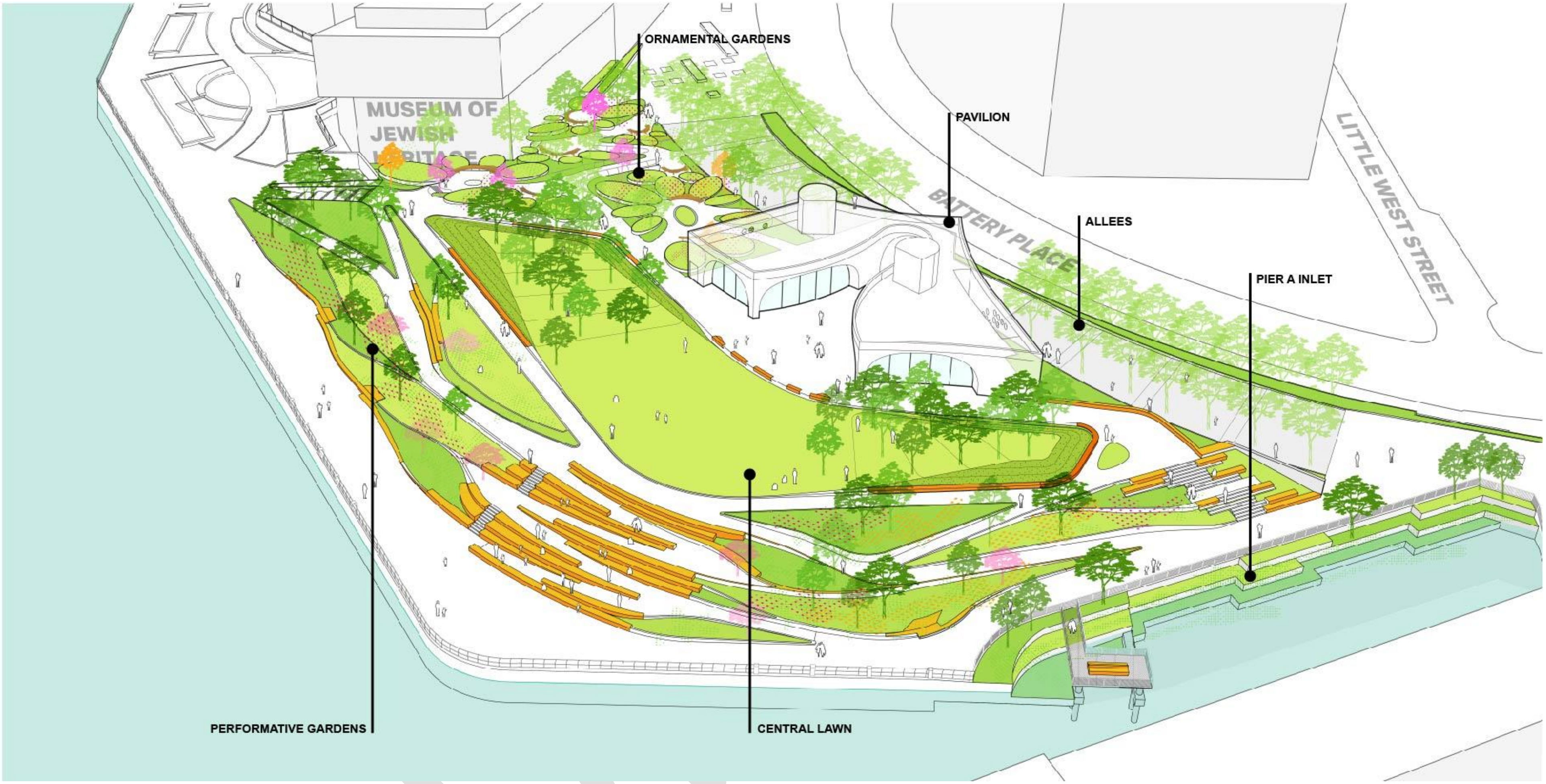


Figure 1.3-8: Proposed Wagner Park Pavilion

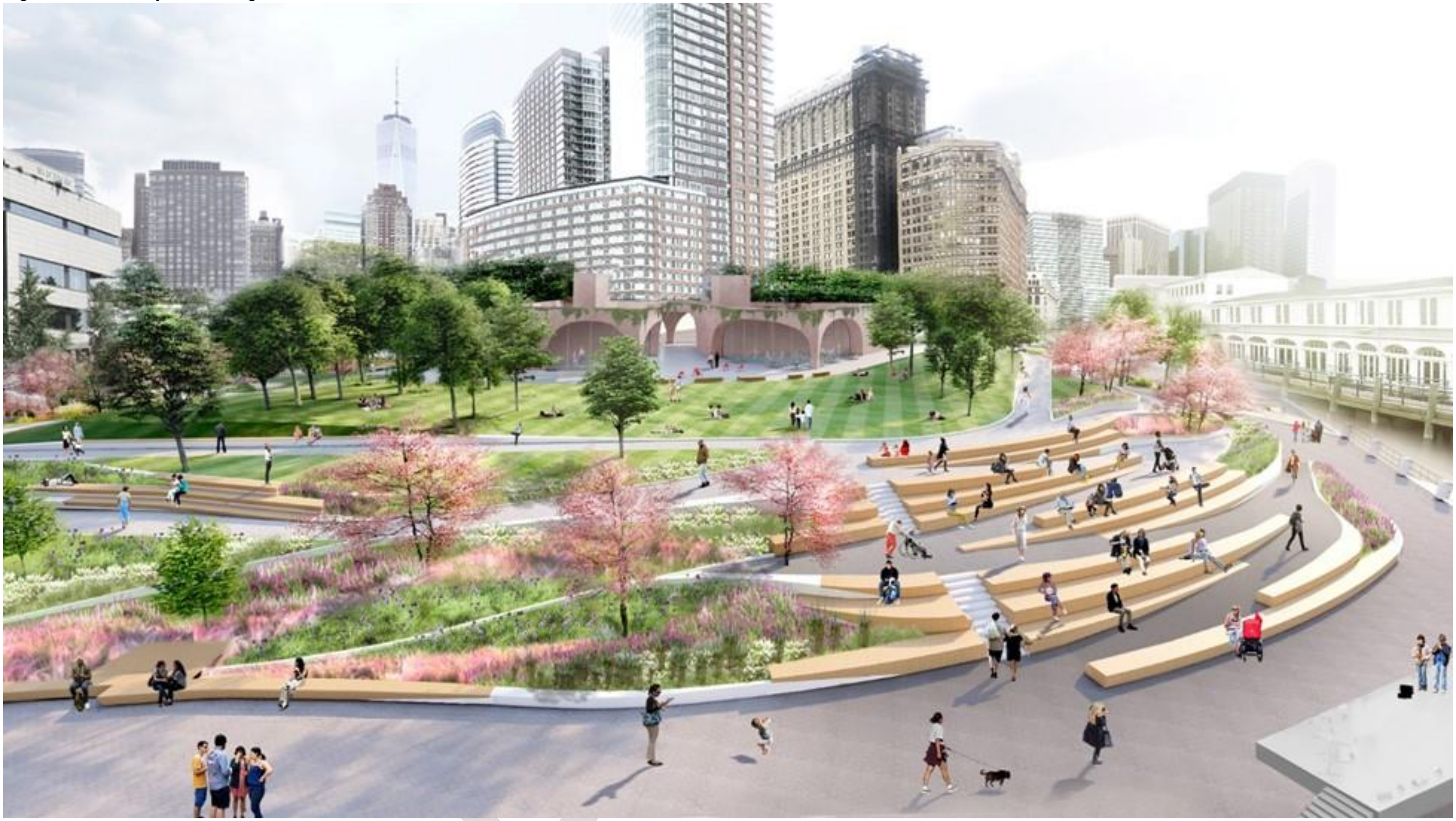
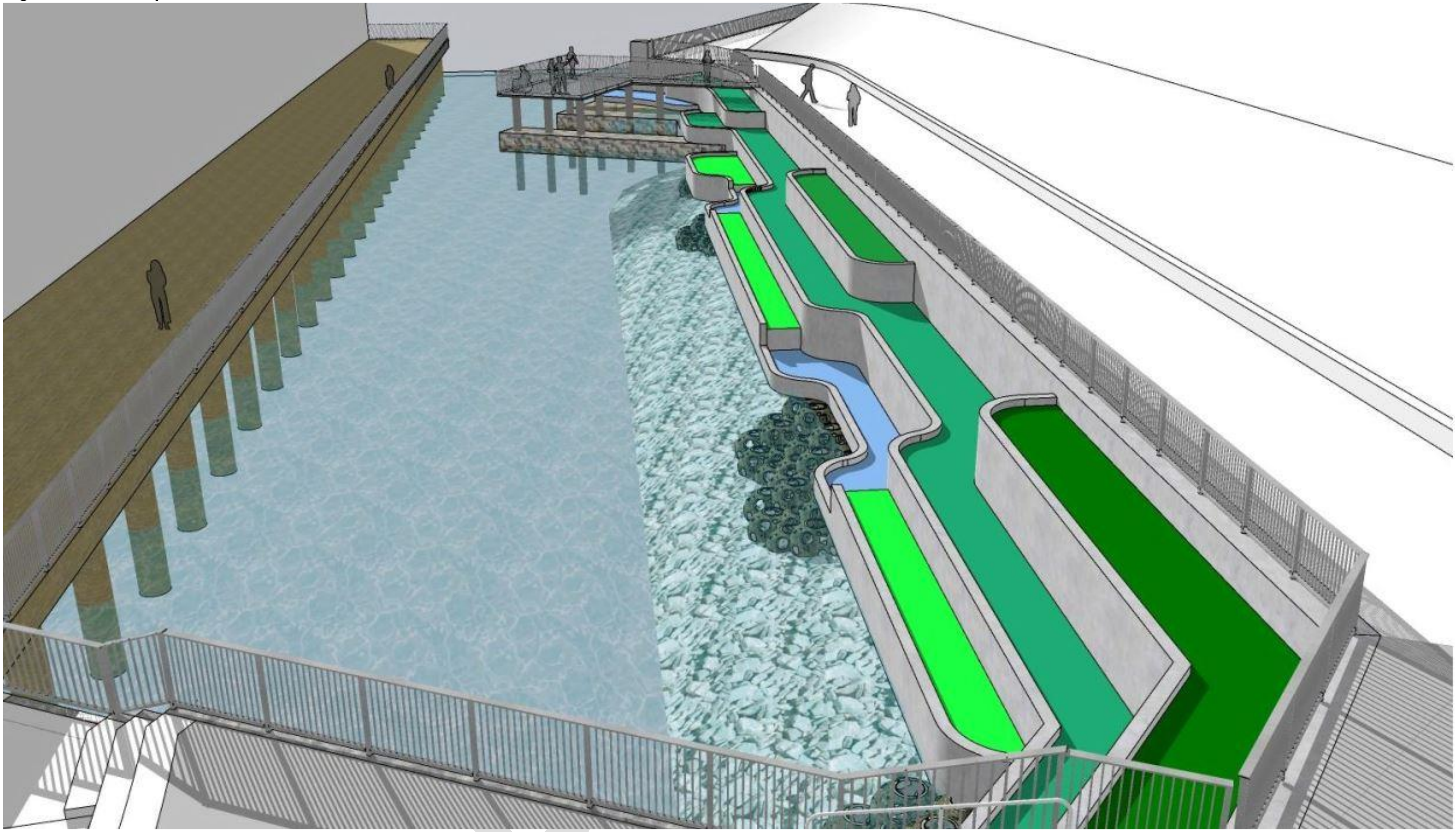


Figure 1.3-9: Proposed Pier A Inlet Observation Platform



1.3.4 Pier A Plaza

Pier A Plaza (or the Plaza) is at the lowest elevation in the Project Area. The flood alignment would consist of a newly raised segment of Pier A Plaza in combination with flip-up deployables and a short section of exposed floodwall (see **Figure 1.3-10**). The DFE in this area is 18.5 feet, and the HOI ranges from approximately 8.5 to 11.5 feet (see **Figure 1.3-1**). Flip-up deployables would seal up against new permanent columns to be located on the upper level of the Plaza (see **Figure 1.3-10**). The columns are designed to complement the materials of Pier A Plaza, and would be placed to accommodate views to the water, circulation (pedestrian, biking, and vehicular), and the programmed use of the Plaza. The existing paving materials of Pier A Plaza would be retained, with new material added for seating and increased planting (see **Figure 1.3-11** and **Figure 1.3-12**). The Plaza would allow for direct and universal access to Pier A and between the upper and lower levels of the Plaza, and would also maintain the bicycle connection from The Battery to the Hudson River Greenway, at the periphery of the Plaza (see **Figure 1.3-11** and **Figure 1.3-13**). Provision of building-specific wet-waterproofing protection of Pier A has been previously addressed by BPCA and is not part of this Project scope.

To protect against accidental or intentional vehicle breaches of the pedestrian-oriented Plaza, physical site security measures are planned for the northern perimeter of the Pier A Plaza, adjacent to the flood alignment, shown in in (see **Figure 1.3-14**). 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 turning south and terminating at the exposed floodwall above the Battery Park Underpass. This security barrier is to be supplemented with bollards at stairs and access points as needed. The exposed floodwall would also serve as a site security measure.

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 four feet, creating a bi-level Plaza and reducing the required height of the flip-up deployables, as shown in **Figure 1.3-12**. In addition, the two-level Plaza design would allow The 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 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.

Figure 1.3-10: Pier A Plaza Proposed Design

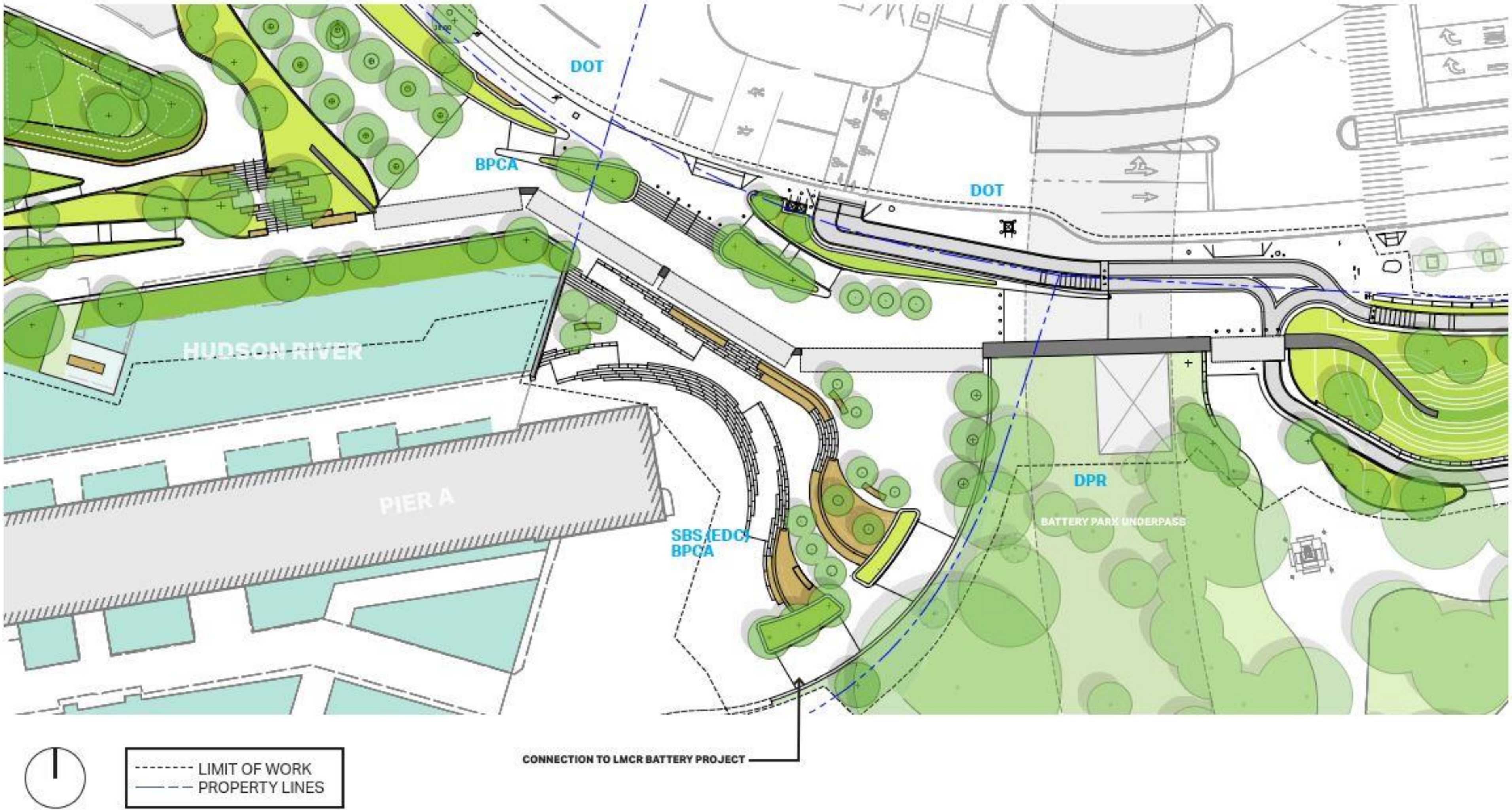
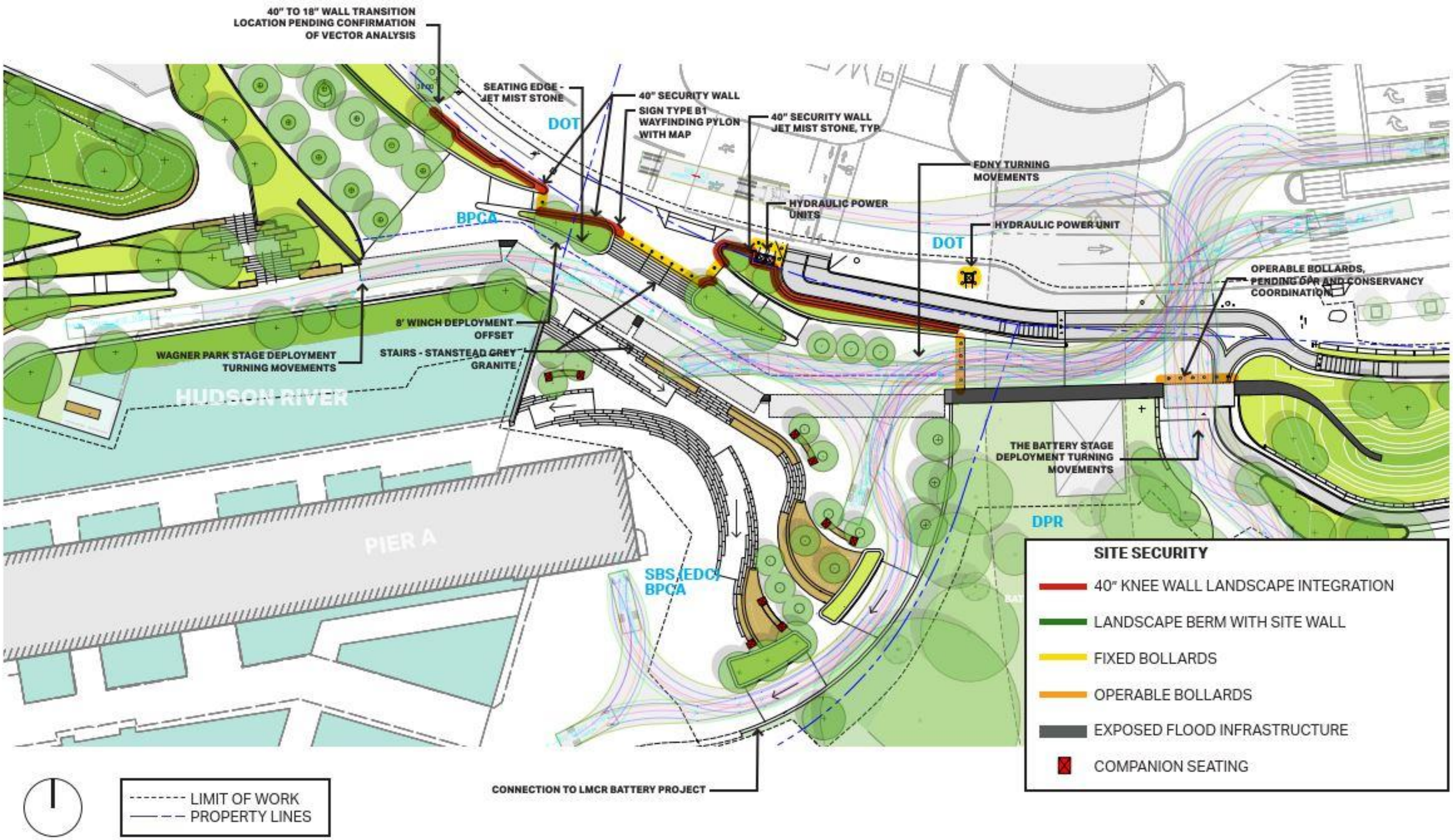


Figure 1.3-11: Proposed Raised Pier A Plaza

Figure 1.3-12: Pier A Plaza Proposed Conceptual Design

Figure 1.3-13: Pier A Pedestrian and Bicycle Connections

Figure 1.3-14: Pier A Plaza and Site Security Measures



1.3.5 The Battery

As the flood alignment continues east from Pier A Plaza, it extends into the Battery Bikeway on the north side of The Battery. This section of the flood alignment is comprised of a combination of flip-up deployables, an exposed floodwall, and a floodwall beneath a landscaped berm (see **Figure 1.3-15**). In this segment, the DFE ranges from 15 to 18.5 feet, and the HOI decreases from 9.5 to 0 feet, as the alignment follows the increasing natural elevation at the east end of the Project alignment (see **Figure 1.3-1**). This concept reconfigures the existing bikeway and requires the relocation of the Peter Caesar Alberti Marker monument 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 required DFEs, the circulation, landscape architecture, use of the bikeway, and a landscaped public park edge would remain, see **Figure 1.3-16**. As the flood alignment continues east towards State Street, which is on naturally higher ground, the DFEs and HOIs start to descend, affected by existing contours and increased distance from the Hudson River shoreline. Once the flood alignment reaches high ground in the easternmost section of the Project Area, which naturally aligns with the DFE, it terminates.

The physical site security measures described in Section 1.3.4 (Pier A Plaza) above would terminate in this segment of the SBPCR Project at the exposed floodwall above the Battery Park Underpass. This would include the 40-inch high barrier supplemented with bollards at stairs and access points as needed.

Figure 1.3-15: The Battery Proposed Design

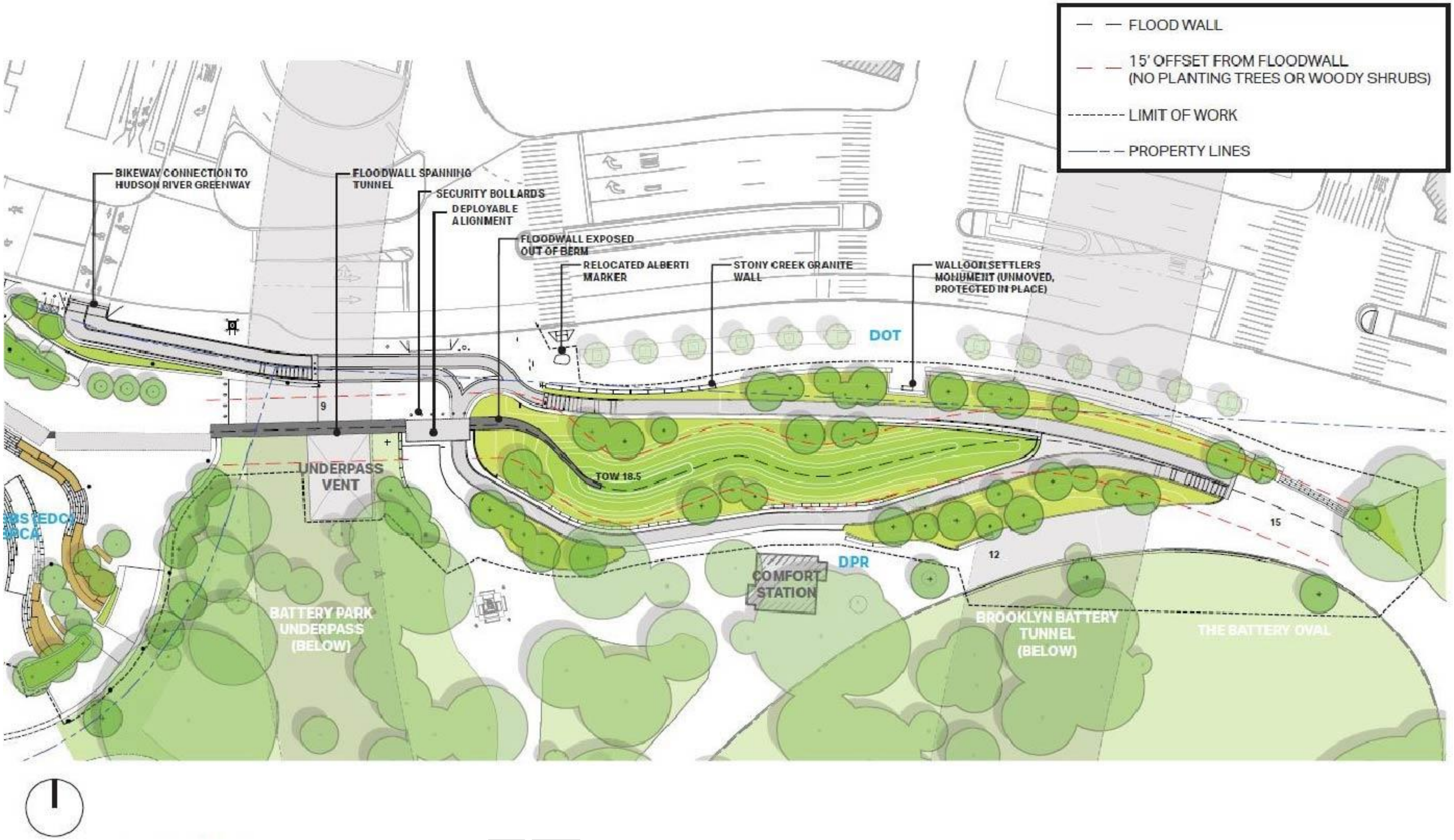


Figure 1.3-16: The Battery Bikeway Proposed Design

1.3.6 Interior Drainage Improvements

The existing sewer infrastructure crossing underneath the SBPCR Study Area would have to be isolated to preclude the coastal surge from entering the Study Area. To accomplish this, an interior drainage management system would be implemented that includes:

- Installation of tidegates: Tidegates would be installed at two existing separate municipal storm sewer (MS4) overflows - one at 1st Place and the second at Rector Street. A third tidegate would be installed on the CSO line at Pier A Plaza southeast of Pier A.

- Installation of isolation valves: Two isolation valves would be installed in The Battery. One valve would be installed at the 12-inch diameter storm drain that collects runoff from The Battery, approximately 50-feet east of the Battery Park Underpass structure underneath The Battery. A sanitary sewer isolation valve would be installed just north of The Battery comfort station. The valves would remain in the open position during non-coastal storm events. In advance of a major coastal storm event, the valves would be closed to prevent coastal waters from surging through the storm water drain and the sanitary lines connected to the comfort station. The Battery and the comfort station would be closed to the public during such major coastal storm events. Stormwater analysis confirmed that closing the valves would not exacerbate flooding in The Battery during major coastal storm events and under the scenario of a forecasted coastal storm that does not materialize (see **Appendix E** for analysis).

- Near Surface Isolation: 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. Additionally, four interceptor manholes 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.

1.4 Potential Regulatory Permitting, Approvals and Coordination

Implementation of the Proposed Action would require federal, state, and local approvals involving the following agencies:

1.4.1 Federal

- USACE – Permits or authorizations for activities in Waters of the United States (Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act).
- US Environmental Protection Agency (USEPA), US Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) – Advisory agencies to the federal permitting process focusing on activities that affect wetlands, water quality, protected plant and wildlife species, and essential fish habitat (EFH).
- FEMA – Review of flood protection design and potential changes to Flood Insurance Rate Maps (FIRM).

1.4.2 State of New York

- Department of Environmental Conservation (NYSDEC) – Permits related to activities in tidal wetlands or adjacent areas (Article 25) or protection of waters (Article 15), Water Quality Certification (Section 401); permits related to the State Pollutant Discharge Elimination System (SPDES) program; and approvals related to the import of fill material requiring Beneficial Use Determination.
- Department of State (NYSDOS) –Coastal Zone Consistency Determination.
- Office of Parks, Recreation and Historic Preservation (OPRHP) – State Historic Preservation Office (SHPO) leading the Section 14.09 of the SHPA review for designated and protected properties on the State and National Registers of Historic Places and properties determined eligible for such listing; and the federal review process pursuant to Section 106 of the National Historic Preservation (NHPA) for the Pier A inlet improvements.
- Department of Transportation (NYSDOT) –Design coordination as needed and construction permits for work within the ROW.
- New York City Transit Authority (NYCTA) – Coordination regarding impacts to bus routes/stops on Battery Place.
- MTA - Triborough Bridge and Tunnel Authority (TBTA) –Approval of alignment crossing over Brooklyn-Battery Tunnel.

1.4.3 City of New York

- Department of Parks & Recreation (NYC Parks) – Tree Work Permits for tree removals, restitution payments and Capital Construction Permit for any construction on NYC Parks property. A Maintenance and Operation Agreement will be required between NYC Parks and BPCA.
- Department of Environmental Protection (NYCDEP) – Design approval of project elements related to stormwater management, water and sewer infrastructure, coordination with respect to potential hazardous materials and natural resources impacts, as well as air quality and noise/vibration analyses.
- NYCDOT – Design approval of bike lane, lighting, and other work in NYCDOT ROW, as well as coordination/review of transportation analyses. Revocable consent would be required for construction in the ROW.
- Department of City Planning (NYCDCP) – Consistency determination under the Local Waterfront Revitalization Program.
- Small Business Services (NYCSBS) – Coordination and approval for activities on NYCSBS owned property. Revocable consent would be required for construction on NYCSBS owned property.
- NYC LPC – Advisory agency for activities on or near sites of historic or archaeological value.
- New York City Police Department (NYPD) – Approval for bollard and security design.
- New York City Fire Department (FDNY) – Coordination of access requirements and impact to FDNY facilities and conduits within the ROW.
- Public Design Commission – Design approval for permanent structures, landscape architecture, and art proposed on City-owned property.

2 Project Alternatives

Chapter 2 of the DEIS evaluates the alternatives considered for the SBPCR Project, identifies the alternatives eliminated from further consideration and the alternative that was selected for further analysis (the Proposed Action).

2.1 Background of Design and Alternatives Development

As stated in Section 1.1 (Introduction), Hurricane Sandy resulted in tremendous damage and loss throughout New York City. Battery Park City was not spared from the destruction. This impact from the storm led BPCA to conduct a study to consider measures that could be taken to protect Battery Park City from future sea level rise and storm surge. The "*Wagner Park Site Assessment and South Battery Park City Resilience Plan* (Perkins Eastman, July 13, 2017)" (the South BPC Study) was conducted prior to the SBPCR Project and served as a starting point for the alternatives considered.

The South BPC Study recommended a flood alignment approach that would protect a large area of the southern portion of Battery Park City and the southwestern corner of the Financial District. The alignment would extend from the northeast corner of Pier A Plaza, along Battery Place east to State Street, then run adjacent to the Museum of Jewish Heritage and terminate at 1st Place. Based upon the understanding at the time that the target DFE for the South BPC Study Area (and other Lower Manhattan Coastal Resiliency (LMCR) Projects) would be set at 16.5 feet, the South BPC Study recommended utilizing a deployable flood barrier stored in the ground and raised in the event of a storm. The resilience concept for Wagner Park was a combination of the deployable barriers and a new pavilion that would form a continuous barrier from 1st Place to the western border of The Battery. The South BPC Study did not include a definitive design concept for The Battery segment of the plan.

Another component of the South BPC Study was the landscape redesign which was intended to preserve the popular elements of the park including the ornamental gardens, while increasing the accessibility and usability of the lawn, introducing new vegetation to improve the water quality in the Pier A inlet and a new outdoor stage.

Additionally, Battery Park City was part of the Lower Manhattan Coastal Resiliency (LMCR) Study which evaluated all of Lower Manhattan and identified solutions to protect this vulnerable portion of Manhattan from flooding, as described in Section 1.1 (Introduction).

2.2 Reasonable Alternatives to the Proposed Action

2.2.1 No Action Condition

Under the No Action Condition, there would be no comprehensive flood alignment within the Study Area and Battery Park City would remain vulnerable to both low inundation flooding and the 100-year storm event. Without flood protection, the Study Area including the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery would be subject to storm damage from major and minor flood events.

The No Action Condition consists of other planned or ongoing projects within the Study Area. These projects are often referred to as the "No Action" projects and are assumed to be constructed whether the Proposed Action is constructed or not. The Battery Coastal Resilience Project is a NYCEDC project within the Study Area and would connect to the SBPCR Project at Pier A Plaza. The Battery Park Underpass and West Street Underpass Project is a NYCDOT project that would provide protection for the Battery Park and West Street underpasses from future sea level rise and flood damage. Coordination with NYCEDC, the NYCDCP and NYCDOT resulted in the following No Action Project List in **Table 2.2-1**.

Table 2.2-1: No Action Project List

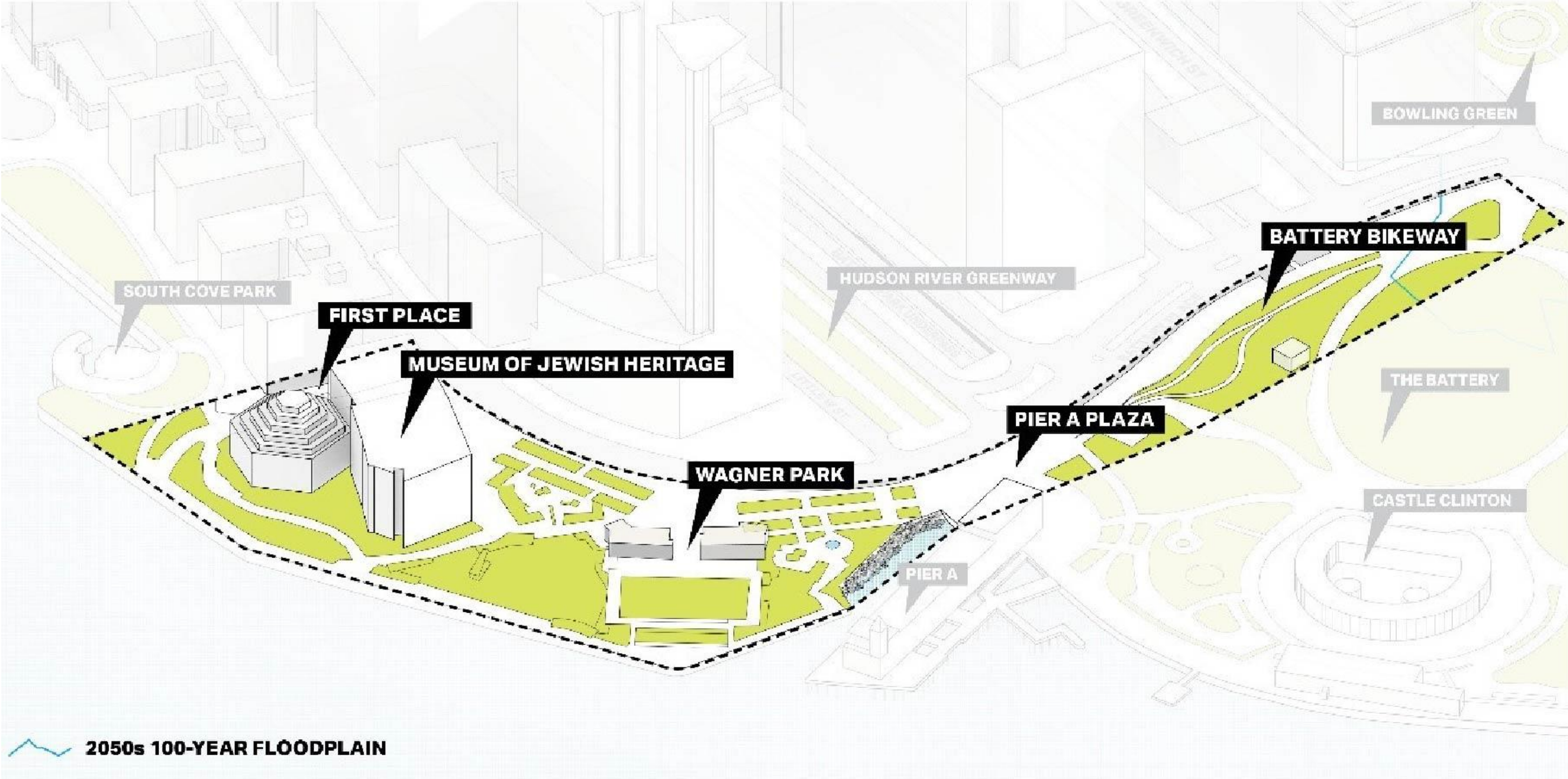
Project Name	Agency/Owner	Summary	Build Year
The Battery Coastal Resilience Project	NYCEDC/NYC Parks	This resilience project is evaluating flood protection measures in The Battery, east of the SBPCR project. This project would rebuild and elevate the wharf promenade in The Battery, staying true to the character and uses of the park, while protecting it from sea level rise in the year 2100.	2024
Battery Park Underpass and West Street Underpass Project	NYCDOT	Resilience measures to protect the Battery Park Underpass and West Street Underpass from sea level rise and storm surge. A series of improvements including installation of flood gates within the portals to prevent underpass flooding.	2024

2.2.2 Action Alternatives Considered

This section would identify alternatives considered for the five segments of the Project Area, individually due to their differing characteristics, as well as interior drainage alternatives. These five segments are shown in **Figure 2.2-1** and include:

- 1st Place
- Museum of Jewish Heritage
- Wagner Park, including Pier A inlet
- Pier A Plaza
- The Battery

Figure 2.2-1: SBPCR Project Segments



2.2.2.1 1st Place

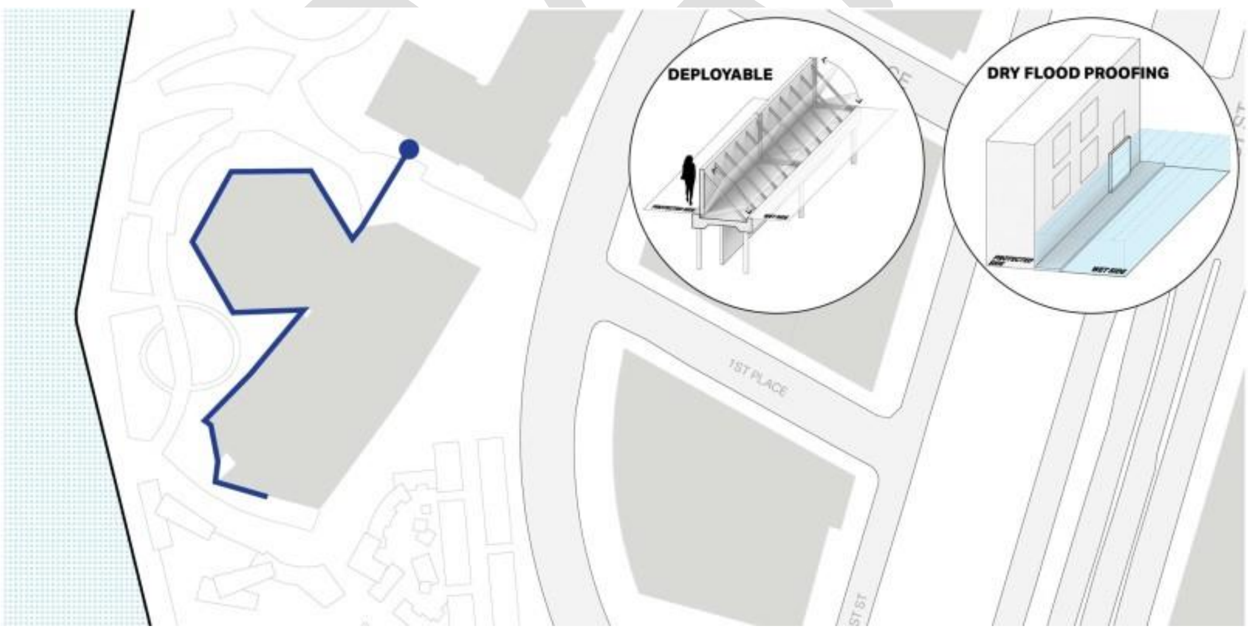
The area around 1st Place is under the jurisdiction of the BPCA, and the ROW of 1st Place itself is under the jurisdiction of NYCDOT. Due to the limited size of this section, the necessity for the Proposed Action to follow the 100-year floodplain contours, provide FEMA certification and to maintain emergency access and egress, only one alternative is feasible for 1st Place.

2.2.2.2 Museum of Jewish Heritage

This segment runs along the landscaped courtyard of the Museum of Jewish Heritage, connecting with the southern end of the 1st Place segment, as shown on **Figure 2.2-2**. The park area around the Museum of Jewish Heritage is under the jurisdiction of the BPCA. The Museum of Jewish Heritage itself is owned and operated privately.

This section of the Project Area has an existing relieving platform, which was constructed on piles when Battery Park City was built, as a support system for the Battery Park City Esplanade. The subsurface relieving platform coincides with a load-restricted zone of 750 pounds per square foot (psf). The relieving platform lies underneath the subsurface between the Museum of Jewish Heritage and the waterfront. As a result, between 1st Place and Wagner Park the location of the flood alignment was limited to near the building. The alternatives for this segment were developed to meet the purpose and need and project objectives. Two alternatives were considered for this segment: Museum Alternative 1; and Museum Alternative 2.

Figure 2.2-2: Museum of Jewish Heritage Proposed Flood Measures



Museum – Alternative 1

Museum Alternative 1 proposes a flood mitigation landscape integration on the water side of the Museum. The flood alignment would be integrated into the landscaped areas along the building but just outside of the building facade. The alignment would connect with the alignment at 1st Place and extend around the Museum of Jewish Heritage with a series of flip-up deployables and glass-topped floodwalls.

Evaluation

This alternative would minimize any work needing to be done on the Museum itself and maintain views to the Hudson River while still providing the necessary flood protection. The top of the floodwall would be constructed of flood-proof glass, set within a metal frame. This alternative was selected to be further analyzed as part of the Proposed Action in the DEIS as it met the purpose and need and project objectives, in contrast to Alternative 2 described below.

Museum – Alternative 2

Museum Alternative 2 proposes flood mitigation built into the façade of the Museum. This alternative would dry-floodproof the existing building. Existing windows and doors would be protected using deployable floodproof panels. To provide floodproofing, the existing cladding would be removed and replaced with a thickened wall section supported by the foundation of the existing building or supported on an independent pile foundation.

Evaluation

The preliminary analysis indicated that the building walls and foundation of the Museum had some capacity to resist flood loads, but in order to achieve the design criteria of the 100-year storm surge, retrofits would be required. This alternative had several challenges that rendered this alternative technically infeasible including:

- Replacement of the façade with a thickened wall created a potential for water to become trapped between the thickened wall and the museum wall which could have led to deterioration of the museum or flood wall concrete;
- BPCA would undertake additional risk in modifying a building that it does not own or maintain; in addition, any future modifications to the building performed by the owner would require BPCA approval and/or FEMA review to ensure continued protection; and
- Construction would have a greater impact on the museum and would conflict with upcoming exhibits at the museum.

For these reasons, this alternative has been eliminated from further consideration.

2.2.2.3 Wagner Park

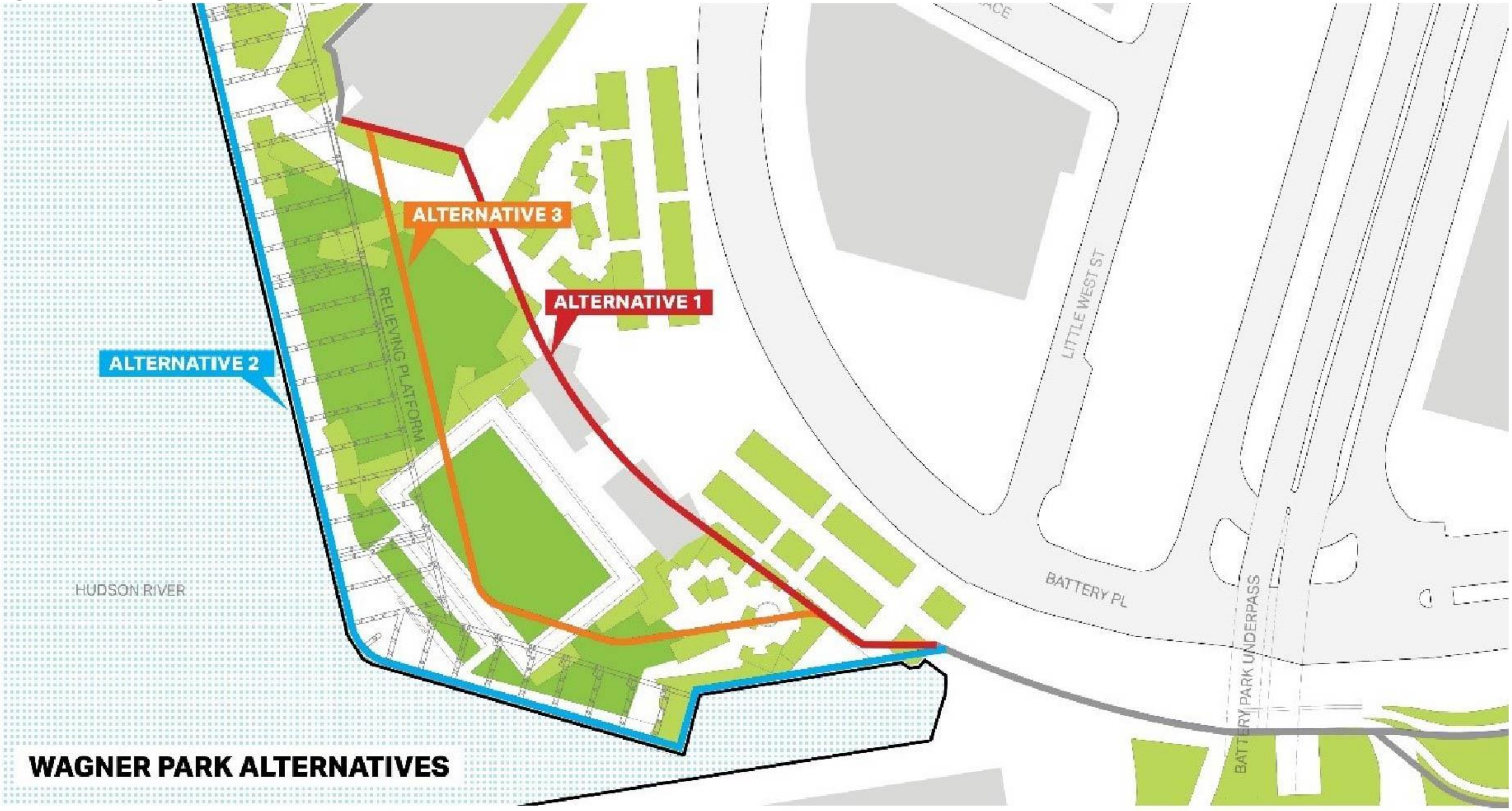
In 2017, BPCA retained Perkins Eastman/KS Engineers, P.C., to conduct an assessment (the South BPC Study) to evaluate the vulnerability of Wagner Park and the area surrounding the park including Pier A Plaza to the risks associated with climate change. This study looked at ways the park and pavilion could be made more resilient while improving the functionality and efficiencies of the park. The objectives of the plan included providing resiliency against flood risk, enhancing the park for BPC residents, improving maintenance and support facilities, extending the Battery Park City Esplanade, and providing an adequate facility for food and beverage offerings.

In 2018, BPCA retained AECOM to design the SBPCR Project. In addition to re-evaluating the elements of the South BPC Study, AECOM identified two additional alternatives. All three action alternatives are featured in **Figure 2.2-3**, and include the following:

- Alternative 1 – Inland Alternative
- Alternative 2 – Waterfront Edge Alternative
- Alternative 3 – Buried Floodwall Alternative (Proposed Action)

Additionally, the Project Team evaluated three alternatives to replace or preserve the existing Pavilion and two options to redesign the shoreline along Pier A inlet. The alternatives for Wagner Park, the Pavilion and Pier A inlet were evaluated based on whether they met the purpose and need and project objectives.

Figure 2.2-3: Wagner Park Alternatives



Wagner Park – Alternative 1 (Inland Alternative)

Under Alternative 1 – Inland Alternative, as proposed in the 2017 South BPC Study, the flood alignment would be constructed furthest from the waterfront, and closer to Battery Place. The alignment in this location would bisect Wagner Park. The flood alignment was based upon a target DEF of 16.5 feet and would require the installation of two types of flood risk reduction systems: a recommended new pavilion designed to function as a barrier against storm surge, flanked by flip-up deployables stowed below ground in chambers that would measure approximately 26 feet deep and 25 feet wide. The freestanding supportive columns that would support the flip-up deployables would be designed as decorative elements for Wagner Park, and possibly incorporate other park amenities such as lighting or charging stations for mobile devices. The new pavilion would have to be built at a height sufficient to act as a barrier to storm surge. **Figure 2.2-4** depicts the concept for Alternative 1.[1]

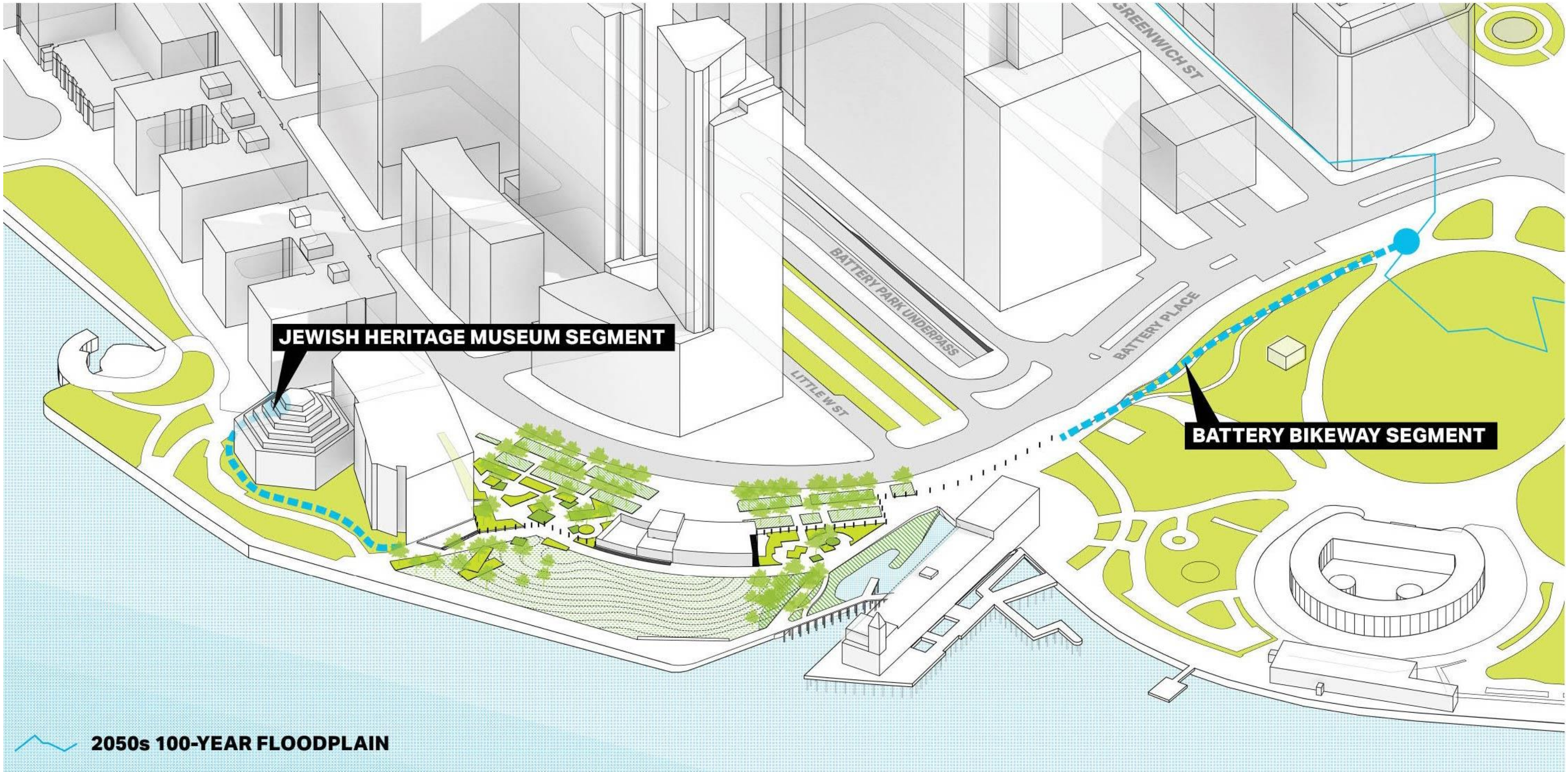
Evaluation

Alternative 1 is not prudent or feasible because it does not meet the project purpose and need. Given subsequent coastal modeling that pegged the target DFE at Wagner Park at significantly in excess of the previously assumed 16.5 feet, a new pavilion at the same elevation would not achieve a sufficient DFE to provide the necessary protection. In addition, this alignment runs inland, closer to Battery Place, leaving most of the park on the wet side of the flood risk reduction system. Alternative 1 would therefore leave the majority of Wagner Park unprotected during a storm event, a level of risk that was more palatable at lower DFE projections. Wagner Park is an important community asset that is frequented and valued by both local residents and visitors alike, and the prospect of extended periods of inaccessibility raised significant concerns. Furthermore, this alternative would be a higher risk option, because it relies on deployables, which are subject to mechanical and human error; thus failing to meet this specific project objective.

With the bulk of Wagner Park remaining unprotected from severe storm events and sea level rise, this alternative has the potential for prolonged periods of inaccessibility due to extensive repairs to and restoration of the Park after storm events, as well as considerable costs for recurrent repairs. Therefore, in addition to not achieving the purpose and need, this alternative fails to meet the specific project objective of utilizing cost-effective solutions to maximize investment. For these reasons, Alternative 1 has been eliminated from further consideration.

[1] Project stakeholders suggested that BPCA also consider an inland flood alignment consisting of a linear series of deployables placed either on the water side or the street side of the pavilion; however, neither of these options would meet the purpose and need of the Project, as they would not protect Wagner Park. Furthermore, they would not cure the inadequacy of the space or the need for ongoing maintenance.

Figure 2.2-4: Alternative 1 – Preliminary Conceptual Design



Wagner Park – Alternative 2 (Waterfront Edge)

Under Alternative 2, the flood alignment would be constructed on the edge of the waterfront along the Battery Park City Esplanade. The DFE would be 21 feet to 24.5 feet (higher than Alternatives 1 and 3, as there is no intervening land to buffer storm surge). This section of the Project Area has an existing relieving platform, which was constructed on piles when Battery Park City was built, as a support system for the Battery Park City Esplanade. The subsurface relieving platform coincides with a load-restricted zone of 750 psf. Two options were considered for flood protection, an exposed floodwall and a flip-up deployable. In either option, the existing relieving platform would need to be reconstructed to support the additional load. Such reconstruction would also increase the elevation of the relieving platform to protect against future sea level rise.

Exposed Floodwall Option

An exposed floodwall option was considered for the waterfront edge. This option involved constructing an exposed floodwall along the waterfront, creating a permanent visual barrier, obstructing views to the harbor from within Wagner Park, as shown in **Figure 2.2-5**.

Flip-up Deployable Floodwall Option

A flip-up deployable option was also considered for the waterfront edge. The foundations for the flip-up deployables would be constructed on top of the reconstructed relieving platform. As flip-up deployables are subject to mechanical and human error, this alternative would require a one-way lane for maintenance to allow emergency vehicles to raise the deployables in the event that they could not deploy mechanically. While the flip-up deployables would only be fully visible while deployed during a flood event or during maintenance, they would be supported by permanent square columns that measure approximately 12 feet high and a minimum of 5 feet wide. These columns would be spaced 40 feet apart to support the deployables along the waterfront edge, as shown in **Figure 2.2-6**.

Evaluation

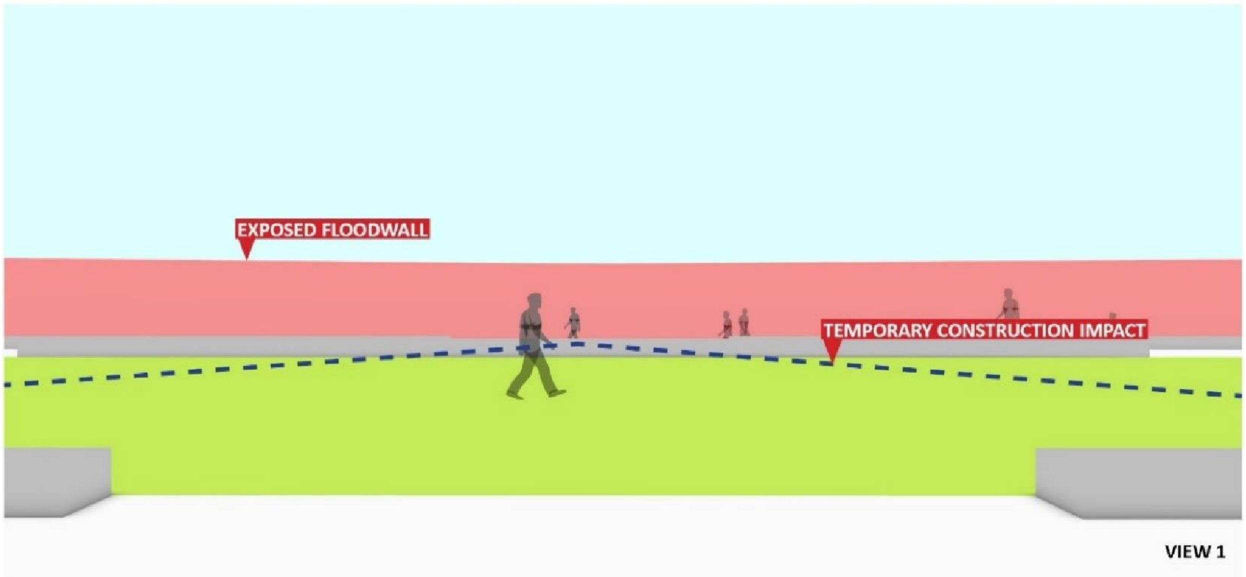
Exposed Floodwall Option

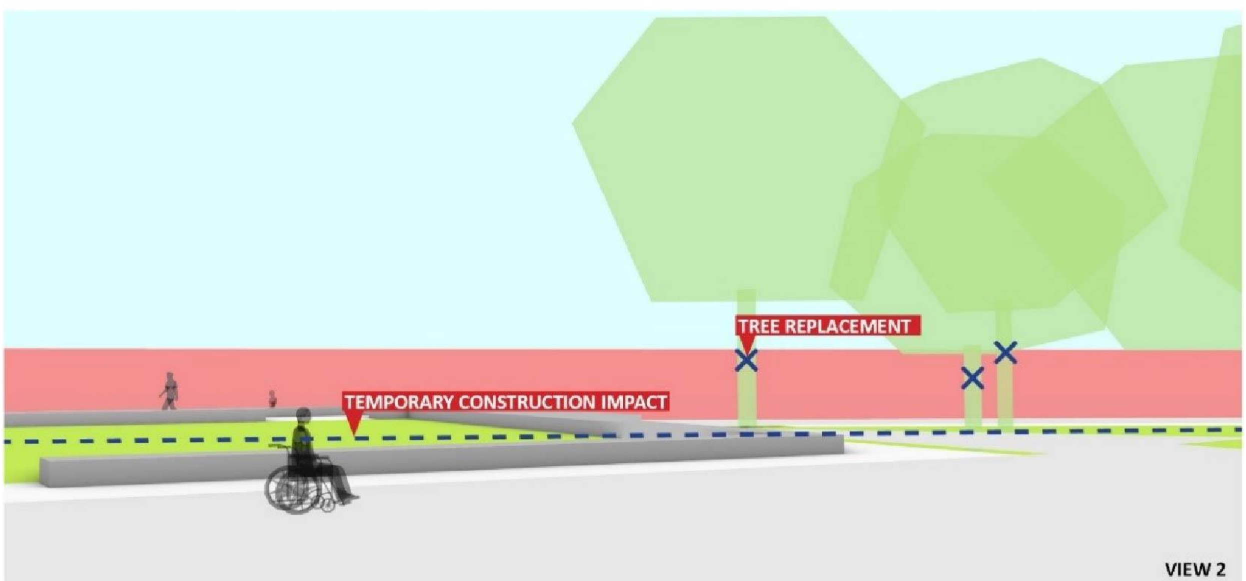
The exposed floodwall option, as depicted in **Figure 2.2-5**, presents several engineering and other challenges that rendered this option technically and economically infeasible including the following:

- An exposed floodwall at the bulkhead edge would create a large and permanent visual barrier, cutting off views to the harbor and Statue of Liberty from within the park. Furthermore, the exposed floodwall would visually separate Wagner Park, the Pier A inlet, and Pier A Plaza from each other and the water. This would impact the context and connectivity of these open spaces.
- Installation of an exposed floodwall would require reconstruction of the relieving platform and bulkhead, resulting in tremendous time, cost and community disruption impacts.
- Bulkhead reconstruction would require extensive fill below the waterline which would eliminate existing marine habitat beneath the relieving platform; as well as scour protection consisting of stone armor at the toe of slope, further encroaching towards the navigation channel. Both would require disturbance to USACE and NYSDEC regulated wetlands and open waters.
- Given the grade changes that would result from the elevation of the newly-constructed relieving platform, it would be challenging to connect the flood alignment to neighboring properties,

including the Museum of Jewish Heritage to the north, and historic Pier A to the south, in a context-sensitive manner that would allow for a smooth transition from each of those resources to the waterfront.

Figure 2.2-5: Alternative 2 – Exposed Floodwall Schematic





Flip-up Deployable Floodwall Option

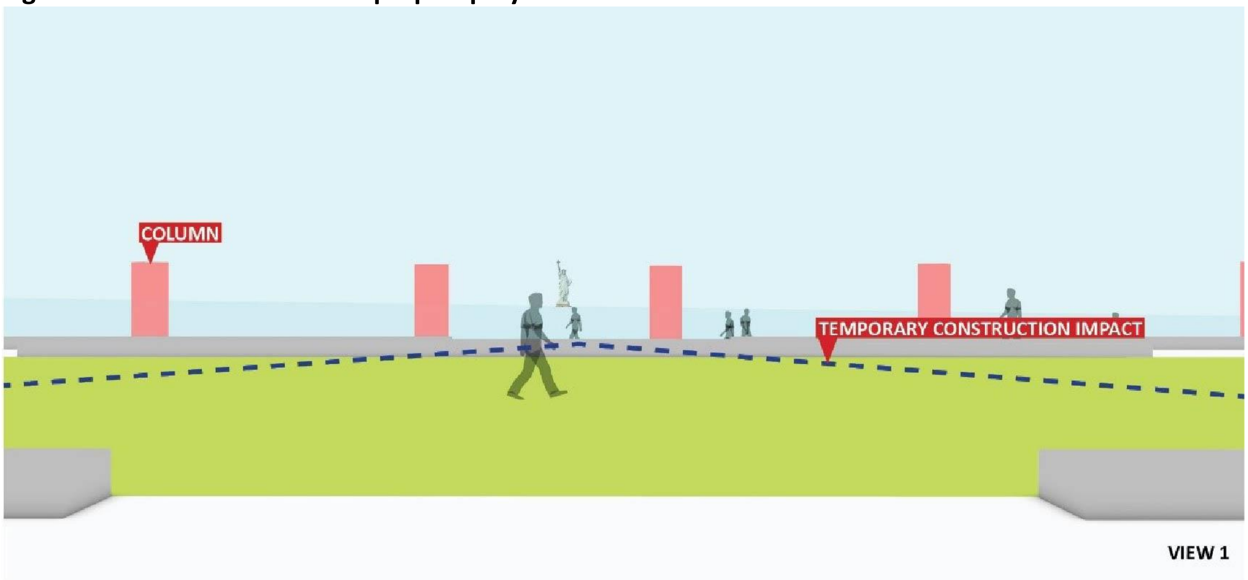
The flip-up deployable option, as depicted in **Figure 2.2-6,** presents several engineering and other challenges that rendered this option economically and technically infeasible, including the following:

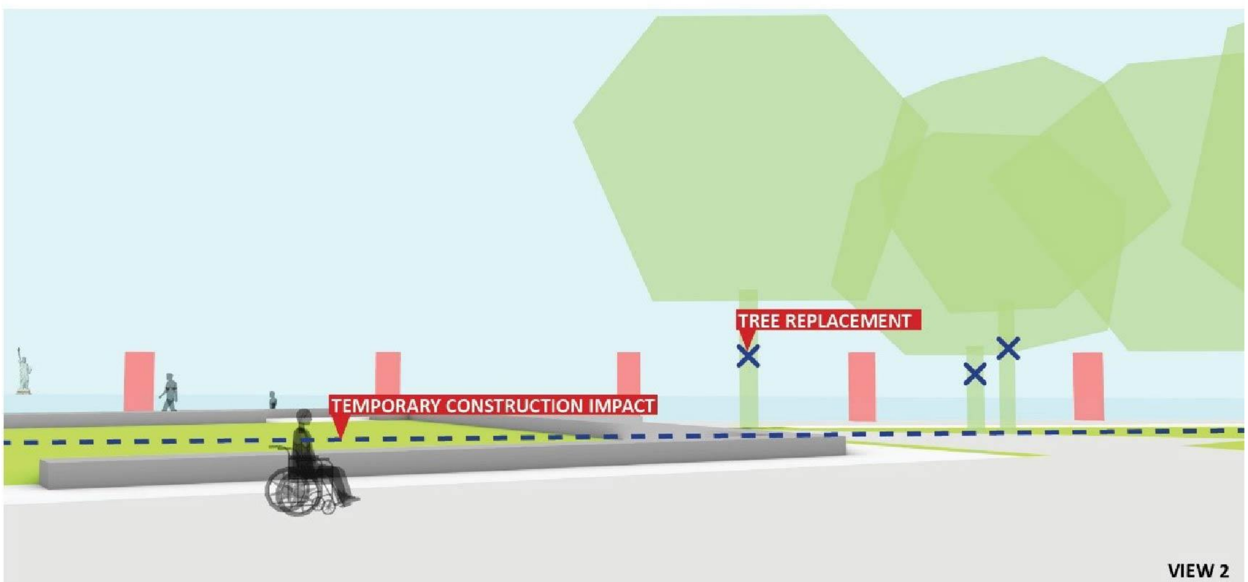
- To provide a continuous watertight system, the relieving platform would need to be modified and sealed. A seepage barrier would likely be required, resulting in fill below the relieving platform that would impact existing marine life, and require fill of USACE and NYSDEC regulated waters.

- Foundations for the flip-up deployables would require demolition or reconstruction of the existing relieving platform.
- Installation of flip-up deployables would require permanent square columns that measure approximately 12 feet high and a minimum of 5 feet wide, spaced 40 feet apart, which would partially block the park's essential vista out to the Statue of Liberty and New York Harbor.
- This option would bring the flip-up deployables to the waterfront edge, leaving them susceptible to damage from vessel collision.
- This option would be a relatively high risk option, because it relies on deployables, which are subject to mechanical and human error.
- Given the grade changes that would result from the elevation of the newly-constructed relieving platform, it would be challenging to connect the flood alignment to neighboring properties, including the Museum of Jewish Heritage to the north, and historic Pier A to the south, in a context-sensitive manner that would allow for a smooth transition from each of those resources to the waterfront.

For all of the reasons noted above, Alternative 2 has been eliminated from further consideration.

Figure 2.2-6: Alternative 2 – Flip-up Deployable Schematic





Wagner Park – Alternative 3 (Buried Floodwall)

After Alternative 2 was deemed not feasible, the Project Team then considered an alignment set back from the relieving platform outside of its structural zone of influence, but as close as possible to the Battery Park City Esplanade. This approach maximizes the protected area to the extent possible without reconstructing the relieving platform, thereby protecting more of Wagner Park while eliminating the structural issues associated with building above the relieving platform. A passive flood system was proposed that would avoid bisecting (and disrupting) the park with a flood alignment. This passive system would bury the floodwall beneath the park, therefore requiring elevation of the entire park, including the level at which the pavilion currently resides. Based in part on the 2017 study's assessment and conclusions, along with the Project Team's own analysis, the Team concurred that the existing pavilion building was in need of major repair; more importantly, it is below the DFE. It was concluded that moving the existing Pavilion presented a variety of risks related to engineering, safety, and cost as detailed in the January 18, 2022, letter responding to SHPO's October 19, 2021, letter requesting further information and evaluation (included in **Appendix B**). Accordingly, the Project Team proposed a new pavilion on the raised park. To accommodate the buried floodwall, as well as accessibility and functionality issues related to the elevation of the Park, the existing Pavilion would be replaced with a new Pavilion in a manner that is sensitive to, and in overall harmony with, the elements of the 1995 Wagner Park design.

Under Alternative 3, a buried floodwall would be constructed beneath the park (see **Figure 1.3-6** and **Figure 2.2-7**). The DFE would be 19.8 feet, and the HOI would be 7.8 to 9.8 feet. Wagner Park would be raised 10 to 12 feet, thereby maximizing the amount of continuous lawn space, maintaining views to the waterfront, and preserving the elevation of the existing Battery Park City Esplanade. The buried floodwall also allows users to occupy the lawn, garden, and public park as continuous open space, in contrast to a traditional exposed floodwall design that would effectively bisect the space. At the connection between Wagner Park and Pier A Plaza, the flood alignment would be resurfaced and exposed as a short segment of exposed floodwall where it would meet the flip-up deployables being used through Pier A Plaza.

Redesigned key features of Wagner Park would include ornamental gardens, central lawn, performative gardens along the waterfront pedestrian esplanade, and a transitioning naturalized edge with an overlook deck at the Pier A inlet. The edges of Wagner Park would be gently sloped and terraced to allow for universal access to the raised park areas and a new pavilion. Additionally, the planting design on the water side of the park would tolerate salt spray and temporary inundation, reducing maintenance costs and providing ecological benefits. Planting designs in some of the terraced planters that transition down to the esplanade would serve as rain gardens for capturing and filtering precipitation. Alternative 3 is shown in **Figure 2.2-7**.

New design considerations, which were also developed in concert with feedback obtained at public meetings held between 2018 to the present (see Section 1.3 (Project Description) for more detail), include:

- Elevating the site to maximize protected area (behind the risk reduction structures);
- Organizing the site around a central lawn, with an uninterrupted view axis to the Statue of Liberty;
- Moving the elevated pavilion closer to Battery Place to maximize continuous lawn area above the DFE;
- Providing universal accessibility across the park and to the pavilion;
- Maintaining restaurant and public toilets in the pavilion at park level;
- Providing new community program and educational room in the pavilion at park level;
- Providing an ample, publicly accessible roof terrace; and
- Adhering to best practice sustainable design.

Figure 2.2-7: Alternative 3 – Proposed Buried Floodwall for Wagner Park

Furthermore, a Design Activities Workshop was held on April 15, 2019, in response to the community's request for another opportunity to provide feedback on Wagner Park's desired programming, design use, and aesthetics. In addition to the April 15th workshop being held in person, BPCA and the Project Team also sent out a digital design activity online survey to capture more input from the community and for those that could not attend the workshop in person. The online survey gave the community additional time to provide feedback.

Battery Park City's Design Heritage Collaboration

Battery Park City has an extensive history of design excellence that extends into the fields of urban planning, urban design, landscape architecture, engineering, architecture, public art, and sustainability.

Given that Wagner Park was designed by masters within the fields of landscape architecture (Hanna/Olin), architecture (Machado & Silvetti) and public garden design (Lynden Miller), members of the Project Team met with Charles Birnbaum, President and CEO of the Cultural Landscape Foundation and Laurie Olin early in the project design process (December 10, 2018), to discuss the estimated coastal surge and flood risk levels of the Project Area, the BPC Master Plan of 1979, and the original design influences, intent and process that Olin and Machado utilized for creating Wagner Park.

In November 2019, the Project Team and Mr. Birnbaum met with BPCA to discuss the proposed conceptual design of Wagner Park. The Project Team provided Mr. Birnbaum with a presentation that covered a range of content including: the flood risk drivers for the design criteria; Battery Park City's (BPC) 1979 Master Plan; the conceptual design for Wagner Park; and how the Project Team planned to incorporate aspects from the original design intent; and why the existing historic fabric of Wagner Park could not be preserved. Mr. Birnbaum emphasized the importance of Wagner Park and its legacy and the desirability of retaining as many of its distinguishing characteristics as possible. As detailed herein, every effort has been made to comply with this request.

Incorporating Community Engagement and Design Heritage into the New Design of Wagner Park

Throughout the community and stakeholder engagement process, the feedback and input derived from the meetings, workshops and other interactions have significantly informed the design of Wagner Park, including the incorporation of expanded programming, universal access, and material aspects of the original design. Below is a list of site planning design elements and programming that the Project Team has incorporated from the original designer's intent and community input:

- Site planning (orientation of site to harbor, access and arrival connections with Lower Manhattan streets per Master Plan of 1979);
- Site features (central lawn gathering space, formal gardens, pair of allée axis arrival);
- Enhanced procession from street to park;
- Arrival sequencing through allées from Pier A Plaza and Museum of Jewish Heritage;
- Interdependent and integrated relationship between the new building and the park – to serve as backbone of the park;
- Scale of features (pavilion, allées, formal gardens, landscape transitions from tighter and tidy spaces to larger (less formal) looser and open landscape – as part of the original design intent);

- Park pavilion with public roof access and restaurant at park level;
- Arched and vaulted façade design;
- Pavilion to serve as arrival portal to the park;
- Pavilion framing Statue of Liberty and "the dream of freedom it represents" views (see **Figure 2.2-8**);
- Park provides panoramic views to harbor and Statue of Liberty;
- Access to the waterfront and esplanade;
- Retention of existing programming and use of the park;
- Americans with Disabilities Act (ADA) access and compliance (Universal Access); and,
- Retention of existing public art.

While the above list describes the aspects of the original design that have been retained, the following is a list of design elements for Wagner Park that were incorporated into the design and further developed in concert with community input:

Pavilion / Architecture:

- Smaller building footprint than existing pavilion (additional kitchen and BPCA Parks maintenance and programming support space is placed under (subterranean) the raised pavilion at street level);
- Full public access to roof terrace with green roof;
- New community room; and,
- High performance sustainable building design for new pavilion - Zero Carbon.

Landscape Architecture:

- Retained northern ornamental/formal gardens, but size increased;
- Retained central lawn gathering space and relationship with pavilion;
- Addition of terraced landscape to transition from esplanade elevation to raised central lawn area;
- Performance landscape terraces for capturing storm water and contributing to flood resilience;
- Extended the esplanade for a continuous waterfront pedestrian experience;
- Expanded waterfront access through transitional edge on southern edge of Wagner Park and Pier A inlet; and,
- Existing public art in Wagner Park would be sited in appropriate locations.

Figure 2.2-8: Alternative 3 – View to Harbor and Statue of Liberty from Proposed Pavilion

Evaluation

Although Alternative 3 requires elevating Wagner Park and constructing a new pavilion closer to Battery Place, it incorporates important aspects of the park's original design intent, and ensures its continued use as a valued and resilient public space into the future. In addition, the buried floodwall within the raised park would: function as a passive flood control system that does not depend upon manpower or mechanical systems for deployment (as do Alternatives 1 and Alternative 2 – *Flip-up Deployable Option*); and would maximize to the extent practicable, the protected open space that lies behind the flood alignment.

In comparison to Alternative 1, Alternative 3 provides more thorough and reliable risk reduction for a larger portion of Wagner Park (and for the Project Area as a whole). It also provides greater continuous access to open space resources than would be provided under Alternative 1 because of the likely need for protracted long-term park repairs after major storms. Furthermore, Alternative 3 is more cost-effective because it eliminates the cost of long-term park repairs and significantly minimizes operations and maintenance costs of the deployable measures compared to Alternative 1.

In comparison to Alternative 2 (*Fixed Floodwall and Flip-Up Deployable Options*), Alternative 3 preserves existing unobstructed views from Wagner Park to the Hudson River and Statue of Liberty (one of the most important design elements of the existing park), eliminates the need to reconstruct the existing bulkhead and relieving platform and eliminates a substantial level of impact to USACE/NYSDEC regulated waters and wetlands. In addition, compared to Alternative 2 (Flip-Up Deployable Option), Alternative 3 minimizes the use of deployables, in accordance with specific SBPCR Project objectives.

Alternative 3 was selected to be further analyzed as part of the Proposed Action in the DEIS.

Pavilion Alternatives

In light of the determination to elevate the Park, three alternatives were considered for replacing or maintaining the existing Pavilion that is located within the Park. The Project Team evaluated elevating the existing Pavilion in-place, elevating the existing Pavilion and locating it further inland towards Battery Place, and constructing a new Pavilion set back slightly closer to Battery Place. The following details the evaluation of each Pavilion alternative.

Alternative 1 - Elevated In-Place Pavilion

As requested by SHPO in a letter dated October 19, 2021, the Elevated In-Place alternative considered raising the existing Pavilion in its current location. In order to meet the 19.8-foot DFE above the project datum for the 100-year storm, the existing Pavilion would need to be raised by over 10 feet from its existing elevation. Raising the Pavilion in-place to meet the new elevation would markedly hamper the flexibility and usability of the Park's waterside lawn area, as access to the Pavilion would require much of this area to be composed of significantly sloped surfaces, rising from the waterfront Esplanade elevation to the new elevated structure. This would significantly decrease the flat area of the park and reduce its functionality and appeal. This outcome is inconsistent with the Project goal of protecting and preserving open space resources. Furthermore, many of the same factors referenced below in the description of the Elevated Inland Pavilion would also render the Elevated In-Place Pavilion infeasible.

The resulting determination was that elevating the Pavilion In-Place does not meet the Project's purpose and need or project objectives and is not prudent or feasible.

Alternative 2 - Elevated Inland Pavilion

The Project Team also evaluated the possibility of shifting the existing Pavilion further inland to accommodate the elevation of the Park. This option, if feasible, would have the dual benefits of both lessening the degree of slope required to connect the waterfront Esplanade to the Pavilion and maximizing the area of contiguous waterside lawn and garden space within the Park. However, moving the existing Pavilion presented a variety of risks related to engineering, safety, and cost as detailed in the January 18, 2022, letter responding to SHPO's aforementioned October 19, 2021, letter requesting further information and evaluation (included in **Appendix B**). Additionally, moving the existing structure towards Battery Place would require modifications to the Park design including the allées; the staircases would intrude onto the public sidewalk; and ADA and universal accessibility requirements would be compromised. As result of these risks and impacts to the Park, this option would not meet the Project's purpose and need and project objectives and is not prudent or feasible.

SHPO considered the preceding alternatives and inquired in a letter dated February 9, 2022 (see **Appendix B**) if the existing Pavilion could be retained. An analysis was performed by the Project Team, as well as third-party evaluations by three consulting/engineering firms (Watts Architects & Engineers, KPFF Engineers, and Nicholas Brothers, Inc.) to review of the feasibility of elevating and relocating the existing Pavilion. These materials can be found in **Appendix B**.

In order to meet the 19.8-foot DFE above the project datum for the 100-year storm, the existing grades of Wagner Park would be elevated to accommodate the buried floodwall infrastructure. In order to maintain an optimal volume of continuous green space along the waterfront, the relocation of the existing Pavilion in an elevated location would need to be shifted back towards Battery Place. By elevating the Pavilion and shifting it towards Battery Place, the relationship and shared narrative between Wagner Park and the Pavilion would be profoundly impaired. The analysis determined that:

- Moving the existing Pavilion would not meet the Proposed Action's goals and objectives;
- Raising and relocating the existing Pavilion would substantially impair the original architectural character of the building and the relationship of the structure with the surrounding park;
- The tree-lined allées and the Battery Place street-front would no longer align with the existing Pavilion, and portions of the structure would no longer be directly accessible;
- The cost of relocating, elevating and upgrading the existing Pavilion would be significant and would result in an end product that is obsolete and does not meet Wagner Park's programming needs;
- The existing Pavilion does not comply with the latest code requirements, including accessibility and seismic requirements; and
- The existing Pavilion does not meet sustainability goals and would prospectively incur higher energy and maintenance costs.

After review of the feasibility report and analysis summarized above, SHPO concurred that there were no prudent or feasible alternatives to the preferred alternative that would avoid or minimize harm to the existing Pavilion in Wagner Park, as reflected in a letter dated April 27, 2022 (see **Appendix B**).

<u>Alternative 3 - New Pavilion (Proposed Action)</u>

For this alternative, a new Pavilion was proposed. To accommodate the buried-floodwall, the existing Pavilion would be replaced with a new Pavilion in a manner that is sensitive to, and in overall harmony with, the elements of the 1995 Wagner Park design:

- Preserves views to the Statue of Liberty;
- Maintains views to the waterfront;
- Maintains a central gathering space; and
- Enhances procession from street to park level.

The location of the proposed Pavilion would be similar to the existing structure, but with a slightly smaller footprint and elevated approximately 11 to 12 feet above ground level, and set back closer to Battery Place, as shown in **Figure 1.3-8**. The Pavilion would have three levels: a ground, first and second level. The ground level would include programming and storage space for Parks and a restaurant kitchen. The first level (at the Park level) would include public programming space, public bathrooms, a new community/educational center, and a restaurant seating area. The second level (roof level) would store mechanical equipment, include public space and contain green roof features (plantings, solar panels etc.). This alternative maintained the central gathering space in the Park, preserved views of the Statue of Liberty and waterfront and allowed for universal accessibility. Furthermore, it eliminated the risks related to engineering, safety and costs associated with elevating the existing pavilion, whether in-place or inland. As a result was selected to be further analyzed as part of the Proposed Action.

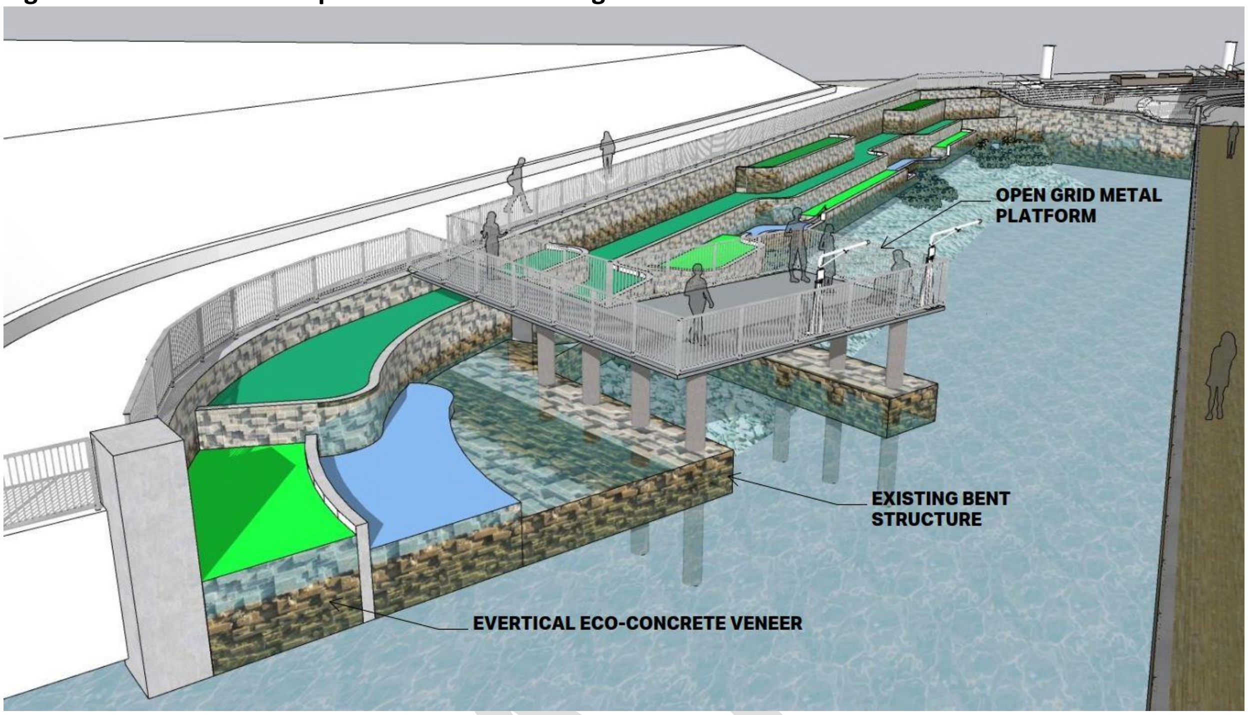
Pier A Inlet

The original design for the Pier A inlet consisted of a large, cantilevered metal platform over the water. A ramp down and a lower observation platform would bring users closer to the water while incorporating bench seating on the bulkhead. This initial design, as shown in **Figure 2.2-9** was presented to the NYSDEC for their initial comments on April 30, 2020. NYSDEC's primary comment was a request for BPCA to revisit the design and downsize the platform.

Figure 2.2-9: Original Pier A Inlet Design

As a result, the design team downsized the metal platform focusing on a smaller area where fill from the relieving platform could be removed and replaced with a metal grate so as to daylight the shoreline below the existing structure (see **Figure 2.2-10**). Along the current rip-rap slope, the design team proposed a series of terraces to be activated by flood surges and tidal action throughout the life of the project. Three distinct levels were proposed consisting of: tidal pools and habitat shelves made from an eco-enhanced concrete; a grass planting bed 5 feet above the water line and designed around flood inundation; and a shrub and tree planting bed adjacent to the new esplanade to provide shade and frame views of the area and adjacent sites.

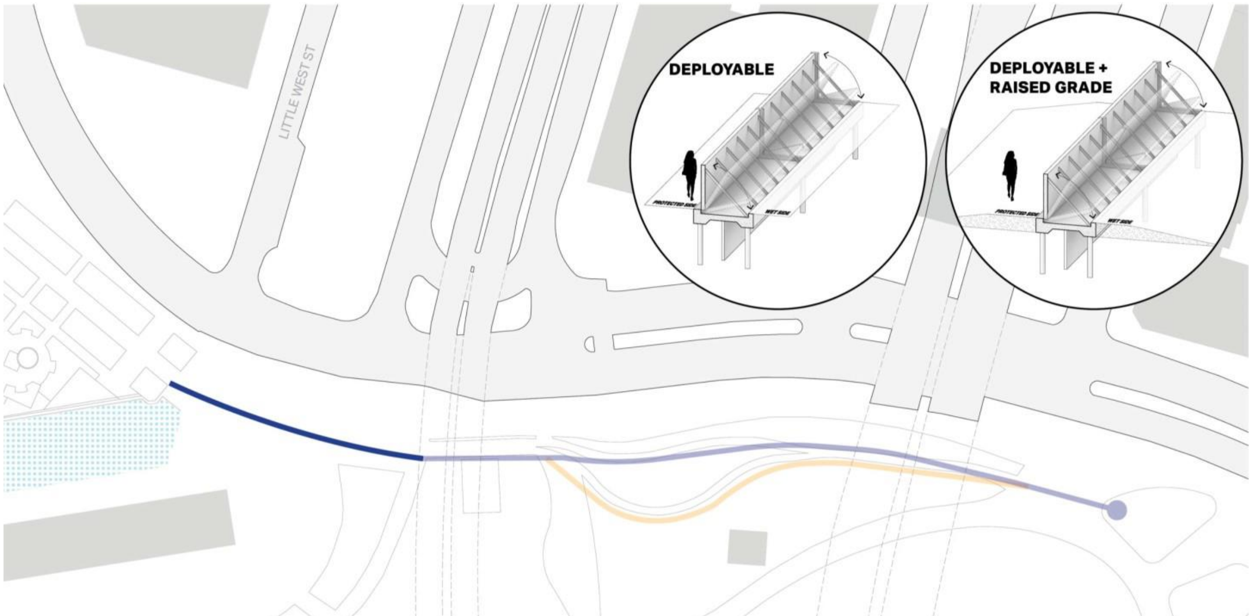
Figure 2.2-10: Current Proposed Pier A Inlet Design



2.2.2.4 Pier A Plaza

Pier A Plaza is under the jurisdiction of the BPCA, NYC Department of NYCSBS, and NYCEDC. This segment connects with Wagner Park to the northwest and extends through Pier A Plaza ending at The Battery. Pier A Plaza is at the lowest elevation in the Project Area. The alternatives for this segment were developed to meet the purpose and need and project objectives but also were evaluated on specific criteria to this area: maximizing flood protection due to the low elevation and avoiding impacts to the subsurface infrastructure including the 84-inch CSO. Two alternatives were evaluated for the Pier A Plaza: a Deployable Alternative and a Deployable plus Raised Grade Alternative, as shown in **Figure 2.2-11**.

Figure 2.2-11: Pier A Alternatives



Pier A Plaza – Alternative 1 (Deployable)

As mentioned previously, the existing grade of the Plaza is the lowest through the entire Project Area and therefore would require the tallest HOI. Alternative 1 would not disturb the existing condition including the elevation and would preserve the existing design and aesthetic of the Plaza. The alignment would run along the upper Plaza closer to Battery Place and consist of flip-up deployables at the existing elevation, as shown in **Figure 2.2-11**. The flip-up deployables would be approximately 12.5 feet high and seal up against permanent columns that would be spaced approximately 60 feet apart as shown in **Figure 2.2-12**.

For the segment connecting Wagner Park and Pier A Plaza, two flood system technology options were evaluated: a horizontal sliding deployable gate and a free-standing floodwall.

- Horizontal sliding deployable gates – This technology consists of steel gates on wheels that could be stored behind a wall during non-storm conditions and then slid into place to provide a continuous barrier. This would require walls or columns on either side of the opening for the gate to seal against.
- Free-standing floodwall - A free-standing flood wall would consist of a solid wall that would serve as a barrier to storm surge and flooding.

The horizontal sliding deployable gates would be a relatively high risk option, because it relies on deployables, which are subject to mechanical and human error. A freestanding exposed floodwall reduces the risk associated with mechanical and human error and maintenance costs. As one of the primary project objectives includes minimizing reliance on passive flood protection measures to reduce the risk associated with mechanical and human error, a free-standing floodwall was selected for this segment of the alignment.

Evaluation

This alignment overall had several challenges that rendered this alternative economically and technically infeasible. Due to the low elevation of this segment, the flip-up deployables would need to be deployed on a more frequent basis to prevent flooding from smaller more frequent storms than the 100-year design storm. Because this alternative maintains the existing grade, it does not address nuisance flooding that occurs during tidal events. By maintaining the existing grade, the flip-up deployables would need to be approximately 12.5 feet high to achieve the DFE. This alternative was significantly taller than Alternative 2 and lacked community support. For these reasons, this alternative has been eliminated from consideration.

Pier A Plaza – Alternative 2 (Deployable plus Raised Grade)

Alternative 2 is similar to Alternative 1 in terms of location of the alignment and the flood technologies considered. Alternative 2 includes an exposed floodwall for the short segment connecting to Wagner Park, as shown in **Figure 2.2-12**. It also includes flip-up deployables that seal up against permanent columns. However, this alternative varies from Alternative 1 by raising the grade of the northern portion of the Plaza by approximately four feet placing the flip-up deployables on top of a raised platform. The inset graphic in **Figure 2.2-11** provides an illustration of this concept. This alternative results in a two-level design that provides seating, bicycle and pedestrian connectivity to The Battery and universal access, while providing an additional dimension of flood protection. The creation of an elevated portion of the Plaza (the “Upper Plaza”) 4 feet above the existing Plaza elevation allows the design to address frequent tidal flooding also referred to as nuisance flooding. Additionally, the two-level Plaza design allows The Battery Coastal Resilience Project to tie into the southeastern portion of the Plaza. The nuisance flooding alignment is shown in **Figure 2.2-13**.

Evaluation

Raising the elevation of the Plaza reduces the HOI of the flip-up deployables, results in a shorter flip-up deployable compared to Alternative 1, and decreases the frequency that the gates would need to be deployed for smaller storms. Alternative 2 redesigns the Plaza to provide access for various stakeholders to Pier A, Battery Park and Wagner Park. This alternative also addresses nuisance flooding. For these reasons, Alternative 2 was selected to be further analyzed as part of the Proposed Action in the DEIS.

Figure 2.2-12: Pier A Plaza Proposed Exposed Floodwall

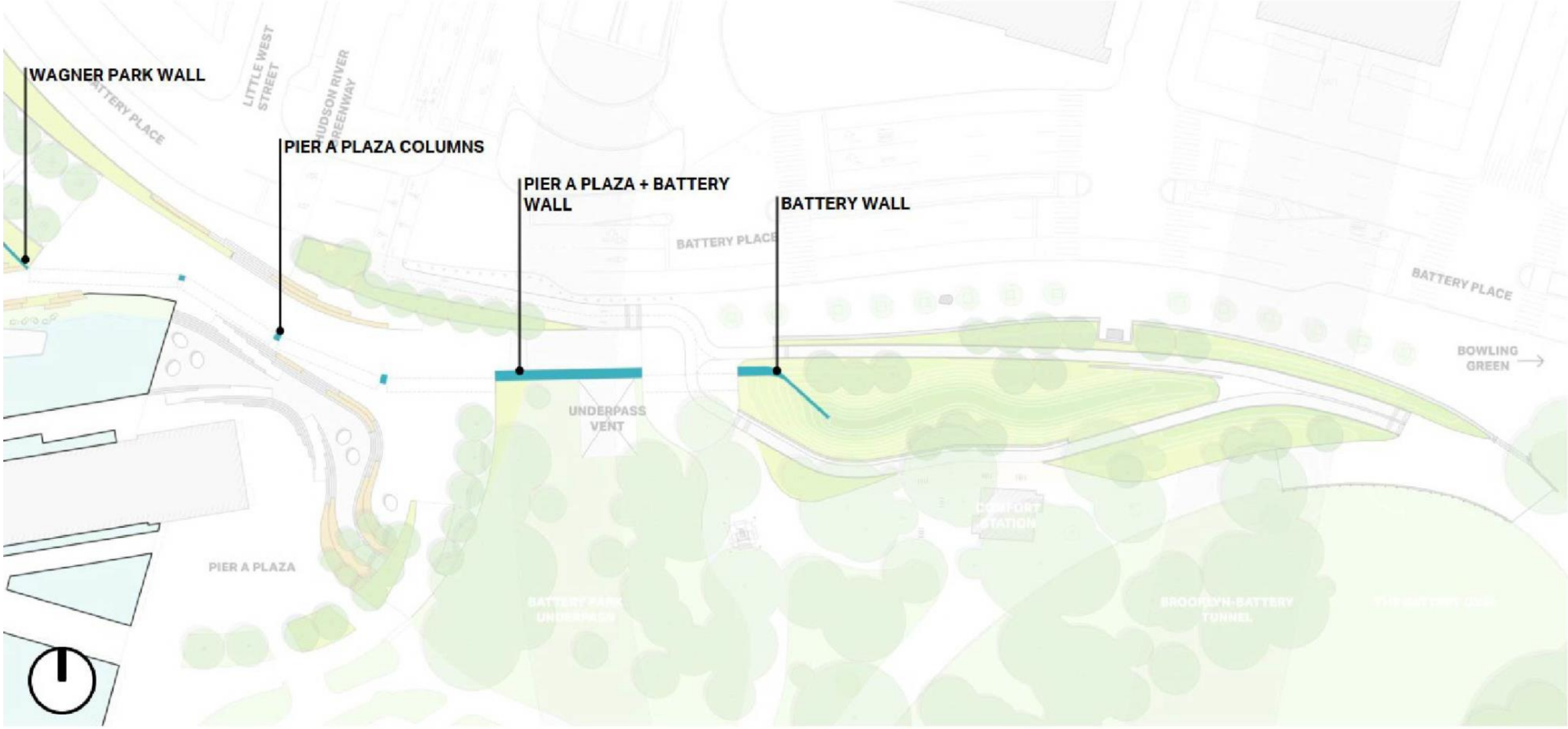
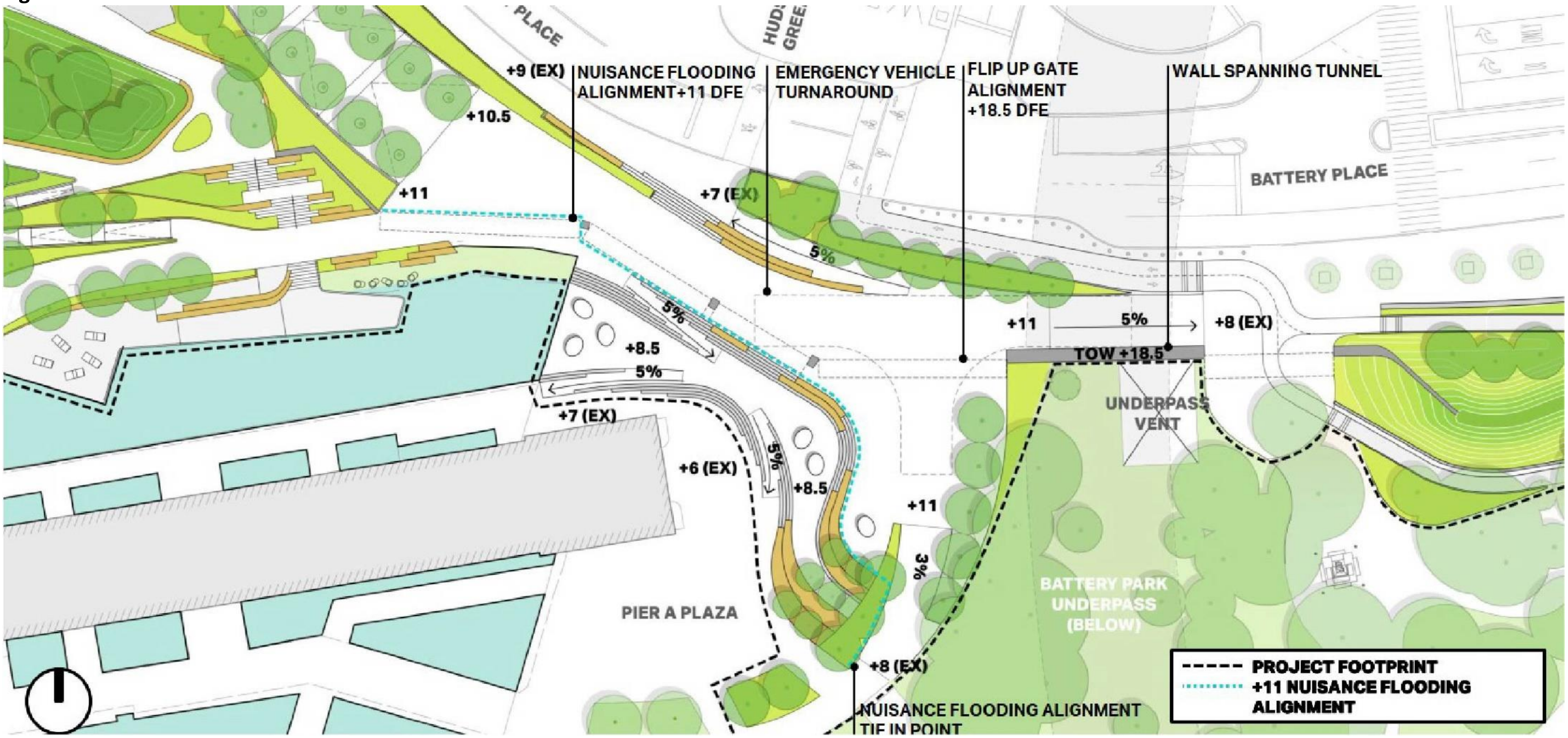


Figure 2.2-13: Pier A Plaza Alternative 2



2.2.2.5 The Battery

The Battery is owned by the City of New York and under the jurisdiction of NYC Parks. The subsurface conditions in The Battery include the Battery Park Underpass of the FDR Drive, Brooklyn-Battery Tunnel, MTA Subway lines for the 1 Train, the Bowling Green Subway Station for the 4 and the 5 Trains, as well as other utilities. Three alternatives were evaluated for this segment as shown in **Figure 2.2-14**.

The alternatives were developed to meet the purpose and need and project objectives but also were evaluated on criteria specific to this area: minimizing reliance on deployables in favor of passive flood protection; minimizing disturbance to public safety and views into the park; minimizing disturbance to existing landscape, historic quality, and pedestrian circulation, and avoiding the subsurface infrastructure.

The Battery – Alternative 1

Alternative 1 considered a floodwall alignment within The Battery, located at the northern edge of the park area, parallel to Battery Place. This option evaluated using a combination of raised grade with flip-up deployables and floodwalls on top. The raised grade was intended to function to integrate areas of vegetation, access and seating.

Evaluation

This alternative had several challenges that rendered it infeasible. Locating the flood alignment and bikeway closer to Battery Place would provide limited ROW space, making universal accessibility challenging. Vegetation would need to be offset from the flood wall, requiring the existing street trees along Battery Place to be removed. Further, to fully conceal the park side of the wall, regrading of the site would be required, which would impact the existing bikeway. This alternative would not minimize reliance on deployables and it was determined not feasible. For these reasons, this alternative has been eliminated from further consideration.

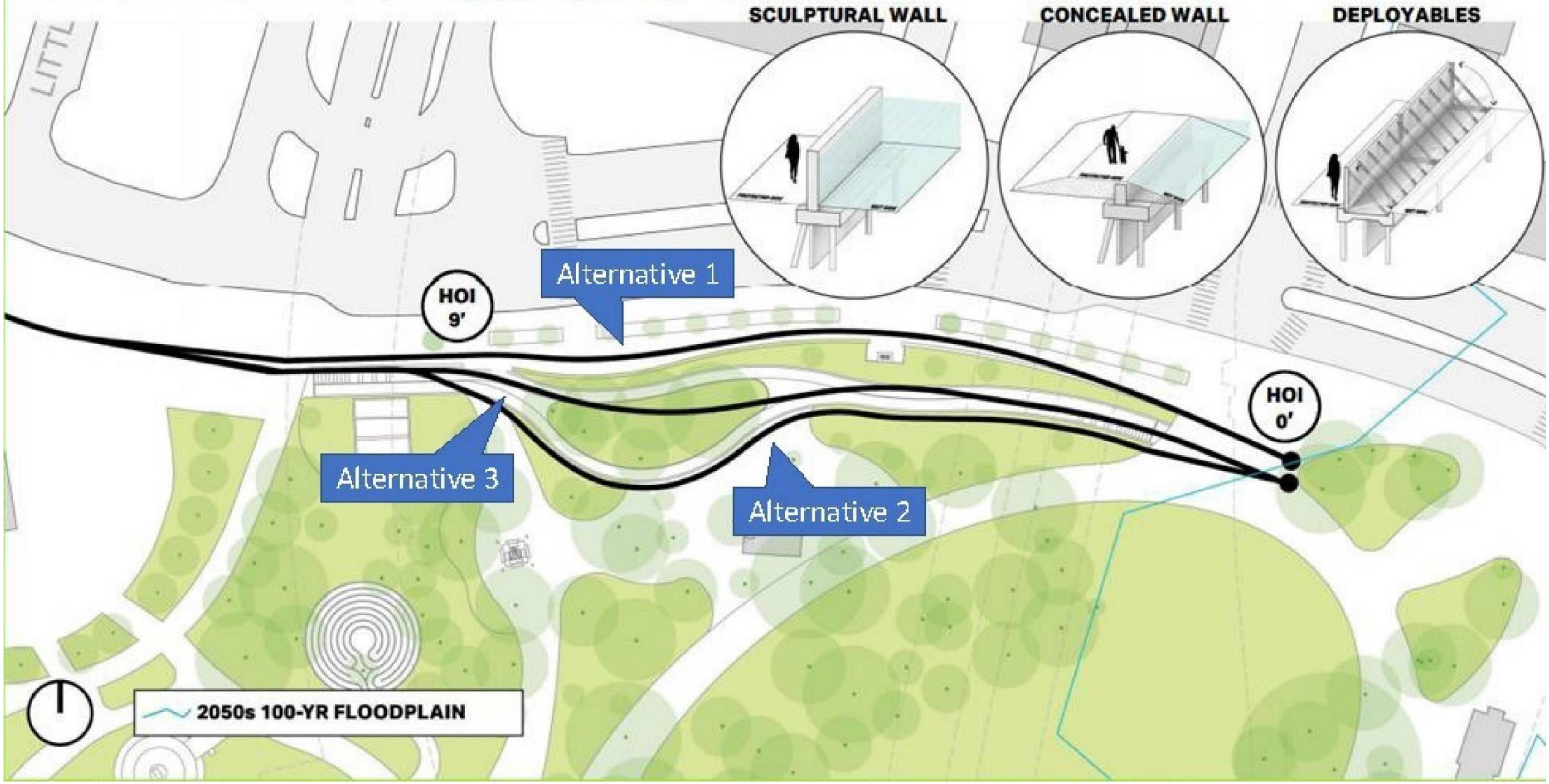
The Battery – Alternative 2

Alternative 2 considered a flood wall alignment within The Battery that runs through the park area parallel to the southern bikeway. This was imagined as a freestanding sculptural wall that would weave through the site, to minimize impact to the existing park landscape and trees. This alignment requires minimal reconfiguration of the western end of the existing bikeway.

Evaluation

Alternative 2 had several design challenges that rendered this alternative infeasible. The location of the flood alignment for Alternative 2 would conflict with subsurface infrastructure on the western end of this alignment, including the combined sewer interceptor and the existing separated stormwater sewer. Additionally, the floodwall would separate the existing bikeway from The Battery, counter to how it currently functions. This alternative would cut off views into the park due to the vertical wall and reduce pedestrian and cyclist safety. For these reasons, this alternative has been eliminated from consideration.

Figure 2.2-14: The Battery Alternatives



The Battery – Alternative 3

Alternative 3 considered placement of the flood alignment between the alignments for Alternatives 1 and 2. The flood alignment is comprised of a combination of flip-up deployables, exposed floodwall, and buried floodwall beneath a landscaped berm. This concept reconfigures the existing bikeway. 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. As a result of these conditions, 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. As the alignment moves further east the flood technologies include a flip-up deployable, a partially exposed wall, and a buried floodwall beneath a landscaped berm, as shown in **Figure 2.2-15**.

Evaluation

Alternative 3 was selected as the most feasible alternative for The Battery. Alternative 3 avoids impacts to the storm water drainage system and removes ROW constraints that would result under Alternative 1. Alternative 3 would also avoid the subsurface conditions on the western end of Alternative 2, as well as eliminate the separation of the bikeway from The Battery that would occur under Alternative 2. Alternative 3 minimizes reliance on deployables in favor of passive flood protection; minimizes disturbance to public safety and views into the park; minimizes disturbance to existing landscape, and maintains the historic quality and the pedestrian and bicycle circulation in this segment. For these reasons, Alternative 3 was selected to be further analyzed as part of the Proposed Action in the DEIS.

Once the alignment was determined, three flood system technologies were evaluated to avoid impacts to the existing Battery Park Underpass tunnels:

- Free-standing floodwall - See definition in Section 2.2.2.4 (Pier A Plaza – Alternative 1).
- Flip-up deployables on a raised concrete sill – Flip-up deployables would lay flat against the ground during non-storm conditions. The deployables would require permanent columns that would be spaced in-between each deployable segment. During a storm event, the deployables would be deployed to create a continuous wall. The gates would be placed on a raised sill, similar to a raised platform to provide further protection from flooding.
- Horizontal sliding deployable gates – See definition in Section 2.2.2.4 (Pier A Plaza – Alternative 1).

The flip-up deployables require deep piles as shown in **Figure 2.2-16**, which could impact the subsurface infrastructure of the Battery Park Underpass. The span across the underpass was too long for a single horizontal sliding gate and would have required a post in between. Additional analysis was needed to determine if the post could be structurally supported with the tunnel. Futhermore, the sliding gate required too much space for storage of the gates. For these reasons, the sliding horizontal gate was eliminated from further consideration. An exposed flood wall utilizes a shallow foundation while still providing the necessary support for the HOI. As a result, only an exposed floodwall was considered for this segment.

Figure 2.2-15: The Battery – Alternative 3 Proposed Alignment

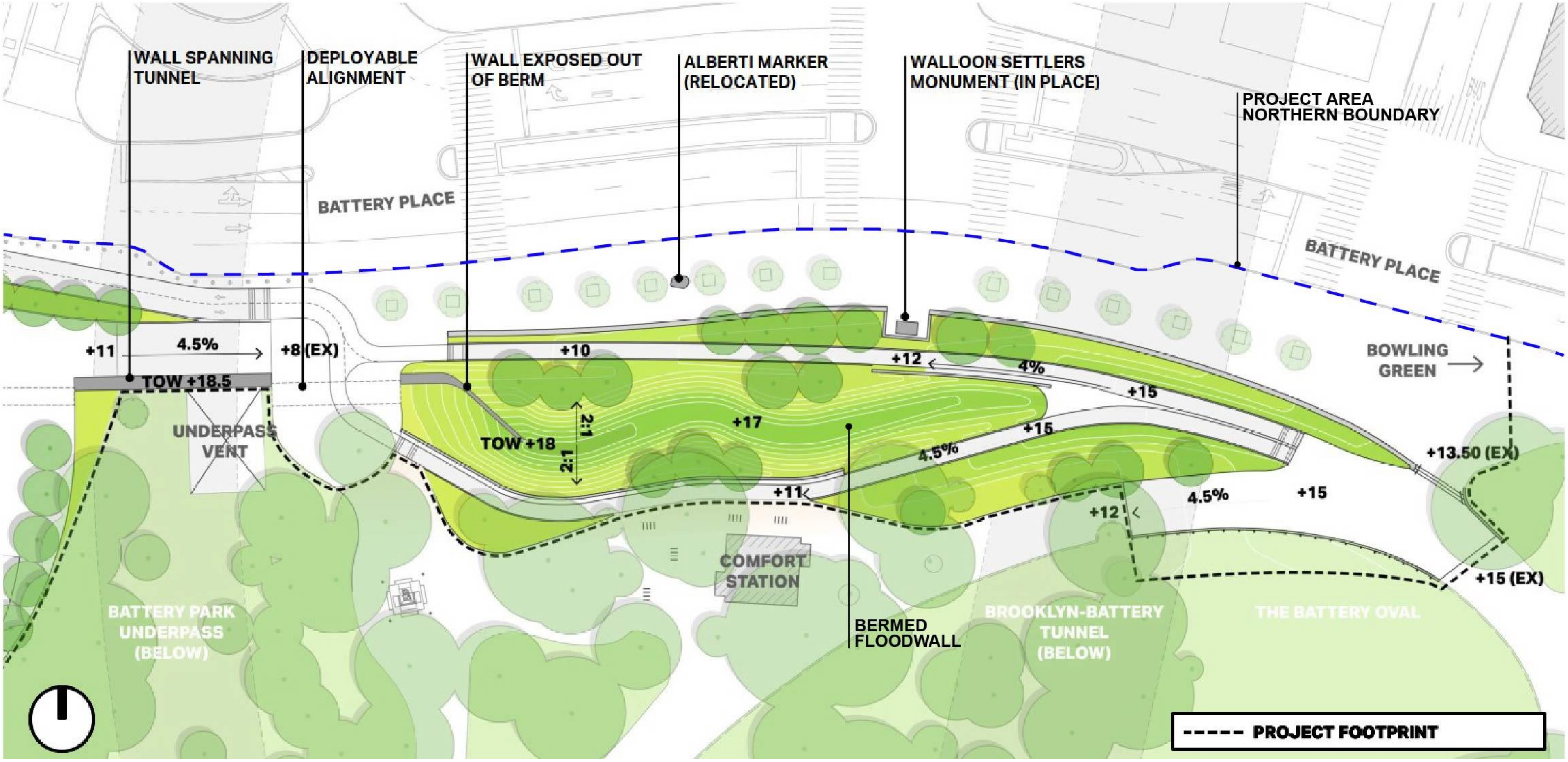
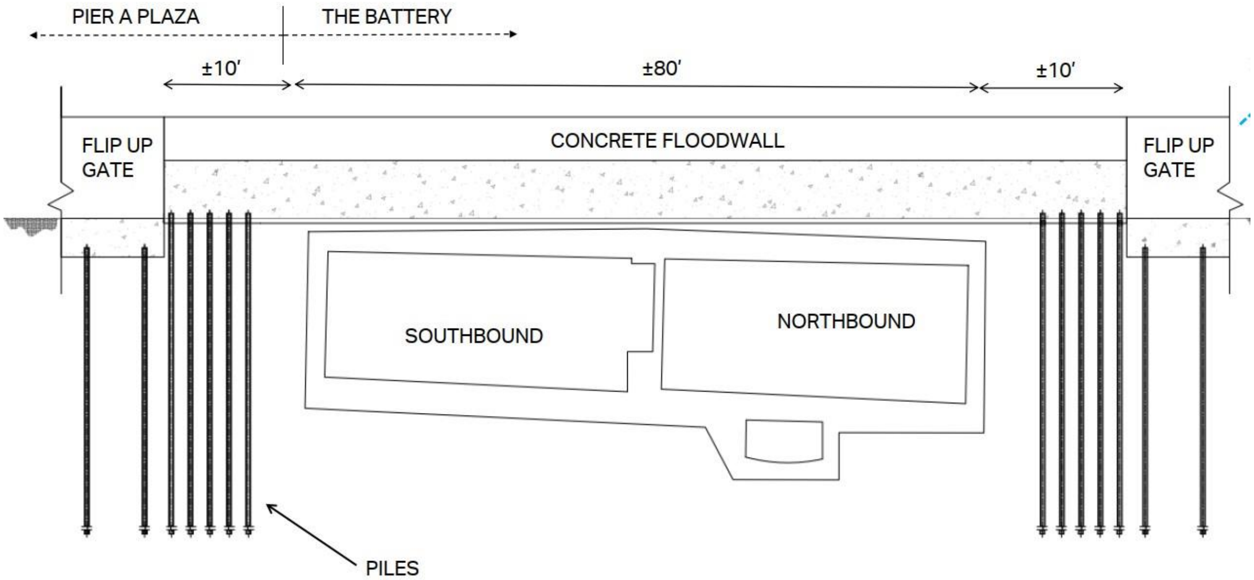


Figure 2.2-16: Exposed Floodwall Foundation over the Battery Park Underpass



2.2.2.6 Interior Drainage Improvements

As described in Section 1.3.6 (Interior Drainage Improvements), interior drainage improvements are required to prevent storm surge from entering the Study Area. Two alternatives were considered to manage storm surge through the interior drainage systems.

Interior Drainage – Alternative 1 (Interceptor Gate Chambers and Buildings)

For Alternative 1, two isolation gates (IGs) in conjunction with the flood alignment were considered. Each IG would require construction of an underground chamber along the existing combined sewer interceptor, and an above-ground building to house mechanical equipment that controls operation of the underground interceptor gate. The underground chambers would be approximately 27 feet deep and have approximate dimensions of 24 feet long by 22 feet wide. The above-ground buildings would be located within 200 feet of the underground chambers, and would be approximately 11 feet high, 12 feet wide, and 60 feet long. Pedestrian access would be maintained around the buildings.

<u>Evaluation</u>

After consultation with NYCDEP, it was determined that the interceptor IG and control building approach was not suitable for NYCDEP's short and long term operations and maintenance strategies. For this reason, this alternative has been eliminated from further consideration.

Interior Drainage – Alternative 2 (Near Surface Isolation System)

Alternative 2 considered a NSI system to prevent storm surge from entering the Study Area. The NSI system would consist of the installation of a gate within the existing regulator structures, M9, M8, and M7 located along West Street between 1st Place and Albany Street, which would be closed in a flood event to prevent the storm surge from rising through the interceptor line and reaching street level. The regulator chambers access points at street level would be retrofitted with pressure tight covers. A sanitary overflow chamber on West Thames Street would be subject to the same access point pressure proofing. Additionally, four interceptor manholes 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.

Evaluation

After consultation with NYCDEP, this alternative was determined to satisfy NYCDEP's short and long-term O&M strategies and that it provided the necessary protection from storm surge. For this reason, Alternative 2 was selected to be further analyzed as part of the Proposed Action in the DEIS.

Additional Drainage Improvements

As mentioned in Section 1.3.6 (Interior Drainage Improvements), tidegates would be installed at two existing separate municipal storm sewer overflows, one at 1st Place and the second at Rector Street. The third tidegate would be installed on the CSO line at Pier A Plaza. Additionally, two isolation valves would be installed in The Battery. The existing sewer infrastructure crossing underneath the SBPCR Study Area would have to be isolated to preclude the coastal surge from entering the Study Area. No alternatives were considered for these improvements.

3 Affected Environment, Impacts and Mitigation

Chapter 3 of this DEIS will document the affected environment and environmental impacts for future conditions with and without the Proposed Action for the following technical resources: land use, zoning and public policy, socioeconomic conditions, community facilities, open space, shadows, historic and cultural resources, urban design and visual resources, neighborhood character, natural resources, hazardous materials, water and sewer, solid waste and sanitation services, energy transportation, air quality, GHG emissions, noise and vibration, public health and construction. Both the operational and construction impacts will be evaluated for each technical resource.

Based on screening analyses set forth in the *CEQR Technical Manual*, detailed analyses of socioeconomic conditions, community facilities and services, solid waste and sanitation services, and public health are not required, as set forth below.

Socioeconomic Conditions

The *CEQR Technical Manual* identifies six circumstances in which a socioeconomic assessment is warranted:

- Displacement of residential population
- Displacement of more than 100 employees
- Business displacements
- New development that is markedly different from existing land uses
- New or improved retail development
- Effects on a specific industry

As the Proposed Action results in no residential, employee or business displacements, includes no retail development, does not create land uses markedly different from existing conditions and does not affect a specific industry, no further socioeconomic assessment is required.

Community Facilities and Services

The Proposed Action would not physically impact or displace any community resources, nor result in any increases in resident population. It would not have any impact on public schools, healthcare facilities, publicly funded group early childhood programs, libraries or local police and fire facilities. Accordingly, no detailed assessment of community facilities is required.

Solid Waste and Sanitation Services

According to the *CEQR Technical Manual*, a detailed analysis should be conducted if the project:

- Exceeds 50 tons per week or more of solid waste generation,
- Involves the construction, operation, or closing of any type of regulated solid waste management facility, New York City Department of Sanitation (DSNY) district garage, or borough repair shop, or
- Involves a change to the public or private waste collection.

As operation of the Proposed Action does not meet any of these criteria, no further assessment is required.

Public Health

According to the *CEQR Technical Manual*, assessment of public health impacts would be required if there are significant unmitigated adverse impacts associated with the Proposed Action. The operation of the SBPCR Project would not have any unmitigated air quality, noise, hazardous materials or natural resource impacts, therefore, no further assessment is required.

3.1 Land Use, Zoning, and Public Policy

This section describes existing land uses within the Study Area and identifies zoning requirements and other public policies which are applicable to the Proposed Action. It also assesses the potential impact of the Proposed Action on Study Area land uses, as well as the Proposed Action's compliance with the City zoning regulations and public policies.

3.1.1 Introduction

The analysis that follows was undertaken in accordance with the requirements of the New York State's SEQR Act (as outlined in the *SEQR Handbook*, 4th Edition 2020), as well as the *CEQR Technical Manual.*

The *CEQR Technical Manual* describes procedures for the analysis of land use, zoning and public policy to ascertain the impacts of a project on the surrounding area. As recommended by the *CEQR Technical Manual,* a 400-foot Study Area from the physical limits of the project is used for the analysis that follows. The analysis describes land uses, zoning regulations, and applicable policies within the Study Area, and then assesses potential land use impacts and compliance with zoning regulations and policies.

3.1.1.1 Land Use

Land use refers to the activity that is occurring on land and within the structures that occupy it. Types of uses include residential, retail, commercial, industrial, vacant land, and parks. According to the *CEQR Technical Manual,* the appropriate study area for land use and zoning is related to the type and size of a proposed project, the location and context of the area that could be affected by the project, and other factors, such as natural and man-made geographic boundaries.

Land use in the Study Area was determined through a review of NYCDCP *Primary Land Use Tax Lot Output* (PLUTO) data (20v7).

3.1.1.2 Zoning

The New York City Zoning Resolution (ZR) dictates the use, density and bulk of developments within the City. The ZR is divided into two parts: zoning text and zoning maps. The zoning text establishes the zoning districts within New York City and dictates the zoning regulations governing land uses and developments, while zoning maps show the boundaries of the City's zoning districts.

New York City has three basic zoning district classifications: residential (R), commercial (C) and manufacturing (M) districts. Residential zoning districts are divided into standard and context districts. Contextual residential districts are categorized by low-, medium- and high-density. Certain areas of the

City are also established as "Special Mixed-Use Districts", which allow mixed residential, commercial and/or manufacturing uses within those mapped districts. The maximum bulk permitted for developments within any zoning district is mainly governed by the district's maximum floor area ratio (FAR) and minimum required open space.

Zoning designations in the Study Area were determined through a review of NYCDCP Zoning Map 12b (effective date March 20, 2013) and through a review of the City's online Zoning Resolution (as updated through January 6, 2021).

3.1.1.3 Public Policy

Various public policies can affect the allowable land uses on a project site. Officially adopted and promulgated public policies also describe the intended use applicable to an area or particular sites in the City. These include Urban Renewal Plans (URPs), 197a Plans, Industrial Business Zones (IBZs), the Criteria for the Location of City Facilities (Fair Share criteria), Solid Waste Management Plan (SWMP), Business Improvement Districts (BIDs), and the New York City Landmarks Law. Two other citywide policies, the Waterfront Revitalization Program (WRP) and *OneNYC* (related to sustainability), are also discussed. Some public policies have regulatory status, while others describe general goals that can help define the existing and future context of the land use and zoning of an area. Policies may also change over time to reflect the evolving needs of the City, as determined by appointed and elected officials and the public.

3.1.2 Affected Environment

The Project Area includes the flood alignment and interior drainage improvements as described in Section 1.3 (Project Description). The flood alignment includes five segments moving from west to east: 1st Place, Museum of Jewish Heritage, Wagner Park, Pier A Plaza and The Battery. These segments are generally bound by Battery Place to the north, the Hudson River to the south, 1st Place to the west, and State Street to the east. Interior drainage improvements associated with the flood alignment are located in the vicinity of the flood alignment segments and also along West Street, Rector Street, and West Thames Street. The Study Area is generally bound by Albany Street and Rector Street to the north, Greenwich Street and Whitehall Street to the east, the U.S. Pierhead Line to the west and a point approximately even with Castle Clinton in The Battery to the south (see **Figure 3.1-1**).

3.1.2.1 Land Use

Development in the Study Area is a combination of residential, commercial, community facility and recreational uses. The waterfront neighborhood consists largely of residential and residential/commercial mixed-use buildings. Community facilities include Battery Park City School, the Museum of Jewish Heritage, the Skyscraper Museum and PS 94 in the northeast quadrant of the intersection of Battery Place and 1st Place.

The Study Area includes diverse land use categories. The major land use types near the Museum of Jewish Heritage and Wagner Park are residential, mixed-use, and community facility use. For institutional use, besides the Museum of Jewish Heritage, the PS/IS 276 Battery Park City School is located at the northeast corner of 1st Place and Battery Place. New York DMV, Manhattan South Traffic Court, New York Film Academy, and other agencies and schools are also located in the vicinity of

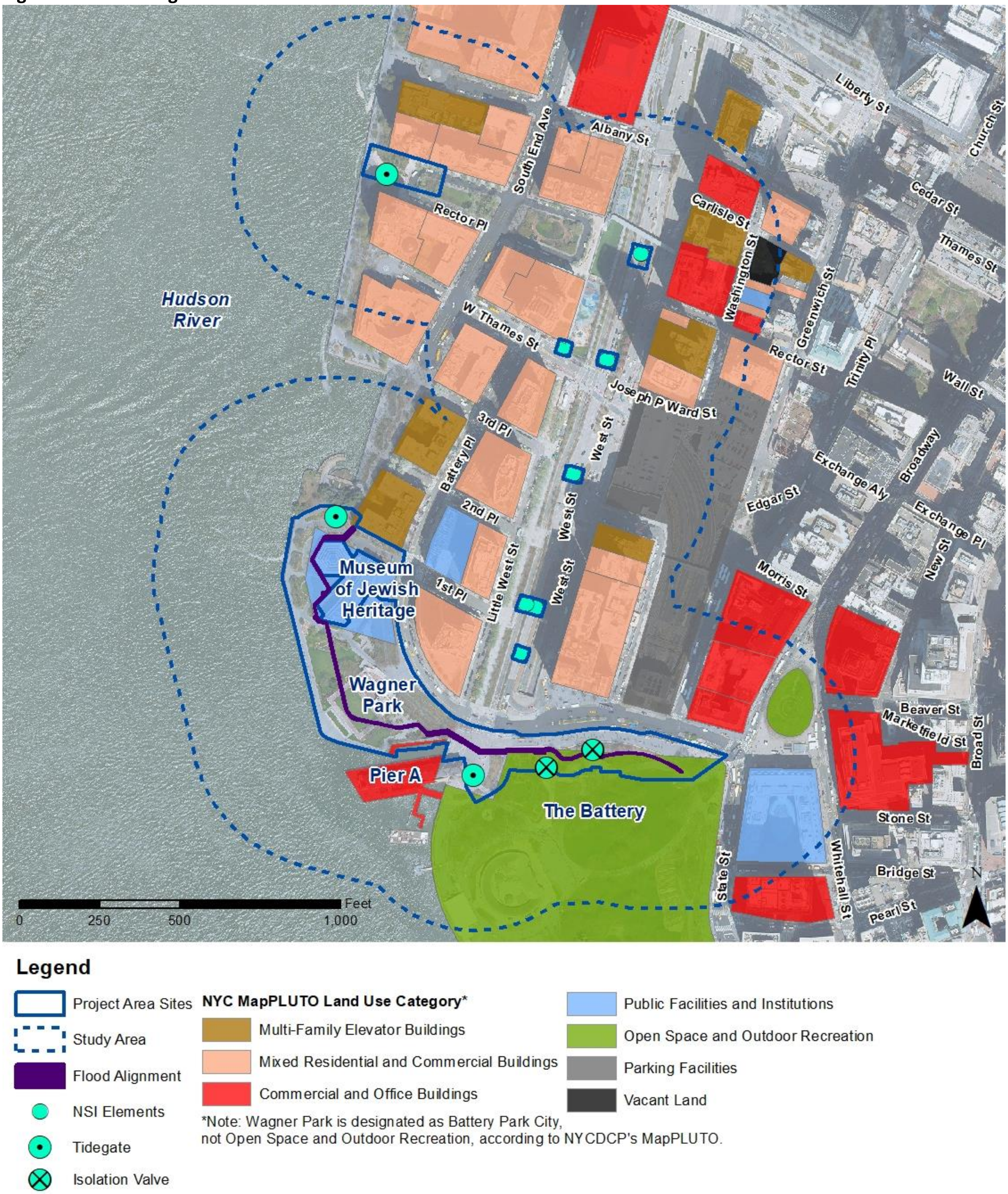
Washington Street and Broadway. In the eastern portion of the Study Area, east of Battery Place, there are other institutional uses, including the Skyscraper Museum and PS/IS 276 – Battery Park City School.

Commercial businesses are scattered throughout the Study Area but concentrated along Battery Place at the north side of the Study Area, along Little West Street, Greenwich Street, and Broadway. Businesses include a hotel, The Wagner at The Battery, at Little West Street and 1st Place, corporate offices at the Millenium Tower Residences building at Little West Street and 2nd Place, Number One Broadway office and Citi Bank along Broadway. There are also restaurants both in the existing Wagner Park pavilion and Pier A.

Open spaces are generally located in the southern side of the Project Area. The Battery and The Battery Urban Farm, including Castle Clinton National Monument and East Coast Memorial, are in the eastern and southern portions of the Study Area. The areas of roadways and parks, including Wagner Park, within Battery Park City on the western side of the Study Area have not been given a land use category in NYC *PLUTO*, so these areas are not depicted with land uses in **Figure 3.1-1**. Wagner Park is under the jurisdiction of the BPCA, and its effective use is as parkland.

The Project Area around the interior drainage improvements along West Street, Rector Place, and West Thames Street is not located within an existing private tax lot. This area consists of mixed-use development with high-rise luxury rental or condominium residential and commercial activities, along 1st Place, 2nd Place, 3rd Place, West Thames Street, and Rector Place.

Figure 3.1-1: Existing Land Uses



Source:
NYCDCP, NYC MapPLUTO Release 21v4

South Battery Park City Resiliency Project

3.1.2.2 Zoning

Zoning in the Study Area is discussed below and depicted in **Figure 3.1-2**. The Study Area to the west of West Street between Albany Street and Pier A is located within the Special Battery Park City District, which regulates permitted uses and bulk within three specified areas of the district and establishes special design controls with respect to front building walls, building heights, waterfront design and parking. The immediate area around Pier A and Pier A Plaza is located within a C6-4 district, which extends northward between West Street and Little West Street and terminates at Hubert Street north of the Study Area. The Study Area north of Morris Street and east of West Street is located in a C6-9 district, which is bound by Morris Street to the south, West street to the west, Liberty Street to north, and Greenwich Street to the east. C6 districts are commercial zoning districts that allow for a wide range of high-bulk commercial uses requiring a central location. Permitted uses spanning residential, community facility, and retail and commercial, are allowed (Use Groups 1 through 12).[2] C6 districts generally permit large hotels, corporate headquarters, retail uses and entertainment facilities, in high-rise, mixed-use buildings. C6-4 districts permit a FAR of up to 10.0 for commercial (a one plaza floor area to six building floor area bonus for public plazas and a one arcade floor area to three building floor area for arcades), residential (a 20 percent FAR bonus for inclusionary housing) and community facility uses alike. C6-9 districts permit a FAR up to 15.0 for commercial and community facility uses and 10.0 for residential uses. Commercial and community facility uses can receive a floor area bonus of with ratios of one plaza floor area to ten building floor area for public plazas and one arcade floor area to three building floor area for arcades. Residential uses in C6-9 districts can receive a 20 percent FAR bonus for inclusionary housing. As C6 districts are usually well-served by mass transit, off-street parking is generally not required.

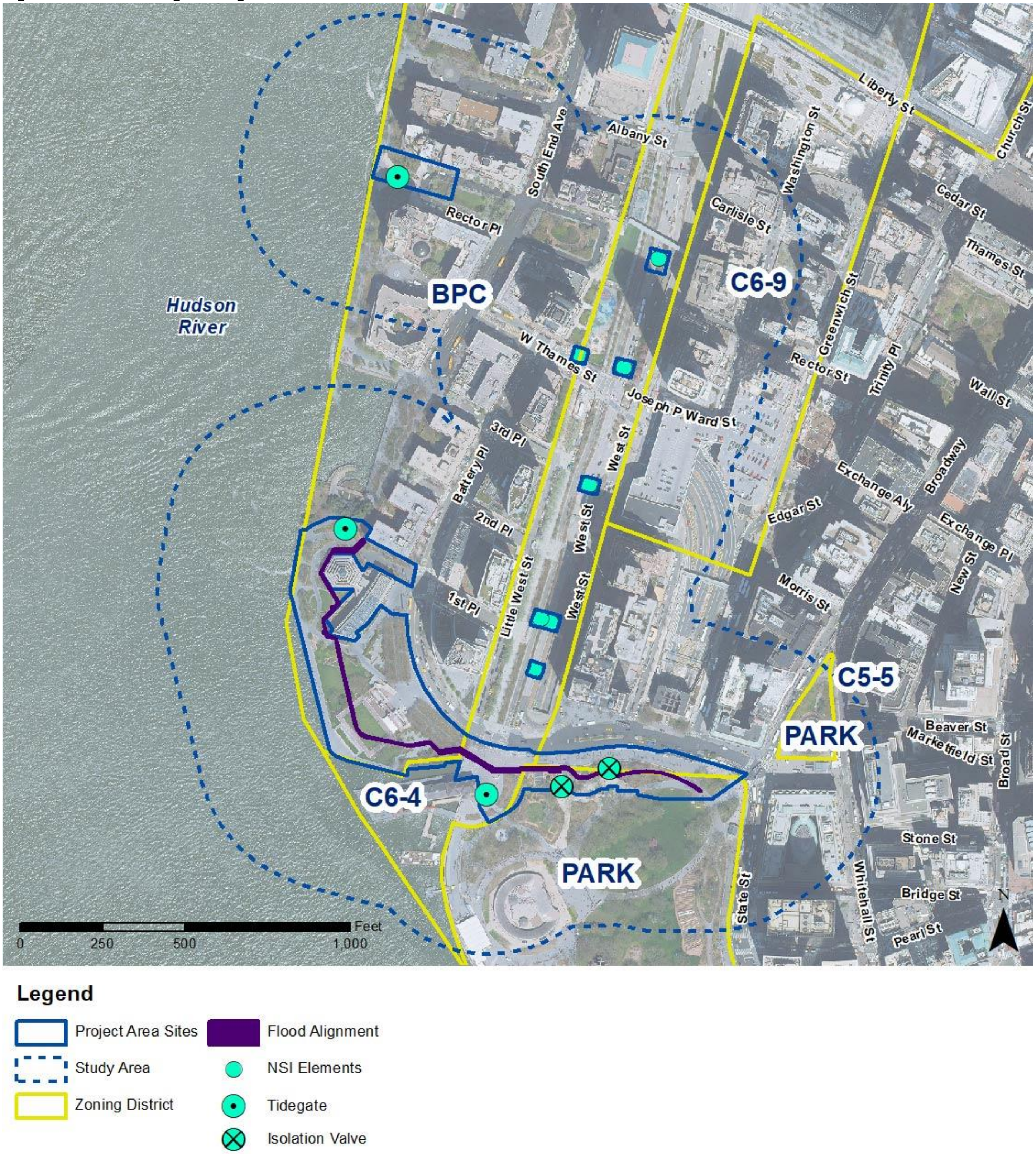
The Special Battery Park City District within the Study Area includes Wagner Park and the Museum of Jewish Heritage. Wagner Park is a publicly-accessible parkland with sloping lawns, the Battery Park City Esplanade, the Wagner Park pavilion, and pedestrian pathways. Wagner Park extends from the south of the Museum of Jewish Heritage to Pier A Plaza, and pedestrian pathways create a seamless connection throughout this area.

Located immediately east of Pier A Plaza is The Battery, which, as parkland, is not mapped within a zoning district. The area north and east of The Battery to Morris Street except for Bowling Green, which is parkland, is located in a C5-5 district. C5 is a central commercial district with continuous retail frontage intended for offices and retail establishments that serve the entire metropolitan region. Department stores, large office buildings, and mixed buildings with residential space above office or commercial floors, are typical C5 uses. Use Groups 5 (hotels), 6, 9 and 10 (retail shops and business services) and 11 (custom manufacturing) are permitted in C5 districts. C5-5 districts permit a FAR of up 15.0 for commercial and community facility uses (a 20 percent FAR bonus option for public plazas), and up to 10.0 for residential. As C5 districts are usually well-served by mass transit, off-street parking is generally not required for commercial uses.

[2] NYC DCP, https://www1.nyc.gov/site/planning/zoning/districts-tools/use-groups.page.

With the exception of those properties located in the Special Battery Park City District described above, the Study Area is located in the Special Lower Manhattan District. The district's regulations allow for the conversion of older commercial buildings to residential use and encourage a dynamic mix of uses in the area while protecting its distinctive skyline and old street patterns. There are also height and setback regulations, as well as requirements for retail continuity, pedestrian circulation space and subway station improvements.

Figure 3.1-2: Existing Zoning



South Battery Park City Resiliency Project

3.1.2.3 Public Policy

The public policy initiatives applicable to the Proposed Action are described below.

State of New York

The Waterfront Revitalization of Coastal Areas and Inland Waterways Act and New York State Coastal Management Program

Article 42 of the New York State Executive Law, the *Waterfront Revitalization of Coastal Areas and Inland Waterways Act* (WRCRA), mandated the creation of the New York State Coastal Management Program (CMP) to establish the boundaries of the Coastal Area within which the CMP is applied. It also provided a set of statewide policies enforceable on all state and federal agencies which manage resources and coordinate actions along New York State's coastline. Implemented by the NYSDOS, the CMP encourages coordination among all levels of government to promote sound waterfront planning and requires government agencies consider the goals of the program in making land use decisions. The Act offers local governments an opportunity to participate in the CMP on a voluntary basis; New York City is a participating municipality. Under the Act, localities prepare and adopt local waterfront revitalization programs (LWRP) which implement the State's Program through the use of municipal ordinances and procedures such as zoning and site plan review.

The Proposed Action's CMP consistency review is contained in **Appendix C**.

New York State Smart Growth Public Infrastructure Policy Act

The *New York State Smart Growth Public Infrastructure Policy Act* (ECL § 6-0107) establishes a policy to maximize the social, economic, and environmental benefits from public infrastructure development by minimizing the impacts associated with unnecessary sprawl. In accordance with the Act, state infrastructure agencies cannot approve, undertake, support, or finance a public infrastructure project, including providing grants, awards, loans or assistance programs unless, to the extent practicable, the project is consistent with the Smart Growth Public Infrastructure Criteria specified in ECL § 6-0107. The chief executive officer of a state infrastructure agency must attest that the project meets the relevant smart growth criteria, to the extent practicable, by providing a written "Smart Growth Impact Statement." If a project cannot meet these criteria, or compliance is considered to be impracticable, a detailed statement of justification should be provided in the Smart Growth Impact Statement.

City of New York

OneNYC 2050 (OneNYC)

OneNYC is the City's comprehensive strategy and policy directive to address long-term challenges related to climate change, an evolving economy, and aging infrastructure. The BPCA voluntarily complies with and works to implement the strategies and policy directives outlined in *OneNYC*. It is built on the 2007 *PlaNYC* (updated in 2011 and 2013). The core visions of *OneNYC* are summarized below.

Growth: To meet the needs of a growing population at a time of rising housing costs, the City will create and preserve 200,000 affordable housing units and support the creation of 160,000 additional housing units by 2024 and support the creation of at least 250,000 to 300,000 additional housing units by 2040. The City will also foster job growth, spurring the creation of more than 4.9

million jobs by 2040, and invest in transportation infrastructure, to ensure that average New Yorkers can reach 1.8 million jobs by transit within 45 minutes by 2040.

Equity: The City aims to lift 800,000 New Yorkers out of poverty or near poverty by 2025 by raising the minimum wage and launching high-impact initiatives to support education and job growth. The City also seeks to reduce premature mortality by 25 percent by ensuring that all New Yorkers have access to physical and mental healthcare services and addressing hazards in homes.

Sustainability: The City's sustainability goals include reducing GHG emissions by 80 percent by 2050 (relative to 2005 levels), sending zero waste to landfills by 2030, having the best air quality among all large U.S. cities by 2030, and reducing the risk of stormwater flooding in most affected communities. Contaminated land will be cleaned up to address disproportionately high exposures in low-income communities and convert land to safe and beneficial use, and major investments will be made to ensure that underserved New Yorkers have more access to parks.

Resiliency: The City seeks to eliminate long-term displacement from homes and jobs after shock events by 2050. Shock events can be both natural and man-made, including superstorms, blackouts, heat waves, and other acute events. City neighborhoods will be made safer by strengthening community, social, and economic resiliency; private and public buildings will be upgraded to be more energy efficient and resilient to the impacts of climate change; infrastructure systems will be adapted to withstand severe weather events; and coastal defenses will be strengthened against flooding and sea level rise.

Waterfront Revitalization Program

Proposed projects that are located within the designated boundaries of New York City's Coastal Zone must be assessed for their consistency with the City's Waterfront Revitalization Plan (WRP). The federal Coastal Zone Management Act (CZMA) of 1972 was enacted to support and protect the distinctive character of the waterfront and to set forth standard policies for reviewing proposed development projects along coastlines. The program responded to city, state, and federal concerns about the deterioration and inappropriate use of the waterfront. In accordance with the CZMA, New York State adopted its own CMP, which provides for local implementation when a municipality adopts a local waterfront revitalization program, as is the case in New York City. The New York City WRP is the City's principal coastal zone management tool. The WRP was originally adopted in 1982 and approved by the NYSDOS for inclusion in the New York State CMP. The WRP encourages coordination among all levels of government to promote sound waterfront planning and requires consideration of the program's goals in making land use decisions. NYSDOS administers the program at the state level, and NYCDCP administers it in the City. The WRP was revised and approved by the City Council in October 1999. In August 2002, NYSDOS and federal authorities (i.e., the USACE and the USFWS) adopted the City's ten WRP policies for most of the properties located within its boundaries.

In October 2013, the City Council approved revisions to the WRP to proactively advance the long-term goals laid out in *Vision 2020: The New York City Comprehensive Waterfront Plan*, released in 2011. The 2013 comprehensive update to WRP solidified New York City's leadership in sustainability and climate resilience planning as one of the first major cities in the U.S. to incorporate climate change considerations into its Coastal Zone Management Program. They also promote a range of ecological objectives and strategies, facilitate interagency review of permitting to preserve and enhance maritime infrastructure, and support a thriving, sustainable working waterfront.

In February 2016 the revised WRP was approved by the New York State Secretary of State; and with concurrence from the U.S. Secretary of Commerce, the revisions were incorporated into the New York State CMP. In June 2016 the City released an updated version of its guidance document, *The New York City Waterfront Revitalization Program*, reflecting the revised WRP and its more fine-grained set of policies that better address the City's varied conditions. The most notable update is that the policies address the risk of climate change and sea level rise for the first time, by promoting the use of climate change projections in the planning and design of projects. Additional substantial policy changes include encouraging new opportunities for public access to the waterfront where appropriate and achievable, and improving interagency coordination to foster a clear, predictable development process.

The Coastal Zone Boundary has been updated to reflect the most recent FEMA Preliminary Flood Insurance Rate Maps (PFIRMs) from 2015. Three new special area designations have been created and mapped: Recognized Ecological Complexes, Priority Marine Activity Zones, and the West Shore Ecologically Sensitive Maritime and Industrial Area; and the two existing special designations (Significant Maritime and Industrial Areas and Special Natural Waterfront Areas) have been updated with new boundary lines and additional mapped areas.

As the Proposed Action and the larger study area are located within the City's designated coastal zone, the Proposed Action must be assessed for its consistency with the ten WRP policies.

Of these policies, the following are most relevant to the Proposed Action:

- **Policy 4: Ecological Systems.** Protect and restore the quality and function of ecological systems within the New York City coastal area.
- **Policy 6: Flooding and Erosion.** Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.
- **Policy 8: Public Access.** Provide public access to, from and along New York City's coastal waters.
- **Policy 9: Scenic Resources.** Protect scenic resources that contribute to the visual quality of the New York City coastal area.

WRP consistency review is required for any project that is within the Coastal Zone boundary and is one of the following:

- A local discretionary action, such as a City Planning Commission action or a city capital project, subject to CEQR.
- A state agency action or program subject to SEQR and WRP consistency review by the relevant state agency.

- A federal agency permit/authorization, funding or direct-action subject to WRP consistency review by the NYSDOS for the relevant federal agency.

The Proposed Action's WRP consistency review is contained in **Appendix C**.

Vision 2020: New York City Comprehensive Waterfront Plan

Vision 2020 is a comprehensive plan for the City's waterfront, and together with *OneNYC* (described above), is a core component of the City's Waterfront Vision and Enhancement Strategy. *Vision 2020* presents strategies for implementing many of the long-term goals of PlaNYC (now *OneNYC*) specific to the City's waterfront. The Plan proposes to make the City more sustainable and resilient, and also proposes innovative stormwater management to improve the ecological health of the City's waterbodies and the protection and restoration of wetlands, beaches, and other natural shorelines to better protect coastal neighborhoods from flooding and storm surges. The following Plan goals are relevant to the Proposed Action:

- **Goal 6:** Enhance the public experience of the waterways that surround New York – our Blue Network.
- **Goal 8:** Identify and pursue strategies to increase the city's resilience to climate change and sea level rise.

Manhattan Waterfront Greenway

Together, the NYCEDC, the NYCDOT, and NYC Parks developed the Manhattan Waterfront Greenway plan with the intent of providing a connected greenway along the entire waterfront perimeter of Manhattan. The plan seeks to improve shoreline access by integrating larger parks via a connected network, and also provides a bike path for recreation and commuting.

3.1.3 Environmental Impacts

The following section assesses the potential for both adverse impacts as well as beneficial effects to land use and zoning as a result of the No Action Condition and Proposed Action. A detailed assessment of impacts to land use, zoning, and public policy is not appropriate for this Proposed Action since it would not result in a change in existing land use within the Study Area. For the Proposed Action, the landscaping of the parkland within the Project Area, including Wagner Park and The Battery, would be changed to elevate sections of parkland, but the use of these areas would not change.

3.1.3.1 No Action Condition

Under the No Action Condition, there would be no comprehensive flood alignment within the Study Area in 2024 which is the year the Proposed Action would be completed. Although the SBPCR Project would not be constructed under the No Action Condition, The Battery Coastal Resilience Project, sponsored by NYCEDC, would begin within the Project Area in Pier A Plaza and extend around The Battery's waterfront esplanade. This project would elevate the waterfront esplanade around The Battery tying into the section of Pier A Plaza just east of Pier A. The purpose of this project is to protect The Battery and the neighborhood behind the park from 2100 sea level rise.

In addition to The Battery Coastal Resilience Project, NYCDOT's Battery Park Underpass and West Street Underpass Project would be built in the Study Area by 2024. This project includes the construction of flood gates at the entrance to the Battery Park Underpass underneath Battery Place, which runs parallel to the northern boundary of The Battery. Ventilation grates that provide ventilation to the Battery Park Underpass are already located within The Battery, and the northern ventilation grate is located in the Project Area south of Battery Place and east of Pier A. There is no proposed work on The Battery parkland itself that would affect the land use, zoning, or use of The Battery.

Under the No Action Condition, a comprehensive flood alignment would not be installed, and land uses within the Study Area would continue to be subject to flooding both during minor and major storm events.

3.1.3.2 Proposed Action

The Proposed Action consists of a flood alignment with associated interior drainage improvements throughout the Project Area (see **Figure 3.1-1** and **Figure 3.1-2**). The flood alignment spans the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery, and the interior drainage improvements are located in the vicinity of the flood alignment, along West Street, Rector Place, and West Thames Street north and northwest of the Project Area.

The Proposed Action would be constructed to naturally blend into the open space environment of the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery. The current uses of these areas and the circulation of pedestrians and bicyclists visiting or passing through the Project Area would be maintained.

Land Use

Upon the Proposed Action's completion, the recreational land use along the waterfront, as well as the adjacent residential, commercial and institutional uses inland, would not be substantively altered. There would be a very minor loss of open space as a result of the exposed floodwall in the eastern portion of Wagner Park near Pier A and within The Battery, which would not alter the community's use of the space (see Section 3.2 (Open Space)). Similarly, the new Wagner Park pavilion would not alter the community's use of this resource.

Zoning

No changes to existing zoning are necessary for the Proposed Action. The Zoning Resolution does not directly apply to the interior drainage improvements along West Street, Rector Place, and West Thames Street as the improvements would be located within the public ROW (not within a zoning lot or marginal street).

Public Policies, Programs and Plans

The Proposed Action is consistent with all relevant and applicable public policies, programs and plans, as summarized in **Table 3.1-1**.

Table 3.1-1: Public Policies, Programs and Plan Compliance Summary

Public Policy/Procedure	Project Applicability
OneNYC 2050	The Proposed Action directly supports the following strategy from the Livable Climate section of the plan: Strategy 21: *Strengthen communities, buildings, infrastructure, and the waterfront to be more resilient.* One of the supporting initiatives of this strategy is to: *Mitigate physical risks posed by climate change by delivering critical projects.* Among the plan milestones is the start of construction of the SBPCR Project.
New York City Waterfront Revitalization Program	The Proposed Action is consistent with the following WRP Policies. For more detail regarding compliance with these policies and additional sub-policies, please refer to the Consistency Assessment Form (CAF): **Policy 1:** *Support and facilitate commercial and residential redevelopment in areas well-suited to such development.* The Proposed Action would provide flood protection for existing and future inland residential and commercial areas using a combination of exposed floodwalls, glass-topped floodwalls, buried floodwalls, and flip-up deployables. **Policy 2**: *Support water-dependent and industrial uses in New York City Coastal areas that are well-suited to their continued operation*. The Proposed Action would not affect water-dependent or industrial uses. **Policy 3**: *Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.* The Proposed Action is adjacent to a Priority Marine Activity Zone, and the Proposed Action would have no effect on the ongoing maintenance of maritime infrastructure for water-dependent uses. **Policy 4**: *Protect and restore the quality and function of ecological systems within the New York City coastal area.* The Proposed Action would include in-water work in tidal wetlands in the vicinity of Pier A Plaza. Much of this work includes ecological betterments including naturalization of the shoreline with native aquatic plants, oyster beds and reef structures. Permits from the NYSDEC and the USACE would be required for this work. **Policy 6**: *Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change*. The Proposed Action seeks to protect the neighborhood behind the flood alignment from flooding caused by storm surge

Public Policy/Procedure	Project Applicability
	and sea level rise. **Policy 7**: *Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.* Any solid waste and hazardous materials generated during demolition and construction would be transported off site and therefore have a low potential to degrade coastal resources. Solid waste generated by the restaurant in the reconstructed Wagner Park pavilion would be managed by a private solid waste collection company. **Policy 8**: *Provide public access to, from, and along New York City's coastal waters*. The Proposed Action would maintain public access to the Battery Park City Esplanade around Wagner Park, Pier A Plaza, and The Battery, which provides views to the Hudson River in the Project Area. **Policy 9**: *Protect scenic resources that contribute to the visual quality of the New York City Coastal area*. The Proposed Action is designed to protect views of scenic resources from inside Wagner Park, Pier A Plaza, and The Battery, such as the Battery Park City Esplanade, the Hudson River, the Statue of Liberty, and Ellis Island. **Policy 10**: *Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City coastal area.* As the Proposed Action proposes to reconstruct the National Register-Eligible Wagner Park, a Letter of Resolution would be developed that would include mitigation measures in accordance with applicable requirements.
Vision 2020: New York City Comprehensive Waterfront Plan	The Proposed Action is directly supportive of the following Waterfront Plan goal: **Goal 8:** Identify and pursue strategies to increase the city's resilience to climate change and sea level rise. As the Proposed Action is a resiliency project intended to address flooding risk associated with climate change and sea level rise, it is directly supportive of this goal.
Manhattan Waterfront Greenway Master Plan	The Proposed Action would not adversely impact, and would be designed to support, the Manhattan Waterfront Greenway vision and principles to maximize the greenway location along the waterfront, enhance safety for pedestrians and bicyclists, improve access from upland areas, and account for

Public Policy/Procedure	Project Applicability
	sea level rise.
NYS Smart Growth Public Infrastructure Policy Act	The Proposed Action is consistent with the NYS Smart Growth Public Infrastructure Policy Act in that it would not cause unnecessary sprawl.

The Proposed Action is designed to protect Battery Park City and the Financial District area of Lower Manhattan from both frequent and major flooding through a flood alignment and interior drainage improvements. Additionally, the Proposed Action would enhance access to the Hudson River waterfront and improve the amenities and recreational facilities within Wagner Park, Pier A Plaza, and The Battery. The Proposed Action would have no significant adverse impacts to existing or planned land use in the Study Area. The Proposed Action would be consistent with applicable zoning and public policies, including the City's WRP.

3.2 Open Space

3.2.1 Introduction

This section examines the potential for the Proposed Action to impact open space directly or indirectly in the Study Area. According to the *CEQR Technical Manual*, open space is "publicly or privately owned land that is publicly accessible and available for leisure, play, or sport, or is set aside for the protection and/or enhancement of the natural environment." Public open space is available "to the public on a constant and regular basis, including for designated daily periods." Examples of public open space observed in the Study Area include, but are not limited to, waterfront parks with passive or active recreational uses, Battery Park City Esplanade, and a waterfront pier with passive recreational uses. Private open space is "not publicly accessible or is available only to limited users and is not available to the public on a regular or constant basis."

The *CEQR Technical Manual* outlines an analysis methodology for evaluating possible direct and indirect effects (referred to as direct and indirect impacts in this section) on open space resources within the Study Area. Direct impacts include those in which a proposed action reduces or limits access to open space. In addition, a direct impacts could occur if a project would:

- Result in a physical loss of public open space (by encroachingon or displacing open space);
- Change the use of an open space so that it no longer serves the same user population;
- Limit public access to an open space; or
- Cause increased noise, air pollutants, odors, or shadows on public open space that would affect its function, usability, or enjoyment, whether on a permanent or temporary basis.

The *CEQR Technical Manual* outlines a preliminary assessment that quantifies the acreage of open space and user population within the Study Area. The purpose of the assessment is to measure the change in the amount of open space available relative to additional population created by the proposed action. The *CEQR Technical Manual* states that the median open space ratio for New York City is 2.5 acres of open space for every 1,000 residents. With the limitations of the urban environment throughout New York City, these open space ratios are considered benchmarks, not "impact thresholds." In addition to open space ratio benchmarks, the *CEQR Technical Manual* provides an additional criterion of the percent decrease in the open space ratio from the No Action Condition to Proposed Action scenarios. For areas in which the existing open space ratio is 2.01 acres or greater, a decrease in open space ratio that "approaches or exceeds five percent" would be considered "a substantial change."

The determination of significant adverse impacts is based on one of two factors following CEQR guidelines. Regarding direct impacts: a significant adverse impact would occur if there would be a direct displacement/alteration of existing open space within a study area without a comparable replacement (size, usability, and quality) within the Study Area, or if a proposed action results in a significant physical impact (such as increasing noise or air pollutant emissions) that would affect the usefulness of a public open space. Regarding indirect impacts: if a proposed action would reduce an open space ratio and consequently result in overburdening existing facilities, or if it would substantially exacerbate an existing deficiency in open space, it may result in a significant adverse impact on open space resources. The determination of significant adverse impacts is based on how a proposed action would change the open space ratios in the study areas, as well as qualitative factors not reflected in the quantitative assessment. In general, if a study area's open space ratios fall below CEQR guidelines, or the proposed action would result in a decrease in open space ratio of more than the applicable percentage (here, five percent), it could be considered a substantial change.

The Proposed Action would require construction of the flood alignment in open spaces near the Museum of Jewish Heritage, the entirety of Wagner Park, portions of Pier A Plaza, and the northern portion of The Battery. Because the Proposed Action would be located in open spaces in the Project Area, a preliminary assessment of potential direct impacts was conducted. The potential impacts of the Proposed Action on open space during construction will be assessed in Section 3.15 (Construction).

Indirect impacts could result from projects that generate residential or commercial population, and that additional population "overtaxes the capacity of existing open space so that their service provided to existing and future populations in the area would be substantially or noticeably diminished." An open space assessment of indirect impacts would be required if a proposed action would generate more than 200 residents or 500 nonresidents, or a similar number of other nonresidential users. Because the Proposed Action would not generate residents or nonresidents, an open space assessment of indirect impacts is not warranted.

3.2.2 Affected Environment

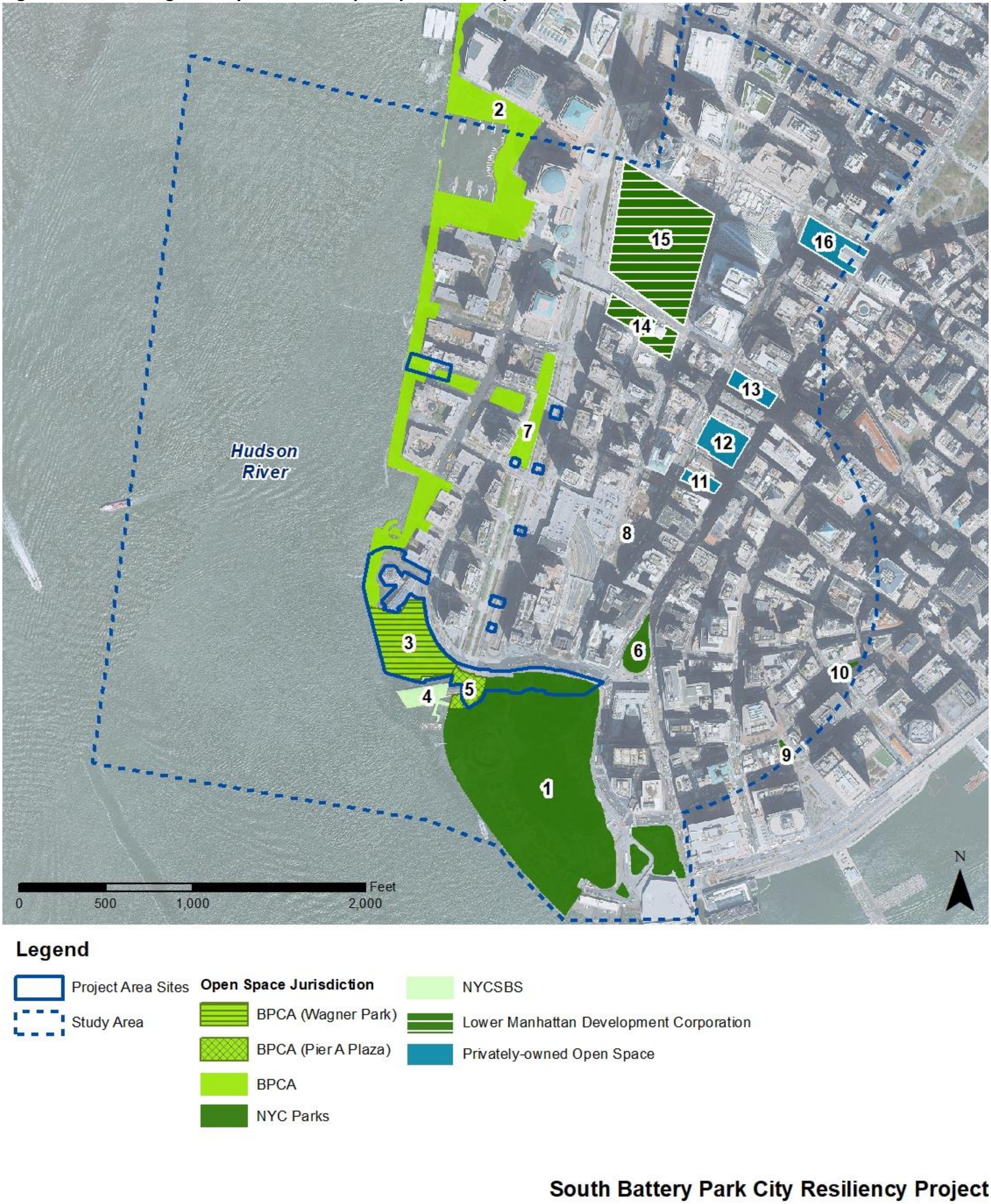
The Study Area consists of all the census tracts with a minimum of 50 percent of their geographic area intersecting or falling within a 0.25-mile buffer around the Project Area. The total population and acreage of publicly accessible open space within the Study Area would provide the basis for measurement. According to the *CEQR Technical Manual*, population within the Study Area is measured from the latest decennial census, and the total population residing in the Study Area reported in the 2010 census is 10,167.

There are 16 publicly accessible open spaces within the Study Area, including parks, recreational areas, sitting areas, memorials, cemeteries, and a community garden. **Table 3.2-1** lists all open space and acreage, while **Figure 3.2-1** illustrates these areas. The total size of open space is 50.92 acres. Under these conditions, the open space ratio is determined by dividing the total acreage of open space (50.92 acres) by the total population (10,167) within the Study Area and mulitplying by 1,000. The existing open space ratio is 5.01 acres for every 1,000 residents.

Table 3.2-1: Publicly Accessible Open Space in the Study Area

ID	Resource	Type	Jurisdiction	Acres
1	The Battery	Park, Recreational Area	NYC Parks	22.33
2	Battery Park City open spaces, including Battery Park City Esplanade and Yacht Harbor (portion within Study Area)	Park, Recreational Area, Esplanade	BPCA	9.50
3	Wagner Park	Park, Recreational Area, Pavilion	BPCA	3.30
4	Pier A	Sitting Area	NYCSBS	0.74
5	Pier A Plaza	Recreational Area and Sitting Area	BPCA	0.73
6	Bowling Green	Park	NYC Parks	0.75
7	West Thames Park	Recreational Area and Community Garden	BPCA	1.25
8	Greenstreet	Sitting Area	NYC Parks	0.05
9	Coenties Slip	Sitting Area	NYC Parks	0.15
10	British Garden at Hanover Square	Sitting Area	NYC Parks	0.14
11	Trinity Church Cemetery	Cemetery	Parish of Trinity Church	0.38
12	Trinity Church Cemetery	Cemetery	Parish of Trinity Church	1.16
13	Zuccotti Park	Park	One Liberty Plaza Condo	0.62
14	Liberty Park	Park	Lower Manhattan Development Corporation	0.63
15	World Trade Center and 9/11 Memorial	Park and Memorial	Lower Manhattan Development Corporation	7.97
16	St. Paul’s Chapel Cemetery	Cemetery	St. Paul’s Church	1.22
Total				**50.92**

Figure 3.2-1: Existing Publicly Accessible Open Space in Study Area



Four open spaces are located within the Project Area: the southern portion of the Battery Park City Esplanade near the Museum of Jewish Heritage, the entirety of Wagner Park, portions of Pier A Plaza, and the northern portion of The Battery.

3.2.2.1 Museum of Jewish Heritage

The Battery Park City Esplanade is located to the west of the Museum of Jewish Heritage and is connected to pedestrian paths that lead to Museum of Jewish Heritage entrances. The Museum is located in Battery Park City to the south of 1st Place and north of Wagner Park, and the Project Area traverses around the exterior of the Museum to the north, west, and south. The eastern side of the Museum is bordered by Battery Place. The primary pedestrian access point to the Museum is located at the intersection of Battery Place and 1st Place. From this entry point, pedestrians have access to the Museum with paths around the Museum that also provide access to the Battery Park City Esplanade along the Hudson River waterfront, Wagner Park, and the sidewalk along Battery Place. In addition, there are grass lawns and seating areas to the west side of the Museum and adjacent to the Battery Park City Esplanade.

3.2.2.2 Wagner Park

Wagner Park is a National-Register-eligible resource located in the southern end of Battery Park City and bound by the Museum of Jewish Heritage to the north, Pier A and Pier A inlet to the south, the Battery Park City Esplanade and the Hudson River to the west, and Battery Place to the east. The entirety of Wagner Park is within the Project Area and is approximately 3.30 acres. The design of Wagner Park is comprised of six organizing elements: Battery Place, north and south allées, a central plaza, the pavilion's northern and southern structures, north and south ornamental gardens and lawns, and a central lawn. All of these elements are located to the west of Battery Place.

Battery Place

Battery Place forms the eastern boundary of Wagner Park and curves from north/south and west/east around the northern boundary of the Project Area. Battery Place provides two pedestrian entry points. The northern pedestrian entry point is located at the intersection of Battery Place and 1st Place. Pedestrians and other recreational users can access the Museum of Jewish Heritage, Wagner Park through the north allée, or continue walking along Battery Place to the east of the north allée. The southern entry point is located at the intersection of Battery Place and Little West Street. From this southern entry point, pedestrians and other recreational users can access The Battery to the east, Pier A Plaza to the south, Wagner Park to the west through the south allée, and the walkway along Battery Place to the west. Pedestrians walking along Battery Place have opportunities to enter the north and south allées through regular gaps in the rectangular beds along the sides of the allées. The north and south walkways along Battery Place converge at the Wagner Park central plaza.

North and South Allées

West of Battery Place, two rows of densely planted trees form allées to the north and south of the Wagner Park pavilion. These allées form the primary pedestrian entry points to Wagner Park and the pavilion through central walkways with a width of 15 feet that converge at the central plaza to the east of the pavilion. The allées consist of hexagonal pavers consistent with those observed throughout

Wagner Park and do not present obstacles to pedestrian accessibility. Along the boundaries of each allée, there are multiple parallel rectangular beds containing trees and and low ground cover plants. The narrow breaks between the rectangular beds provide access to and from the central walkway between the trees. This access allows pedestrians to access the narrow walkway immediately adjacent to Battery Place or enter the north and south ornamental gardens in Wagner Park.

Central Plaza

The central plaza is a paved open space bordered by the allées on the north and south, Battery Place on the east, and the pavilion on the west. Two staircases connect the plaza to the upper levels of the pavilion. The central plaza creates a threshold into the core of the park through the gap between the pavilion structures.

Pavilion (Northern and Southern Structures)

The two-story, asymmetrical pavilion is situated west of the central plaza. It consists of two artful north and south structures, linked by a foot bridge, approximately 18 feet above ground, supported by pylons to the north and south, respectively. Access to the foot bridge that links the Pavilion’s northern and southern structures is gained via the plaza on the east side of the pavilion. In this area, two staircases with intermediate landings, constructed of brick and stone with metal railings, are appended to the east facades.

North and South Ornamental Gardens and Lawns

The north and south ornamental gardens each have a distinct character, with irregular planting beds forming different scaled spaces and plants featuring “hot” or “cool” color palettes. The north ornamental garden is the “hot” garden, with a large open central lawn space. It is located west of the north allée. Access to the garden is gained from the east side via the north allée, and the west side via the opening between the north and south hedges. The north lawn is located west of the planting beds, separated by a path paved in hexagonal pavers. The triangular-shaped lawn features a central open space, interspersed with trees. The south ornamental garden is the smaller “cool” garden and is located west of the south allée. The south lawn is west of the ornamental garden. The lawn is a small central open area, interspersed with trees along the edges.

Central Lawn

The central lawn is the primary gathering space of Wagner Park. The lawn is a raised rectangular grass panel with an expansive view of the Hudson River Waterfront. The lawn is flanked by the Pavilion to the east and the Battery Park City Esplanade to the west. The gap between the Pavilion’s northern and southern structures provides direct access to the lawn from the plaza. At the waterfront, entry to the lawn is gained via two flights of three granite steps, separated by a narrow rectangular lawn panel. The second flight of steps leads to the perimeter pathway that frames the central lawn.

The eastern boundary of the central lawn is formed by the Battery Park City Esplanade along the Hudson River Waterfront. The Esplanade is approximately 20 feet wide and is directly adjacent to the Hudson River Waterfront with unobstructed views of the Hudson River Waterfront, the Statue of Liberty, and the New York Harbor looking west. Directly to the west of the central lawn, there is a large triangular section of the Esplanade with a width of approximately 45 feet that creates a gathering point for users of Wagner Park. Walking north along the Esplanade from the central plaza, pedestrians can continue along the Hudson River Waterfront or access the Museum of Jewish Heritage. Moving south and east along the Esplanade, pedestrians can access the Pier A inlet and Pier A Plaza.

3.2.2.3 Pier A Plaza

Pier A Plaza is an open space that is bound by Wagner Park to the west, The Battery to the east and south, and Battery Place to the north. Pedestrians access Pier A Plaza from three directions. First, pedestrians from Wagner Park access to the west using the allée that is parallel to Battery Place. Second, pedestrians access The Battery to the east using the sidewalk along Battery Place and the paths in The Battery. Third, pedestrians cross Battery Place to the north from the greenway parallel to Little West Street. Bicyclists access Pier A Plaza via the Battery Bikeway that transitions into the Hudson River Greenway to the north of Battery Place. Pier A Plaza provides a paved open space for visitors with seating and access to paths into The Battery, including the Esplanade along the Hudson River Waterfront.

3.2.2.4 The Battery

The Battery is an open space owned by the City of New York and maintained by NYC Parks as a recreational resource and located to the east of Pier A Plaza. It is further bound by Battery Place to the north and State Street to the east. The Project Area includes the northern portion of The Battery, which is approximately 1.41 acres. The entirety of The Battery is 22.33 acres. The northern section of The Battery provides pedestrian paths, a bikeway, access to the Esplanade along the Hudson River waterfront, grass lawns, seating, and visitor attractions, such as the Castle Clinton National Monument. Pedestrians access The Battery from Pier A Plaza, Battery Place, and State Street. Bicyclists access The Battery using the Battery Bikeway, which enters The Battery in its southeastern end, traverses north and parallel to State Street, curves to the west in The Battery's northern edge, and crosses Battery Place to the north of Pier A Plaza. There is a clear demarcation between the wide sidewalk along Battery Place and The Battery within the Project Area. Physically, a short stone wall marks the northern boundary of The Battery.

3.2.3 Environmental Impacts

3.2.3.1 No Action Condition

Under the No Action Condition, two planned projects would be located within the Study Area: the Battery Park Underpass and West Street Underpass Project and The Battery Coastal Resilience Project. The Battery Park Underpass and West Street Underpass Project would be constructed by NYCDOT and would have no direct impact on open space in the Study Area.

The Battery Coastal Resilience Project being undertaken by NYCEDC in partnerhisp with NYC Parks, would extend from Pier A Plaza around Hudson River Waterfront along The Battery's waterfront esplanade. This project would elevate the waterfront esplanade in The Battery and integrate a grassy berm at the back of The Battery. Pedestrian access throughout The Battery and along the Hudson River Waterfront would be maintained. This project would have no direct impact on open space within the portions of The Battery in the vicinity of the Project Area.

The No Action Condition would have no direct impact on open space in the Study Area. However, under the No Action Condition, the SBPCR Project would not be constructed, and the open spaces that this project is intended to protect would remain subject to flooding both during minor and major storm events. Existing open spaces, if flooded, would be damaged or be rendered inaccessible by these storm events.

3.2.3.2 Proposed Action

The Proposed Action consists of the flood alignment and interior drainage improvements across the Project Area (see **Figure 3.2-2**). Open space in the Project Area is further described in Section 3.1.2 (Affected Environment). The flood alignment begins at 1st Place near the Museum of Jewish Heritage, passes around the Museum, through Wagner Park, Pier A Plaza, and The Battery before terminating in the eastern side of The Battery near State Street. The design of the flood alignment would blend naturally into the Project Area open space environment and become a part of the recreational experience provided by Wagner Park, Pier A, and The Battery. In addition, the Project Area includes interior drainage improvements to the north and northwest. The following descriptions provide additional details of the flood alignment related to the open space near the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery.

1st Place and the Museum of Jewish Heritage

The flood alignment begins on 1st Place, where a flip-up deployable spans across 1st Place with fixed columns constructed on both sides of the flip-up deployable. The northernmost fixed column is situated near a contemporary residential high-rise building at 50 Battery Place. This area is not considered an open space. Flip-up deployables would extend along the north face of the Museum of Jewish Heritage. In a typical condition, these flip-up deployables would lay flat in the ground and would not interrupt the function of 1st Place or the open space to the north of the Museum of Jewish Heritage. A glass-topped floodwall would be constructed along the western face of the Museum of Jewish Heritage but with a slight separation between the floodwall and the museum's structure. Because the glass-topped floodwall would be constructed in close proximity to the Museum of Jewish Heritage, the glass-topped floodwall would have no direct impacts on open space near 1st Place and the Museum of Jewish Heritage (see **Figure 3.2-2**).

Wagner Park

The flood alignment in Wagner Park would consist of a buried floodwall constructed beneath the raised park (10 to 12 feet), maximizing the amount of protected open space, while maintaining views to the Hudson River Waterfront. The buried floodwall would allow all users to occupy the lawn, garden, and public park.

Wagner Park would be redesigned to maintain and enhance the park programming that currently exists in Wagner Park. Redesigned features would include ornamental gardens with a water feature, a central lawn, performative gardens along the Battery Park City Esplanade, and an overlook deck at the Pier A inlet. The Proposed Action would maintain and maximize continuous green space and pedestrian paths that provide connections to the Museum of Jewish Heritage to the north and Pier A Plaza and The Battery to the east.

With the elevation of Wagner Park, the existing Pavilion would be removed, and a new Pavilion would be constructed farther east toward Battery Place where the current central plaza is located. The proposed Pavilion would be designed to retain or replace key elements of the existing Pavilion: preserve the framed view of the Statue of Liberty, maintain views of the Hudson River Waterfront, maintain a central gathering space, and enhance the procession of pedestrians from the street to park level through the north and south allées.

Pedestrian access to Wagner Park from Battery Place would be modified to provide universal access to the elevated Wagner Park and Pavilion from northern and southern pedestrian entry points. However, because of the elevation of Wagner Park, pedestrian access along Battery Place between the entrances to the north and south allées would be removed. Under the Proposed Action, pedestrian access from the northern and southern entry points would be maintained and enhanced. The existing tree-lined north and south allées that guide pedestrians to the Wagner Park central plaza would be replaced and redesigned with 40-foot-wide tree-lined allées that extend across an eight percent grade increase from street level to the center of elevated Wagner Park Pavilion. These allées would provide universal access to pedestrian users of all ages and ability from the Museum of Jewish Heritage to the north and Pier A Plaza from the south

Pedestrian access to Wagner Park from the walkway immediately adjacent to Battery Place and the area that is currently the Wagner Park central plaza would be removed to accommodate the elevated Wagner Park. This walkway would be widened and repaved to provide a paved sidewalk between 6 and 11 feet wide providing universal access to pedestrians along Battery Place.

At the connection between Wagner Park and Pier A Plaza, the flood alignment would be resurfaced and exposed as a 36-foot-long segment of exposed floodwall where it would meet the flip-up deployables extending through Pier A Plaza. The exposed floodwall would be incorporated into the design of the proposed south allée. The buried floodwall and exposed floodwall through Wagner Park would have no direct impacts on open space in Wagner Park because the Proposed Action would maintain and enhance the existing park programming and uses (see **Figure 3.2-2**).

Pier A Plaza

The flood alignment across Pier A Plaza would consist of flip-up deployables. This area of Pier A Plaza would be elevated approximately four feet to reduce the height of the flip-up deployables and address the higher vulnerability of portions of Pier A Plaza that would be subject to daily tidal flooding in the future. Fixed columns would be constructed between each flip-up deployable, so that when deployed, the flip-up deployables would seal against the fixed columns to form a linear flood barrier. The design of the flip-up deployables and fixed columns would complement the materials of Pier A Plaza, and would be placed to accommodate views to the water, circulation (pedestrian, biking, and vehicular), and the programmed use of the Plaza. The Plaza would allow for direct and universal access to Pier A, as well as maintaining the bicycle connection from The Battery to the Hudson River Greenway, outside the Plaza.

The flip-up deployables and fixed columns in Pier A Plaza would have no direct impacts on open space in Pier A Plaza (see **Figure 3.2-2**).

The Battery

As the flood alignment continues east out of Pier A Plaza, it extends into the northern section of The Battery and the Battery Bikeway. The section of the flood alignment in The Battery is comprised of a combination of flip-up deployables, exposed floodwall, and buried floodwall beneath a landscaped berm to the east of the Project Area. In addition, the flood alignment requires the reconfiguration of the existing Battery Bikeway, but the bikeway would maintain its existing access points on State Street and Battery Place. The DFE in this section descends from 18.5 feet to 15 feet, and the HOI descends from 9.5 to 0 feet moving west to east in the Project Area. The Proposed Action would elevate the grade of this section of The Battery to meet the DFE, but the design of the circulation, landscape architecture, use of the Battery 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 Waterfront. Once the flood alignment reaches the high point in the furthest east section of the Project Area, which naturally meets the DFE, it terminates. The Proposed Action would remove and transplant trees within The Battery to accommodate the flood alignment and the reconfigured Battery Bikeway.

Along the western side of the flood alignment in The Battery, the section of exposed floodwall would be approximately 9.5 feet tall, span 165 feet, and include two sections with a flip-up deployable connecting the two sections. This flip-up deployable would provide pedestrian and bicyclist access into The Battery and the Battery Bikeway and maintain the pathway to the statue of Giovanni da Verrazzano inside The Battery. At the eastern end of the flood alignment in The Battery, pedestrian and bicyclist access through The Battery would be maintained with the same pedestrian and bicyclist entry points from Battery Place and State Street.

The flood alignment extending east into the north side of The Battery from the Pier A Plaza would maintain and enhance the circulation, landscape architecture, use of the existing bikeway, and a landscaped public park edge within The Battery. The flip-up deployable and the bermed floodwall would be carefully designed into the open space landscape and would have no direct impacts on open space in The Battery (see **Figure 3.2-2**).

Interior Drainage Improvements

The existing sewer infrastructure crossing underneath the SBPCR Study Area would have to be isolated to preclude the coastal surge from entering the Study Area, including open spaces, during a major coastal storm event. To accomplish this, an interior drainage management system would be implemented that includes: the installation of tidegates, isolation valves, and a NSI system, as described in Section 1.3.6 (Interior Drainage Improvements).

As shown in **Figure 3.2-2**, two isolation valves are located in The Battery. One isolation valve would be installed at the 12-inch diameter storm drain that collects runoff from The Battery, approximately 50-feet east of the Battery Park Underpass structure underneath The Battery. A sanitary sewer isolation valve would be installed just north of The Battery comfort station. The valves would be installed underground, connected to existing mains, and require an excavation area of approximately four feet by four feet. The valves would remain in the open position during non-coastal storm events. Only in advance of a major coastal storm event, the valves would be closed to prevent coastal waters from surging through the stormwater drain and the sanitary lines connected to the comfort station. The Battery and the comfort station would be closed to the public during such major coastal storm events. Stormwater analysis confirmed that closing the valves would not exacerbate flooding in The Battery during major coastal storm events and under the scenario of a forecasted coastal storm that does not materialize (see **Appendix E** for analysis).

The operation of the two isolation valves would have no direct impacts on open space in The Battery because they are located underground as part of the existing stormwater and sewer systems. Any open spaces disturbed during construction of the isolation valves would be returned to their previous use as open space.

Figure 3.2-2: Proposed Flood Alignment in Open Spaces

Preliminary Assessment

As discussed in Section 3.2.1 (Introduction), a significant adverse direct impact would occur if there would be a direct displacement/alteration of existing open space within a study area without a comparable replacement (size, usability, and quality) within the Study Area, or if a proposed action results in a significant physical impact (such as increasing noise or air pollutant emissions) that would affect the usefulness of a public open space. In addition, according to the *CEQR Technical Manual*, the open space ratio for the Proposed Action should be calculated with any changes in acreage of open space as part of the Proposed Action and compared to the open space ratio under the No Action Condition. If the decrease in the open space ratio is near or exceeds 5 percent, a detailed analysis would be required.

The Proposed Action would require construction of the flood alignment in open spaces near the Museum of Jewish Heritage, Wagner Park, portions of Pier A Plaza, and the northern portion of The Battery. As discussed above, the Proposed Action would not result in a physical loss of public open spaces, change the use of the open spaces, limit public access to open spaces, or cause increased noise, air pollutants, odors, or shadows. Therefore, the Proposed Action open space ratio would remain 5.01 acres per every 1,000 residents. Because the Proposed Action would not result in a physical loss of public open spaces, a detailed analysis of open space is not required. The Proposed Action would have no significant adverse direct impact to open space resources.

3.3 Shadows

3.3.1 Introduction

This section examines the potential for the Proposed Action to produce incremental shadows long enough to cover all or portions of publicly-accessible sunlight-sensitive resources. According to the *CEQR Technical Manual*, public open spaces, architectural resources, natural resources, and greenstreets are resources that depend on sunlight either for their enjoyment or to maintain their natural condition. The incremental shadow is the additional, or added, shadow cast onto a sunlight-sensitive resource. A significant adverse impact of this incremental shadow is determined if it "falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight exposure, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources."

3.3.1.1 Definitions and Methodology

This analysis has been prepared in accordance with CEQR procedures and follows the guidelines of the *CEQR Technical Manual*.

Definitions

Incremental shadow is the additional, or new, shadow that a structure resulting from a proposed project would cast on a sunlight-sensitive resource.

Sunlight-sensitive resources are those resources that depend on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity. Such resources generally include:

- *Public open space* such as parks, beaches, playgrounds, plazas, school yards (if open to the public during non-school hours), greenways, and landscaped medians with seating. Planted areas within unused portions of roadbeds that are part of the Greenstreets program are also considered sunlight-sensitive resources.
- *Features of architectural resources that depend on sunlight for their enjoyment by the public.* Only the sunlight-sensitive features need be considered, as opposed to the entire resource. Such sunlight-sensitive features might include: design elements that depend on the contrast between light and dark (e.g., recessed balconies, arcades, deep window reveals); elaborate, highly carved ornamentation; stained glass windows; historic landscapes and scenic landmarks; and features for which the effect of direct sunlight is described as playing a significant role in the structure's importance as a historic landmark.
- *Natural resources* where the introduction of shadows could alter the resource's condition or microclimate. Such resources could include surface water bodies, wetlands, or designated resources such as coastal fish and wildlife habitats.

Non-sunlight-sensitive resources include, for the purposes of CEQR:

- City streets and sidewalks (except Greenstreets);
- *Private open space* (e.g., front and back yards, stoops, vacant lots, and any private, non-publicly accessible open space);

- *Project-generated open space* cannot experience a significant adverse shadow impact from the project, according to CEQR, because without the project the open space would not exist.

A significant adverse shadow impact occurs when the incremental shadow added by a proposed project falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources. Each case must be considered on its own merits based on the extent and duration of new shadow and an analysis of the resource's sensitivity to reduced sunlight.

Methodology

The *CEQR Technical Manual* outlines a tiered screening assessment designed to identify sunlight-sensitive resources within the Study Area, measure the incremental shadows on the sunlight-sensitive resources added by the Proposed Action, and determine the impacts of those incremental shadows. A shadow assessment is required for projects that would "either (a) result in new structures (or additions to existing structures including the addition to rooftop mechanical equipment) of 50 feet or more or (b) be located adjacent to, or across the street from, a sunlight sensitive resource." The Tier 1 Screening Assessment involves mapping the sunlight-sensitive resources within the longest shadow area, which "encompasses the site of a proposed project and a perimeter around the site's boundary with a radius equal to the longest shadow that could be cast by the proposed structure, which is 4.3 times the height of the structure and occurs on December 21, the winter solstice."

If there are sunlight-sensitive resources within this longest shadow study area, the analysis proceeds to the second tier, which reduces the area that could be affected by project shadow by accounting for the path of the sun in the northern hemisphere. The Tier 2 Screening Assessment assesses sunlight-sensitive resources determined to be within the longest shadow study area and within the path of the sun in the northern hemisphere. Within the northern hemisphere, the path of the sun would not cast shadows in a triangular area south of any project; and the specific areas in New York City where no shadows can be cast "lie between -108 and +108 degrees from true north."

A Tier 3 Screening Assessment should be conducted only for projects in which all or a portion of a sunlight-sensitive resource is within the longest shadow study area and outside the triangular area south of the project that would not experience shadows. The Tier 3 Screening Assessment further refines the area that could be reached by project shadows by looking at specific representative days in each season and determining the maximum extent of shadow over the course of each representative day.

If the third tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a detailed shadow analysis is required to determine the extent and duration of the incremental shadow resulting from the project. The detailed analysis provides the data needed to assess the shadow impacts. The effects of the new shadows on the sunlight-sensitive resources are described, and their degree of significance is considered. The results of the analysis and assessment are documented with graphics, a table of incremental shadow durations, and narrative text.

3.3.2 Affected Environment

There are three publicly-accessible sunlight-sensitive resources within or adjacent to the Tier 1 Shadow Screening Study Area, or the boundary of the longest shadow: Wagner Park, Pier A, and Pier A inlet. The existing Wagner Park pavilion currently sits between Wagner Park's central lawn and central plaza located to the west of Battery Place. The existing pavilion is 37 feet tall. The park area to the west of the existing pavilion consists of grass lawn and trees with pedestrian paths crossing through the park area. Surrounding this grass lawn are paved pedestrian walkways, and the rest of the area around the existing pavilion is paved open space. Pier A is located to the south and east of Wagner Park and includes an open plaza where pedestrians can gather and access either Wagner Park or The Battery. Pier A inlet is located to the south of Wagner Park and connects to the Hudson River. Utilizing the methodology of a Tier 1 Screening Assessment the longest shadow that could be cast by the existing pavilion, which is 4.3 times the height of the structure and occurs on the winter solstice, is approximately 159 feet. This longest shadow range covers portions of Wagner Park, Pier A and the Pier A inlet surrounding the existing pavilion.

3.3.3 Environmental Impacts

3.3.3.1 No Action Condition

Under the No Action Condition, the Wagner Park pavilion would remain in its existing location, and the new Wagner Park pavilion would not be constructed. As discussed in Section 3.3.2 (Affected Environment), the existing pavilion's longest shadow cast is 159 feet, which covers portions of Wagner Park, a sunlight-sensitive resource. The condition of the existing pavilion casting shadows on Wagner Park would remain in the No Action Condition.

The two planned projects under the No Action Condition, the Battery Park Underpass and West Street Underpass Project and The Battery Coastal Resilience Project would not generate incremental shadows.

3.3.3.2 Proposed Action

Under the Proposed Action, the existing pavilion in Wagner Park would be removed and reconstructed on the elevated Wagner Park slightly closer to Battery Place, but largely overlapping the footprint of the existing pavilion. The height of the proposed pavilion would be approximately 47 feet compared to the height of the existing pavilion, which is 37 feet. The proposed pavilion structure would be 47 feet tall at its highest point compared to the grade at street level, which would be east of the proposed pavilion and adjacent to Battery Place. To the north, west, and south of the proposed pavilion, Wagner Park would be elevated 12 feet, so the proposed pavilion would be 35 feet tall at the grade of the elevated Wagner Park. For the purposes of assessing shadows cast by the proposed pavilion in Wagner Park, the pavilion height was set at 47 feet to assess the longest possible shadow cast in any direction by the proposed pavilion. Although the proposed Wagner Park Pavilion would be below CEQR's 50-foot threshold, it is located within Wagner Park, which is a sunlight-sensitive resource. Therefore, a preliminary screening assessment was carried out for the proposed Wagner Park pavilion. According to the *CEQR Technical Manual*, the lead agency may determine whether a shadow assessment is appropriate for projects that meet the following criteria:

1. a project's height increase is ten feet or less; and
2. a project is located adjacent to, or across the street from, a sunlight-sensitive open space resource, which is not a designated New York City Landmark or listed on the State/National Registers of Historic Places or eligible.

Because the other proposed flood alignment elements and interior drainage improvements would be below the screening threshold, no further analysis was warranted.

Preliminary Screening Assessment

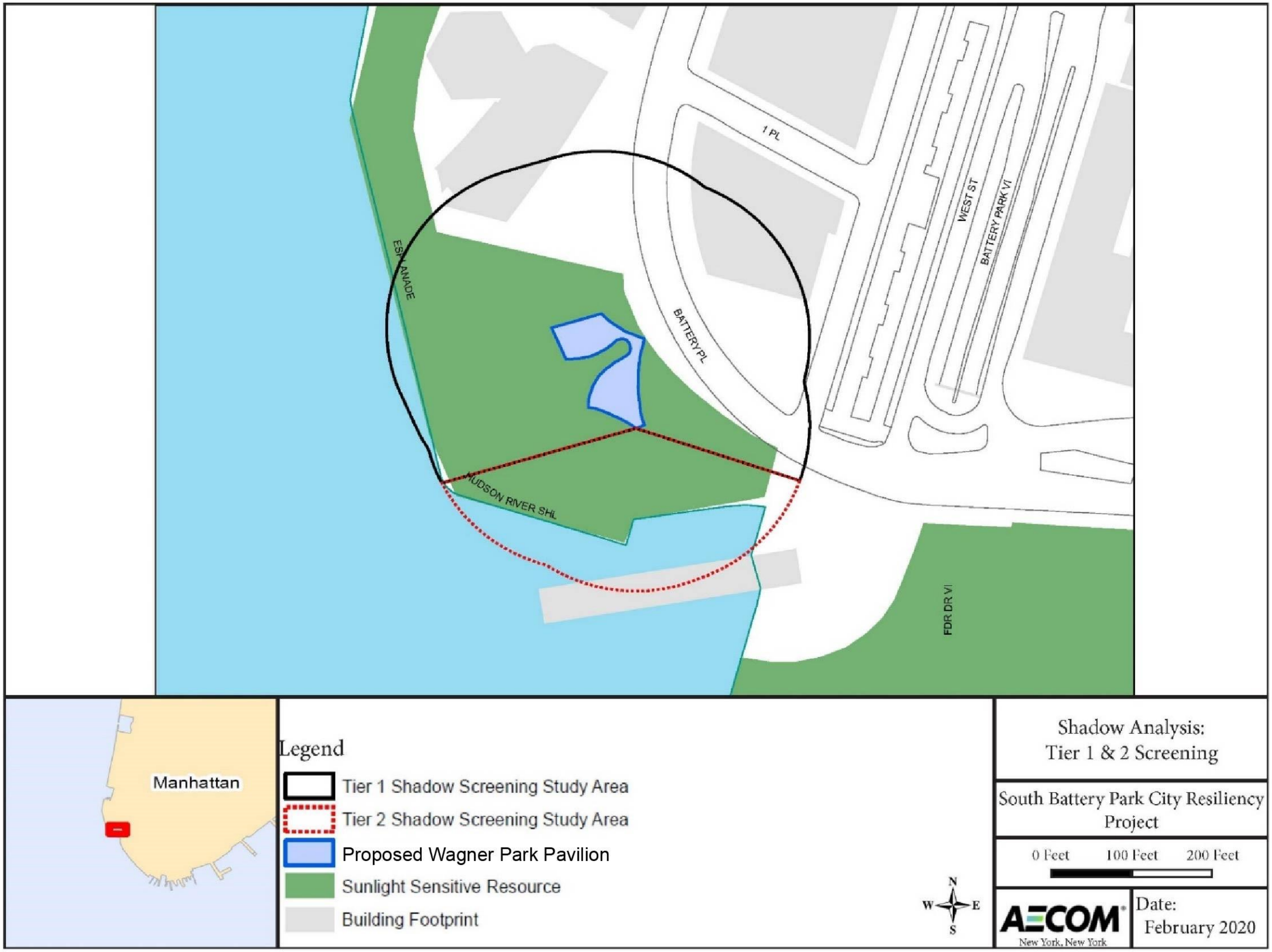
The shadow assessment begins with a preliminary screening assessment to ascertain whether a project's shadow may reach any sunlight-sensitive resources at any time of the year. If the screening assessment does not eliminate this possibility, a detailed shadow analysis is generally warranted in order to determine the extent and duration of the net incremental shadow resulting from the project. The effects of shadows on sunlight-sensitive resources are site-specific; therefore, the screening assessment and subsequent shadow assessment (if necessary) was performed for the new structure to be built in Wagner Park.

Tier 1 Screening Assessment

The first step in the preliminary shadow screening assessment is a Tier 1 Screening Assessment. A base map is developed that illustrates the proposed site location in relationship to any sunlight-sensitive resources. The Tier 1 Shadow Screening Study Area, the boundary of the longest shadow, is then determined, which encompasses the footprint of the proposed Wagner Park pavilion and a perimeter around the footprint with a radius equal to the longest shadow that could be cast by the pavilion. To find the longest shadow length, the maximum height of the structure (47 feet) is multiplied by the factor of 4.3.

The Tier 1 Shadow Screening Study Area for the Proposed Action has a radius of approximately 202 feet, encompassing portions of Wagner Park, Pier A and the Pier A inlet (see **Figure 3.3-1**), therefore a Tier 2 Screening Assessment was completed.

Figure 3.3-1: Tier 1 and 2 Screening Assessment



Tier 2 Screening Assessment

In accordance with *CEQR Technical Manual* guidance, if any portion of a sunlight-sensitive resource lies within the Tier 1 Shadow Screening Study Area, the boundary of the longest shadow, a Tier 2 Screening Assessment should be performed. Because of the path that the sun travels across the sky in the northern hemisphere, no shadow can be cast in a triangular area south of any given project site. In New York City, this area lies between -108 and +108 degrees from true north.

For a Tier 2 Screening Assessment, sunlight sensitive resources within the triangular area that cannot be shaded by a project, starting from the southernmost portion of the site covering the area between -108 degrees from true north and +108 degrees from true north, are screened out. The complementing portion to the north within the Tier 1 Shadow Screening Study Area is the area that can be shaded by a project. According to the Tier 2 Screening Assessment, the southern portion of Wagner Park, Pier A and the Pier A inlet are located within the triangular area that lies between -108 and +108 degrees and therefore screen out of further analysis (see **Figure 3.3-1**). Therefore, based on the results of the Tier 1 and 2 Screening Assessments, a Tier 3 Screening Assessment is warranted only for those portions of Wagner Park that are located outside of this triangular area.

Tier 3 Screening Assessment

A Tier 3 Screening Assessment is used to determine if project-generated shadows have the potential to reach a sunlight-sensitive resource. In order to determine whether the sun-sensitive features of the nearby resources would potentially be affected by shadows cast from the Proposed Action, a three-dimensional model was created surrounding the proposed Wagner Park pavilion.

The *CEQR Technical Manual* states that for the New York City area, the months of interest for an open space resource encompass the growing season (March through October) and one month between November and February (usually December) representing a cold-weather month. Representative days for the growing season are generally the vernal equinox (or the autumnal equinox, which is approximately the same), the summer solstice, and a spring or summer day halfway between the summer solstice and equinoxes. For the cold-weather months, the winter solstice is usually included to demonstrate conditions during cold-weather when people who do use open spaces rely most heavily on available sunlight for warmth. As representative of the full range of possible shadows, these months and days are used for assessing shadows on historic or natural sunlight-sensitive resources.

Assessments of the shadows cast during the following four representative dates were made in accordance with the *CEQR Technical Manual*: March 21/ September 21, May 6/ August 6, June 21 and December 21. As discussed in the preceding paragraph, the four analysis dates encompass the growing season as well as December, which represents a cold-weather month (and the longest shadow of the year). Under CEQR, shadows occurring within one and one-half hour of sunrise or sunset are not considered significant and thus were excluded from the screening assessment.

The results of the Tier 3 Screening Assessment are shown in **Figure 3.3-2**, **Figure 3.3-3**, **Figure 3.3-4**, and **Figure 3.3-5** and depict the extent and duration of shadows generated by the proposed Wagner Park pavilion on Wagner Park. The Tier 3 Screening Assessment results demonstrate that shadows from the proposed Wagner Park pavilion would fall within areas of Wagner Park on the March 21/ September 21, May 6/ August 6, June 21 and December 21 analysis dates, as they currently do from the existing pavilion.

According to the CEQR Technical Manual, a detailed analysis should be conducted to determine whether project-generated shadows would reach any sunlight-sensitive resources and, if so, to determine the extent and duration of new incremental shadows that fall on a sunlight-sensitive resource as a result of the Proposed Action. However, the Tier 3 Screening Assessment made it clear that the proposed Wagner Park pavilion would cast a shadow in Wagner Park, a sunlight-sensitive resource, eliminating the need for any further analysis. In addition, the Tier 3 Screening Assessment determined the extent and duration of shadows generated by the proposed Wagner Park pavilion as shown in **Figure 3.3-2**, **Figure 3.3-3**, **Figure 3.3-4**, and **Figure 3.3-5**. Pier A Plaza and Pier A inlet, which are other sunlight-sensitive resources in the Tier 1 Shadow Screening Study Area, would not experience incremental shadows cast by the Wagner Park pavilion because of their location south of the pavilion as shown in the Tier 2 Screening Assessment (see **Figure 3.3-1**).

The proposed Wagner Park pavilion with a height of 47 feet would be built in an overlapping location to the existing pavilion at a height of 37 feet, but the proposed pavilion would be constructed further east towards Battery Place. The proposed pavilion structure would be 47 feet tall at its highest point compared to the grade of the street level. To the north, west, and south of the proposed pavilion, Wagner Park would be elevated 12 feet, so the proposed pavilion would be 35 feet tall at the grade of the elevated Wagner Park. Because both structures would be located in similar positions, and the proposed pavilion would be constructed closer to Battery Place and further away from Wagner Park open space, both structures cast a similar shadow pattern on the same areas of Wagner Park. Visitors to this section of Wagner Park would have a similar experience with shadows cast from the proposed pavilion as they would with the existing pavilion. Therefore, the Proposed Action would have no significant adverse shadow impacts on Wagner Park.

Figure 3.3-2: Tier 3 Screening Assessment March 21st/September 21st

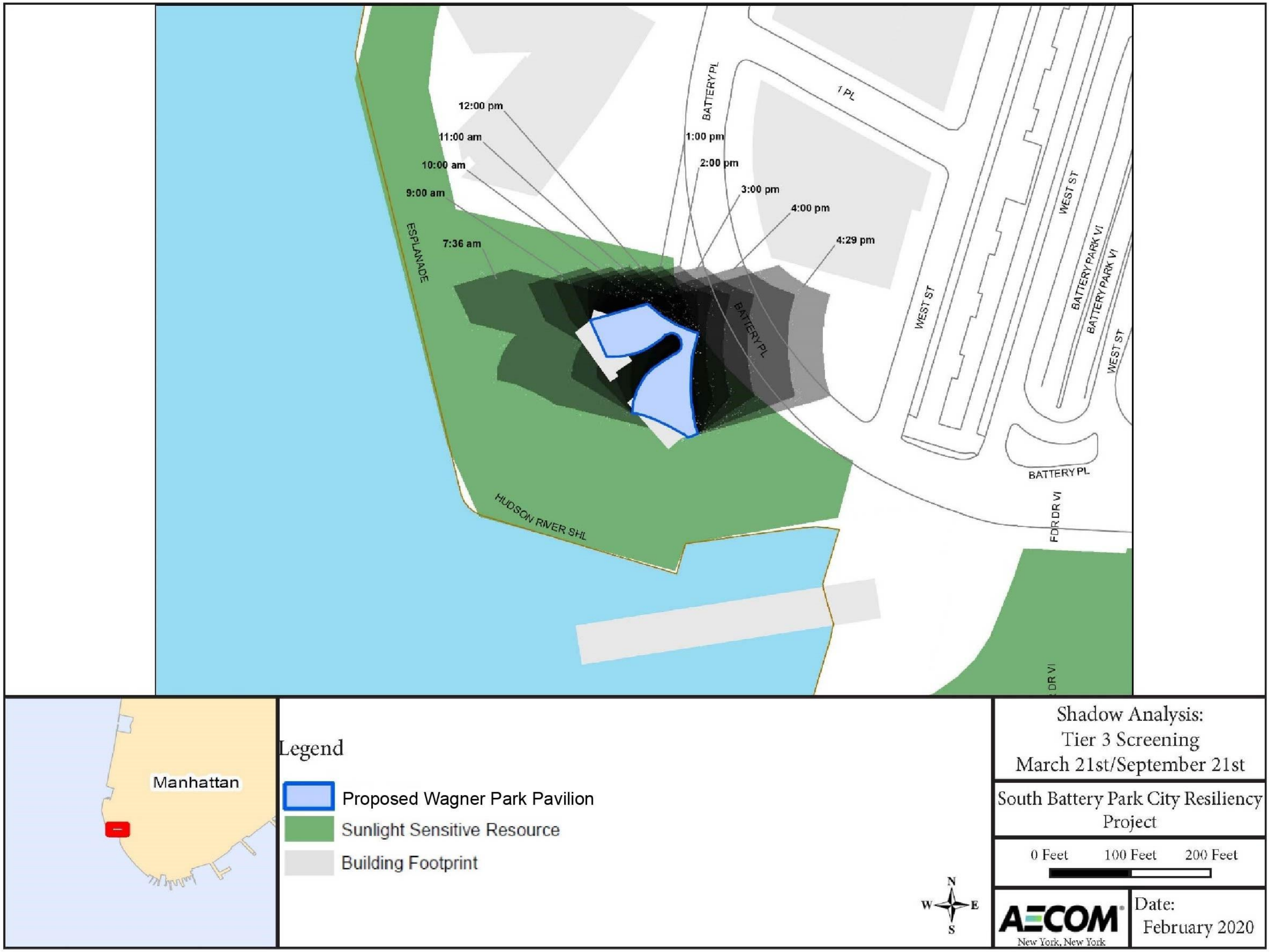


Figure 3.3-3: Tier 3 Screening Assessment May 6th/August 6th

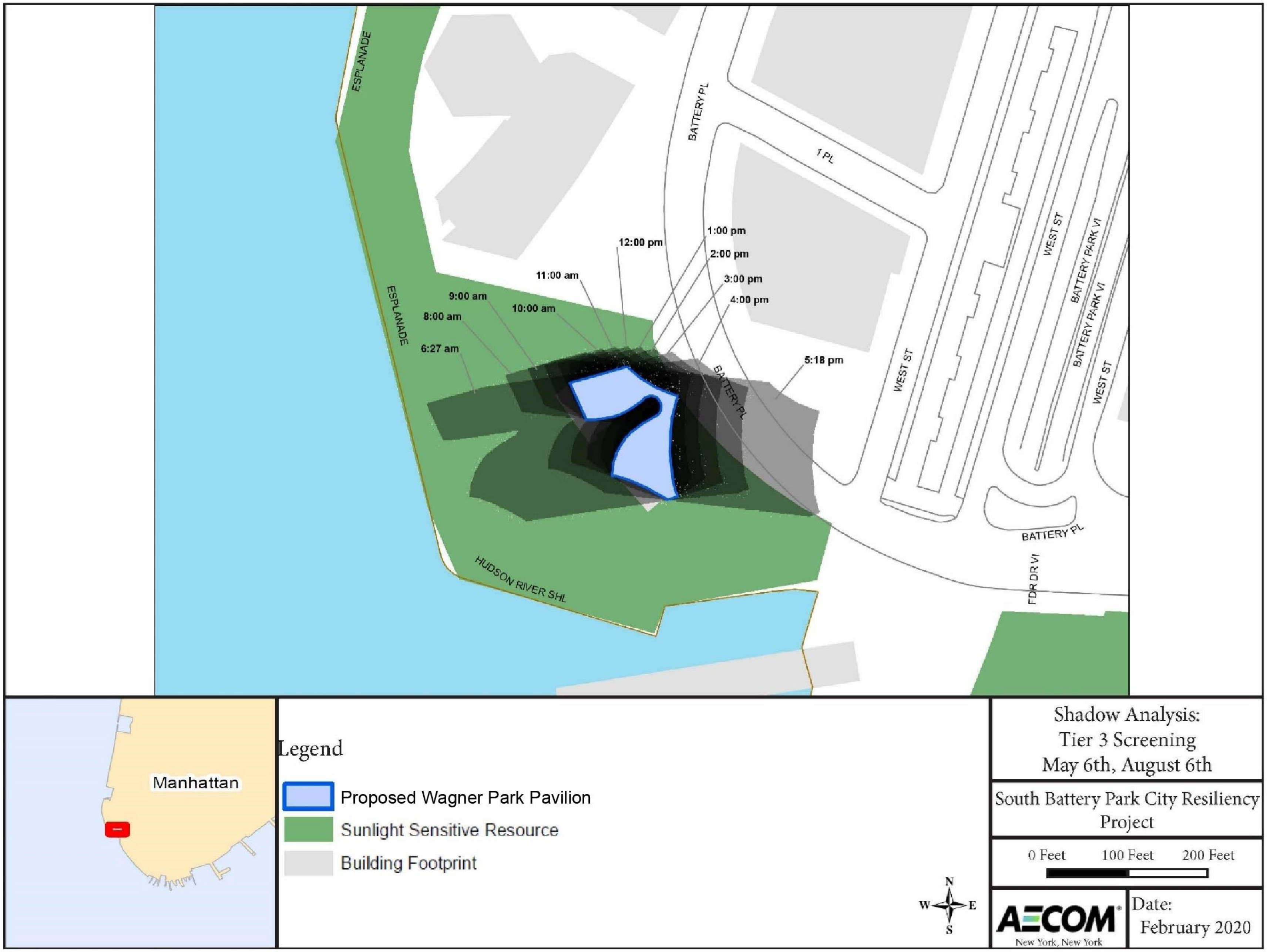


Figure 3.3-4: Tier 3 Screening Assessment June 21st

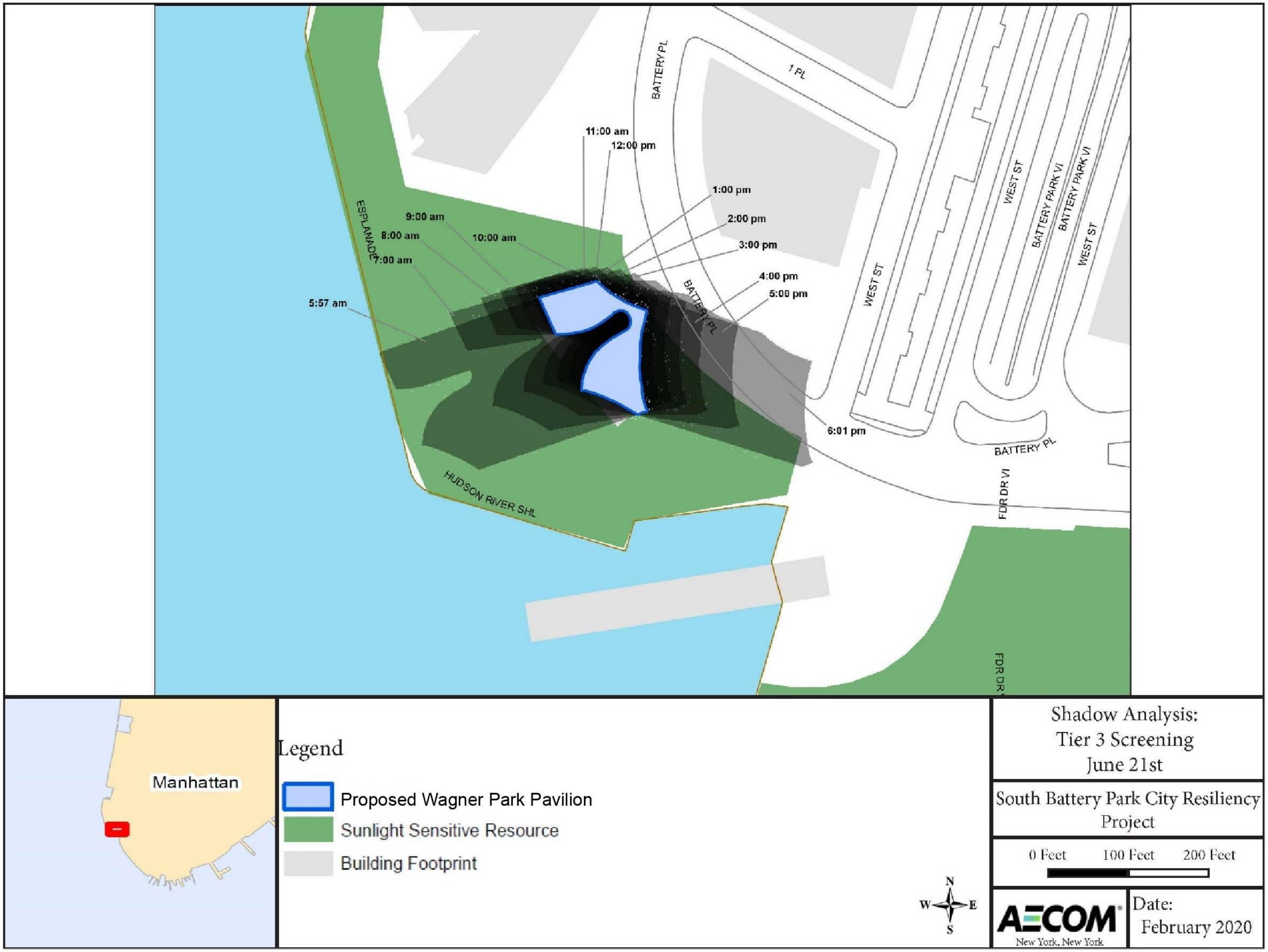
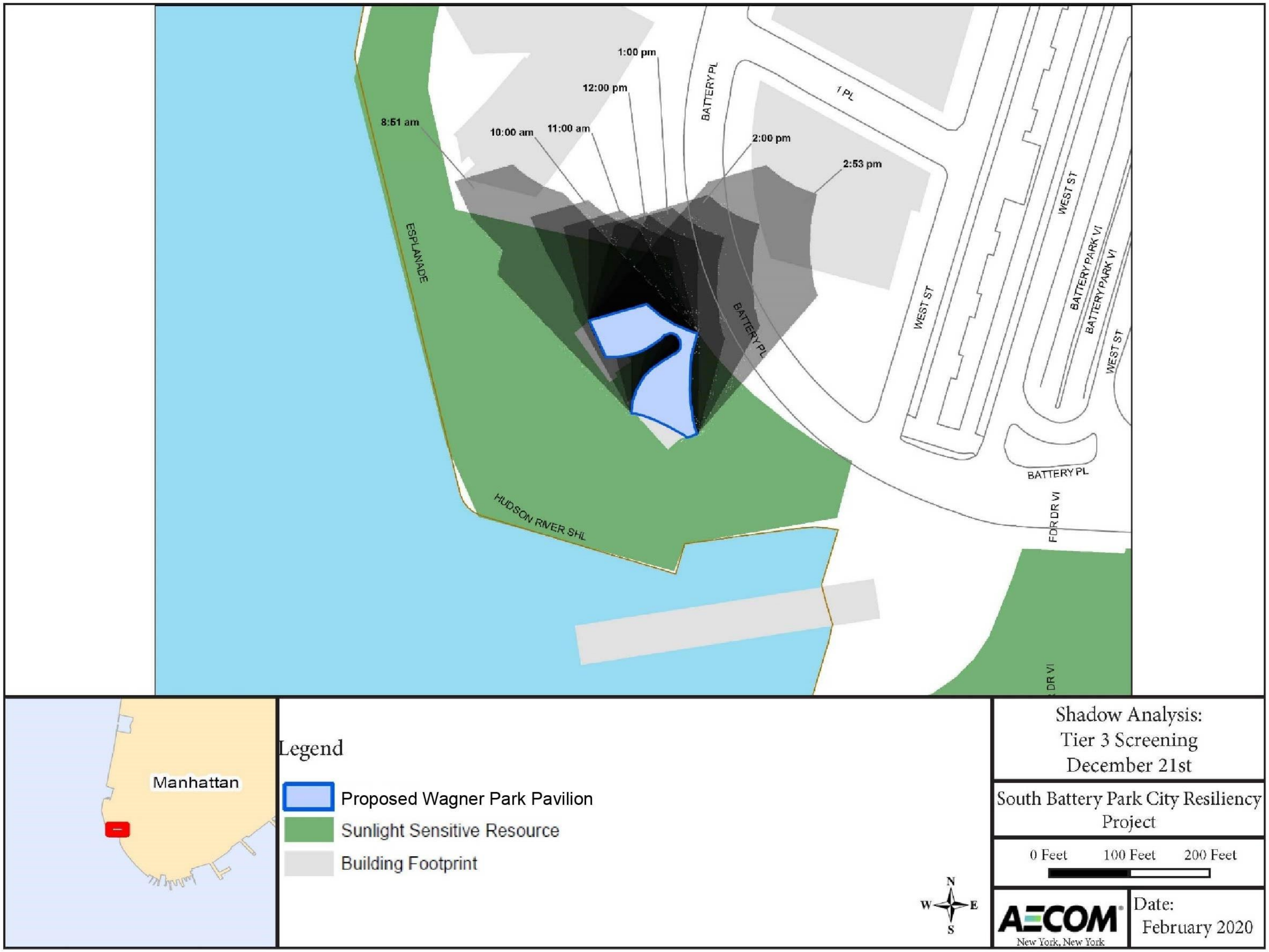


Figure 3.3-5: Tier 3 Screening Assessment December 21st



3.4 Historic and Cultural Resources

3.4.1 Introduction

BPCA, the lead agency, is proposing to undertake the SBPCR Project in the Borough of Manhattan in New York City, and is preparing this DEIS in accordance with the SEQR and Section 14.09 of the New York SHPA (Section 14.09). In addition, because a federal permit will be sought from the USACE for the proposed improvements in Pier A inlet, the project must also comply with Section 106 of NHPA. The USACE Section 106 review will be limited to the effects of the Pier A inlet improvements, while the Section 14.09 review will consider the entirety of the Proposed Action.

3.4.2 Regulatory Framework

3.4.2.1 Federal Regulations

The NHPA of 1966 was enacted to integrate consideration of cultural resources into the early stages of projects that are funded, licensed, or permitted by the federal government, collectively, an "undertaking." Under Section 106 of NHPA (54 USC 306108), prior to execution of a project, a federal agency or federally, licensed, permitted, or funded agency is required to consider the project's impact on historic properties, including any prehistoric or historic district, site, building, structure, or object that is included in, or eligible for inclusion in, the National Register of Historic Places (National Register). To qualify for inclusion in the National Register, cultural resources must be over 50 years old, retain integrity, and possess significance according to the four National Register criteria (i.e., A – Event; B – Person; C – Design/Construction; D – Information Potential). The National Register also includes seven criteria considerations for properties that are not usually considered for listing, but can be eligible for listing if they meet special requirements. Criteria Consideration G: Properties that have Achieved Significance Within the Past Fifty Years is applicable to resources that possess exceptional significance (National Park Service, 1992). Criteria Consideration G is relevant to the SBPCR Project as described in subsequent subsections.

Implementing regulations for Section 106, established by the Advisory Council on Historic Preservation (ACHP) (36 CFR Part 800), require that lead federal agencies consider the direct, indirect, and cumulative effects of their actions on any National Register-listed and/or National Register-eligible archaeological and historic architectural resources that have been previously identified within the APE, or identified within the APE as part of the Section 106 process.

Section 106 review will be limited to the effects of the Pier A inlet improvements which will be permitted by USACE. Under Section 106, if adverse effects to National Register-listed and/or National Register-eligible resources occur as a result of the undertaking, the regulation requires that lead federal agencies work toward resolving adverse effects and document that alternatives to avoid or minimize impacts have been considered. If adverse effects cannot be avoided, these agencies would collaborate with the SHPO, other consulting parties, and the ACHP if they wish to participate, to develop and implement measures to mitigate such effects.

3.4.2.2 New York State Regulations

At the state level, SEQR requires all state and local government agencies to consider environmental impacts equally with social and economic factors during discretionary decision-making. The involved agencies must assess the environmental significance of all actions they have discretion to approve, fund, or directly undertake.

Section 14.09 of the New York SHPA was passed in 1980 as a counterpart to the federal NHPA of 1966, and declares historic preservation to be the public policy of, and in the public interest of, the state. The SHPA created the State Register, the official list of resources significant in the history, architecture, archeology or culture of the state, its communities, or the nation. The act requires State agencies to consult with the commissioner if it appears that any project which is being planned may or will cause any change, beneficial or adverse, in the quality of any historic, architectural, archeological or cultural property that is listed on the National Register or property listed on the State Register or that is determined by the commissioner to be eligible for listing on the State Register of Historic Places. It requires State agencies, to the fullest extent practicable, consistent with other provisions of the law, to avoid or mitigate adverse impacts to such properties, to fully explore all feasible and prudent alternatives and to give due consideration to feasible and prudent plans which would avoid or mitigate adverse impacts to such property. It establishes agency preservation officers for the purpose of implementing these provisions.

3.4.2.3 New York City Regulations

CEQR is New York City's process for implementing SEQR. According to the *CEQR Technical Manual*, an assessment of archaeological and historic architectural resources is generally required for any project funded, directly undertaken or approved by a New York City agency which involves new construction, demolition, or any in-ground disturbance. In New York City, the NYC LPC functions as the city's expert technical agency for historic and cultural resources.

CEQR defines archaeological resources as physical remains, usually subsurface, of the prehistoric, Native American, and historic periods. CEQR defines architectural resources as historically important buildings, structures, objects, sites, and districts. Architectural resources include properties designated as Landmarks and Historic Districts by the NYC LPC, properties calendared for consideration as Landmarks or Historic Districts by NYC LPC; properties listed on or formally determined eligible for inclusion on the State and/or National Register, or contained within a district listed on or formally determined eligible for inclusion on the State/National Register; properties recommended for listing in the State/National Register by the New York State Board for Historic Preservation; NHLs; and properties not identified by these programs, but that meet their eligibility requirements as determined by the SHPO. It should be noted that while the National Register protects resources that meet eligibility criteria over 50 years old, the New York City Landmarks Law protects resources that meet eligibility criteria over 30 years old.

If it is determined that the project would significantly impact archaeological and historic architectural resources, BPCA would collaborate with SHPO and NYC LPC to develop and implement measures to mitigate such effects.

3.4.3 Project Actions

A detailed project description is provided in Chapter 1 (Background and Project Description) of this DEIS and identifies key project actions across the five Project Area segments, and associated interior drainage improvement areas. Please refer to Section 1.2 (Purpose and Need for the Proposed Action) for further details on the type of flood alignment infrastructure proposed for each segment. For easy reference within this section, please see **Figure 3.4-1** and **Figure 3.4-2** below illustrating major project actions throughout the Project Area.

3.4.4 Area of Potential Effects

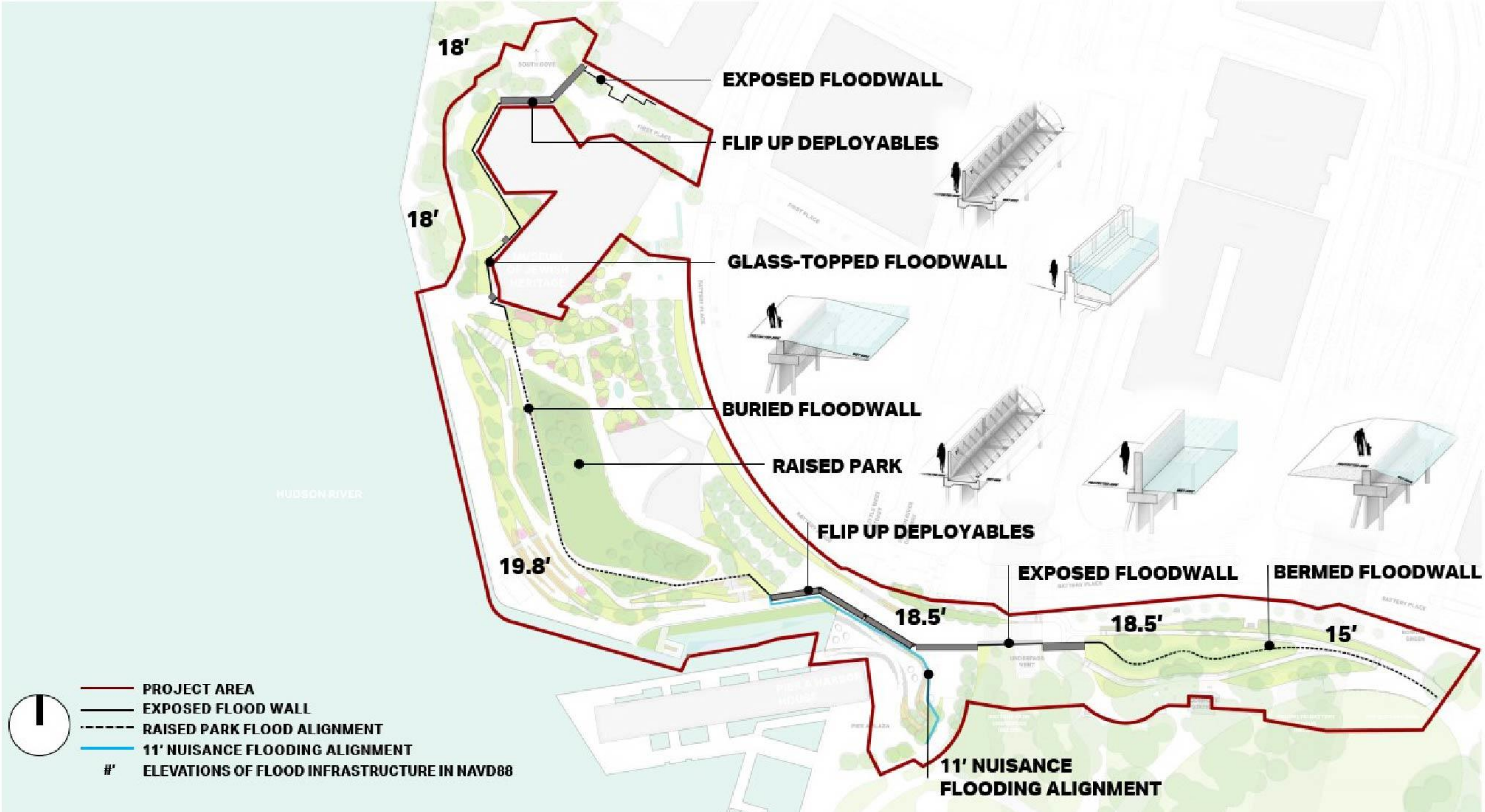
An initial step in assessing the potential impacts to historic resources is to determine the APE. Section 106 defines the APE as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if such properties exist" (36 CFR § 800.16[d]). Section 14.09 refers to this as the project impact area; however, for purposes of this document, all such areas will be referred to as APEs. The APE is influenced by the scale and nature of an undertaking and may vary for different kinds of effects caused by the undertaking. Accordingly, the APE for purposes of the USACE's Section 106 review is limited to the improvements associated with the Pier A inlet, while Section 14.09 review will consider the entirety of the Proposed Action. Archaeological and historic architectural APEs have been delineated to take into account potential direct effects of the Proposed Action on archaeological resources, and potential direct and indirect effects of the Proposed Action on historic architectural resources. Archaeological and historic architectural APEs were developed for the project as described below.

3.4.4.1 Archaeological Area of Potential Effects

Archaeological resources are subject to direct effects caused by subsurface disturbances to previously undisturbed soils or minimally disturbed soils associated with the execution of the Proposed Action. The Archaeological 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.

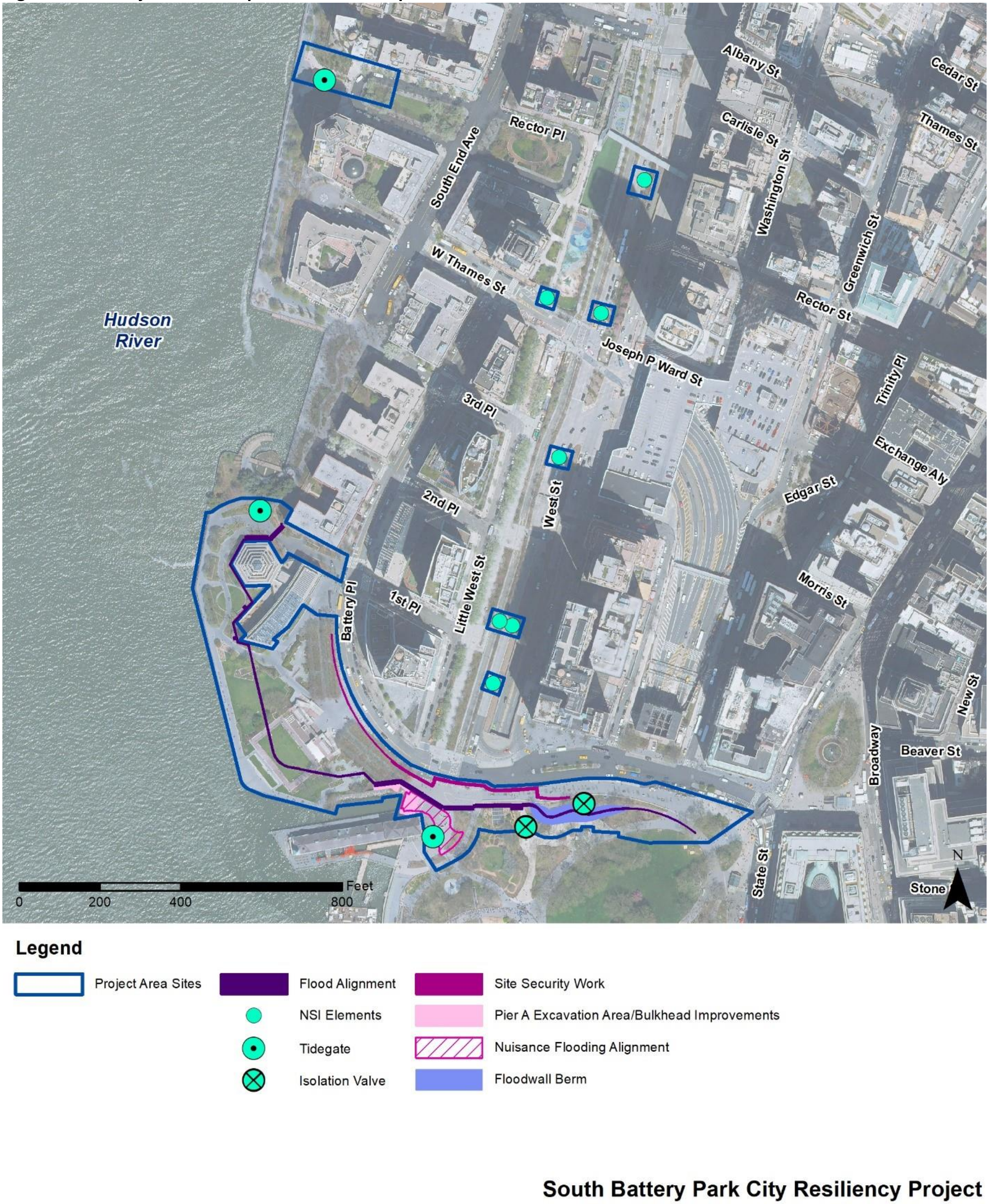
The Proposed Action includes alterations to 1st Place, Wagner Park, Pier A Plaza, the area traversed by the Battery Bikeway in the northern portion of The Battery, and existing infrastructure locations along the Hudson River Greenway and West Street (Route 9A) north of Battery Place, namely through installation of the flood alignment components, utility relocations, and drainage improvements including the NSI System modifications to three regulator chambers, one emergency sanitary sewer overflow chamber, four interceptor manholes, and three regulator underflow slide gates (see **Figure 3.4-2**). The Proposed Action would create varying levels of ground disturbance, each of which could directly impact potential archaeological resources.

Figure 3.4-1: SBPCR Project Flood Alignment and DFEs



Note: The 11’ Nuisance Flooding Alignment in Pier A Plaza represents the tie-in point with The Battery Park Coastal Resilience Project that is being undertaken by NYCEDC in The Battery. This alignment would also serve to minimize low levels of inundation (i.e., 1 to 4 inches possibly caused by unusually high tides or minor storm events) that do not typically pose significant threats to public safety or infrastructure.

Figure 3.4-2: Project Area Proposed Action Components



The Project Area includes modern landfill, historic landfill, historic shoreline and a small portion of fast land at its extreme inland end. SBPC and Wagner Park are located on modern landfill and of no archaeological interest. However, other portions of the Project Area, including Pier A Plaza, the northern portion of The Battery adjacent to Battery Place, and the NSI interior drainage improvement locations along the Hudson River Greenway and West Street, are composed of historic landfill sequences and associated bulkheads that extended the Manhattan shoreline westward into the Hudson River. In addition, The Battery grounds contain former shorelines and associated military defenses (The Battery grounds and bulkhead walls). Therefore, the proposed Archaeological APE for the Proposed Action is the footprint of the project actions that would create subsurface disturbance within Pier A Plaza, the northern portion of The Battery adjacent to Battery Place, and the NSI interior drainage improvement locations along the Hudson River Greenway and West Street above Battery Place. **Figure 3.4-3**, **Figure 3.4-4**, and **Figure 3.4-5** depict the archaeological APE with the project actions that would create subsurface disturbance depicted individually in the legend.

Figure 3.4-3: Archaeological Area of Potential Effects – Pier A Plaza Proposed Action

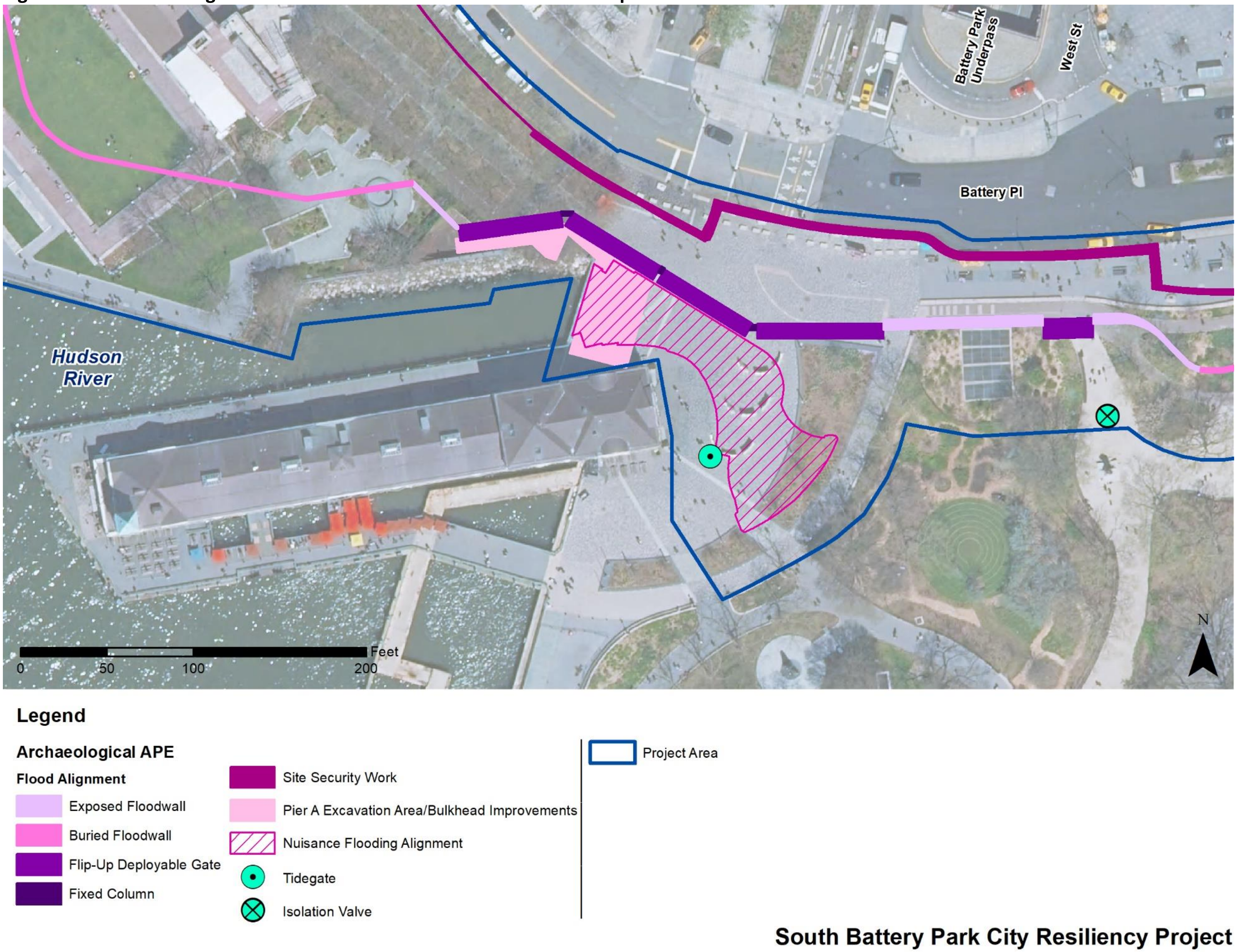


Figure 3.4-4: Archaeological Area of Potential Effects – The Battery Proposed Action

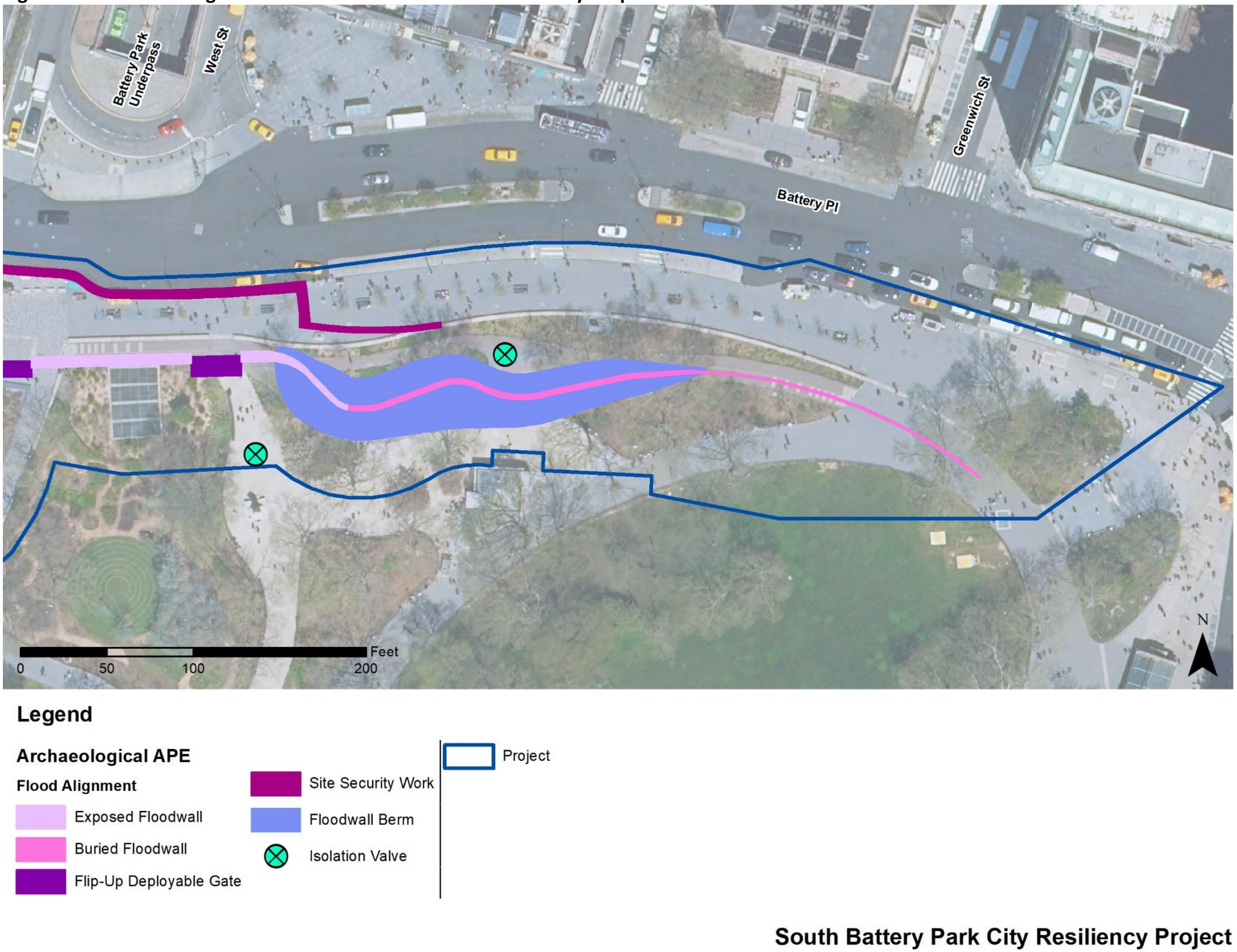
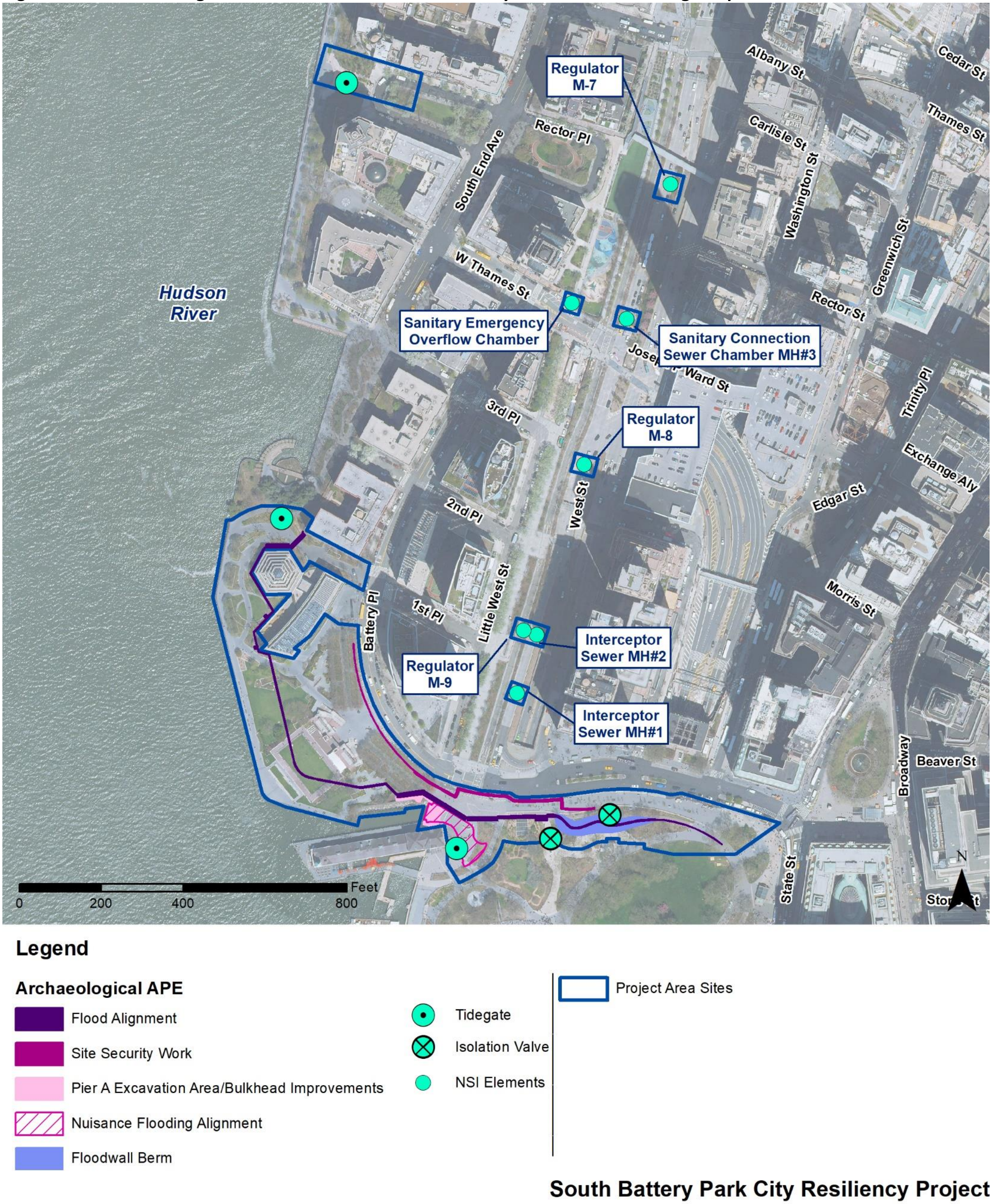


Figure 3.4-5: Archaeological Area of Potential Effects – NSI System Interior Drainage Improvements



3.4.4.2 Historic Architectural Area of Potential Effects

The Historic Architectural APE for the Proposed Action includes all areas where the action may cause changes to land or structures and their uses, including the area of ground disturbance caused by the action, and locations from which elements of the undertaking may be visible (see **Figure 3.4-6**). The Project Area includes both parkland, a dense urban neighborhood, including historic and contemporary commercial buildings, and historic and contemporary high-rise residential buildings.

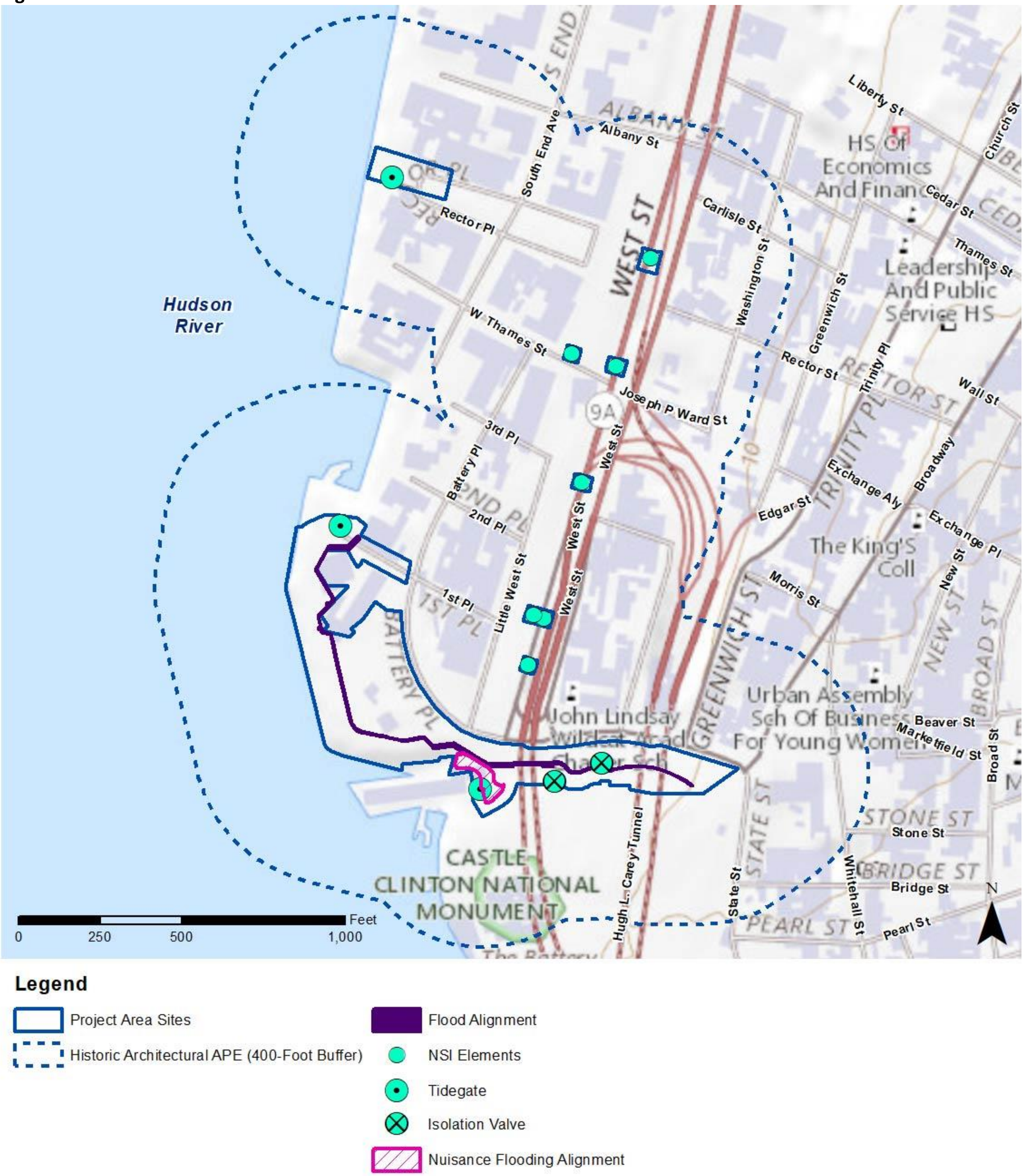
The Historic Architectural APE forms a 400-foot buffer around the Project Area and flood alignment. According to *CEQR Technical Manual* guidelines, historic resources study areas are generally defined as the project site plus a 400-foot radius around the Project Area. Therefore, the 400-foot APE is adequate to take into account potential direct effects of the proposed flood alignment, extends through the southern portion of Battery Park City, spanning from existing high points near 1st Place and the Museum of Jewish Heritage, through Wagner Park and abutting Pier A Plaza, and along the north side the Battery Bikeway in The Battery, to the higher ground near the intersection of Battery Place and State Street. It also takes into account the proposed location of the interior drainage improvements, and other improvements such as subsurface tidegates on Rector Street and 1st Place in Battery Park City, and outside Battery Park City at Pier A Plaza; and subsurface valves in The Battery, south of the flood alignment. The proposed APE also takes into account indirect visual effects, premised upon the concept that views toward the Statue of Liberty, and New York Harbor, would be preserved by the SBPCR Project.

3.4.4.3 SHPO and NYC LPC Consultation

On behalf of BPCA, AECOM initiated consultation with SHPO and NYC LPC on March 26, 2020, by providing a consultation initiation package that included a project description and identification of historic architectural and archaeological resources within and in the general vicinity of the APEs. It also explained the extent and nature of the SBPCR Project, including the need for in-ground construction.

On April 10, 2020, NYC LPC responded by concurring with the preliminary archaeological assessment provided in the consultation package. NYC LPC agreed that the following sections of the Project Area possess the potential for encountering 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 above Battery Place. Therefore, the NYC LPC recommended that a Phase IA archaeological documentary study be completed to further assess this potential in compliance with the 2018 Guidelines for Archaeological Work in New York City (Sutphin April 10, 2020).

Figure 3.4-6: Historic Architectural Area of Potential Effects



South Battery Park City Resiliency Project

On April 13, 2020, NYC LPC provided a response concerning historic architectural resources. The agency noted that it "concurs with the recommendations of AECOM in a letter dated March 26, 2020, to the SHPO that the project areas contain properties listed and/or eligible for Local, State and National Registers." (Frye, April 13, 2020).

On April 23, 2020, SHPO concurred with NYC LPC's request that a Phase IA archaeological background and sensitivity assessment report be prepared for the project. In addition, SHPO concurred with the proposed Archaeological APE. SHPO also concurred with the consultation package assessment that the 1st Place, Wagner Park, and Museum of Jewish Heritage portions of the project area are not archaeologically sensitive. With respect to historic architectural resources, SHPO agreed with the Historic Architectural APE. The agency also requested information on the history of Battery Park City and Wagner Park, resources that are both less than 50 years old.

On January 19, 2021, cultural resources consultant AKRF provided a response to SHPO via the agency's online Cultural Resource Information System (CRIS). The response provided additional information on the history and design of Wagner Park and Battery Park City. On February 23, 2021, SHPO indicated that "Wagner Park is significant under National Register Criterion A in the area of community and urban planning, under Criterion C in the areas of landscape architecture and architecture, and meets the standard for exceptional significance necessary to satisfy National Register Criteria Consideration G for properties less than fifty years old" (Cumming, February 23, 2021).

On September 29, 2021, BPCA provided the SBPCR Project SEQR Environmental Assessment Form and DEIS Draft Scoping Document to SHPO and NYC LPC for review. In addition, on October 7, 2021, AECOM submitted to SHPO the Wagner Park Alternatives Analysis Memorandum, and key construction plans for the Wagner Park segment of the SBPCR Project. The purpose of the memorandum is to demonstrate to SHPO that of the three alternatives under consideration for the Wagner Park segment of the SBPCR Project, only the Proposed Action meets project purpose, need, and objectives, and all three alternatives result in an Adverse Impact on Wagner Park.

On October 4, 2021, NYC LPC responded that the scoping document appears acceptable for historic and cultural resources (Santucci, October 4, 2021). On October 19, 2021, SHPO concurred that the three alternatives would have an Adverse Impact on the park, including the Proposed Action, and indicated that the scoping document was acceptable with respect to archaeological resources. They also requested additional information "supporting the conclusion that that the pavilion cannot be rehabilitated, elevated, and retrofitted for flood-resiliency, and integrated into the new park design" because that could potentially "meet the stated project goal of providing sustainably designed and carbon-neutral park structure" (Brazee, October 19, 2021). On January 18, 2022, AECOM submitted a response to SHPO which indicated that elevation of the Pavilion in place, or relocation inland are not prudent and feasible alternatives because they do not meet the SBPCR Project's purpose and need, and do not avoid an Adverse Impact on Wagner Park. SHPO considered the alternatives and inquired in a letter dated February 9, 2022 (see **Appendix B**) if the existing Pavilion could be retained. An analysis was performed by the Project Team, as well as third-party evaluations by three consulting/engineering firms (Watts Architects & Engineers, KPFF Engineers, and Nicholas Brothers, Inc.) to review of the feasibility of elevating and relocating the existing Pavilion. These materials can be found in **Appendix B**. After review of the feasibility report and analysis summarized above, SHPO concurred that there were no prudent or feasible alternatives to the preferred alternative that would avoid or minimize harm to the existing Pavilion in Wagner Park, as reflected in a letter dated April 27, 2022 (see **Appendix B**).

The Phase IA Archaeological Documentary Study report was submitted to SHPO for review on January 17, 2022. The report recommended that archaeological monitoring during construction be conducted for two discrete areas of the larger Archaeological APE. SHPO responded on January 28, 2022, and concurred with the Phase IA report recommendations. The response letter stated: "The SHPO concurs with the report recommendations summarized below.

- Archaeological monitoring during construction of the flip up deployable gate at Pier A Plaza.
- Archaeological monitoring during construction of the NSI system between sanitary connection sewer chamber MH #3 and the emergency overflow chamber." (Lloyd January 28, 2022)."

Copies of all correspondence and the Wagner Park memorandum packages are included in **Appendix B**.

3.4.5 Affected Environment – Archaeology

3.4.5.1 Archaeological Resources

For archaeological sites, the *CEQR Technical Manual* guidelines suggest a 0.5-mile search area around the Project Area for previously identified precontact archaeological resources and an adequate search radius for historic archaeological resources around the Project Area that accommodates inclusion of similar environmental conditions. A 0.25-mile search area was employed for historic archaeological resources.

While extensive disturbance within the APE portion of The Battery has occurred due to transportation infrastructure improvements across the area (Battery Park Underpass, Hugh L. Carey Brooklyn-Battery Tunnel, IRT Subway Lines), the tenacity of archaeological resources has been demonstrated in recent years with the documentation of intact sections of the 18th-Century Battery walls during archaeological excavations for the New South Ferry Terminal Subway Project.

To illustrate the archaeological resources that could be encountered within the APE, as well as the extensive disturbances that have occurred as a result of transportation infrastructure improvements, **Figure 3.4-7** is compiled from the 2010 and 2011 Geismar reports for The Reconstruction of Battery Park and Perimeter Bikeway Borough of Manhattan, County of New York. The information concerning the locations of the 1755 Battery wall segments was originally compiled by Geismar from information courtesy of AKRF and the MTA (AKRF et. al. 2010).

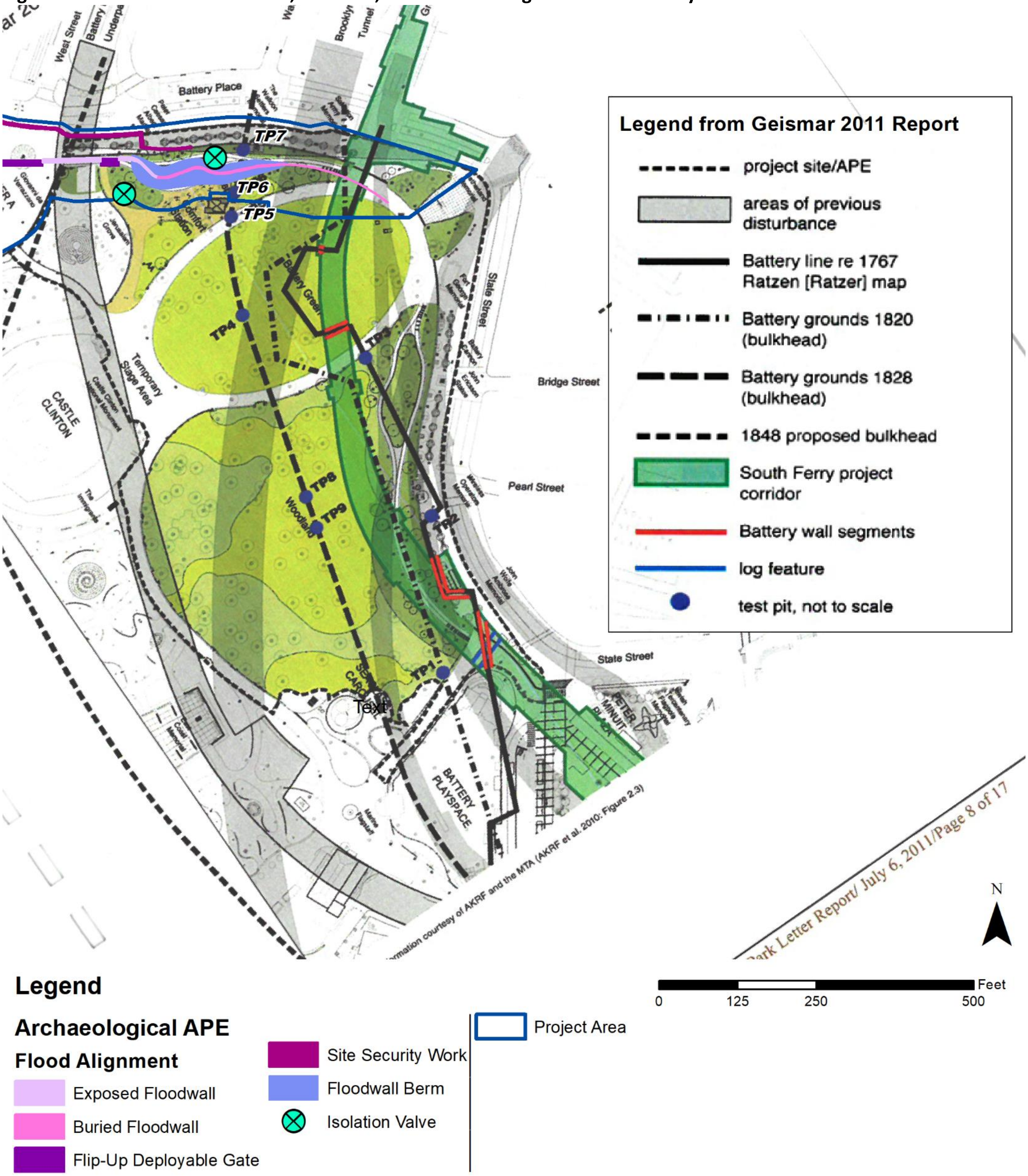
Previously Identified Archaeological Sites

The Archaeological APE was researched in the SHPO's CRIS website in compliance with Section 106, SEQR, and CEQR. The search area for historic archaeological resources was a 0.25-mile-radius surrounding the Project Area, and the search area for prehistoric archaeological resources was a 0.5-mile-radius surrounding the Project Area. **Table 3.4-1** presents the known archaeological 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.

Multiple sites were identified in the 18th-Century landfill within the present-day boundaries of The 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 (see **Figure 3.4-7**). 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 (see **Figure 3.4-7**). The National Register status of this feature remains undetermined.

Figure 3.4-7: Historic Disturbance, Features, and Prior Testing across The Battery



Source: Geismar 2011

South Battery Park City Resiliency Project

The archaeological survey for The Battery Playscape project identified a section of cut stone wall in the southeast portion of Battery Park, west of Peter Minuit Place. This feature is likely another section of the 18th-Century Battery Wall (see **Figure 3.4-7**). 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.

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.

In the northern portion of the 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. To the north of the Project Area, the Liberty Street Pilings Site 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 a former structure. The site is dated ca. 1857-1903. The Liberty Street Pilings site has been determined National Register eligible. The WTC Ship Site is bounded by Liberty, West (Route 9A), Cedar, Washington, Albany, and Greenwich Streets. Archaeological monitoring for the excavation of the Vehicular Security Center on two blocks adjacent to the south side of the World Trade Center Site identified curved timbers of what proved to be the stern of a buried ship. Located today at a considerable distance inland, the remains were located in a former slip of a former commercial pier/wharf area along the Hudson River shoreline. The WTC Ship was discovered at a depth between 20 and 30 feet below modern street grade. Analysis suggests the ship was constructed during the period of the late-1770s to 1780s, possibly in Philadelphia and in the style of a Hudson River Sloop. Artifact analysis suggests the ship was incorporated as landfill during the 1790s. It was likely built for local river trade, but shipworm analysis revealed that she had plied much warmer waters, probably those of the Caribbean. The WTC Ship was determined by SHPO to be National Register-eligible upon discovery, and data recovery excavation was completed as mitigation, because the continued excavation for the Vehicular Security Center would directly impact this 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, 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 6 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/NHLs. These sites include Federal Hall at 26 Wall Street and Castle Clinton in The Battery. The archaeological potential of the Federal Hall Archaeological Site predates the construction of the existing building at 26 Wall Street. The Phase IB survey conducted at this site encountered portions of the foundation of an earlier building on the site and recovered associated mid-18th-Century artifacts. The resources were determined not eligible for listing in the National Register. Archaeological monitoring was conducted during the geotechnical testing program of the foundation repairs. No National Register-eligible resources were encountered during the monitoring.

Table 3.4-1: 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	19^{th} 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	17^{th} -19^{th} 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	17^{th} - 18^{th} Century Historic	Part fast land/ part early landfill block of 18^{th} Century residences	Excavated
06101.001272	64 Pearl Street Site	17^{th} Century Landfill	64 Pearl Street	Late 17^{th} Century Historic	Artifacts dating to the last quarter of the 17^{th} Century	Excavated
06101.001282	Broad Financial Center (Ronson Project Site 33 Whitehall)	17^{th} Century fast land site	Bounded by Pearl, Whitehall and Bridge Streets	17^{th}-19^{th} C Historic Occupations	Four 17^{th} Century structures; 6 features identified; 43,318 artifacts recovered	Excavated
06101.015768	18^{th} Century Battery	Structure	South Ferry Corridor in	Ca. 1730-1789	4 sections of cut	Eligible

SHPO/NYSM Site Number	Resource Name	Resource Type	Location/Address	Date/Time Period	Description	National Register Status
	Wall		Battery Park		sandstone and schist stone wall; mid-18th C artifacts recovered	
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 commercial pier area developed before and after Hudson River	Eligible

SHPO/NYSM Site Number	Resource Name	Resource Type	Location/Address	Date/Time Period	Description	National Register Status
					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

Previously Conducted Surveys

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 Battery Park and LaGuardia Airport (Geismar 1986:4).

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.

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 Battery Park. 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 Battery Park. 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 Battery Park 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 Battery Park 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 2010. 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 (see **Figure 3.4-7**). 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.

Following upon the archaeological investigations for the New South Ferry Terminal Project and the identification of segments of the 18th-Century Battery wall, 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, visited the excavations and 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.

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 Parks, 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 would 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 project area where prior disturbance could not be documented. 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 (LMDC). 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 provisions and outline procedure for Data Recovery excavations, should significant resources be encountered.

3.4.6 Environmental Impacts on Archaeological Resources

Archaeological resources are subject to direct effects of the Proposed Action. Subsurface disturbances associated with excavation for implementation of project components have the potential to directly impact known as well as potential archaeological resources. The Phase IA documentary study of the Project Area was requested by the NYC LPC and SHPO. An important objective of the Phase IA study is to develop an assessment of the potential for encountering National Register-eligible archaeological resources within the APE.

3.4.6.1 Phase IA Archaeological Documentary Study

The assessment of the archaeological potential of the Project APE involved completion of several tasks including a visual survey, historic cartographic research, the synthesis of information derived from previous archaeological survey work completed for the Project Area, additional project-specific archival, documentary, and photographic research, review of original studies related to the proposed construction of Battery Park City, and the analysis of all collected information. A copy of the Phase IA Archaeological Documentary Study is included as **Appendix B.**

Research Design

The primary objective of the Phase IA archaeological 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 known archaeological resources that are located within 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 and integrity of potential archaeological resources.
- Determine whether additional archaeological work is necessary, either by additional research, Phase IB subsurface testing, or archaeological monitoring during construction.

Methods

The Phase IA archaeological assessment is organized by dividing the APE into three geographic sections: Pier A Plaza, the northern portion of The Battery, and the NSI System drainage improvement locations area along the Hudson River Greenway/West Street (Route 9A) north of Battery Place. Doing so provides for a systematic presentation of the results of the research into the historical development balanced against the historic and modern disturbances documented, in order to determine the areas of potential sensitivity for each section.

Types of Prior Disturbance

Historic Pier Construction and Reconstruction

The Hudson River piers were constantly being updated and reconfigured through time to meet the demands of trade as more and larger vessels were being used. Review of historic maps shows the evolution of the number and size of piers along the Hudson River as the shoreline was pushed out and old piers were either removed and rebuilt or extended and new piers were built.

Modern Bulkhead Construction

The modern bulkhead system was initiated in 1871 by the New York City Department of Docks. According to an 1873 Department of Docks map, the modern bulkhead project would have required substantial landfill along the river side of West Street (Route 9A). The bulkhead project included the widening of West Street and a "Marginal Street" to be added to provide pedestrian and vehicular access to the piers and bulkhead.

Dredging

Dredging is a required feature of port maintenance to remove the accumulated mud and debris (cultural material) from channels and slips. Each dredging episode would remove some of the river bottom underlying the mud and debris and could have impacted archaeological resources. However, the frequency of such dredging episodes and the depths to which it was accomplished were not usually recorded prior to the 20th Century.

Utility Installations

Multiple utility lines, including water, sewer and stormwater mains have been installed across the Project Area. In addition to these mains, gas, telephone, electric, and other telecommunication lines have also been installed. The potential impacts to archaeological resources by existing utility lines is limited by the size of the line and the depth and width of the trench required for installation.

Research on the existing utility lines and their impacts on potential archaeological resources across the APE are documented in the Phase IA assessment report.

Transportation Improvement Projects

Several transportation improvement projects have been completed within and in the vicinity of the Project Area. The improvements include:

- The IRT # 4/5 subway tunnel and station
- The IRT #1 South Ferry subway tunnel and terminal
- Brooklyn-Battery Tunnel (Hugh L. Carey Tunnel)
- Battery Park Underpass
- Elevated West Side Highway
- At-grade West Side Highway

Potential Resources

Historic Piers, Landfill Retaining Structures and Bulkheads

The 18th and 19th-Century historic bulkheads along The Battery were used as devices for retaining fill, as land making episodes pushed the shoreline further and further out into the Hudson River.

The Project Area above The Battery was gradually filled in incorporating structures built using a variety of bulkhead, pier and wharf building techniques. As bulkheads, wharves and piers were built, slips and channels between piers were created. As land making activity continued and the bulkheads, wharves and piers were rebuilt and replaced, the slips and channels between piers were filled in, making the completion of the Washington Street and West Street (Route 9A) corridors possible.

3.4.6.2 No Action Condition

The No Action Condition assumes that the Proposed Action would not be constructed, however, other planned projects within the Study Area would be constructed including the following:

- The Battery Coastal Resilience Project (NYCEDC)
- Battery Park Underpass and West Street Underpass Project (NYCDOT)

The No Action Condition would have no effect on potential archaeological resources within the SBPCR Project APE, as existing conditions would remain as is, and no subsurface disturbance would be created. In addition, any additional projects that would be undertaken in proximity to the SBPCR Project would be subject to their own environmental review process per NEPA, SEQR and/or CEQR, and be subject to related Section 106/14.09 requirements.

3.4.6.3 Proposed Action

The following section summarizes the potential effects of the Proposed Action on archaeological resources for each project segment.

1st Place, Museum of Jewish Heritage and Wagner Park

The subsurface disturbance to 1st Place west of Battery Place, the Museum and Wagner Park would take place within the 20th-Century landfill placed to construct Battery Park City and is not of archaeological concern.

Pier A Plaza

It is noted that the installation of the flood alignment components across Pier A Plaza have the potential to impact 19th-Century historic piers, wharves, slips, and bulkheads that were installed during the mid to late-19th Century, in association with the construction of the modern bulkhead, and further filled during the 20th Century to enable construction of Battery Park City.

The Battery

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 subject to impacts as a result of the Proposed Action.

Near Surface Isolation System Interior Drainage Improvements

The NSI system concept involves pressure-proofing and replacing various near-surface sewer system elements connected to the existing South Interceptor Main that runs north-south through the Project Area above Battery Place. 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 components of the NSI drainage improvements above Battery Place include modifications to three regulator chambers, one emergency sanitary sewer overflow chamber, four interceptor manholes, and three regulator underflow slide gates. These existing infrastructure components of the NSI System require modifications to resist uplift and be watertight during storm events. It is anticipated that the extent of construction activities necessary to meet these project goals would 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 acknowledged that the construction of the existing South Interceptor Main has previously created extensive subsurface disturbance along its route. However, 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.

Other Interior Drainage Improvements

Other interior drainage improvements include tidegates that would be installed at two existing municipal separate storm sewer system (MS4) overflows:

- Newtown Creek Wastewater Treatment Plant Manhattan Side (NCM)-634 (1st Place)
- NCM-628 (Rector Street).

A tidegate would also be installed at CSO NCM-070 (Pier A Plaza). These gates would be located within 250 feet from the existing discharge points, and measure approximately 20-feet-by-20-feet.

An isolation valve would be installed in the vicinity of the Battery Bikeway at the storm drain that collects runoff from The Battery. A sanitary sewer isolation valve would also 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 and are therefore of no archaeological concern.

3.4.6.4 Phase IA Survey Results

Prior Disturbance

All three sections of the Archaeological APE have been impacted to varying degrees by prior construction actions and infrastructure improvements. For example, large-diameter water, sewer and stormwater mains exist within the Project Area and cross all three sections of the Archaeological APE.

Pier A Plaza

The existing bulkhead (c. 1871) north of Pier A was modified in 1947, according to the 1971-1972 Mueser Rutledge study.

Pier A Plaza has been impacted by the 1970s installation of the 84-inch diameter CSO outfall pipe and the existing CSO outfall point in the bulkhead. The CSO main continues northward past Battery Place. The existing CS Interceptor main runs through the extreme western edge of The Battery near the eastern boundary of Pier A Plaza and continues northward (see **Figure 3.4-8**).

The area covered by Pier A Plaza was re-landscaped during the 2010s and included the placement of commemorative paving stones indicating the locations of former piers. 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.

The Battery

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.

NSI System Interior Drainage Improvement Locations

The NSI System interior drainage improvement locations north of Battery Place lie within the Hudson River Greenway in Hudson River Park and present-day West Street (Route 9A) (see **Figure 3.4-5** and **Figure 3.4-8**).

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 (see **Figure 3.4-8**). 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. However, it is unlikely that such utility lines would have impacted deeply buried archaeological resources such as historic bulkheads.

Prior Archaeological Testing in the APE

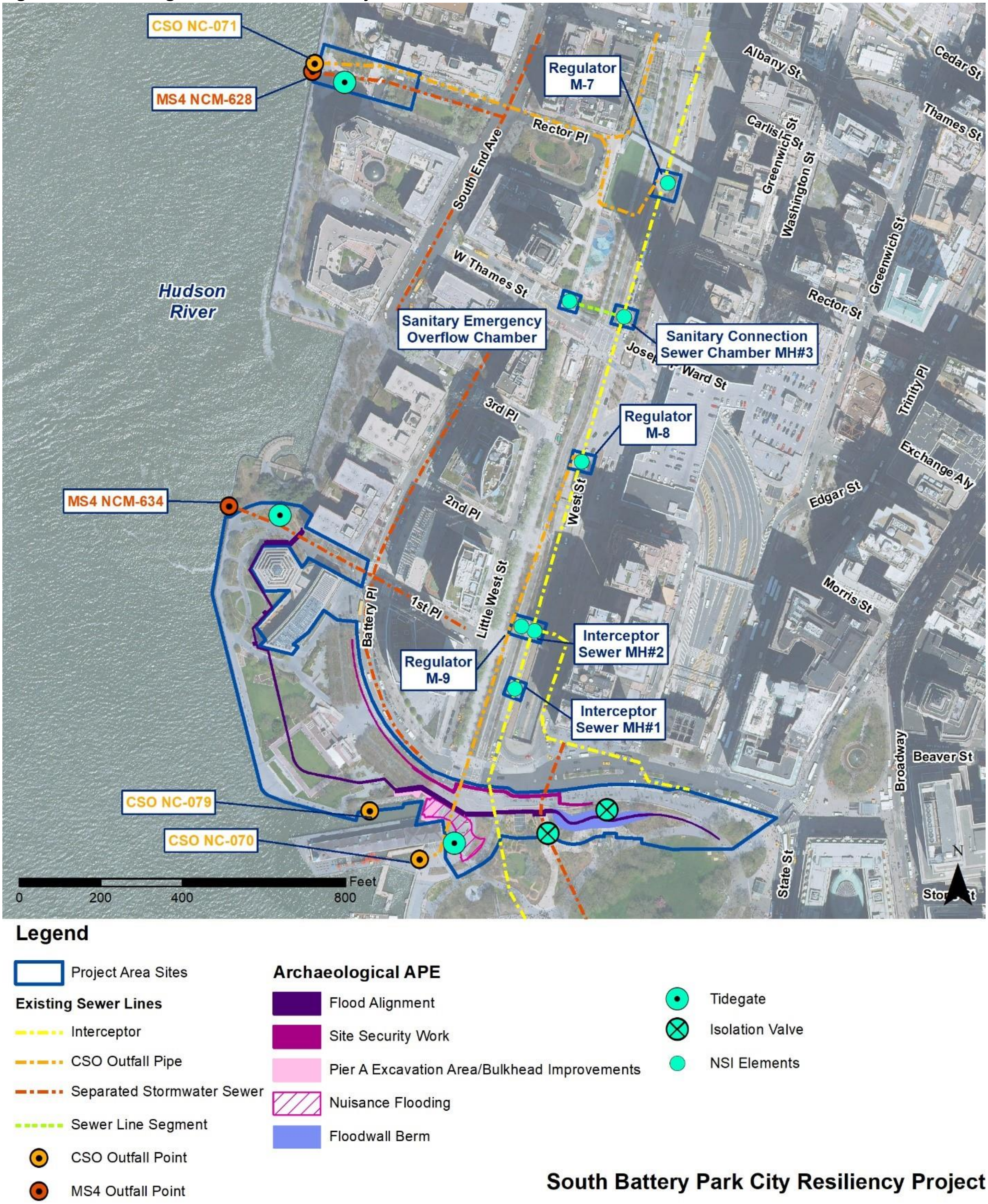
A subsurface testing survey was conducted by Joan H. Geismar, Ph.D. in The Battery during 2011 in association with the Reconstruction of Battery Park and the Perimeter Bikeway project prepared for the New York City Department of Parks and Recreation. This subsurface testing survey included a portion 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 Project Area was superimposed (see **Figure 3.4-7**). 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.

Two of the test trenches were located within the Archaeological APE for the SBPCR Project and one was located adjacent to the Project Area on the south. All three locations were placed along the projected line of the 1828 bulkhead taken from the Ewen 1827-1830 maps (see **Figure 3.4-7**). No remnants of this bulkhead were encountered.

While details of trench testing results are provided in the Phase 1A report, in general, the soils encountered were determined to be more recent fill introduced above landfill. No significant archaeological deposits or features were identified in any of the nine tests.

Figure 3.4-8: Existing Sewer Lines in the Project Area



Pier A Plaza Archaeological Sensitivity

The Proposed Action project elements that would incur subsurface disturbance in Pier A Plaza are: the flood alignment consisting of a short section of exposed floodwall leaving Wagner Park; flip-up deployables supported on deep piles; the nuisance flooding alignment which entails excavation and bulkhead improvements; interior drainage improvements including the installation of a tidegate; 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 (see **Figure 3.4-3** and **Figure 3.4-4**).

Nuisance Flooding Alignment

The current SBPCR Project's nuisance flooding alignment lies across the depicted location of the 1857 bulkhead. Most of the proposed work associated with the nuisance flooding 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 would be removed and the substrate would likely be graded. It is anticipated that the depth of disturbance would be approximately two feet across the plaza, with a few locations for lighting supports and stair supports excavated to deeper levels in discrete locations. The addition of fill is not of archaeological concern. The minimal grading work would likely be within two 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 two feet below current grade when renovations were made within the past decade.

The nuisance flooding 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 flooding alignment (see **Figure 3.4-3**). The Proposed Action in Pier A Plaza excavations/bulkhead improvements are in proximity to the 1871 bulkhead line. The Proposed Action includes 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 would probably 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 3.4-8**. 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 tidegate is proposed for the area off the southeast corner of Pier A in the plaza, to be connected to this CSO main. The proposed tidegate in Pier A Plaza is in proximity to the 1857 bulkhead line and lies immediately east of the 1871 bulkhead line.

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 3.4-8**. The excavation trench for this large diameter main was likely over 10-feet deep and of unknown width. The excavation required for the proposed tidegate would not be impacting undisturbed soils or intact landfill deposits.

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

Flip-Up Deployables

The flood alignment across the northern portion of Pier A Plaza consists of flip-up deployables that would rest on deep piles. The flood alignment would be constructed across landfill deposits dating to the 19th Century. However, the latest major 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. This landfill retaining bulkhead is likely the 1857 bulkhead depicted on the 1873 Department of Docks map and may well be intact in the extreme northeastern portion of Pier A Plaza, and would likely be impacted by the installation of the flip-up deployables and the deep piles which would support them.

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 flip-up deployables 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. Project engineers indicate that 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 would 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.

Historic Piers Archaeological Summary

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. 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 Pier A Plaza segment of the Archaeological APE.

However, north of Battery Place, there is 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 fill in place and connected the made land with the original shore. The remains of the 1857 bulkhead and the later 1871 bulkhead may also lie beneath the Hudson River Greenway and West Street in the interior drainage improvements segment of the Archaeological APE.

The Battery Archaeological Sensitivity

The Archaeological APE across the northern portion of The Battery is shown on **Figure 3.4-4**. The Proposed Action from west to east include installation of flip-up deployables, sections of 40-inch high security walls, an exposed floodwall including flanking seepage barrier installation, construction of a buried floodwall, and the creation of an earthen berm atop the buried floodwall.

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 Deployables

The proposed flip-up deployables in the far western portion of The Battery grounds would entail the installation of piles for subsurface support. These piles may be as deep as 40-feet. However, it is unlikely that this area has been undisturbed 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 deployables 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 (see **Figure 3.4-4**). As noted above, the bollards and 40-inch wall proceed eastward from Pier A Plaza, cross the over the Battery Park Underpass, continue into The Battery, and replace a section of existing Battery wall north of the proposed buried floodwall and earthen berm. The anticipated depth of disturbance is 4-feet below current grade.

The security measure elements would be constructed in landfill that has been previously impacted, likely impacted several times and the anticipated four-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. exceed the anticipated four-foot depth of the 40-inch high security wall that may be constructed to the north of the proposed buried floodwall and earthen berm. No significant archaeological resources were encountered during the 2011 testing.

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

Exposed Floodwall

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

Buried Floodwall and Earthen Berm

The flood alignment continues eastward across The Battery as a bermed floodwall. A section of buried floodwall would be installed below the earthen berm. It is anticipated that the depth of disturbance associated with the buried floodwall would be four feet. Actions to construct the earthen berm around the buried floodwall are anticipated to involve subsurface disturbance from two feet to four 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 ranged in depth from three feet to 5.2-feet below existing ground surface and yielded no evidence of the 1828 bulkhead or any other significant archaeological resources.

In the locations of the 2011 tests, the depth of the test trenches was deeper than the anticipated depths of disturbance for the Proposed Action 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 earthen berm location in The Battery.

<u>Interior Drainage Improvements</u>

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 four feet by four 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.

NSI System Interior Drainage Improvements Locations Archaeological Sensitivity

The Archaeological APE for the interior drainage improvement locations associated with the NSI system north of Battery Place is shown on **Figure 3.4-5**. The NSI system locations north of Battery Place lie in proximity to and within the Hudson River Greenway in Hudson River Park and present-day West Street (Route 9A). 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. Implementation of the NSI system would require pressure-proofing and retrofitting of multiple existing infrastructure element associated with the 84-inch South Interceptor Sewer Main.

Large diameter utility mains run northward from Battery Place and depicted on **Figure 3.4-8**. 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 as running through or adjacent to several of the existing infrastructure elements that comprise the NSI system (see **Figure 3.4-5**). 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. There is low to moderate potential that 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). It is interesting to note that this section of bulkhead was dated to 1903 based on research conducted at the NYC Department of Docks by Michael J. Lenardi of the New York State Museum (NYSM). It is probable that the 1871 bulkhead at this location was modified ca. 1903. The extent of this modification is unknown.

Recommendations

Pier A Plaza

The flip-up deployables 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.

The Battery

The Proposed Action 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 System Interior Drainage Improvement Locations

Intact portions of the 1857 and 1871 bulkheads may exist 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. Project actions associated with the NSI system requiring excavation in this portion of the Archaeological APE may expose these portions of the bulkheads for documentation.

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

Recommended Next Steps

The current 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 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 (see **Figure 3.4-3**).

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 (see **Figure 3.4-5**). There is low to moderate potential that 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.

As discussed above in Section 3.4.4.3 (SHPO and NYC LPC Consultation), the Phase IA report was submitted to SHPO for review on January 17, 2022. SHPO concurred with the report recommendation for archaeological monitoring during construction in their response letter of January 28, 2022.

Preparation of a Phase IB Archaeological Monitoring Plan (Plan) is the next step in the compliance process for the consideration/protection of archaeological resources. Disruption of traffic flow and closing of public spaces during testing are important considerations when proposing Phase IB testing. As the Project Area lies within highly utilized public spaces, archaeological monitoring during construction would prove to be the most practical strategy. It is anticipated that the Plan would be developed through consultation with BPCA, SHPO, NYC 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.

3.4.7 Affected Environment – Historic Architecture

Based on research of the Historic Architectural APE on SHPO's CRIS website, and the National Register eligibility evaluation of Wagner Park undertaken for this project, **Table 3.4-2**, keyed to **Figure 3.4-9**, identifies the 28 historic architectural resources within the Historic Architectural APE. These include NHLs, National Register-listed and eligible resources, buildings and districts designated by NYC LPC. Photographs of the resources are included in **Appendix B**.

Figure 3.4-9: Historic Architectural Resources within the Area of Potential Effects

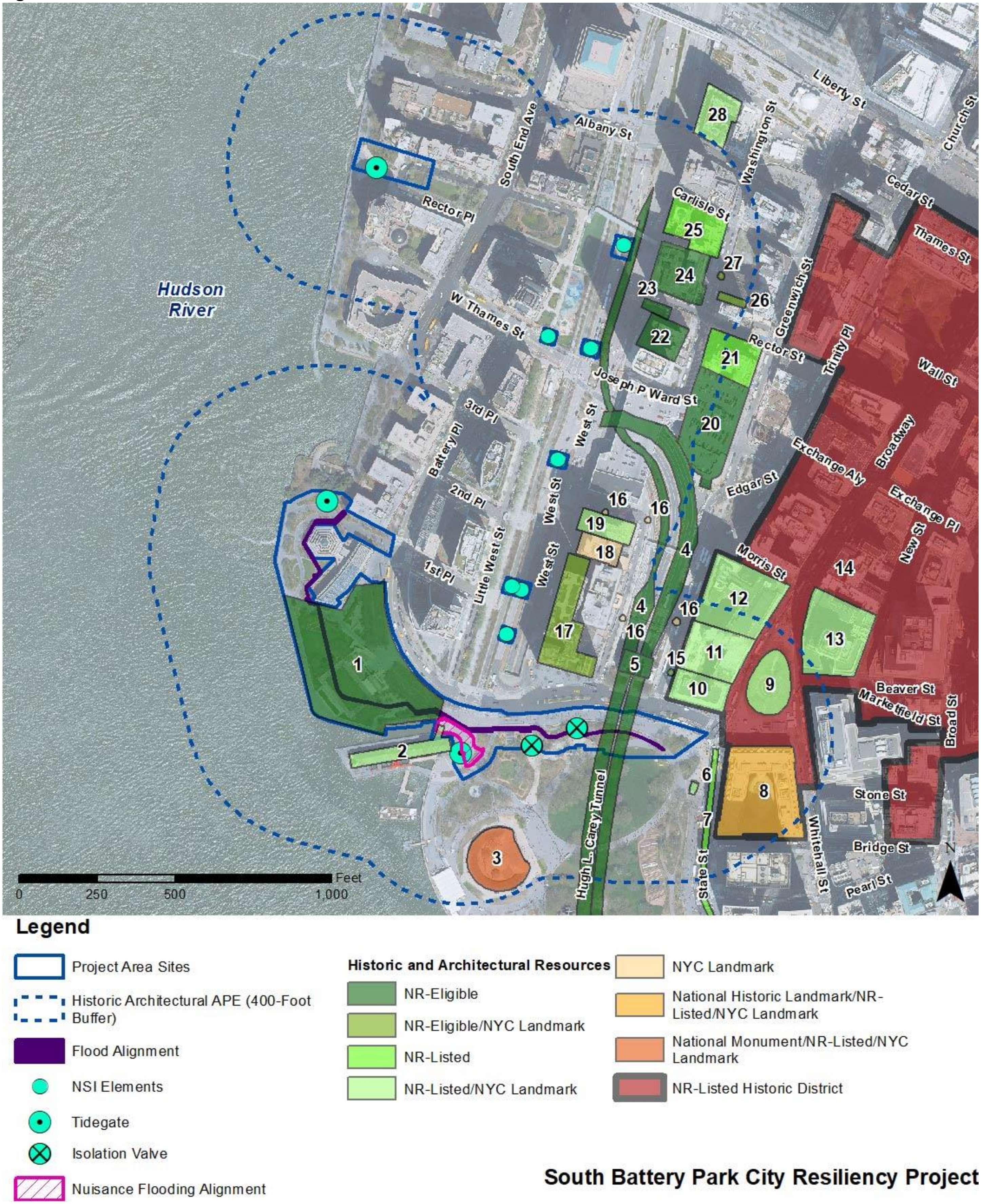


Table 3.4-2: Historic Architectural Resources in the APE

Resource Number	NRHP/SHPO USN/LPC Number	Resource Name	Location	NRHP/LPC Status
1	06101.021832	Robert F. Wagner, Jr. Park	Southern end of Battery Park City, bound to the north by the Museum of Jewish Heritage; the south by Pier A inlet and Pier A; the east by Battery Place; the west by the Esplanade and Hudson River	National Register-Eligible
2	90NR00767/ LP-00918	Pier A	22 Battery Place	National Register-Listed/NYC Landmark
3	90NR00865/ LP-00029	Castle Clinton National Monument	Battery Park	National Monument/National Register-Listed/NYC Landmark
4	06101.018925	Brooklyn-Battery Tunnel (present-day Hugh L. Carey Tunnel)	81 Washington Street	National Register-Eligible
5	06101.001319	Brooklyn-Battery Tunnel Blower House	Battery Place	National Register-Eligible
6	90NR00693/ LP-0829	Battery Park Control House	State Street and Battery Place	National Register-Listed/NYC Landmark
7	05NR05428	Joralemon Street Tunnel	Under East River between Manhattan and Brooklyn	National Register-Listed
8	90NR00616/ LP-1022	U.S. Custom House	Bowling Green	National Historic Landmark/National Register-Listed/NYC Landmark/Contributing resource to National Register-listed Wall Street Historic District
9	90NR00651/ LP-00548	Bowling Green Fence and Park	Foot of Broadway at Beaver Street	National Register-Listed/ Contributing resource to National Register-listed Wall Street Historic District Bowling Green Fence only is a designated NYC Landmark
10	94NR00582/ LP-01926	International Mercantile Marine Company Building	1 Broadway	National Register-Listed/NYC Landmark/ Contributing resource to National Register-listed Wall Street Historic District
11	06101.006989/ LP-01927	Bowling Green Offices	11 Broadway	National Register-Listed/NYC Landmark/ Contributing resource to National

Resource Number	NRHP/SHPO USN/LPC Number	Resource Name	Location	NRHP/LPC Status
				Register-listed Wall Street Historic District
12	06101.001528/ LP-1928/01929	Cunard Building	25 Broadway	National Register-Listed/NYC Landmark/Contributing resource to National Register-listed Wall Street Historic District
13	06101.006990/ LP-01930	Standard Oil Building	26 Broadway	National Register-Listed/NYC Landmark/Contributing resource to National Register-listed Wall Street Historic District
14	06NR05647	Wall Street Historic District	Bounded by Cedar Street & Maiden Lane on north; Pearl St on east; Bridge and S. William St on south; and Greenwich St & Trinity Place on west (majority within footprint)	National Register-Listed Historic District
15	06101.009461/ LP-01961	Lamppost 8	Near 13-19 Greenwich Street	National Register-Eligible/NYC Landmark
16	LP-01961	Historic Street Lampposts	Greenwich Street, Washington Street, and Morris Street	NYC Landmark
17	06101.001318/ LP-02056	Whitehall Building	17 Battery Place	National Register-Eligible/NYC Landmark
18	LP-02075	Downtown Athletic Club	19 West Street (aka 18-20 West Street and 28-32 Washington Street)	NYC Landmark
19	90NR01402 LP-1999	21 West Street	21 West Street	National Register-Listed/NYC Landmark
20	06101.013375	Battery Parking Garage	70 Greenwich Street	National Register-Eligible
21	02NR01912	19 Rector Street	19 Rector Street	National Register-Listed
22	06101.014511	Former Babbitt Soap Factory	74-80 Washington Street	National Register-Eligible
23	06101.007218	Frasch Building	56 West Street/33 Rector Street	National Register-Eligible
24	06101.007219	Barrett Building	40 Rector Street	National Register-Eligible
25	06101.001322	New York Evening Post Building	75 West Street	National Register-Listed
26	06101.001534/ LP-2167	(Former) St. George's Syrian Roman Catholic Church	103 Washington Street	National Register-Eligible/NYC Landmark
27	06101.009470/LP-01961	Lamppost 80	Near 107-109 Washington Street	National Register-Eligible/NYC Landmark
28	06NR05646/LP-01984	West Street Building	90 West Street	National Register-Listed/NYC Landmark

3.4.8 Environmental Impacts on Historic Architectural Resources

3.4.8.1 Impacts Assessment Methodology

The direct and indirect impacts of the Proposed Action on the 28 historic architectural resources are analyzed in accordance with 9 NYCRR Part 428, and the *CEQR Technical Manual*. The impact assessment methodology is described below. Potential effects of Pier A Inlet Living Shoreline are analyzed in accordance with Section 106 (i.e., Criteria of Adverse Effect set forth in 36 CFR 800.5[a][1]).

Direct impacts include, but are not limited to, physical damage or destruction of all or part of a property; physical alterations; moving or realigning a historic property; and/or isolating a property from its setting. Direct impacts may also include acquisitions of portions of property that do not include buildings or large-scale structures, but may include small-scale features such as fences, portions of driveways and sidewalks, and landscaping. Indirect impacts may include visual, auditory or atmospheric intrusions; shadow effects; vibrations; and changes in access or use.

Undertakings could have one of three effects on National Register-listed and eligible resources:

- No Historic Properties Impacted (i.e., No Impact) – Undertaking would not impact National Register-listed or eligible resources.
- No Adverse Impact – Undertaking may have potential to directly or indirectly impact historic property, but would not alter characteristics that qualify it for inclusion in the National Register, and, if relevant, impacts could be reduced through design or other means prior to implementation.
- Adverse Impact – Undertaking would directly or indirectly alter characteristics that qualify a property for inclusion in the National Register.

Section 14.09 defines an adverse impact as destruction or alteration of all or part of a property; isolation/alteration of property's environment; introduction of visual, audible, or atmospheric elements which are out of character with the property; or neglect of the property. Section 106 defines adverse effects in a similar manner to Section 14.09, but concerns itself with "effects" rather than "impacts." Section 14.09 requires agencies, to the fullest extent practicable, consistent with other provisions of the law, to avoid or mitigate adverse impacts to such properties, to fully explore all feasible and prudent alternatives and to give due consideration to feasible and prudent plans which would avoid or mitigate adverse impacts to such property.

In New York City, impact assessments undertaken in accordance with the *CEQR Technical Manual* generally ask three major questions for historic and cultural resources:

- Would there be a physical change to the property?
- Would there be a physical change to its setting, such as context or visual prominence (also known as indirect impacts)?
- If there would be a change to the property or setting, would it alter or eliminate significant characteristics of the resource that make it important?

If a project negatively impacts characteristics that make a resource eligible for National Register listing or designation as a New York City Landmark, it would most likely result in a significant adverse impact. Significant adverse impacts on historic architectural resources may include the following:

- Physical destruction, demolition, damage, alteration, or neglect of all or part of an historic property. For example, alterations that would add a new wing to an historic building or replacement of the resource's entrance may result in adverse impacts, depending on the design.
- Changes to the architectural resource that cause it to become a different visual entity, such as a new location, design, materials, or architectural features. An example would be recladding an architectural resource with new brickwork.
- Isolation of the property from, or alteration of, its setting or visual relationships with the streetscape. This includes changes to the resource's visual prominence so that it no longer conforms to the streetscape in terms of height, footprint, or setback; is no longer part of an open setting; or can no longer be seen as part of a significant view corridor. For example, if all the buildings on a block, including an architectural resource, are four floors high, and a proposed project would replace most of those with a 15-story structure, the four-story architectural resource would no longer conform to the streetscape. Another example would be a proposed project that would result in a new building at the end of a street so that views of an historic park beyond were blocked.
- Introduction of incompatible visual, audible, or atmospheric elements to a resource's setting. An example would be construction of a noisy highway or factory near a resource noted for its quiet, such as a park.
- Replication of aspects of the resource so as to create a false historical appearance. If a house was built during the Revolutionary War but later underwent extensive alteration, re-creation of its 18th-Century appearance may have an adverse impact on that resource.
- Elimination or screening of publicly accessible views of the resource.
- Construction-related impacts, such as falling objects, vibration (particularly from blasting or pile-driving), dewatering, flooding, subsidence, or collapse.
- Introduction of significant new shadows, or significant lengthening of the duration of existing shadows, over an historic landscape or an historic structure (if the features that make the resource significant depend on sunlight) to the extent that the architectural details that distinguish that resource as significant are obscured.

Impacts of the No Action Condition and Proposed Action on historic architectural resources in the Historic Architectural APE are described below.

3.4.8.2 No Action Condition

The No Action Condition assumes that the Proposed Action would not be constructed; however, other planned projects within the Study Area would be constructed, including the following:

- The Battery Coastal Resilience Project (NYCEDC)
- Battery Park Underpass and West Street Underpass Project (NYCDOT)

These projects would undergo their own environmental review process per NEPA, SEQR and/or CEQR, and be subject to related Section 106/14.09 requirements. Under the No Action Condition, existing conditions in the southern portion of the Historic Architectural APE may be somewhat altered because two of the 28 resources, Pier A and Castle Clinton, are in close proximity to The Battery Coastal Resilience Project and could possibly be indirectly affected by reconstruction of the deteriorating Battery wharf, and other improvements associated with that project.

Without the SBPCR Project, the 28 historic architectural resources in the APE may still be subject to damage by storms that could impact their integrity, and possibly result in deterioration or destruction. The resources could also be impacted by actions undertaken by building owners, or other unforeseen circumstances.

3.4.8.3 Proposed Action

The Proposed Action described in Section 1.3 (Project Description) could potentially affect 28 historic architectural resources. The effects to each resource are described below.

Robert F. Wagner, Jr. Park (Resource 1)

The National Register-eligible Wagner Park is an approximately 3.3-acre park located at the southern end of the 92-acre Battery Park City neighborhood (see **Figure 3.4-9**). It is bound to the north by the Museum of Jewish Heritage, the south by Pier A inlet and Pier A, the east by Battery Place, and the west by the Esplanade and Hudson River. The Postmodern-style park was designed by the landscape architecture firm, Hanna/Olin in collaboration with the architecture firm Machado & Silvetti, and public garden designer, Lynden Miller. Built between 1994 and 1996, the park site was identified in the 1979 Battery Park City Master Plan, prepared by Alexander Cooper Associates, as one of a string of "special places," and was designed to maximize the visual relationship between the waterfront park and the Statue of Liberty in New York Harbor (Alexander Cooper Associates, 1979).

Around 1995, BPCA articulated the design philosophy of Wagner Park in its formal design statement, one year prior to its completion:

> *"The project occupies a small yet very distinctive site, set amid the truly colossal surroundings of the nearby World Trade Center, and the immense natural scale of the Hudson River and New York Harbor. As this is the closes point in Manhattan to the Statue of Liberty, she serves as a focal point of the park's design.*
>
> *[The park] is a successful collaboration among landscape architects, architects and a garden designer, in the best tradition of Battery Park City. As one progresses from the street to the Hudson River's edge, there is a dramatic shift in scale and formal order – from small, tidy and regular to larger and looser; from upland species of plants to maritime ones; from enclosed spaces to wide open vistas and from the familiar and ordinary to the unexpected and extraordinary. Here one finds a park and gardens framing pavilions, and pavilions framing the Statue of Liberty and the dream of freedom it represents, just as the city frames the lives of millions of its residents and visitors"* (BPCA, ca. 1995).

Hence, the visual relationship between the park and the Statue of Liberty across New York Harbor determined the axis that served as the foundation of design.

As indicated in the 1995 design statement, the park layout was based on three primary components, laid out in a Y-shaped architectural ensemble that facilitates access to the Battery Park City Esplanade heading north, and The Battery heading south. The three components include:

- Pair of allées that bring visitors from the sidewalks toward the pavilion buildings at the entrance to the park.
- Pavilion that frames the view of the Statue of Liberty; ground level dedicated to a café, restrooms and maintenance space; balconies with tall-backed wooden benches reminiscent of those found at windy coastal resorts in northern Europe.
- Central grass lawn framed by brick pathway with benches that steps down toward New York Harbor, flanked by ornamental gardens, and the Battery Park City Esplanade along its western edge, all with a clear view of the harbor (BPCA, ca. 1995).

As built, Wagner Park is comprised of five organizing elements, including:

- North and south maple allées
- Central plaza
- Pavilion with northern and southern structures with intricate brickwork and arches, linked by a footbridge
- North and south ornament gardens and lawns
- Central lawn

In addition, the park was augmented by a strong program of public art, including three contemporary sculptures:

- Jim Dine's *Ape & Cat (At the Dance)* (1996)
- Louise Bourgeois' *Eyes* (1998)
- Tony Cragg's *Resonating Bodies* (1999)

Postmodernism in landscape design emphasizes urban contextuality, ecological systems, diversity of site organization and experience, a pluralistic use of design motifs, and playfulness. Wagner Park expresses this design philosophy through its multitude and variety of spaces and circulation systems, its responsiveness to neighborhood character and needs, idiosyncratic cubist-inspired planting beds, native plants, and classically referenced pavilion, among other design characteristics. When the park opened in 1996, Paul Goldberger wrote in *The New York Times* that the park is "one of the finest public spaces New York has seen in at least a generation" (Goldberger, November 24, 1996).

Wagner Park is significant under National Register Criterion A in the area of community and urban planning, and under Criterion C in the areas of landscape architecture, architecture and art. SHPO also determined that Wagner Park meets the standard for exceptional significance necessary to satisfy

National Register Criterion Consideration G for properties less than fifty years old (Cumming, February 23, 2021).

The SBPCR Project would occur within Wagner Park. Specifically, the flood alignment would be constructed as a buried floodwall within Wagner Park that connects to exposed floodwall at the Museum of Jewish Heritage. 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 the buried floodwall would be constructed beneath the raised park, maximizing the amount of protected open space, while maintaining views to the waterfront. The buried floodwall also allows all users to occupy the lawn, garden, and public park, in contrast to a traditional floodwall design which would bisect the space. At the connection between Wagner Park and Pier A Plaza, the flood alignment would resurface as a short segment of exposed floodwall where it would meet the flip-up deployables in Pier A Plaza.

Redesigned key features of Wagner Park include ornamental gardens with a water feature, central lawn, performative gardens along the Battery Park City Esplanade, and a transitioning naturalized edge with an overlook deck at the Pier A inlet. The edges of Wagner Park would be gently sloped and terraced to allow for universal access to the raised park areas and the new pavilion. Additionally, the planting design on the water side of the park would tolerate salt spray and temporary inundation, reducing maintenance costs and providing ecological benefits. Planting designs in some of the terraced planters that transition down to the Esplanade would serve as rain gardens for capturing and filtering precipitation.

The north and south allées along Battery Place would be reinstated along two ramps which connect the northern and southern arrival points of Wagner Park with the raised park and a new pavilion. Because of this, the condition along Battery Place would be altered.

In order to accommodate the buried floodwall and the raised park, the brick pavilion buildings would be replaced with a new pavilion in a manner that retains select elements articulated by BPCA in its 1995 design statement for Wagner Park, including:

- Preserves view to Statue of Liberty;
- Maintains views to the waterfront;
- Maintains a central gathering space;
- Maintains restaurant in the pavilion at park level;
- Maximizes continuous green space; and,
- Enhances procession from street to park level.

New design considerations include:

- Elevates the site to maximize protected area;
- Organizes the site around central lawn, with an uninterrupted view axis to Statue of Liberty;
- Moves pavilion closer to Battery Place to maximize continuous lawn area above the DFE;
- Provides universal accessibility across the park and to the pavilion;

- Provides new community program and educational space in the pavilion at park level;
- Provides an ample, publicly accessible roof terrace; and,
- Meets and exceeds best practice sustainable design.

The National Register-eligible Wagner Park retains integrity of location, design, setting, materials, workmanship, feeling, and association. The Proposed Action would redesign and reconfigure Wagner Park at a higher elevation. The new design would follow organizing principles of the existing park promulgated in 1995, including preservation of views to the Statue of Liberty and waterfront, maintenance of a central gathering space, maximization of continuous green space, and enhancement procession from street to park level. This reflects BPCA's recognition of the centrality of these concepts in the design for the new Wagner Park, in an effort to mitigate the replacement of the National Register-eligible park. However, the Proposed Action would ultimately alter the characteristics of the property that qualify it for inclusion in the National Register. Therefore, the Proposed Action would have an Adverse Impact on Wagner Park. As indicated in Section 3.4.4.3 (SHPO and NYC LPC Consultation) and the documentation in **Appendix B**, alternatives to the proposed action have been explored, and there are no feasible and prudent alternatives that would avoid or mitigate the adverse impact (pending SHPO concurrence). Potential mitigation measures are described in Section 3.4.8.4 (Historic Architectural Resources Summary).

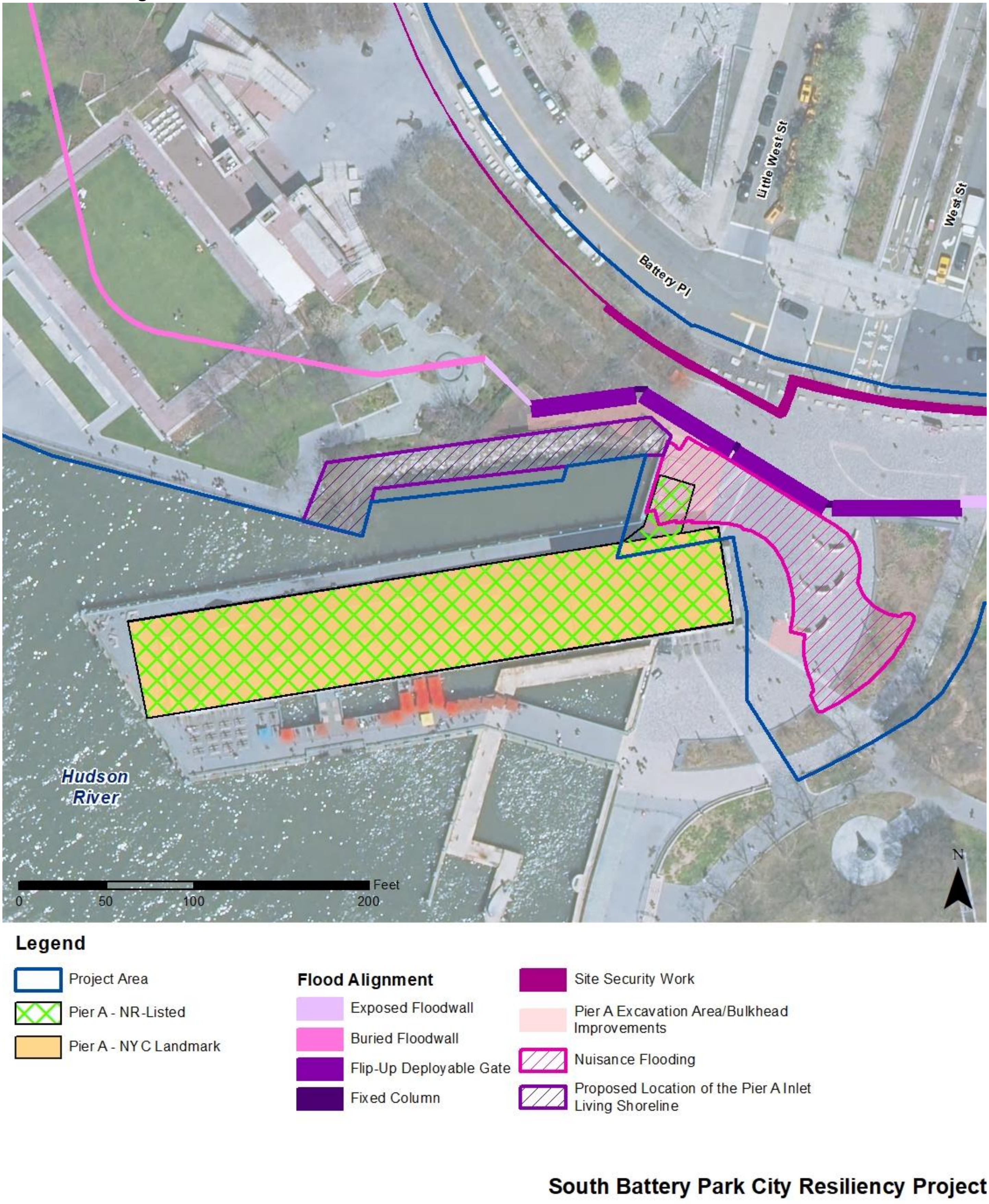
Pier A (Resource 2)

The National Register-listed and NYC Landmark Pier A is located at 22 Battery Place (see **Figure 3.4-9**). It is situated on the south side of Battery Place between Battery Park City to the north, and The Battery to the east, and overlooks New York Harbor. Pier A was constructed by the City of New York in 1886 and is equipped with a two-to-three story fireproof building embellished with a blind arcade along the building's central portion, sheathed in galvanized iron. The building also features a four-story clock tower. Since its construction, Pier A has been occupied by multiple New York City agencies, including the Department of Docks (now defunct); Police Department; and Fire Department (Beebe, June 10, 1975). Between 2009 and 2014, Pier A was renovated and converted to function as Pier A Harbor House, a waterfront restaurant (Pier A, ca. 2014). Pier A is significant in areas of architecture and commerce between 1800-1899(Beebe, June 10, 1975). The National Register boundary and the NYC Landmark boundary of Pier A are the same and surround the rectangular-shaped building. However, the National Register boundary extends north along the east side of the Pier A inlet, beyond the footprint of Pier A, as shown in **Figure 3.4-10**.

The portions of the SBPCR Project involving Wagner Park, Pier A Plaza and the Pier A inlet would mainly occur outside the National Register and NYC Landmark boundaries, directly north and east of the Pier A structure. North of Pier A, the buried floodwall would be built through a reconstructed Wagner Park where the DFE would be 19.8 feet, and the HOI would be approximately 7.8 to 9.8 feet. The Wagner Park pavilion would be removed and replaced with a new taller building. In addition, the inlet located on the north side of Pier A between Wagner Park and Pier A would be improved with the Pier A Inlet Living Shoreline for which a permit will be sought from USACE in accordance with federal environmental regulations, including Section 106. The Living Shoreline would accommodate a four-level terraced structure on the north side of the Pier A inlet, opposite Pier A. The location of the Living Shoreline is featured in **Figure 3.4-10**.

Within Pier A Plaza, two sections of the flood alignment would be constructed: the +18.5-foot DFE flood alignment, and the +11-foot DFE nuisance flooding alignment. Retaining Pier A Plaza's aesthetics of existing materials, hardscape, views to the water, circulation (pedestrian, biking, and vehicular), and programmed use in the new flood design is an important aspect of the SBPCR Project. With respect to the flood alignment, the HOI would be significantly increased to meet the DFE because the plaza is at the lowest elevation point within the Project Area. The design currently envisions the buried floodwall in Wagner Park meeting a short segment of exposed floodwall that would connect to a series of four flip-up deployables in Pier A Plaza, north and east of Pier A. The deployables would be nested into the ground and deployed when flood emergencies are declared. Fixed concrete columns that seal the edges of the flip-up deployables when deployed would be needed. Specifically, three columns would be installed to support the two inner deployables; the two outer deployables only require support of the two outer columns because they link to the exposed floodwalls in Wagner Park to the west, and Pier A Plaza to the east. The northern section of the Plaza would be raised by roughly 4 feet, thereby reducing the required height of the flip-up deployables. The flip-up deployables would be approximately 90 feet from the Pier A. East of Pier A Plaza, the deployables would connect to the flood alignment segment in The Battery, over 170 feet east of Pier A. It would be comprised of an exposed floodwall above the Battery Park Underpass, flip-up deployable, exposed floodwall, and bermed floodwall.

Figure 3.4-10: Detailed View of National Register and NYC Landmark Boundaries of Pier A and Proposed Location of Pier A Inlet Living Shoreline



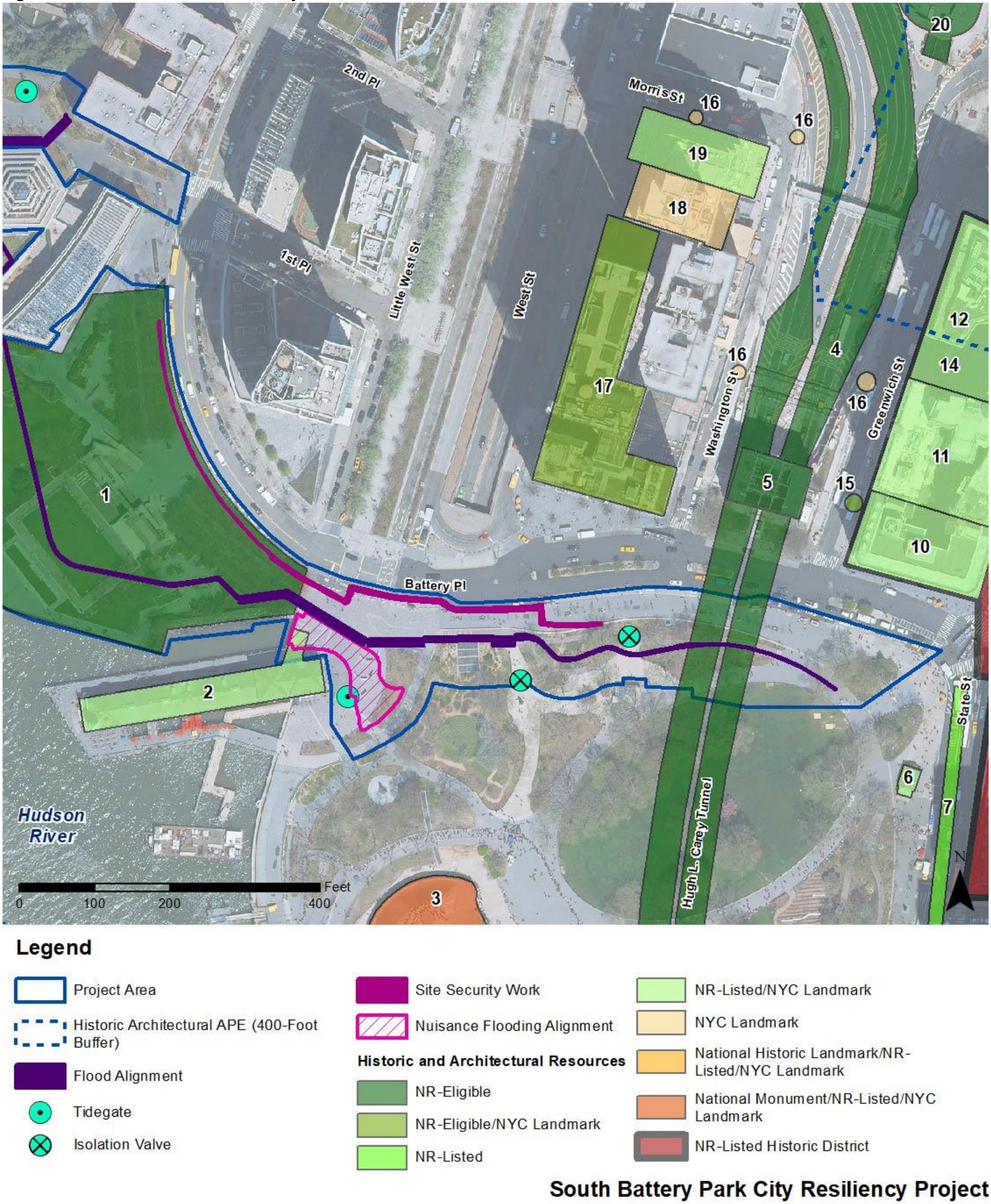
With respect to the nuisance flooding alignment, the majority of the alignment would be constructed within Pier A Plaza. The alignment facilitates a tie-in with The Battery Park Coastal Resilience Project, and would minimize low levels of flooding that do not typically pose significant threats to public safety or infrastructure. The alignment would extend from the flip-up deployables south of the Wagner Park allées, pass through the bulkhead area within the National Register boundary, and terminate at the southeastern edge of Pier A Plaza. It would be comprised of a two-level plaza design with curved and straight steps and site walls that function as terrace-like seating/flush seating, interspersed with trees along the eastern edge of the plaza where it meets The Battery. Seating pods would also be placed directly east of Pier A inlet, north and east of Pier A, within the National Register boundary.

Additional excavation would also be required in Pier A Plaza in association with the nuisance flooding alignment. Specifically, a small area within the National Register boundary on the north side of Pier A, just east of the Pier A inlet would be reconstructed. As shown in **Figure 3.4-10**, this area would be excavated to accommodate removal of the fill along the existing subsurface bulkhead to relieve pressure on the bulkhead, and replace the excavated material with lightweight fill. The existing contemporary guardrail along the inlet would be removed and replaced. Portions of the existing seawall on the north side of Pier A inlet, outside the National Register boundary, would also be removed. A new section of retaining wall/seawall would be constructed between Pier A inlet and the flood alignment.

In addition to the nuisance flooding alignment, universal access and security improvements would be made on the north side of Pier A Plaza where the plaza meets the southern edge of Battery Place, and West Street (Route 9A) terminates (see **Figure 3.4-11**). These actions are outside the National Register and NYC Landmark boundaries. In this area, a K 12-rated 40-inch-high security wall, or knee wall, integrated into the allée wall/seating on the east side of reconstructed Wagner Park would be built, and link to K 12-rated planters; and curbside K 12-rated fixed and retractable bollards. Hydraulic power units (HPUs) for flip-up deployables would also be integrated into the security improvements at the southern edge of Battery Place. A flight of steps and ramps that flank the steps to the east and west, respectively, would provide access from the south side of Battery Place to Pier A Plaza, Wagner Park, and The Battery. Within Pier A Plaza in the vicinity of the nuisance flooding alignment, the terraced area would be augmented with 15-inch raised edges and companion seating. These elements would be designed in a manner that does not conflict with the ability of FDNY trucks to maneuver turnarounds.

Other improvements in close proximity to Pier A include the proposed Pier A Inlet Living Shoreline which would remove the riprap edge on the north side of the inlet, and replace it with four-level terraced structure that would increase the physical complexity of the site; improve the public connection to the water; provide additional intertidal habitat; and provide increased environmental education opportunities within the Wagner Park (see **Figure 3.4-10**). Finally, interior drainage would be upgraded. Specifically, a subsurface tidegate would be installed at existing subsurface CSO NCM-070 in Pier A Plaza; the tidegate would be located below grade, within 250 feet from the existing discharge point (see **Figure 3.4-9**).

Figure 3.4-11: Detailed View of Project Actions



Pier A is significant as a 19th-Century waterfront pier erected by the City of New York, and has served both municipal and commercial functions over time. The pier building retains integrity of location, design, setting, materials, workmanship, feeling, and association. The portion of Pier A Plaza situated approximately 90 feet to the east of the historic pier would be reconstructed with flip-up deployables. Views from the pier to Wagner Park to the north, and Pier A Plaza and The Battery to the east would be altered. Wagner Park would be reconstructed with buried floodwall, while the flood alignment within The Battery would be comprised of exposed floodwall, deployable, and bermed floodwall. Universal access and security improvements would also be installed 100 feet from Pier A.

The nuisance flooding alignment in Pier A Plaza would be constructed south of the flood alignment, be located partially within the National Register boundary of Pier A that does not include the building, and result in a two-level plaza design. In addition, excavation would occur partially within the National Register boundary to accommodate bulkhead improvements. Furthermore, portions of the existing seawall on the north side of Pier A inlet, outside both boundaries, would be removed. A new section of retaining wall/seawall would be constructed between Pier A inlet and the flood alignment; this area is partially within the National Register boundary. In addition, the Pier A inlet redesign would also accommodate four-level terraced structure on the north side of the inlet.

Collectively, these actions would indirectly and directly affect Pier A. In terms of indirect visual effects, the inland side of the pier would be altered by the flood alignment, especially during occasional major storm events when the flip-up deployables, supported by exposed floodwalls and three fixed columns, would be deployed. The nuisance flooding alignment and excavation proposed for bulkhead/seawall improvements, and redesign of Pier A inlet would occur outside NYC Landmark boundary, with a small portion occurring within the National Register boundary, outside the building footprint. These actions would result in a terraced Pier A Plaza, reconstructed bulkhead/seawall and terraced Pier A inlet. Thus, the inland side of the pier would be altered. However, the Pier A building, the key historic character-defining feature of Pier A, would remain intact, and the primary water-based views from the pier toward New York Harbor for which the pier is most closely associated would remain unobstructed. Although physical changes would be made within and immediately adjacent to National Register and NYC Landmark boundaries the Proposed Action would result in No Adverse Impact in accordance with Section 14.09. Similarly, implementation of the Pier A Inlet Living Shoreline would have No Adverse Effect in accordance with Section 106.

Initially constructed in 1886, and occupied by multiple New York City agencies for over a century, the pier was most recently renovated and converted to function as a restaurant between 2011-2014. As a result, Pier A has changed over time, and implementation of the Proposed Action would not diminish the historic integrity of this waterfront structure, or alter the significant qualities for which it was listed in the National Register, and designated a NYC Landmark. However, because the Proposed Action and the Pier A Inlet Living Shoreline would both occur within 90 feet of Pier A, a CPP would be prepared in accordance with the NYCDOB "Technical Policy and Procedure Notice 10/88: Procedures for the Avoidance of Damage to Historic Structures Resulting from Adjacent Construction When Subject to Controlled Inspection by Subsection 27-724 and for Any Existing Structure Designated by the Commissioner." This notice defines adjacent historic structures as resources that are located contiguous to or within a lateral distance of 90 feet from a lot under development or alteration (Polsky, June 6, 1988), and construction activities slated near the Pier A building meets this definition. The CPP would also follow the guidance included in "New York City Landmarks Preservation Commission Guidelines for Construction Adjacent to a Historic Landmark," and "Protection Programs for Landmark Buildings" (both on file with NYC LPC). The CPP would be implemented by a professional engineer before excavation and construction activities associated with the Proposed Action takes place.

Castle Clinton National Monument (Resource 3)

The National Monument/National Register-listed/NYC Landmark-designated Castle Clinton is located at the southern tip of The Battery, overlooking New York Harbor. It is surrounded by mature trees, especially on its north side which faces Pier A. The circular brownstone building was constructed as a fort on a manmade island in 1808, and modified through 1821. In 1824, it was converted into Castle Garden, an entertainment and reception center, equipped with a garden, theater, officer's quarters, and roof; between 1824-1855, landfill was added to connect Castle Garden with The Battery at the tip of Manhattan Island. Between 1855-1890, it functioned as an immigration depot, and in 1896, was converted into an aquarium, and retained this function until 1941. In 1950, Castle Clinton was designated a National Monument, overseen by the National Park Service. Castle Clinton is significant in areas of community planning, military, social history, and theater, and its period of significance spans the 1800s to 1900s (Millman and Weible, March 1984).

The SBPCR Project would take place northwest and north of the National Register boundary of Castle Clinton National Monument (see **Figure 3.4-9**). Specifically, Pier A Plaza located approximately 300 feet northwest of Castle Clinton would be reconstructed to accommodate the flood alignment comprised of flip-up deployables north the Castle Clinton. As indicated in Section 3.4.8.3 (Proposed Action – Pier A), within Pier A Plaza, the HOI would be significantly increased to meet the DFE because the plaza is at the lowest elevation point within the Project Area. In addition, the nuisance flooding alignment would be situated in Pier A Plaza, south of the flood alignment and the universal access and security improvements would be installed north of both.

The Battery Bikeway, which is located approximately 300 to over 550 feet north of Castle Clinton in The Battery, would also be reconstructed. The flood alignment would be comprised of a combination of flip-up deployables, exposed floodwall, and buried floodwall beneath a landscaped berm, or bermed floodwall. In this segment, the DFE is 18.5 to 15 feet, and the HOI is 9.5 to 0 feet. This concept reconfigures the existing bikeway, and requires the relocation of the Peter Caesar Alberti Marker (dedicated June 2, 1959; replica rededicated ca. 1985), which is comprised of a cast bronze panel on a granite plinth (NYC Parks, no date). The ca. 1985 marker would be relocated to the median of the Battery Place sidewalk. It would be placed as close to the current locations as possible to be consistent with the NYC Park's Monuments Plan. Proposed monument locations/relocations have been reviewed and approved (including potential options) by NYC Parks. Conversely, the Walloon Settlers Memorial (1924), which is comprised of a limestone stele on a base, would remain in situ, set within a niche along the Battery Place sidewalk. In addition, security improvements that would be comprised of bollards along the south side of Battery Place, and turn south to meet an approximately 100-foot long, 40-inch high knee wall that would taper to meet the existing Stony Creek granite wall benches on the south side of Battery Place between West Street (Route 9A) and Washington Street (see **Figure 3.4-11**).

In addition to these actions, interior drainage would be upgraded. Specifically, a subsurface isolation valve would be installed approximately 50 feet east of the Battery Park Underpass near the Battery Bikeway, and over 200 feet north of Castle Clinton. In addition, a sanitary sewer isolation valve would be installed on The Battery comfort station subsurface sewer lateral (i.e., sanitary pipe connection), over 300 feet northeast of Castle Clinton (see **Figure 3.4-9**).

Castle Clinton National Monument is significant for its historic and architectural importance as a 19th-Century defensive structure that overlooks in New York Harbor and has been altered over time to serve civilian purposes over time. The monument retains integrity of location, design, setting, materials, workmanship, feeling, and association. The Proposed Action would occur northwest and north of Castle Clinton, but no construction activity would occur within the confines of the National Register boundary. Although Pier A Plaza to the northwest would be reconstructed to accommodate the flood alignment and nuisance flooding alignment, views between the plaza and Castle Clinton are blocked by mature trees, and the introduction of these improvements would continue to be screened from Castle Clinton. This is also described in Section 3.5 (Urban Design and Visual Resources). Essentially, the primary water-based views from the monument toward New York Harbor for which it is most closely associated would remain unobstructed and intact.

The Proposed Action may have the potential to alter the northern edge of The Battery, approximately 300 to 500 feet north of Castle Clinton. The flood alignment in this section would be comprised of a combination of exposed floodwall atop the Battery Park Underpass, flip-up deployables, partially exposed floodwall, and buried floodwall beneath bermed floodwall. This concept also reconfigures the bikeway, and requires relocation of a monument along the Battery Place sidewalk. The approximate HOI begins at 9.5 feet, and at the eastern end of the Project Area, the design would transition into the existing sidewalks, planters, and other existing conditions in The Battery. Security improvements, comprised of bollards and a knee wall, may also be installed along the south side of Battery Place, and meet the existing Stony Creek granite benches between West and Washington streets.

These actions would indirectly affect Castle Clinton because they may result in slight alteration of the inland views from the structure. However, the primary water-based views from Castle Clinton toward New York Harbor for which it is most closely associated would remain unobstructed and intact. Therefore, the Proposed Action would have No Adverse Impact on Castle Clinton. Because Castle Clinton is situated within The Battery (Block 3/Lot 1), contiguous to Pier A (Block 1/Lot 16), it is recommended that a CPP be prepared for Castle Clinton. CPPs are recommended by NYCDOB and NYC LPC for historic structures that are contiguous to or within a lateral distance of 90 feet from a lot under development or alterations. Although Castle Clinton itself is approximately 200 feet southeast of the Proposed Action in Pier A Plaza, the CPP would ensure that all measures are being undertaken to protect this National Monument during construction on the adjacent lot.

Brooklyn-Battery Tunnel (Present-Day Hugh L. Carey Tunnel) (Resource 4)

The National Register-eligible Brooklyn-Battery Tunnel was constructed between 1940-1943, and 1945-1950, and provides a subsurface link between Manhattan and Brooklyn under the mouth of the East River. The tunnel was built to supplement the Brooklyn Bridge (1869-1883), Manhattan Bridge (1912), and Williamsburg Bridge (1903). Contributing elements of the tunnel include the Manhattan and Brooklyn approaches; masonry portals in Manhattan and Brooklyn; twin tunnel tubes beneath the mouth of the East River; four ventilation buildings (one in Brooklyn, two in Manhattan, and one on Governor's Island); and the main service building in Brooklyn. The Federal Highway Administration (FHWA) has determined the Brooklyn-Battery Tunnel National Register-eligible as part of their "Final List of Nationally and Exceptionally Significant Features of the Federal Interstate Highway System" noting that it is significant in the area of engineering as "the longest continuous underwater vehicular tunnel in North America and the longest continuous underwater vehicular tunnel in the world" (FHWA, May 10, 2019). The Brooklyn-Battery Tunnel possesses significance under Criteria A and C for its historic and engineering importance (Howe, April 20, 2017). The tunnel is operated by the TBTA, doing business as MTA Bridges and Tunnels.

The SBPCR Project would take place southwest, south, and southeast of the contributing Vent/Blower Building, and directly above the National Register boundary of the contributing tunnel tubes (see **Figure 3.4-9**). Proposed improvements in close proximity to these resources are described below.

With respect to the contributing Vent/Blower Building, proposed improvements to Pier A Plaza would occur over 540 feet southwest of the structure. As previously noted in Section 3.4.8.3 (Proposed Action – Pier A), the flood alignment and nuisance flooding alignment would be constructed in Pier A Plaza. The universal access and security improvements would also be installed north of both alignments (see **Figure 3.4-11**).With respect to the Battery Bikeway, proposed improvements would occur approximately 168 feet south of the Vent/Blower Building, and over 350 feet southwest, and 190 feet southeast, respectively. The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument). In addition, security improvements, comprised of bollards and a knee wall, may also be installed along the south side of Battery Place, and meet the existing Stony Creek granite benches between West Street (Route 9A) and Washington Street., approximate 300 feet southwest of the Vent/Blower Building. With respect to the contributing tunnel tubes, proposed improvements to the Battery Bikeway would be constructed above the tubes. Specifically, improvements associated with a bermed floodwall would take place over five feet and two inches above the east tube, and over four feet and five inches above the west tube. At grade above the tunnel tubes, the Battery Bikeway would be reconfigured to accommodate the buried floodwall.

The Brooklyn-Battery Tunnel is historically significant because it forms part the of the mid-20th-Century highway network that conveyed traffic between Manhattan and Brooklyn, via the longest continuous underwater vehicular tunnel in the world. The tunnel retains integrity of location, setting, design, materials, workmanship, feeling, and association, and the contributing Vent/Blower Building survives as an excellent example of Art Deco-style design. The project actions would indirectly affect the contributing Vent/Blower Building. In the case of Pier A Plaza located southwest of the building, the views between the structure and the plaza would be altered because the plaza would be reconstructed with to accommodate flip-up deployables, supported by exposed floodwalls, and three fixed concrete columns. The reconstruction of the plaza would also accommodate the tie-in point for the nuisance flooding alignment. Universal access and security improvements would be made north of the flood alignment and the nuisance flooding alignment. These actions would alter views between the building and the plaza, which would be raised to accommodate the flood alignment. During storm events, opaque flip-up deployables, supported by fixed columns, would be deployed in an area that currently permits unobstructed lines of sight between the Vent/Blower Building and the plaza. In the case of the Battery Bikeway in The Battery, the northern portion of the park directly across from the building would be raised and modified to accommodate the flood alignment. Security bollards and a knee wall may also be installed on the south side of Battery Place, southwest of the Vent/Blower Building. Therefore, the visual relationship between the Vent/Blower Building and bikeway would be altered. With respect to the contributing tunnel tubes, construction of the buried floodwall would occur over five feet above the east tube, and over four feet above the west tube, and not impact their structural integrity. However, because the Brooklyn-Battery Tunnel tubes are in close proximity to construction, the contractor would be required to obtain permits and approvals from the TBTA prior to commencing work within the influence zone of the tunnel, which coincides with subsurface area between the top of the tunnel tubes and the foundation footing of the buried floodwall (AECOM, Magnusson Klemncic Associates, and SiteWorks, 2020).

Overall, the significance of the Brooklyn-Battery Tunnel, and the contributing Vent/Blower Building and tubes, is tied to the role it has played in conveying traffic through New York City, and its status as one of the longest vehicular tunnels, and not its relationship to Pier A Plaza or the Battery Bikeway. It is expected that the tunnel's integrity would remain intact after project implementation, as the contractor would obtain all permits and approvals from TBTA prior to construction within the influence zone of the subsurface tunnel tubes. Therefore, it is anticipated that the Proposed Action would have No Adverse Impact on the Brooklyn-Battery Tunnel.

Brooklyn-Battery Tunnel Vent/Blower Building (Resource 5)

The National Register-eligible Brooklyn-Battery Tunnel Vent/Blower Building is located on the north side of Battery Place between Greenwich and Washington streets; the building is individually eligible, and also contributes to the National Register-eligible Brooklyn-Battery Tunnel (see **Figure 3.4-9**). The limestone structure with Art Deco elements was built between 1945-1950, and was designed by Aymar Embury II, an architect closely associated with Robert Moses. Each façade has a simple granite entrance enframement and undulating parapet. The building retains its architectural integrity (Dolkart, May 1989a).

Impacts of the SBPCR Project on the Brooklyn-Battery Tunnel Vent/Blower Building are described under Section 3.4.8.3 (Proposed Action – Brooklyn-Battery Tunnel) because it is a contributing resource to the National Register-eligible tunnel.

Battery Park Control House (Resource 6)

The National Register-listed/NYC Landmark Battery Park Control House is located at the southwest corner of Battery Place and State Street. Constructed between 1904-1905, it was designed by Heins &

LaFarge, the firm that designed subway stations and buildings for the Interborough Rapid Transit Company (IRT), the private operator of the original subway line in New York City. The Control House is constructed of yellow brick, with limestone quoins, and glass in the Beaux-Arts style; it also features terra cotta ornament at the roof level. The Battery Park Control House is significant for its design and association with New York City's first subway system. Furthermore, it is one of the last remaining examples of a type of "monumental subway entrance which expressed the City's pride" in the subway system (NYC LPC, November 20, 1973).

The SBPCR Project segment closest to the Battery Park Control House would occur along the Battery Bikeway on the north side of The Battery (see **Figure 3.4-9**). At its closest point, the bikeway would be located approximately 200 feet northwest of the National Register boundary of the Control House, near the intersection of Battery Place and Greenwich Street; at its farthest point, the bikeway would be located approximately 550 feet northwest of the National Register boundary of the Control House, in the vicinity of the Battery Park Underpass. The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The Battery Park Control House possesses significance for its Beaux-Arts design, and its direct association with New York City's first subway system, the IRT. It also retains integrity of location, setting, design, materials, workmanship, feeling, and association. No construction activity would occur within the National Register boundary of the Battery Park Control House, but the Proposed Action would indirectly affect the resource. Specifically, the Battery Bikeway north of the Control House would be raised and modified to accommodate the flood alignment, but at the eastern end of the flood alignment, closest to the Battery Park Control House, the alignment would transition into existing conditions at The Battery. However, introduction of the flood alignment along the Battery Bikeway would alter the visual relationship between the Custom House and bikeway. Overall, the significance of the Battery Park Control House is tied to its Beaux-Arts design and association with the first subway in New York City that was constructed during the 1900s. It is not significant for its views to and from the Battery Bikeway. In addition, The Battery itself, situated directly north and west of the Control House, has been altered since construction of the Control House in the 1900s, and construction of the flood alignment along the bikeway would be consistent with these changes over time. It is expected that the Control House's integrity would remain intact after project implementation. Therefore, it is anticipated that the Proposed Action would have No Adverse Impact on the Battery Control House.

Joralemon Street Tunnel (Resource 7)

The National Register-listed Joralemon Street Tunnel is a 6,544-foot long, 22-foot wide concrete and cast-iron subway tunnel that was constructed between 1902-1908 by the IRT, the private operator of the original subway line in New York City. The tunnel, comprised of two parallel cast iron tubes that measure 16-feet and 8-inches in diameter, extends beneath the East River between lower Manhattan and Brooklyn Heights. The tunnel is significant under Criterion A for its transportation, community planning/development, and social history importance and Criterion C for its engineering significance; period of significance is 1902-1908 (Bedford and Vairo, March 30, 2004).

The SBPCR Project segment closest to the Joralemon Street Tunnel would occur along the Battery Bikeway, approximately 200 feet west of the National Register boundary of the subsurface tunnel (see **Figure 3.4-9**).The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The Joralemon Street Tunnel possesses significance for its engineering significance, and its direct association with New York City's first subway system, the IRT. It also retains integrity of location, setting, design, materials, workmanship, feeling, and association. No construction activity would occur within the National Register boundary of the subsurface tunnel, and its integrity would remain intact after project implementation. Therefore, it is anticipated that the Proposed Action would have No Impact on the Joralemon Street Tunnel.

U.S. Custom House (Resource 8)

The NHL/National Register-listed/NYC Landmark U.S. Custom House is located at 1 Bowling Green, on the south side of Bowling Green between Whitehall Street to the east, State Street to the west, and Bridge Street to the south. Designed by Cass Gilbert, with a sculptural program by Daniel Chester French, the Custom House was erected between 1900-1907, facing Bowling Green, the lowest point of land in Manhattan that was once the shore of The Battery. The steel-framed, trapezoidal-shaped, seven-story, Beaux-Arts-style building is clad in ashlar masonry, and capped by a slate-clad mansard roof with copper cresting, a stone parapet, and elaborate entablature. (Pitts, August 1976). The U.S. Custom House is significant on a national, state, and local level in the areas of architecture, art, and sculpture. It is also a contributing resource to the National Register-listed Wall Street Historic District (Resource 14).

The SBPCR Project segment closest to the U.S. Custom House would occur along the Battery Bikeway, approximately 300 feet west of its National Register boundary (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The U.S. Custom House possesses significance in the areas of architecture, art, and sculpture. It also retains integrity of location, setting, design, materials, workmanship, feeling, and association. No construction activity would occur within the National Register boundary, but the Proposed Action would indirectly affect the U.S. Custom House. Specifically, the Battery Bikeway west of the Custom House would be raised and modified to accommodate the flood alignment. At the eastern end of the flood alignment, closest to the U.S. Custom House, the alignment would transition into existing conditions at The Battery. However, introduction of the flood alignment along the Battery Bikeway would alter the visual relationship between the Custom House and bikeway. Overall, the significance of the U.S. Custom House is tied to its Beaux-Arts design and sculptural program conceived by Cass Gilbert, Daniel Chester French, among others, all considered leading designers and artists when they practiced during the early 20th Century. It is not significant for its views to and from the Battery Bikeway, and in fact, the principal facade of the Custom House faces north toward Bowling Green, while its west, or side, façade faces The Battery. It is expected that the Custom House's integrity would remain intact after project implementation, and the west façade would still have an unobstructed view westward toward The Battery, and New York Harbor in the distance. Therefore, it is anticipated that the Proposed Action would have No Adverse Impact on the U.S. Custom House.

Bowling Green Fence and Park (Resource 9)

The National Register-listed Bowling Green Fence and Park is located on the north side of Bowling Green. Bowling Green Fence is also a designated NYC Landmark. The half-acre, elliptical-shaped park splits Broadway into two segments that meet Whitehall Street to the southeast, and State Street to the southwest. Key features of the park include the oval-shaped lawn with a fountain, and simple iron fence of thin spikes and posts, with entrance gates to the north and south. The sidewalks that flank the park are sheathed in bluestone. Between the 17th and 18th Centuries, Bowling Green served multiple functions, including a hog and cattle market, parade ground for British soldiers, and eventually, a bowling green for nearby residents. The iron fence was initially erected in 1771, and raised atop stones by the 1790s. By the early 19th Century, grass and trees had been planted, and by the 1900s, the fence was removed to accommodate subway construction. The fence was replaced in 1919, eventually equipped with electric lanterns by the 1930s.

In 1971, the park was restored, and is maintained in excellent condition through present time. Bowling Green is historically significant in the areas of exploration and settlement, politics and government from 1600-1799 (Kurshan, August 1979; NYC LPC, July 14, 1970). It is also a contributing resource to the National Register-listed Wall Street Historic District (Resource 14).

The SBPCR Project segment closest to Bowling Green Fence and Park would occur along the Battery Bikeway, approximately 350 feet southwest of the National Register boundary (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The Bowling Green Fence and Park, and NYC Landmark Bowling Green Fence, possesses significance as a park ensemble that dates to the 17th Century in Manhattan. It also retains integrity of location, setting, design, materials, workmanship, feeling, and association. Construction activity associated with improvements to the Battery Bikeway would be well removed from the National Register boundary, and not be directly visible from the park. Therefore, the integrity of the oval shaped park would remain intact after project implementation, nestled within the dense urban fabric of Manhattan's Financial District. Therefore, it is anticipated that the Proposed Action would have No Impact on the Bowling Green Fence and Park.

International Mercantile Marine Building (Resource 10)

The National Register-listed and NYC Landmark International Mercantile Marine Company Building is located at 1 Broadway on the north side of Battery Place, just north of The Battery, and west of Bowling Green. The building was originally constructed in 1882, and redesigned in 1919-1922 by architect Walter B. Chambers, a well-known practitioner of the Classical Revival style. The 12-story granite, limestone, and copper building with nautical ornamentation housed the International Mercantile and Marine Company, a shipping syndicate that was formed in 1902 when American and British shipping lines merged.

The International Mercantile Marine Company is significant under Criterion C as an excellent example of a post-World War I-era, Neoclassical-style office building in New York City (Dolkart, May 1989b). It is also a contributing resource to the National Register-listed Wall Street Historic District (Resource 14).

The SBPCR Project segment closest to the International Mercantile and Marine Building would occur along the Battery Bikeway on the south side of Battery Place, less than 200 feet southwest of its National Register boundary (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument). In addition, security improvements, comprised of bollards and a knee wall, may also be installed along the south side of Battery Place, and meet the existing Stony Creek granite benches between West Street (Route 9A) and Washington Street, over 500 feet southwest of the building (see **Figure 3.4-11**).

The Mercantile and Marine Building possesses architectural significance as a post-World War I-era office building erected in the Classical Revival style to serve the shipping industry. It overlooks The Battery and New York Harbor. The building retains integrity of location, setting, design, materials, workmanship, feeling, and association. Although construction would not occur within the International Mercantile and Marine Building's National Register boundary, the Proposed Action would indirectly affect it because the Battery Bikeway southwest of the building would be raised and modified to accommodate the flood alignment. However, in the area directly south of the building, the flood alignment would transition to the naturally higher ground that characterizes the eastern end of the bikeway. As a result, the view from the building to The Battery and New York Harbor would remain unaltered and intact. Therefore, it is anticipated that the Proposed Action would have No Adverse Impact on the International Mercantile and Marine Building.

Bowling Green Offices (Resource 11)

The National Register-listed and NYC Landmark Bowling Green Offices is located at 5-11 Broadway, on the west side of Broadway, opposite Bowling Green. The 21-story building was constructed in 1895-1898, and is clad in stone and glazed brick, and features Egyptian Revival and Classical Revival-style ornamentation. It was designed by W. & G. Audsley. Above the third story, the building reflects elements of the Chicago School. Upon completion, the building housed steamship lines and shipping firms; it was altered in 1920 by Ludlow & Peabody. The building is National Register-eligible under Criterion C for its architectural significance (Howe, January 4, 2000). It is also a contributing resource to the National Register-listed Wall Street Historic District (Resource 14).

The SBPCR Project segment closest to Bowling Green Offices would occur approximately 400 feet southwest of the National Register boundary, along the Battery Bikeway (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The Bowling Green Offices possess architectural significance as a good example of a late 19th/early 20th-Century Egyptian/Classical Revival-style office building erected to serve the shipping industry. It also retains integrity of location, setting, design, materials, workmanship, feeling, and association. Construction activity associated with improvements to the Battery Bikeway would be well-removed from the National Register boundary of Bowling Green Offices, and not be directly visible from the building, which faces Broadway. Thus, its integrity would remain intact after project implementation, nestled within the dense urban fabric of Manhattan's Financial District. Therefore, it is anticipated that the Proposed Action would have No Impact on the Bowling Green Offices.

Cunard Building (Resource 12)

The National Register-eligible and NYC Landmark Cunard Building is located at 25 Broadway, just northwest of Bowling Green. The 22-story, Italian Renaissance-style, limestone-clad building was built in 1921 and was designed by Benjamin Wistar Morris with Carrere & Hastings. The Broadway entrance features a wide vestibule with vaulted plaster ceilings ornamented with sea creatures. The domed Great Hall is beyond the vestibule, and originally functioned as the booking office for Cunard Lines. The Cunard Building is significant under Criterion C as an excellent example of early 20th-Century skyscraper design in Manhattan which contains one the city's most ornate and impressive interior spaces (Dolkart, May 1990). It is also a contributing resource to the National Register-listed Wall Street Historic District (Resource 13).

The SBPCR Project segment closest to the Cunard Building would occur approximately 600 feet southwest of the National Register boundary, along the Battery Bikeway (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The Cunard Building possesses significance as a good example of an early 20th-Century skyscraper erected to serve the shipping industry. It also retains integrity of location, setting, design, materials, workmanship, feeling, and association. Construction activity associated with improvements to the Battery Bikeway would be well removed from the National Register boundary of the Cunard Building, and not be directly visible from the building, which faces Broadway. Thus, its integrity would remain intact after project implementation, nestled within the dense urban fabric of Manhattan's Financial District. Therefore, it is anticipated that the Proposed Action would have No Impact on the Cunard Building.

Standard Oil Building (Resource 13)

The National Register-eligible and NYC Landmark Standard Oil Building at 26 Broadway is located northeast of Bowling Green. This 29-story neo-Renaissance-style, limestone-clad building was constructed between 1921-1928 for John D. Rockefeller's Standard Oil Company, and was designed by Carrere & Hastings with Shreve, Lamb & Blake as associate architects. The building is significant under Criterion C for its architectural design, including powerful sculptural massing and arresting silhouette that exemplifies the set-back skyscraper forms that emerged during the 1920s (Bradley, 1995). It is also a contributing resource to the National Register-listed Wall Street Historic District (Resource 14).

The SBPCR Project segment closest to the Standard Oil Building would occur approximately 550 feet southwest of the National Register boundary, along the Battery Bikeway (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The Standard Oil Building possesses significance as a good example of an early 20th-Century skyscraper. It also retains integrity of location, setting, design, materials, workmanship, feeling, and association. Construction activity associated with improvements to the Battery Bikeway would be well removed from the National Register boundary of the Standard Oil Building, and not be directly visible from the building, which faces Broadway. Thus, its integrity would remain intact after project implementation, nestled within the dense urban fabric of Manhattan's Financial District. Therefore, it is anticipated that the Proposed Action would have No Impact on the Standard Oil Building.

Wall Street Historic District (Resource 14)

The National Register-listed Wall Street Historic District includes 66 contributing buildings on part or all of 36 blocks the occupy the inner core of the southernmost tip of Manhattan, south of Maiden Lane. The district is significant under Criteria A and C for its historic and architectural importance. Its period of significance spans from 1656 to 1956; 1960 and 1967. It's history spans from the establishment of the Dutch colony of New Amsterdam, its 18th-Century role as the nation's first capital, and its two-centuries-old status as the nation's financial center (Robins, September 5, 2006). Several individually National Register-listed or eligible buildings are situated within the district, including the U.S. Custom House (Resource 8); Bowling Green Fence and Park (Resource 9); International Mercantile Marine Company Building (Resource 10); Bowling Green Offices (Resource 11); Cunard Building (Resource 12); and the Standard Oil Building (Resource 13).

The SBPCR Project segment closest to the Wall Street Historic District would occur along the Battery Bikeway on the south side of Battery Place, less than 200 feet southwest of contributing International Mercantile Marine Building (Resource 10), and approximately 300 feet west of the U.S. Custom House (Resource 8) (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The Wall Street Historic District possesses historic and architectural significance for its collection of buildings and sites that represent the history of New York City as the financial capital of the nation. The southwest corner of the district overlooks The Battery and New York Harbor. The district retains integrity of location, setting, design, materials, workmanship, feeling, and association. The Proposed Action would indirectly affect the district because the Battery Bikeway southwest of the historic district would be raised and modified to accommodate the flood alignment. However, in this area, the flood alignment would transition to the naturally higher ground that characterizes the eastern end of the bikeway. As a result, the view from the district to The Battery and New York Harbor would remain unaltered and intact. Therefore, it is anticipated that the Proposed Action would have No Adverse Impact on the Wall Street Historic District.

Lamppost 8 (Resource 15)

Lamppost 8 is a National Register-eligible and NYC Landmark cast iron lamppost. The lamppost was constructed between the 19th and 20th centuries, and approximately 100 survive in Manhattan, Brooklyn, the Bronx, and Queens. The lamppost is located on the east side of Greenwich Street between Battery Place and Morris Street (Woodoff, 1997).

The SBPCR Project segment closest to Lamppost 8 would occur along the Battery Bikeway on the south side of Battery Place, over 500 feet south of the lamppost (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

Lamppost 8 possesses significance as a historic cast iron lamppost. Construction activity associated with improvements to the Battery Bikeway would not obstruct views to Lamppost 8, or substantially change its setting. Its integrity would remain intact after project implementation, nestled within the dense urban fabric of Manhattan's Financial District. Therefore, it is anticipated that the Proposed Action would have No Impact on Lamppost 8.

Historic Street Lampposts (Resource 16)

Historic Street Lampposts are NYC Landmark-designated cast iron lampposts. The lampposts were constructed between the 19th and 20th centuries, and approximately 100 survive in Manhattan, Brooklyn, the Bronx, and Queens (Woodoff, 1997). The lampposts are located on the west side of Greenwich Street, the east side of Washington Street between Battery Place and Morris Street, and at the corner of Washington and Morris streets.

The SBPCR Project segment closest to the lampposts would occur along the Battery Bikeway on the south side of Battery Place, over 350 feet south of the lampposts (see **Figure 3.4-9**). The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

The Lampposts possess significance as historic cast iron lamppost. Construction activity associated with improvements to the Battery Bikeway would not obstruct views to Historic Street Lampposts, or substantially change their setting. Their integrity would remain intact after project implementation, nestled within the dense urban fabric of Manhattan's Financial District. Therefore, it is anticipated that the Proposed Action would have No Impact on the lampposts.

Whitehall Building (Resource 17)

The National Register-eligible and NYC Landmark Whitehall Building is located at 17 Battery Place opposite The Battery on the north side of Battery Place. The Beaux-Arts-style, limestone and terra cotta-clad 20-story building was initially completed in 1904, according to the designs of Henry Hardenbergh. A 31-story addition by Clinton and Russell was constructed in 1908, facing Battery Place. The Whitehall Building is significant under Criterion C for its architectural design (SHPO, no date [a]).

The SBPCR Project would take place southwest, south, and southeast of the Whitehall Building (see **Figure 3.4-9**). Proposed improvements in close proximity to the Whitehall Building include Pier A Plaza, the Battery Bikeway, and the proposed NSI improvements. Proposed improvements to Pier A Plaza would occur over 350 feet southwest of the National Register boundary of the building. The proposed design is described in Section 3.4.8.3 (Proposed Action – Pier A). With respect to the Battery Bikeway, proposed improvements would occur over 160 feet south of the National Register boundary of the building, and over 280 feet southeast. Proposed security improvements may also be made in the vicinity of the existing Stony Creek granite wall benches on the south side of Battery Place between West Street (Route 9A) and Washington Street, directly south of the building. The proposed design is described in Section 3.4.8.3 (Proposed Action – Castle Clinton National Monument).

With respect to proposed NSI improvements, the Whitehall Building is approximately 150 feet east of subsurface Regulator M9 beneath the Hudson River Greenway, northeast of 1st Place, and existing interceptor sewer MH#2 which is beneath West Street (Route 9A), east of 1st Place. The Whitehall Building is also over 100 feet east of existing interceptor sewer MH#1 beneath West Street, between 1st Place and Battery Place. At Regulator M9, the two cast openings would be pressure-proofed, and replaced with flood-hardened castings to be watertight and resist uplift. In addition, the underflow slide gate in the regulator chamber would be replaced. With respect to MH#1 and MH#2, the existing manholes would be replaced with flood-hardened manholes to be watertight, and resist uplift (see **Figure 3.4-12**).

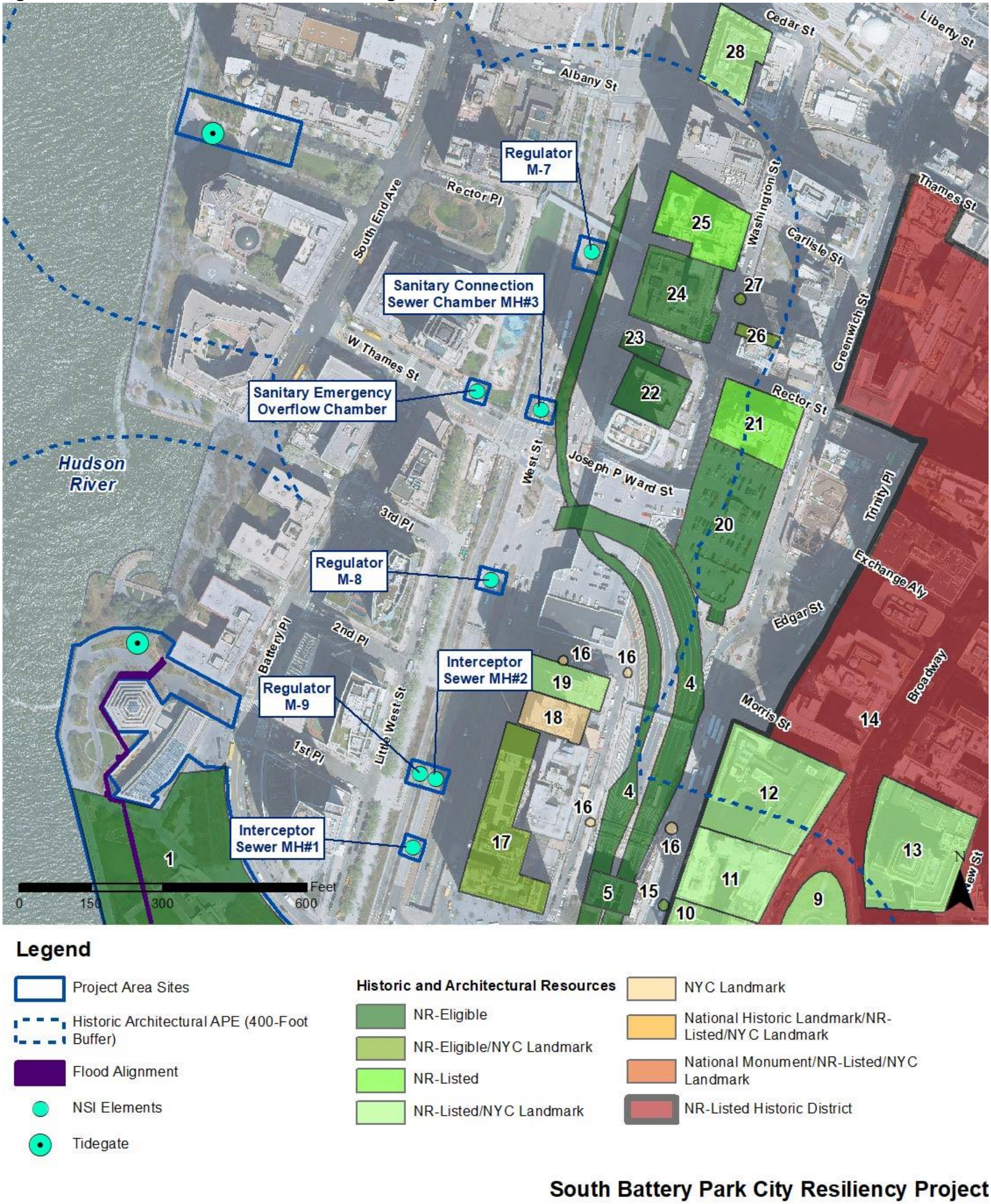
The Whitehall Building is significant as an early 20th-Century, Beaux-Art-style skyscraper that faces The Battery and New York Harbor, and is flanked by urban arterials including Route 9A and the Battery Park Underpass along its west side. The building retains integrity of location, setting, design, materials, workmanship, feeling, and association. Although construction would not occur within the Whitehall Building's National Register boundary, the Proposed Action would indirectly affect it because Pier A Plaza southwest of the building, and the Battery Bikeway south and southeast of the building would be raised and modified to accommodate the flood alignment.

In the case of Pier A Plaza located southwest of the building, the views between the Whitehall Building and the plaza would be altered because the plaza would be reconstructed to accommodate flip-up deployables. In addition, the nuisance flooding alignment would also require reconstruction of Pier A Plaza to meet the tie-in point of The Battery Coastal Resilience Project. During storm events, opaque flip-up deployables supported by fixed columns would be set up in an area that currently permits unobstructed lines of sight between the Whitehall Building and the plaza. Furthermore, north of both the nuisance flooding alignment and 2050 100-year flood alignment, universal access and security improvements would be made. With respect to Battery Bikeway improvements, the HOI along the bikeway would range from 9.5 to 0 feet, and security improvements in the form of bollards and possibly a 40-inch knee wall directly south of the building on the south side of Battery Place may be erected. Despite these alterations, the building would still have commanding views of The Battery and New York Harbor. In addition, the building would still be highly visible along the north side of Battery Place after project implementation. Regarding the proposed NSI improvements west of the Whitehall Building, the building towers over the east side of West Street (Route 9A), and it is unlikely that pressure-proofing openings and manhole covers, coupled with subsurface upgrades would alter its location, setting, feeling, and association. Therefore, it is anticipated that the Proposed Action would have No Adverse Impact on the Whitehall Building.

Downtown Athletic Club (Resource 18)

The NYC Landmark Downtown Athletic Club is located at 19 West Street (Route 9A) on the east side of the street. This 35-story, Art Deco skyscraper opened in 1930 as the Downtown Athletic Club. The club became most famous as the home of the Heisman Trophy, given every year to the most outstanding college football player. New York City-based Starrett & Van Vleck designed the building, and the neighboring tower at 21 West Street (NYC Landmark and National Register-listed), with which the club shares its modernistic style and skillfully applied brickwork. The architects juxtaposed the simple massing of the building with stylized, theater-like entrance prosceniums on both facades and a dexterous use of flat and angled brick, creating a dramatic addition to the city's skyline. The powerful chevron motifs in the rectangular areas over the entrances and in the spandrels between the windows of the upper stories are a variation of a common design theme of the period, reflective of the speed and energy of the Jazz Age (Kurshan, November 14, 2000).

Figure 3.4-12: Detailed View of Interior Drainage Improvements



The SBPCR Project would take place southwest of the Downtown Athletic Club (see **Figure 3.4-9**). The Proposed Action in close proximity include the NSI improvements associated with Regulator M9, MH#2, and MH#1, which are described in Section 3.4.8.3 (Proposed Action – Whitehall Building). The Downtown Athletic Club is approximately 250 feet northeast of subsurface Regulator M9 and existing interceptor sewer MH#2, and over 300 feet northeast of existing interceptor sewer MH#1 (see **Figure 3.4-12**).

The Downtown Athletic Club is significant as an early 20th-Century, Art Deco-style skyscraper, and is flanked by urban arterials, including Route 9A and the Battery Park Underpass along its west side. The building retains integrity of location, setting, design, materials, workmanship, feeling, and association. Regarding the proposed NSI improvements southwest of the Downtown Athletic Club, the building towers over the east side of West Street (Route 9A), and it is unlikely that pressure-proofing openings and manhole covers, coupled with subsurface upgrades, would alter its location, setting, feeling, and association as a skyscraper situated in a dense urban environment. Therefore, it is anticipated that the Proposed Action would have No Impact on the Downtown Athletic Club.

21 West Street (Resource 19)

The National Register-listed and NYC Landmark, 31-story, brick Art Deco speculative office building at 21 West Street was constructed in 1929-31 to the designs of Starrett & Van Vleck, well known practitioners of the Art Deco style. With its bold, set-back profile, finely detailed brickwork suggestive of woven fabric, a recessed street-level shopping arcade, and comer windows, this building on the east side of West Street (Route 9A) epitomizes the skyscrapers built in New York during the early 20th Century. The building at 21 West Street is significant under Criteria A and C for its historic and architectural importance (Balson, December 10, 1998).

The SBPCR Project would take place southwest of 21 West Street (see **Figure 3.4-9**). Proposed improvements in close proximity include the NSI associated with Regulator M9, MH#2, and MH#1, as described in Section 3.4.8.3 (Proposed Action – Whitehall Building). The building at 21 West Street is approximately 250 feet northeast of Regulator M9 and MH#2, and over 350 feet northeast of MH#1 (see **Figure 3.4-12**).

The building at 21 West Street is significant as an early 20th-Century, Art Deco-style skyscraper, and is flanked by urban arterials, including Route 9A and the Battery Park Underpass along its west side. The building retains integrity of location, setting, design, materials, workmanship, feeling, and association. Regarding the proposed NSI improvements southwest of 21 West Street, the building towers over the east side of West Street (Route 9A), and it is unlikely that pressure-proofing openings and manhole covers, coupled with subsurface upgrades, would alter its location, setting, feeling, and association as a skyscraper situated in a dense urban environment. Therefore, it is anticipated that the Proposed Action would have No Impact on 21 West Street.

Battery Parking Garage (Resource 20)

The National Register-eligible Battery Parking Garage is located at 70 Greenwich Street; it is bound to the north by Rector Street, the south by the access ramps to the Brooklyn-Battery Tunnel, the east by Greenwich Street, and the west by Washington Street. The rounded concrete and brick garage was constructed in 1949, and was the first parking garage in New York City to be erected by a public agency, the TBTA. It originally accommodated 1,050 parking spaces, and was expanded in the mid-1960s, and now accommodates 2,126 spaces (MTA.info, June 8, 2015). It is assumed that the Battery Parking Garage is significant under Criteria A and C for its historic and architectural importance.

The SBPCR Project would take place west of the Battery Parking Garage (see **Figure 3.4-9**). The Proposed Action in close proximity include the NSI improvements associated with Regulator M8 and improvements proposed at MH#3. The Battery Parking Garage is located approximately over 450 feet northeast of subsurface Regulator M8, which is beneath West Street (Route 9A), east of 3rd Place. At Regulator M8, the two cast openings would be pressure-proofed, and replaced with flood-hardened castings to be watertight and resist uplift. In addition, the underflow slide gate in the regulator chamber would be replaced. The garage is located approximately over 400 feet east of MH#3, which is beneath West Street, northeast of West Thames Place. At MH#3, the existing manhole over the sanitary sewer chamber would be replaced with a flood-hardened manhole that would resist uplift and be watertight. Furthermore, the manhole above the sanitary emergency overflow chamber on the north south of West Thames Street, south of West Thames Playground, would also be replaced with a flood-hardened manhole that would resist uplift, and be watertight (see **Figure 3.4-12**).

The Battery Parking Garage is significant as a mid-20th-Century rounded concrete structure that was built by a public agency, the first of its kind in New York City. The building retains integrity of location, setting, design, materials, workmanship, feeling, and association. The parking garage is screened from the proposed location of the NSI associated with Regulator M8 and MH#3 by intervening development. Therefore, it is anticipated that the Proposed Action would have No Impact on the Battery Parking Garage.

19 Rector Street (Resource 21)

The National Register-listed building at 19 Rector Street is located on the south side of Rector Street between Greenwich Street to the east, and Washington Street to the west. The Art Deco-style office building was constructed in ca. 1929-1930, and was designed by Lafayette Goldstone. In 1955, an addition designed by Alexander Zamschnick was appended to the building. In recent times, the commercial building was converted into residences. The building at 19 Rector Street is significant under Criteria A and C for its historic (community planning/development) and architectural importance, and its period of significance is 1929-1930 (Dolkart, January 8, 2002).

The SBPCR Project would take place southwest of 19 Rector Street (see **Figure 3.4-9**). The Proposed Action in close proximity include MH#3, and the subsurface sanitary emergency overflow chamber described under Section 3.4.8.3 (Proposed Action – Battery Parking Garage), and shown in **Figure 3.4-12**.

The building at 19 Rector Street is significant as an early 20th-Century Art Deco-style building that retains integrity of location, setting, design, materials, workmanship, feeling, and association. The building is screened from the proposed location of the NSI associated with MH#3 by intervening development. Therefore, it is anticipated that the Proposed Action would have No Impact on 19 Rector Street.

Former Babbitt Soap Factory (Resource 22)

The former Babbitt Soap Factory is located at 74-80 Washington Street on the west side of Washington Street. Originally constructed by Babbitt Soap in 1882, it was remodeled ca. 1911 by Blum & Blum. The building is significant under Criterion C as a good example of early 20th-Century office building. The building has been altered and enlarged from 1969 onward, and currently functions as a condominium (Howe, March 13, 2007).

The SBPCR Project would take place over southwest of the former Babbitt Soap Factory (see **Figure 3.4-9**). The Proposed Action in close proximity to the building include proposed NSI improvements. The building is located 250-300 feet northeast of MH#3, and the subsurface sanitary emergency overflow chamber described under Section 3.4.8.3 (Proposed Action – Battery Parking Garage), and shown in **Figure 3.4-12**.

The Babbitt Soap Factory has been altered, and no longer retains integrity of location, setting, design, materials, workmanship, feeling, and association. Although the west façade of the building is within view of the proposed NSI improvements, the former soap factory has been highly altered, thus, it is unlikely that would impact this building. Therefore, it is anticipated that the Proposed Action would have No Impact on the former Babbitt Soap Factory.

Frasch Building (Resource 23)
The National Register-eligible Frasch Building is located at 56 West Street/33 Rector Street is a Renaissance Revival-style building built in 1921 by Herman Frasch, founder and first president of Union Sulphur Company (*The New York Times*, June 25, 2000). In recent times, the building has been converted into residences. It is assumed that the building is significant under Criterion C for its architectural importance.

The SBPCR Project would take place northwest and southwest of the Frasch Building (see **Figure 3.4-9**). The Proposed Action in close proximity include NSI improvements. Specifically, the Frasch Building is situated over 400 feet northwest of MH#3, whose improvements are described under Section 3.4.8.3 (Proposed Action – Former Babbitt Soap Factory). In addition, the Frasch Building is situated over 200 feet southwest of improvements associated with Regulator M7, which is situated West Street (Route 9A), just south of the Rector Street pedestrian bridge. At Regulator M7, the two cast openings would be pressure-proofed, and replaced with flood-hardened castings to be watertight and resist uplift. In addition, the underflow slide gate in the regulator chamber would be replaced (see **Figure 3.4-12**).

The Frasch Building is significant as an early 20th-Century multi-story office building with Renaissance Revival details. It retains integrity of location, setting, design, materials, workmanship, feeling, and association. The west façade of the towers over West Street, and the area of the proposed NSI improvements at Regulator M7. However, it is unlikely that pressure-proofing openings and manhole covers, coupled with subsurface upgrades, would alter its location, setting, feeling, and association as a skyscraper situated in a dense urban environment. Therefore, it is anticipated that the Proposed Action would have No Impact on the Frasch Building.

Barrett Building (Resource 24)
The National Register-eligible Barrett Building is located at 40 Rector Street. It is a Renaissance Revival-style building that was built in 1921 (AKRF, May 2005). In recent times, the building has been converted into residences. It is assumed that the building is significant under Criterion C for its architectural significance.

The SBPCR Project would take place east of the Barrett Building (see **Figure 3.4-9**). Proposed improvements in close proximity include proposed NSI associated with Regulator M7 described under Section 3.4.8.3 (Proposed Action – Frasch Building). Improvements would be built over 450 feet southwest of the Barrett Building (see **Figure 3.4-12**).

The Barrett Building is significant as an early 20th-Century multi-story office building with Renaissance Revival details. It retains integrity of location, setting, design, materials, workmanship, feeling, and association. Regarding the proposed NSI improvements east of the Barrett Building at Regulator M7, building towers over the east side of West Street (Route 9A), and it is unlikely that pressure-proofing openings and manhole covers, coupled with subsurface upgrades, would alter its location, setting, feeling, and association as a skyscraper situated in a dense urban environment. Therefore, it is anticipated that the Proposed Action would have No Impact on the Barrett Building.

The west façade of the building faces West Street (Route 9A), and the area of the proposed NSI associated with Regulator M8. However, the building towers over Route 9A, building in the vicinity of Route 9A would impact the Barrett Building. Therefore, it is anticipated that the Proposed Action would have No Effect on the Barrett Building.

New York Evening Post Building (Resource 25)

The National Register-listed New York Evening Post Building is located at 75 West Street. It is located on the east side of West Street (Route 9A), north of, and adjacent to the Barrett Building (Resource 23). The 17-story, Art Deco-style building was built in 1926, designed by Horace Trumbauer. The building functioned as the headquarters of the newspaper until the 1990s, when the newspaper relocated its offices to midtown under the ownership of Australian media magnate, Rupert Murdoch. The building has since been converted into residences. The Art Deco-style New York Evening Post Building is significant under Criteria A and C for its historic (communications, social history, architecture) and architectural importance. It retains integrity and character-defining features, including terra cotta ornament fabricated by the Atlantic Terra Cotta Company, and Guastavino Company; bronze and steel accents; and distinctive set-backs of the upper stories (Dierickx and Baumoel, July 24, 2000).

The SBPCR Project would take place southwest of the New York Evening Post Building (see **Figure 3.4-9**). The Proposed Action in close proximity include NSI improvements associated with Regulator M7, as described under Section 3.4.8.3 (Proposed Action – Frasch Building). Improvements would be built over 150 feet southwest of the New York Evening Post Building (see **Figure 3.4-12**).

The New York Evening Post Building is significant as an Art Deco-style office building. It retains integrity of location, setting, design, materials, workmanship, feeling, and association. Regarding the proposed NSI improvements at Regulator M7 southwest of the New York Evening Post Building, the building towers over the east side of West Street (Route 9A). It is unlikely that pressure-proofing openings and manhole covers, coupled with subsurface upgrades, would alter its location, setting, feeling, and association as a skyscraper situated in a dense urban environment. Therefore, it is anticipated that the Proposed Action would have No Impact on the New York Evening Post Building.

(Former) St. George's Syrian Roman Catholic Church (Resource 26)

The National Register-eligible and NYC Landmark (Former) St. George's Syrian Roman Catholic Church is located at 103 Washington Street, on the east side of Washington Street, opposite 19 Rector Street (Resource 24). The five-story, Neo-Gothic-style building was erected as a boardinghouse/tenement in 1812, and raised to five stories in 1869. In 1925, St. George's Syrian Catholic Church moved into this building, and in 1929, Harvey F. Cassab designed a Neo-Gothic-style façade comprised of white terra cotta, and a polychrome relief of St. George and the Dragon. After World War II, St. George's was converted to a Roman Rite church for a period, and in 1982, the building was sold and converted into a pub (Caratzas, July 14, 2009). The building is National Register-eligible under Criterion A for its historic importance (SHPO, no date [b]). NYC LPC has opined that the building possesses both historic and architectural significance (Caratzas, July 14, 2009).

The SBPCR Project would take place over northwest and southwest of (Former) St. George's Syrian Roman Catholic Church (see **Figure 3.4-9**). The Proposed Action in close proximity include proposed NSI improvements associated with Regulator M7 (over 300 feet northwest), and MH#3 (over 550 feet southwest), as described under Section 3.4.8.3 (Proposed Action – Frasch Building) (see **Figure 3.4-12**).

(Former) St. George's Syrian Roman Catholic Church is significant as Neo-Gothic-style building associated with Syrian and Lebanese settlement in Lower Manhattan during the early 20th Century. The former church retains integrity of location, setting, design, materials, workmanship, feeling, and association. The building is screened from the proposed location of the NSI at Regulator M7 and MH#3 by intervening development. Therefore, it is anticipated that the Proposed Action would have No Impact on (Former) St. George's Syrian Roman Catholic Church.

Lamppost 80 (Resource 27)

Lamppost 80 is a National Register-eligible and NYC Landmark cast iron lamppost. The lamppost was constructed between the 19th and 20th centuries, and approximately 100 survive in Manhattan, Brooklyn, the Bronx, and Queens. The lamppost is located on the east side of Washington Street, near 107-109 Washington Street (Woodoff, 1997).

The SBPCR Project would take place northwest and southwest of Lamppost 80 (see **Figure 3.4-9**). The Proposed Action in close proximity include proposed NSI improvements associated with Regulator M7 (over 300 feet northwest), and MH#3 (over 550 feet southwest), as described under Section 3.4.8.3 (Proposed Action – Frasch Building) (see **Figure 3.4-12**).

Lamppost 80 possesses significance as a historic cast iron lamppost. Construction activity associated with NSI at Regulator M7, and MH#3 would not obstruct views to Lamppost 80, or substantially change its setting. Its integrity would remain intact after project implementation, nestled within the dense urban fabric of Manhattan's Financial District. Therefore, it is anticipated that the Proposed Action would have No Impact on Lamppost 80.

West Street Building (Resource 28)

The National Register-listed and NYC Landmark is located at 90 West Street at the northeast corner of Albany Street and West Street (Route 9A). The C-shaped, 23-story building was designed by noted American architect, Cass Gilbert; construction began in 1905, and was completed in 1907. The building is historically significant under Criterion A in the area of commerce as an early 20th-Century skyscraper that served Manhattan's waterfront enterprises. It is also significant under Criterion C for its architectural design. Prior to the commencement of construction of Battery Park City in the 1960s, the West Street Building had a highly visible location along the Hudson River. The building was designed by Cass Gilbert, and is a superior example of an early skyscraper adorned with Classical and Gothic-style details rendered in terra cotta, granite, marble, copper, and cast iron. The West Street Building has also acquired additional historic importance because it was severely damaged during the terrorist attacks of September 11, 2001. After the attack, it was restored and converted into an apartment building (Dennis, December 5, 2006).

The SBPCR Project would take place over 400 feet southwest the West Street Building (see **Figure 3.4-9**). Proposed improvements in close proximity include proposed NSI associated with Regulator M7 described under Section 3.4.8.3 (Proposed Action – Frasch Building) (see **Figure 3.4-12**).

The West Street Building is significant as an early 20th-Century skyscraper designed by Cass Gilbert. It retains integrity of location, setting, design, materials, workmanship, feeling, and association. The building is screened from the proposed location of Regulator M7 NSI improvements by intervening development. Therefore, it is anticipated that the Proposed Action would have No Impact on the West Street Building.

3.4.8.4 Historic Architectural Resources Summary

The impacts of the Proposed Action were analyzed in accordance with Section 14.09 on the 28 historic architectural resources in the Historic Architectural APE. The Pier A Inlet Living Shoreline was analyzed in accordance with Section 106 because a federal permit will be sought for those improvements from USACE. **Table 3.4-3** summarizes the impact findings for all 28 resources. The three potential findings include:

- No Impact – Undertaking would not impact National Register-listed or eligible resources.
- No Adverse Impact – Undertaking may have potential to directly or indirectly affect historic property, but would not alter characteristics that qualify it for inclusion in the National Register, and, if relevant, impacts could be reduced through design or other means prior to implementation.
- Adverse Impact – Undertaking would directly or indirectly alter characteristics that qualify a property for inclusion in the National Register.

The Proposed Action would have an Adverse Impact on one resource: Wagner Park. With respect to the remaining 27 resources, the project would result in No Adverse Impact on nine resources, and No Impact on 18 resources. Avoidance, mitigation, and minimization measures are described below.

Table 3.4-3: Summary of Findings for Historic Architectural Resources

Number	Name	NRHP/LPC Status	Recommended Impact Finding	Recommended Mitigation (Adverse Impact)
1	Wagner Park	National Register Eligible	Adverse Impact	HALS Documentation; other stipulations to be developed as part of LOR
2	Pier A	National Register-Listed/NYC Landmark	No Adverse Impact (Proposed Action) and No Adverse Effect (Pier A Inlet Living Shoreline); CPP recommended as minimization	N/A
3	Castle Clinton National Monument	National Monument/ National Register-Listed/NYC Landmark	No Adverse Impact; CPP recommended as minimization	N/A
4	Brooklyn-Battery Tunnel (present-day Hugh L. Carey Tunnel)	National Register-Eligible	No Adverse Impact	N/A
5	Brooklyn-Battery Tunnel Blower House	National Register-Eligible	No Adverse Impact	N/A
6	Battery Park Control House	National Register-Listed/NYC Landmark	No Adverse Impact	N/A
7	Joralemon Street Tunnel	National Register-Listed	No Impact	N/A
8	U.S. Custom House	National Historic Landmark/National Register-Listed/NYC Landmark/Contributing resource to National Register-listed Wall Street Historic District	No Adverse Impact	N/A
9	Bowling Green Fence and Park	National Register-Listed/ Contributing resource to National Register-listed Wall Street Historic District Bowling Green Fence only is a designated NYC Landmark	No Impact	N/A
10	International Mercantile Marine Company Building	National Register-Listed/NYC Landmark/ Contributing resource to National Register-listed Wall Street Historic District	No Adverse Impact	N/A
11	Bowling Green Offices	National Register-Listed/NYC Landmark/ Contributing resource to National Register-listed Wall Street Historic District	No Impact	N/A
12	Cunard Building	National Register-Listed/NYC Landmark/Contributing resource to National Register-listed Wall Street Historic District	No Impact	N/A

Number	Name	NRHP/LPC Status	Recommended Impact Finding	Recommended Mitigation (Adverse Impact)
13	Standard Oil Building	National Register-Listed/NYC Landmark/Contributing resource to National Register-listed Wall Street Historic District	No Impact	N/A
14	Wall Street Historic District	National Register-Listed Historic District	No Adverse Impact	N/A
15	Lamppost 8	National Register-Eligible/NYC Landmark	No Impact	N/A
16	Historic Street Lampposts	NYC Landmark	No Impact	N/A
17	Whitehall Building	National Register-Eligible/NYC Landmark	No Adverse Impact	N/A
18	Downtown Athletic Club	NYC Landmark	No Impact	N/A
19	21 West Street	National Register-Listed/NYC Landmark	No Impact	N/A
20	Battery Parking Garage	National Register-Eligible	No Impact	N/A
21	19 Rector Street	National Register-Listed	No Impact	N/A
22	Former Babbitt Soap Factory	National Register-Eligible	No Impact	N/A
23	Frasch Building	National Register-Eligible	No Impact	N/A
24	Barrett Building	National Register-Eligible	No Impact	N/A
25	New York Evening Post Building	National Register-Listed	No Impact	N/A
26	(Former) St. George's Syrian Roman Catholic Church	National Register-Eligible/NYC Landmark	No Impact	N/A
27	Lamppost 80	National Register-Eligible/NYC Landmark	No Impact	N/A
28	West Street Building	National Register-Listed/NYC Landmark	No Impact	N/A

Avoidance, Minimization, and Mitigation Measures

The Proposed Action would result in No Adverse Impact on the two resources for which avoidance measures are recommended: Pier A and Castle Clinton. For Pier A, both the Proposed Action and Pier A Inlet Living Shoreline would result in No Adverse Impact and No Adverse Effect, respectively. Pier A is located less than 90 feet from the Proposed Action and the Pier A Inlet Living Shoreline for which a USACE permit will be sought. Therefore, it is recommended that a CPP be prepared in accordance with NYCDOB and NYC LPC guidelines. Regarding Castle Clinton, it is situated within The Battery adjacent to, and approximately 200 feet southeast of the Proposed Action in Pier A Plaza. The CPP recommended for Castle Clinton would ensure that all measures are being undertaken to protect this National Monument from construction that would occur on an adjacent lot.

In addition, the Proposed Action would result in an Adverse Impact on Wagner Park. Section 14.09 requires that adverse impacts to National Register-listed and/or eligible resources caused by implementation of the undertaking be resolved through mitigation. Therefore, a Letter of Resolution (LOR) would be drafted and executed between BPCA and SHPO to mitigate the Adverse Impact. Potential mitigation could possibly include, but not be limited to:

- HALS Documentation of Wagner Park prior to construction. Documentation would include a physical description, historic overview, statement of significance, project information, high-quality digital or large-format photographs, and reproduction of select original plans and historic photographs.
- Interpretive panels installed at the new Wagner Park; panels could describe the original park, and the reasons why it was deemed an exceptionally significant National Register-eligible resource.
- Website publicized on-site or QR codes that could be activated on-site, and direct user to a history of Wagner Park, and the reasons why it was deemed an exceptionally significant National Register-eligible resource; the content could be similar to the panels.

Ultimately, mitigation recommendations that are agreeable to all parties would be incorporated into the LOR as stipulations.

3.5 Urban Design and Visual Resources

3.5.1 Introduction

This section considers the potential of the Proposed Action's impact on urban design and visual resources. It has been prepared in accordance with the *CEQR Technical Manual* methodologies that define urban design as the totality of components that may affect a pedestrian's experience of public space, and visual resources as the connection from the public realm to significant natural or built features, including views of the waterfront, public parks, landmark structures or districts, or otherwise distinct buildings, and natural resources. This section has also been prepared in compliance with the NYSDEC *Assessing and Mitigating Visual Impacts* (DEP-00-2, revised December 13, 2019), which provides guidance on assessing and mitigating effects on aesthetic and visual resources.

3.5.2 Regulatory Context

3.5.2.1 CEQR Technical Manual Guidelines

As defined in the *CEQR Technical Manual*, urban design is the totality of components that may affect a pedestrian's experience of public space. These components include the following:

- Streets – the arrangement and orientation of streets define location, flow of activity, street views, and create blocks on which buildings and open spaces are arranged. Other elements, including sidewalks, plantings, streetlights, curb cuts, and street furniture, also contribute to an area's streetscape.
- Buildings – a building's size, shape, setbacks, pedestrian and vehicular entrances, lot coverage, and orientation to the street are important urban design components that define the appearance of the built environment.
- Visual Resources -- visual resources include significant natural or built features, including important view corridors, public parks, landmarks, structures or districts, or otherwise distinct buildings.
- Open Space – open space includes public and private areas that do not include structures, including parks and other landscaped areas, cemeteries, and parking lots.
- Natural Features – natural features include vegetation, and geologic and aquatic features that are natural to the area.

Sunlight and wind conditions also affect the pedestrian experience of a given area. According to the *CEQR Technical Manual*, the construction of large buildings at locations that experience high wind conditions, such as along the waterfront, may result in an exacerbation of wind conditions due to "channelization" or "downwash" effects that may affect pedestrian safety. Although the Proposed Action would be constructed along the Hudson River waterfront, it would not involve the construction of tall buildings; therefore, an analysis of pedestrian wind conditions is not warranted. Regarding sunlight, the openness of Wagner Park, Pier A Plaza, The Battery, and the Hudson River Waterfront allow sunlight to reach much of the Project Area throughout the day. This condition would not be substantially altered with the Proposed Action, and no further assessment of sunlight is warranted.

The *CEQR Technical Manual* suggests that a preliminary assessment of urban design is needed when a project may have an effect on one or more of the elements that contribute to the pedestrian experience described above. Given that the Proposed Action would involve several public open spaces and City streets, a preliminary assessment was conducted, as set forth below.

3.5.2.2 NYSDEC Guidelines

NYSDEC has developed a methodology for assessing and mitigating visual effects (DEP-00-2).[3] This policy was developed for NYSDEC review of actions and defines visual and aesthetic effects, describes when a visual assessment is necessary and how to review a visual effect assessment, differentiates state and local concerns, and defines avoidance, mitigation and offset measures that eliminate, reduce or compensate for negative visual effects. The methodology and effect assessment criteria established by the policy are comprehensive and can be used by other state and local agencies to assess potential effects.

According to DEP-00-2, certain variables can affect a viewer's perception of an object or project and the visibility of the landscape (existing vegetation, buildings, and topography), size perspective (reduction of apparent size of objects as distance increases), and atmospheric perspective.[4] Consequently, according to the NYSDEC guidance, an "impact" would occur when there is a detrimental effect on an aesthetic resource that interferes with or reduces the public's enjoyment of a resource and when the mitigating[5] effects of perspective, such as vegetation, distance, and atmospheric perspective or other designed mitigation, do not reduce the visibility of a project to insignificant levels. Beauty plays no role in this concept. Further, a visual impact may also be considered in the context of contrast. Thus, objects that may be visible but are of a similar color or reflectance to background forms, would not constitute a visual impact. NYSDEC provides further definition of an "aesthetic impact," which occurs when there is a detrimental effect on the perceived beauty of a place or structure. Mere visibility, even startling visibility of a project proposal, should not be the threshold for decision making. Instead, a project, by virtue of its visibility, must clearly interfere with or reduce the public's enjoyment and/or appreciation in the appearance of an inventoried resource.

Therefore, while the construction of the Proposed Action may be visible from certain vantage points, visibility alone is not a threshold of significance. A determination of significance depends on several factors: presence of designated historic or scenic resources within the viewshed of the project, distance between the viewer and the project, general characteristics of the surrounding landscape, and the extent to which the visibility of a project interferes with the public's enjoyment or appreciation of the resource. A significant adverse visual impact would only occur when the effects of design, distance, and

[3] DEP-00-2. Assessing and Mitigating Visual Impacts, December 13, 2019. Retrieved from https://www.dec.ny.gov/docs/permits_ej_operations_pdf/visualpolicydep002.pdf.

[4] DEP-00-2 describes "atmospheric perspective" as follows: Even on the clearest of days, the sky is not entirely transparent because of the presence of atmospheric particulate matter. The light scattering effect of these particles causes atmospheric or aerial perspective, the second important form of perspective. In this form of perspective there is a reduction in the intensity of colors and the contrast between light and dark as the distance of objects from the observer increases. Contrast depends upon the position of the sun and the reflectance of the object, among other items. The net effect is that objects appear "washed out" over great distances.

[5] DEP-00-2 uses the term "mitigating" or "mitigation" to refer to design parameters that avoid or reduce potential visibility of a project. This should not be confused with the use of the term "mitigation" with respect to mitigation of significant adverse environmental effects as required by SEQR and CEQR.

intervening topography and vegetation minimize the visibility of an object and the visibility significantly detracts from the public's enjoyment of a resource (e.g., a cooling tower plume blocks a view from a State Park overlook, resulting in a diminishment of the public enjoyment and appreciation of the State Park or an impairment of the character or quality of such a place).

3.5.3 Methodology

Based on *CEQR Technical Manual* guidance, the following analysis considers a 400-foot Study Area around the Project Area. Due to the dense urban environment of Lower Manhattan, the Project Area is generally not visible from longer distances. However, this analysis does consider longer views from the Project Area to surrounding visual resources that are beyond the Study Area, primarily the Statue of Liberty National Monument. This analysis addresses the urban design and visual resources of the Study Area for existing conditions, the No Action Condition, and Proposed Action for the 2024 analysis year, when the SBPCR Project is expected to be completed. To prepare this analysis, information was collected through field visits, visually sensitive locations and viewer groups were identified, and duration of views assessed to determine any potential effects.

In compliance with NYSDEC guidelines, aesthetic resources were identified, and a visual assessment was conducted. Utilizing visual modeling techniques, the conditions that would be present for the Proposed Action were assessed as to their relative visual effects from specific viewpoints and distances. This modeling was conducted to provide some indication as to whether any specific viewpoint might be associated with obvious positive or negative visual effects.

Viewer groups are defined as viewers from the Project Area (e.g., users of Wagner Park, Pier A Plaza, and The Battery) or viewers of the Project Area (e.g., residents, pedestrians and bicyclists on local streets, and motorists on local streets). Viewers are considered in the following three ways:

- The viewer's sensitivity and view duration, with residents considered among the most sensitive viewers, because they may view the proposed visual change from a stationary viewpoint for the most prolonged periods of time. Motorists on Battery Place and other local streets, on the other hand, could be less sensitive because they may only experience the proposed visual change for a short duration;
- The existing features in the Project Area that obstruct an observer's view of a visual resource; and
- The distance of the observer from the visual change; as the distance increases, the ability of the viewer to see the details of an object decreases.

The preliminary assessment was conducted to consider the following:

- A description of the visual character of the Project Area and Study Area;
- Identification of aesthetic/visual resources and viewer groups;
- Identification of key views for the visual assessment;
- Evaluation of the visibility of the Project Area in the Study Area;
- A description of visible components of the No Action Condition and Proposed Action; and

- Assessment of the visual effects of the No Action Condition and Proposed Action.

Following the methodology of the *CEQR Technical Manual*, urban design impacts are determined "by considering the degree to which a project would result in a change to a built environment's arrangement, appearance, or functionality such that the change would negatively affect a pedestrian's experience of the area." In assessing the significance of a visual resource impact, key considerations include "whether the project obstructs important visual resources and whether such obstruction would be permanent, seasonal, or temporary; how many viewers would be affected; whether the view is unique or do similar views exist; or whether it can be seen from many other locations."

A detailed analysis was conducted for the Proposed Action due to the potential for significant adverse impacts on the urban design and aesthetic and visual resources in Wagner Park. According to the *CEQR Technical Manual*, a detailed analysis would be required if the preliminary assessment shows that changes to the pedestrian environment could be significant and adverse. This determination would happen if the following was determined:

- When the project partially or totally blocks a view corridor or a natural or built visual resource, and that resource is rare in the area or considered a defining feature of the neighborhood; or
- When the project changes urban design elements so that the context of a natural or built visual resource is altered.

The Proposed Action would block two existing views from the east side of Wagner Park adjacent to Battery Place through Wagner Park to the Hudson River Waterfront and the Statue of Liberty. The detailed analysis for Wagner Park includes the following additional elements from the preliminary assessment.

- Visualizations of each view showing the existing view compared to the view with the Proposed Action;
- Comparison of the proposed Wagner Park pavilion to the existing pavilion;
- Description of the program and use distribution in Wagner Park;
- A cross section and visualizations along Battery Place showing the elevated Wagner Park wall heights, setbacks, and entrances to the proposed pavilion;
- Landscape plans and visualizations of the Proposed Action in Wagner Park showing paving, planting, and seating; and
- Sections through Battery Place and other pedestrian areas showing sidewalk widths, plantings, furnishings, and other elements of pedestrian streetscape for the Proposed Action in Wagner Park.

Although the detailed analysis is focused on the potential adverse impacts in Wagner Park, visualizations of existing views compared to the views with the Proposed Action are included to provide reference to the overall assessment.

3.5.4 Affected Environment

3.5.4.1 Urban Design

The Project Area consists of multiple sites in which the Proposed Action would be constructed. For the purposes of the assessment of urban design and visual resources, the sites where interior drainage improvements would be located would not be assessed. A preliminary assessment is not needed for the interior drainage improvements because the Proposed Action elements in these sites would be built in public rights-of-way and would have no effect on the pedestrian experience in these areas, which are dominated by the urban building environment of Lower Manhattan. The following assessment would focus only on the Project Area around the proposed flood alignment to the south of Battery Place. The flood alignment spans from 1st Place and the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and then along the north side of the Battery Bikeway in The Battery to higher ground near the intersection of Battery Place and State Street. The northern and eastern boundaries of the Project Area are marked by Battery Place and State Street, respectively.

The Study Area extends 400 feet around this section of the Project Area and includes multiple aesthetic and visual resources and views to additional resources of visual importance beyond the Study Area. In general, the Study Area includes the southern portion of Battery Park City, The Battery, and the southern portion of Lower Manhattan bound by 3rd Place, West Street, Whitehall Street, and State Street (see **Figure 3.5-1**). The Study Area is characterized by park and open spaces and a public institution along the Hudson River Waterfront, residential and mixed residential and commercial buildings in Battery Park City, and commercial, mixed residential and commercial buildings, and a public institution to the north of Battery Place and east of State Street.

As part of the assessment of aesthetic and visual resources, photographs and graphic renderings were used to depict views of aesthetic and visual resources. **Figure 3.5-2** provides a numbered key that corresponds to the viewpoints of photographs and renderings used in this assessment.

Figure 3.5-1: Visual Resources Study Area

Legend

Project Area

Study Area (400-Foot Buffer)

Aesthetic and Visual Resource

South Battery Park City Resiliency Project

3.5.4.2 Aesthetic and Visual Resources

The NYSDEC guidance provides a list of 16 categories of state aesthetic and visual resources that should be evaluated. In addition, NYSDEC guidance and the *CEQR Technical Manual* discuss evaluation of local resources without State or National importance. Following NYSDEC guidance and the *CEQR Technical Manual*, an inventory of sensitive aesthetic and visual resources was prepared, and the following aesthetic and visual resources have been identified and analyzed to determine the potential effects of the Proposed Action. **Table 3.5-1** lists the aesthetic and visual resources in or around the Study Area, the category that qualifies it as an aesthetic and visual resource, and its location in relationship to the Project Area. In addition, these resources are depicted in **Figure 3.5-1**.

Table 3.5-1: Aesthetic and Visual Resources Inventory

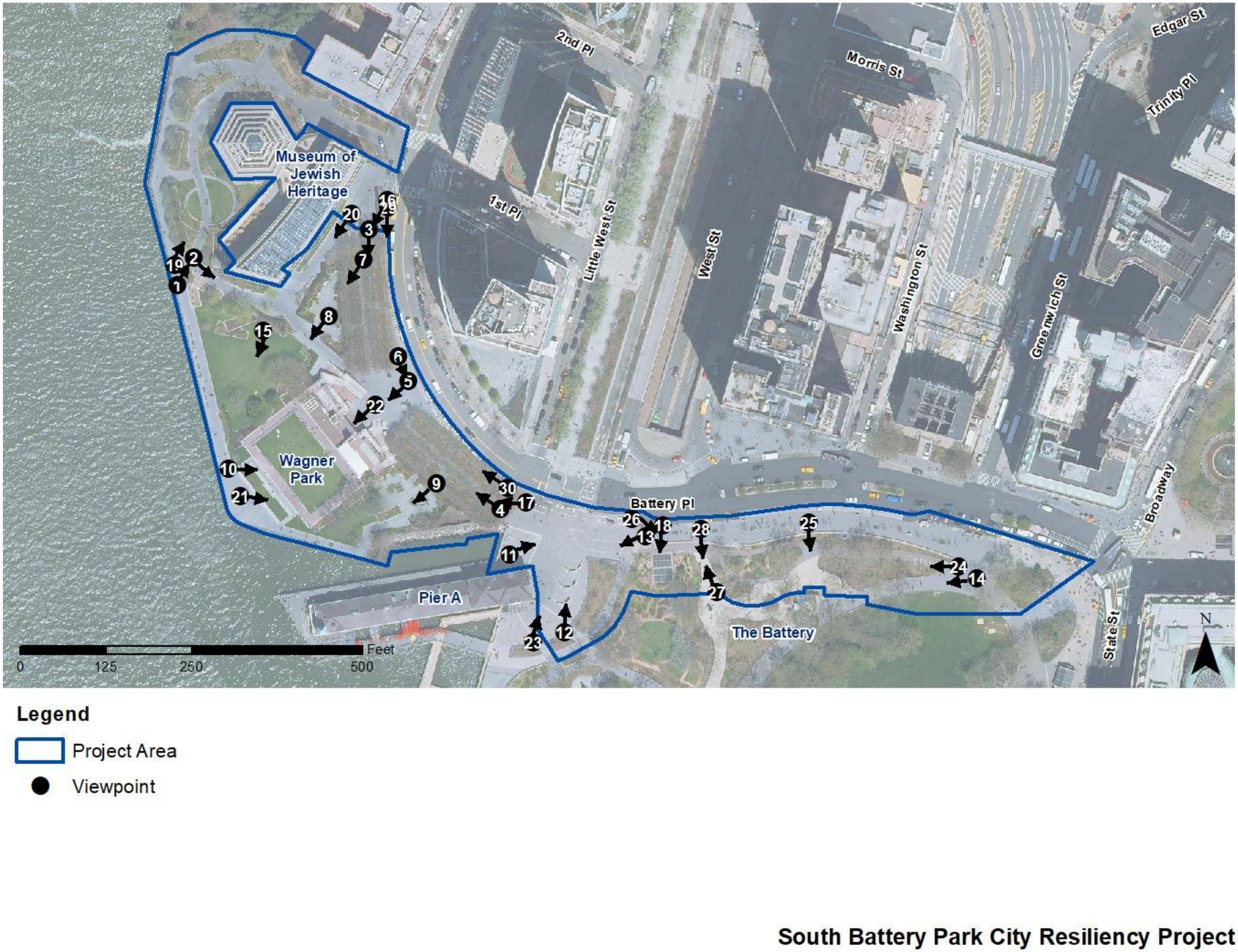
Number	Resource	Category	Location
1	Museum of Jewish Heritage	Locally Significant Resource	Study Area
2	Wagner Park	National Register Eligible	Project Area
3	Pier A Plaza	Locally Significant Resource	Project Area
4	Pier A	National Register Listed/NYC Landmark	Study Area
5	The Battery	Locally Significant Resource	Project Area
6	Battery Bikeway	Locally Significant Resource	Project Area
7	Hudson River	Locally Significant Resource	Study Area
8	Statue of Liberty National Monument	National Monument/NYC Landmark	Outside of Study Area

There are additional potential aesthetic and visual resources within the Study Area that would not be assessed because of existing obstructions that block an observer's view of that resource. Intervening obstructions include trees and hedges in Wagner Park and The Battery, buildings north of Battery Place, distance from the Proposed Action to the resource, or the resource's location underground. In particular, the Castle Clinton National Monument located in The Battery is near the Project Area, including Pier A Plaza. However, any existing views from Castle Clinton National Monument to Pier A Plaza and the northern portion of The Battery are obstructed by intervening trees around the Castle Clinton National Monument. The resources along Battery Place would be prominently visible from within the Project Area with the Proposed Action due to their existing height. These potential aesthetic and visual resources that would not be considered further are listed in **Table 3.5-2**.

Table 3.5-2: Aesthetic and Visual Resources Not Considered

Number	Resource	Number	Resource
9	Castle Clinton National Monument	**17**	Bowling Green Offices
10	Brooklyn-Battery Tunnel (present day Hugh L. Carey Tunnel)	**18**	Cunard Building
11	Brooklyn-Battery Tunnel Blower House	**19**	Standard Oil Building
12	Battery Park Control House	**20**	Wall Street Historic District
13	Joralemon Street Tunnel	**21**	Lamppost
14	U.S. Custom House	**22**	Historic Street Lampposts
15	Bowling Green Fence and Park	**23**	Whitehall Building
16	International Mercantile Marine Company Building		

Figure 3.5-2: Viewpoints



Museum of Jewish Heritage

The Museum of Jewish Heritage is located in Battery Park City to the south of 1st Place and north of Wagner Park, and the Project Area traverses around the exterior of the Museum to the north, west, and south. The eastern side of the Museum is bordered by Battery Place. The Museum was opened in 1997 and operates as a cultural institution with permanent exhibits and temporary exhibitions for residents and visitors in Lower Manhattan. As shown in **Figure 3.5-5**, the primary pedestrian access point to the Museum is located at the intersection of Battery Place and 1st Place where there is also a nearby MTA bus stop on Battery Place. From this entry point, pedestrians have access to the Museum with paths around the Museum that also provide access to the Battery Park City Esplanade along the Hudson River waterfront, Wagner Park, and the sidewalk along Battery Place (see **Figure 3.5-3** and **Figure 3.5-4**). In addition, there are grass lawns and seating areas to the west side of the Museum.

Figure 3.5-3: Viewpoint 1 – Museum of Jewish Heritage looking north from the Battery Park City Esplanade

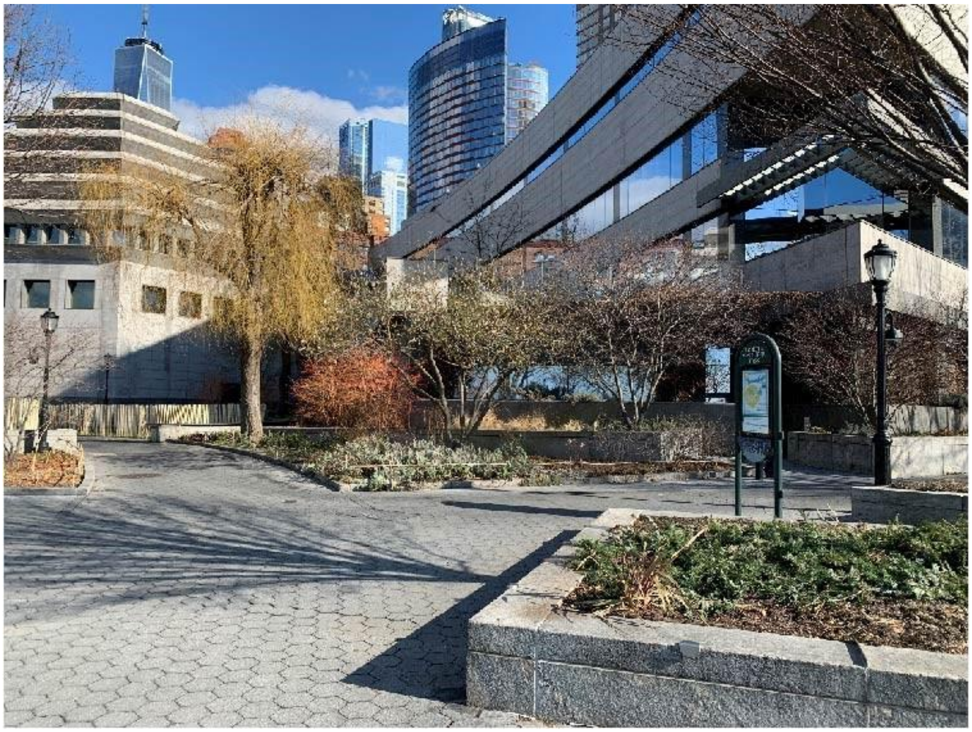
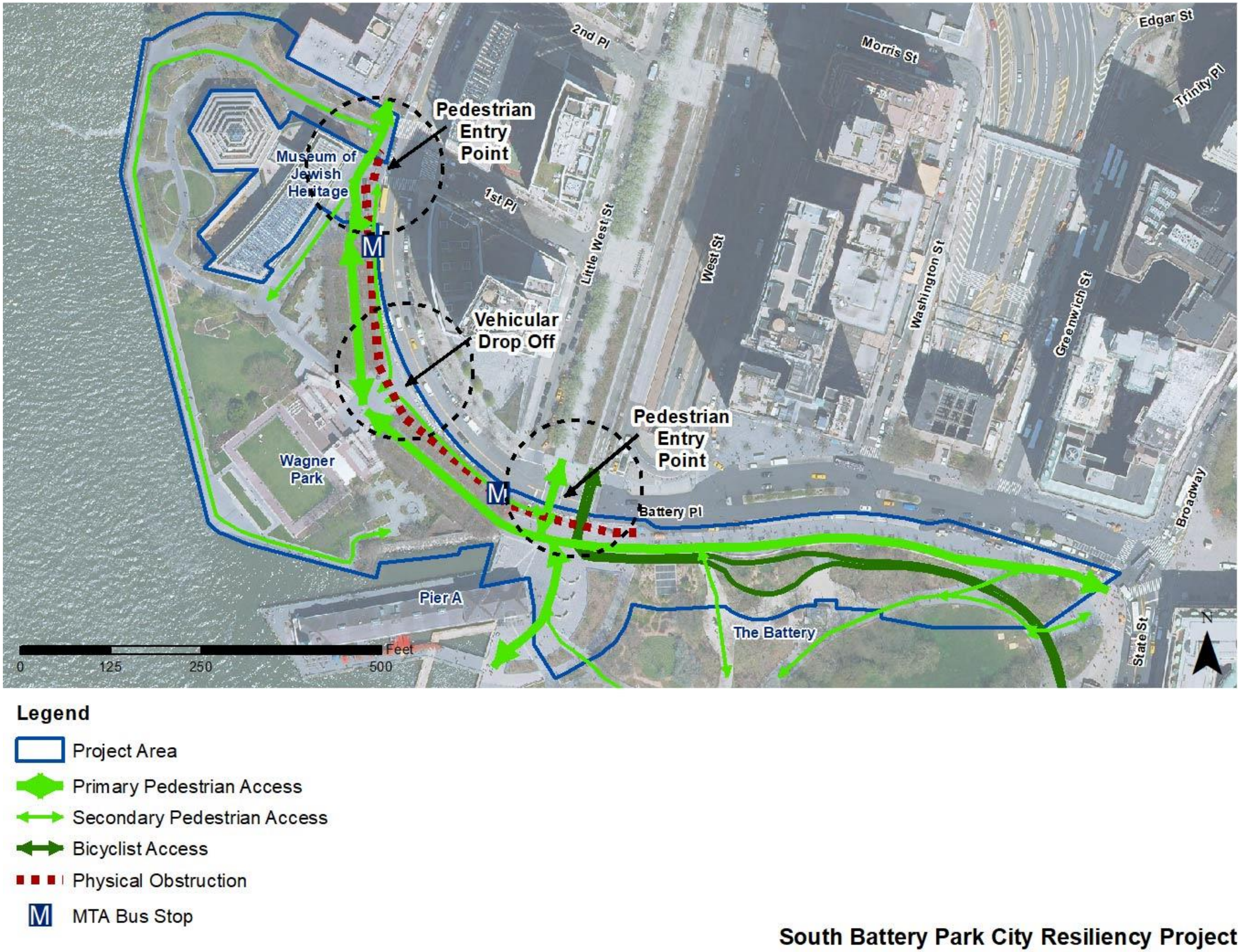


Figure 3.5-4: Viewpoint 2 – Museum of Jewish Heritage looking west towards Wagner Park

Figure 3.5-5: Pedestrian and Bicyclist Access in the Existing Conditions



Wagner Park

Wagner Park is a National-Register-eligible resource located in the southern end of Battery Park City and bound by the Museum of Jewish Heritage to the north, Pier A and Pier A inlet to the south, the Battery Park City Esplanade and the Hudson River to the west, and Battery Place to the east. The entirety of Wagner Park is within the Project Area. The design of Wagner Park is comprised of six organizing elements: Battery Place, north and south allées, a central plaza, the pavilion's northern and southern structures, north and south ornamental gardens and lawns, and a central lawn. All of these elements are located to the west of Battery Place.

Battery Place

Battery Place forms the eastern boundary of Wagner Park and curves from north/south and west/east around the northern boundary of the Project Area. Battery Place provides two pedestrian entry points to Wagner Park as shown in **Figure 3.5-5**. The northern pedestrian entry point is located at the intersection of Battery Place and 1st Place. This intersection is unsignalized with stop signs controlling vehicle traffic as pedestrians use the crosswalks across Battery Place and 1st Place. From this northern entry point, pedestrians can access the Museum of Jewish Heritage to the west and Wagner Park to the southwest. The primary pedestrian access from the northern pedestrian entry point to Wagner Park is the north allée, which is described below and shown in **Figure 3.5-5**. Secondarily, pedestrians can continue walking south along Battery Place and to the east of the north allée. This walkway begins with a width of 10 feet at the north end of the north allée and expands to a width of 30 feet where the north allée meets the central plaza. This walkway is comprised of two rows differentiated by paving materials: the hexagonal asphalt pavers that are throughout Wagner Park and rectangular cobblestones. The hexagonal pavers are typical in parks owned and managed by NYC Parks. The row of hexagonal pavers begins at a width of 4 feet to the north and expands to 26 feet feet at the central plaza. The row of cobblestones maintains a width of 6 feet and runs immediately alongside Battery Place. This material is not accessible to all pedestrian users, particularly those requiring ADA-accessibility. Because of the narrow width of the walkway at the northern end and the differing materials used along the walkway limiting pedestrian accessibility, this walkway is considered a secondary pedestrian access point to Wagner Park.

The southern entry point is located at the intersection of Battery Place and Little West Street as shown in **Figure 3.5-5**. This intersection is signalized with separate pedestrian and bicyclist crosswalks across Battery Place. From this southern entry point, pedestrians can access The Battery to the east, Pier A Plaza to the south, and Wagner Park to the west. The primary pedestrian access from the southern pedestrian entry point to Wagner Park is the south allée. Secondarily, pedestrians can continue walking north along Battery Place. Similar to the northern portion walkway described above, the southern portion is divided into two rows differentiated by the same paving materials as described above. The entire southern portion of the walkway begins with a width of 9 feet at the south end of the south allée and expands to a width of 29 feet where the south allée meets the central plaza. The row of accessible hexagonal pavers begins with a width of 3 feet and expands to 23 feet. The row of rectangular cobblestones maintains a width of 6 feet and runs immediately alongside Battery Place. Because of the narrow width of the walkwaly at the southern end and the differing materials used that limit pedestrian accessibility, this walkway is also considered a secondary pedestrian access point to Wagner Park.

There are two MTA bus stops located along Battery Place. The northernmost bus stop is located near the northern entrance to the north allée, and the southernmost bus stop is located near the southern entrance to the south allée (see **Figure 3.5-5**). Transit users at these bus stops gather along the narrowest portions of the walkway along Battery Place and on the portion of the walkway comprised by rectangular cobblestones.

Pedestrians walking along Battery Place have opportunities to enter the north and south allées through regular gaps in the rectangular beds along the sides of the allées. The north and south walkways along Battery Place converge at the Wagner Park central plaza. From this position, even adjacent to Battery Place, pedestrians have an unobstructed view through the Wagner Park pavilion structures to the Hudson River and the Statue of Liberty, which is described in detail below. However, the existing design of the entrances to Wagner Park and the inaccessibility of the narrow walkway entrances along Battery Place intuitively lead pedestrians into the north and south allées and then into Wagner Park or the ends of the allées in the central plaza.

<u>North and South Allées</u>

West of Battery Place, two rows of densely planted trees form allées to the north and south of the Wagner Park pavilion (see **Figure 3.5-6** and **Figure 3.5-7**). These allées form the primary pedestrian entry points to Wagner Park and the pavilion through central walkways with a width of 15 feet that converge at the central plaza to the east of the pavilion. The path of the allées also lead directly to the staircases on the pavilion's northern and southern structures. The allées consist of hexagonal pavers consistent with those observed throughout Wagner Park and do not present obstacles to pedestrian accessibility. Along the boundaries of each allée, there are multiple parallel rectangular beds that hold two narrowly spaced rows of trees in each, forming a thick canopy overhead. The beds are planted with low ground cover plants and are retained by low, cut granite coping, a material typical to Wagner Park. The narrow breaks between the rectangular beds provide access to and from the central walkway between the trees. This access allows pedestrians to access the narrow walkway immediately adjacent to Battery Place or enter the north and south ornamental gardens in Wagner Park. The rectangular allée beds also include regularly spaced benches and lampposts aligned on both sides of the central walkway.

Figure 3.5-6: Viewpoint 3 – North allée looking southwest to Wagner Park and the existing pavilion

Figure 3.5-7: Viewpoint 4 – South allée looking north to Wagner Park and the existing pavilion

Central Plaza

The central plaza is a paved open space bordered by the allées on the north and south, Battery Place on the east, and the pavilion on the west. Two staircases connect the plaza to the upper levels of the pavilion. Two bronze free-standing sculptures are situated within the plaza. The central plaza creates a threshold into the core of the park through the gap between the pavilion structures. This gap provides a framed and unobstructed view through the gap between the pavilion's northern and southern structures to the Statue of Liberty and the Hudson River Waterfront (see **Figure 3.5-8**).

The central plaza is sheathed with hexagonal asphalt pavers that connect to the north and south allées, the walkway along Battery Place, and the path into the central lawn. A row of concrete barriers connect the easternmost boundaries of the north and south allées and are used as security measures to prohibit vehicles from turning into the plaza. This linear barrier also creates a boundary between the walkway adjacent to Battery Place and the path created by the north and south allées (see **Figure 3.5-5**, **Figure 3.5-8**, and **Figure 3.5-9**). There is a vehicle drop off point along the easternmost boundary of the central plaza along Battery Place. This vehicle drop off is used by visitors to Wagner Park, including tourist buses.

Figure 3.5-8: Viewpoint 5 – Central plaza looking southwest to the existing pavilion and Hudson River Waterfront

Figure 3.5-9: Viewpoint 6 – Central plaza looking south to the southern pavilion structure and Pier A

Pavilion (Northern and Southern Structures)

The two-story, asymmetrical pavilion is situated west of the central plaza. It consists of two artful north and south structures, linked by a foot bridge, approximately 18 feet above ground, supported by pylons to the north and south, respectively. The Pavilion is illuminated by twin-type lampposts. The foot bridge has a direct view of the Statue of Liberty. The Pavilion is constructed of red-to-brown colored Roman brick laid in decorative patterns. The west facade of the Pavilion faces the Hudson River and feature broad arches.

Access to the foot bridge that links the Pavilion's northern and southern structures is gained via the plaza on the east side of the pavilion. In this area, two staircases with intermediate landings, constructed of brick and stone with metal railings, are appended to the east facades. Opposing towers on the north and south function as the north and south foot bridge pylons. The foot bridge links balconies atop the Pavilion. On the balcony, the east and west parapets of the foot bridge are constructed of weathered wood planks, similar to the wood benches that outline the perimeter of the central lawn. The surface of the balconies is paved in brick and stone. High-backed, weathered wood benches are situated along the west edge of the balconies to facilitate view of Hudson River Waterfront (see **Figure 3.5-8**).

North and South Ornamental Gardens and Lawns

The north and south ornamental gardens each have a distinct character, with irregular planting beds forming different scaled spaces and plants featuring "hot" or "cool" color palettes.

The north ornamental garden is the "hot" garden, with a large open central lawn space. It is located west of the north allée. The north side of the garden is bordered by trimmed hedges that divide the garden from the Museum of Jewish Heritage. The south side of the garden is bordered by a V-shaped hedge. Access to the garden is gained from the east side via the north allée, and the west side via the opening between the north and south hedges. The center of the garden includes two clusters of deep and shallow planting beds, bordered by Stony Creek granite blocks. Double-width wood slat benches flank the perimeter of the garden near the hedges. The north lawn is located west of the planting beds, separated by a path paved in hexagonal pavers. The triangular-shaped lawn features a central open space, interspersed with trees. The north, south, and east edges are accented by intersecting deep and shallow Stony Creek granite planters with a variety of hedges, flowers, and ornamental plantings. The planters on the south side of the lawn are separated by a flight of two stone steps that provide access to the central lawn area (see **Figure 3.5-10** and **Figure 3.5-11**).

The south ornamental garden is the smaller "cool" garden and is located west of the south allée. The north side is bordered by a planting bed with trimmed hedges and the Pavilion. The south side is bordered by a planting bed with hedges and the Pier A inlet, and the west side is bordered by south lawn with trees and planting beds. Three deep and shallow Stony Creek granite planting beds are situated in the garden. The central square planting bed is appended to a circular raised pool, with smooth basalt-like coping. Two interlocking rectilinear planting beds are located north of the central bed. A large rectangular planting bed is situated on the west side of the garden and serves to divide the south garden from the small south lawn. Double-width wood slat benches flank the perimeter of the garden. The benches are interspersed with various species of shrubs, perennials, and trees. The surface of the south garden is sheathed in bluestone pavers that extend between the planting beds. The south lawn is west of the ornamental garden. The lawn is a small central open area, interspersed with trees along the edges. Deep and shallow granite planting beds are located along the north side of the lawn, and divide the south lawn from the central lawn, which is accessed from the south lawn via two stone steps (see **Figure 3.5-12**).

Figure 3.5-10: Viewpoint 7 – North ornamental garden looking southwest towards the Hudson River Waterfront and Statue of Liberty

Figure 3.5-11: Viewpoint 8 – North ornamental garden and lawn looking southwest towards the Hudson River Waterfront and Statue of Liberty

Figure 3.5-12: Viewpoint 9 – South ornamental garden and lawn looking west towards the Hudson River Waterfront and Statue of Liberty

Central Lawn

The central lawn is the primary gathering space of Wagner Park. The lawn is a raised rectangular grass panel with an expansive view of the Hudson River Waterfront. The lawn is flanked by the Pavilion to the east and the Battery Park City Esplanade to the west. The gap between the Pavilion's northern and southern structures provides direct access to the lawn from the plaza. Long granite seat walls accented by perforated metal cylinders at the north and south ends shape the rectangular frame around the lawn panel. The pathway around the lawn is sheathed in red brick laid in a chevron pattern, with granite around the outer edges; this pathway meets flush to the lawn near the Pavilion. At the waterfront, entry to the lawn is gained via two flights of three granite steps, separated by a narrow rectangular lawn panel. The second flight of steps leads to the perimeter pathway that frames the central lawn. Low weathered wood benches frame the lawn on its four sides but include breaks on the east and west sides for access (see **Figure 3.5-13**).

The eastern boundary of the central lawn is formed by the Battery Park City Esplanade along the Hudson River Waterfront. Marked by the same hexagonal pavers throughout Wagner Park, the Esplanade is approximately 20 feet wide and provides unobstructed views of the Hudson River Waterfront, the Statue of Liberty, and the New York Harbor looking west. Looking east, the Esplanade provides views of Wagner Park and the dense urban environment of Lower Manhattan. Directly to the west of the central lawn, there is a large triangular section of the Esplanade with a width of approximately 45 feet that creates a gathering point for users of Wagner Park. Walking north along the Esplanade from the central plaza, pedestrians can continue along the Hudson River Waterfront or access the Museum of Jewish

Heritage. Moving south and east along the Esplanade, pedestrians can access the Pier A inlet and Pier A Plaza.

Figure 3.5-13: Viewpoint 10 – Central lawn looking east towards Pier A Plaza and Pier A

Pier A Plaza and Pier A

Pier A Plaza is a locally significant resource that is bound by Wagner Park to the west, The Battery to the east and south, and Battery Place to the north. Pier A which is National Register-listed and a NYC Landmark, is located to the south of the Plaza along the Hudson River waterfront. Pier A Plaza is within the Project Area, and Pier A is within the Study Area. Pedestrians access Pier A Plaza from three directions. First, pedestrians from Wagner Park access to the west using the allée that is parallel to Battery Place. Second, pedestrians access The Battery to the east using the sidewalk along Battery Place and the paths in The Battery. Third, pedestrians cross Battery Place to the north from the greenway parallel to Little West Street. Bicyclists access Pier A Plaza via the Battery Bikeway that transitions into the Hudson River Greenway to the north of Battery Place. Pier A Plaza provides a paved open space for visitors with seating and access to paths into The Battery, including the Esplanade along the Hudson River Waterfront (see **Figure 3.5-14**, **Figure 3.5-15**, and **Figure 3.5-16**).

Figure 3.5-14: Viewpoint 11 – Pier A Plaza looking east towards the Battery Bikeway and Lower Manhattan

Figure 3.5-15: Viewpoint 12 – Pier A Plaza looking north towards Lower Manhattan and the One World Trade Center Tower

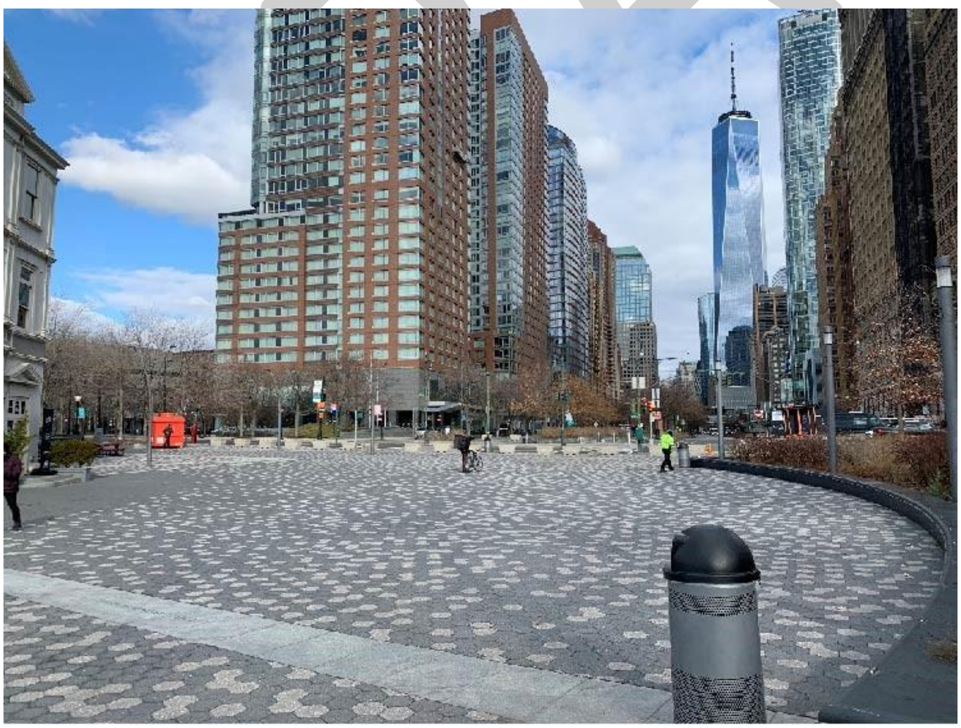


Figure 3.5-16: Viewpoint 13 – Pier A Plaza looking southwest towards Pier A and Hudson River Waterfront

The Battery and Battery Bikeway

The Battery is locally significant as a NYC Parks recreational resource and located to the east of Pier A Plaza. It is further bound by Battery Place to the north and State Street to the east. The Project Area includes the northern portion of The Battery. The Battery provides pedestrian paths, a bikeway, access to the Esplanade along the Hudson River waterfront, grass lawns, seating, and visitor attractions, such as the Castle Clinton National Monument. Pedestrians access The Battery from Pier A Plaza, Battery Place, and State Street (see **Figure 3.5-5**). Bicyclists access The Battery using the Battery Bikeway, which enters The Battery in its southeastern end, traverses north and parallel to State Street, curves to the west in The Battery's northern edge, and crosses Battery Place to the north of Pier A Plaza (see **Figure 3.5-17**).

There is a clear demarcation between the wide sidewalk along Battery Place and The Battery within the Project Area. Physically, a short stone wall marks the northern boundary of The Battery. Visually, beyond this stone wall are trees that obstruct views from the sidewalk into The Battery (see **Figure 3.5-16**, **Figure 3.5-21**, and **Figure 3.5-22**).

Figure 3.5-17: Viewpoint 14 – The Battery and Battery Bikeway looking west from the intersection of Battery Place and State Street

Hudson River Waterfront and Statue of Liberty National Monument

Following guidance in the *CEQR Technical Manual*, views of the waterfront are considered visual resources, and the Hudson River waterfront is located in the Project Area in the western section of Battery Park City, including near the Museum of Jewish Heritage and Wagner Park. The Battery Park City Esplanade follows the Hudson River Waterfront in this area and includes a wide pedestrian path with viewing areas and seating. Hudson River Waterfront views continue to the east of Wagner Park in the southern portion of Pier A Plaza and The Battery, which is outside of the Project Area but within the Study Area.

The Statue of Liberty National Monument is located approximately 1.75 miles from the Esplanade sections of the Study Area in Wagner Park and The Battery. Views of the Statue of Liberty are prominent from within Wagner Park, Pier A Plaza, and The Battery, but views from Battery Place in the northern side of the Project Area are largely obstructed by existing trees and structures in Wagner Park, Pier A Plaza, and The Battery. To obtain a clear view of the Statue of Liberty, a pedestrian must travel into Wagner Park, Pier A Plaza, or The Battery (see **Figure 3.5-18**). The only notable exception is the Wagner Park Pavilion, discussed above. The walkway between the Pavilion's northern and southern structures provides a framed view of the Statue of Liberty through the Pavilion and from the central plaza adjacent to Battery Place (see **Figure 3.5-8**).

Figure 3.5-18: Viewpoint 15 – Hudson River Waterfront and the Statue of Liberty looking southwest from Wagner Park

3.5.4.3 Views to the Waterfront

Following the *CEQR Technical Manual*, views to the waterfront are considered visual resources, and the Project Area is within and adjacent to the Hudson River Waterfront. In the Study Area, views to the waterfront from Battery Place are often obstructed due to intervening trees, hedges, and buildings (see **Figure 3.5-19**, **Figure 3.5-20**, **Figure 3.5-21**, and **Figure 3.5-22**). From the vicinity of Battery Place, there are two unobstructed views of the Hudson River Waterfront. First, as shown in **Figure 3.5-8**, there is a framed and unobstructed view of the Hudson River Waterfront and the Statue of Liberty from the central plaza and through the Wagner Park Pavilion northern and southern structures. Second, as show in **Figure 3.5-18**, the Hudson River Waterfront and the Statue of Liberty can be viewed by stepping slightly further west from Battery Place near the entrance to the north allée and south of the Museum of Jewish Heritage.

Typically, pedestrians must pass beyond the intervening trees, hedges, and buildings and walk into Wagner Park from Battery Place to obtain unobstructed views of the Hudson River Waterfront. Clear views of the waterfront are present from inside Wagner Park, Pier A Plaza, and The Battery in close proximity to Pier A Plaza and the Esplanade. However, even in Pier A Plaza, Pier A obstructs views of the Hudson River Waterfront and resources in the river, particularly the Statue of Liberty National Monument.

Unobstructed views of the Hudson River Waterfront and the Statue of Liberty are found in the northern portion of the Project Area inside Wagner Park to the west of the Pavilion and allées adjacent to Battery Place. This area of the park consists of open grass lawns, wide pedestrian paths, seating areas, and the

Battery Park City Esplanade. From this viewing area, there are clear views of the New York Harbor, including the Hudson River Waterfront and Statue of Liberty.

Additional Views of the Project Area

Due to intervening trees, hedges, and buildings, views of the Project Area are largely obstructed from the streets around the northern and eastern portions of the Project Area, including Battery Place and State Street. In addition, pedestrian flow towards the Project Area is channeled such that pedestrians are naturally led inside Wagner Park, Pier A Plaza, and The Battery in order to view and experience these open spaces and the aesthetic and visual resources viewable from these open spaces. To the east of the Museum of Jewish Heritage and Wagner Park, there are barriers as safety measures to prohibit vehicles and allées that naturally guide pedestrians inside Wagner Park (see **Figure 3.5-19** and **Figure 3.5-20**). Similar concrete barriers are located in Pier A Plaza as safety measures to prohibit vehicles from entering Pier A Plaza, but these create a clear separation between Battery Place and the open space of Pier A Plaza (see **Figure 3.5-14** and **Figure 3.5-15**). Further to the east, the stone wall along The Battery's northern border serves as a boundary between pedestrians walking on the wide Battery Place sidewalk and pedestrians and bicyclists using The Battery (see **Figure 3.5-21** and **Figure 3.5-22**).

The southern portion of the Project Area consists of the Battery Park City Esplanade in Wagner Park, the southern portion of Pier A Plaza, and the interior of The Battery. Looking north from these viewing points, pedestrians can view aesthetic and visual resources within the Study Area, including the Museum of Jewish Heritage, Wagner Park and the Pavilion, Pier A and Pier A, and The Battery. Beyond these features, pedestrians can see the tall and dense urban environment of Lower Manhattan to the north of Battery Place and the east of State Street. The clearest view from south of the Project Area looking north is located in the southern portion of Pier A Plaza. This view includes Pier A to the west, The Battery to the east, Pier A Plaza in the foreground and the long, wide view of West Street to the north with the One World Trade Center Tower in the background.

Figure 3.5-19: Viewpoint 16 – Intervening trees and structures obstructing views and pedestrian access near the Museum of Jewish Heritage

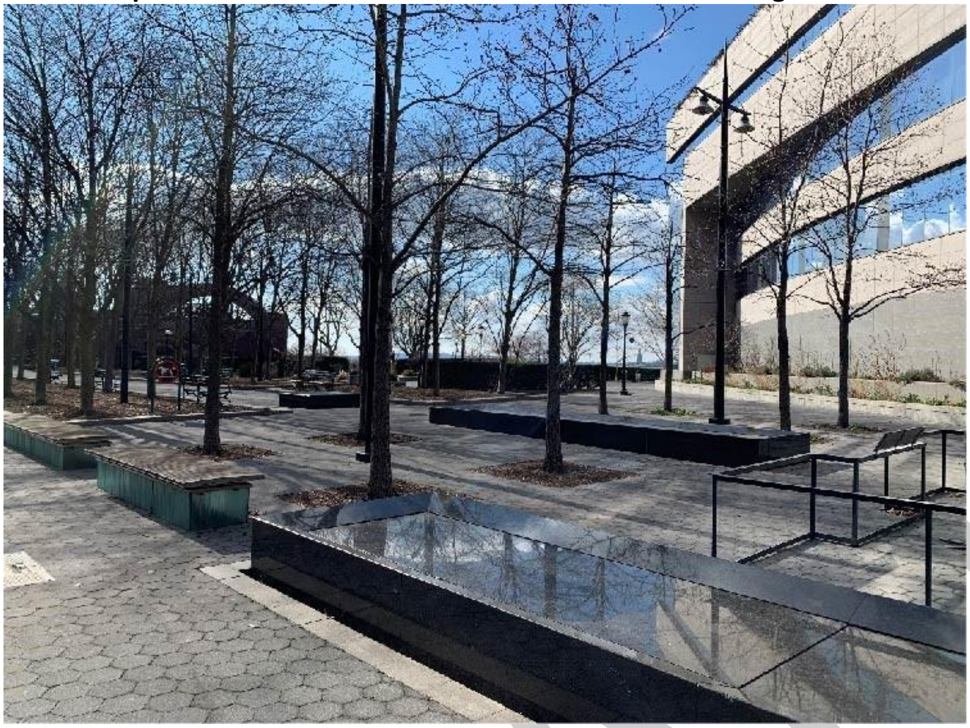
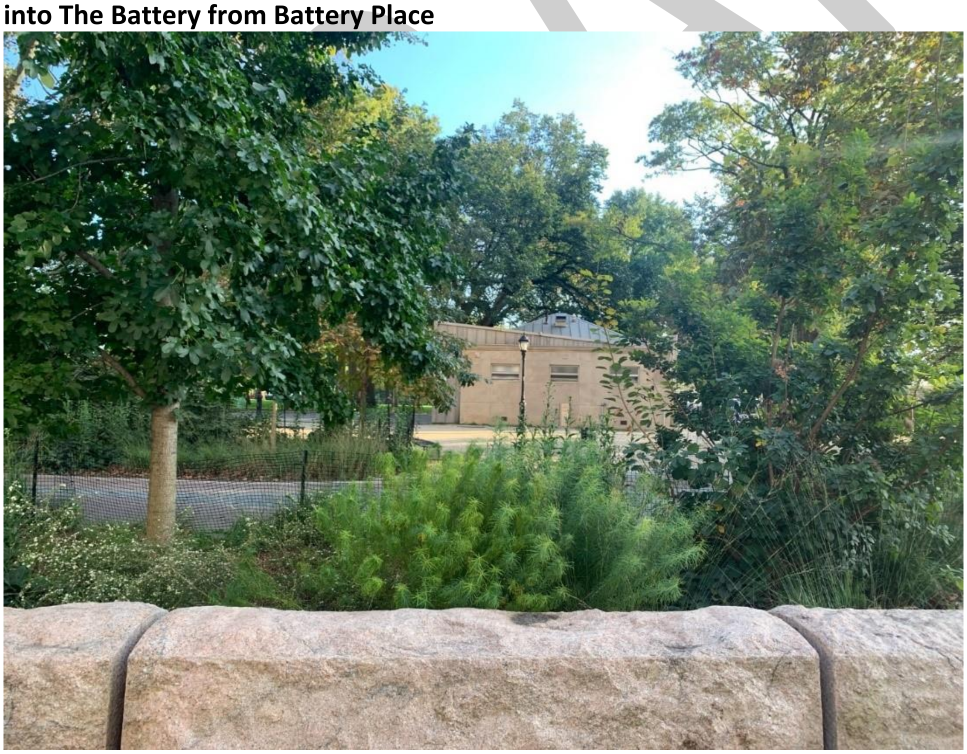


Figure 3.5-20: Viewpoint 17 – Intervening trees, hedges, and structures obstructing views of the Hudson River Waterfront

Figure 3.5-21: Viewpoint 18 – Intervening trees obstructing views of The Battery

Figure 3.5-22: Viewpoint 25 – View of intervening trees and comfort station looking into The Battery from Battery Place



3.5.4.4 Viewer Groups

Viewers from the Project Area

Within the Project Area, viewer groups include users of the park spaces around the Museum of Jewish Heritage, Wagner Park and the Pavilion, Pier A Plaza, and The Battery. Motorists do not have access to the Project Area, and their views of the Project Area are obstructed by intervening trees, hedges, and buildings.

Users of the Museum of Jewish Heritage, Wagner Park, and the Pavilion include pedestrians, users engaged in active recreation like jogging, and users engaged in passive recreation like sitting, using the Esplanade viewing areas, sunbathing, and picnicking. These viewers have expansive views of the Hudson River and the Statue of Liberty from inside these open spaces. From inside these open spaces, these viewers have views of the Museum of Jewish Heritage, the Wagner Park Pavilion, Pier A, and the tall and dense urban environment of Lower Manhattan to the north of Battery Place.

Users of Pier A Plaza and The Battery include pedestrians, users engaged in active recreation like jogging and bicycling, and users engaged in passive recreation like sitting and using the Esplanade viewing areas. These viewers have limited views of the Hudson River because of the prominent location of Pier A. Looking north from Pier A Plaza and The Battery, these viewers have a view of the wide West Street to the north of Battery Place with the One World Trade Center Tower in the background and the tall and dense urban environment of Lower Manhattan.

Viewers of the Project Area

Viewers of the Project Area include residents, pedestrians, bicyclists, and motorists. In general, residents within view of the Project Area have stationary, prolonged views of the Project Area. However, the views of residents on lower floors are obstructed by the intervening trees, hedges, and buildings bordering Wagner Park, Pier A Plaza, and The Battery that obstruct views of those open spaces and the Hudson River Waterfront as discussed above(see **Figure 3.5-19**, **Figure 3.5-20**, **Figure 3.5-21**, and **Figure 3.5-22**). Residents on higher floors with apartments facing the waterfront would have unobstructed views of the Hudson River.

Within the Study Area, pedestrians, bicyclists, and motorists on Battery Place and State Street have largely obstructed views of the Project Area, as described in detail above. The best views from outside the Project Area are along Battery Place across from the Wagner Park Pavilion and Pier A Plaza because these areas are unobstructed by trees. Motorists on local streets have similar views to pedestrians and bicyclists but they are fleeting views of shorter duration.

3.5.5 Environmental Impacts

3.5.5.1 No Action Condition

Under the No Action Condition, there would be no comprehensive flood alignment within the Study Area in early 2024, which is the year the SBPCR Project would be completed. Although the Proposed Action would not be constructed under the No Action Condition, there is one resiliency project planned in Lower Manhattan in the vicinity of the Study Area that could have an effect on the urban design and aesthetic and visual resources in the Study Area: The Battery Coastal Resilience Project.

The Battery Coastal Resilience Project is a planned project sponsored by NYCEDC in partnership with NYC Parks and The Battery Conservancy. This project extends from Pier A Plaza around Hudson River Waterfront along The Battery's waterfront esplanade. This project would elevate the waterfront esplanade in The Battery and integrate a grassy berm at the back of The Battery. This design would preserve the look and feel of the existing park while protecting it from sea level rise in the year 2100. The design concept integrates climate adaptation with preservation of The Battery's historic character and active waterfront uses. This project would enhance the pedestrian experience on The Battery waterfront esplanade and have no effect on pedestrian access of The Battery and Pier A Plaza. This project would have no effect on the existing views of the Hudson River Waterfront and aesthetic and visual resources within the Study Area and would provide important flood protection measures to The Battery and the surrounding neighborhood in Lower Manhattan.

Under the No Action Condition, a comprehensive flood alignment system would not be installed, and the aesthetic and visual resources within the Study Area would continue to be subject to flooding both during minor and major storm events. The neighborhood in Lower Manhattan within the 100-year floodplain would continue to be vulnerable to flooding during both minor and major storm events which are anticipated to increase in number and severity over time without proper flood protection. Existing aesthetic and visual resources, if flooded, would be damaged or be inaccessible by these storm events. The Battery Coastal Resilience Project would protect The Battery from sea level rise but not to the surrounding neighborhood.

With the No Action Condition, views to the Hudson River waterfront, the Museum of Jewish Heritage, Wagner Park and the Pavilion, Pier A Plaza, The Battery, and other aesthetic and visual resources would remain similar to existing conditions. No changes to views or view corridors would occur with the No Action Condition.

3.5.5.2 Proposed Action

The following section describes the Proposed Action in relationship to its urban design and potential for adverse impacts on views and viewer groups of aesthetic and visual resources in the Study Area.

The Proposed Action would include a comprehensive flood alignment in the Project Area from 1st Place, through Wagner Park and Pier A Plaza, and ending within the northern portion of The Battery. This area is vulnerable to flooding during both minor and major storm events. The SBPCR Project would be constructed to meet the DFE throughout the Project Area, which represents the highest possible flood elevation (see **Figure 1.3-1**). The following assessment of the effects of the SBPCR Project on urban design and aesthetic and visual resources is broken into the five segments of the Project Area from west to east: 1st Place, the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery.

1st Place

The flood alignment begins on the north side of 1st Place, where it ties into the 11-foot flood contour. It then extends south fully across 1st Place as a flip-up deployable, which would seal up against permanent columns when deployed. The DFE in this section is 18 feet. With existing grading of this section, the HOI required would be 7 feet, so a flip up deployable across 1st Place would raise up to a height of 7 feet when deployed. In addition, the Proposed Action would remove a small number of trees along the northern and southern sides of 1st Place to construct the flip-up deployable.

The aesthetic and visual resources within the 1st Place area include the Hudson River Waterfront and the Museum of Jewish Heritage. The Proposed Action in 1st Place would have no significant adverse impacts on the urban design and aesthetic and visual resources within the Study Area. The flip-up deployable would be a new feature to the public realm near the Museum of Jewish Heritage, but the flip-up deployable would lie flat in the ground until deployed during a flood event and would not create a visual obstruction or obstruct pedestrian access to 1st Place, the Museum of Jewish Heritage, or the Battery Park City Esplanade. Flip-up deployables throughout the flood alignment would be deployed only during flood events when there should be no park users in the vicinity of 1st Place, the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, or The Battery. The removal of trees along 1st Place would have no significant adverse impacts on the views of the Hudson River Waterfront as this view is already obstructed by trees, landscaping, and the location of the existing surrounding buildings on the northern and southern sides of 1st Place that restrict views from 1st Place to the Hudson River Waterfront. The views of residents, pedestrians, bicyclists, and motorists in this section of the Study Area would be minimally affected by the Proposed Action. Pedestrians near 1st Place would continue to have stationary views, or views standing still in place, of the Hudson River Waterfront and other aesthetic and visual resources in the Project Area.

Museum of Jewish Heritage

At the south end of 1st Place, the flood alignment runs west and south around the perimeter of the Museum of Jewish Heritage facing the landscaped courtyard between the Museum and the Battery Park City Esplanade. A flip-up deployable would be built in front of the north facing side of the Museum, and glass-topped exposed floodwalls would be constructed around the western perimeter of the Museum. The DFE in this section is 18 feet, and the HOI required would be 7 to 8 feet. In addition, the Proposed Action would remove a small number of trees along the northern and western perimeter of the Museum of Jewish Heritage.

The aesthetic and visual resources within the vicinity of the Museum of Jewish Heritage include the Museum, its courtyard to the west, the Hudson River Waterfront, and Wagner Park. The Proposed Action around the Museum of Jewish Heritage would have no significant adverse impacts on the urban design and aesthetic and visual resources within the Study Area. The flip-up deployable and the glass-topped exposed floodwall would be new features around the Museum of Jewish Heritage and the courtyard to the west of the Museum. However, the flip-up deployable would lie flat in the ground until deployed during a flood event and would not create a visual obstruction or obstruct pedestrian access around the Museum of Jewish Heritage, the courtyard to the west of the Museum, or the Battery Park City Esplanade. In addition, the glass-topped exposed floodwalls along the western perimeter of the museum would be constructed to blend into the façade of the Museum and maintain existing views of the Museum. The base of this exposed floodwall would be masked by landscaping to further blend the flood alignment into the Museum. The Proposed Action would not include construction on the Battery Park City Esplanade, and it would maintain pedestrian access to the walkways around the Museum and the Battery Park City Esplanade running north to Battery Park City and south to Wagner Park. The removal of trees around the perimeter of the Museum of Jewish Heritage would have no significant adverse impacts on the views of the Hudson River Waterfront and the Museum because the trees are located along the perimeter of the Museum and do not obstruct views of aesthetic and visual resources in the Project Area (see **Figure 3.5-23** and **Figure 3.5-24**). The views of residents, pedestrians, bicyclists, and motorists in this section of the Study Area would be minimally affected by the Proposed Action.

Figure 3.5-23 and **Figure 3.5-24** compare the same view of the Museum of Jewish Heritage from the Battery Park City Esplanade in the existing conditions and with the Proposed Action. **Figure 3.5-24** shows the proposed view of the Museum of Jewish Heritage from the Battery Park City Esplanade. It also illustrates the glass-topped floodwall around the Museum's façade and the landscaping that would be located in the courtyard to the west of the Museum. Pedestrian access between the Battery Park City Esplanade and the Museum would be maintained from the existing conditions to the Proposed Action.

Figure 3.5-23: Viewpoint 19 – Existing view of the Museum of Jewish Heritage looking northeast from the Battery Park City Esplanade

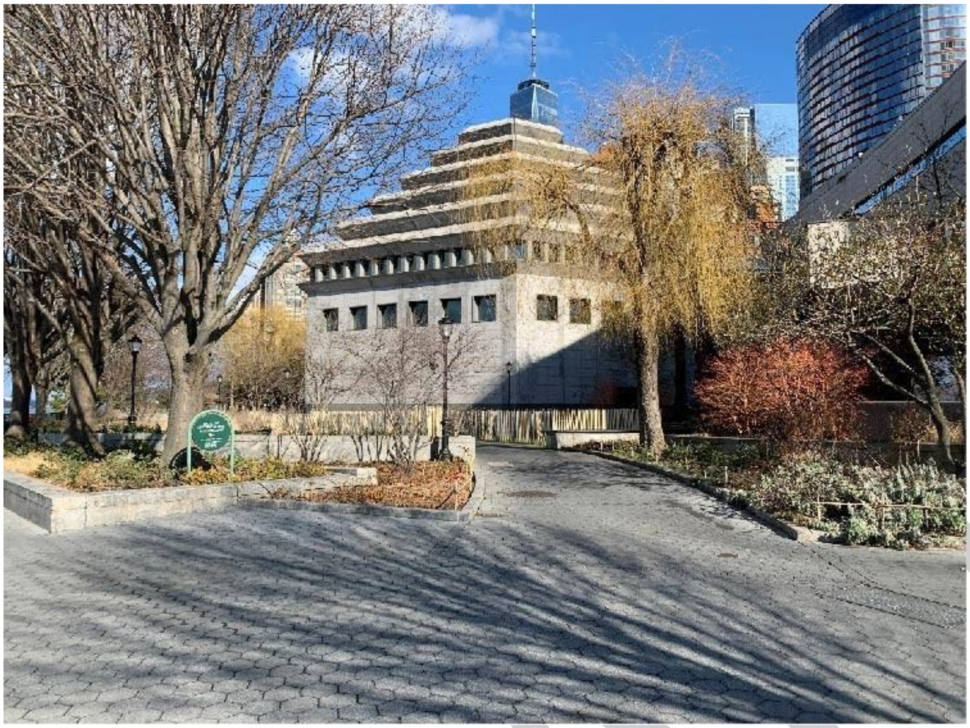


Figure 3.5-24: Viewpoint 19 – Proposed view of the Museum of Jewish Heritage looking northeast from the Battery Park City Esplanade

Wagner Park

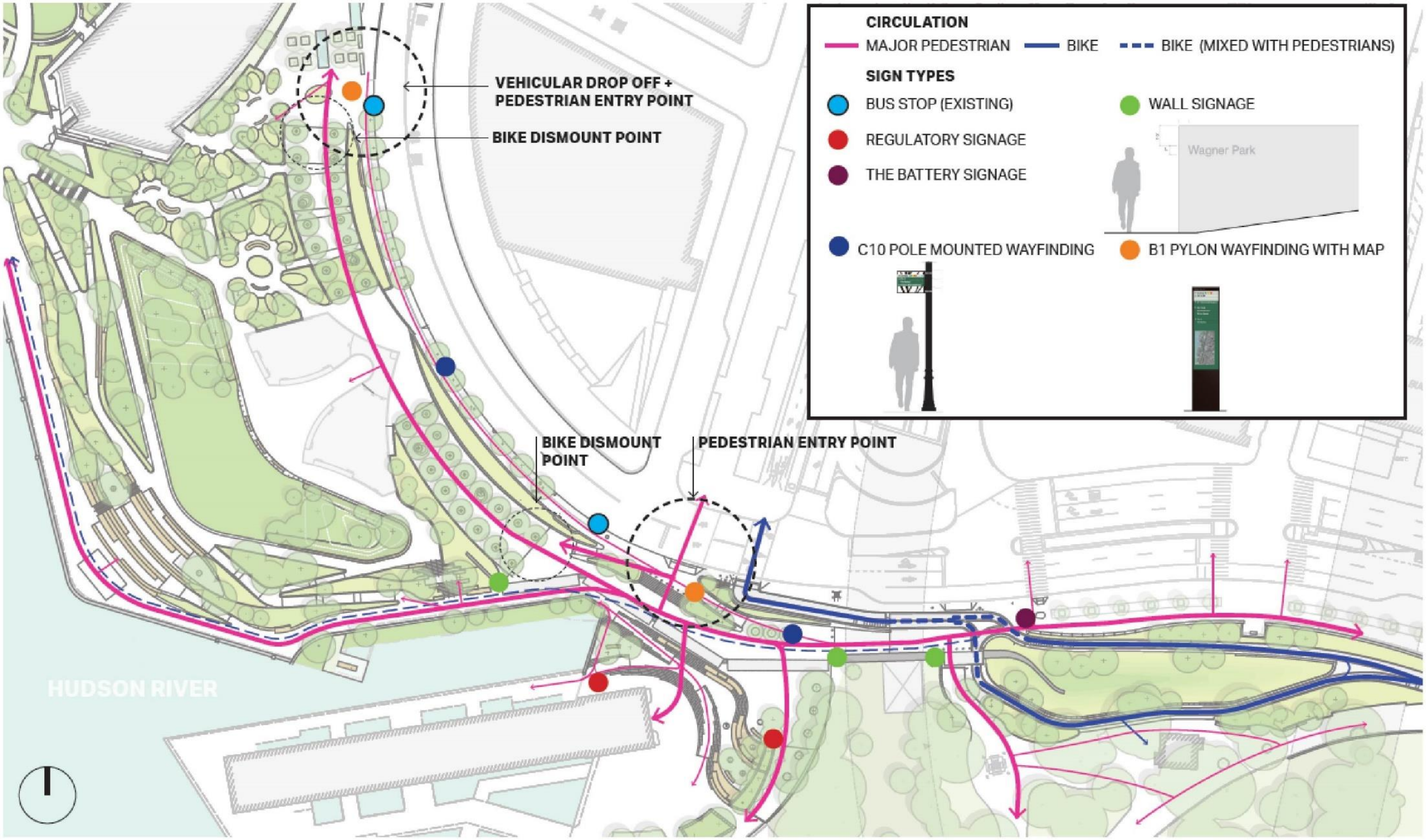
As the glass-topped floodwall would extend to the south beyond the Museum of Jewish Heritage, the flood alignment would transition into a buried floodwall that traverses southeast through Wagner Park and to the west of the existing Pavilion. The DFE in Wagner Park is 19.8 feet, and the HOI would be 7.8 to 9.8 feet. To meet the DFE, Wagner Park would be elevated 10 to 12 feet, and the floodwall would be buried inside the elevated Wagner Park. The elevated Wagner Park would begin rising from street level to the south of the Museum of Jewish Heritage, plateau at the position of the proposed Pavilion, and decline down to street level near the western entrance of Pier A Plaza.

The portion of Wagner Park to the west of the proposed Pavilion and facing the Hudson River Waterfront would be redesigned to maintain and enhance the park programming that currently exists in Wagner Park. Redesigned features would include ornamental gardens with a water feature, a central lawn, performative gardens along the Battery Park City Esplanade, and an overlook deck at the Pier A inlet. The Proposed Action would maintain and maximize continuous green space and pedestrian paths that provide connections to the Museum of Jewish Heritage to the north and Pier A Plaza and The Battery to the east.

With the elevation of Wagner Park, the existing Pavilion would be removed, and a new Pavilion would be constructed farther east toward Battery Place where the current central plaza is located. The proposed structure would be approximately 47 feet tall compared to the existing Pavilion, which is 37 feet tall. The proposed Pavilion would be designed to retain or replace key elements of the existing Pavilion: preserve the framed view of the Statue of Liberty, maintain views of the Hudson River Waterfront, maintain a central gathering space, and enhance the procession of pedestrians from the street to park level through the north and south allées.

Pedestrian access to Wagner Park from Battery Place would be modified to provide universal access to the elevated Wagner Park and Pavilion from northern and southern pedestrian entry points. However, because of the elevation of Wagner Park, pedestrian access along Battery Place between the entrances to the north and south allées would be removed. As discussed in Section 3.5.4.2 (Aesthetic and Visual Resources), pedestrians currently access Wagner Park from Battery Place at three entry points: northern entry point near the intersection of Battery Place and 1st Place, southern entry point near the intersection of Battery Place and Little West Street, and the Wagner Park central plaza. Under the Proposed Action, pedestrian access from the northern and southern entry points would be maintained and enhanced (see **Figure 3.5-25**). The existing MTA bus stops near the northern and southern entry points would be maintained. The existing tree-lined north and south allées that guide pedestrians to the Wagner Park central plaza would be replaced and redesigned with 40-foot-wide tree-lined allées that extend across an 8 percent grade increase from street level to the center of elevated Wagner Park Pavilion. These allées would provide universal access to pedestrian users of all ages and ability from the Museum of Jewish Heritage to the north and Pier A Plaza from the south (see **Figure 3.5-25**).

Figure 3.5-25: Pedestrian and Bicyclist Access in the Proposed Action



Pedestrian access to Wagner Park from the walkway immediately adjacent to Battery Place and the area that is currently the Wagner Park central plaza would be removed to accommodate the elevated Wagner Park. This walkway would be widened and repaved to provide a paved sidewalk between 6 and 11 feet wide providing universal access to pedestrians along Battery Place. The vehicular drop off currently located at the entrance to the central plaza along Battery Place would be relocated near the northern pedestrian entry point to the north allée (see **Figure 3.5-25**).

The aesthetic and visual resources within the vicinity of Wagner Park include Wagner Park, the Hudson River Waterfront and Statue of Liberty, the Museum of Jewish Heritage, and Pier A. Views of the Hudson River Waterfront, the Statue of Liberty, and Wagner Park, including the Pavilion, were assessed to identify potential adverse impacts on the urban design and aesthetic and visual resources within the Project Area and Study Area. Viewpoints of the existing Wagner Park and of aesthetic and visual resources that can be viewed from Wagner Park were compared to visualizations of those same views with the Proposed Action. These viewpoints are described below with their corresponding visualizations.

View Inland of Wagner Park and Lower Manhattan

As discussed above, the Proposed Action would elevate Wagner Park 10 to 12 feet and replace the existing Pavilion with a new Pavilion on top of the elevated Wagner Park. The sloping portion of Wagner Park between the proposed Pavilion and Battery Park City Esplanade would be redesigned to maintain and enhance the existing park programming and uses that currently exist in Wagner Park. In addition, pedestrian access and use of the Battery Park City Esplanade would be maintained with the redesigned Wagner Park.

Figure 3.5-26 depicts the existing view of Wagner Park and Lower Manhattan from the Battery Park City Esplanade along the Hudson River Waterfront. The Wagner Park Pavilion, central lawn, Pier A, and dense urban environment of Lower Manhattan can be viewed clearly from the Esplanade. **Figure 3.5-27** shows the same view of Wagner Park with the Proposed Action. Views of Wagner Park, the proposed Pavilion, central lawn, Pier A, and Lower Manhattan would be maintained with the Proposed Action. Although the Museum of Jewish Heritage is not depicted in **Figure 3.5-27**, the view of the Museum from the Battery Park City Esplanade would be maintained due to the building's height and because the Proposed Action in this area would not be elevated such that views would be obstructed.

The Proposed Action would have no significant adverse impacts on the urban design and aesthetic and visual resources within Wagner Park and within the Project and Study Area viewing inland from the Battery Park City Esplanade.

Figure 3.5-26: Viewpoint 21 - Existing view of Wagner Park looking east from the Battery Park City Esplanade

Figure 3.5-27: Viewpoint 21 – Proposed view of Wagner Park looking east from the Battery Park City Esplanade

<u>View of the Hudson River Waterfront and Statue of Liberty</u>

Pedestrians near Battery Place to the east of Wagner Park have unobstructed views of the Hudson River Waterfront and Statue of Liberty from two locations: a framed and unobstructed view from the central plaza through the Pavilion's northern and southern structures and the northern pedestrian entry point between the entrance to the north allée and the Museum of Jewish Heritage. As discussed above, the elevation of Wagner Park 10 to 12 feet would include a buried floodwall that begins rising near the Museum of Jewish Heritage, plateaus at the location of the existing Pavilion, and lowers as it ties into an exposed floodwall near the entrance to Pier A Plaza. The existing walkway along Battery Place would be improved with a sidewalk, provide universal accessibility to all pedestrian users, add landscaping, including perennials along the western side of the sidewalk and trees along the eastern side of the sidewalk, and maintain the existing MTA bus stops. However, the redesign of Wagner Park would remove the existing Pavilion and central plaza and obstruct the existing framed view of the Hudson River Waterfront by elevating Wagner Park and constructing a new Pavilion. The obstructed view would be recreated and enhanced within the new Pavilion, which would provide a more expansive view of the Hudson River Waterfront, Statue of Liberty, and New York Harbor from a higher elevation. In addition, the elevation of Wagner Park would obstruct a view of the Hudson River Waterfront and the Statue of Liberty from Battery Place to the north of the existing Pavilion.

Figure 3.5-28 depicts the framed and unobstructed view of the Hudson River Waterfront and Statue of Liberty through the existing Wagner Park Pavilion from the central plaza. **Figure 3.5-29** shows how the Proposed Action would obstruct this view by elevating Wagner Park 10 to 12 feet, removing the Pavilion and central plaza, and replacing the Pavilion at the plateau of the elevated Wagner Park. This section of the elevated Wagner Park would include the ground level of the proposed Pavilion with park and restaurant service entrances along Battery Place. This section of the Pavilion wall exposed along Battery Place is necessary to provide easy and safe entrances for park and restaurant staff to access the interior of the Pavilion, park service vehicles, and receive deliveries. This separation of the park and restaurant service entrances from pedestrian access points into Wagner Park and the Pavilion removes potential conflicts with pedestrians. However, for the purposes of the urban design and aesthetic and visual resources assessment, the alignment and uses of the Pavilion would remain consistent. As is discussed in Section 3.5.5.3 (Minimization of Impacts in Wagner Park), although the existing view of the Hudson River Waterfront would be removed, a similarly framed and unobstructed view of the Hudson River Waterfront and the Statue of Liberty would be recreated within the proposed Pavilion and from a higher elevation (see **Figure 3.5-29**). This new view from a higher elevation would provide a clearer and more expansive view of the Hudson River Waterfront, Statue of Liberty, and New York Harbor.

Figure 3.5-30 shows another viewpoint of Wagner Park, the Hudson River Waterfront and Statue of Liberty near Battery Place, and this viewpoint is located at the entrance to the north allée viewing west to through Wagner Park. This viewpoint provides a relatively unobstructed view of the Hudson River Waterfront and Statue of Liberty, even though the view is limited due to the site distance and existing intervening park features. **Figure 3.5-32** depicts this view with the Proposed Action, and the rising buried floodwall in the elevated Wagner Park is clearly visible in the middle ground. Although this portion of Wagner Park would not be elevated to its full 10 to 12-foot height, this section of the buried floodwall obstructs the view of the Hudson River Waterfront and the Statue of Liberty.

As shown in **Figure 3.5-29** and **Figure 3.5-32**, the Proposed Action would have significant adverse impacts on the aesthetic and visual resources, including Wagner Park, the Hudson River Waterfront and the Statue of Liberty from viewpoints along Battery Place. The Proposed Action would obstruct two existing views of the Hudson River Waterfront through Wagner Park from Battery Place: 1) from the Wagner Park central plaza through the existing Pavilion, and 2) from the Battery Place sidewalk adjacent to the Museum of Jewish Heritage. To minimize these impacts, the Proposed Action would redesign the entirety of Wagner Park to improve access to the park, the user experience within the park, and recreate the framed and unobstructed view of the Hudson River Waterfront and the Statue of Liberty from the proposed Pavilion. These measures are discussed below in Section 3.5.5.3 (Minimization of Impacts in Wagner Park). These measures would improve pedestrian access to Wagner Park, enhance the pedestrian user experience of Wagner Park and the Pavilion, and maintain pedestrian connectivity to the Museum of Jewish Heritage, Pier A Plaza, the sidewalk along Battery Place, and the MTA bus stations along Battery Place. As such, the Proposed Action would have no significant adverse impacts on the urban design within Wagner Park and within the Project and Study Area.

Figure 3.5-28: Viewpoint 22 – Existing view of the Hudson River Waterfront and Statue of Liberty from the central plaza adjacent to Battery Place and through the Pavilion

Figure 3.5-29: Viewpoint 22 – Proposed view towards the Hudson River Waterfront from the area that is currently the central plaza adjacent to Battery Place

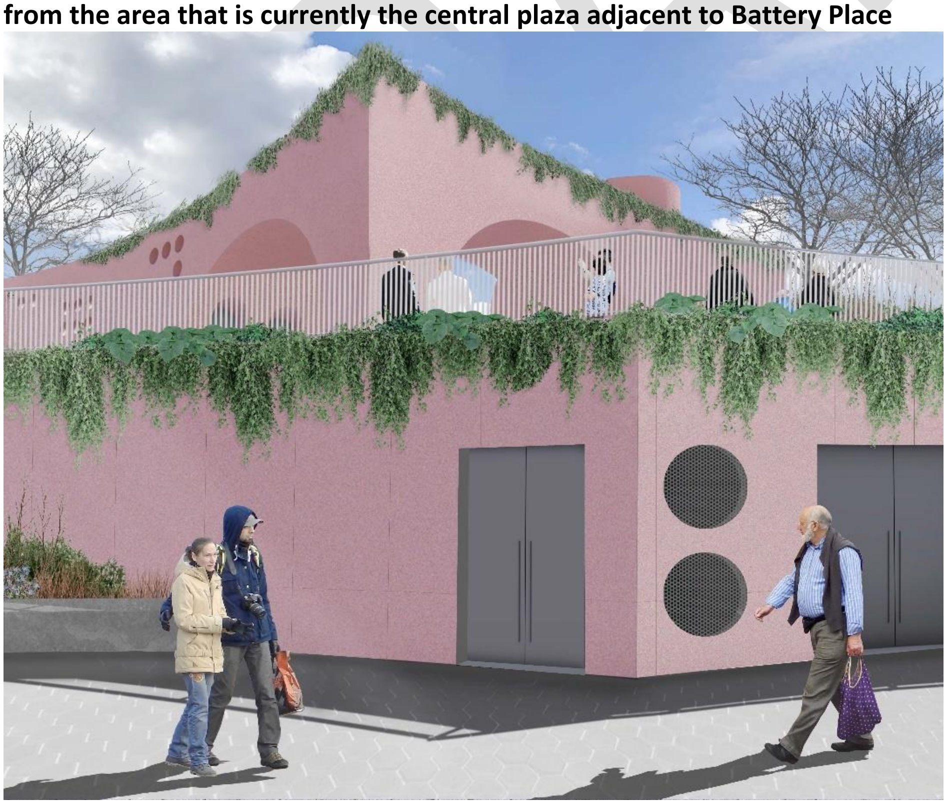


Figure 3.5-30: Proposed View of the Hudson River Waterfront and Statue of Liberty from the proposed Pavilion

Figure 3.5-31: Viewpoint 20 – Existing view of the northern section of Wagner Park and the Hudson River Waterfront

Figure 3.5-32: Viewpoint 20 – Proposed view of the northern section of Wagner Park and the Hudson River Waterfront

Pier A Plaza

As the buried floodwall terminates at the eastern edge of Wagner Park, a short section of exposed floodwall would be constructed at the boundary of Pier A Plaza, and a line of flip-up deployables with small, fixed columns connecting the flip-up deployables would be constructed across Pier A Plaza to the north of the Pier A inlet. This line of flip-up deployables would extend to The Battery and tie into a section of exposed floodwall in The Battery. Pier A Plaza has the lowest elevation in the Project Area resulting in a higher vulnerability to daily tidal flooding. In order to address this vulnerability, portions of Pier A Plaza would be elevated by approximately 4 feet, and the flip-up deployables would be constructed within this elevated portion of Pier A Plaza. To the south of the flood alignment, Pier A Plaza would be redesigned with tiered steps and seating to transition from the elevated portion of Pier A Plaza down to the southern end of Pier A Plaza and the entrance to The Battery's waterfront esplanade. Part of this redesign would require the removal of trees in Pier A Plaza.

The aesthetic and visual resources within the vicinity of Pier A Plaza include the Plaza, Pier A, and The Battery. The Proposed Action in Pier A Plaza would have no significant adverse impacts on the urban design and aesthetic and visual resources within the Study Area. The short section of free-standing floodwall would be integrated into the design of the south allée in Wagner Park and would be located where an existing maintenance storage area for Wagner Park currently sits. The flip-up deployables, the elevated section of Pier A Plaza, and the tiered steps and seating would be new features in Pier A Plaza. However, these features would not create a visual obstruction or obstruct pedestrian access in Pier A Plaza or connections to the Pier A, Wagner Park, or The Battery. The small sections of fixed columns in Pier A Plaza connecting the flip-up deployables would create new obstructions, but their size and location would not impede pedestrian movement or obstruct views looking into Pier A and looking north to Lower Manhattan. In addition, the longer section of exposed floodwall tying the flip-up deployables in Pier A Plaza to the flood alignment in The Battery would not obstruct existing views of Pier A Plaza or views from Pier A Plaza to Lower Manhattan. The existing trees and planting of new trees in the area between Pier A Plaza and The Battery would obstruct views from Pier A Plaza to Battery Place and from Battery Place into Pier A Plaza. Because of these intervening existing trees that obstruct existing views in this area and new trees that would be planted and further obstruct these views, the exposed floodwalls would not obstruct existing views.

Figure 3.5-33 and **Figure 3.5-34** compare the same view of Pier A Plaza from the entrance to The Battery's Esplanade looking north to Lower Manhattan and One World Trade Center for existing conditions and the Proposed Action, respectively. **Figure 3.5-34** depicts the tiered steps in Pier A Plaza, the elevation of the Plaza, and the sections of fixed columns connecting the flip-up deployables and the flood alignment in The Battery. Pedestrian and bicyclist access to Pier A Plaza, Wagner Park, and The Battery would be maintained in the Proposed Action. In addition, amenities would be added to Pier A Plaza, including seating. **Figure 3.5-34** also shows the sections of exposed floodwall with the longest section connecting to the flood alignment in The Battery, which would be behind intervening trees, both existing and new trees that would be planted, between Pier A Plaza and The Battery. These intervening trees would obstruct views from Battery Place to Pier A Plaza and The Battery and views from Pier A

Plaza to Lower Manhattan. The views of residents, pedestrians, bicyclists, and motorists in this section of the Study Area would be minimally affected by the Proposed Action.

Figure 3.5-33: Viewpoint 23 – Existing view of Pier A Plaza looking north along West Street

Figure 3.5-34: Viewpoint 23 – Proposed view of Pier A Plaza looking north along West Street and the One World Trade Center Tower

The Battery

As the flood alignment continues east out of Pier A Plaza, it extends into the northern section of The Battery and the Battery Bikeway. The section of the flood alignment in The Battery is comprised of a combination of flip-up deployables, exposed floodwall, and buried floodwall beneath a landscaped berm to the east of the Project Area. In addition, the flood alignment requires the reconfiguration of the existing Battery Bikeway, but the bikeway would maintain its existing access points on State Street and Battery Place. The DFE in this section descends from 18.5 feet to 15 feet, and the HOI descends from 9.5 to 0 feet moving west to east in the Project Area. The Proposed Action would elevate the grade of this section of The Battery to meet the DFE, but the design of the circulation, landscape architecture, use of the Battery 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 Waterfront. Once the flood alignment reaches the high point in the furthest east section of the Project Area, which naturally meets the DFE, it terminates. The Proposed Action would remove and transplant trees within The Battery to accommodate the flood alignment and the reconfigured Battery Bikeway.

The aesthetic and visual resources within The Battery include The Battery, the Battery Bikeway, and the entrance to Pier A Plaza. The Proposed Action in The Battery would have no significant adverse impacts on the urban design and aesthetic and visual resources within the Study Area. The exposed floodwall, flip-up deployables, and buried floodwall would be new features in The Battery. However, these features would not create a visual obstruction or obstruct pedestrian and bicyclist access in The Battery. As discussed in Section 3.5.4.3 (Views to the Waterfront) and above in relationship to the exposed floodwall connecting to Pier A Plaza, views into The Battery from Battery Place and views from The Battery are obstructed by tall trees that line the pathways within The Battery. The Proposed Action would remove and transplant some of these trees and add additional landscaping along the flood alignment, particularly at the eastern Battery Bikeway access point.

Along the western side of the flood alignment in The Battery, **Figure 3.5-36** and **Figure 3.5-38** depict views of the proposed section of exposed floodwall in The Battery compared to the existing conditions (see **Figure 3.5-35** and **Figure 3.5-37**). This section of exposed floodwall would be approximately 9.5 feet tall, span 165 feet, and include two sections with a flip-up deployable connecting the two sections. This flip-up deployable would provide pedestrian and bicyclist access into The Battery and maintain the pathway to the statue of Giovanni da Verrazzano inside The Battery. **Figure 3.5-35** and **Figure 3.5-37** show the existing conditions in which trees planted within The Battery obstruct views from Battery Place into The Battery and from The Battery into Lower Manhattan. The sections of existing stone wall around The Battery would be replaced with sections of exposed floodwall depicted in **Figure 3.5-36** and **Figure 3.5-38**. The existing trees within The Battery form a visual barrier with the only views into The Battery being the entrances to pathways. The proposed exposed floodwall would obstruct views of trees within The Battery, but views of the pathways within The Battery would be maintained. In addition, the location of the flip-up deployable between the two sections of exposed floodwall would be in the same position as the existing entrance to The Battery, which would maintain the unobstructed view of the statue of Giovanni da Verrazzano inside The Battery (see **Figure 3.5-39**).

Figure 3.5-35: Viewpoint 26 – Existing view of The Battery and pedestrian/bicyclist entrance near statue of Giovanni da Verrazzano

Figure 3.5-36: Viewpoint 26 – Proposed view of The Battery and pedestrian/bicyclist entrance over a flip-up deployable and between the exposed floodwall near statue of Giovanni da Verrazzano

Figure 3.5-37: Viewpoint 27 – Existing view of Battery Place and Lower Manhattan from pedestrian pathway in The Battery

Figure 3.5-38: Viewpoint 27 – Proposed view of Battery Place and Lower Manhattan From pedestrian pathway in The Battery with the exposed floodwall and flip-up deployable

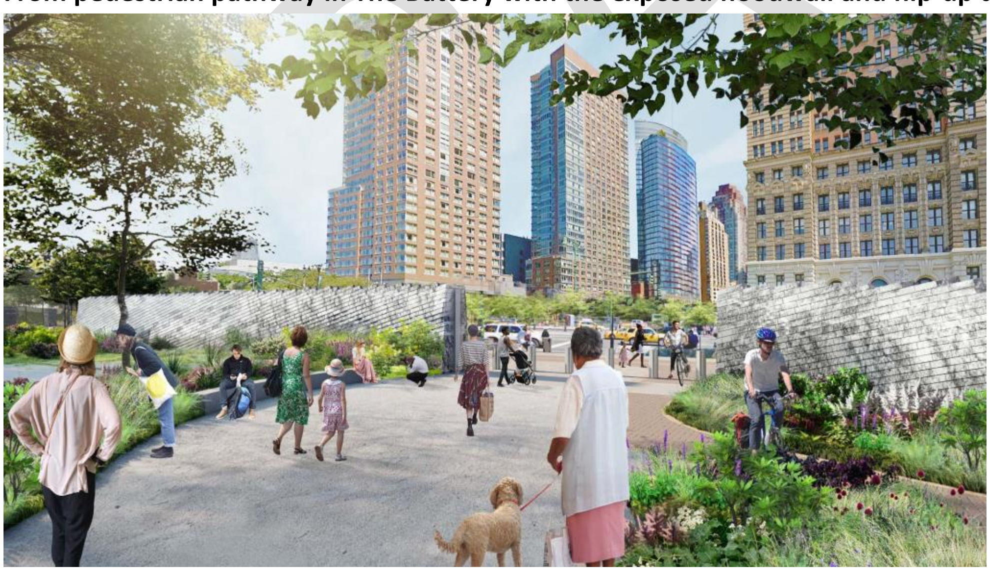
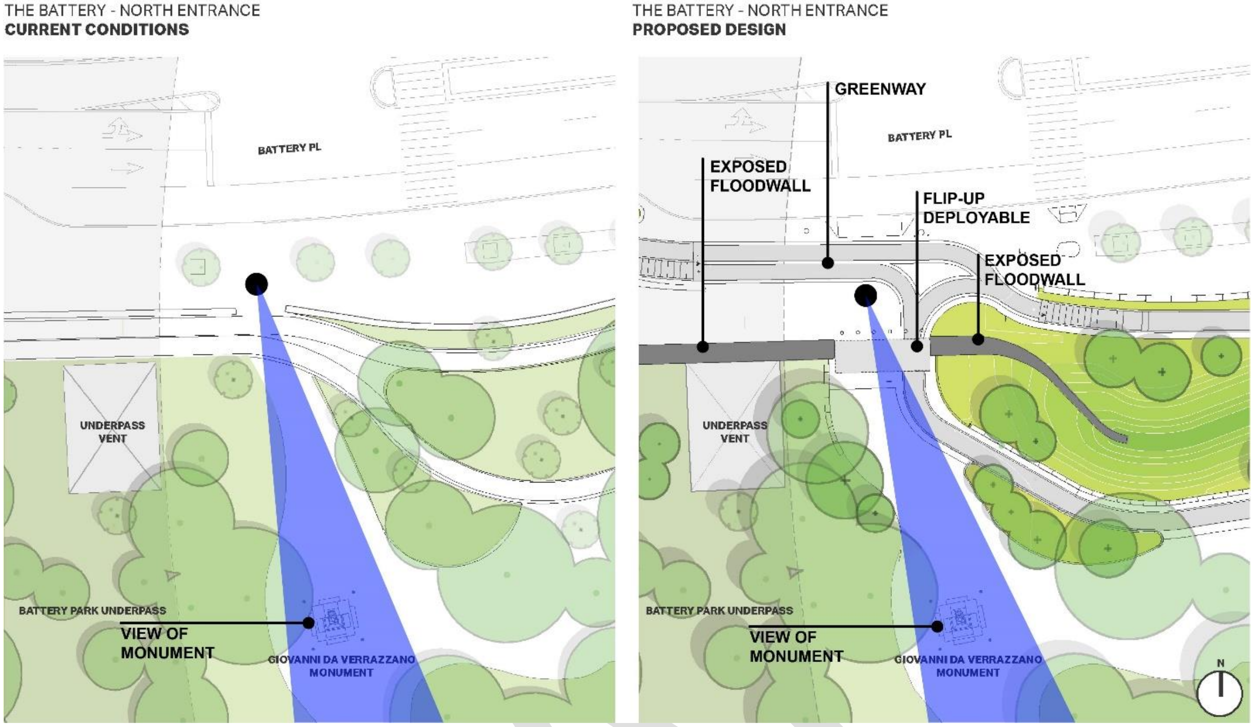


Figure 3.5-39: Viewpoint 28 – View of the existing and proposed pedestrian/bicyclist entrance to The Battery and pathway to the statue of Giovanni da Verrazzano



At the eastern end of the flood alignment in The Battery, **Figure 3.5-40** and **Figure 3.5-41** compare the same view of the Battery Bikeway in the northern section of The Battery looking west towards Pier A Plaza for existing conditions and the Proposed Action, respectively. **Figure 3.5-41** shows the buried floodwall and landscaping proposed for the northern section of The Battery. Pedestrian and bicyclist access through The Battery would be maintained with the same pedestrian and bicyclist entry points from Pier A Plaza, Battery Place, and State Street in the Proposed Action. Intervening trees obstruct views into and out of The Battery in the existing conditions, and these obstructions would remain in the Proposed Action.

Figure 3.5-40: Viewpoint 24 – Existing view of The Battery and the Battery Bikeway looking west toward Pier A Plaza

Figure 3.5-41: Viewpoint 24 – Proposed view of The Battery and the Battery Bikeway looking west toward Pier A Plaza

3.5.5.3 Minimization of Impacts in Wagner Park

The Proposed Action would have a significant adverse impact on views of the Hudson River Waterfront and the Statue of Liberty from Battery Place due to the elevation of Wagner Park and the removal of the existing Pavilion. As discussed in Section 3.5.5.2 (Proposed Action – Wagner Park), the Proposed Action would obstruct the existing view of the Hudson River Waterfront from the Wagner Park central plaza and the area near the entrance to the north allée near the Museum of Jewish Heritage. To both meet the purpose and need for the SBPCR Project and minimize these adverse impacts, the Proposed Action would redesign Wagner Park by elevating it 10 to 12 feet, reconstructing the Pavilion at the plateau of Wagner Park slightly east of the existing Pavilion, improving the entrances into Wagner Park by reconstructing the north and south allées, adding wayfinding within Wagner Park, and enhancing the walkway along Battery Place. These improvements are depicted in **Figure 3.5-42** and **Figure 3.5-43** and discussed further below.

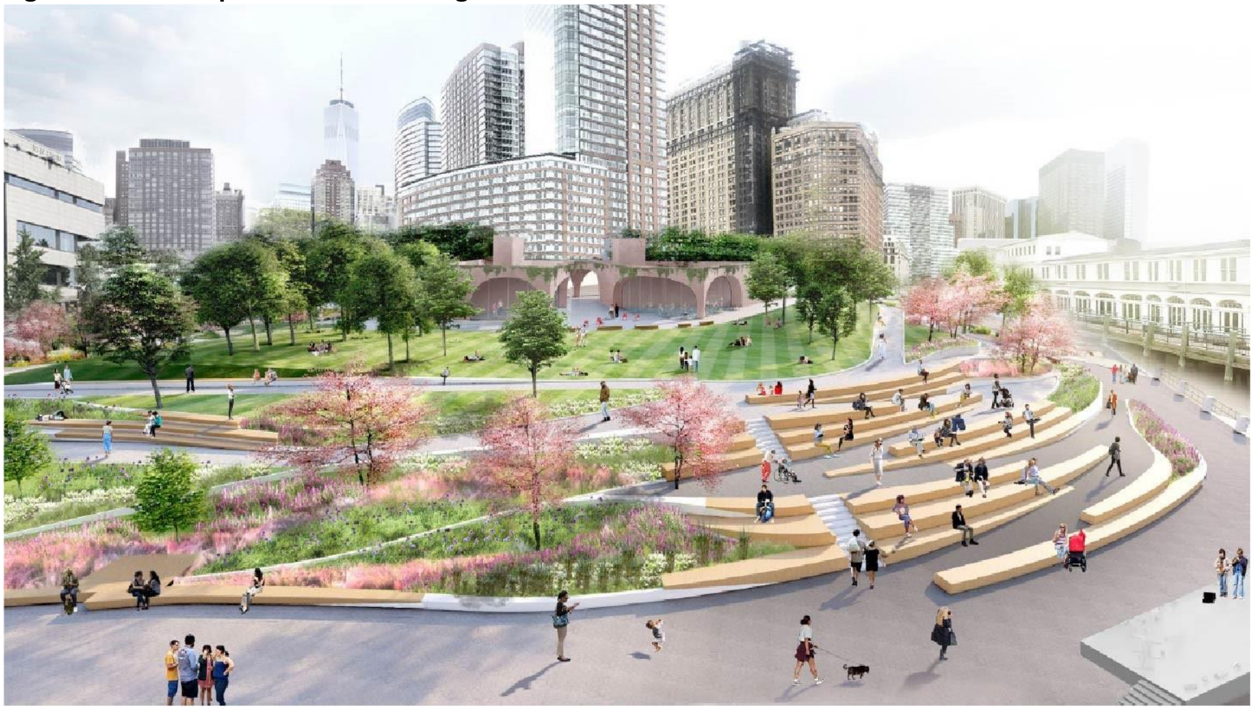
Elevation of Wagner Park

As shown in **Figure 3.5-43**, Wagner Park would be elevated 10 to 12 feet from its existing grade for the construction of a buried floodwall crossing Wagner Park from the Museum of Jewish Heritage and Pier A Plaza. As discussed in Chapter 2 (Project Alternatives), the Proposed Action was determined as the only reasonable alternative to fulfill the SBPCR Project purpose and need and maintain existing park programming and use in Wagner Park. Between Battery Place and the Battery Park City Esplanade along the Hudson River Waterfront, the Proposed Action would construct new open lawns connected by pedestrian walkways with tiered seating areas and sloped walkways descending from the proposed Pavilion to the Esplanade (see **Figure 3.5-44**).

Figure 3.5-42: Proposed Action in Wagner Park along Battery Place

Figure 3.5-43: Cross Section of Proposed Action in Wagner Park along Battery Place

Figure 3.5-44: Proposed Action in Wagner Park



As illustrated in **Figure 3.5-46,** the views of the Hudson River Waterfront, Statue of Liberty, and New York Harbor from the elevated Wagner Park would be improved due to the ability to see further from an unobstructed and higher elevation. These unobstructed and elevated viewpoints can be seen in **Figure 3.5-44** In addition, views of surrounding aesthetic and visual resources, primarily the Museum of Jewish Heritage and the Pier A would improve because of the higher viewpoints.

Reconstruction of the Wagner Park Pavilion

The Proposed Action would remove the existing Wagner Park Pavilion and reconstruct a new Pavilion on the plateau of the elevated Wagner Park (see **Figure 3.5-44**). The proposed Pavilion would be located further east and closer to Battery Place compared to the existing Pavilion. This area is currently the Wagner Park central plaza (see **Figure 3.5-28** and **Figure 3.5-45**). The framed and unobstructed view of the Hudson River Waterfront and Statue of Liberty that is currently viewed from the central plaza (see **Figure 3.5-45**) would be recreated in the proposed Pavilion (see **Figure 3.5-46**). The framed and unobstructed view through the Pavilion would be improved with the elevated Pavilion and removal of the northern and southern structures and connecting pedestrian bridge that limit the existing view of the Hudson River Waterfront.

Figure 3.5-45: Viewpoint 5 – Existing view of the Hudson River Waterfront and the Statue of Liberty through the Pavilion

Figure 3.5-46: Proposed view of the Hudson River Waterfront and Statue of Liberty from the Pavilion

Improved Entrances to Wagner Park

The Proposed Action would maintain and enhance the existing entrances to Wagner Park through reconstructing the north and south allées. The proposed allées would be designed for universal access with widened 40-foot walkways, trees lining both sides, and a gentle 8 percent slope to the Wagner Park Pavilion. Along each allée, there would be new seating and plateaus along the walkway providing pedestrians opportunities to stop and rest. **Figure 3.5-48** and **Figure 3.5-50** show renderings of the proposed north and south allées. The viewing positions in these renderings can be compared to the existing views shown in **Figure 3.5-47** and **Figure 3.5-49**.

The entrance to the north allée would become the vehicle drop off point for tourist buses and other vehicles dropping off park users, and the north allée entrance would be softened, or rounded, to allow for more natural pedestrian movements into Wagner Park from Battery Place (see **Figure 3.5-42**). In addition, this northern entrance would be located near the existing MTA bus stop. The Proposed Action would maintain the location of this MTA bus stop.

The entrance to the south allée would be integrated with the flood alignment in Pier A Plaza, which would elevate this portion of the Plaza. As shown in **Figure 3.5-42**, pedestrians would access the south allée directly from Pier A Plaza or a pedestrian ramp from Battery Place to the north of the pedestrian crosswalk across Battery Place.

Figure 3.5-47: Viewpoint 29 – Existing view of north allée leading to the Pavilion

Figure 3.5-48: Proposed north allée leading to the Pavilion

Figure 3.5-49: Viewpoint 30 – Existing view of south allée leading to the Pavilion

Figure 3.5-50: Proposed south allée leading to the Pavilion

Wayfinding near the Wagner Park Entrances

The Proposed Action would include wayfinding signage and maps at the northern and southern entrances to Wagner Park. Wayfinding signage and maps would provide useful information and directions to orient pedestrians within Wagner Park, including to the locations of the allée entrances, walkways in Wagner Park, directions to the new Pavilion, and directions to the Battery Park City Esplanade. As shown in **Figure 3.5-42**, a wayfinding sign with a map would be added at the entrance of the north allée adjacent to Battery Place, which would be observed by Wagner Park users accessing the park from the northern or southern sides of Battery Place and the vehicle drop off point. This wayfinding signage is also depicted in **Figure 3.5-48**.

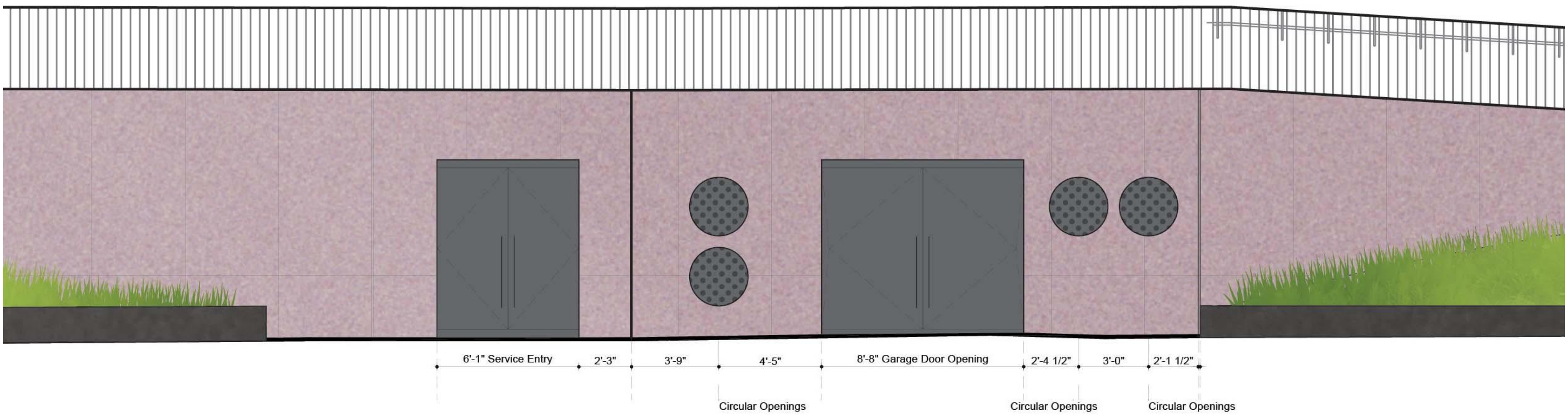
As shown in **Figure 3.5-42**, a wayfinding sign with a map would be added at the entrance of the south allée situated directly in front of the pedestrian entry point on Battery Place. The location of this wayfinding signage would be observed by pedestrians accessing Pier A Plaza or the pedestrian ramp from Battery Place to the north allée.

Battery Place Walkway Enhancements

Because the Proposed Action would elevate Wagner Park, access from the Battery Place walkway to Wagner Park would be limited to the entrances to the north and south allées. To improve the pedestrian experience along the Battery Place walkway, the Proposed Action would expand the walkway to a minimum of 6 feet, so the walkway functions as a sidewalk accessible to all pedestrian users. In addition, the existing rectangular cobblestone walkway would be removed, and the entire sidewalk would be paved with hexagonal asphalt pavers (see **Figure 3.5-48** and **Figure 3.5-50**). The Proposed Action would add landscaping, including a variety of perennials for every season of the year, along the bermed wall on the western side of the Battery Place sidewalk to enhance the visual experience of pedestrians (see **Figure 3.5-43**, **Figure 3.5-48**, and **Figure 3.5-50**). In addition, seating would be constructed at the southern MTA bus stop, which is slightly north of the pedestrian entry point to Pier A Plaza and the south allée to Wagner Park (see **Figure 3.5-50**).

As shown in **Figure 3.5-51**, the first level of the Wagner Park Pavilion at the Battery Place street level would include service entrances for park and restaurant employees and maintenance vehicles. The location of this entrance is also depicted in **Figure 3.5-42** and **Figure 3.5-43**. The design of the service entrance would blend into the façade of the first level of the Pavilion and be slightly offset to reduce its visibility along Battery Place. This section of the Pavilion wall exposed along Battery Place is necessary to provide easy and safe entrances for park and restaurant staff to access the interior of the Pavilion, park service vehicles, and receive deliveries. This separation of the park and restaurant service entrances from pedestrian access points into Wagner Park and the Pavilion removes potential conflicts with pedestrians.

Figure 3.5-51: Battery Place Service Entrance Design



3.5.5.4 Summary and Conclusion

The Proposed Action would have no significant adverse impact on aesthetic and visual resources in the vicinity of 1st Place, the Museum of Jewish Heritage or Wagner Park for viewpoints inside the park area, Pier A Plaza, and The Battery. However, the Proposed Action would have a significant adverse impact in Wagner Park for views along Battery Place towards the Hudson River Waterfront because of the proposed elevation of Wagner Park. In order to meet the SBPCR Project purpose and need, Wagner Park would be elevated and redesigned to maintain and enhance park programming and use. To minimize the adverse impacts on views from Battery Place to the Hudson River Waterfront and the Statue of Liberty, the Proposed Action would redesign Wagner Park between Battery Place and the Battery Park City Esplanade, construct a new Pavilion on the plateau of the elevated Wagner Park, recreate the framed and unobstructed view of the Hudson River Waterfront and Statue of Liberty through the new Pavilion, reconstruct and enhance the northern and southern entrances to Wagner Park, and improve the pedestrian experience on the walkway along Battery Place.

3.6 Neighborhood Character

3.6.1 Introduction

The following analysis has been prepared in accordance with the *CEQR Technical Manual*. Under the CEQR guidance, neighborhood character assessments consider how elements of the environment combine to create the context and feeling of a neighborhood and how a proposed project may affect that context and feeling. To determine a proposed project's effects on neighborhood character, the elements that contribute to a neighborhood's context and feeling are considered together. As defined by the *CEQR Technical Manual*, neighborhood character is considered to be a combination of the various elements that give a neighborhood its distinct "personality." These elements may include a neighborhood's land use, urban design, visual resources, historic resources, socioeconomics, traffic, and/or noise.

An assessment of neighborhood character is generally recommended when a proposed project has the potential to result in significant adverse impacts in any, or moderate impacts on several, of the following technical areas that define a neighborhood's character: land use, zoning, and public policy; socioeconomic conditions; open space; historic and cultural resources; urban design and visual resources; shadows; transportation; and noise. A "moderate" effect is generally defined as an effect considered reasonably close to the significant adverse impact threshold for a particular technical analysis area. When considered together, there are elements that may have the potential to significantly impact neighborhood character.

According to the *CEQR Technical Manual*, significant adverse impacts to neighborhood character are rare. Only under unusual circumstances would a combination of moderate effects to the neighborhood result in an impact to neighborhood character, in the absence of an impact in any of the relevant technical areas. Moreover, a significant impact identified in one of the technical areas that contribute to a neighborhood's character is not automatically equivalent to a significant impact on neighborhood character. Rather, it serves as an indication that neighborhood character should be examined.

Since many of the relevant components of neighborhood character are considered in other sections of this DEIS, this section has been coordinated with those analyses. The Study Area for the assessment of effects to neighborhood character is 400 feet from the Project Area for the flood alignment. This is consistent with the Study Area for several sections that support this analysis, including land use, zoning and public policy, socioeconomic resources, historic and cultural resources, and urban design and visual resources. Photographs which depict the character of the Study Area are provided in Section 3.5 (Urban Design and Visual Resources).

3.6.2 Affected Environment

The SBPCR Project is located on the Hudson River waterfront in the vicinity of the southern portion of Battery Park City in Lower Manhattan. Open spaces, public facilities, museums, and high-rise residential/commercial mixed-use buildings form the foundation of the neighborhood's character. The Project Area along the waterfront consists of open space around the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery. The Hudson River waterfront runs on the western side of the Project Area and includes views to the Statue of Liberty from Wagner Park. The buildings within the Study Area are predominantly residential/commercial mixed-use, with supporting educational and health care facilities. The Museum of Jewish Heritage, located north of Wagner Park, is an important cultural institution in the Study Area providing educational opportunities for the neighborhood and visitors from the City and abroad.

The prominent roadways forming the boundary around the Project Area include 1st Place to the north, Battery Place running along the Project Area's northern border, and State Street to the east. Battery Place is the central roadway running through the Study Area, providing two-way connections from the northwest to the southeast of the Study Area. The intersection of Battery Place and Little West Street is located north of the Wagner Park Pavilion. This intersection provides pedestrian and bicyclist access to the waterfront open spaces and serves as the signalized crossing for the Battery Bikeway to cross Battery Place and become the Hudson River Greenway. The Battery Park Underpass begins at the southern end of West Street, passes underneath The Battery, and becomes FDR Drive to the east of The Battery and Whitehall Terminal. In addition, the northern entrance to the Hugh L. Carey Tunnel is located to the north of The Battery alongside Greenwich Street and passes underneath The Battery.

There are several recreational resources in the neighborhood within the Study Area that support local residents, recreational users passing through the area, and tourists to Lower Manhattan, including Wagner Park and The Battery. Wagner Park includes pedestrian paths, open lawn spaces, a Pavilion open to the public, and the Battery Park City Esplanade. The Esplanade extends from 1st Place to Wagner Park within the Project Area. The Esplanade provides both active and passive recreational amenities, including open space with views of the Statue of Liberty and Ellis Island, a pedestrian path, and seating. The primary pedestrian access to Wagner Park is through north and south tree-lined allées that are situated to the west of Battery Place and form the eastern boundary of Wagner Park. The entrances to these allées are located near the Museum of Jewish Heritage to the north and Pier A Plaza to the south. The section of The Battery within the Project Area includes the Battery Bikeway located along the northern side of The Battery. The Battery Bikeway provides a safe recreational connection from Whitehall Terminal, through The Battery, and to the Hudson River Greenway running north from Battery Place. The Battery Bikeway is part of the Manhattan Waterfront Greenway, which is a continuous bikeway around the entirety of Manhattan.

The most dominant visual features in the Study Area are Wagner Park and the Pavilion, the Museum of Jewish Heritage, Pier A, and The Battery, but these features obstruct views of the Hudson River Waterfront and the Statue of Liberty from Battery Place. Typically, a visitor would need to enter Wagner Park, Pier A Plaza, and The Battery and approach the watefront through these parks to have an unobstructed view of the Hudson River and the Statue of Liberty. Views of the Hudson River from Battery Place are obstructed by rows of trees and hedges between Battery Place and Wagner Park with the exception of the view of the Statue of Liberty through the opening in the Wagner Park Pavilion. To the north of Wagner Park, the Museum of Jewish Heritage is a structure of architectural interest but obstructs views of the Hudson River. To the east of Wagner Park, Pier A Plaza is a gathering place for pedestrians accessing paths into Wagner Park, The Battery, and the Hudson River Waterfront, entering Pier A, or traveling north into Lower Manhattan. The building in Pier A obstructs views of the Hudson

River Waterfront and the Statue of Liberty. Further east of Pier A Plaza, the northern side of The Battery consists of the Battery Bikeway and pedestrian paths crossing through rows of trees. These trees obstruct views of the rest of The Battery and the Hudson River.

There are several buildings and structures within the Study Area that are historic architectural resources listed on or eligible for listing on the National Register. Most notably with the Project Area are Wagner Park, and the Hugh L. Carey Tunnel passing underneath The Battery. The entirety of Wagner Park is located with the Project Area, and it is a National Register-eligible resource. Pier A is immediately adjacent to the Project Area and associated with the Pier A Plaza, which is within the Project Area. The historic properties within the Study Area contribute to its rich and diverse history, as well as its character.

Noise within the Study Area is generally the result of traffic on roadways, as vehicular traffic is the dominant noise source.

3.6.3 Environmental Impacts

As discussed in Section 3.6.1 (Introduction), an assessment of neighborhood character is generally recommended when a proposed project has the potential to result in significant adverse impacts in any, or moderate effects on several, of the following technical areas that define a neighborhood's character: land use, zoning, and public policy; socioeconomic conditions; open space; historic and cultural resources; urban design and visual resources; shadows; transportation; and noise. The Proposed Action would have no significant adverse impacts on land use, zoning, public policy, socioeconomic conditions, open space, shadows, transportation or noise, so the neighborhood character assessment would not include discussions of these technical analyses. However, the Proposed Action would have significant adverse impacts on Wagner Park as a historic and cultural resource and views of Wagner Park, the Hudson River Waterfront, and the Statue of Liberty from Battery Place. The following preliminary assessment would focus only on these technical analyses that have indicated significant adverse impacts: historic and cultural resources and urban design and visual resources.

3.6.3.1 No Action Condition

The No Action Condition assumes that the Proposed Action would not be constructed, however, other planned projects within the Study Area would be constructed including: The Battery Coastal Resilience Project (NYCEDC) and Battery Park Underpass and West Street Underpass Project (NYCDOT). None of these planned projects are anticipitated to noticably alter the character of the neighborhood within the Study Area. The Battery Coastal Resilience Project would enhance the waterfront esplanade in The Battery and therefore could have beneficial effects to neighborhood character. The Battery Park Underpass and West Street Underpass Project would add flood protection improvements to the Battery Park Underpass traveling underneath The Battery, which would have no significant adverse impact on the neighborhood character within the Study Area.

Under the No Action Condition, a comprehensive flood alignment system would not be installed, and the neighborhood within the Study Area would continue to be subject to flooding both during minor and major storm events, which are anticipated to increase in number and severity over time without proper flood protection. Because of this continued vulnerability, the southern edge of Lower Manhattan, including the areas of recreational, institutional, residential, and commercial uses, could experience potential adverse impacts to neighborhood character, including impacts to the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery.

3.6.3.2 Proposed Action

Implementation of the Proposed Action would not have a significant adverse impact on the character of the neighborhood in relationship to land use, zoning, and public policy, socioeconomic conditions, open space, and shadows.

In Section 3.4 (Historic and Cultural Resources), it was concluded that the Proposed Action would have an Adverse Effect on the National-Register eligible Wagner Park. In addition, in Section 3.5 (Urban Design and Visual Resources), it was concluded that the Proposed Action would have a significant adverse impact on the view from the existing Wagner Park central plaza to the Hudson River Waterfront and the Statue of Liberty as well as near the entrance to the north allée and the Museum of Jewish Heritage. Sections 3.4 (Historic and Cultural Resources) and 3.5 (Urban Design and Visual Resources) provide minimization and mitigation measures to reduce adverse impacts as further summarized below.

As Section 3.4 (Historic and Cultural Resources) states, due to the Proposed Action's Adverse Effect on Wagner Park, it is anticipated that a Letter of Resolution (LOR) would be drafted between BPCA and SHPO. Potential mitigation could possibly include, but not be limited to: HALS Documentation and interpretive panels installed at Wagner Park.

As Section 3.5 (Urban Design and Visual Resources) describes, to mitigate the adverse visual impacts of elevating and redesigning Wagner Park, the Proposed Action would maintain and enhance park programming by providing continuous green space, new amenities, and maintaining and enhancing pedestrian access to Wagner Park and the Pavilion. In addition, the Proposed Action would recreate views of the Hudson River Waterfront and Statue of Liberty by replacing and enhancing viewpoints of these visual resources from elevated positions throughout Wagner Park and the Pavilion. See Section 3.5.5.2 (Proposed Action – Wagner Park) and Section 3.5.5.3 (Minimization of Impacts in Wagner Park) for detailed discussions and visualizations of the redesign of the elevated Wagner Park.

Potential environmental impacts related to historic and cultural resources and urban design and visual resources in Wagner Park would occur under the Proposed Action; however, these conditions would have no significant adverse impact on the neighborhood character in the Study Area.

3.7 Natural Resources

3.7.1 Introduction

This section describes the existing aquatic, terrestrial and wetland habitats; and flora and fauna in the Project Area. Although much of the work would be accomplished within previously developed land, some disturbance to vegetated and open water habitats would occur. These activities include:

- Temporary removal and replanting of landscaped open space;
- Removal of 1,746.4 square feet (sf) of a permanent decked area that completely shades the water. The decked area would be lowered to create 1,298.7 of intertidal, supratidal habitat and upland plantings, would daylight 165.4 sf of open water, whose depths vary from 5 to 10 feet in depth, and create a 282.3 sf metal grated viewing platform over open water that would allow an estimated 50 percent sunlight penetration. Water depth under the platform varies from 10 to 14 feet. The existing piles that supported the permanent decking would be left in place, and the additional lighting would benefit the aquatic habitat;

The proposed Pier A Inlet Living Shoreline design would modify the concrete relieving platform and riprap edge to a terraced structure. The reconstruction of the existing riprap slope would: establish a series of ledges at four distinct elevations; increase the physical complexity of the site; improve the public connection to the water; provide additional intertidal habitat; and provide increased environmental education opportunities within the Park. A tree inventory survey was conducted by an International Society of Arboriculture (ISA) Certified Arborist – Municipal Specialist on May 1, 2020, to identify and categorize trees within the Project Area. A total of 242 trees consisting of 24 species were identified and surveyed within the Project Area as a part of this inventory. A list of tree species identified during the May 2020 survey is shown in **Table 3.7-2.**

Table 3.7-2 identifies the habitat types, square footage, and elevations of the four ledges:

- Intertidal shelf zone (at elevation 1 foot to 2.5 feet just above mean sea level up to mean high water (MHW) zone) with ECOncrete textured blocks and slow draining tidal pools to accommodate shellfish, crabs, birds, and intertidal flora.
- Intertidal Marsh (at elevation 3 feet just above the mean highwater zone) with stabilized grass plantings tolerant of salt spray and daily saltwater inundation along the middle terraces.
- Coastal High Marsh Shrub Plantings (at elevation 6 feet) with mixed plantings line tolerant of salt spray, storm surge regular wave overtopping.
- Coastal Upland (at elevation 9 feet just below the esplanade) with mixed planting along the esplanade railing line tolerant of salt spray as well as storm surge wave overtopping and saltwater inundation.

The Proposed Action would impact 432 sf (0.011 acres) of habitat below MHW.

The SBPCR Project result in a net negative fill of 1.3 cubic yards below MHW; and would remove approximately 555 cubic yards of fill between spring high tide and 10-foot contour line. The Project would realize a net fill of 3.3 cubic yards in between MHW and MHWS. **Figure 3.7-1** and **Figure 3.7-2** illustrate an example of this reconfiguration compared to the existing shoreline.

A list of created habitats their elevations and square footage is provided in **Table 3.7-1**.

Table 3.7-1: Created Habitats

Habitat Type	Size (Sf)	Elevation* (Ft)	Notes
Rocky Intertidal / Rocky Shoreline	1,150	-1 to 2.5+*	ECOncrete textured blocks and slow draining tidal pools to accommodate shellfish, crabs, and intertidal flora. ECOncrete micro-surfacing textures mimics natural rock features and enhances biological recruitment by modifying small scale hydrodynamics, creating additional habitat complexity. ECOveneer would encapsulate the relieving platform piles and bent structures.
Intertidal Marsh	890	3	Stabilized grass plantings (*Spartina patens*, *Distichlis spicata.)* tolerant of salt spray and daily saltwater inundation at high tide.
Coastal High Marsh Shrub Plantings	737	5	Mixed planting along the esplanade railing that are tolerant of salt spray (e.g., Iva frutescens) and storm inundation.
Coastal Upland Plantings	700	7-8	Trees, shrubs and vegetation for pollinator species found along the shoreline of New York Harbor
*** Notes: EcoVeneer to occur on some vertical fascia above 2.5 ft in elevation**			

Figure 3.7-1: Shoreline Example with Tidepools

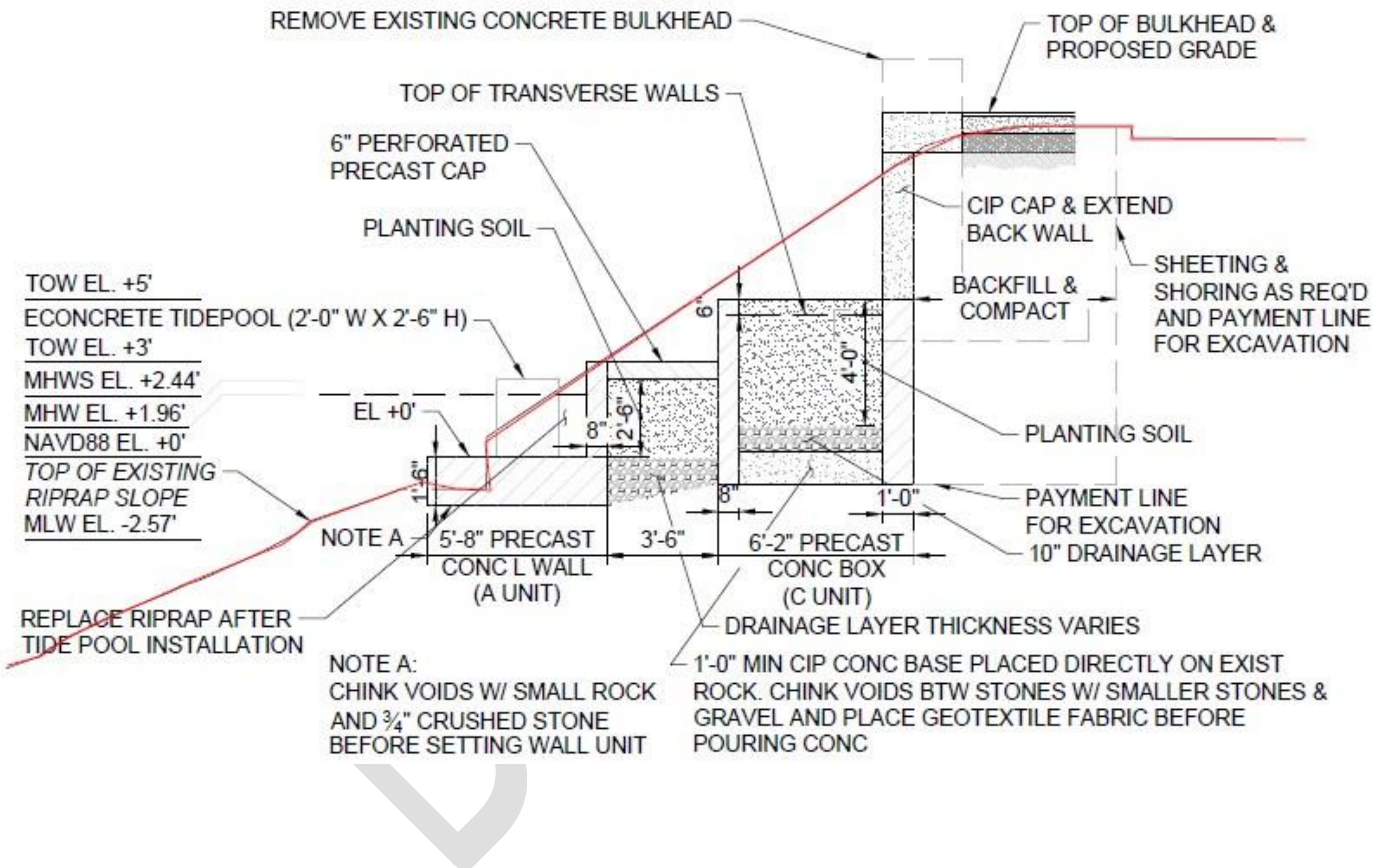
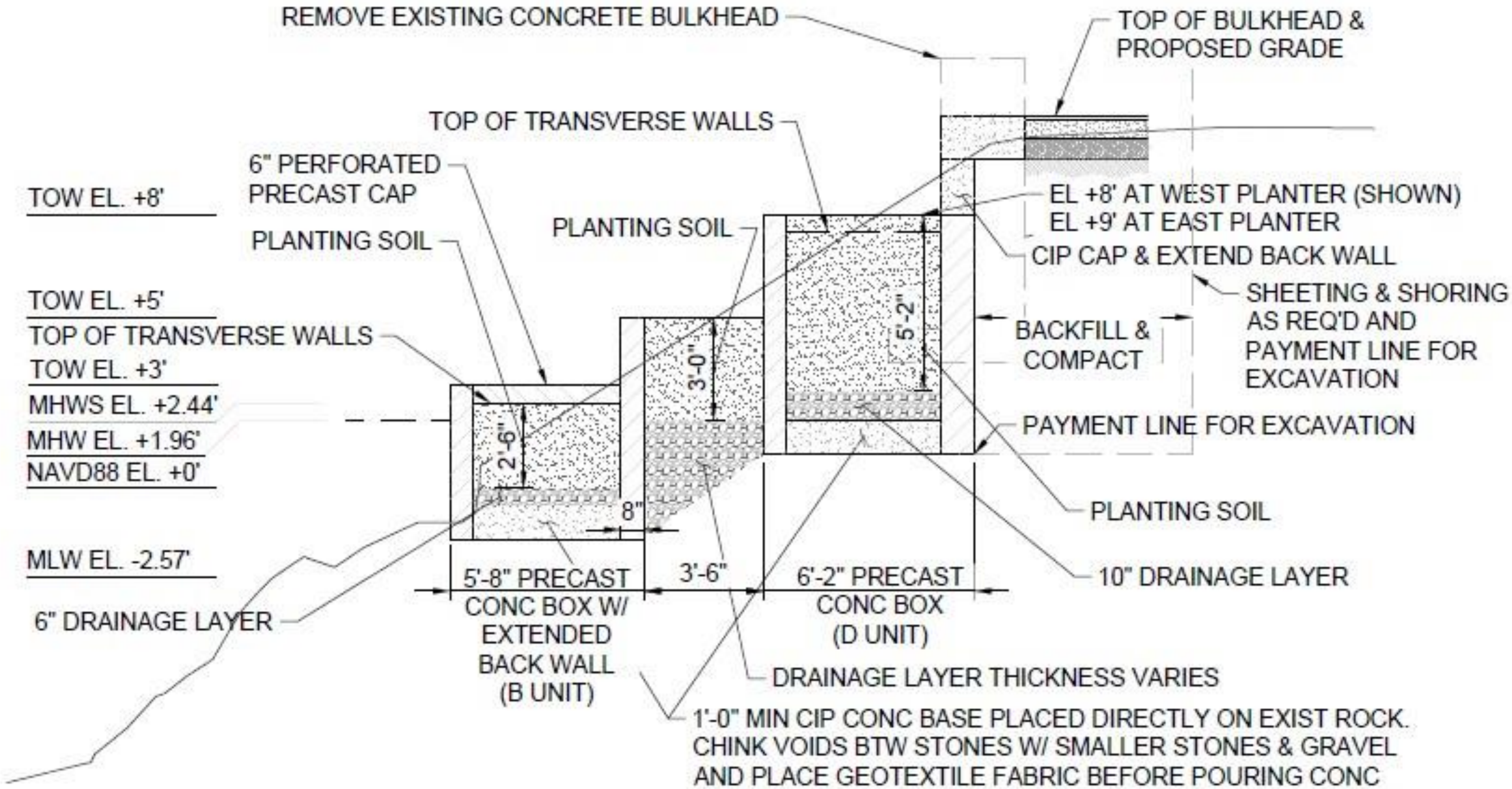


Figure 3.7-2: Shoreline with Planting Shelves at 3, 5 and 8 Feet



3.7.2 Affected Environment

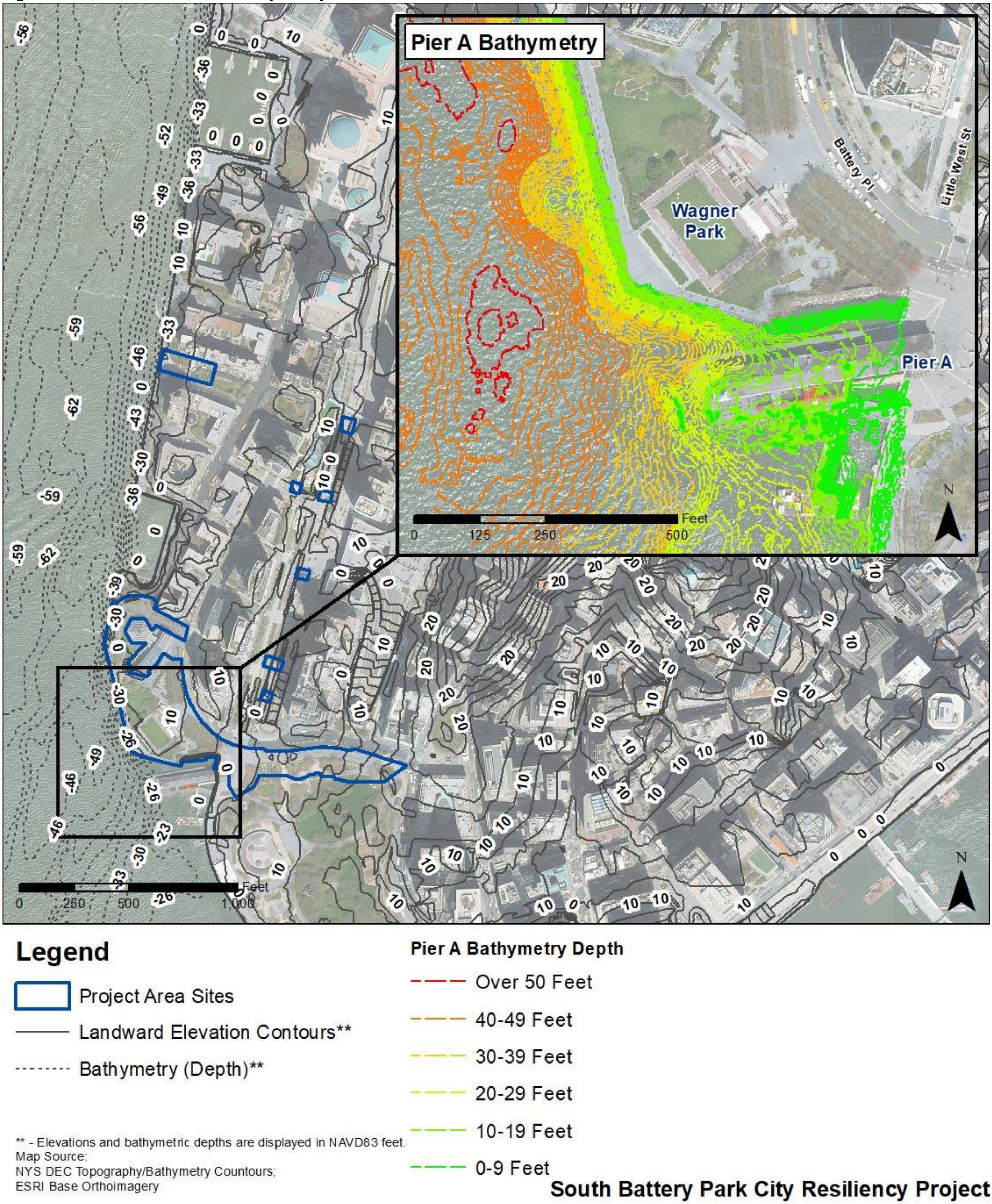
3.7.2.1 Terrestrial Ecosystems

The Project Area is a mixture of hardscape and manicured landscapes. Historically, much of the land area adjacent to the Hudson River Estuary at the southern tip of Manhattan has been subjected to filling activities due to land reclamation and/or stabilization efforts. The entire Project Area has been disturbed through previous earthmoving, grading and filling actions. Elevations in the area range from zero to 16 feet (see **Figure 3.7-3**). No freshwater wetlands, surface waters, or other sensitive habitats (e.g., designated critical habitat for endangered species) occur within the upland portion of the Project Area.

Within the Project Area, the planted trees are deciduous species generally 30 feet to 50 feet in height. The understory of the trees is actively landscaped consistent with an urban park containing perennial flower beds, lawns, and ornamental shrubs. These terrestrial natural resources provide some resource opportunities for species common to an urban environment (rock dove, house sparrow, european starling, ring-billed gull, mallard etc.).

A portion of the Project Area is situated within Wagner Park. A complete plant list of bulbs, ferns, grasses, perennials, shrubs, trees, and vines has been developed for Battery Park City Parks (BPCP, 2016).

Figure 3.7-3: Elevation and Bathymetry



A tree inventory survey was conducted by an International Society of Arboriculture (ISA) Certified Arborist – Municipal Specialist on May 1, 2020, to identify and categorize trees within the Project Area. A total of 242 trees consisting of 24 species were identified and surveyed within the Project Area as a part of this inventory. A list of tree species identified during the May 2020 survey is shown in **Table 3.7-2**.

Table 3.7-2: Tree Species Identified During May 2020 Tree Inventory Survey

Scientific Name	Common Name	Scientific Name	Common Name
Acer buergerianum	Trident maple	***Pyrus calleryana***	Callery Pear
Amelanchier sp.	Serviceberry	***Quercus bicolor***	Swamp white oak
Cercis canadensis	Eastern redbud	***Quercus laevis***	Turkey oak
Gleditsia triacanthos	Honey locust	***Quercus palustris***	Pin oak
Gymnocladus dioica	Kentucky coffee tree	***Quercus phellos***	Willow oak
Liquidambar styraciflua	Sweetgum	***Quercus sp.***	Oak sp.
Liriodendron tulipifera	Tulip tree	***Salix sp.***	Willow sp.
Magnolia sp.	Magnolia sp.	***Taxodium distichum***	Bald cypress
Malus sp.	Crabapple	***Ulmus sp.***	Elm sp.
Pinus strobus	Eastern white pine	***Zelkova serrata***	Japanese zelkova
Platanus x acerifolia	London planetree	***Prunus sp.***	Cherry sp.

3.7.2.2 Aquatic Ecosystems

The waters adjacent to the Project Area form the southern endmouth of the Hudson River, River Mile (RM) zero, close to its confluence with the East River and upper New York Bay. New York Bay is a 25-square mile waterbody at the mouth of the Hudson River where it joins the Atlantic Ocean near the Verrazzano-Narrows Bridge. Despite the urban character of New York City, the harbor is home to numerous fish species and habitats.

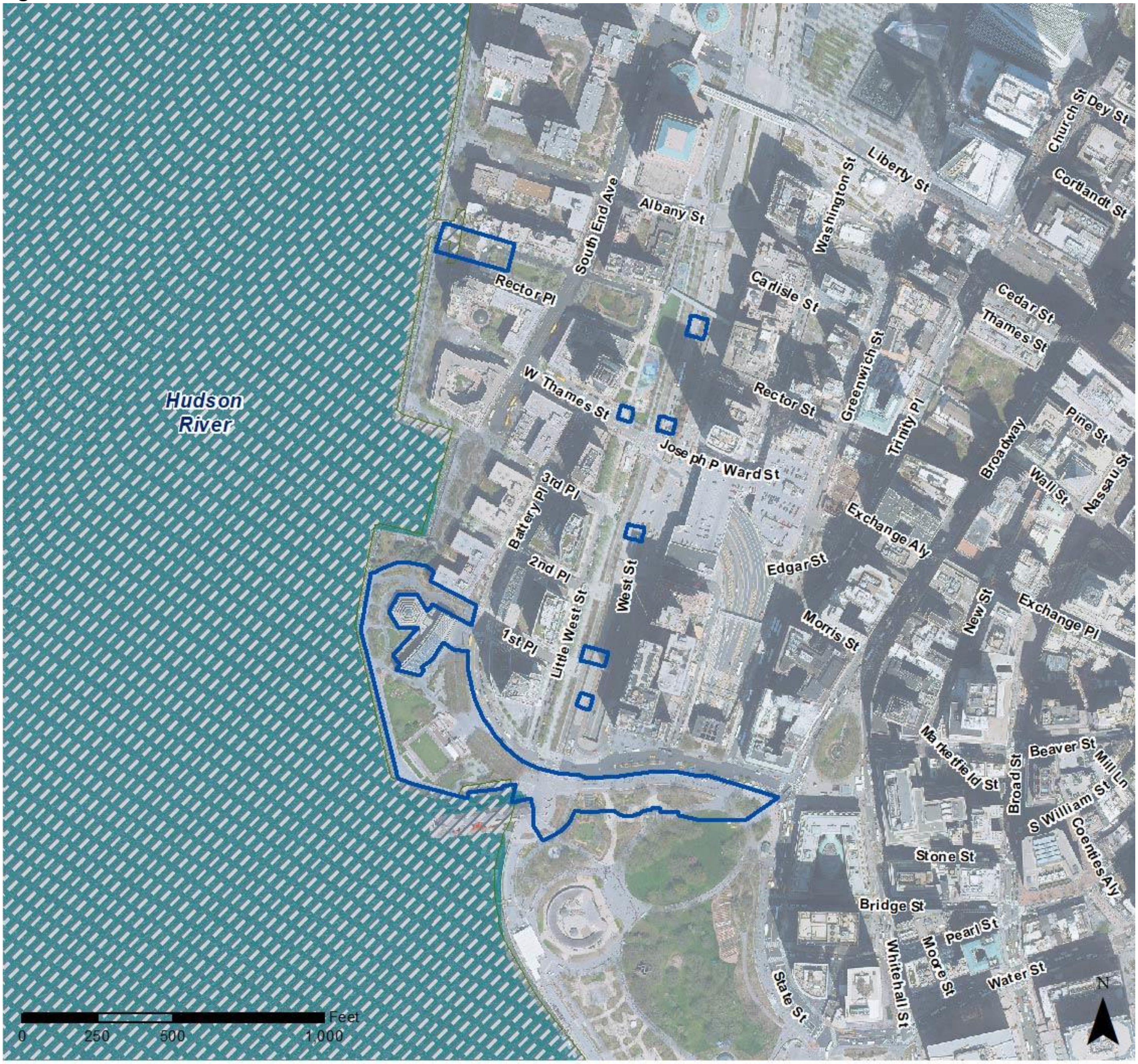
3.7.2.3 Habitat

Due to the previous filling activities associated with the growth of southern Manhattan, the waters near the Project Area are approximately 25 feet deep at the shoreline and drop in depths over 60 feet less than 400 feet from the shoreline (see **Figure 3.7-4**). Also along the southern edge of the Project Area is the Pier A inlet (see **Figure 3.7-5**). The inlet currently measures 52 feet wide by 174 feet long and varies in depth from zero to 14 feet. Along the inlet's northern shoreline, the western half of the shoreline consists of the Wagner Park relieving platform while the eastern half of the shoreline is stabilized with rip-rap. This rocky shoreline provides some habitat to estuarine communities that can develop between the rocks and attract species such as bay anchovy (*Anchoa mitchilli*) and blue crabs (*Callinectes sapidus*). The eastern edge of the inlet is bulkheaded and the southern boundary is formed by the Pier A structure that supports the Pier A, a waterfront restaurant.

Water depths in this stretch of the river range from 6 feet to 70 feet, and tides range from 4 feet to 5 feet. The entire area is characterized as a brackish environment with salinity ranging from 3.8 parts per thousand (ppt) to 18.7 ppt. Salinity depends on the location of the saltfront which varies with the seasons. Water velocity in the area ranges from approximately 0.2 to 0.7 feet/second, and average dissolved oxygen content varies with seasons ranging from 3.5 parts per million (ppm) in August to 13.0 ppm in February (NYSDOS, 2020). Sediment maps of the vicinity around the Project Area indicate that the bottom substrate is fine grained sediment (mud). Materials in deeper waters of the harbor are mapped as coarser grained sand (see **Figure 3.7-6**).

The waters adjacent to the Project Area are designated as Lower Hudson Reach Significant Coastal Fish and Wildlife Habitat (SCFWH) (see **Figure 3.7-7**). The Lower Hudson Reach SCFWH is identified as one of only a few large tidal river mouth systems in the northeastern United States, providing a unique range of salinity and other estuarine features. Numerous estuarine and marine species occur regularly in the harbor, along with various anadromous and catadromous fish species. This habitat sustains a diverse community of benthic, planktonic, and pelagic species. The river provides important wintering habitat for large numbers of striped bass (*Morone saxatilis*). Significant numbers of yearling winter flounder (*Pseudopleuronectes americanus*) also occupy this stretch of the River in winter months. Surveys have also found summer flounder (*Paralichthys dentalus*), white perch (*Morone americana*), Atlantic tomcod (*Microgadus tomcod*), Atlantic silversides (*Menidia menidia*), bay anchovy (*Anchoa mitchilli*), hogchokers (*Trinectes maculatus*) and American eel (*Anguilla rostrata*) in significant numbers. This area of the River is also utilized by bluefish (*Pomatomus saltatrix*) and weakfish (*Cynoscion regalis*) young of year and both Atlantic sturgeon *(Acipenser oxyrinchus oxyrinchus)* and shortnose (adult only) sturgeon (*Acipenser brevirostrum*). American shad (*Alosa sapidissima*) and blue crabs (*Callinectes sapidus*) also contribute to the fishery. Animals of lower trophic levels are also present in substantial numbers providing an important food source. These include planktonic forms such as copepods, rotifers, mysid shrimp; and, benthic forms such as nematodes, oligochaetes, polychaetes, and amphipods (NYSDOS, 2020).

Figure 3.7-4: Wetlands



Legend

Project Area Sites

NYSDEC Tidal Wetlands

Littoral Zone

NWI Wetlands

E1UBL - Estuarine and Marine Deepwater

* - No Check Zones located within map extents
Map Source:
USFWS NWI Surface Water and Wetlands;

South Battery Park City Resiliency Project

Figure 3.7-5: Photograph 1 – Looking west at the Pier A inlet. Note the unvegetated rip-rap shoreline of Wagner Park in the right side of the photograph

3.7.2.4 Wetlands and Submerged Aquatic Vegetation

Review of the USFWS National Wetlands Inventory (NWI) and New York State freshwater and tidal wetland maps indicated that no mapped vegetated wetlands are located within the Project Area above the high tide line. The NWI mapper indicates that the Hudson River Estuary adjacent to the Project Area is classified as an estuarine and marine deepwater environment (E1UBL: Estuarine, Subtidal Unconsolidated). The New York State Tidal Wetland Maps indicate the Pier A inlet is mapped as Littoral Zone (LZ).

Observations on site confirmed that there are no vegetated wetlands within and/or immediately adjacent to the Pier A inlet, nor are there any Submerged Aquatic Vegetation (SAV) beds present within the Pier A Inlet. Despite the lack of vegetation, disturbances within the Pier A inlet and immediate adjacent areas would trigger federal and state permitting.

Figure 3.7-6: Mapped Sediments

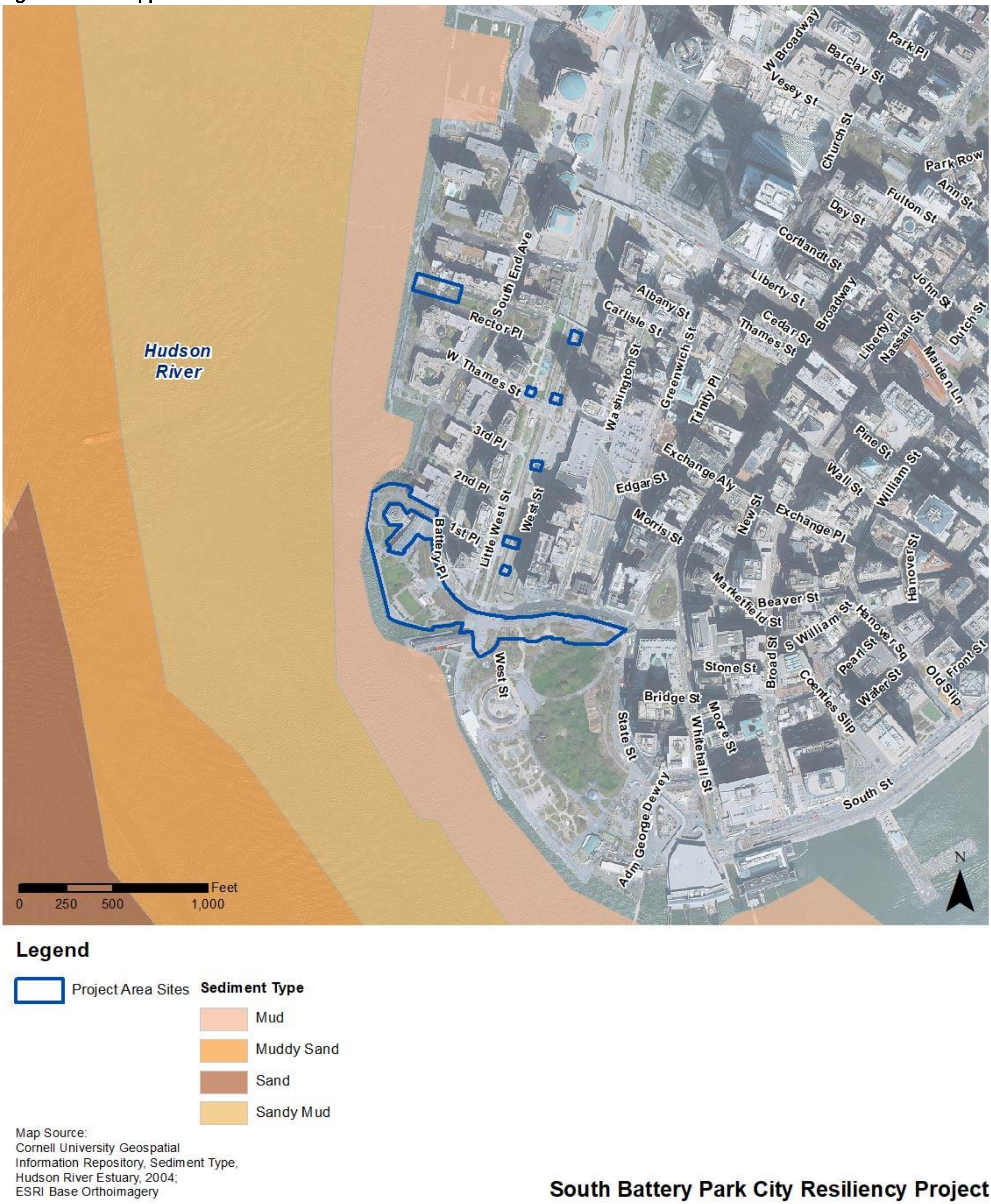


Figure 3.7-7: Significant Coastal Fish and Wildlife

Legend

Project Area

Habitat

Lower Hudson Reach Significant Coastal Fish and Wildlife Habitat

* - No SAV located within map extents
Map Source:
NYS DEC Submerged Aquatic Vegetation (SAV) 2016;
NYS DEC Significant Coastal Fish and Wildlife Boundars 2013;
ESRI Base Orthoimagery

South Battery Park City Resiliency Project

3.7.2.5 Water Quality

Waters of New York State are classified by letter according to their specified designated use. Additionally, under section 303(d) of the CWA, states are required to develop lists of impaired waters. The segment of the Lower Hudson River from the mouth at The Battery to Harlem River is listed on New York State's List of Section 303(d) Priority Waters as Class I Impaired. The best usages of Class I waters are secondary contact recreation and fishing. Fish consumption use in this portion of the Lower Hudson is impaired by elevated levels of priority organics (polychlorinated biphenyls (PCBs), dioxin), heavy metals (cadmium) and other toxics primarily the result of past industrial discharges. A ban on swimming imposed by the New York City Department of Health (NYCDOH) remains in effect for the Hudson up to Riverdale (at the Bronx/Westchester County line) (NYSDEC, 2020b). The 2018 New York Harbor Water Quality Report published by the NYCDEP reports water quality, as estimated by bacteria concentrations and dissolved oxygen has dramatically improved in the inner harbor in recent years. Nitrogen levels in the inner harbor are however the highest of the four regions (Upper East River, Inner Harbor, Lower NY Bay, and Jamaica Bay) (NYCDEP, 2018).

3.7.2.6 Essential Fish Habitat

The Fishery Conservation and Management Act of 1976, later changed to the Magnuson Fishery Conservation and Management Act in 1980, established a 200-nautical mile fishery conservation zone in United States waters and a regional network of Fishery Management Councils. The Fishery Management Councils are composed of federal and state officials, including the USFWS, which oversee fishing activities within the fishery management zone. In 1996, the Magnuson Fishery Conservation and Management Act was reauthorized and amended as the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). The MSFCMA mandated numerous changes to the existing legislation designed to prevent overfishing, rebuild depleted fish stocks, minimize by-catch, enhance research, improve monitoring, and protect fish habitat.

One of the most significant mandates in the MSFCMA is the EFH provision, which provides the means to conserve fish habitat. The EFH mandate requires that the regional Fishery Management Councils, through federal Fishery Management Plans, describe and identify EFH for each federally-managed species, minimize to the extent practicable adverse impacts on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitats.

Congress defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 United States Code 1802[10]).

The Mid-Atlantic Fisheries Management Council (MAFMC), which manages the lower Hudson River (including the Project Area) has designated EFH in the lower portion of the Hudson River. Review of NOAA's Essential Fish Habitat Mapper for the Project Area indicates that up to 11 federally managed species may utilize the Upper Bay of the New York Harbor at the mouth of the Hudson River for part or all of their life history, as summarized in **Table 3.7-3**.

Table 3.7-3: Summary of Essential Fish Habitat Designations

Species	Eggs	Larvae	Juveniles	Adults
Atlantic butterfish (*Peprilus triacanthus*)		X		
Atlantic sea herring (*Clupea harengus*)		X	X	X
Bluefish (*Pomatomus saltatrix*)			X	X
Clearnose skate (*Raja eglanteria*)			X	X
Little skate (*Leucoraja erinacea*)			X	X
Longfin inshore squid (*Doryteuthis pealeii*)	X			
Red hake (*Urophycis chuss*)	X	X	X	X
Summer flounder (*Paralicthys dentatus*)			X	X
Windowpane flounder (*Scopthalmus aquosus*)	X	X	X	X
Winter flounder (*Pseudopleuronectes americanus*)	X	X	X	X
Winter skate (*Leucoraja ocellate*)			X	X
Source: NOAA, 2020b.				

The following EFH life history descriptions were provided in NOAA's *Guide to Essential Fish Habitat Designations in the Northeastern United States* and the *Final Amendment 10 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan: Essential Fish Habitat and Environmental Assessment*. Additional citations are provided where applicable.

Atlantic Butterfish

Atlantic butterfish (*Peprilus triacanthus*) utilize New York Harbor from April to the late fall and as a nursery area in the summer. Eggs and larvae are present from June to August and juveniles are present in the fall. NMFS has designated EFH for the larvae stage of this species in the vicinity of the Project Area. It is likely that some amount of American butterfish larvae would be present in the work locations during construction.

Atlantic Sea Herring

NMFS has designated EFH for the larvae, juvenile and adult stages of this species in the vicinity of the Project. Based on data reviewed on NOAA's Estuarine Living Marine Resources (ELMR) Database (NCCOS, 2012), larval, juvenile, and adult life stages of Atlantic herring (*Clupea harengus*) have the potential to transit the Project Area. ELMR lists juvenile and adult life stage as common in the Hudson River/Raritan Bay.

Bluefish

NMFS has designated EFH for the juvenile and adult stages of this species in the vicinity of the Project Area. Bluefish (*Pomatomus saltatrix*) juveniles and adults may be present in the Project Area in the warmer months of the year.

Clearnose Skate

NMFS has designated EFH for the juvenile and adult stages of this species in the vicinity of the Project Area. Clearnose skate (*Raja eglanteria*) juveniles may occur in the Project Area in the cooler months of the year. Clearnose skates would transit through the Project Area and use the benthic habitat for foraging opportunities.

Little Skate

NMFS has designated EFH for the juvenile and adult stages of this species in the vicinity of the Project Area. Little skate (*Leucoraja erinacea*) juveniles and adults may occur in the Project Area as they sometimes prefer mud bottoms. The species may transit through the Project Area and use the habitat for foraging.

Longfin Inshore Squid

NMFS has designated EFH for the egg stage of this species in the vicinity of the Project Area. Longfin squid (*Doryteuthis pealeii*) eggs may occur in inshore waters near the Project Area in the summer.

Red Hake

NMFS has designated EFH for the egg, larvae, juvenile and adult stages of this species in the vicinity of the Project Area. Larval, juvenile, and adult red hake (*Urophycis chuss*) are listed as common in the mixing zone of the Hudson River/Raritan Bay Estuary (NCCOS, 2012). Juvenile red hake substitute anthropogenic debris for shell fragments.

Summer Flounder

NMFS has designated EFH for the juvenile and adult stages of this species in the vicinity of the Project Area. Juveniles and adults are listed as “rare” or “common” in salinities between 5 and 25 ppt and greater than 25 ppt March through December. Juvenile and adult summer flounder (*Paralichthys dentatus*) have the potential to occur within Project Area.

Windowpane Flounder

NMFS has designated EFH for the egg, larvae, juvenile and adult stages of this species in the vicinity of the Project Area. Based on data reviewed on NOAA’s ELMR (NCCOS, 2012); adult, spawning, juvenile, and egg life stages of windowpane (*Scopthalmus aquosus*) are identified as common in salinities greater than 25 ppt in the Hudson River/Raritan Bay Estuary. Egg and spawning life stages were identified as rare in salinities between 5 and 25 ppt; whereas the remaining life stages were considered common. In summer months, the juvenile and adult species would tend to gravitate to deeper waters within the channel where water quality conditions would be more constant and avoid the shallow areas. The under-pier habitat does not offer favorable conditons for windowpane flounder, although the species could odccur in the Project Area.

Winter Flounder

Winter flounder *(Pseudopleuronectes americanus)* are distributed in the northwest Atlantic from Labrador to Georgia. The species is found in brackish and saltwater habitats. Abundance is highest from the Gulf of St. Lawrence to Chesapeake Bay. Optimum substrate for adults and juveniles is silty-sand. The diet consists primarily of benthic invertebrates. Movement patterns are generally localized. Winter flounder undertake small-scale migrations into estuaries, embayments, and saltwater ponds in winter to spawn, subsequently moving to deeper water during summer. Winter flounder are a bottom dwelling species that spawns in the winter months in shallow waters less than 20 feet deep. Optimum water temperature for spawning is 34 to 41°F. Females usually produce between 0.5 to 1.5 million eggs. Eggs are adhesive and settle to the bottom. Generally, winter flounder release their eggs within areas that are less than 50°F, with salinities from 10 to 30 ppt, and in depths of less than 15 feet. Larval winter flounder are often found in shallow water between depths less than 18 feet (NEMFC NERO, 2013h). Juvenile and adult flounder can be found in waters up to approximately 160 and 325 feet in depth, respectively.

NMFS has designated EFH for the egg, larvae, juvenile and adult stages of this species in the vicinity of the Project Area. Based on data reviewed on NOAA's ELMR (NCCOS, 2012), all life stages of winter flounder have the potential to transit the Project Area. ELMR lists each life stage as abundant in the Hudson River/Raritan Bay Estuary. In studies performed in the East River (TRC, 2000; TGE, 2002; ENSR, 2007), winter flounder was most abundant December through May and larval and juvenile life stages were one of the top four species collected. The shallow waters of the Pier A inlet could be used by winter flounder as spawning habitat.

Winter Skate

NMFS has designated EFH for the juvenile and adult stages of this species in the vicinity of the Project Area. Winter skate (*Leucoraja ocellata*) juveniles may occur in the Project Area in the cooler months of the year. Winter skates would transit through the Project Area and use the benthic habitat for foraging opportunities.

3.7.2.7 Threatened and Endangered Species

SEQR requires assessment of the known occurrences of federal and state listed threatened and endangered species as well as rare natural communities within the vicinity of the Project Area. Those species and communities which may be present on or in the vicinity of the Project Area have been identified through review of the Environmental Resource Mapper (ERM), an online tool on the NYSDEC website. The ERM identifies peregrine falcon, Atlantic sturgeon, and shortnose sturgeon as potentially present at the Project Area.

An online data request has been made via the USFWS Information for Planning and Consultation (IPaC) website and the NOAA's NMFS Endangered Species mapper. Four sea turtles were identified, in addition to Atlantic and shortnose sturgeon, and critical habitat for Atlantic sturgeon (see **Appendix A**). No Federally-listed species were identified in the IPaC results.

Sea Turtles

Four sea turtle species occur seasonally during warmer months (May through late-November) in the offshore waters of New York Bight (i.e., the bend in the shoreline from the New Jersey coast to Long Island). These are the leatherback (*Dermochelys coriacea*) (endangered), loggerhead (*Caretta caretta*) (threatened), Kemp's ridley (*Lepidochelys kempii*) (endangered), and green (*Chelonia mydas*) (threatened). NMFS and the USFWS share jurisdiction for sea turtles, with NMFS having lead responsibility for the conservation and recovery of sea turtles in the marine environment and USFWS for turtles on nesting beaches.

Based on the lack of upriver sighting records and their open ocean habitat, it is unlikely that any sea turtles would occur in the Hudson River in the vicinity of the project; therefore, the Proposed Action would have no effect on the leatherback, loggerhead, Kemp's ridley, and green sea turtles, and those species are not discussed further.

Peregrine Falcon

The peregrine falcon (*Falco peregrinus*) is a crow-sized bird of prey with an extensive range within North America, including along the Lower Hudson River in New York State. Prey consists of a variety of other birds including songbirds, shorebirds, wading birds, and waterfowl, which are captured through stoop hunting. The falcon prefers open country for hunting and in the Northeast is found nesting in man-made structures (bridges and hacking towers or platforms) and in natural nest sites located on cliff ledges. Nesting season generally ranges from March to July (NYSDEC, 2020a) with variation in specific dates for individual pairs. Breeding activity begins in late winter (February and March) with nest location selection and courtship, followed by egg-laying (March and April). Once the full clutch of eggs is laid, it generally takes about 31 days to hatch. Young fledge in approximately 35 to 40 days and remain dependent on the adults for another 4 to 8 weeks relying on the adults for food and protection.

Currently the peregrine falcon is listed as an endangered species within New York state under the New York Code of Rules and Regulations (6NYCRR Part 182.5), and as such is protected from take or taking (6NYCRR Part 182.8), which is defined as the pursuing, shooting, hunting, killing, capturing, trapping, snaring and netting of any species listed as endangered or threatened in this Part, and all lesser acts such as disturbing, harrying or worrying. Take is regulated as incidental take if it involves a species listed as endangered or threatened in 6NYCRR Part 182.5 and otherwise prohibited by Section 11-0535 of the Environmental Conservation Law (ECL) that is incidental to, and not the intended purpose of, an otherwise lawful activity.

No active nests or suitable nesting stuctures currently occur in the Project Area.

Atlantic Sturgeon and Atlantic Sturgeon Critical Habitat

The Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) is a large sturgeon that spends most of its life in salt and brackish waters and returns to freshwater periodically to spawn (Atlantic States Marine Fisheries Commission 2017). Atlantic sturgeon range from Newfoundland to the Gulf of Mexico and are highly migratory. Atlantic sturgeon are long-lived and can live 60+ years (Sulak and Randall 2002). Atlantic sturgeons are bottom feeders and their diet includes invertebrates such as crustaceans, worms, and mollusks, and bottom-dwelling fish (NOAA Fisheries 2018b). In rivers and estuaries, Atlantic sturgeon typically use the deepest waters available; however, Atlantic sturgeon also seasonally occur over shallow (8 feet), tidally influenced flats and mud, sand, and mixed cobble substrates (Savoy and Pacileo 2003). Occurrence in these shallow waters is thought to be tied to the presence of suitable benthic resources for foraging and the time of year that they are actively foraging.

In 2017, critical habitat was designated for Atlantic Sturgeon DPSs (82 Federal Register 39160). Critical habitat designated in the Hudson River runs from the southern end of Manhattan to the Troy Lock and Dam in Rensselaer County (see **Figure 3.7-8**).

Figure 3.7-9 shows Atlantic sturgeon location by season and life stage. The adults of this species occupy the Hudson River during the spawning period from May through August, where they tend to be in the deeper parts of the river. Spawning generally occurs between May and July/August in the Hudson River (Bain 1997, Bain et al. 2000b).

Eggs are adhesive and usually deposited on hard-bottom substrate (e.g., cobble, coarse sand, and bedrock) (Greene et al., 2009). After hatching, larval fish of the Hudson River move downstream at night and seek refuge during the day. Larvae drift downstream and are generally found on the river bottom near where they spawn between RM 60 and 148 (Bain et al. 2000b). Larvae are believed to remain upstream of the salt wedge because of their low salinity tolerance (Peterson et al. 2000). As larval sturgeon make their way downstream, they grow and become more tolerant of brackish and saline waters. Larvae are expected to occur from June through August in the vicinity of the spawning area (Bain et al. 2000b), which tend to occur north of Peekskill.

Based on habitat preferences, Atlantic sturgeon are more likely to be found in deeper waters in the channel than along shoreline areas, especially during the colder months. Although unlikely because of the reasons discussed above (feeding temperature, winter behavior, seasonal locations and movement), it is possible that sturgeon may swim within the Pier A inlet for foraging or transiting. The fine-grained sediments and shallow waters of the Project Area would be unattractive spawning habitat and the Project Area is not near any documented spawning area.

Figure 3.7-8: Atlantic Sturgeon Critical Habitat

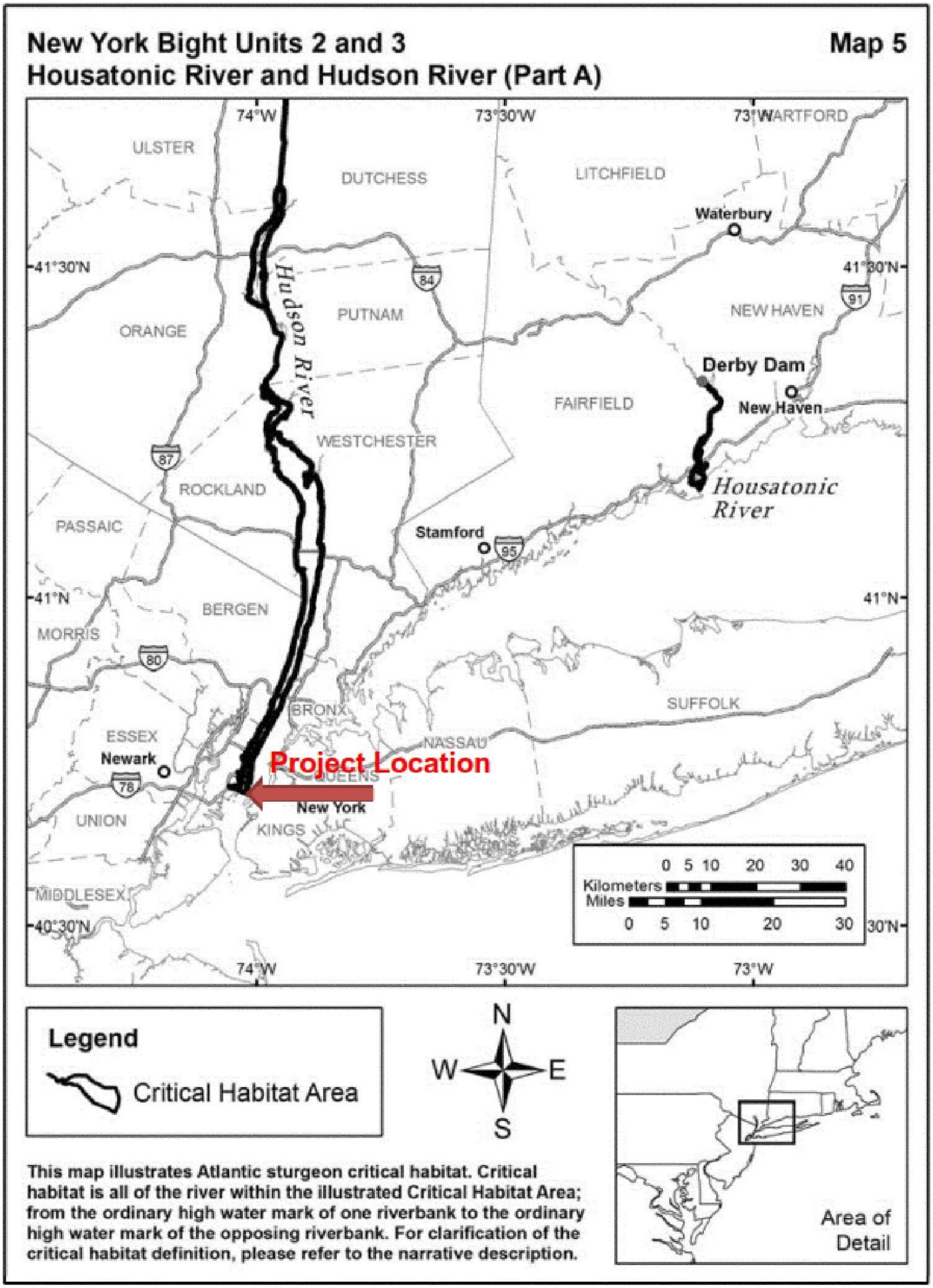
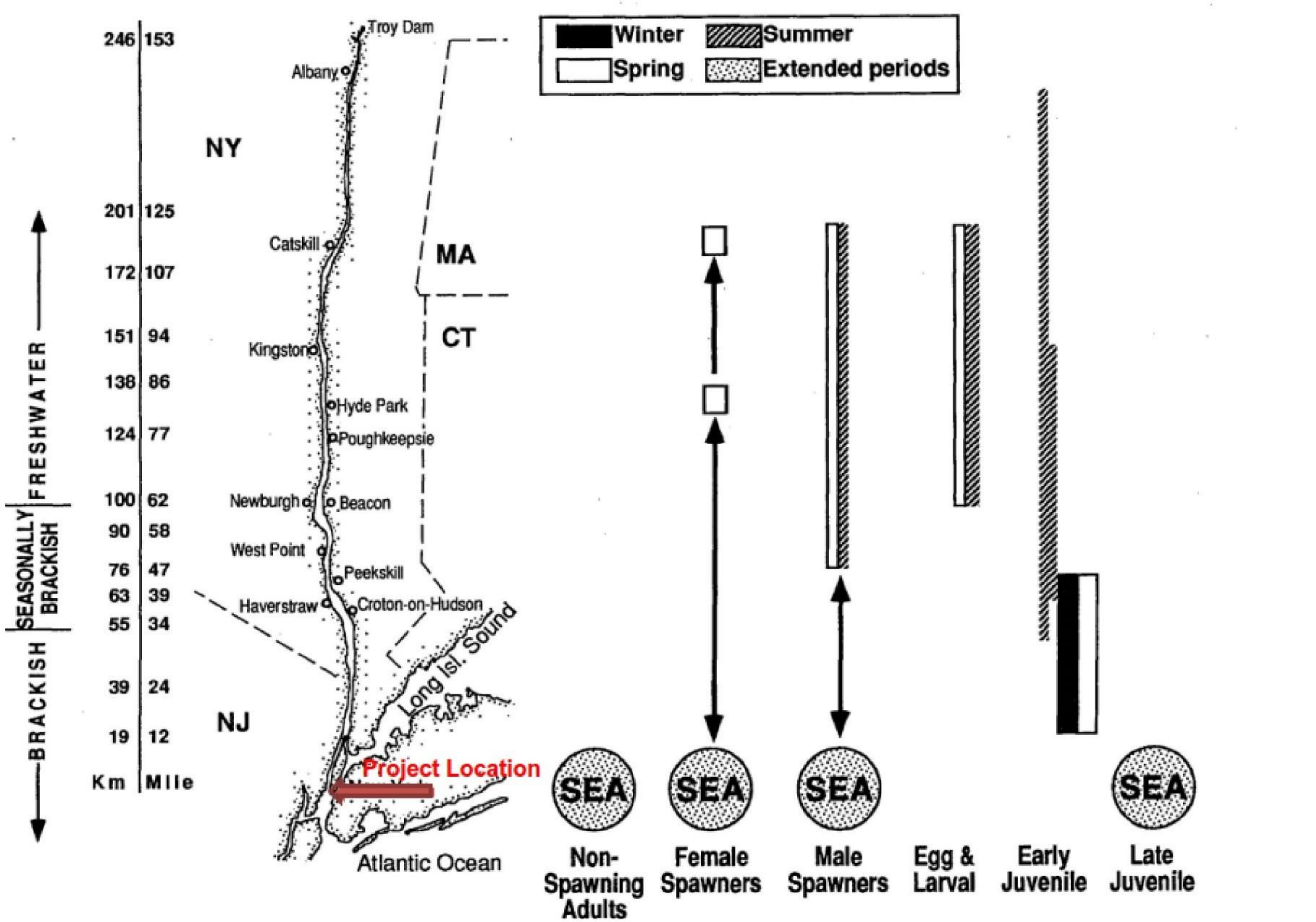


Figure 3.7-9: Atlantic Sturgeon Seasonal Distribution by Life Stage



Atlantic sturgeon seasonal distribution by life stages. Fall distributions are not shown because these seasons are transitional periods. Width of the distribution lines and symbols indicates relative density of individuals. (Extracted from Bain et al. 1998)

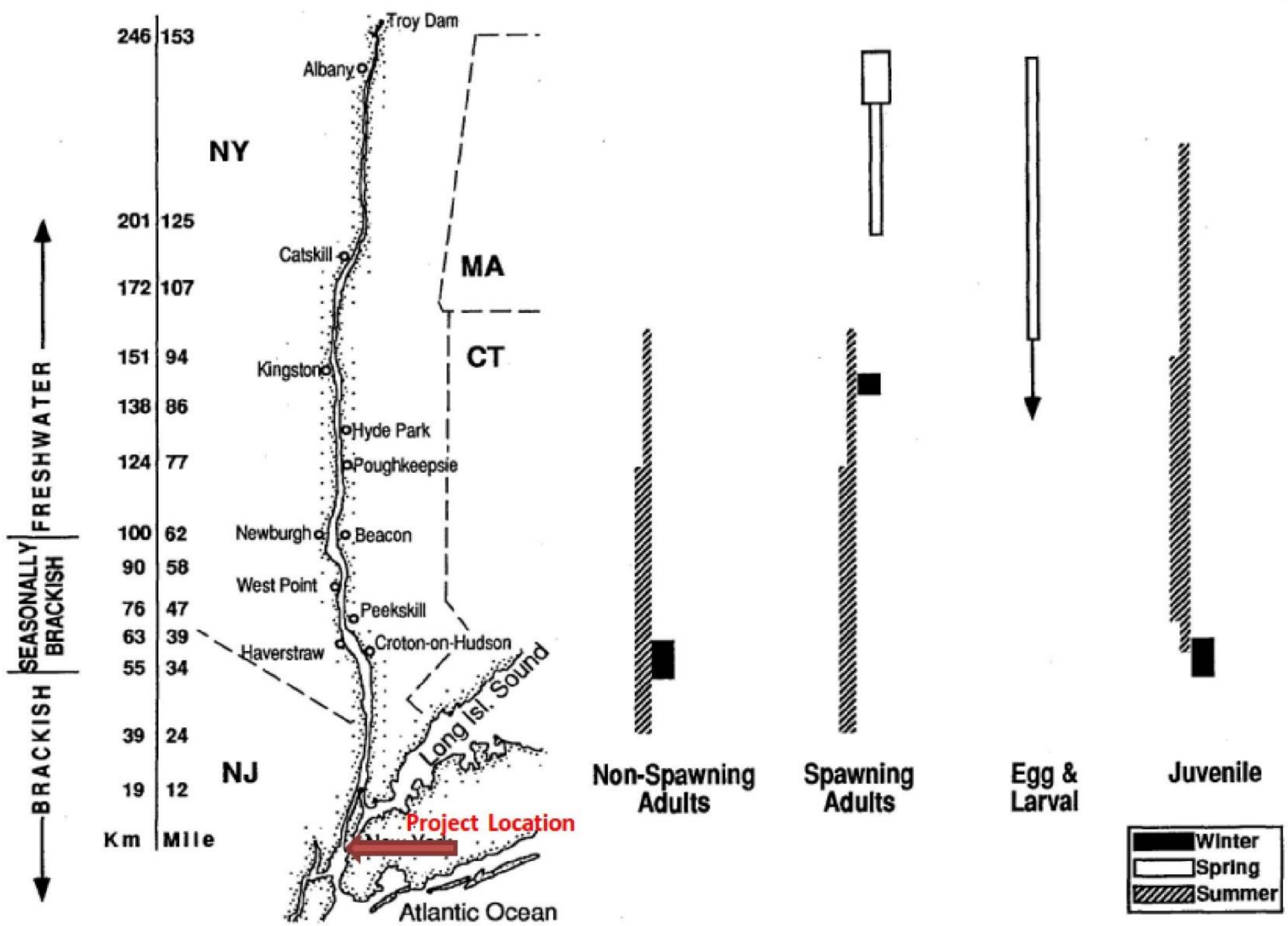
Shortnose Sturgeon

The shortnose sturgeon (*Acipenser brevirostrum*) was originally listed as an endangered species in 1967 (32 Federal Register 4001). There is no designated or proposed designated critical habitat for the shortnose sturgeon.

The shortnose sturgeon is an anadromous fish species which is found mainly in large freshwater rivers and coastal estuaries on the east coast of North America from New Brunswick to Florida. The shortnose sturgeon is known to occur in the Hudson River over a large portion of the fresh and brackish reaches in deep channel habitats from the Troy Dam at the most northern extent down through the Hudson River estuary (Bain 1997, Bain et al. 2000a). All life stages occur in the lower Hudson River, however their location varies by season.

The seasonal location of sturgeon has been well documented in the Hudson River. **Figure 3.7-10** shows shortnose sturgeon location by season and life stage. There are no wintering areas, spawning areas or other areas important to any life stage in the Pier A inlet.

Figure 3.7-10: Shortnose Sturgeon Seasonal Distribution by Life Stage



Shortnose sturgeon seasonal distribution by life stages. Fall and sometimes spring distributions are not shown because these seasons are transitional periods. (Extracted from Bain et al. 1998)

3.7.3 Environmental Impacts

3.7.3.1 No Action Condition

Terrestrial Ecosystem

The No Action Condition assumes that the Proposed Action would not be constructed, however, other planned projects within the Study Area would be constructed including The Battery Coastal Resilience Project (NYCEDC) and Battery Park Underpass and West Street Underpass Project (NYCDOT). The operation of these projects would have negligible impacts on the terrestrial ecosystem. Under the No Action Condition, the SBPCR Project would not be constructed and the Project Area's existing vegetation and limited terrestrial natural resources would remain subject to storm events and sea level rise.

Aquatic Ecosystem

Under the No Action Condition, the site's existing ratio of intertidal and upland area would change slightly with projected sea level rise. The net increase of the projected sea level rise could result in negligible beneficial impacts to the existing estuarine habitat including SCFWH, EFH, and benthic resources as additional habitat may be created; however, increased storm activity and turbidity may reduce any benefits due to increased sedimentation and displacement.

Threatened and Endangered Species

Under the No Action Condition, there would be no impacts to threatened and endangered species.

3.7.3.2 Proposed Action

Terrestrial Ecosystem

The Proposed Action would remove approximately 114 trees within the Project Area, including trees near the Museum of Jewish Heritage, on 1st Place, Wagner Park, Pier A Plaza, and The Battery. The areas with the greatest number of trees removed include the rows of trees in front of Wagner Park and adjacent to Battery Place and The Battery. In addition to the tree removal, existing trees within The Battery might be viable candidates for transplant to park areas outside of the Project Area if they are within the required caliper size. Discussions between BPCA, NYC Parks and The Battery Conservancy are ongoing regarding transplant material and ultimate transplant locations; however, all efforts would be made to dig and replant in the same season and as close to the site as possible to minimize storage and transportation costs and to maximize survivability of the plant material.

To compensate for the removal of approximately 77 trees in The Battery, which is owned and maintained by NYC Parks, and within the NYCDOT ROW, 86 new trees would be planted, and 3 trees would be transplanted. The tree restitution, which is for trees on NYC Parks and NYCDOT property, is valued at approximately $5.2 million.

While implementing the Proposed Action would result in the loss of 114 existing trees, this would not result in a significant adverse impact on vegetation.

Aquatic Ecosystem

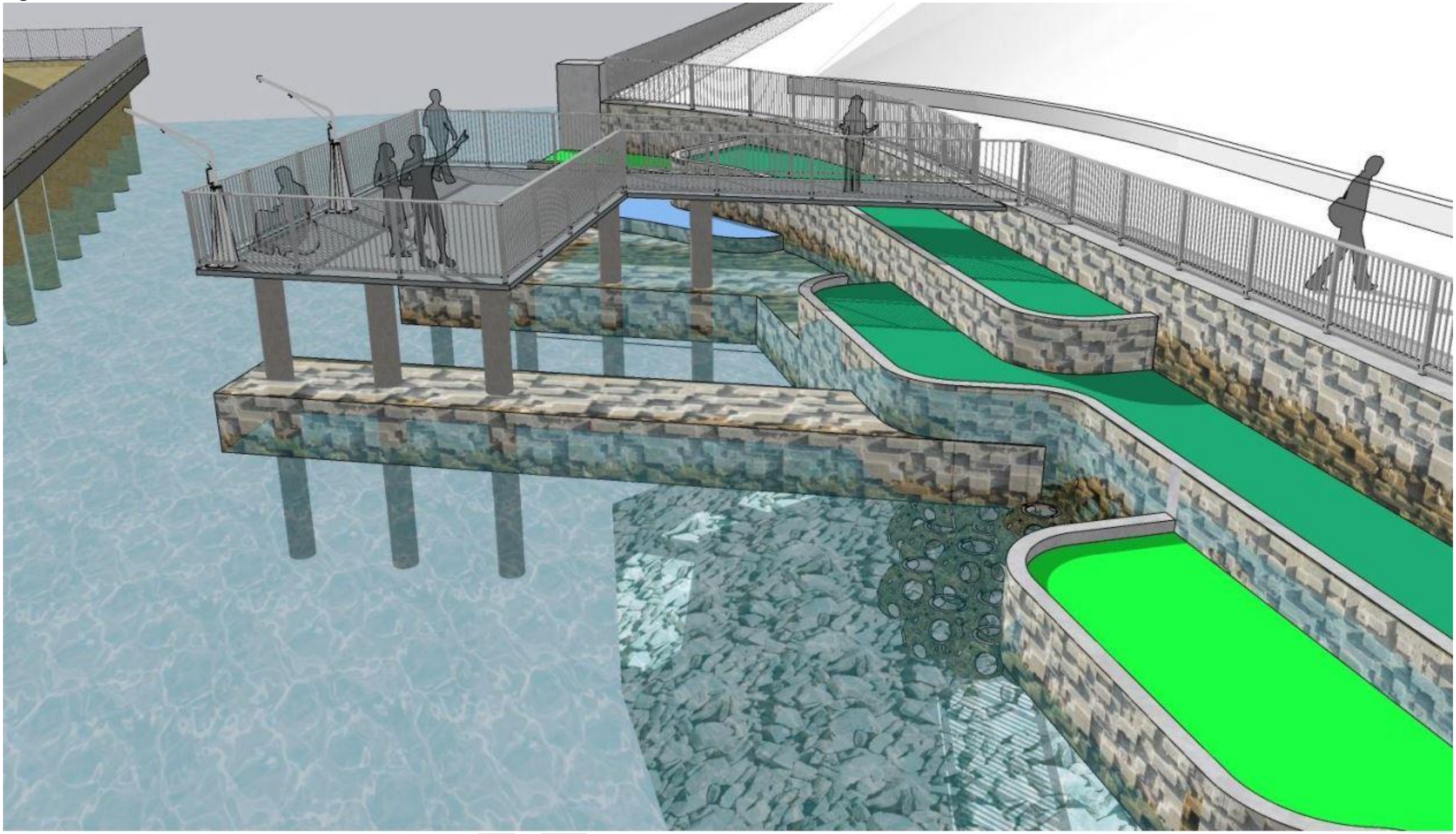
The Proposed Action within the Pier A inlet would result in positive benefits to the aquatic ecosystem. The removal of existing decking would provide opportunities for intertidal and supratidal vegetative plantings, as well as provide sunlight to a currently completely shaded aquatic environment. **Figure 3.7-11** identifies the location of the new metal grate decking adjacent to Pier A. The penetrating sunlight from the metal grating would not deter fish from swimming near and/or under relieving platform or new deck.

The existing piles supporting the decking would be left in place and coated with ECOncrete as well as other subtidal surfaces to further encourage colonization of aquatic organisms. Moreover, as part of the planned restoration, intertidal and supratidal vegetative plantings would be placed in the area of existing rip rap and tide pools would be constructed, further enhancing the habitat quality of the area. The vegetative plantings would consist of salt marsh grasses in the intertidal zone and salt tolerant vegetation above the high tide line to simulate shoreline habitats. Any temporary habitat disturbances and minor losses of benthic habitat would be offset by the positive operational habitat improvements in the Project Area. The Proposed Action would increase the value of the habitat through increased sunlight, as well as the placement of intertidal and supratidal plantings to a habitat currently devoid of plants.

Threatened and Endangered Species

The operation of the Proposed Action would have no significant adverse impact on threatened and endangered species.

Figure 3.7-11: Location of Metal Grate Structures



3.8 Water and Sewer Infrastructure

The *CEQR Technical Manual* requires that the environmental analyses include a discussion of how projects may affect the City's water and sewer infrastructure systems. In cases where the potential for adverse impacts is determined, detailed analyses are required to determine if the impact is significant and to determine mitigation strategies.

3.8.1 Introduction

This section assesses the potential for the proposed flood control system to result in impacts on the infrastructure, treatment and demand for sewer and water service in the Study Area. The section provides an overview of the sewer and water service areas where the project is located, as well as the potential for the SBPCR Project's effect on the physical components or the treatment/demands upon these sewer and water systems. Since the SBPCR Project is located within an area of the City that is served by a combined sewer system (CSS), the potential for effects on stormwater drainage are also discussed. The *CEQR Technical Manual* indicates significant effects on water and sewer infrastructure would be expected when an action results in physical changes to the infrastructure or in situations where an action will increase demands for these services or affects treatment capacities. The potential for effects on this infrastructure and its capacities have been evaluated using CEQR Technical Manual guidelines for infrastructure assessments. Further, the assessment evaluates the SBPCR Project's compliance with federal, state and local regulatory programs.

3.8.2 Affected Environment

The SBPCR Project is generally located along the southern end of Battery Park City and Battery Place between Pier A Plaza and State Street in Lower Manhattan. It is situated within low-lying coastal areas associated with the Hudson River. The Study Area for this assessment is the physical location of the proposed flood control system as well as the portion of the neighborhoods that would be protected by the SBPCR Project, as shown in **Figure 1.1-1**. This Study Area is served by public potable water transmission, distribution mains and public sewers that mainly consist of combined sewers, regulators, interceptors and CSOs, as shown in **Figure 3.8-1.** These components are part of the CSS that serves the portion of the study area outside BPCA jurisdiction. The CSS conveys only sanitary sewer flow during dry weather, but during wet weather, carries both stormwater and sewer flows to a wastewater treatment plant (WWTP). In the Study Area, during and directly following large wet weather events, stormwater flows at the maximum capacity of the system with excess combined sewage overflowing into the Hudson River. NYCDEP estimates and reports annual volumes of CSO under federal, state and local regulatory requirements and CSO abatement programs. The flows conveyed by the CSS up to its capacity, ultimately discharge to the East River and Newtown Creek, after they are pumped via the Manhattan Pumping Station (MPS) and treated at NYCDEP's Newtown Creek WWTP in Brooklyn, as shown in **Figure 3.8-2**. The WWTP has an existing SPDES permit that regulates the volumes and content of treated discharge and sets monitoring and treatment requirements for the discharge to Newtown Creek and the East River.

The Study Area within BPCA jurisdiction is served by a separated sewer system, with sanitary flows conveyed to the south interceptor connected to the MPS (see **Figure 3.8-1)**. Stormwater runoff discharges to the Hudson River through MS4 outfalls, other stormwater separated outfalls as well as some direct drainage along the areas closer to the shoreline.

Figure 3.8-1: Existing Drainage System Overview

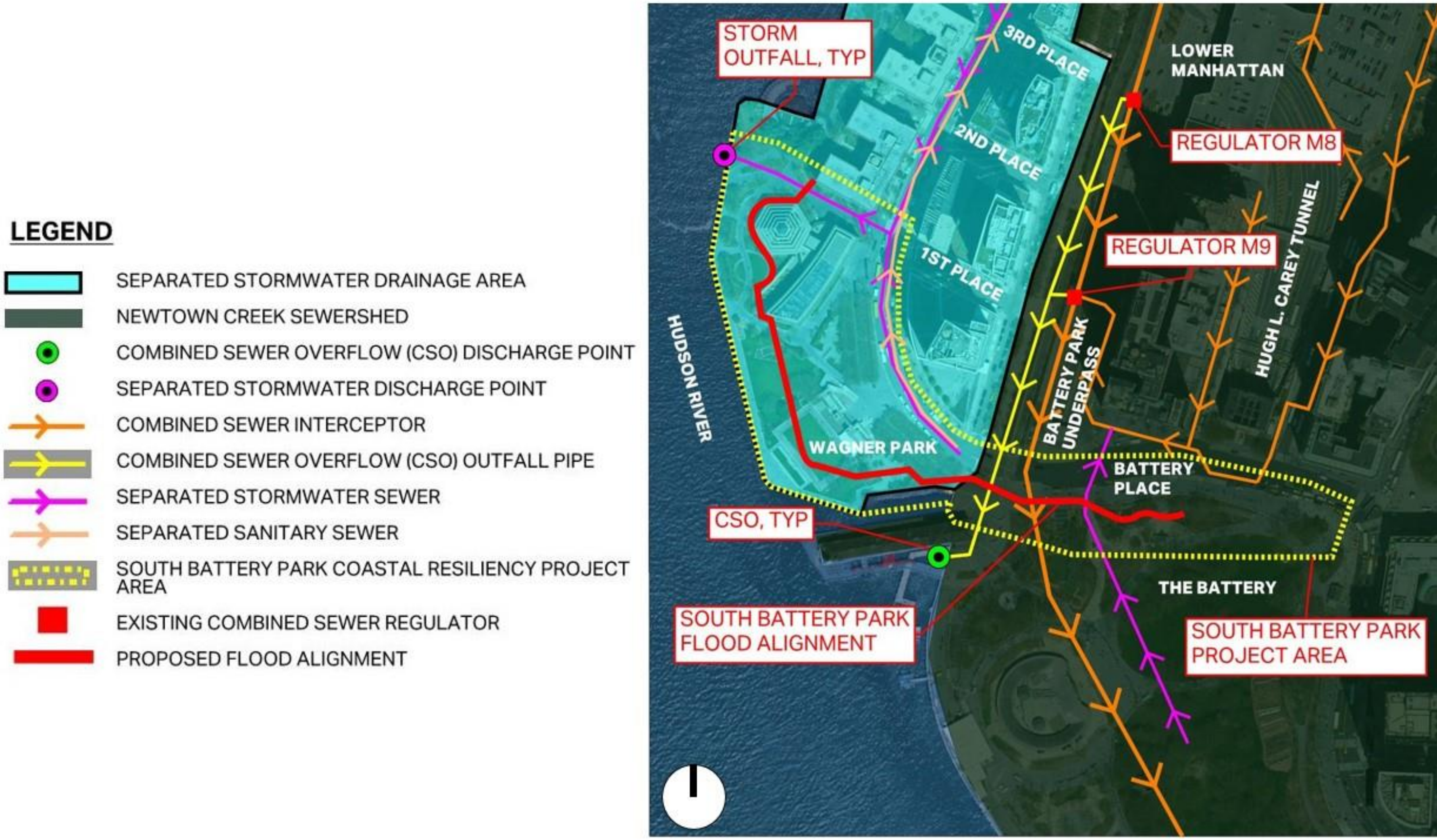


Figure 3.8-2: Existing Drainage to Manhattan Pump Station

3.8.3 Environmental Impacts

The *CEQR Technical Manual* indicates an action that results in physical changes to the infrastructure, increases demand for services, or affects capacities has the potential for significant effects on sewer and water resources. Further, the *CEQR Technical Manual* indicates, that in Manhattan, significant effects on these resources are typical of actions that:

- Create large demands for water (e.g., projected to use more than one million gallons per day such as power plants, very large cooling systems, or large developments);
- Occur in areas that experience low water pressure;
- Occur in unsewered or partially unsewered areas;
- Occur in areas of Manhattan that are served by CSSs, projects that create 1,000 or more residential units or 250,000 sf or more of commercial space;
- Create industrial developments;
- Result in increased impervious surfaces; or,
- Result in construction of new stormwater outfalls.

The *CEQR Technical Manual* also states that actions that comply with applicable regulations and permit programs, typically only require preliminary assessment. However, even where the above thresholds are not met, physical changes have the potential for significant overall effects to existing sewer and water infrastructure and further analysis is required.

3.8.3.1 No Action Condition

The No Action Condition assumes that the Proposed Action would not be constructed; however, other planned projects within the Study Area would be constructed including The Battery Coastal Resilience Project (NYCEDC) and Battery Park Underpass and West Street Underpass Project (NYCDOT). The operation of these projects would have negligible impacts on the CSS and the water infrastructure would remain unchanged.

It should be noted that the City has recently implemented water conservation measures that would result in future water demands for Manhattan to be reduced over the next 10 years. In recent years, NYCDEP has made significant improvements that ensure the Newtown Creek WWTP meets all requirements of the CWA, as well as improvements to the MPS to ensure pumping capacity for future sewer demands. In the No Action Condition, these elements of the sewer system and the existing interceptor and CSS would serve the future needs of the Study Area.

3.8.3.2 Proposed Action

The construction of the proposed flood control system would require modifications to the existing CSS and MS4 system in order to: 1) ensure that the existing infrastructure does not allow storm surge to migrate to the protected (dry-side) of the alignment; and 2) manage any water that enters the proposed flip-up deployable sections either from runoff or regular maintenance. As such, the following discussion is broken down to define proposed changes to water, sewer, and stormwater infrastructure as well as to discuss the findings of the modelling and analyses used to evaluate the SBPCR Project.

Water

As per the *CEQR Technical Manual*, no further analysis of water supply is needed if the project:

1) Does not result in an exceptionally large demand for water (more than one million gallons per day); or

2) If the project is not located in an area that experiences low water pressure.

As the SBPCR Project is estimated to use approximately 10,000 gallons per day of water and is not in an area that experiences low water pressure, no further analysis is required.

Portions of water lines would be relocated due to the proposed landscape site design, new Pavilion location, flood alignment and existing and proposed utility crossings. Consistent ground cover would be maintained over the water lines including areas where the surface grade is proposed to change. For example, in Pier A Plaza, the water lines feeding the building in Pier A would be adjusted to provide consistent cover based on the new plaza elevation and to avoid the flood alignment foundations as well as proposed utilities. These changes would not result in any significant adverse impacts on the water supply and distribution system.

Stormwater

Stormwater infrastructure running beneath the coastal barrier alignment from the “wet-side” of the alignment to the “dry-side” during a storm surge would create a failure condition by conveying stormwater to the dry-side of the alignment. In order to avoid such conditions during storm surge, tidegates would be installed at two existing separate MS4 outfalls – one at 1st Place and the second at Rector Place. A third tidegate would be installed on the CSO outfall at Pier A Plaza southeast of Pier A.

These modifications would not impact the stormwater drainage systems’ capacity under coastal and non-coastal surge conditions. Tidegates open whenever there is a positive head differential between the water level in the outfalls upstream of the tidegates and the Hudson River. The proposed tidegates would not introduce flow area restrictions and therefore would not impact the MS4 system’s discharge capacity under either scenario.

Two isolation valves are located in The Battery. One isolation valve would be installed at the 12-inch diameter storm drain that collects runoff from The Battery, approximately 50-feet east of the Battery Park Underpass structure underneath The Battery. A sanitary sewer isolation valve would be installed just north of The Battery comfort station. The valves would be installed underground, connected to existing mains, and require an excavation area of approximately four feet by four feet. The valves would remain in the open position during non-coastal storm events. Only in advance of a major coastal storm event, the valves would be closed to prevent coastal waters from surging through the stormwater drain and the sanitary lines connected to the comfort station. The Battery and the comfort station would be closed to the public during such major coastal storm events. Stormwater analysis confirmed that closing the valves would not exacerbate flooding in The Battery during major coastal storm events and under the scenario of a forecasted coastal storm that does not materialize (see **Appendix E** for analysis).

For these reasons, the Proposed Action would not result in significant adverse impacts to the stormwater system.

Sewer

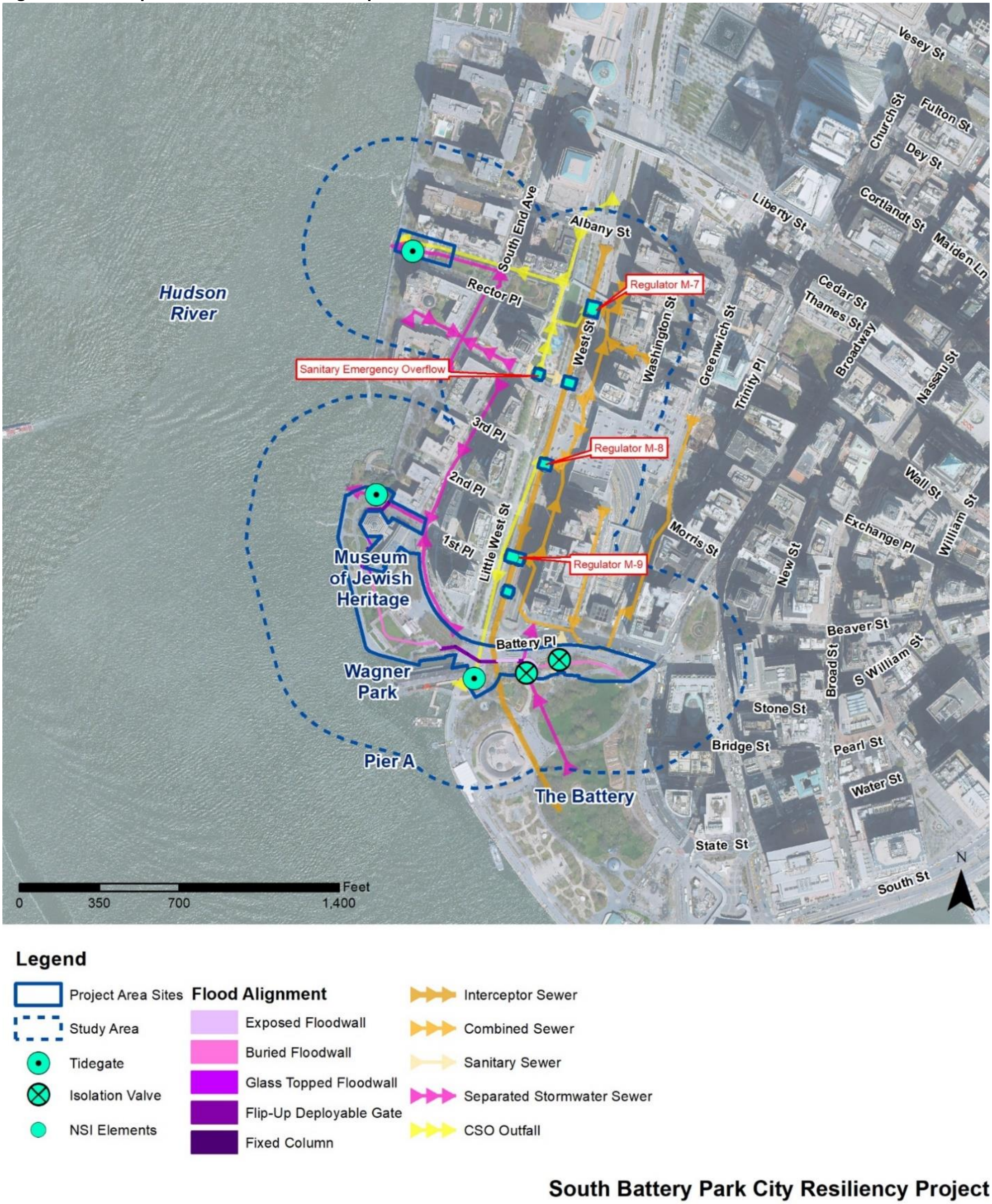
The sewer interceptor line branches would be isolated with a NSI system. The NSI system would consist of the installation of a gate within the existing regulator structures, M9, M8, and M7. During coastal surge events, these three regulator structures would be closed to prevent the storm surge rising through the interceptor line from reaching the street level. The regulator chambers' access points at street level would be retrofitted with pressure tight covers. A sanitary overflow chamber on West Thames Street would be subject to the pressure-proofing improvements. Additionally, four interceptor manholes along West Street between Battery Place and Albany Street would be pressure-proofed and retrofitted with a cover that can be sealed shut and locked during a flood event. In coordination with NYCDEP, model evaluations were conducted to confirm that there would be no significant adverse flooding impacts to adjacent unprotected areas served by the interceptor sewer as a result of the implementation of the NSI system within the Study Area. The model evaluations can be found in **Appendix E**.

Effects on Capacities and Treatment Systems

The Proposed Action is located in an area entirely connected to sewer and water infrastructure and would not create any type of new development that would be associated with additional permanent water or sanitary sewer demands beyond those that would result from the reconstruction of the Wagner Park Pavilion, which, because it would only be slightly larger, would be negligible.

The Proposed Action would not create new outfalls nor result in increased impervious surfaces that would increase stormwater runoff. As such, the Proposed Action would not result in significant adverse impacts to sewer and water infrastructure or the treatment and demand for these resources.

Figure 3.8-3: Proposed Water and Sewer Improvements



3.9 Transportation

3.9.1 Introduction

The *CEQR Technical Manual* recommends a two-tier screening process for the preparation of a "preliminary analysis" to determine if quantified analyses of transportation conditions are warranted. As discussed below, the preliminary analysis begins with a trip generation analysis (Level 1) to estimate the volume of person and vehicle trips attributable to the proposed project. If the proposed project is expected to result in fewer than fifty peak hour vehicle trips and fewer than 200 peak hour transit or pedestrian trips, further quantified analyses are not warranted.

When these thresholds are exceeded, detailed trip assignments (Level 2) are performed to estimate the incremental trips at specific transportation elements and to identify potential locations for further analyses. If the trip assignments show that the proposed project would result in fifty or more peak hour vehicle trips at an intersection, 200 or more peak hour subway trips at a station, fifty or more peak hour bus trips in one direction along a bus route, or 200 or more peak hour pedestrian trips traversing a pedestrian element, then further quantified analyses may be warranted to assess the potential for significant adverse impacts on traffic, transit, pedestrians, parking, and vehicular and pedestrian safety.

The following transportation assessment evaluates the potential operational impacts of the Proposed Action. Construction impacts are addressed in Section 3.15 (Construction). Construction of the SBPCR Project is expected to be completed in 2024; accordingly, the Build year is 2024.

3.9.2 Study Area

The transportation analysis study area covers the extent of the SBPCR Project with respect to the introduction of physical elements into the street and street closures related to operational deployment and the periodic testing of the flood protection system. As shown in **Figure 3.9-1**, the Project Area represents the transportation analysis study area.

3.9.3 Affected Environment

3.9.3.1 Transportation Access

The Project Area is located in the Battery Park City neighborhood in the southern tip of Lower Manhattan, in close proximity to Route 9A, also called West Street, a New York State owned facility; Battery Park; the Brooklyn-Battery Tunnel; and the FDR Drive. In general, the Project Area is geographically linked to surrounding neighborhoods and population and employment centers through a network of local roads in Lower Manhattan. The majority of roads in the Project Area are identified as local streets or avenues, which primarily function to provide access to abutting residential and commercial properties and serve as easements for various public utilities.

Interstate Roadways and Highways

Route 9A (West Street), a NYSDOT facility, is a major roadway in the Project Area extending between Battery Place on the south and 59th Street to the north. In the vicinity of the Project Area, there is a multi-use path west of, and parallel to Route 9A consisting of a pedestrian promenade and a separated bicycle facility together referred to as the Henry Hudson Greenway. A vehicular tunnel, the Battery Park Underpass, connects Route 9A to the FDR Drive, another NYSDOT-owned limited-access facility which runs along the southern tip and then along the east side of Manhattan. Route 9A also provides direct access to and from the Hugh L. Carey Tunnel, a major MTA-owned facility connecting Brooklyn and Lower Manhattan.

Local Roadways

There are several local roadways in the Project Area, some of which intersect with Route 9A. These roadways include West Thames Street to the north; Battery Place to the south; the entrance/exit ramps from the Hugh L. Carey Tunnel; and Morris Street, all of which are signalized. West of the Henry Hudson Greenway and running parallel to Route 9A is Little West Street which provides local access to, and circulation for the Battery Park City neighborhood. Local roadways including 1st Place, 2nd Place, and 3rd Place intersect with Little West Street; these intersections are all unsignalized.

Battery Place runs along an east-west alignment between Broadway and Little West Street on the south, and along a north-south alignment between Little West Street and West Thames Street. Except for 1st Place and 3rd Place, the intersections along Battery Place are all signalized. North of 1st Place, on-street parking is allowed on both sides of the roadway.

Little West Street is a one-way northbound roadway extending from Battery Place to 3rd Place with parallel parking on one side of the roadway: on the west side south of 1st Place and on the east side north of 1st Place.

1st Place is a one-way westbound roadway extending from Little West Street to Battery Place with parallel parking on both sides of the roadway.

2nd Place is a two-way east-west roadway extending from Little West Street to the Battery Park City Esplanade with parallel parking on both sides of the roadway.

3rd Place one-way westbound roadway extending from Little West Street to the Battery Park City Esplanade with parallel parking on both sides of the roadway.

West Thames Street is a two-way roadway extending from Route 9A to the Battery Park City Esplanade with limited on-street parking except for the block between South End Avenue and Battery Park City Esplanade where parking is allowed on both sides of the roadway. A Citi Bike bicycle rack is located in the median of West Thames Street between Battery Place and South End Avenue.

Truck Routes

There are a limited number of truck routes in the Project Area, as shown in **Figure 3.9-1**. Route 9A is a "*through*" truck route. Barclay Street, Trinity Place and Broadway are "*local*" truck routes. The ramps to and from the Hugh L. Carey Tunnel, and the tunnel itself, is classified as a "through truck route on Expressway". Trucks and commercial vehicles are prohibited on the FDR Drive.

Parking

In the Project Area, on-street parking is generally allowed along one or both sides of the local roadways in Battery Park City. On-street parking is not allowed on Route 9A in the Project Area. There are several off-street parking facilities in the area including the 70 Battery Place Garage, Battery Place Parking, and the Citi Parking Garage on the east side of Route 9A, just north of Battery Place.

Bicycle Network

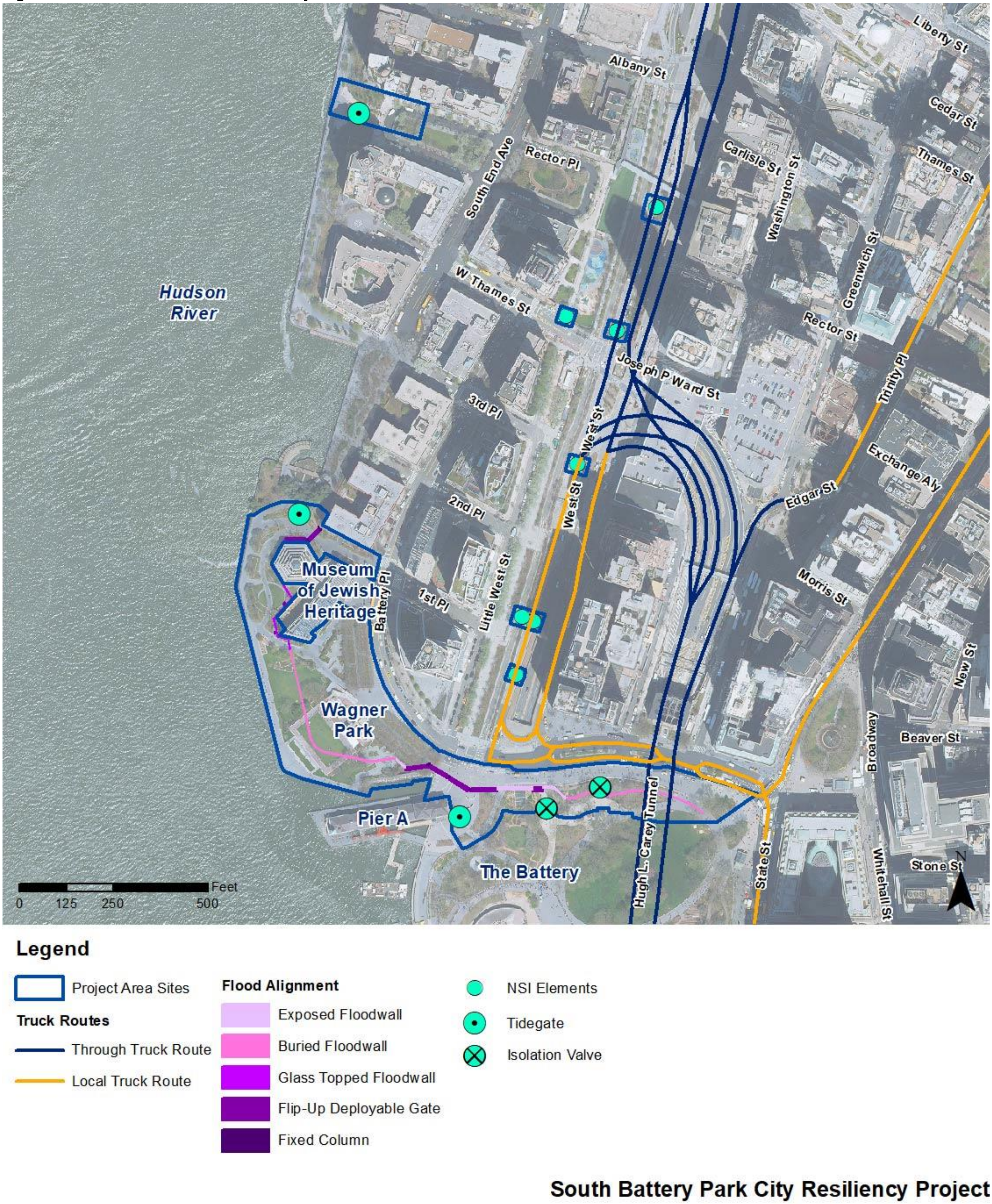
There are several bicycle facilities in the Project Area. The Hudson River Greenway which includes a protected bicycle facility, runs along the west side of Route 9A. A protected bicycle lane also runs along the Battery Park City Esplanade on the westerly edge of the Project Area, and along Battery Park on the south. There is a Citi Bike bicycle rack located in the median of West Thames Street between South End Avenue and Battery Place.

Public Transportation

In the Project Area, the nearest bus routes operate on South End Avenue (M20 and M9 bus routes), Battery Place (M20 bus route) and on Route 9A (M9 bus route). The M55 bus route operates on Broadway and Trinity Place.

The nearest subway stations to the Project Area are the Rector Street station (1, R and W subway lines); at Bowling Green station (4 and 5 subway lines); and the South Ferry station (1 subway line). These subway stations are all within an approximately 10-minute walk from Battery Park City. The Staten Island Ferry Terminal is located to the south and east of Battery Park City and is served by the M15, M20 and M55 bus routes, and the 1, R and W subway lines.

Figure 3.9-1: Truck Routes in the Project Area



3.9.3.2 Transportation Screening

According to the *CEQR Technical Manual*, interrelationships between the key technical areas of the transportation system – Traffic, Parking, Transit, and Pedestrians – should be taken into account in any assessment. Furthermore, the individual technical areas should be separately assessed to determine whether a project has the potential to adversely and significantly affect a specific area of the transportation system. The *CEQR Technical Manual* states that a preliminary trip generation assessment should be prepared to determine whether a quantified analysis of any technical areas of the transportation system is necessary. Except in unusual circumstances, a further quantified analysis would typically not be needed for a technical area if the proposed development would result in fewer than the following increments:

- 50 peak hour vehicle trips;
- 200 peak hour subway/rail or bus transit riders; or
- 200 peak hour pedestrian trips.

The *CEQR Technical Manual* also states that if the threshold for traffic is not surpassed, it is likely that further parking assessment is also not needed.

The SBPCR Project has the potential to affect transportation operations both in its permanent, post-construction state (During Operations) and as well as during the construction of the flood resiliency measures (During Construction). The following assessment is for the operational condition.

3.9.3.3 During Operations

Traffic and Parking

In its permanent, non-deployed state, the Proposed Action would not generate any vehicular traffic trips; therefore, the CEQR threshold of 50 vehicle trips per hour would not be met or exceeded. Further, all roadways temporarily affected by construction would be restored to their pre-construction configurations resulting in no permanent loss of capacity or impacts on traffic operations or parking capacity. Accordingly, the SBPCR Project would not have significant adverse impacts on traffic operations and parking.

During an emergency when the flip-up deployables are activated and deployed, there would be roadway closures; traffic, transit and pedestrian diversions; and emergency vehicle operations. However, this "*emergency state*" of operations does not represent typical traffic, parking and roadway conditions, and is not typically subject to CEQR-level analyses.

Transit

In its permanent, non-deployed state, the Proposed Action measures would not generate any transit (bus or subway) trips; therefore, the CEQR threshold of 200 subway trips per hour and 50 bus trips per route, per direction per hour would not be met or exceeded. Therefore, the Proposed Action would not have significant adverse impacts on transit services in the area.

Pedestrians

In its permanent, non-deployed state, the Proposed Action would not generate any pedestrian traffic trips; therefore, the CEQR threshold of 200 pedestrian trips per hour would not be met or exceeded.

Therefore, the Proposed Action would not have significant adverse impacts on transit services in the area.

Storm Conditions

The extent of effects on transportation systems during storm deployment conditions would be managed in coordination with a plan to be developed with input from City's Emergency Management Department (NYCEM), NYCDOT, NYPD, FDNY, NYC Parks, and other City and State agencies including the MTA for coordination with respect to transit management. Once a design storm impact on the City is determined to be increasingly likely, NYCEM would begin its emergency preparedness actions to ensure that transportation routes critical to evacuation are managed in coordinated manner. Should evacuations be required as a result of an impending design storm event, closure of roadways would require management of traffic circulation patterns in coordination with NYCDOT, NYPD, and FDNY. Traffic management to allow for circulation of emergency vehicles would be implemented and maintained by NYPD, FDNY, and NYCDOT.

Summary and Conclusions

In its permanent non-storm, non-deployed condition, the Proposed Action would not generate any traffic, transit or pedestrian trips. Accordingly, the CEQR thresholds for detailed analyses were not met and the Proposed Action would not result in any significant adverse transportation impacts.

3.10 Hazardous Materials

3.10.1 Introduction

A Phase I Environmental Site Assessment (ESA) and a Phase II Limited Site Investigation (SI) were undertaken to assist in the initial evaluation of potential environmental concerns associated with the Proposed Action. The scope of work was developed to provide an initial assessment of potential environmental concerns that may be encountered during the construction of the Proposed Action and as such to design the appropriate construction methods to manage potential environmental concerns.

3.10.2 Phase I ESA

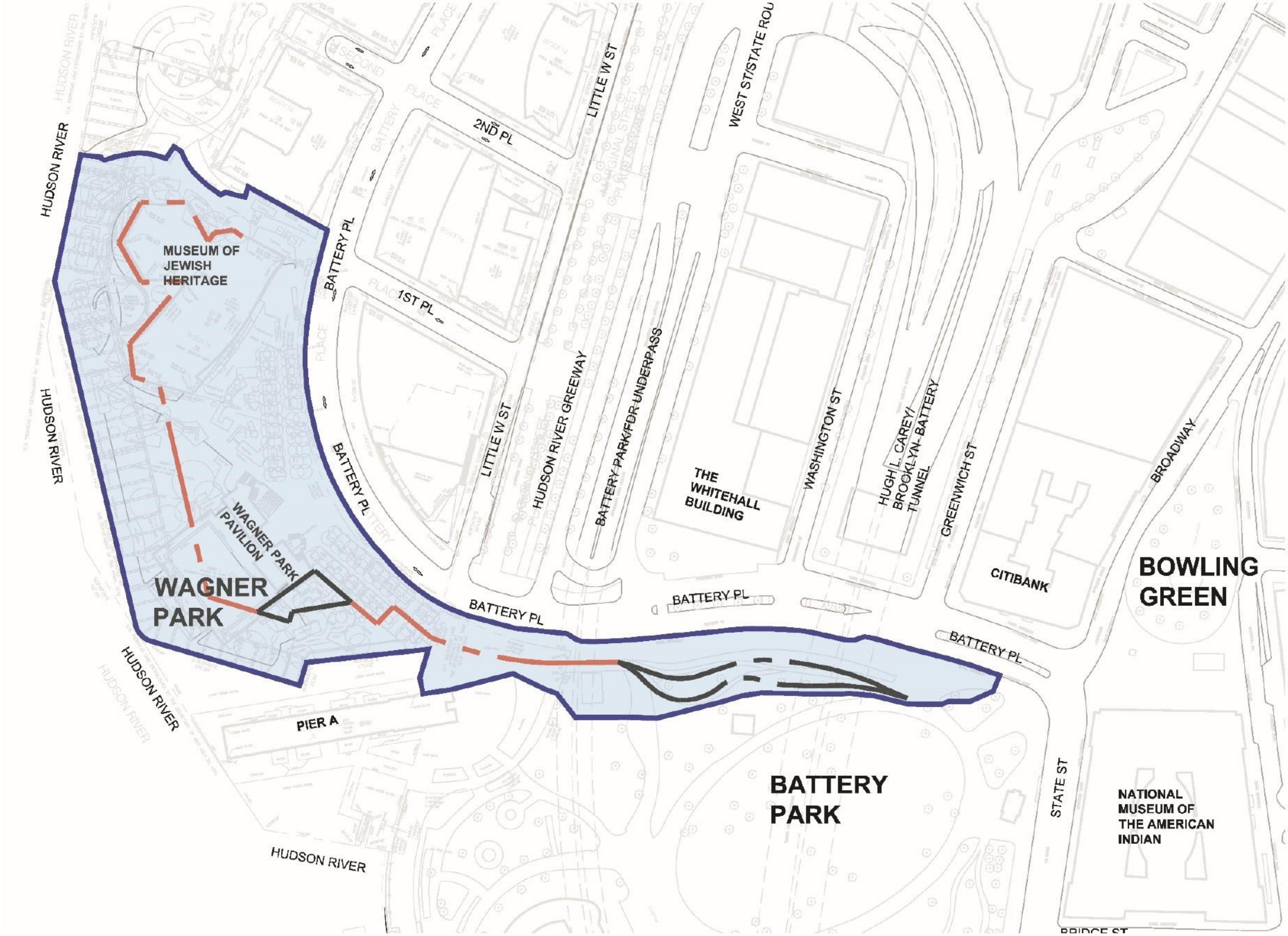
AECOM performed a Phase I ESA of the subject property in accordance with the scope and limitations of ASTM Standard Practice Designation E 1527-13 for ESAs. The subject property is an irregularly-shaped parcel located in a predominately residential and commercial neighborhood in the Battery Park section of Manhattan. The subject property is located to the south and west of Battery Place and approximately 200 feet southwest of the intersection of Battery Place and 2nd Place. According to the New York City Department of Finance (NYCDOF), the subject property is designated as Block 16, Lot 10 (18 1st Place), and portions of Block 16, Lot 3 (401 South End Avenue) and Block 3, Lot 1 (10 Battery Park). The approximate location of the subject property is illustrated on **Figure 3.10-1**. The Phase 1 ESA can be found in **Appendix D**.

In preparation of the Phase I ESA, a site visit was conducted on June 14, 2019, which consisted of a visual inspection of the green space, pedestrian walkways, bike paths, and three buildings within the subject property. Two of the buildings are associated with the Museum of Jewish Heritage and the third building is the Wagner Park Pavilion. No visual evidence of underground storage tanks (e.g., vent pipes, fill ports), potable water wells, monitoring wells, clarifiers, dry wells, septic tanks, or leach fields was observed during the site visit. Gasoline service stations and dry cleaners were not observed in the immediate vicinity (approximately 500 feet) of the subject property. Other off-site sources of concern were not identified in the immediate vicinity.

The subject property, under the address Battery Park Pier and Pier A North River at The Battery, was identified on New York Spills (NY Spill) and the New York Aboveground Storage Tank (NY AST) databases. The NY Spills database indicates that there was evidence of apparent dumping of raw sewage into the Hudson River. The spill was closed in 1987. The NY Spills database also identified a discharge of oil from a street cleaning machine in 1996. This spill, which was identified as being 75 feet long by 2 feet wide, was closed in 2003. A former 2,500-gallon diesel fuel tank had been located on or near Pier A in 1962. The AST was removed in 2009. These database listings are not considered a recognized environmental condition (REC) with respect to the subject property.

A number of surrounding sites were identified in the environmental database search report. However, the majority of these sites were listed on non-contamination-related databases. Based on AECOM's review and analysis of the database listings, none of the surrounding sites would present a REC to the subject property, based on their distance (generally greater than 500 feet), regulatory status (i.e. regulatory closure, no violations found), media impacted (soil only), and/or topographical position relative to the subject property (i.e. down-gradient or cross-gradient).

Figure 3.10-1: Phase I ESA Site Location Map



The following REC was identified during the Phase I ESA:

- Due to the use of fill material from unidentified off-site sources during the construction of the subject property, the possibility exists for subsurface contamination on and in the immediate vicinity of subject property to be present.

Based on the above-described activities, no controlled recognized environmental conditions (RECs)or historical RECs were identified in connection with the subject property. The following de minimis condition (DMC) was identified:

- Hydraulic fluid was observed to be leaking from an elevator motor located in the basement of the museum. The leak/stain was approximately two to three square feet and was observed to be on an intact concrete surface. Based on the limited extent, this leak/staining is considered a DMC.

3.10.3 Phase II Environmental Site Investigation (ESI)

Soil and ground water samples were collected in conjunction with the geotechnical investigation to properly characterize the subject property for potential environmental impacts from historic on-site/off-site uses, operations, etc. The sampling addressed the historic fill at the subject property as well as provided general horizontal/vertical characterization of soil and ground water across the subject property for the development of the flood alignment. The sampling procedures of this investigation were performed in accordance with the NYSDEC *Technical Guidance for Site Investigation and Remediation (DER-10)*. The Phase II Limited Site Investigation Report can be found in **Appendix D**.

Seven of the eleven soil borings advanced for the collection of geotechnical data were used for the collection of soil samples, with four of these seven borings used for the collection of ground water grab samples. AECOM attempted to collect three soil samples from each of the borings. However, due to the type of fill material encountered at some of the boring locations, it was only possible to collect one or two samples from the borings. Duplicate samples were also collected during the course of the investigation for quality assurance/quality control (QA/QC) purposes. One ground water grab sample was collected from the four soil borings, as well as one duplicate sample for QA/QC purposes. Each sample point location at the site was surveyed by a New York State licensed surveyor.

The soil and ground water samples were submitted to a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory for the following analyses:

Soil Samples

- VOCs by USEPA Methods 5035/8260;
- Semivolatile organic compounds (SVOCs) by USEPA Method 8270;
- Pesticides/Polychlorinated Biphenyls (PCBs) by USEPA Methods 8081/8082;
- Target Analyte List (TAL) Metals by USEPA Methods 6010/CVAA; and
- Total Cyanide

Groundwater Samples

- VOCs by USEPA Method 8260;
- SVOCs by USEPA Method 8270;
- Pesticides/PCBs by USEPA Method 8081/8082;
- TAL Metals by USEPA Methods 6010/CVAA (filtered and unfiltered samples); and
- Total Cyanide

3.10.3.1 Analytical Results

Soils

The analytical results of the 17 soil samples were compared to the NYSDEC Part 375-6.8(a) Unrestricted Used Soil Cleanup Objectives, and appropriate Part 375-6.8(b) Restricted Soil Cleanup Objectives (residential and commercial SCOs).

Volatile Organic Compounds

Soil sample B-7 collected at a depth of 5 to 7 feet below grade surface (bgs) detected total xylenes and 1,2,4-Trimethylbenzene above the unrestricted SCOs. No other VOCs were detected above the unrestricted SCOs from any of the remaining soil samples collected at the subject property.

Semi-Volatile Organic Compounds

Soil sample B-8 collected at a depth of 0 to 2 feet bgs and B-9 collected at a depth of 0.2 to 2 feet bgs detected polynuclear aromatic hydrocarbons (PAHs) consisting of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected above either the residential or commercial SCOs. 2-Methylphenol was also detected above the unrestricted SCO in soil sample B-8 collected at a depth of 0 to 2 feet bgs. No other SVOCs were detected above the unrestricted SCOs from any of the remaining soil samples collected at the subject property.

Pesticides

Pesticides consisting of 4,4'-dichlorodiphenyldichloroethylene (4,4'DDE) 4,4'-dichlorodiphenyltrichloroethane (4,4'-DDT) exceeded the unrestricted use SCOs in the soil samples collected from B-4 (0 to 2 feet bgs), B-4 (18-20 feet bgs), and B-9 (0.2 – 2 feet bgs). 4,4'-dichlorodiphenyldichloroethane (4,4'-DDD) exceeded the unrestricted use SCOs in the soil samples collected from B-4 (0 to 2 feet bgs) and B-9 (0.2 to 2 feet bgs). Dieldrin exceeded the unrestricted SCO in the sample collected from B-4 (0 to 2 feet bgs) and exceeded the residential SCO in the sample collected from B-9 (0.2 to 2 feet bgs).

Polychlorinated Biphenyls

No PCBs were detected above the unrestricted use SCOs.

Metals

Copper was detected above the unrestricted SCOs in samples B-7 (15 to 17 feet bgs) and B-9 (0.2 to 2 feet bgs). Lead was detected above the unrestricted SCO in sample B-7 (15 to 17 feet bgs), and above the residential SCO in sample B-4 (0 to 2 feet bgs) and sample B-9 (0.2 to 2 feet bgs). Mercury was detected above the residential SCO in samples B-4 (0 to 2 feet bgs) and B-9 (0.2 to 2 feet bgs) and above the commercial SCO in sample B-9 (0.2 to 2 feet bgs). Nickel was detected above the commercial SCO in sample B-9 (25 to 27 feet bgs). Zinc was detected above the unrestricted SCOs in sample B-9 (0.2 to 2 feet bgs). No other metals were detected above the unrestricted SCOs in any of the other samples.

Total Cyanide

Total Cyanide was either not detected above the laboratory minimum detection limit (MDL) or above the unrestricted SCOs in any of the soil samples collected from the subject property.

Groundwater

The analytical results were compared to NYSDEC's Part 703 Groundwater Quality Standards (GQS) (class GA) or Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (AWQS), AWQSGVs.

Volatile Organic Compounds

Chloroform was detected above the AWQSGV in the ground water grab sample collected from borings B-5 and B-9. No other VOCs were detected above the AWQSGVs in any of the other ground water grab samples.

Semi-Volatile Organic Compounds

PAHs consisting of benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno (1,2,3-cd)pyrene were detected above the AWQSGVs in the ground water grab sample collected from B-5). No other SVOCs were detected above the AWQSGVs from any of the remaining ground water grab samples collected at the subject property.

Pesticides

No pesticides were detected above the AWQSGV.

Polychlorinated Biphenyls

No PCBs were detected above the AWQSGV.

Total Metals

Total metals detected above the AWQSGV consisting of aluminum and iron were detected in the sample obtained from B-5. No other samples detected metals above the AWQSGV.

Dissolved Metals

Dissolved metals were only analyzed from the sample collected from B-9. No dissolved metals above the AWQSGV were detected in the sample.

Total Cyanide

Total Cyanide was not detected above the either the laboratory MDL or the AWQSGV in any of the ground water samples collected from the subject property.

Soil analytical results were compared to the NYSDEC Part 375 unrestricted, residential, and commercial, SCOs. The results indicated PAH compounds, dieldrin, lead, mercury, and nickel were detected above either the residential or commercial SCOs. The presence of these compounds, along with others that were detected but below the SCOs, indicate that the majority of the contamination detected is from the fill material that was placed along the shoreline of the Hudson River to create the subject property.

Ground water analytical results were compared to the NYSDEC AWQSGV. The results indicated chloroform, PAH compounds, aluminum, and iron were detected above the AWQSGV. The presence of these compounds, along with others that were detected but below the AWQSGV, similarly indicate that the majority of the contamination detected is from the fill material that was placed along the shoreline of the Hudson River to create the subject property.

3.10.4 Environmental Impacts

3.10.4.1 No Action Condition

Under the No Action Condition, there would be no comprehensive flood alignment within the Study Area in 2024, which is the year the SBPCR Project would be completed. Although the SBPCR Project would not be constructed under the No Action Condition, there are two other projects planned in the Study Area that would have the potential to disturb contaminated materials and increase human and environmental exposure: the Battery Park Underpass and West Street Underpass Project (NYCDOT) and The Battery Coastal Resilience Project (NYCEDC). While these projects have the potential to disturb contaminated materials and increase exposure, they would need to comply with all applicable regulatory requirements and health and safety protocols such that this potential is avoided.

3.10.4.2 Proposed Action

The potential for significant adverse impacts from contaminated materials can occur when: a) contaminated materials exist on a site; b) an action would increase pathways to their exposure; or c) an action would introduce new activities or processes involving contaminated materials. The Proposed Action would involve demolition and excavation activities and would have the potential to disturb hazardous materials in the subsurface and existing structures. However, with the implementation of appropriate protection measures, described further in Section 3.15 (Construction), any potential for significant adverse impacts related to hazardous materials would be avoided. The Proposed Action would also require import of a large volume of regulated clean fill that would include a final soil cover in accordance with a plan approved by NYCDEP as well as impervious cover (asphalt and/or concrete). This final soil/impervious cover would form a cap providing park users protection from pathways to exposure to any contaminants present below the project construction area. A demarcation fabric would be placed between existing soils and any clean imported material that would be used for landscaping. As such, the operation and maintenance of the Proposed Action would have no significant adverse impacts related to hazardous materials.

Construction impacts related to contaminated materials are addressed in Section 3.15 (Construction).

3.11 Energy

3.11.1 Introduction

This section examines the potential for energy impacts from the Proposed Action on existing utility infrastructure in the Study Area. According to the *CEQR Technical Manual*, the analysis of energy "focuses on a project's consumption of energy and, where relevant, potential effects on the transmission of energy that may result from the project. The assessment evaluates energy sources typically used in a project's operation (HVAC, lighting, etc.) and includes electricity, fossil fuels (oil, coal, gas, etc.), nuclear power, hydroelectric power, and occasionally, miscellaneous fuels like wood, solid waste, and other combustible materials." The purpose of the analysis is to determine if the Proposed Action would result in a significant impact on energy supply and to ensure the City's power supply and transmission systems have the capacity to meet future demand.

Measuring incremental energy demand begins with assessing the net increase of energy required to operate a project. Typically, operational energy includes "heating, cooling, lighting, pumps, fans, domestic hot water, plug loads, and elevators." Operational energy consumption is measured in British Thermal Units (BTUs), the quantity of heat required to raise the temperature of one pound of water one-degree Fahrenheit.

This analysis will evaluate the energy consumption required for operation of the flip-up deployables during emergency conditions or maintenance. With respect to the proposed Wagner Park Pavilion, it would be constructed using low carbon energy efficient materials and would utilize modern, energy efficient fixtures and appliances.

3.11.2 Affected Environment

The energy supply in the Study Area is regulated by the New York Public Service Commission, which regulates utilities in State of New York and New York City under the New York Energy Law. ConEdison supplies electricity throughout the Study Area, including Battery Park City. BPCA purchases power from the New York Power Authority (NYPA) for BPCA-operated spaces.

3.11.3 Environmental Impacts

3.11.3.1 No Action Condition

The No Action Condition assumes that the Proposed Action would not be constructed, however, other planned projects within the Study Area would be constructed including The Battery Coastal Resilience Project (NYCEDC) and Battery Park Underpass and West Street Underpass Project (NYCDOT). The operation of these projects would have negligible impacts on energy consumption and would therefore not result in significant adverse impacts. As a result, no changes to energy consumption would occur under the No Action Condition.

3.11.3.2 Proposed Action

The Proposed Action consists of several flood alignment elements: flip-up deployables, glass-topped floodwalls, buried floodwalls, exposed floodwalls, and bermed floodwalls. The flip-up deployables would be powered by the New York City electrical grid system during an emergency as well as for routine maintenance. A series of mobile emergency generators would be brought to the site for backup power in case of grid power failure at the time of deployment. The energy consumption required for post-construction gate deployment, whether off the grid or via emergency generators would be negligible.

The existing Wagner Park Pavilion would be replaced with a similarly sized new high performance building that utilizes best practice energy conservation measures for both the enclosure and building systems. This includes a horizontal geothermal system under the lawn that transfers heat into the building in the winter and pulls heat away from the building in the summer through a fluid loop system. The proposed Pavilion is pursuing ILFI Zero Carbon certification, which targets reductions in both operational and embodied carbon within the design, and offsets carbon emissions with both onsite renewable technologies and the purchase of renewable energy credits. The proposed Pavilion design would result in–a 38 percent EUI reduction over a similar baseline building. Solar powered site mast lighting is also proposed in the primary open public spaces in Wagner Park and Pier A Plaza to offset 100 percent summer lighting needs.

As a result of negligible energy consumption needed for the operation of the Proposed Action, particularly for the flip-up deployables and the net zero energy targets for the proposed Pavilion, the Proposed Action would have no significant adverse impacts to energy for the operation of the SBPCR Project.

3.12 Air Quality

3.12.1 Introduction

This section examines the potential for air quality impacts from the operation of the SBPCR Project. The air quality assessment determines if the Proposed Action impacts ambient air quality, which is the quality of the surrounding air. Construction related impacts on air quality are discussed in Section 3.15 (Construction).

Pollutant sources that could affect air quality include mobile and stationary sources and construction activities. Mobile sources are related to vehicular traffic or other moving sources, such as vehicles, airplanes, trains, or boats. Mobile sources are generally linked to projects that add vehicles to an area or “change traffic patterns by diverting vehicles.” Stationary sources are pollutants that are fixed in a location and can include “exhaust stack(s) used for the heating, hot water, ventilation, and air conditioning (HVAC) systems of a building” amongst other manufacturing or industrial processes.

It is standard practice to utilize National Ambient Air Quality Standards (NAAQS) to measure the effects of mobile and stationary pollutant sources in ambient air. In order to protect public health and welfare from the adverse impacts associated with pollutants in the ambient air, as required under the Clean Air Act (CAA) (42 USC § 7401 *et seq.*), the USEPA has established NAAQS for seven contaminants, referred to as criteria pollutants (40 Code of Federal Regulations (CFR) part 50). The criteria pollutants are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter with diameters up to 10 µm (PM_{10}), particulate matter with diameters up to 2.5 µm ($PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). The criteria pollutants of primary concern related to the SBPCR Project are vehicle and/or construction equipment-related CO, PM_{10} and $PM_{2.5}$, and O_3 precursors (nitrogen oxides (NO_x) and volatile organic compounds (VOCs)).

The CAA requires geographic areas to be designated according to their ability to attain the NAAQS, and these areas are categorized for each criteria pollutant as:

- *Attainment Area* – Areas where no exceedance of NAAQS for a specific criteria pollutant occurred.
- *Nonattainment Area* – Areas where exceedance of NAAQS for a specific criteria pollutant occurred.
- *Maintenance Area* – Areas that have previously been designated as a nonattainment area but are still in need of efforts to maintain the improved conditions in the future. Most of the CAA rules for nonattainment areas are still applicable to a maintenance area.

If an area is designated as nonattainment for a criteria pollutant under the NAAQS, state governments must develop a State Implementation Plan (SIP) and implement control plans to reduce the emission level of that pollutant.

3.12.2 Affected Environment

New York County, which encompasses the SBPCR Project, is an attainment area for SO_2, NO_2, and Pb. It is a nonattainment area for O_3, including its NO_x and VOCs precursors, and PM_{10}. It is also a maintenance area for CO and $PM_{2.5}$.

3.12.3 Environmental Impacts

3.12.3.1 No Action Condition

The No Action Condition assumes that the Proposed Action would not be constructed, however, other planned projects within the Study Area would be constructed including The Battery Coastal Resilience Project (NYCEDC) and the Battery Park Underpass and West Street Underpass Project (NYCDOT). The operation of these projects would have negligible impacts on air quality and would therefore not result in significant adverse impacts. As a result, no changes to air quality effects within the Study Area would occur under the No Action Condition.

3.12.3.2 Proposed Action

Mobile Sources

Implementation of the Proposed Action would not increase or cause a redistribution of traffic once the Proposed Action is constructed, nor add new uses near mobile sources. It would not create new mobile sources of pollutants or introduce new uses near existing or planned stationary sources. As a result, no further evaluation with regard to mobile sources is warranted.

Stationary Sources

The Proposed Action consists of several flood alignment elements: flip-up deployables, glass-topped floodwalls, buried floodwalls, exposed floodwalls, and bermed floodwalls. The flip-up deployables would be powered by the New York City electrical grid system during an emergency as well as for routine maintenance. A series of mobile emergency generators would be brought to the site for backup power in case of grid power failure at the time of deployment. These mobile emergency generators would be tested off site during routine maintenance resulting in no adverse air quality impacts.

The new Pavilion building is also considered a stationary source of emissions as it must be climate controlled through HVAC systems. As described in Section 3.11 (Energy), the proposed Pavilion design would result in a 38 percent EUI reduction over a similar baseline building and would include an energy efficient geothermal system.

Impacts from HVAC emissions are a function of fuel type, stack height, minimum distance from the source to the nearest building, and square footage of the development. The new Pavilion would be approximately 18,200 square feet and 47 feet in height. The total proposed building size is smaller than the minimum distance screening threshold for a new building to have potential impacts to the nearest residential buildings per the HVAC screening graphs provided as Figures 17-6 and 17-8 in the CEQR Technical Manual Air Quality Appendix.

Therefore, the Proposed Action would result in no significant adverse impacts to air quality.

3.13 Greenhouse Gas Emissions and Climate Change

3.13.1 Introduction

This section evaluates the GHG emissions that would be generated by the SBPCR Project and its consistency with the citywide and statewide GHG reduction goals under PlaNYC, New York City's long-term sustainability program, and the new state law, Climate Leadership and Community Protection Act (CLCPA), signed in July 2019.

GHG emissions are gas emissions that trap heat in the atmosphere. Under Section 202(a) of the CAA, the USEPA has recognized potential risks to public health or welfare and signed endangerment findings regarding GHG emissions. These findings reveal that the current and projected concentrations of six key, well-mixed GHG emissions in the atmosphere, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), threaten the public health and welfare of current and future generations. The dominant GHG gas emitted by manmade sources is CO_2, mostly from fossil fuel combustion.

According to CEQR, climate change is projected to have wide-ranging effects on the environment, including rising sea levels, increases in temperature, and changes in precipitation levels. Although this is occurring on a global scale, the environmental effects of climate change are also likely to be felt at the local level.

According to the *CEQR Technical Manual*, although the contribution of a proposed project's GHG emissions to global GHG emissions is likely to be considered insignificant when measured against the scale and magnitude of global climate, it should still be analyzed to determine a project's consistency with the City's citywide GHG reduction goal "*… of reducing citywide GHG emissions by 30 percent below 2005 levels by 2030.*" This is currently the most appropriate standard by which to analyze a project under CEQR. Currently, the GHG consistency assessment focuses on projects that would result in development of 350,000 square feet or greater and are being reviewed in the DEIS.

3.13.2 Affected Environment

Through PlaNYC, New York City's long-term sustainability program, the City advances sustainability initiatives and goals to both greatly reduce GHG emissions and increase the City's resilience to climate change. The goal to reduce citywide GHG emissions to 30 percent below 2005 levels by 2030 was codified by Local Law 22 of 2008. Subsequently, on November 13, 2014, the City Council passed a bill to reduce Citywide GHG emissions by 80 percent by 2050 and it was adopted on December 14, 2014.

GHG emissions in the Citywide Inventory consists of all direct and indirect GHG emissions from:

- Energy used by buildings and other stationary sources, and fugitive emissions from natural gas distribution within City limits.
- On-road transportation, railways, marine navigation, and aviation within City limits.
- Wastewater treatment within city limits and solid waste generated within the City but disposed outside of City limits.

Citywide GHG emissions in 2016 were 52.0 million metric tons of carbon dioxide equivalent (CO_2e). Since 2005, Citywide GHG emissions have decreased by approximately 15 percent despite significant increases in population and economic activity.

Under the CLCPA, the state would achieve 100 percent zero-emission electricity by 2040 and reduce emissions at least 85 percent below 1990 levels by 2050. Achieving these goals under this law will mean transforming how we generate and use electricity, how we heat our homes, and how we commute. With record temperatures and extreme storms, the CLCPA requires the state to undertake a sweeping set of measures to reduce our carbon footprint, make our communities more resilient, and adapt to a changing climate.

3.13.3 Environmental Impacts

3.13.3.1 No Action Condition

The No Action Condition assumes that the Proposed Action would not be constructed, however, other planned projects within the Study Area would be constructed including The Battery Coastal Resilience Project (NYCEDC) and the Battery Park Underpass and West Street Underpass Project (NYCDOT). The operation of these projects would have negligible impacts on GHG and would therefore not result in significant adverse impacts. As a result, no changes to GHG emissions within the Study Area would occur under the No Action Condition.

3.13.3.2 Proposed Action

The *CEQR Technical Manual* recommends a GHG analysis for projects where the project size is greater than 350,000 gross square feet, or projects that have unique energy demands (e.g., power plants, major modifications in transportation). The SBPCR Project has no unique energy demands and includes the new Pavilion, which is approximately 18,200 square feet, substantially below the 350,000 square foot threshold. Thus, no further analysis of GHG is required and no significant adverse impacts related to GHG or subsequent impacts to global climate change would occur during operation of the SBPCR Project. In fact, the net zero emission targets of the proposed Pavilion would result in an overall net reduction of GHG emissions compared to the current GHG emissions, in compliance with the City's sustainability goals and initiatives and the CLCPA.

In addition, the design of the proposed Pavilion targets ILFI Zero Carbon certification which requires the reduction of operational and embodied carbon (as per Section 3.11 (Energy)). In terms of overall sustainability, the SBPCR Project's design also calls for assessing all materials including existing site stone, wood, trench drains, trees, shrubs and plants for salvage. A select amount of materials have been targeted to be reused within the SBPCR Project site. The remaining materials would be recycled or reused offsite where possible.

3.14 Noise and Vibration

3.14.1 Introduction

This section examines the potential for noise and vibration from the operation of the Proposed Action to impact nearby sensitive receptors in the vicinity of the Study Area. In accordance with the *CEQR Technical Manual*, a noise and vibration assessment was conducted to assess the potential for impacts during operation of the flip-up deployables. The assessment of noise and vibration impacts during temporary construction activities are presented in Section 3.15 (Construction).

The noise assessment included a monitoring program to document baseline noise levels at the closest noise-sensitive receptors and a screening analysis to evaluate the potential for noise effects during operation of the flip-up deployables. While Section 3.15 (Construction) includes a detailed construction noise and vibration analysis for the SBPCR Project, this section will introduce the affected environment, and address the noise and vibration impacts of operationing the SBPCR Project.

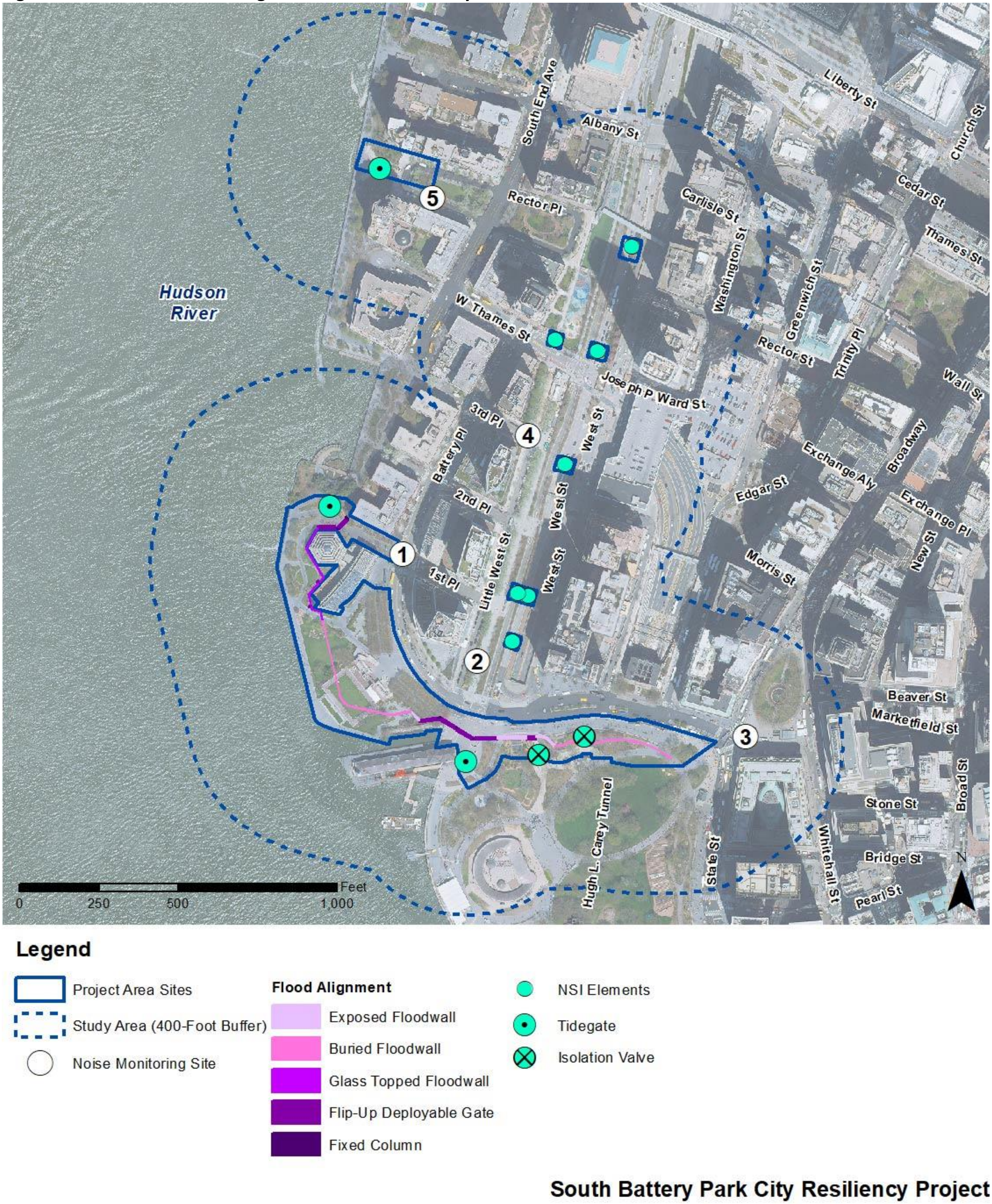
3.14.2 Affected Environment

To determine the existing background noise levels at sensitive receptors near the Study Area, a noise-monitoring program was conducted at five representative locations shown in **Figure 3.14-1**. Short-term noise measurements were conducted at various times of the morning, midday and afternoon periods to establish the range of baseline ambient conditions. Measurements were conducted during both peak (morning and afternoon) and off-peak (midday) periods to document a range of ambient levels. Typically, traffic noise decreases during peak periods due to slower speeds as a result of increased congestion. The short-term noise measurements documented existing noise sources in the vicinity of the Study Area, including arterial traffic along Battery Place, Battery Park Underpass and the Hugh L. Carey Tunnel access and egress roads. The dominant source of noise at each monitoring location is the surface traffic along local streets.

As shown in **Table 3.14-1**, peak-hour noise levels measured at receptors near the Study Area range from 57 dBA at residences at 50 Battery Place (Site 1) to 70 dBA at the National Archives at 1 Bowling Green (Site 3). All of these one-hour noise levels are representative of active downtown urban land uses adjacent to local streets.

The sound-level meter that was used to measure current noise conditions (Larson Davis Models LxT) meets or exceeds the American National Standards Institute (ANSI) standards for Type I accuracy and quality. The sound-level meter was calibrated using a Larson Davis Model Cal200 before and after each measurement period. All measurements were conducted according to *ANSI Standard S1.13-2005, Measurement of Sound Pressure Levels in Air* (March 5, 2010). All noise levels are reported in dBA, which best approximates the sensitivity of human hearing.

Figure 3.14-1: Noise Monitoring Sites in the SBPCR Study Area



Source: AECOM, January 2021.

Table 3.14-1: Existing Noise Levels Measured at Representative Receptors (in dBA)

Rec	Location	Leq
1	Residences, 50 Battery Place	57 – 60
2	Residences, 10 West Street	64 – 66
3	National Archives, 1 Bowling Green	68 – 70
4	Residences, 70 Little W. Street	63 – 70
5	Residences, 200 Rector Place	57 – 62

3.14.3 Environmental Impacts

The noise and vibration effects associated with the operation of the SBPCR Project are negligible as discussed below.

3.14.3.1 No Action Condition

The Study Area is characterized by a mix of both urban residential and mixed-use retail-commercial land-uses whose noise and vibration exposure is currently dominated by arterial traffic along along Battery Place, Battery Park Underpass and the Hugh L. Carey Tunnel access and egress roads. The No Action Condition assumes that the Proposed Action would not be constructed, however, other planned projects within the Study Area would be constructed including The Battery Coastal Resilience Project (NYCEDC) and the Battery Park Underpass and West Street Underpass Project (NYCDOT).

Future noise and vibration levels for the No Action Condition would be similar to existing conditions. The No Action Condition would have negligible impacts on noise and vibration and would therefore not result in significant adverse impacts.

3.14.3.2 Proposed Action

The Proposed Action consists of multiple flood alignment elements, including flip-up deployables. Once completed, no noise and vibration effects due to the operation of the flood alignment flip-up deployables would occur. Except during an emergency condition, the flip-up deployables would not operate. Additionally, maintenance testing would occur once yearly to verify that the flip-up deployables and the underground hydraulic motors and pumps function properly. Therefore, there would be no operational impacts related to noise and vibration as a result of the SBPCR Project.

3.15 Construction

3.15.1 Introduction

This section establishes the framework used to assess potential impacts from construction of the Proposed Action. The preliminary assessment criteria described in the *CEQR Technical Manual* were evaluated to determine whether further assessment of the impacts of construction upon individual resources and technical areas are required and, where required, the preliminary assessment is presented.

The *CEQR Technical Manual* indicates a preliminary assessment is required when construction activities are anticipated to occur for 24 months or longer, or when construction activities would directly impact a technical resource(s). In order to determine if significant adverse impacts may occur, the assessment must include consideration of the duration of construction activities, construction related pedestrian and vehicular activities, the distance between emissions sources and sensitive receptors, construction intensity, and the thresholds that trigger further analysis for each resource that could be impacted by construction activities.

The SBPCR Project is anticipated to have a 24-month construction schedule, so preliminary assessments were carried out for potential adverse impacts from construction on the following technical resources: transportation, air quality, noise and vibration, historic and cultural resources, hazardous materials, natural resources, open space, socioeconomic conditions, community facilities, land use and public policy, neighborhood character, and water and sewer infrastructure. Detailed assessments were only required for transportation, air quality and noise and vibration. The detailed assessment methodology and conclusions are summarized in the following sections.

3.15.2 Description of Alternatives

3.15.2.1 No Action Condition

In the No Action Condition, the SBPCR Project would not be constructed, therefore, no construction related impacts to any resource or technical area would occur. Under the No Action Condition, the other projects identified on the No Action Condition project list (see **Table 2.2-1** in Section 2.2.1 (No Action Condition)) would be implemented.

3.15.2.2 Proposed Action

Construction of the SBPCR Project would consist of the following four construction packages: the Wagner Park Pavilion, Wagner Park and the Museum of Jewish Heritage, Pier A Plaza and The Battery, and NSI drainage improvements. The majority of the scope of work would involve the construction of various types of flood protection measures (permanent floodwalls, buried floodwalls, and flip-up deployables). The SBPCR Project also includes demolition of the existing Wagner Park Pavilion building, construction of a new building, an enhance Pier A inlet, and various hard/landscaped elements.

Wagner Park Pavilion

The Wagner Park Pavilion package would consist of demolition of the existing building, foundation, and utilities to make way for the new Pavilion building, including new mechanical, new electrical, new plumbing, and a green roof.

Wagner Park and the Museum of Jewish Heritage

The Wagner Park site work involves raising the current elevation of the Park by 10 to 12 feet with a buried floodwall on a micro pile foundation and sheet pile cut-off wall to prevent water migration. The raised park would be gently sloped and terraced towards the waterfront to allow for universal access. The Park's key features would include ornamental gardens, a central lawn, and stormwater reuse cistern and infiltration gallery underneath the Battery Park City Esplanade.

The Museum of Jewish Heritage including 1st Place would include five flip-up deployables, floodwalls, and a section of a glass-topped floodwall that wraps around the west side of the museum. At the southern end of Wagner Park, adjacent to Pier A Plaza, five additional flip up deployables would be placed along the Pier A inlet and Battery Place. The flip-up deployables and floodwalls would be constructed using micro pile foundations, with a flowable fill or jet grout cut-off wall, or a sheet pile foundation that also serves as the cut-off wall to prevent water migration.

Pier A Plaza and The Battery

In Pier A Plaza, the proposed flood alignment would include a combination of a newly raised segment of the plaza, 10 flip-up deployables, and exposed floodwall. The flip-up deployables and floodwalls would be constructed on micro pile foundations with a flowable fill or jet grout cut-off wall to prevent water migration.

The Battery would continue the use of the flip-up deployables, buried and exposed floodwalls constructed on a micro pile foundation, with flowable fill or jet grout cut-off wall to prevent water migration, or on spread footings. Special care would need to be taken when the floodwall crosses over the Battery Park Underpass structure to limit damage to the structure.

The work also includes improving the Pier A inlet to a terraced vegetated condition that creates habitat opportunities and the construction of a new observation deck on the existing relieving platform structure.

Near Surface Isolation Drainage Improvements

The NSI drainage improvements would consist of the installation of a gate within the existing regulator structures. Regulators control the amount of water flow to a downstream point in the sewer system and provide an outlet for flows that exceed the sewer capacity. Regulator structures, M9, M8, and M7 located on West Street between 1st Place and Albany Street, would be closed in a flood event to prevent the storm surge rising through the interceptor line from reaching the street level. Additionally, four interceptor manholes along West Street between Battery Place and Albany Street would be reinforced and retrofitted to receive a cover that can be sealed shut and locked during a flood event. This manhole reinforcement would serve to resist the pressure resulting from the surge rising through the interceptor line and the piping connecting the manholes to the interceptor. The contractor would perform pavement demolition, excavation and reconstruction within the manholes as necessary.

Table 3.15-1 below lists the construction activities associated with each construction component.

Construction Schedule

Construction of the SBPCR Project would begin from the west at 1st Place and move east to The Battery. Mobilization is anticipated to commence in July 2022. Construction of the flood alignment in Wagner Park, the new Wagner Park Pavilion, and Pier A Plaza are anticipated to commence first in September 2022, with construction of the flood alignment along the Museum of Jewish Heritage and in The Battery is expected to commence in December 2022. Construction of the NSI drainage improvements is anticipated to commence in April 2023. Construction will be completed by the end of July 2024.

BPCA is committed to working with the community throughout the duration of construction to minimize impacts. A 24-hour hotline would be established during construction for the community to make complaints, ask questions, provide input and receive construction updates.

Construction Equipment Inventory

An inventory of the construction equipment anticipated to be used in the construction of each component of the SBPCR Project is provided in **Table 3.15-1** below.

Table 3.15-1: Anticipated Construction Equipment

Equipment	Description	Wagner Park Pavilion	Wagner Park and the Museum of Jewish Heritage	Pier A Plaza and The Battery	Near Surface Isolation
Auger Drill Rig	Crawler-type drill, 4”				
Auger Drill Rig	Drill rig & augers				
Backhoe	Backhoe loader; 48 HP	X	X	X	
Backhoe	Mounted Impact Hammer		X	X	X
Boring Machine	Horizontal Boring Hydraulic Jack	X	X	X	
Chain Saw	Chain saws, 36”	X	X	X	
Clam Shovel (Dropping)	Pavement removal bucket				
Compactor (ground)	Gas engine vibrator				
Compressor (air, > 350 cfm)	Compressor, 600 cfm	X	X	X	
Compressor (air, </= 350 cfm)	Compressor, 160 cfm				X
Compressor (air, </= 350 cfm)	Compressor, 250 cfm				
Concrete Pump Truck	Concrete pump, small	X	X	X	
Concrete Saw	Concrete saw		X	X	X
Crane		X	X	X	
Crane	Piling Driving Leads	X	X	X	
Crane	Vibratory Pile Driver	X	X	X	
Dozers	Dozer, 75 HP and 300 HP				
Drum Mixer	Cement mixer, 2 CY				
Dump Truck	Assumed 200 HP diesel truck	X	X	X	X
Excavator	Front end loader, 2.5 CY	X	X	X	X
Flat Bed Truck	Tractor (240 HP) & water tank truck, 5000 gal				
Forklift		X	X	X	
Front End Loader	Front end loader, 1.5 CY	X	X	X	X
Front End Loader	Loader, skid-steer				
Gradall, 3 tone, ½ Cy					X
Gas engine vibrator		X	X	X	X
Grader	Grader, 30,000 lb				
Impact Pile Driver	Hammer, 15 K-ft				
Jackhammers	Pavement Breakers		X	X	
Jumping Jacks	Compactor (ground)	X	X	X	

Equipment	Description	Wagner Park Pavilion	Wagner Park and the Museum of Jewish Heritage	Pier A Plaza and The Battery	Near Surface Isolation
Mounted Impact Hammer (Hoe Ram)	Hydraulic Hammer, 1,200 lb				
Pavers	Asphalt paver (130 HP) and equip.				
Pickup Truck	Truck, stake body, 3 ton	X	X		
Pumps	Centrif. Water pump, 6”				X
Pumps	Dewatering pump, 75 HP				
Roller	Pneumatic and steel wheel				
Roller	Roller, vibratory		X	X	
Skidsteer	Tractor	X	X	X	
Welder/Torch	Electric welding machine	X	X	X	
Welder/Torch	Gas welding machine				

Note: “Check-mark” symbol indicates use of that tool during that construction activity.

Construction Labor Force

Construction of the SBPCR Project would have 102 construction workers on site at the start of construction, which would include construction on the Wagner Park Pavilion, Wagner Park, and Pier A Plaza. Approximately 142 construction workers on site per day would be present during the peak period, approximately 12 months. These workers would be spread out over each project component, as seen in **Table 3.15-2** below.

Table 3.15-2: Estimated Peak Construction Labor Force

Construction Component	Workers per Day
Construction Package 1	**28**
Wagner Park Pavilion	28
Construction Package 2	**70**
Wagner Park	52
Museum of Jewish Heritage	18
Construction Package 3	**39**
Pier A Plaza	22
The Battery	17
Construction Package 4	**5**
Near Surface Isolation Drainage Improvements	5

Construction Vehicle and Traffic

Construction materials would be delivered to and removed from the Project Area by a combination of trucks. Based on current estimates, approximately 34,288 cy of excavation and demolition debris would be required for construction of the SBPCR Project. **Table 3.15-3** below describes the estimated excavation for each project component.

Table 3.15-3: Estimated Excavation Loads

Construction Component	Excavation & Demolition Debris (CY)	Embankment (CY)	Truck Loads
Construction Packages 1 and 2	**26,915**	**27,916**	**5,484**
Wagner Park (including Wagner Park Pavilion)	22,327	27,278	4,961
Museum of Jewish Heritage	4,588	638	523
Construction Package 3	**7,175**	**9,399**	**1,658**
Pier A Plaza	3,706	4,800	851
The Battery	3,469	4,599	807
Construction Package 4	**198**	**152**	**35**
Near Surface Isolation Drainage Improvements	198	152	35
Total	**34,288**	**37,467**	**7,177**

Table 3.15-4 below describes the average daily truck trips estimated to occur during construction of the SBPCR Project. Construction materials (e.g., pipe, rebars, asphalt, concrete) that are transported by trucks (e.g., dump trucks, flatbed trucks, concrete trucks) would adhere to strict schedules as a result of site constraints and limited vehicular access to the different construction areas along the project alignment. To adhere to delivery schedules, flaggers would be employed where necessary, pursuant to standard procedures for construction in New York City. The flaggers could be supplied by the contractor on site at that time or by the construction manager. The flaggers would manage truck traffic into and out of the Project Area. In addition, the flaggers would aid trucks entering and exiting the on-street traffic streams in order to ensure the safety of the public passing through the area.

Table 3.15-4: Estimated Daily Truck Trips for Construction Materials

Construction Component	Dirt (truckload/day)	Concrete (truckloads/day)	Miscellaneous Material (truckload/day)	Total (truckload/day)
Construction Package 1	**2.5**	**0.5**	**5**	**8**
Wagner Park Pavilion	2.5	0.5	5	8
Construction Package 2	**10**	**1**	**3.5**	**14.5**
Wagner Park	8.5	0.5	2	11
Museum of Jewish Heritage	1.5	0.5	1.5	3.5
Construction Package 3	**4**	**1**	**2.5**	**7.5**
Pier A Plaza	2	0.5	1	3.5
The Battery	2	0.5	1.5	4
Construction Package 4	**0.25**	**0.25**	**1**	**1.5**
Near Surface Isolation Drainage Improvements	0.25	0.25	1	1.5

3.15.3 Preliminary and Detailed Assessments of Environmental Effects of Key Technical Areas

Based on potential project related impacts, and guidance provided in the *CEQR Technical Manual* the following section describes the technical areas identified for preliminary assessment: Transportation, Air Quality, Noise and Vibration, Historic and Cultural Resources, Hazardous Materials, and Natural Resources. This section also addresses "other technical areas" as described in the *CEQR Technical Manual* including Open Space, Socioeconomic Conditions, Community Facilities, Land Use and Public Policy, and Neighborhood Character, Socioeconomic Conditions, Community Facilities and Services, Open Space, and Water and Sewer Infrastructure.

The *CEQR Technical Manual* requires preliminary assessment of other technical areas described above, only if the following scenarios occur:

- Construction activities are considered long-term (greater than 24 months); or
- Short-term construction activities would directly affect a technical area.

Since construction of the entire project would take 24 months, it is considered long-term. The following Preliminary Assessments include a discussion of the potential for construction related impacts on the above listed resources.

3.15.3.1 Transportation

A Preliminary Assessment of the impacts to transportation would be needed if the SBPCR Project:

- Is in a Central Business District (CBD) or along an arterial or major thoroughfare; or,
- Requires the closing, narrowing, or otherwise impeding moving lanes, roadways, key pedestrian facilities (sidewalks, crosswalks, corners, corners reservoirs, etc.), parking lanes and/or spaces

(on-site or nearby lots and garages), bicycle routes and facilities, bus lanes or routes, or access points to transit; or,

- Would involve the construction of multiple development sites in the same geographic area, so the potential for several construction timelines to overlap exists and lasts for more than 24 months overall.

The SBPCR Project is located within a CBD and includes a portion of an arterial or major thoroughfare, Route 9A or West Street. Construction is expected to last 24 months and would require temporary closure of portions of Route 9A, 1st Place, and Battery Place as the Maintenance and Protection of Traffic (MPT) section describes below. Additionally, temporary–sidewalk closures would be required along Battery Place between 1st Place and West Street for utility work. As such, preliminary assessment of the impacts on transportation from construction activities is necessary.

According to the *CEQR Technical Manual*, interrelationships between the key technical areas of the transportation system – Traffic, Parking, Transit, and Pedestrians – should be taken into account in any assessment. Furthermore, the individual technical areas should be separately assessed to determine whether a project has the potential to adversely and significantly impact a specific area of the transportation system. The *CEQR Technical Manual* states that a preliminary trip generation assessment should be prepared to determine whether a quantified analysis of any technical areas of the transportation system is necessary. Except in unusual circumstances, a further quantified analysis would typically not be needed for a technical area if the proposed development would result in fewer than the following increments:

- 50 peak hour vehicle trips;
- 200 peak hour subway/rail or bus transit riders; or
- 200 peak hour pedestrian trips.

The *CEQR Technical Manual* also states that if the threshold for traffic is not surpassed, it is likely that further parking assessment is also not needed.

Since construction of the SBPCR Project is expected to last for 24 months, a screening assessment of construction traffic was performed to determine if detailed traffic analyses *"During Construction"* would be required. The assessment includes an estimation of additional construction-related vehicle trips that would be generated on the roadway system as a result of construction activities during the peak construction phase. Based on current estimates of manpower distribution over the construction duration, the peak month of construction activity was determined. The *"During Construction"* traffic screening assessment was performed for a typical weekday during the peak construction month.

Traffic

The preliminary screening thresholds in the *CEQR Technical Manual* suggest that any project which generates 50 or more peak hour incremental vehicle trips through a single intersection in any given peak hour is likely to warrant a detailed traffic operations analysis. Conversely, projects that are anticipated to generate fewer than 50 peak hour incremental vehicle trips through a single intersection generally do not warrant detailed traffic assessments, and potential traffic impacts would not occur.

Construction Trip Generation

The number of vehicle trips that would occur during construction was estimated based on review and consideration of the following components:

- The proposed construction schedule (and the peak construction phase)
- Expected number of construction workers per weekday during the peak construction phase
- Expected number of trucks per weekday during the peak construction phase

The number of construction workers and trucks were estimated during the peak hours on a typical weekday for the peak phase of construction.

Construction Schedule

The project is proposed to be constructed in 24 months, involving six (6) major construction tasks, as follows:

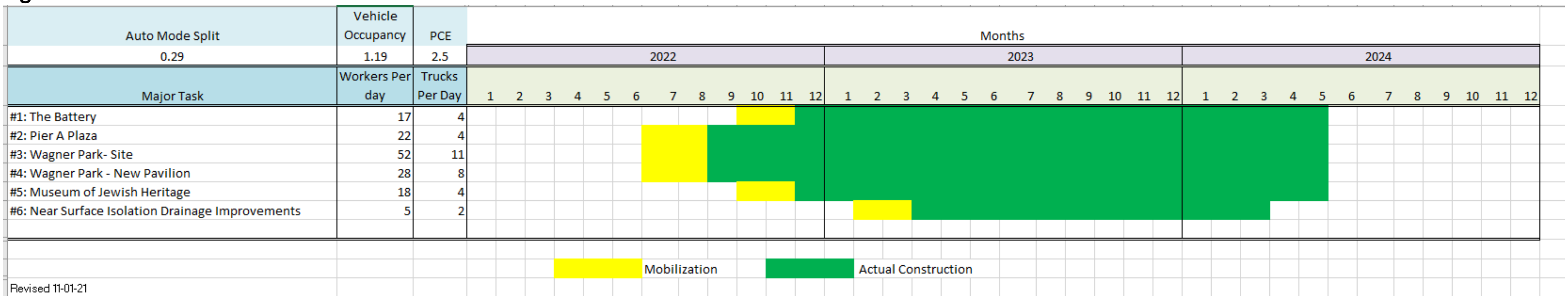
#1: Site Work at The Battery
#2: Site Work at Pier A Plaza
#3: Site Work at Wagner Park
#4: New Pavilion at Wagner Park
#5: Museum of Jewish Heritage
#6: NSI Drainage Improvements

The estimated starting date for "*actual*" construction, not including a 2-month mobilization period, is expected to be September 2022. All construction is scheduled to be completed by July 2024. The construction schedule is shown in **Table 3.15-5. Figure 3.15-1** presents a graphical illustration of the construction schedule, showing the duration of each major task as well as overlapping tasks.

Table 3.15-5: Construction Schedule

Major Task	Duration (Months)	Start	Finish
#1: The Battery	18	12/22	05/24
#2: Pier A Plaza	21	09/22	05/24
#3: Wagner Park – Site	21	09/22	05/24
#4: Wagner Park – New Pavilion	21	09/22	05/24
#5: Museum of Jewish Heritage	18	12/22	05/24
#6: Near Surface Isolation Drainage Improvements	12	04/23	03/24

Figure 3.15-1: Construction Schedule



As shown in **Figure 3.15-1**, all six major work tasks would overlap for a 12-month period: nine months in 2023 and three months in 2024; and at least five major tasks would overlap for several months in 2023 and 2024.

The number of vehicle trips to be generated during the peak construction phase was then estimated based on the combined number of construction workers and trucks that would occur during the peak months of construction.

Construction Workers

The number of daily construction workers would vary depending on the specific work task. The task with the highest number of daily construction workers is associated with the site work at Wagner Park and the Museum of Jewish Heritage with 52 workers per day (see **Table 3.15-6**). However, due to multiple overlapping work tasks, the highest number of daily construction workers (142) would occur during the peak 12-month period: the last nine months in 2023 and the first three months in 2024 (see **Figure 3.15-1**).

For estimating purposes, it was assumed that workers would work one main shift between 7 AM and 3 PM, as is typical in New York City. Normally work would end at around 3:00 or 3:30 PM, but in order to complete certain critical tasks (e.g., finishing a concrete pour), the workday may occasionally be extended beyond normal work hours. Any extended weekday workdays would generally last until approximately 6:00 PM and would not include all construction workers on-site, but only those involved in the specific task requiring additional work time.

Weekend or night work may also be occasionally required for certain construction activities. Work permits from NYCDOB would be obtained for any necessary work outside of normal construction. The numbers of workers and pieces of equipment in operation for weekend work would typically be limited to those needed to complete the particular task. Therefore, the level of activity for any weekend or night work would be less than that of a normal workday. The weekend workday, if necessary, would typically occur from 8:00 AM to 4:00 PM.

It was estimated that 29 percent of workers would arrive and leave in private vehicles; 69 percent would arrive and leave via transit; and 2 percent would arrive and leave by the walking/bicycling. The transportation modes used by transportation workers to arrive and leave the site were obtained by reviewing the 2000 CTPP Reverse Journey to Work (RJTW) Data Tables for census tracts 9, 13 and 317.01 in Lower Manhattan for *Construction and Excavation* occupations. These are the census tracts where construction activities would occur. The census data tables also provided information regarding the use of single-occupant and multi-occupant vehicles from which the average vehicle occupancy for workers expected to arrive by private autos was calculated. A vehicle occupancy rate of 1.19 persons per vehicle was estimated from the same data source. The “raw” and “rounded” modal splits are shown in **Table 3.15-7**.

NYCDOT reviewed the Traffic Screening Assessment During Construction in July 2021 and concurred with the methodology and findings.

Table 3.15-6: Daily Estimate of Construction Workers and Trucks

Major Task	Workers Per Day	Trucks Per Day
#1: The Battery	17	4
#2: Pier A Plaza	22	4
#3: Wagner Park – Site	52	11
#4: Wagner Park – New Pavilion	28	8
#5: Museum of Jewish Heritage	18	4
#6: Near Surface Isolation Drainage Improvements	5	2

Table 3.15-7: Modal Splits for Census Tracts 9, 13, 317.01

Mode	Raw	Rounded
Drive	28.9%	29%
Subway	42.9%	43%
Bus	11.2%	11%
Ferry or Railroad	14.9%	15%
Bicycle or Walk	1.8%	2%
Taxi or Motorcycle	0.3%	0%
	100.0%	**100%**

Trucks

It is assumed that all construction debris and materials would be transported by trucks. Trucks would typically remain on-site for relatively short durations (typically one hour or less). Trucks would use local truck routes in the area to arrive and depart the construction site(s).

The daily volume of trucks making deliveries to the site and hauling away debris and excavated materials from the site would vary according to the specific construction activity being undertaken. As shown in **Table 3.15-6**, approximately eleven (11) trucks, the highest number of daily trucks for any major task, would occur per day during the site work at Wagner Park. Between two and eight trucks would occur per day for each of the other tasks.

Daily Vehicle Estimates

Based on the above assumptions, the number of construction workers and trucks that would occur during a typical weekday during the peak construction phase was estimated, as shown in **Figure 3.15-2**. The peak construction phase would occur during the 12-month period from April 2023 through March 2024. On a typical weekday during this peak phase of construction, 35 construction worker vehicles *passenger car equivalents* (pces) and 83 trucks (pces) are projected to occur, for a total of 117 vehicles (pces). Note: *for purposes of this analysis, trucks were converted to pces using a conversion factor of 2.5*.

Hourly Vehicle Trip Estimates

The estimated *daily* vehicle volumes were converted to *hourly* vehicle trips by applying appropriate temporal (hourly) and directional (in and out) distributions for construction workers and trucks. All of the workers would arrive by 8 AM and leave by 5 PM, with 80 percent arriving during the 6-7 AM hour, and 80 percent leaving during the 3-4 PM hour. Trucks would arrive at, and leave the Project Area, throughout the day between 6 AM and 5 PM.

Table 3.15-8 shows the estimated number of vehicle trips for construction workers and trucks (separately and combined) that are projected to occur during a typical weekday. Specifically, it shows the estimated number of trips during the weekday morning peak arrival hour (6-7 AM) and afternoon peak departure hour (3-4 PM). During both of these hours, 38 vehicle trips are projected to occur: 33 in and 5 out during the AM peak hour; and 5 in and 33 out during the PM peak hour.

Since these Level 1 trip generation estimates do not exceed 50 vehicle trips during any hour, a Level 2 screening assessment (trip distribution and trip assignment) is not required. Accordingly, no intersection would experience an increase of 50 or more vehicular trips during any hour, and therefore, no further traffic analysis during construction is needed.

Transit and Pedestrians

With a transit modal split of 69 percent, approximately 98 construction workers would arrive and leave *daily* by transit modes (bus and subway). During the AM and PM peak hours, approximately 78 workers would arrive and leave by transit modes, respectively. The projected increase in peak hour transit trips (78) does not meet or exceed the *CEQR* thresholds (200 peak hour transit trips) for detailed analyses, and therefore, no further transit analysis during construction is required.

In addition, with 142 construction workers expected on a typical *weekda*y during the peak construction period, the CEQR threshold of 200 pedestrian trips *per hour* would not be met or exceeded. Therefore, no further pedestrian analysis during construction is required.

Figure 3.15-2: Estimated Daily Vehicles During Construction

Auto Mode Split	Vehicle Occupancy	PCE	Months																																			
0.29	1.19	2.5	2022												2023												2024											
Major Task	Workers Per day	Trucks Per Day	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
#1: The Battery	17	4																																				
#2: Pier A Plaza	22	4																																				
#3: Wagner Park- Site	52	11																																				
#4: Wagner Park - New Pavilion	28	8																																				
#5: Museum of Jewish Heritage	18	4																																				
#6: Near Surface Isolation Drainage Improvements	5	2																																				
Overlapping Construction																																						
Construction Workers: Typical Weekday											102	102	102	137	137	137	137	142	142	142	142	142	142	142	142	142	142	142	142	137	137							
Construction Vehicles: Typical Weekday											25	25	25	33	33	33	33	35	35	35	35	35	35	35	35	35	35	35	35	33	33							
Trucks: Typical Weekday											23	23	23	31	31	31	31	33	33	33	33	33	33	33	33	33	33	33	33	31	31							
Truck **PCES**: Typical Weekday											58	58	58	78	78	78	78	83	83	83	83	83	83	83	83	83	83	83	83	78	78							
Total Vehicles (PCEs): Typical Weekday											82	82	82	111	111	111	111	117	117	117	117	117	117	117	117	117	117	117	117	111	111							

Peak Months Mobilization Actual Construction

Table 3.15-8: Estimated Hourly Vehicle Trips

Peak Truck PCEs =	83	
Peak Workers =	142	
Average Auto Occupancy=	1.19	persons/vehicle
Worker Mode-Split Auto =	29%	
Worker Mode-Split Transit* =	69%	

Hour of Day	Temporal Distributions				Car Trips (Workers)			Truck (PCE) Trips			Total Vehicle Trips (PCEs)		
	Workers IN	Workers Out	Trucks IN	Trucks OUT	In	Out	Total	In	Out	Total	In	Out	Total
12-1AM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
1-2 AM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
2-3AM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
3-4AM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
4-5AM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
5-6AM	10%	0%	0%	0%	3	0	3	0	0	0	3	0	3
6-7AM	80%	0%	6%	6%	28	0	28	5	5	10	33	5	38
7-8AM	10%	0%	6%	6%	3	0	3	5	5	10	8	5	13
8-9AM	0%	0%	11%	11%	0	0	0	9	9	18	9	9	18
9-10AM	0%	0%	11%	11%	0	0	0	9	9	18	9	9	18
10-11AM	0%	0%	11%	11%	0	0	0	9	9	18	9	9	18
11AM-12PM	0%	0%	11%	11%	0	0	0	9	9	18	9	9	18
12-1PM	0%	0%	11%	11%	0	0	0	9	9	18	9	9	18
1-2PM	0%	0%	11%	11%	0	0	0	9	9	18	9	9	18
2-3PM	0%	10%	11%	11%	0	3	3	9	9	18	9	13	22
3-4PM	0%	80%	6%	6%	0	28	28	5	5	10	5	33	38
4-5PM	0%	10%	5%	5%	0	3	3	4	4	8	4	8	12
5-6PM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
6-7PM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
7-8PM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
8-9PM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
9-10PM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
10-11PM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
11PM-12AM	0%	0%	0%	0%	0	0	0	0	0	0	0	0	0
TOTAL =	100%	100%	100%	100%	35	35	69	83	83	165	117	117	234

Parking

All or most of the 35 daily construction worker vehicles during the peak construction period would utilize on-street or public off-street parking facilities within and near the Project Area. Existing parking would accommodate the parking need for construction worker vehicles. Accordingly, no detailed parking assessment during construction is required.

Maintenance and Protection of Traffic

Preliminary Maintenance and Protection of Traffic (MPT) plans (MT 101 through MT105) prepared for the SBPCR Project and a letter from Construction Manager LiRo dated December 20, 2021, to NYCDOT were reviewed for purposes of including planned long-term and short-term roadway and sidewalk closures into this DEIS.

The selected Contractor would be responsible for implementing these plans and coordinating the implementation with the NYCDOT, Office of Construction Mitigation and Coordination (OCMC). Work permits would be issued by NYCDOT and working hours would be specified in the Traffic Stipulations provided by NYCDOT. No deviations from these stipulations would be permitted without written prior authorization from NYCDOT.

The following is a summary of the planned roadway and sidewalk closures.

Roadway Closures

The *eastbound* direction of Battery Place approximately between Little West Street and northbound West Street (Route 9A) would be temporarily closed for utility work. During this closure, two-way traffic would be accommodated on the westbound roadway, one lane in each direction.

The *center roadway* of Battery Place (the northern half of the eastbound roadway and the southern half of the westbound roadway) approximately between Little West Street and northbound West Street (Route 9A) would be temporarily closed for utility work. During this closure, one lane of traffic would operate on each of the eastbound and westbound roadways.

The *westbound* direction of Battery Place approximately between Little West Street and northbound West Street (Route 9A) would be temporarily closed for utility work. During this closure, two-way traffic would be accommodated on the eastbound roadway, one lane in each direction.

The *intersection* of Battery Place and Northbound West Street would be temporarily closed. During this closure, two westbound approach lanes to the intersection would be maintained (one lane turning right onto northbound West Street and one proceeding through the intersection). One eastbound approach lane at the intersection would be maintained. East of the intersection, both the eastbound and westbound bus lanes would be maintained. 1st Place, between Battery Place and the Hudson River is anticipated to be fully closed. This closure is expected to last for the entire 24-month construction duration of the project. During the closure, access would be maintained to the Museum of Jewish Heritage and to 50 Battery Place.

Sidewalk Closures

The *western* sidewalk of Battery Place between 1st Place and West Street is expected to be fully closed. During this closure, a temporary 5-foot sidewalk would be maintained on the adjacent eastbound roadway of Battery Place.

During any sidewalk closure, a minimum of five feet of pedestrian walking space would be maintained. In addition, at all times, bicycle traffic between the existing bicycle crossing of Battery Place and the eastern end of Battery Park would be maintained. A temporary bicycle detour would be provided on the south side of Battery Place during construction.

Potential Impacts of Roadway and Sidewalk Closures

Most of the roadway and sidewalk closures discussed above would be partial and short-term in nature, except for the full closure of 1st Place between Battery Place and the Hudson River, and the full closure of the western sidewalk of Battery Place between First Place and West Street.

The segment of First Place proposed to be fully closed (between Battery Place and the Hudson River) is a non-vehicular, pedestrian pathway that provides access to the Battery Park City Esplanade and waterfront. Since this a non-vehicular facility, there will be no impacts on traffic circulation, transit access and parking. Pedestrian access to the Esplanade and Waterfront would be maintained through alternative access points, including Second Place (located one block north of First Place) and a signalized intersection at Battery Place and Little West Street. In addition, access will be maintained to 50 Battery Place and the Museum of Jewish Heritage during the closure of First Place. Accordingly, no significant adverse impact to pedestrian access would occur due to the closure of this portion of First Place during construction.

The short-term lane closures on Battery Place may result in worsening of traffic operations during construction, as is typical in New York City. In general, one travel lane will be closed in both the eastbound and westbound directions on Battery Place approximately between Little West Street and northbound West Street (Route 9A). One travel lane in the eastbound direction and two travel lanes in the westbound direction will remain open, with all lanes open at the eastern and western ends of the work zone. To minimize traffic disruptions during construction, the Contractor will be required to monitor traffic conditions during construction, and in coordination with NYCDOT OCMC, may be required to implement additional mitigation measures during construction, such as providing and signing alternative travel routes, modification of traffic signal timings, and deployment of Traffic Enforcement Agents (TEAs) to guide and control traffic at key locations.

The full closure of the western sidewalk of Battery Place between First Place and West Street will be replaced by a temporary 5-foot minimum sidewalk on the adjacent roadbed of eastbound Battery Place. Pedestrians will be protected from vehicles on the adjacent roadway by the use of timber barricades and appropriate signage, typical in NYC construction methods. Accordingly, no significant adverse impact to pedestrian mobility and safety would occur during the closure of the western sidewalk of Battery Place.

The Contractor would be responsible to construct a fully functional temporary bike facility by removing all planters, trees, light poles and other obstructions along the temporary alignment. In addition, the Contractor would be responsible to maintain a smooth bike riding surface free from debris and other impediments. This proposed detour of bicyclists along a new temporary 2-way, 8-foot minimum bicycle facility on the south side of Battery Place would not result in any significant adverse impacts on bicycle safety or mobility.

In summary, for the duration of construction, the Contractor would maintain communication and coordination with NYCDOT OCMC (and other agencies, as needed). Prevailing roadway and traffic conditions during construction are expected to be closely monitored and appropriate changes in the traffic stipulations made, as needed, in consultation with, and upon approval by NYCDOT. Such refinements to the Maintenance and Protection of Traffic (MPT) plans would not only ensure that potential traffic and pedestrian disruptions during construction are minimized, but that safety to motorists, pedestrians, bicyclists and the general public are maintained and prioritized. Accordingly, construction of the Proposed Action would not result in any significant adverse transportation impacts.

Summary and Conclusion

Based on the Level 1 screening assessment described above, it was determined that the traffic volume threshold of 50 vehicles per hour (vph) would not be met or exceeded at any intersection during the AM peak arrival and PM peak departure hours during construction. As shown in **Table 3.15-8**, the highest number of vehicle trips (in pces) would be 38 trips during each of the AM and PM peak hours, below the 50 vph threshold. In addition, all or most of the 35 daily construction worker vehicles would utilize public off-street parking facilities within and near the Project Area.

Therefore, in accordance with the *CEQR Technical Manual,* this screening assessment concludes that during construction of the proposed SBPCR Project*:*

- No further analysis of traffic is required.
- The thresholds for transit analyses (200 trips per hour) and pedestrian analyses (200 trips per hour) would not be met; therefore, no transit and pedestrian analysis are required.
- A parking shortfall would not occur; therefore, a detailed parking assessment is not required.

Based on the above assessment, no further transportation analyses during construction are required for the SBPCR Project.

3.15.3.2 Air Quality

This section examines the potential for air quality impacts from construction activities associated with the proposed SBPCR Project.

According to the *CEQR Technical Manual*, a quantitative assessment of air quality for construction activities is likely not warranted if the project's construction activities: (1) are considered short term, which for air quality assessments has generally been accepted as 24 months or less; (2) are not located near sensitive receptors; (3) do not involve the construction of multiple buildings where there is a potential for cumulative impacts from different buildings under simultaneous construction before the final build-out; and (4) would not operate multiple pieces of diesel equipment in a single location during peak construction. If a project does not meet one or more of the criteria above, a quantitative air quality assessment could be required.

As construction of the Proposed Action is anticipated to last 24 months and would involve the use of multiple pieces of diesel equipment, a quantitative air quality assessment was performed. The activities considered, the analysis methodologies and results of this analysis are described below.

Construction Activities

Air pollutant emissions would be generated from equipment, including excavators, loaders, cranes, generators, as well as dump and concrete trucks, the material handling process, surface fugitive dust, etc. with construction site operations including:

- Site clearing, demolition, and excavation,
- Site fill, grading and foundation construction,
- Material transporting,
- Material such as soil transferring among various sites within the project boundary, and,
- Building and structure construction.

Methodology

Emissions from on-site construction equipment and on-road construction-related vehicles, as well as dust generating construction activities, have the potential to affect air quality. The analysis of potential impacts of the construction activities includes a screening analysis of non-road source and a quantitative analysis of on-site sources of air emissions.

This analysis was conducted according to both operational and construction assessment methodologies presented in the "Air Quality and Noise/Vibration Construction Assessment Protocol" approved by NYCDEP's Bureau of Environmental Planning and Analysis (BEPA).

Off-site Sources

As shown in **Table 3.15-8**, the traffic increments include construction worker commuting trips and construction truck deliveries. According to the off-site on-road traffic analysis results, truck trips under the proposed condition indicate that the peak traffic hour for overall traffic (6-7 am) and truck traffic (8-9 am) would be:

- 6-7 am: 28 commuter and 4 truck trips
- 8-9 am: 7.2 total truck trips.

These peak hour commuter vehicle and truck trips would be well below the *CEQR* screening thresholds of 170 or more auto trips per hour for CO and heavy-duty diesel vehicle (HDDV) equivalents applicable for any roadway types for $PM_{2.5}$, respectively. Therefore, no further refined dispersion modeling analysis of potential construction period on-road mobile source impacts is warranted. The on-road mobile source air quality impacts would be negligible.

On-site Sources

The following on-site emission sources were considered in the analysis:

- Trucks and nonroad equipment diesel engine exhaust.
- Surface fugitive dust resulting from the movement of trucks and nonroad equipment.
- Dust from material handling activities.

The on-site nonroad equipment is powered by diesel engines that would generate relatively high levels of NO_2 and PM. Fugitive dust generated by construction activities is also a source of PM. Therefore, the impact assessment on potential construction air quality impacts focuses on these two pollutant categories plus CO for which short-term impact standards have been established.

On-site construction activities are considered stationary source activities. Because these activities would occur for 24 months, the reasonable worst-case periods for the pollutants of concern (PM, CO, NO_2) were determined throughout the duration of construction on an 'annual average' and a 'peak day' basis for $PM_{2.5}$ as the representative pollutant. $PM_{2.5}$ was selected for determining the worst-case periods because the ratio of predicted $PM_{2.5}$ incremental concentrations due to on-site construction activities is considered higher than for the other pollutants particularly including fugitive dust component in addition to equipment engine exhausts. Generally, equipment engine exhaust emission patterns of PM_{10}, CO, and NO_2 would follow $PM_{2.5}$ emissions, since their emission rates are related to the sizes of diesel engines.

$PM_{2.5}$ emissions profiles were generated over the construction duration to determine the construction periods with the highest potential to affect air quality.

Based on the resulting multi-year profiles of annual average and peak day average emissions of $PM_{2.5}$, the worst-case short-term and annual periods for construction were identified for dispersion modeling of annual and short-term average concentrations, including annual and 24-hour $PM_{2.5}$, 24-hour PM_{10}, one-hour and eight-hour CO, and annual NO_2 average conditions. Dispersion of the relevant air emissions over these averaging periods was modeled and described in the following sections.

Engine Emissions

The sizes, types, and number of units of construction equipment were estimated based on the construction activity schedule and depicted in detail in **Appendix F** (Noise Analysis Input). Emission factors for NO_x, CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the USEPA's Motor Vehicle Emission Simulator emission model (Version MOVES2014b) associated with default New York County model input parameters provided by the NYSDEC. The same model was also used to estimate on-site truck engine emission rates for NO_X, CO, PM_{10}, and $PM_{2.5}$.

Fugitive Dust

Fugitive dust emissions from construction operations (e.g., excavation, grading, and transferring of excavated materials into dump trucks) were calculated based on USEPA procedures provided in AP-42 Sections 13.2.1 and 13.2.2.

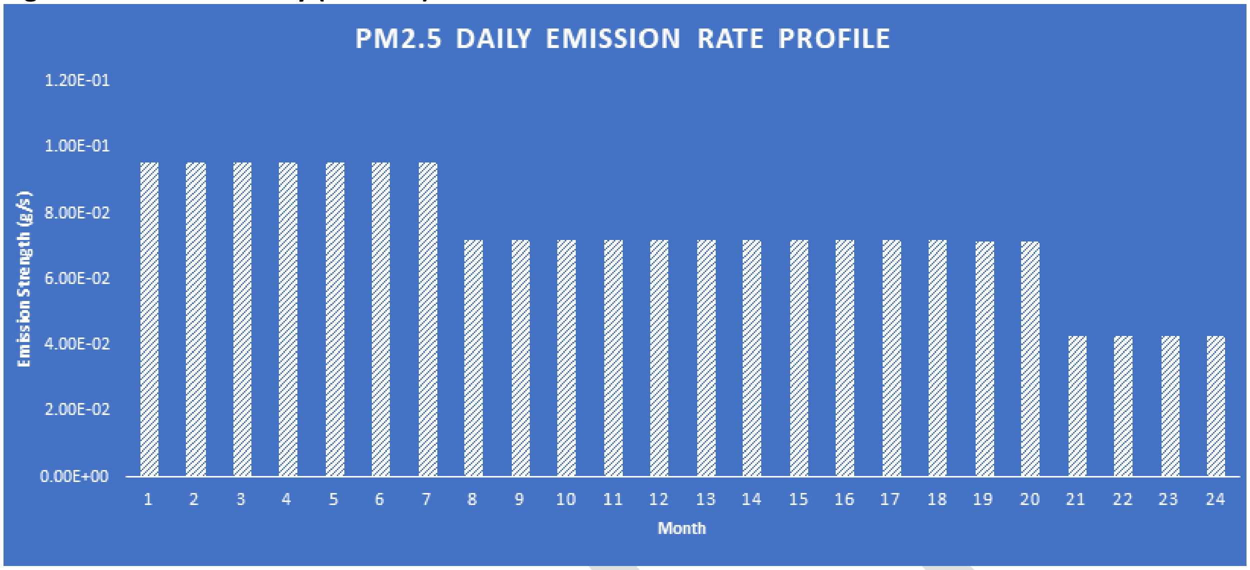
Road dust (PM_{10} and $PM_{2.5}$) emissions from loaders moving on unpaved surfaces inside construction sites were calculated based on USEPA procedures provided in AP-42, Section 13.2.2. The average unit weight of five tons for empty and loaded loaders and on-site average travel distances ranging from 100 to 600 feet were used in the emissions analysis.

In order to minimize potential adverse air quality impacts from construction activities, measures would be implemented as practicable to reduce pollutant emissions in accordance with applicable regulations including those to ensure compliance with the New York City Air Pollution Control Code regulating construction-related dust emissions such as: water sprays within the site would be implemented to prevent fugitive becoming airborne. The planned control of fugitive emissions during construction would result in reduction of PM emissions by 50 percent or greater.

Analysis Periods

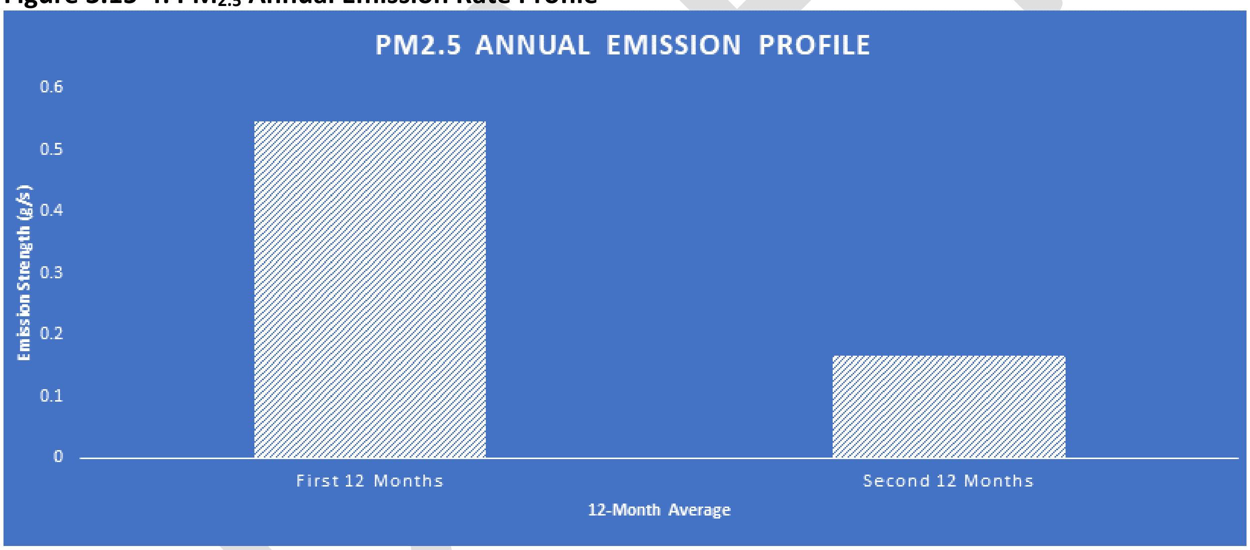
The resulting emission factors were used for the emissions and dispersion analyses. Average annual and peak-day $PM_{2.5}$ engine emission profiles were developed by multiplying the emission factors for each piece of equipment, the working hours per day, and fraction of the day each equipment engine would be operating during each month of construction. These profiles are depicted in **Figure 3.15-3** and **Figure 3.15-4**. As shown in **Figure 3.15-3**, based on the short-term $PM_{2.5}$ emissions profile, the worst-case scenario is estimated to occur during the first seven months of construction for the short-term average condition with the highest projected emissions. Based on **Figure 3.15-4**, the first 12 months of construction was selected as the worst-case annual analysis period.

Figure 3.15-3: $PM_{2.5}$ Daily (24-hour) Emission Rate Profile



Source: AECOM, October 2021.

Figure 3.15-4: $PM_{2.5}$ Annual Emission Rate Profile



Source: AECOM, October 2021.

<u>Dispersion Modeling and Receptors</u>

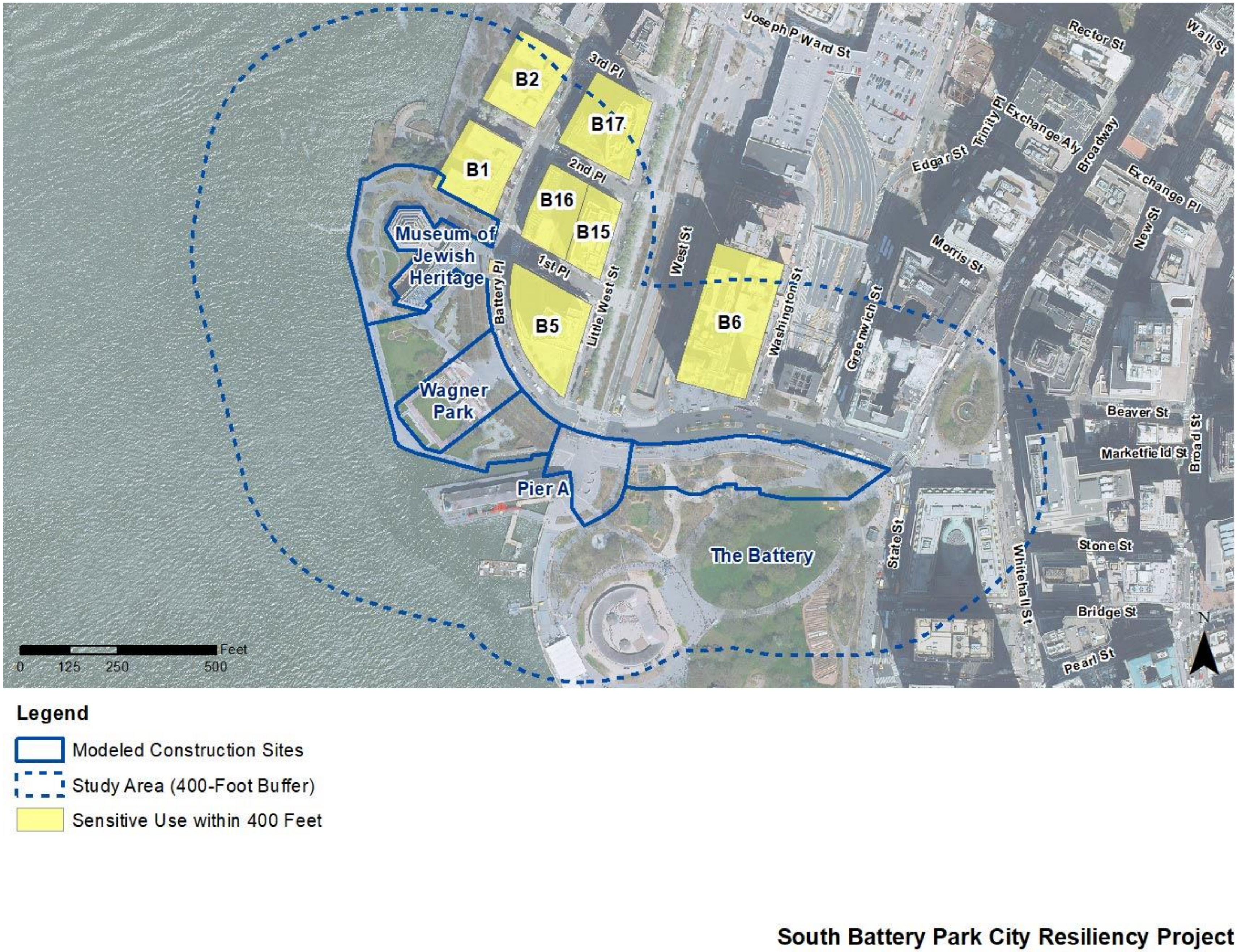
The refined dispersion model (the USEPA/AMS AERMOD dispersion model) was used to predict the reasonable worst-case condition of PM, CO, and NO_2 concentrations during the construction period at the sensitive receptors (e.g., residential buildings) located within the 400-foot radius impact area of the construction sites located within the Project Area as depicted in **Figure 3.15-5**. The *CEQR Technical Manual* defines the study area based on whether there are major stationary sources, such as solid waste or medical waste incinerators, cogeneration facilities, asphalt and concrete plants, or power generating plants, within the potential impact area. As there are no such major stationary sources in or immediately surrounding the Project Area, the analysis was conducted using the smaller study area of 400 feet. The discrete receptors were placed at residential unit windows of each floor of those residential buildings within the Study Area. These specific receptor buildings and modeled construction sites are depicted in **Figure 3.15-5**.

The dispersion of pollutants during the worst-case short-term and annual periods was then modeled to predict resulting maximum concentration increments from construction activities and total concentrations (including background concentrations) in the surrounding area. Overall, the modeled peak construction periods are considered representative of worst-case construction activities associated with the Proposed Action.

Source Modeling

For both short- and long-term model scenarios (predicting concentration averages for periods of 24 hours or less, or annual), all non-road equipment were simulated as ground level area sources since all sources would move around from time to time and site by site. Therefore, the receptors closest to these sites at lower floors would experience the greatest air quality impacts.

Figure 3.15-5: Potential Affected Residential Receptors within the Study Area



Impact Determination

The highest predicted concentrations are compared with the NAAQS as summarized in **Table 3.15-9** and the *de minimis* thresholds for $PM_{2.5}$ established in the New York City (*CEQR Technical Manual 2020*) as shown below. *De minimis* threshold levels have been defined for certain pollutants per the *CEQR Technical Manual*, as a means to maintain ambient concentrations below the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in nonattainment areas:

- Predicted increase of more than half the difference between the background concentration and the 24-hour NAAQS; and
- Annual average $PM_{2.5}$ concentration increments which are predicted to be greater than 0.3 $\mu g/m^3$ at a discrete receptor location (elevated or ground level).

Based on the background levels monitored at the stations that are closest to the project site as shown in **Table 3.15-10**, the 24-hour de minimis criterion was calculated to be 7.67 $\mu g/m^3$.

If the worst-case results show exceedances, the next level of annual and/or short-term period activities should be considered in the modeling in order to determine the duration of potential impacts. This incremental 'stepping' process would be carried out, as the exceedances of either NAAQS and/or NYC *de minimis* levels are predicted, until the broader conclusions can be reached regarding potential pollutant concentration impacts over other periods of construction. In other words, if exceedances are predicted for the worst-case time periods, the time period with the activities on the next level compared with the worst-case condition would be further analyzed to determine the duration of potential impacts within the overall construction duration. It should be noted that, given the construction duration for the Proposed Action is less than three years, several NAAQS based on three-year average conditions do not apply.

Table 3.15-9: National Ambient Air Quality Standards and Applicability

Pollutant		Averaging Time	Level	Form	Applicable to Proposed Temporary Construction
Carbon Monoxide (CO)		8-hour	9 ppm	Not to be exceeded more than once per year	Yes
		1-hour	35 ppm		Yes
Nitrogen Dioxide (NO_2)		1-hour	100 ppb	98th percentile, averaged over 3 years	No
		Annual	53 ppb	Annual mean	Yes
Particulate Matter (PM)	$PM_{2.5}$	Annual	12 µg/m^3	Annual mean, averaged over 3 years	No
		24-hour	35 µg/m^3	98th percentile, averaged over 3 years	No
	PM_{10}	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years	Yes

Source: http://www.epa.gov/air/criteria.html

Table 3.15-10: Monitored Background Levels and Calculated de minimis Criteria

Pollutant	Averaging Time	Form	Monitoring Location	Year			Background Level	NAAQS	*de minimis* Criteria	Unit
				2017	2018	2019				
CO	8-hr	2nd Max	CCNY	0.25	2.52	1.68	2.52	9	n/a	ppm
	1-hr	2nd Max	CCNY	0.2	1.2	1.1	1.2	35	n/a	ppm
NO_2	Annual	Mean	IS 52	17.3	17.46	16.87	17.46	100	n/a	μg/m^3
$PM_{2.5}$	24-hr	98%	Division St	17.9	21.6	19.5	19.7	35	7.67[1]	μg/m^3
	Annual	Mean over 3 years		8.8	9.6	8.6	9.0	12	0.3	μg/m^3
PM_{10}	24-hr	2nd Max	Division St	28	38	29	38	150	n/a	μg/m^3

Source: https://www.dec.ny.gov/docs/air_pdf/2019airqualreport.pdf

Notes:

[1] Based on the 2020 CEQR Technical Manual, de minimis criteria for $PM_{2.5}$ 24-hour is determined based on an increase of more than half the difference between the background concentration and the 24-hour standard.

Modeling Results

Maximum predicted concentration increments from construction, and maximum overall concentrations including background concentrations, are presented in **Table 3.15-11**, respectively, for the construction peak periods analyzed. For $PM_{2.5}$, monitored background concentrations are not added to modeled concentrations from sources, since impacts are determined by comparing the predicted increment from construction activities to the CEQR *de minimis* criteria. The maximum predicted concentration increments include both construction stationary sources and construction mobile sources.

All maximum predicted concentrations would occur at the residential units on the lowest floor in each residential building shown in **Figure 3.15-5**. Based on the dispersion modeling results presented in **Table 3.15-11**, the maximum predicted 24-hour average $PM_{2.5}$ incremental concentration of 4.57 µg/m^3 would be below the NYC *de minimis* criterion. However, from a total of 1,128 discrete ground and elevated receptors modeled, exceedances of the NYC annual $PM_{2.5}$ *de minimis* criterion were predicted to occur during the first 12-month rolling period at a total of 32 receptors at the ground floor of Buildings 1 and 5 shown in **Figure 3.15-5**. Since the exceedances of the NYC annual $PM_{2.5}$ *de minimis* criterion were predicted over the first 12-month rolling period, the second 12-month rolling period between July 2023 and July 2024 was considered in the dispersion modeling to determine the duration of such exceedances based on the construction schedule. Based on the modeling results, no exceedances of the NYC annual $PM_{2.5}$ *de minimis* criterion were predicted to occur during the second 12-month rolling period.

As described in **Table 3.15-9**, the annual average $PM_{2.5}$ NAAQS is based on a 3-year average. If Proposed Action activities do not occur for the entire duration of the 3-year period, the period of no or minimal activity would lower the 3-year average level. Therefore, the duration and intensity of $PM_{2.5}$ exposure within the adjacent neighborhood of each localized activity area were considered.

New York City's Local Law 77, signed in 2003, requires that all nonroad diesel-powered equipment use ultra-low sulfur diesel fuel and utilize BAT for reducing emissions. Diesel particulate filters (DPFs) and Tier 4 engines constitute BAT for purposes of this law; therefore, construction equipment would comply with the BAT requirements further reducing potential PM 2.5 emissions.

Given the use of BAT and the temporary nature of potential exceedances of the NYC annual $PM_{2.5}$ *de minimis* criterion predicted to occur at multiple ground floor receptors only during the first 12-month rolling period, the potential air quality impacts would be considered temporary and not significant. Furthermore, as shown in **Table 3.15-11**, the maximum predicted total concentrations of $PM_{2.5}$, PM_{10}, CO, and annual-average NO_2 for the peak periods are all below the applicable NAAQS. Therefore, the overall construction period air quality impacts would not be significant, and no mitigation measures are warranted.

Table 3.15-11: Maximum Predicted Pollutant Concentrations under Worst-case Periods

Pollutant	Averaging Period	Background	Maximum Modeled Increment	Total Concentration	*de minimis* Criteria	NAAQS	Exceed *de minimis* Criteria or NAAQS
$PM_{2.5}$	24-hour[1]	—	4.57 µg/m^3	--	7.67 µg/m^3 [2]	—	No
	First 12-month Annual Local[1]	—	0.50 µg/m^3	--	0.3 µg/m^3	—	Yes
	Second 12-month Annual Local[1]	—	0.25 µg/m^3	--	0.3 µg/m^3	—	No
	24-hour[3]	19.7 µg/m^3	4.57 µg/m^3	24.27µg/m^3	—	35 µg/m^3	No
	Annual[3]	9.0 µg/m^3	0.50 µg/m^3	9.50 µg/m^3	—	12 µg/m^3	No
PM_{10}	24-hour	31 µg/m^3	12.0 µg/m^3	43.0 µg/m^3	—	150 µg/m^3	No
NO_2	Annual	32.4 µg/m^3	7.12 µg/m^3	39.5 µg/m^3	—	100 µg/m^3	No
CO	One-hour	2.52 ppm	0.22 ppm	2.74 ppm	—	35 ppm	No
	Eight-hour	1.2 ppm	0.05 ppm	1.25 ppm	—	9 ppm	No

Notes:

$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.

1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.

2 $PM_{2.5}$ *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m^3.

3 $PM_{2.5}$ comparison with NAAQS including the background concentration.

3.15.3.3 Noise and Vibration

This section examines the potential for noise and vibration from the construction of the proposed flood alignment to impact nearby sensitive receptors in the vicinity of the Study Area. In accordance with the *CEQR Technical Manual*, a noise and vibration assessment was conducted to assess the potential for significant adverse impacts during temporary construction activities. The noise assessment includes a monitoring program to document baseline noise levels at the closest noise-sensitive receptors and a modeling analysis to predict both noise and vibration levels from the proposed project construction activities. The noise and vibration operational impacts during operation of the flip-up deployables are addressed in Section 3.14 (Noise and Vibration).

Effects on community noise and vibration levels during construction include operation of construction equipment within the Study Area. Noise and vibration levels at a given location are dependent on the type and quantity of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating), the distance from the construction site, and any shielding effects (from structures such as buildings, walls, or barriers). Noise levels caused by construction activities would vary widely, depending on the stage of construction (i.e., flood barrier construction) and the location of the construction activities relative to noise-sensitive receptor locations.

The noise assessment included a screening assessment to identify noise-sensitive receptors, a monitoring program to document baseline noise levels at the closest receptors and a detailed modeling analysis to evaluate the potential for noise and vibration impacts during construction of the SBPCR Project. Effects of construction and delivery vehicles traveling to and from the site were not evaluated due to the low level of truck traffic compared to the existing traffic levels.

Principal Conclusions and Impacts

The noise assessment indicated that short-term noise impacts at receptors along Battery Place and Little West Street are predicted during peak construction activities. Noise exceedances are predicted from impact and pounding equipment, including pile drivers, hoe rams and clam shovels. Regarding vibration, no exceedances of the conservative damage criterion are predicted as a result of the proposed construction equipment. Although the potential for nuisance vibration effects is predicted at the building facades, these effects are temporary and would not to persist throughout the construction process. Additionally, the vibration levels were assessed at the exterior building façades and are, therefore, conservative as they do not reflect the building damping and attenuation effects.

Although temporary exceedances of the CEQR noise and vibration criteria are predicted, they would not persist due to the widespread use of BMPs and the temporary or sporadic duration of impact devices such as pile drivers and hoe rams. During construction, BMPs, such as acoustical curtains or other limp mass barriers hung from temporary trusses along Battery Place, would minimize noise from construction activities for all residences north of the park. Similarly, during the construction of NSI drainage improvements within the DEP sewer system along Little West Street and the installation of the tidegate at Rector Place, acoustical curtains applied to perimeter fencing would minimize temporary noise impacts. Finally, equipment enclosures or shrouds are used to eliminate or minimize noise from exposed stationary equipment. Vibration impacts from pile drivers would be minimized by substituting impact devices with less vibratory equipment such as augers. With the implementation of BMPs and the limited use of impact devices, there would be no significant adverse noise and vibration impacts during construction.

Methodology

The construction impacts were evaluated using the guidelines set forth in the *CEQR Technical Manual* Chapter 19 (Noise) and Chapter 22 (Construction). Construction equipment levels were determined using the *Noise Control Code* or Local Law No. 113. Vibration equipment source levels and methodologies were utilized using the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment*.[6] Potential building cosmetic damage was assessed using the NYSDOT's *EI 05-044*.[7] Construction scenarios, equipment usage and staging were developed by the project team using conservative yet realistic estimates. The methodology and approach were presented to and approved by BEPA.[8]

Noise

Sound is a fluctuation in air pressure. Sound pressure levels are measured in units called decibels (dB). The particular character of the sound that we hear is determined by the speed or frequency at which the air pressure fluctuates. Frequency defines the oscillation of sound pressure in terms of cycles per second. One cycle per second is known as one Hertz (Hz). People can hear over a relatively limited range of sound frequencies, generally between 20 Hz and 20,000 Hz, and the human ear does not perceive all frequencies equally well. High frequencies are more easily discernible and therefore more intrusive than many of the lower frequencies.

In order to establish a uniform noise measurement that simulates people's perception of loudness and annoyance, the decibel measurement is weighted to account for those frequencies most audible to the human ear. This is known as the A-weighted sound level (dBA) and it is the descriptor of noise levels most often used for community noise assessment. As shown in **Table 3.15-12**, the threshold of human hearing is defined as 0 dBA; very quiet conditions (as in a library or rural area at night) are approximately 40 dBA; levels between 50 dBA and 70 dBA define the range of noise levels generated by normal daily activity; levels above 70 dBA would be considered noisy, and then loud, intrusive, and deafening as the scale approaches 130 dBA.

[7] New York State Department of Transportation, Engineering Instruction (EI) 05-044, "Special Specification for Building Condition Survey(s) and Vibration Monitoring (Nonblasting)", Geotechnical Engineering Bureau, December 23, 2005.

[8] NYCDEP, BEPA, March 3, 2021.

Table 3.15-12: Noise Levels of Common Sources

Sound Source	SPL (dBA)
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area	70
Typical Suburban Area	60
Quiet Suburban Area at Night	50
Typical Rural Area at Night	40
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0

Note: CEQR Technical Manual, Chapter 19, *Noise*, Table 19-1.

Noise is defined as unwanted or excessive sound, and can interfere with sleep, work, relaxation, and/or recreation. The extent to which noise interferes with daily activities is based on noise duration, loudness, noise frequency, time of day, and personal preferences. Overall, noise can affect the quality of life.

In considering these values, it is important to note that the dBA scale is logarithmic, meaning that each increase of 10 dBA describes a doubling of perceived loudness. Thus, the background noise in an office at 50 dBA is perceived as twice as loud as a library at 40 dBA. For most people to perceive an increase in noise, it must be at least 3 dBA. At 5 dBA, a change in noise level would be readily noticeable.

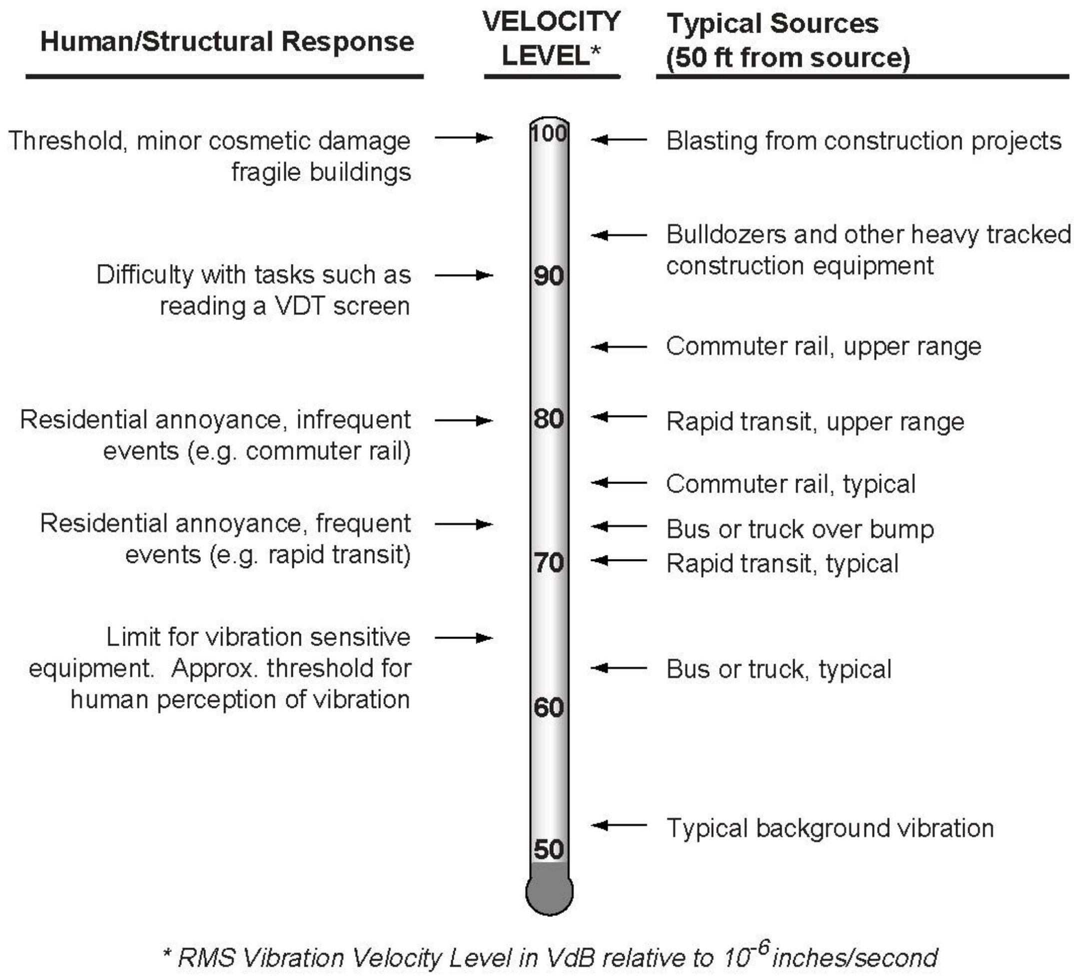
Vibration

Ground-borne vibration associated with construction activity is usually the result of pounding or dropping of heavy equipment elements. Examples of such interactions (and subsequent vibrations) include clam shovel drops, pile driver pounding and hoe ram impacts. Typical ground-borne vibration levels from construction and other common sources are shown on **Figure 3.15-6**.

Unlike noise, which travels in air, vibration typically travels along the surface of the ground. The geological properties of the surrounding terrain and the type of building structure exposed to vibration can affect the level of vibration propagation within the building. For example, buildings with a solid foundation set in bedrock experience relatively higher vibration levels than buildings located in sandier soil. Heavier buildings (such as masonry structures) are less susceptible to vibration than wood-frame buildings because they absorb more vibration energy.

Vibration induced by passing vehicles or construction equipment can generally be discussed in terms of displacement, velocity, or acceleration. However, human responses and responses by monitoring instruments and other objects are most accurately described in terms of velocity. Therefore, the vibration velocity level is used to assess vibration impacts from construction projects.

Figure 3.15-6: Typical Ground-Borne Vibration Levels



Source: FTA, September 2018.

To describe the human response to vibration, the average vibration amplitude (called the root mean square [RMS] amplitude) is used to assess nuisance impacts. The RMS velocity level is expressed in inches per second (ips) or vibration velocity levels in decibels (VdB). Similar to noise decibels, vibration decibels are dimensionless because they are referenced to one micro-inch per second (μips). This convention allows compression of the scale over which vibration occurs, such as 40 to 100 VdB rather than 0.0001 ips to 0.1 ips. To assess potential for building structural damage, however, the peak particle velocity (or PPV) is used in monitoring of construction vibration since it is related to the stresses that are experienced by buildings rather than human annoyance. PPV is the maximum instantaneous positive or negative peak of the vibration signal and is expressed in inches per second.

Regulatory Context

Projects constructed in New York City are subject to the following noise regulations:

- New York City *Noise Control Code* or Local Law No. 113 of 2005; and,
- Rules of New York City, Title 15 NYCDEP, Chapter 28 *Citywide Construction Noise Mitigation*

During construction, according to Chapter 22 of the *CEQR Technical Manual*, a quantitative assessment of noise impacts from construction activities is likely not warranted if the project's construction activities:

- are considered short term with the duration expected to last less than 24 months;
- are not located near sensitive receptors; and,
- do not involve the construction of multiple buildings where there is a potential for cumulative impacts from different buildings under simultaneous construction before the final build-out.

If a project meets one or more of the criteria above or if one of the above criteria is unknown at the time of review, a noise assessment may be required with a further consideration of various factors. Additional factors for consideration include the types of construction equipment (e.g., gas, diesel, electric), the nature and extent of any commitment to use the BAT for construction equipment, the physical relationship of the project site to nearby sensitive receptors, the type of construction activity, and the duration of any heavy construction activity.

Noise

The SBPCR Project is scheduled to take place during a time span of 24 months for all stages of construction. Additionally, all of the major tasks are expected to occur in proximity to sensitive receptors. Therefore, a quantitative construction noise assessment was conducted in accordance with *CEQR Technical Manual* Chapters 19 and 22. In accordance with *CEQR Technical Manual* Chapter 19 and 22, an average hourly noise level ($L_{eq(1)}$) threshold of 65 dBA was applied to all noise-sensitive receptors. In accordance with CEQR Chapter 19, Section 410 "Impact Thresholds at Receptors", the operational noise criteria of 3-5 dBA over the No-Action noise levels was applied. This allowable increase in noise is based on the future cumulative noise level of 65 dBA whereby:

- 5 dBA increase – No-Action levels are less than or equal to 60 dBA;
- 4 dBA increase – No-Action levels are equal to 61 dBA; and,
- 3 dBA increase – No-Action levels are greater than or equal to 62 dBA.

To determine potential significant adverse impacts caused by the construction activity, the construction noise impacts are initially compared to these criteria. If exceedances of those criteria are predicted, then supplemental factors would also be considered (such as the affected area, the magnitude and the duration of impacts) in the final determination of whether an impact is significant or not to account for the temporary and transient nature of construction impact.

Several of the closest residential buildings include balconies and other outdoor land-uses, accordingly the exterior noise levels are proposed as the primary approach to assess the level of impact.

Vibration

The *CEQR Technical Manual* (CEQR Chapter 22 Section 710) recommends using a conservative criterion for a significant adverse impact of 0.5 in/sec to assess minor cosmetic or structural damage at historic structures from construction activities.[9] For all other non-historic buildings, cosmetic damage would be assessed using a limit of 2.0 in/sec as recommended in NYSDOT's EI 05-044.[10] Similarly, the FTA *Manual* recommends using the threshold of 72 VdB for residences (75 VdB for institutional land-uses) to assess nuisance impacts from active or frequently occurring construction activities.

Modeling Assumptions

The various noise and vibration modeling assumptions, reference levels for each of the proposed construction equipment sources and usage factors are described herein. These data are based on default *CEQR Technical Manual* data as well as data developed for this project. Supplemental support information (such as variation in monthly activity levels) is based on information developed for other recent construction projects, such as the ESCR Project and the BMCR Project.

Construction noise was assessed using the prediction methods outlined in the FHWA's *Highway Construction Noise Handbook* and codified in the FHWA *Roadway Construction Noise Model* (RCNM). The *Noise Control Code* and the *CEQR Technical Manual* guidelines utilize the same construction equipment reference noise levels as the FHWA RCNM. These references include maximum noise emission levels (L_{max}) and equipment usage factors, which were then used to predict $L_{eq(1)}$ noise levels at a given distance. Concurrent noise sources for each stage of construction were added logarithmically and compared to the applicable noise standards outlined above.

Noise and vibration modeling assumptions for this analysis include the following:

- The estimated inventory of proposed construction equipment types and quantities expected for each activity are described in more detail in **Appendix F** (Noise Analysis Input);
- The noise levels and usage factors for each of the equipment types selected for each major task are based on the inventory included in the CEQR Chapter 22 "Noise Emission Reference Levels" (Table 22-1);
- A screening assessment was conducted to identify the closest noise-sensitive receptors in the vicinity of the Study Area;
- Using the FHWA's noise modeling guidance, noise levels were determined for each equipment type, activity level and phase of construction;
- Cumulative noise levels were computed using the estimated quantity of equipment and usage factor. These maximum noise levels were adjusted to reflect source-receptor distances for each applicable construction activity;
- No adjustments were applied for acoustically 'soft' ground. This applies to both ground-level and elevated receptors;
- Consistent with other similar recent DEP projects, the CEQR default usage factors were applied for all construction activities during a standard 8-hour work shift;
- In accordance with the CEQR Chapter 28, *Citywide Construction Noise Mitigation*, the predicted noise levels reflect noise control measures or BMPs as summarized in Table 3.15-13. Although the final noise control measures would need to be developed by the selected contractor as part

[9] New York City Department of Buildings, Technical Policy and Procedure Notice (TPPN) #10/88, June 6, 1988.

[10] New York State Department of Transportation, Engineering Instruction (EI) 05-044, "Special Specification for Building Condition Survey(s) and Vibration Monitoring (Nonblasting)", Geotechnical Engineering Bureau, December 23, 2005.

of their required CPP submittals, the BMPs identified in Table 3.15-13 would reduce any potential temporary impacts predicted during construction. All of these BMPs are intended to be temporary, portable, and flexible in their application. The primary BMPs that can be reasonably applied and would reduce overall noise levels by 10 decibels include:

  - noise barriers
  - equipment enclosures and shrouds
  - effective mufflers
  - operational modifications to limit noise exposure at sensitive receptors (such as relocating louder equipment away from residences and selecting a straight drive-through truck route to avoid use of backup alarms);

- Effects of construction and delivery vehicles traveling to and from the site were not evaluated due to the low level of truck traffic compared to the existing traffic levels;
- Maximum vibration levels were developed using the same assumptions for construction equipment as were utilized for the noise analysis;
- Reference vibration levels from the FTA *Manual* were also adjusted to reflect source-receptor distances for each applicable construction activity with no adjustments for soft ground or building coupling attenuation effects; and

As summarized in **Appendix F** (Noise Analysis Input), maximum noise and vibration levels were developed for each of the discrete construction activities on a monthly basis, each with their own equipment and operating conditions.

Table 3.15-13: Construction Noise Control Best Management Practices

No.	Reference	Type	Description
1	28-101a	Practice	Equipment is self-certified to operate at manufacturer's specifications.
2	28-101b	Practice	Equipped with original equipment manufacturers (OEM) muffler.
3	28-101c	Practice	Engine housing doors are closed and properly insulated.
4	28-101d	Practice	Compressors, generators, pumps, etc. are covered with noise-insulating fabric.
5	28-101e	Practice	Prevent vehicle engine idling while onsite.
6	28-101f	Practice	Utilize quieter backup alarms.
7	28-101g	Practice	Provide construction fence or perimeter barrier if there are noise-sensitive receptors within 200'.
8	28-101h	Practice	Implement a noise-training program for all field workers.
9	28-101i	Practice	Cooperate with nearby noise-sensitive facility owners to minimize impacts on the facilities.
10	28-101j	Practice	DEP inspection of the construction site to verify compliance with Noise Mitigation Plan.
11	28-101k	Practice	construction activities are only allowed daytimes 7:00 am to 6:00 pm.
12	28-101l	Practice	fabricate temporary or portable barriers for shorter duration activities.
13	28-101m	Practice	for sandblasting activities, line perimeter barriers with noise barrier materials.
14	28-101n	Practice	For shorter duration activities less than 24-hours, apply noise control measures and scheduling changes to not create unreasonable noise.
15	28-102a1a	Impact Equipment	Pile Drivers – source controls: quieter models, mufflers, substitutions, impact cushions, noise bellows
16	28-102a1b		Pile Drivers – pathway controls: barriers, shields, shipping containers
17	28-102a2a		Jackhammers – source controls: quieter models, elongated mufflers, smaller substitutions
18	28-102a2b		Jackhammers – pathway controls: portable barriers, jersey barriers, portable enclosures, noise tents
19	28-102a3a		Hoe Rams – source controls: quieter models, smaller models, noise shroud, skilled operators, alternative methods
20	28-102a3b		Hoe Rams – pathway controls: portable noise barriers, alternative barriers, shipping containers
21	28-102a4a		Blasting – source controls: reduce charge size, slower burning explosives
22	28-102a4b		Blasting – pathway controls blast mats, portable barriers
23	28-102b1a	Earth Moving Devices	Vacuum Excavators – source controls: smaller capacity vac-trucks, operate at lower power setting, air intake & exhaust silencers, blower enclosure/housing
24	28-102b1b		Vacuum Excavators – pathway controls: portable noise barriers, portable noise shields, alternative barriers such as shipping containers, operational modifications
25	28-102c1a	Construction Trucks	Dump Trucks – source controls: smaller size, rubberized bed liner, quieter European models, operational modifications, quieter backup alarm, effective muffler, avoid slamming tailgate, close engine housing
26	28-102c1b		Dump Trucks – pathway controls: portable barriers, noise curtains, position trucks away from sensitive receptors, use conveyor belts, alternative barriers, shipping containers
27	28-102d1a	Stationary Devices	Cranes – source controls: smaller quieter cranes, rubber-tired models, hydraulic vs. mechanical cranes, quieter European models, tower cranes vs. mobile cranes, effective muffler
28	28-102d1b		Cranes – pathway controls: portable barriers, noise curtains, noise shields, alternative barriers, shipping containers

No.	Reference	Type	Description
29	28-102d2a		Auger Drills – source controls: effective muffler, lubricate parts to avoid squeaking, remove debris on drill bit with water hose or shovel rather than quick twisting, jerking, or hammering the drill bit
30	28-102d2b		Auger Drills – pathway controls: portable barriers, noise curtains, alternative barriers, shipping containers
31	28-102d3a		Street Plates – source controls: install with level and smooth transition from pavement, secure plates firmly, apply asphalt cold-patch around edges
32	28-102d3b		Street Plates – pathway controls: route traffic around street plates
33	28-102d4a		Backup Alarms – source controls: quieter devices
34	28-102d4b		Backup Alarms – pathway controls: operational modifications to avoid use, portable barriers, alternative barriers, shipping containers
35	28-102e1a	Manual Devices	Concrete Saws – source controls: smaller saws, quieter saw blade such as a grinding blade
36	28-102e1b		Concrete Saws – pathway controls: portable barriers, noise enclosures, noise tents

Source: CEQR Chapter 28, *Citywide Construction Noise Mitigation.*

Affected Environment

To determine the existing background noise levels at sensitive receptors near the Study Area, a noise-monitoring program was conducted at five representative locations shown in **Figure 3.15-7**. Short-term noise measurements were conducted at various times of the morning, midday and evening periods to establish the range of baseline ambient conditions. Measurements were conducted during both peak and off-peak periods to document a range of ambient levels. However, the morning and midday periods were utilized to determine potential impacts of the SBPCR Project as construction activities are expected to finish before the evening peak period. Typically, traffic noise decreases during peak periods due to slower speeds as a result of increased congestion. The short-term noise measurements documented existing noise sources in the vicinity of the Study Area, including arterial traffic along Battery Place, Battery Park Underpass and the Hugh L. Carey Tunnel access and egress roads. The dominant source of noise at each monitoring location is the surface traffic along local streets.

As shown in **Table 3.15-14**, peak-hour noise levels measured at receptors near the Study Area range from 57 dBA at residences at 50 Battery Place (Site 1) to 70 dBA at the National Museum of the American Indian at 1 Bowling Green (Site 3) and residences along Little West Street (Site R4). All of these one-hour noise levels are representative of active downtown urban land uses adjacent to local streets.

The sound-level meter that was used to measure current noise conditions (Larson Davis Models LxT) meets or exceeds the ANSI standards for Type I accuracy and quality. The sound-level meter was calibrated using a Larson Davis Model Cal200 before each measurement period. All measurements were conducted according to *ANSI Standard S1.13-2005, Measurement of Sound Pressure Levels in Air* (March 5, 2010). All noise levels are reported in dBA, which best approximates the sensitivity of human hearing.

Environmental Impacts

The temporary noise and vibration effects associated with short term construction activities are described in the following subsections.

Figure 3.15-7: Noise Monitoring Sites in the SBPCR Study Area

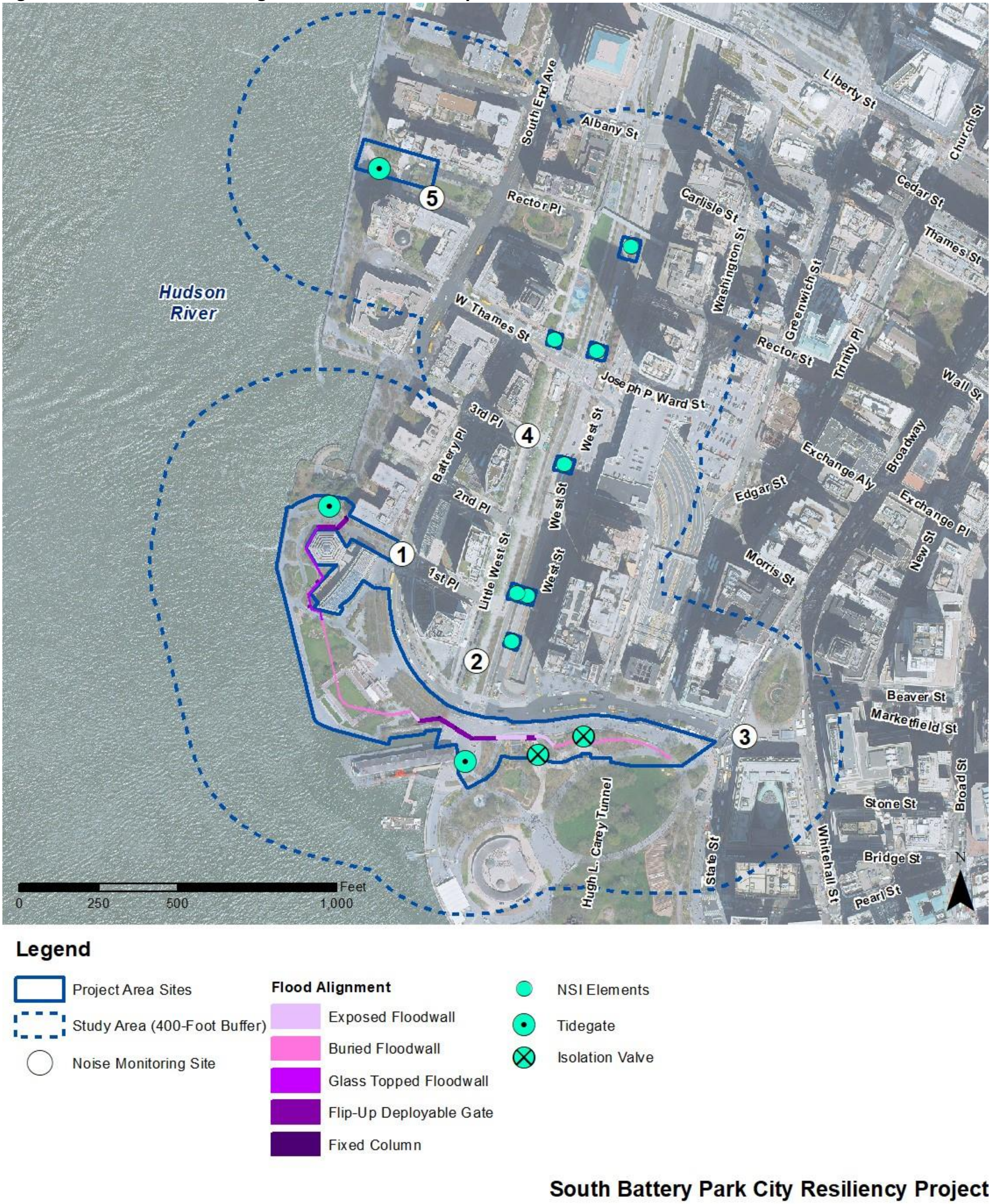


Table 3.15-14: Existing Noise Levels Measured at Representative Receptors (in dBA)

Rec	Location	Period	Date	Time	Duration	CAL[1]	L_{eq}[11]	L_{min}[12]	L_{max}[13]	L_1[14]	L_{10}[15]	L_{50}[16]	L_{90}[17]
1	South Cove Plaza Residences, 50 Battery Place	AM	02/25/21	8:51 AM	20 min	94.0	60	56	76	65	61	59	58
		MD	02/25/21	12:50 PM	30 min	94.0	57	53	76	65	58	55	54
		PM	02/25/21	5:06 PM	30 min	94.0	57	52	74	65	58	55	54
2	The Wagner (formerly the Ritz-Carlton), 10 West Street	AM	01/21/21	6:59 AM	30 min	94.0	66	57	83	74	68	64	61
		MD	01/21/21	12:07 PM	30 min	93.8	64	57	84	72	65	62	60
		PM[2]	01/21/21	12:07 PM	30 min	93.8	64	57	84	72	65	62	60
3	National Museum of the American Indian, 1 Bowling Green	AM	01/21/21	7:45 AM	30 min	94.1	70	59	86	79	73	67	62
		MD	01/21/21	11:30 AM	30 min	94.1	68	57	89	78	71	64	61
		PM[2]	01/21/21	11:30 AM	30 min	94.1	68	57	89	78	71	64	61
4	The Visionaire Residences, 70 Little West Street	AM	02/25/21	8:06 AM	30 min	94.0	70	61	107	76	69	66	64
		MD	02/25/21	1:25 PM	30 min	94.0	64	55	86	72	65	62	60
		PM	02/25/21	5:40 PM	30 min	94.0	63	56	76	70	66	62	59
5	Liberty Residences, 200 Rector Place	AM	02/25/21	6:56 AM	30 min	94.1	62	53	82	71	64	60	56
		MD	02/25/21	12:13 PM	30 min	94.1	62	52	82	73	63	57	54
		PM	02/25/21	4:26 PM	30 min	94.1	57	50	69	63	59	56	54

Note: Noise measurements were conducted during various periods of the daytime that correspond with the proposed construction periods including morning (AM), midday (MD) and afternoon (PM).
1 CAL represents the calibration level of the sound level meter at the time of the measurement.
2 Based on observations in the field, the afternoon measurement is estimated using the midday measurement.

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[11] *L_{eq} – is the continuous equivalent sound level, defined as the single SPL that, if constant over a stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period.*

[12] *L_{min} – the minimum sound level measured over a period of time.*

[13] *L_{max} – the maximum sound level measured over a period of time.*

[14] *L_1 – the SPL exceeded 1 percent of the time, is usually regarded as the average maximum noise level when readings are an hour or less in duration.*

[15] *L_{10} – is usually regarded as an indication of traffic noise exposure with a steady flow of evenly-spaced vehicles.*

[16] *L_{50} – provides an indication of the median sound level.*

[17] L_{90} – *is usually regarded as the residual level, or the background noise level without the source in question or discrete events.*

No Action Condition

The Study Area is characterized by a mix of both urban residential and mixed-use retail-commercial land-uses whose noise and vibration exposure is currently dominated by arterial traffic along Battery Place, Battery Park Underpass and the Hugh L. Carey Tunnel access and egress roads.

Future noise and vibration levels for the No Action Condition would be similar to existing conditions. The areas in the vicinity of the Study Area are affected by motor vehicle traffic along local streets that contribute to the ambient noise and vibration levels. Other ambient activities include the Liberty Island Ferry and leisure activities at The Battery. The No Action Condition would not cause any new noise or vibration impacts because no construction (of the SBPCR Project) is proposed.

In terms of No Action projects, two other resiliency projects are planned in the Study Area: The Battery Coastal Resilience Project (NYCEDC) and the Battery Park Tunnel and West Street Tunnel Resiliency Project (NYCDOT). Any noise or vibration impacts predicted during temporary construction activities from these projects would be mitigated as required by NYCDEP.

Proposed Action

Noise and vibration levels from construction activities in the Study Area, although temporary, could be a nuisance at nearby sensitive receptors such as residences, schools and other institutional land-uses. Although the construction of the NSI system is expected to last 13 months, construction of other project components (e.g., Wagner Park, The Battery, etc.) are expected to last approximately 24 months. During this time frame, temporary noise and vibration impacts would occur in the Project Area, particularly at sensitive receptors along Battery Place. Potential noise and vibration impacts during temporary construction activities would be minimized or controlled to the extent practicable with BMPs. As described previously and in accordance with CEQR Chapter 22 *Construction* (Section 500), BMPs for limiting construction noise impacts may include noise barriers, use of low noise emission equipment, locating stationary equipment as far as feasible away from receptors, use of area enclosures, limited duration of activities, use of quiet equipment, or substituting diesel equipment with electric-powered equipment, scheduling of activities to minimize impacts (based on either time of day or seasonal considerations), and locating noisy equipment near natural or existing barriers that would shield sensitive receptors. The contractor would be required by contract to use noise and vibration control measures (such as substituting equipment with lower noise levels, temporary barriers, exhaust mufflers, equipment enclosures, etc.) to minimize the impact on the surrounding community. In accordance with the requirements established by CEQR Chapter 28, *Citywide Construction Noise Mitigation*, the selected contractor would need to comply with the local noise ordinances to the maximum extent practicable with regard to work within the Project Area.

However, in order to expedite construction to reduce road closures and diversions during construction, work could take place outside specified local noise ordinance work hours. In cases where work is performed outside specified work hours in locations adjacent to residential neighborhoods, every effort would be made to keep intrusive noise and vibration to a minimum. For any necessary night work, for example, there would be extensive consultation with the community to minimize the effects of construction noise and vibration. BPCA is committed to implementing a community noise and vibration monitoring program, working with local businesses and the affected communities to schedule nearby construction activity as unobtrusively as practicable and feasible, and implementing a CPP to protect any historic architectural resources from vibration impacts.

Noise

Noise levels during construction would vary depending on the types of activity and equipment used for each stage of work and the location of the activity. Heavy machinery, the major source of noise in construction, would be constantly moving and stationary equipment would be required to include sound-suppression devices such as mufflers, shrouds or other noise-control measures. This analysis makes conservative assumptions regarding construction noise and vibration so that potential maximum impacts are analyzed and disclosed consistent with CEQR requirements Chapter 22, *Construction*. Due to the variability of the construction activities and resultant noise levels, a range of noise levels of sometimes over 30 decibels between the minimum and the maximum are presented. Although impact is assessed based upon the maximum potential impact, the actual level of construction noise would be considerably lower. Conservative or worst-case assumptions (such as the use of pile drivers) were applied based on the availability and accuracy of the proposed construction equipment, activities and operating schedules during this initial phase of the project. However, BMPs applied by the contractor (such as vibratory pile drivers or augers) would minimize any potential noise impacts in the community.

Noise and vibration levels were determined for various construction stages and equipment proposed for use on the Proposed Action. These reference levels reflect the maximum allowable levels based upon CEQR Chapter 22 *Construction*, the New York City Noise Control Code (Local Law 113 of 2005) and Chapter 28 of Title 15 of the Rules of the City of New York, *Citywide Construction Noise Mitigation*. For example, reference maximum noise levels (or Lmax) at a distance of 50 feet range from 55 dBA for a pickup truck to 80 dBA for a backhoe to 90 dBA for a mounted impact driver (or hoe ram) to 93 dBA for clam shovel dropping.

The construction equipment projections shown in **Appendix F** (Noise Analysis Input) reflect the average daily variation in construction activities estimated for each phase of construction. Since the level of noise produced by construction fluctuates throughout the days and months of the construction period, maximum or worst-case noise reflects the period with the peak construction activity. By comparing the noise effects from different construction scenarios and operating conditions over the entire construction period, the peak noise impact was determined.

The results of the detailed construction noise analysis are summarized in **Table 3.15-15** for the receptors closest to the Project Area (shown in **Figure 3.15-8**). The maximum predicted noise levels shown in **Table 3.15-15** would occur during the most noise-intensive activities of construction, which typically do not occur every hour or even every day. During hours when the loudest pieces of construction equipment (e.g., pile driver, hydraulic break ram) are not in use, receptors would experience significantly lower construction noise levels. As described above, construction noise levels would fluctuate during the construction period at each receptor, with the greatest levels of construction noise occurring for limited periods during construction. Where exceedances of the impact criteria are predicted, BPCA is committed to implementation of BMPs in accordance with Chapter 28 *Citywide Construction Noise Mitigation*.

Table 3.15-15: Construction Noise Analysis Results (in dBA)

Receptor			Measured	Existing	Build	Future	Change
ID	**Address**	**Land use**	**Receptor**	**Condition**	**Alternative**	**(EX + BD)**	**(BD – EX)**
1	50 Battery Place	RES	1	57 - 60	49 - 74	58 - 74	1 - 14
2	2 Little West St	RES	2	64 - 72	46 - 73	64 - 76	0 - 4
3	1 Bowling Green	MUS	3	68 - 70	43 - 70	68 - 73	0 - 3
4	70 Little West Place	RES	4	63 - 70	47 - 68	63 - 72	0 - 2
5	300 Rector Place	RES	5	57 - 62	44 - 63	57 - 66	0 - 4
6	36 Battery Place	RES	1	57 - 60	48 - 74	58 - 74	1 - 14
7	17 Battery Place	RES	2	64 - 72	45 - 71	64 - 75	0 - 3
8	30 Little West Street	RES	2	64 - 72	48 - 68	64 - 74	0 - 2
9	39 Battery Place	RES	2	64 - 72	47 - 74	64 - 76	0 - 4
10	28 Washington Street	RES	2	64 - 72	46 - 70	64 - 74	0 - 2
11	1 Broadway	RES	3	68 - 70	44 - 69	68 - 73	0 - 3
12	Washington Street and Battery Place	RES	3	68 - 70	45 - 71	68 - 74	0 - 4
13	Battery Place between Greenwich and Broadway	RES	3	68 - 70	44 - 72	68 - 74	0 - 4
14	Greenwich Street and Battery Place	RES	3	68 - 70	45 - 70	68 - 73	0 - 3
15	One Battery Park Plaza	RES	3	68 - 70	42 - 64	68 - 71	0 - 1
16	11 Greenwich Street	RES	3	68 - 70	45 - 72	68 - 74	0 - 4

Receptor			Measured	Existing	Build	Future	Change
ID	**Address**	**Land use**	**Receptor**	**Condition**	**Alternative**	**(EX + BD)**	**(BD – EX)**
17	99 Battery Place	RES	4	63 - 70	46 - 70	63 - 73	0 - 3
18	50 West Street	RES	4	63 - 70	44 - 67	63 - 72	0 - 2
19	377 Rector Place	RES	5	57 - 62	43 - 75	57 - 75	0 - 13
20	380 Rector Place	RES	5	57 - 62	44 - 69	57 - 70	0 - 8

Note: The 'Build Alternative' represents the predicted noise levels for the construction only. The 'Future (EX + BD)' represents the future combined noise levels for both the existing and the new construction. The 'Change (BD – EX)' represents the future increase over the measured existing levels.

Figure 3.15-8: Noise Modeling Sites in the Study Area

Source: AECOM, October 2021.

Receptor

As shown in **Table 3.15-15**, maximum exterior construction noise levels are predicted to range from 42 to 75 dBA resulting in noise level increases between 1 to 14 dBA during the most noise-intensive stages of construction. Receptors immediately adjacent to the proposed construction (such as R1, R6 and R19, residences at 50 Battery Place, 36 Battery Place and 377 Rector Place, respectively) would experience the highest noise levels. During all other times, the future construction noise levels are predicted to be below the CEQR interior threshold. The predicted noise levels from the construction activities would not result in significant noise operational impacts due to the required use of multiple BMPs and the limited duration of the use of impact construction equipment such as pile drivers, hoe rams and jackhammers.

The expected levels of noise are typical of New York City construction projects in residential areas and would comply with all New York City *Noise Control Code* and NYCDOB restrictions on construction noise. According to *CEQR Technical Manual* noise exposure criteria, noise levels at these receptors would at times during the construction period be in the "marginally unacceptable" range during the most noise-intensive period of construction and in the "marginally acceptable" range throughout the remainder of construction.

While these noise level increases would be noticeable, noise levels in the low to mid 70s dBA are typical for areas along heavily trafficked avenues such as Battery Place and West Street.

During the 24 months of construction, the activity that would produce the highest noise levels would be activities that utilize pile drivers and impact hammers. Consequently, the maximum noise levels predicted by the construction noise analysis would not persist throughout the construction period. Construction noise levels occurring during activities other than pile driving and impact hammering would still be audible, but their noise levels would be similar to or slightly above the measured existing background. In other words, the noise levels associated with non-impact construction equipment would be substantially lower than the maximum levels predicted for pile drivers and impact hammers. For the majority of the construction period, noise levels at residences and businesses adjacent to the Project Area would be perceptibly lower by 10-15 dBA as depicted in **Table 3.15-15**. The predicted levels represent maximum or peak construction noise with equipment controls that reflect reasonable BMPs described in the methodology and **Table 3.15-13**. Finally, if nighttime or weekend construction is required, project noise levels would be significantly lower due to the decrease in intensity compared to the weekday activity levels.

For all of the reasons stated above, construction noise associated with the Proposed Action would not result in a significant adverse impact.

Vibration

Unlike noise, which is assessed using cumulative noise levels over a one-hour period, vibration impacts are assessed based on individual events, such as a banging or pounding. Similar to noise, projected vibration levels during construction would be dominated by equipment causing instantaneous impacts including pile drivers, vibratory rollers and impact hammers or hoe ram activity. Little to no impact would occur from heavy trucks and front-end loaders since pneumatic tires and suspension systems eliminate most ground-borne vibration except very close to the construction activity. Due to the types of construction equipment expected and the location of the activities, there would be no structural or cosmetic damage at any of the closest residences.

As shown in **Table 3.15-16**, the maximum vibration levels from all construction activities for each of the proposed construction tasks are predicted to range from 0.008 in/sec at 300 Rector Place and 165 Russek Drive (Sites 5 and 15, respectively) to 0.059 in/sec at 377 Rector Place (Site 19). Vibration levels at all of the closest buildings and structures to the proposed construction activities would be below the NYSDOT 2.0 in/sec damage threshold. There were no historic buildings identified within the immediate vicinity of the proposed Project Area that would warrant use of the CEQR 0.5 in/sec damage threshold. Due to the distance between the proposed construction equipment and receiving buildings, vibration would not approach the levels that would have the potential to result in cosmetic or structural damage.

Table 3.15-16: Construction Vibration Analysis Results

Receptor			Damage			Nuisance		
			PPV		Criteria	VdB		Criteria
ID	Address	Land use	Min	Max	in/sec	Min	Max	VdB
1	50 Battery Place	RES	0	0.054	0.5	37	**83**	72
2	2 Little West St	RES	0	0.033	0.5	33	**78**	72
3	1 Bowling Green	MUS	0	0.019	0.5	29	73	75
4	70 Little West Place	RES	0	0.03	0.5	38	**77**	72
5	300 Rector Place	RES	0	0.008	0.5	32	65	72
6	36 Battery Place	RES	0	0.055	0.5	36	**83**	72
7	17 Battery Place	RES	0	0.026	0.5	32	**76**	72
8	30 Little West Street	RES	0	0.028	0.5	36	**77**	72
9	39 Battery Place	RES	0	0.032	0.5	35	**78**	72
10	28 Washington Street	RES	0	0.039	0.5	33	**80**	72
11	1 Broadway	RES	0	0.017	0.5	30	**73**	72
12	Washington Street and Battery Place	RES	0	0.024	0.5	31	**75**	72
13	Battery Place between Greenwich and Broadway	RES	0	0.031	0.5	30	**78**	72
14	Greenwich Street and Battery Place	RES	0	0.022	0.5	32	**75**	72
15	One Battery Park Plaza	RES	0	0.008	0.5	27	65	72
16	11 Greenwich Street	RES	0	0.027	0.5	31	**77**	72
17	99 Battery Place	RES	0	0.043	0.5	37	**80**	72
18	50 West Street	RES	0	0.025	0.5	34	**76**	72
19	377 Rector Place	RES	0	0.059	0.5	31	**83**	72
20	380 Rector Place	RES	0	0.02	0.5	32	**74**	72

Note: **Bold shaded** values represent an exceedance of the project impact criteria.

In terms of potential vibration levels that could contribute to a nuisance (i.e., perceptible and annoying), the pieces of equipment that would have the most potential for producing levels that exceed the 72 VdB limit are the pile driver, hoe ram and any other high-impact equipment (e.g., clam shovel drops). As shown in **Table 3.15-16**, this equipment would produce perceptible vibration levels (i.e., vibration levels exceeding the FTA nuisance thresholds) at several residences within a distance of approximately 135 feet. However, since all of these residences are indoor land-uses, the actual vibration levels would be approximately 10 VdB lower to reflect the building's coupling loss due to the structural dampening and attenuation effects. BPCA is committed to implementation of BMPs in accordance with Chapter 28 *Citywide Construction Noise Mitigation* to further reduce the effects of construciton vibration. BMPs for vibration that could be implemented include:

- Modify construction methods to utilize smaller equipment for rock breakers or impact hammers.
- Replace traditional pile driving activities with the following:
  - Predrill or prejet the pile holes.
  - Substitute displacement piles with non-displacement ones.
  - Utilize vibratory pile drivers.
  - Replace driven piles with cast-in-place or drilled shafts.
- Utilize small weights during dynamic compaction.
- Establish safe buffer zones to create larger distances between equipment and nearby sensitive receptors.
- Apply time restrictions for the most excessive vibration activities by performing vibration-heavy activities during the daytime shift or the midday period rather than during the early morning or late evening periods.

For all of the reasons stated above, construction vibration associated with the Proposed Action would not result in a significant adverse impact.

3.15.3.4 Historic and Cultural Resources

Where an action may result in ground disturbances or vibrations to the foundation or structural integrity of nearby cultural resources, a preliminary assessment would be required.

Historic Architectural Resources

There are 28 historic architectural resources situated within the Historic Architectural APE, which forms a 400-foot buffer around the Project Area and project alignment. As indicated in Section 3.4 (Historic and Cultural Resources), there are three impact findings under Section 14.09, including No Impact, No Adverse Impact, and Adverse Impact.

Impact summaries are provided in Table 3.4-3. The Proposed Action would have an Adverse Impact on one resource, Wagner Park. Therefore, a LOR would be drafted between BPCA and SHPO that would include agreed upon stipulation measures to mitigate the Adverse Effect. With respect to the remaining 27 resources, the project would result in No Adverse Impact on nine resources, and No Impact on 18 resources.

Two resources for which the Proposed Action would have No Adverse Impact require coordination prior to construction as indicated in Section 3.4 (Historic and Cultural Resources). These resources include:

- Pier A
- Castle Clinton National Monument

Pier A is located within 90 feet of the flip-up deployable and nuisance flooding alignment slated for construction in Pier A Plaza. Therefore, it is recommended that a CPP be prepared for Pier A in accordance with the NYCDOB "*Technical Policy and Procedure Notice 10/88: Procedures for the Avoidance of Damage to Historic Structures Resulting from Adjacent Construction When Subject to Controlled Inspection by Section 27-724 and for Any Existing Structure Designated by the Commissioner*," which defines adjacent historic structures as resources that are located contiguous to or within a lateral distance of 90 feet from a lot under development or alteration (Polsky, June 6, 1988).

Because Castle Clinton National Monument is situated within The Battery (Block 3/Lot 1), contiguous to Pier A (Block 1/Lot 16), it is also recommended that a CPP be prepared for Castle Clinton. Although the resource is approximately 200 feet southeast of the Proposed Action in Pier A Plaza, the CPP would ensure that all measures are being undertaken to protect this National Monument during construction on the adjacent lot.

Historic Archaeological Resources

In terms of archaeological resources, a Phase IA archaeological documentary study of the Project Area has been prepared as requested by SHPO and NYC LPC. The primary objective of the Phase IA study was to assess the potential for encountering National Register-eligible archaeological resources within the Archaeological APE. The Phase IA documentary study technical report has concluded that there are discrete areas of potential historic archaeological sensitivity across the APE that may be impacted by the construction of the SBPCR Project. The Phase IA report recommended that a Phase IB Archaeological Monitoring (Plan) be developed. The Phase IA report was be submitted to SHPO and NYC LPC for review and concurrence.

Archaeological resources are subject to direct effects of proposed project actions. Subsurface disturbances associated with excavation, pile driving, utility removal, replacement and installation, and multiple other construction activities necessary for implementation of the SBPCR Project flood alignment and NSI system have the potential to directly impact previously identified as well as potential archaeological resources.

The Archaeological 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. The vertical APE for the flood alignment and its associated project actions varies 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.

The Archaeological APE was researched in the SHPO's CRIS website in compliance with Section 106, SEQRA, and CEQR. According to the research conducted in CRIS, nearly the entire APE lies within an Area of Archaeological Sensitivity.

In compliance with AECOM's initial recommendations and SHPO and NYC LPC concurrence, the Archaeological APE for this Phase IA survey was divided into three sections. These sections are Pier A

Plaza, the northern portion of The Battery adjacent to Battery Place, and the proposed NSI system locations above Battery Place. The three sections that comprise the Archaeological APE were mapped separately and presented in the Phase IA report.

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 results of the Phase IA archaeological assessment indicate that only two discrete areas across the three sections of the Archaeological APE retain archaeological potential. The following brief synopsis of the archaeological potential within the APE is taken from the Phase IA report Chapter 6, Conclusions and Recommendations.

Pier A Plaza

The flip-up deployable portion of the flood alignment in Pier A Plaza below the line of West Street and near the western 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 Battery

The proposed project actions in The Battery portion of the Archaeological APE would not impact potential archaeological resources. The Proposed Action from west to east includes installation of flip-up deployables, sections of 40-inch high security walls, an exposed floodwall including flanking seepage barrier installation, construction of a buried floodwall, and the creation of an earthen berm atop the buried floodwall. The Battery was extensively impacted during the 1950s by cut and cover excavations for the Brooklyn-Battery Tunnel and the Battery Park Underpass, and the eastern portion of the park was most recently impacted by the completion of the New South Ferry Terminal Project during the 2000s.

The flip-up deployables portion of the flood alignment is in proximity to the Battery Park Underpass and was likely disturbed during its construction c. 1950. The security wall elements would be constructed in landfill that has been previously impacted, likely impacted several times and the anticipated 4-foot depth of disturbance is not of archaeological concern. In addition, the depths of the test trenches excavated in 2011 by Joan H. Geismar, Ph.D. exceed the anticipated 4-foot depth of the 40-inch high security wall that may be constructed to the north of the proposed buried floodwall and earthen berm. No significant archaeological resources were encountered during the 2011 testing which was completed in association with the Battery Bikeway Project. An exposed floodwall is proposed to cross the Battery Park Underpass, which would entail installation of a seepage barrier on its east and west sides. This area of the Battery Park Underpass, including the locations for the seepage barriers, was severely impacted during the 20th Century by the initial cut and cover construction of the underpass and does not possess archaeological potential.

The flood alignment continues eastward across The Battery as a bermed floodwall. A section of buried floodwall would be installed below the earthen berm. It is anticipated that the depth of disturbance associated with the buried floodwall would be 4-feet. Actions to construct the earthen berm around the buried floodwall are anticipated to involve subsurface disturbance from 2-feet to 4-feet below the existing ground surface. The depths of the test trenches excavated in 2011 by Joan H. Geismar, Ph.D. mentioned above exceed the anticipated 4-foot depth of disturbance associated with the bermed floodwall. No archaeological resources were encountered in the test trenches, two of which were located within the current Archaeological APE, and one of which was adjacent to the APE.

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 four feet by four feet and be connected to existing mains. Neither isolation valve would create ground disturbance in undisturbed soils.

No further archaeological work is necessary in The Battery portion of the APE.

<u>Near Surface Isolation Locations</u>

Given that the NSI system components would be installed within existing infrastructure connected to the South Interceptor Main, most, if not all, of this section 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 project actions requiring excavation in this portion of the Archaeological APE may expose these portions of the bulkheads for documentation. Phase IB archaeological monitoring during construction is recommended for this portion of the Project Area.

Proposed Next Steps

Preparation of a Phase IB Archaeological Monitoring Plan (Plan) is the next step in the compliance process for the consideration/protection of archaeological resources, as concurred by SHPO in their response letter of January 28, 2022. There are two locations within the Archaeological APE recommended for archaeological monitoring during construction:

- The flip-up deployable portion of the flood alignment in Pier A Plaza below the line of West Street and near the western boundary of The Battery.
- The route of the existing connector main between sanitary connection sewer chamber MH #3 and the sanitary emergency overflow chamber to the west near West Thames Street.

It is anticipated that the Plan would be developed through consultation with BPCA, SHPO, NYC LPC, and other involved state and city agencies. The Plan would identify and map onto the latest design plans the sensitive portions of the Archaeological APE recommended for monitoring during construction, and outline all protocols to be followed.

3.15.3.5 Hazardous Materials

A preliminary assessment for hazardous materials is only necessary if the construction activities are likely to disturb a site or occur adjacent to a site containing hazardous materials. As Section 3.10 (Hazardous Materials) of this DEIS describes construction of the SBPCR Project would involve demolition and excavation activities that would have the potential to disturb hazardous materials in the subsurface and exiting structures. As a result, a preliminary assessment is required for construction impacts to hazardous materials.

Construction of the SBPCR Project would require both demolition and disturbance of existing structures within the Project Area and subsurface disturbance that could encounter contamination within soil and/or fill.

Given the results of the subsurface investigations, hazardous materials are likely to be encountered during construction of the SBPCR Project. Excavation and construction activities could disturb these materials and increase the potential pathways for human exposure if not performed with appropriate safety procedures, air monitoring, and engineering controls. Construction of the SBPCR Project would require rebuilding of manholes, sewer infrastructure, and gate chambers, which, based on their ages could include ACM, LBP, mercury or PCBs. Such demolition would be conducted in accordance with an approved health and safety plan. A RAP has been prepared for the planned construction activities associated with the SBPCR Project and is included in **Appendix D**. The RAP describes the remedial and mitigation measures that will be performed in accordance with all local, state, and federal laws when transporting or disturbing contaminated materials.

A CHASP has been prepared for implementation during construction activities and is included in **Appendix D**. The CHASP proposes measures to ensure that soil is handled appropriately to minimize human contact, and to reduce airborne dust, in order to protect construction workers, site employees and neighborhood residents. Further, excavated soil is suitable to be re-used on-site as fill material; as long as excavated historic fill is backfilled so that it remains in historic fill areas, and covered by either impervious cover or clean fill. Excavated soils may also be disposed of off-site at a facility licensed to accept historic fill contaminated soils and with appropriate analytical documentation.

The Proposed Action would also require import of a large volume of regulated clean fill that would include a final soil cover in accordance with a plan approved by NYCDEP as well as impervious cover (asphalt and/or concrete). This final soil/impervious cover would form a cap providing park users protection from pathways to exposure to any contaminants present below the project construction area.

Although hazardous materials are potentially present in the subsurface (related primarily to historic fill placed along the shoreline to create the property) with the implementation of a variety of measures prior to and during construction (including both testing and health and safety procedures), no significant adverse impacts related to hazardous materials would occur as a result of construction of the SBPCR Project.

Best Management Practices

The potential for significant adverse impacts would be avoided by ensuring that construction activities are performed in accordance with the following protocols:

- Based on the results of the Phase II Limited Site Investigation, a RAP and CHASP has been prepared for implementation during project construction and is included in **Appendix D**. These plans address both the remediation of known and potential environmental conditions that may be encountered during sub-surface disturbance associated with project construction. The purpose of the RAP is to present measures for managing contaminated on-site soil and groundwater and USTs, removing any potentially unknown underground petroleum storage tanks in accordance with applicable federal, state, and local regulations. Contaminated soil management protocols would include guidelines for temporary on-site stockpiling and off-site transportation and disposal. The plans would incorporate safety and other measures to minimize the potential for impacts to the community and construction workers. The RAP also would specify the need for engineering controls as warranted based on the testing, such as the incorporation of vapor mitigation systems into the project design.

- To minimize the potential for impacts to the community and construction workers, all demolition, excavation, and construction work involving soil disturbance may be performed under a site-specific environmental CHASP. The CHASP would also be based on the results of the subsurface investigation study and would specify appropriate testing and/or monitoring, and detail appropriate measures to be implemented (including notification of regulatory agencies, dust suppression techniques, appropriate air monitoring action levels and responses, etc.) if underground storage tanks, soil and groundwater contamination, or other unforeseen environmental conditions are encountered.

- If dewatering is required for construction, testing would be performed to ensure compliance with applicable discharge regulatory requirements. If necessary, pre-treatment would be conducted prior to discharge.

- Unless there is labeling or test data that indicated that electrical equipment, including transformers, is not mercury- and/or PCB-containing, removal and disposal would be performed in accordance with applicable federal, state, and local regulations.

- Any demolition activities with the potential to disturb LBP would be performed in accordance with applicable Occupational Safety and Health Administration (OSHA) regulations including OSHA 29 CFR 1926.62 - Lead Exposure in Construction.

- All material that needed to be disposed of (e.g., miscellaneous debris, tires, contaminated soil, and any excess fill) would be characterized and disposed of off-site in accordance with applicable federal, state, and local requirements.

- Any disturbances that would impact below-grade elements (including underground utility lines and vaulted spaces) would be assumed to contain ACM. Construction activities would be monitored for potential to encounter such below ground elements and sampling/analysis would be performed prior to performing work which may impact such features.

- Universal and regulated wastes including metal halide lamps, mercury (Hg) vapor containing lamps, and associated (assumed) PCB containing lighting ballasts and igniters should be properly segregated and recycled/disposed of in accordance with applicable federal, state, and local requirements.
- Construction and demolition waste management and disposal specifications will be adhered to. These include requirements for waste management goals, diversion and disposal of demolition and construction waste and a Construction and Demolition Waste Management Plan.

With the implementation of the above protocols and compliance with all applicable federal, State and local regulations and permit programs, there would be no significant adverse impacts related to contaminated/hazardous materials.

3.15.3.6 Natural Resources

A preliminary assessment is needed for natural resources if the construction activities, particularly excavation, grading, site clearance or other vegetative removal, cutting and filling, installation of piles, bulkheads or other waterfront structures, dredging, dewatering, or soil compaction would disturb natural resources on or adjacent to the site.

As described in Section 3.7 (Natural Resources), the SBPCR Project occurs at mouth of the Hudson River close to its confluence with the East River and Upper New York Bay. The upland portions of the SBPCR Project within Wagner Park, Pier A Plaza, and The Battery support terrestrial ecosystems. The Proposed Action would remove approximately 114 trees within the Project Area, largely within Wagner Park, Pier A Plaza, and The Battery.

A tree survey has been conducted, and all tree removal and replacement would be done in coordination with BPCA, NYC Parks, and The Battery Conservancy. To compensate for the removal of approximately 77 trees in The Battery, which is owned and maintained by NYC Parks, and within the NYCDOT ROW, 86 new trees would be planted, and 3 trees would be transplanted. The tree restitution, which is for trees on NYC Parks and NYCDOT property, is valued at approximately $5.2 million.

In an April 29, 2021, correspondence with the New York Natural Heritage Program, three species were identified in proximity to the site: Peregrine Falcon (State endangered), Shortnose Sturgeon (state endangered), and Atlantic sturgeon (federal endangered). In addition, four sea turtles were identified through IPac. As discussed below, proposed upland and in-water construction would have no significant adverse impact on these species.

The proposed upland and in-water construction work would have no effect on any threatened and endangered species. Regarding the Shortnose and Atlantic sturgeons, the seasonal distributions of both sturgeon species are well documented. The mouth of the Hudson river is neither a wintering area, spawning area or other area important to any one life stage. Moreover, sturgeon use the mouth of the Hudson river as a transit location going upstream to spawn or downstream to travel out to sea. The sturgeon would use the deeper water of the river to swim and it is high unlikely the fish would swim in the shallow waters of the Pier A inlet. Additionally, only a fraction of the project would occur within the intertidal region, and that area would be cordoned off with the placement of a silt curtain above the low tide line. In-water work would extend no further than the low tide line in Pier A inlet.

Sea turtles are uncommon visitors to the waters of the Hudson River; although even if they are present, they would be unaffected by the project as the minor amount of work that occurs below the hightide line would be constructed in an area protected by silt curtains.

There are no documented peregrine falcon nests in the Project Area. Although it is possible that a peregrine falcon may fly past the site on occasion, the construction activities would not result in a measurable loss of prey or serve as an impediment to the falcon's ability to hunt.

Accordingly, construction of the SBPCR Project would have no significant adverse impact on natural resources.

3.15.3.7 Other Technical Areas

In addition to the above technical areas, the *CEQR Technical Manual* requires investigation of construction impacts to "other technical areas" including: Open Space, Socioeconomic Conditions, Community Facilities, Land Use, Public Policy, and Neighborhood Character, and Water and Sewer Infrastructure.

Open Space

This section examines the potential for the Proposed Action to impact open space directly or indirectly in the Study Area by adding, eliminating, or changing the use of open space during construction. As described in Section 3.2 (Open Space), open space is "publicly or privately owned land that is publicly accessible and available for leisure, play, or sport, or is set aside for the protection and/or enhancement of the natural environment." Public open space is available "to the public on a constant and regular basis, including for designated daily periods." Examples of public open space observed in the Study Area include, but are not limited to, the Battery Park City Esplanade, Wagner Park, Pier A Plaza, and The Battery. Private open space is "not publicly accessible or is available only to limited users and is not available to the public on a regular or constant basis."

The *CEQR Technical Manual* outlines an analysis methodology for evaluating possible direct and indirect effects (referred to as direct and indirect impacts in this section) on open space resources within the Study Area. Direct impacts include those in which a proposed action reduces or limits access to open space. In addition, a direct impacts could occur if a project would:

- Result in a temporary closure of public open space (by encroachingon or displacing open space);
- Change the use of an open space so that it no longer serves the same user population;
- Limit public access to an open space; or
- Cause increased noise, air pollutants, odors, or shadows on public open space that would affect its function, usability, or enjoyment, whether on a permanent or temporary basis.

The Proposed Action would require construction of the flood alignment in the southern portion of the Battery Park City Esplanade near the Museum of Jewish Heritage, Wagner Park, portions of Pier A Plaza, and the northern portion of The Battery, which would result in a temporary closure of public space during construction. Because the Proposed Action would result in a temporary closure of public open space during construction, the following assessment considers the potential significant adverse impacts on open space. During construction, the public would not have access to portions of the Battery Park City Esplanade near the Museum of Jewish Heritage, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery. The preliminary assessment considers the duration of open space closures during construction and whether there are other open space resources within close proximity to the Project Area that would provide similar recreational opportunities to the public.

Indirect impacts could result from projects that generate residential or commercial population, and that additional population "overtaxes the capacity of existing open space so that their service provided to existing and future populations in the area would be substantially or noticeably diminished." An open space assessment of indirect impacts would be required if a proposed action would generate more than 200 residents or 500 nonresidents, or a similar number of other nonresidential users. Due to the direct impacts of temporary displacement of open space resources, the capacity of open space in the area could be impacted, therefore causing indirect open space impacts. In particular, an increase in demand for other open space resources within a reasonable walking distance that would remain available during construction of the Proposed Action may result in temporary significant adverse impacts. The preliminary assessment considers potential indirect impacts to the residential population in the Study Area resulting from the closure of portions of the Battery Park City Esplanade near the Museum of Jewish Heritage, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery.

The *CEQR Technical Manual* outlines a preliminary assessment that quantifies the acreage of open space and user population within the Study Area. The purpose of the assessment is to measure the change in the amount of open space available relative to additional population created by the proposed action. The *CEQR Technical Manual* states that the median open space ratio for New York City is 2.5 acres of open space for every 1,000 residents. With the limitations of the urban environment throughout New York City, these open space ratios are considered benchmarks, not "impact thresholds." In addition to open space ratio benchmarks, the *CEQR Technical Manual* provides an additional criterion of the percent decrease in the open space ratio from the No Action Condition to Proposed Action scenarios. For areas in which the existing open space ratio is 2.01 acres or greater, a decrease in open space ratio that "approaches or exceeds five percent" would be considered "a substantial change."

The determination of temporary significant adverse impacts is based on one of two factors following CEQR guidelines. Regarding direct impacts: a significant adverse impact would occur if there would be a direct displacement/alteration of existing open space within a study area without a comparable replacement (size, usability, and quality) within the Study Area, or if a proposed action results in a significant physical impact (such as increasing noise or air pollutant emissions) that would affect the usefulness of a public open space. Regarding indirect impacts: if a proposed action would reduce an open space ratio and consequently result in overburdening existing facilities, or if it would substantially exacerbate an existing deficiency in open space, it may result in a significant adverse impact on open space resources. The determination of significant adverse impacts is based on how a proposed action would change the open space ratios in the study areas, as well as qualitative factors not reflected in the quantitative assessment. In general, if a study area's open space ratios fall below CEQR guidelines, or the proposed action would result in a decrease in open space ratio of more than the applicable percentage (here, 5 percent), it could be considered a substantial change.

Affected Environment

The Study Area consists of all the census tracts with a minimum of 50 percent of their geographic area intersecting or falling within a 0.25-mile buffer around the Project Area. The total population and acreage of publicly accessible open space within the Study Area would provide the basis for measurement. According to the *CEQR Technical Manual*, population within the Study Area is measured from the latest decennial census, and the total population residing in the Study Area reported in the 2010 census is 10,167.

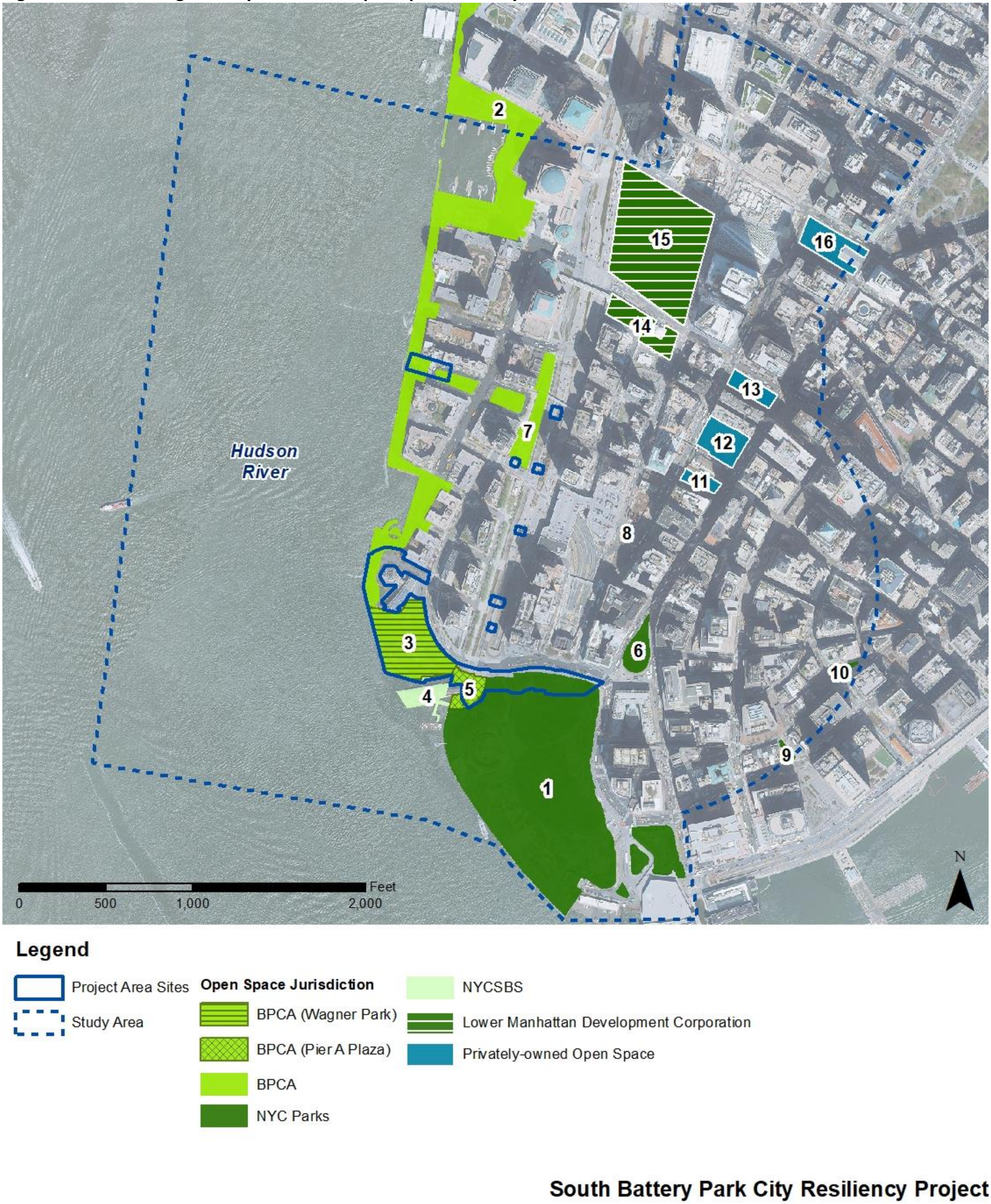
There are 16 publicly accessible open spaces within the Study Area, including parks, recreational areas, sitting areas, memorials, cemeteries, and a community garden. **Table 3.15-17** lists all open space and acreage, while **Figure 3.15-9** illustrates these areas. The total size of open space is 50.92 acres. Under these conditions, the open space ratio is determined by dividing the total acreage of open space (50.92 acres) by the total population (10,167) within the Study Area and mulitplying by 1,000. The existing open space ratio is 5.01 acres for every 1,000 residents.

From west to east, the Project Area contains the portions of the Battery Park City Esplanade near the Museum of Jewish Heritage (0.58 acres), the entirety of Wagner Park (3.30 acres), portions of Pier A Plaza (0.59 acres) and portions of The Battery (1.41 acres) for a total of 5.88 acres of open space, and all open spaces contain active and passive uses. Comparable open space resources within the Study Area would include Battery Park City open spaces to the north of the Project Area, including the Battery Park City Esplanade, The Battery to the south of the Project Area, West Thames Park, Zuccotti Park, and Liberty Park.

Table 3.15-17: Publicly Accessible Open Space in the Study Area

ID	Resource	Type	Jurisdiction	Acres
1	The Battery	Park, Recreational Area	NYC Parks	22.33
2	Battery Park City open spaces, including Battery Park City Esplanade and Yacht Harbor (portion within Study Area)	Park, Recreational Area, Esplanade	BPCA	9.50
3	Wagner Park	Park, Recreational Area, Pavilion	BPCA	3.30
4	Pier A	Sitting Area	NYCSBS	0.74
5	Pier A Plaza	Recreational Area and Sitting Area	BPCA	0.73
6	Bowling Green	Park	NYC Parks	0.75
7	West Thames Park	Recreational Area and Community Garden	BPCA	1.25
8	Greenstreet	Sitting Area	NYC Parks	0.05
9	Coenties Slip	Sitting Area	NYC Parks	0.15
10	British Garden at Hanover Square	Sitting Area	NYC Parks	0.14
11	Trinity Church Cemetery	Cemetery	Parish of Trinity Church	0.38
12	Trinity Church Cemetery	Cemetery	Parish of Trinity Church	1.16
13	Zuccotti Park	Park	One Liberty Plaza Condo	0.62
14	Liberty Park	Park	Lower Manhattan Development Corporation	0.63
15	World Trade Center and 9/11 Memorial	Park and Memorial	Lower Manhattan Development Corporation	7.97
16	St. Paul's Chapel Cemetery	Cemetery	St. Paul's Church	1.22
Total				**50.92**

Figure 3.15-9: Existing Publicly Accessible Open Space in Study Area



Environmental Impacts

No Action Condition

Under the No Action Condition, two planned projects would be located within the Study Area: the Battery Park Underpass and West Street Underpass Project and The Battery Coastal Resilience Project. The Battery Park Underpass and West Street Underpass Project would be constructed by NYCDOT with construction beginning in 2024. This project would close portions of The Battery during construction as shown in **Figure 3.15-10**.

The Battery Coastal Resilience Project would be constructed by NYCEDC and extend from Pier A Plaza around the Hudson River Waterfront along The Battery's waterfront esplanade. This project would elevate the waterfront esplanade in The Battery and integrate a grassy berm at the back of The Battery. Construction of The Battery Coastal Resilience Project would begin in July 2022 and end in December 2024. **Figure 3.15-10** depicts the areas of The Battery and Pier A Plaza that would be closed during construction of The Battery Coastal Resilience Project. The sequencing of construction activities would be staggered, some of which would overlap over the course of the entire construction schedule. In addition, construction of The Battery Coastal Resilience Project would overlap with construction of the Battery Park Underpass and West Street Underpass Project from January 2024 to the end of December 2024.

Table 3.15-18 summarizes the six distinct construction periods in which portions of The Battery would be closed as a result of the No Action Condition projects. The construction of the No Action Condition projects is compared to the affected environment as a baseline. As discussed above, there are 50.92 acres of open space in the Study Area in the affected environment, and the open space ratio is 5.01 acres for every 1,000 residents.

Table 3.15-18: No Action Condition Direct and Indirect Open Space Impacts

	Jul 2022–Jan 2023	Jan 2023–Mar 2023	Mar 2023–Jan 2024	Jan 2024–Mar 2024	Mar 2024–Jun 2024	Jun 2024–Dec 2024
NYCDOT Displaced Open Space (acres)	0.00	0.00	0.00	0.53	0.53	0.53
NYCEDC Displaced Open Space (acres)	0.46	0.86	2.60	2.60	0.86	1.36
Total Displaced Open Space (acres)	0.46	0.86	2.60	3.13	1.39	1.89
Total Open Space Available (acres)	50.46	50.06	48.32	47.79	49.53	49.03
Open Space Ratio	4.96	4.92	4.75	4.70	4.87	4.82
Percent Change from Existing Conditions	-0.94%	-1.72%	-5.14%	-6.18%	-2.76%	-3.74%

The Battery Coastal Resilience Project would begin in July 2022 and would displace approximately 0.46 acres of open space in The Battery from July 2022 to January 2023. During this time period, there would be approximately 50.46 acres of open space available within the Study Area and an open space ratio of 4.96 acres for every 1,000 residents. This would be a 0.94 percent decrease in available open space in the Study Area from July 2022 to January 2023.

The Battery Coastal Resilience Project would displace approximately 0.86 acres of open space in The Battery from January 2023 to March 2023. During this time period, there would be approximately 50.06 acres of open space available within the Study Area and an open space ratio of 4.92 acres for every 1,000 residents. This would be a 1.72 percent decrease in available open space in the Study Area from January 2023 to March 2023.

The Battery Coastal Resilience Project would displace approximately 2.60 acres of open space in The Battery and Pier A Plaza from March 2023 to January 2024. During this time period, there would be approximately 48.32 acres of open space available within the Study Area and an open space ratio of 4.75 acres for every 1,000 residents. This would be a 5.14 percent decrease in available open space in the Study Area from March 2023 to January 2024.

The Battery Coastal Resilience Project would displace approximately 2.60 acres of open space in The Battery and Pier A Plaza from January 2024 to March 2024. In addition, the Battery Park Underpass and West Street Underpass Project would displace approximately 0.53 acres of open space in The Battery during this period. During this time period, there would be approximately 47.79 acres of open space available within the Study Area and an open space ratio of 4.70 acres for every 1,000 residents. This would be a 6.18 percent decrease in available open space in the Study Area from January 2024 to March 2024. This is the greatest percent decrease in open space in the No Action Condition.

The Battery Coastal Resilience Project would displace approximately 0.86 acres of open space in The Battery from March 2024 to June 2024. In addition, the Battery Park Underpass and West Street Underpass Project would displace approximately 0.53 acres of open space in The Battery during this period. During this time period, there would be approximately 49.53 acres of open space available within the Study Area and an open space ratio of 4.87 acres for every 1,000 residents. This would be a 2.76 percent decrease in available open space in the Study Area from March 2024 to June 2024.

The Battery Coastal Resilience Project would displace approximately 1.36 acres of open space in The Battery from June 2024 to December 2024. In addition, the Battery Park Underpass and West Street Underpass Project would displace approximately 0.53 acres of open space in The Battery during this period. During this time period, there would be approximately 49.03 acres of open space available within the Study Area and an open space ratio of 4.82 acres for every 1,000 residents. This would be a 3.74 percent decrease in available open space in the Study Area from June 2024 to December 2024.

Under the No Action Condition, The Battery Coastal Resilience Project and the Battery Park Underpass and West Street Underpass Project would have a direct impact on open space in the Study Area by displacing a maximum of 3.13 acres of the The Battery and Pier A Plaza from public use during construction of the No Action Condition projects. In addition, the No Action Condition projects would have an indirect impact on open space by reducing the open space ratio from 5.01 acres to 4.70 acres at the lowest from January 2024 to March 2024 based on the current population estimate. The current open space ratio is well above the 2.5-acre benchmark set by the *CEQR Technical Manual,* indicating that there would be sufficient open space available within the Study Area. Although the No Action Condition open space ratio would be above the 2.5-acre benchmark, The Battery Coastal Resilience Project and the Battery Park Underpass and West Street Underpass Project would decrease open space in the Study Area by greater than 5 percent (5.14 percent from March 2023 to January 2024 and 6.18 percent from January 2024 to March 2024), which would constitute a "substantial change" from March 2023 to March 2024.

Figure 3.15-10: No Action Condition Construction Areas

Proposed Action

According to the *CEQR Technical Manual*, the No Action Condition described above serves as the baseline condition to which the Proposed Action would be compared. This section assesses the incremental change to open space in the Study Area that would result from the Proposed Action compared to the No Action Condition. As discussed above, the Project Area contains portions of the Battery Park City Esplanade (0.58 acres), the entirety of Wagner Park (3.30 acres), portions of Pier A Plaza (0.59 acres) and portions of The Battery (1.41 acres). Therefore, there is a total of 5.88 acres of open space in the Project Area.

As shown in **Table 3.15-5** and **Figure 3.15-1**, a preliminary construction schedule was developed for the Proposed Action that illustrates the construction sequencing over a 24-month period from July 2022 to July 2024. For the purposes of the following assessment, the construction schedule for the Proposed Action was compared to the construction schedules and open space displacements identified in the No Action Condition (see **Table 3.15-18**). Construction of the Proposed Action would overlap with construction of The Battery Coastal Resilience Project from July 2022 to the end of July 2024 and construction of the Battery Park Underpass and West Street Underpass Project from January 2024 to July 2024. **Table 3.15-19** summarizes the incremental change to open space resulting from the Proposed Action's displacement of portions of the Battery Park City Esplanade, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery from July 2022 to July 2024. Over the course of the Proposed Action's 24 months of construction, there would be six construction periods that correspond to the No Action Condition construction periods in **Table 3.15-18**.

Construction of the Proposed Action and No Action Condition projects would occur concurrently in portions of The Battery and Pier A Plaza in the Project Area, as shown in **Figure 3.15-10**. As shown in **Table 3.15-19**, open spaces in the Project Area that would be displaced by one of the No Action Condition projects from March 2023 to July 2024 were not considered in the assessment of the impacts of the Proposed Action (i.e., this acreage was not considered in calculating the amount of open space that would be displaced for the construction of the Proposed Action).

Table 3.15-19: Proposed Action Construction Direct and Indirect Open Space Impacts

	Jul 2022–Jan 2023	Jan 2023–Mar 2023	Mar 2023–Jan 2024	Jan 2024–Mar 2024	Mar 2024–Jun 2024	Jun 2024–Jul 2024
No Action Total Open Space Available (acres)	50.46	50.06	48.32	47.79	49.53	49.03
Total Displaced Open Space (acres)	5.88	5.88	5.80	5.72	5.80	5.80
Total Open Space Available (acres)	44.58	44.18	42.52	42.07	43.73	43.23
Open Space Ratio	4.38	4.35	4.18	4.14	4.30	4.25
Percent Change from No Action Condition	-11.65 %	-11.75%	-12.00%	-11.97%	-11.71%	-11.83%

From July 2022 to January 2023, the Proposed Action would displace an additional 5.88 acres of open space in the Project Area consisting of portions of the Battery Park City Esplanade, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery. Construction of the No Action Condition projects would not displace open space in the Project Area in this construction period. The total open space available in the Study Area would be 44.58 acres. The open space ratio would be reduced by 11.65 percent to 4.38 acres for every 1,000 residents.

From January 2023 to March 2023, the Proposed Action would displace an additional 5.88 acres of open space in the Project Area consisting of portions of the Battery Park City Esplanade, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery. Construction of the No Action Condition projects would not displace open space in the Project Area in this construction period. The total open space available in the Study Area would be 44.18 acres. The open space ratio would be reduced by 11.75 percent to 4.35 acres for every 1,000 residents.

From March 2023 to January 2024, the Proposed Action would displace an additional 5.80 acres of open space in the Project Area consisting of portions of the Battery Park City Esplanade, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery. The Battery Coastal Resilience Project would displace 0.08 acres of open space within Project Area in The Battery and Pier A Plaza. The total open space available in the Study Area would be 42.52 acres. The open space ratio would be reduced by 12 percent to 4.18 acres for every 1,000 residents.

From January 2024 to March 2024, the Proposed Action would displace an additional 5.72 acres of open space in the Project Area consisting of portions of the Battery Park City Esplanade, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery. The Battery Coastal Resilience Project would displace 0.08 acres of open space within Project Area in The Battery and Pier A Plaza. In addition, the Battery Park Underpass and West Street Underpass Project would displace 0.08 acres of open space within the Project Area in The Battery. The total open space available in the Study Area would be 42.07 acres. The open space ratio would be reduced by 11.97 percent to 4.14 acres for every 1,000 residents.

From March 2024 to June 2024, the Proposed Action would displace an additional 5.80 acres of open space in the Project Area consisting of portions of the Battery Park City Esplanade, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery. During this construction period, the Battery Park Underpass and West Street Underpass Project would displace 0.08 acres of open space within Project Area in The Battery. The total open space available in the Study Area would be 43.73 acres. The open space ratio would be reduced by 11.71 percent to 4.30 acres for every 1,000 residents.

From June 2024 to July 2024, the Proposed Action would displace an additional 5.80 acres of open space in the Project Area consisting of portions of the Battery Park City Esplanade, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery. During this construction period, the Battery Park Underpass and West Street Underpass Project would displace 0.08 acres of open space within Project Area in The Battery. The total open space available in the Study Area would be 43.23 acres. The open space ratio would be reduced by 11.83 percent to 4.25 acres for every 1,000 residents. Although the Proposed Action in each of the construction periods (see **Table 3.15-19**) would maintain an open space ratio well above the 2.5-acre benchmark set by the *CEQR Technical Manual*, the Proposed Action would have a temporary significant adverse impact because it would decrease the open space ratio by greater than five percent, indicating a substantial change.

Mitigation of Impacts

The Proposed Action would have a temporary significant adverse impact on open space during construction due to the closure of portions of the Battery Park City Esplanade, the entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery for 24 months. To continue to provide public programs and events which have traditionally taken place at Wagner Park, BPCA would be temporarily relocate all of the programs and events from Wagner Park to other parks and open spaces within Battery Park City for the duration of the Proposed Action's construction.

The following is a list of BPCA programs and events that would be relocated to parks and open spaces within Battery Park City during construction of the Proposed Action:

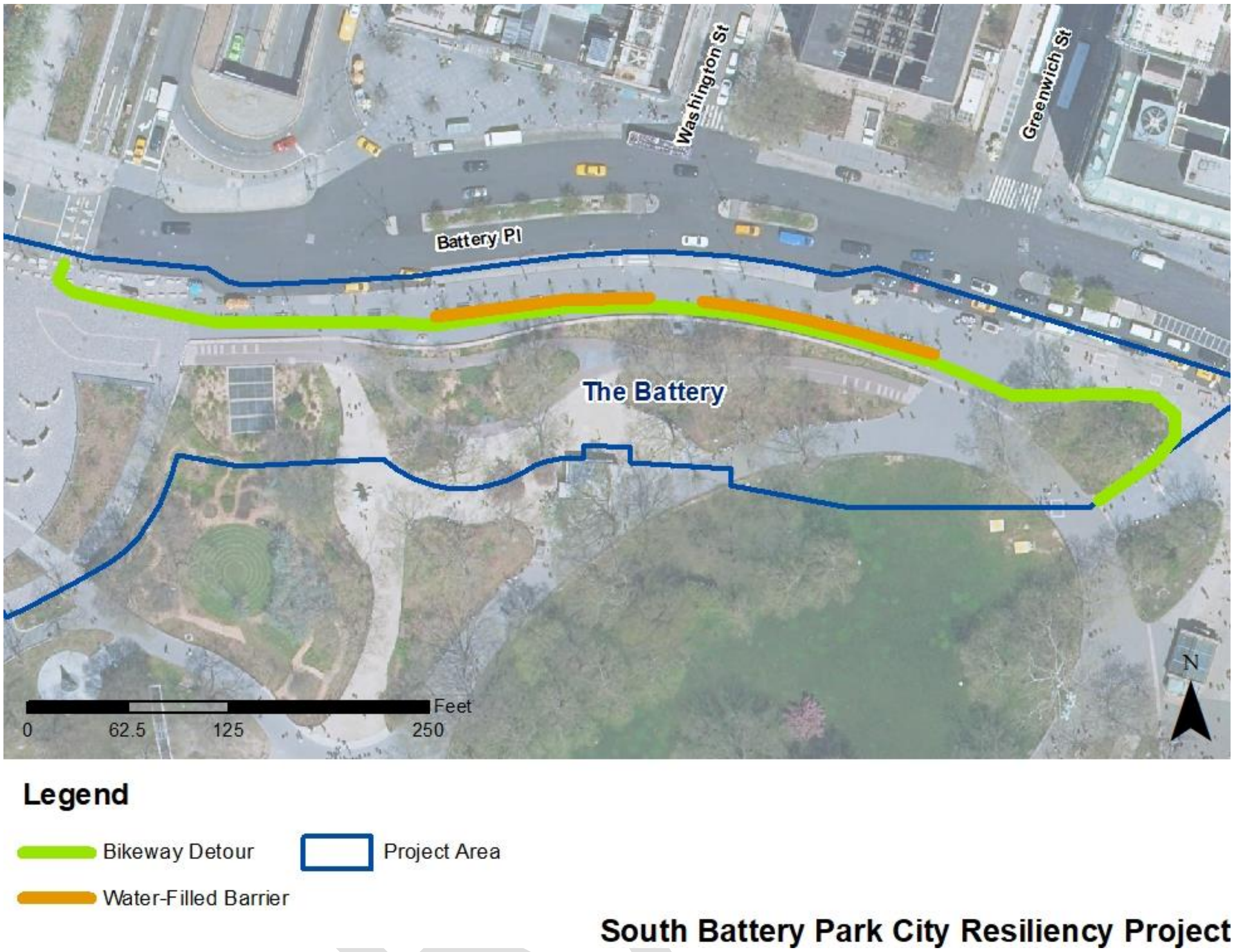
- Go Fish! (series of public fishing festivals) – relocating to South Cove and southern esplanade;
- Swedish Midsummer Festival – relocating to north lawn and north esplanade of Rockefeller Park;
- River & Blues (July concert series) – relocating to north esplanade and north lawn of Rockefeller Park;
- Silent Disco Dance Party (seasonal community dances) – relocating to Esplanade Plaza or Rockefeller Park;
- Sunset Singing Circle (community singing series) – relocating to park house area of Rockefeller Park;
- Public Art Tours – will feature public art installations in other locations of Battery Park City;

- The three art works currently installed in Wagner Park – *Resonating Bodies* by Tony Cragg, *Eyes* by Louise Bourgeois, and *Ape and Cat* by Jim Dine – would be relocated to alternative temporary sites within Battery Park City to keep them on public view;
- Elements of Nature Drawing (weekly adult art class) – relocating to various gardens in Rockefeller Park;
- Kindie Rock! (weekly live music performance series for toddlers) – relocating to park house area of Rockefeller Park;
- Sunset Yoga – weekly program relocating to south lawn of Rockefeller Park;
- Figure al Fresco (weekly adult figure drawing art program) – relocating to Rector Park East;
- Preschool Play (seasonal daily programs) – relocating to park house area of Rockefeller Park;
- Bird & Nature Walks series – will explore other parks and gardens of Battery Park City; and
- Marine education classroom visits- relocating to South Cove and Southern Esplanade.

However, even with this replacement programming, the impacts to open space during construction would not be fully mitigated. BPCA will continue to consider potential options to mitigate these temporary significant adverse impacts during construction. Should other mitigation options be identified, they will be included as part of the Final Environmental Impact Statement.

During construction in The Battery, the existing Battery Bikeway would remain in service; however, a portion of the existing Battery Bikeway would be rerouted to maintain connectivity along the City's bikeway network in Lower Manhattan. The Battery Bikeway would be rerouted along The Battery's northern boundary from State Street to West Street. The temporary bikeway would be located to the north of the fixed wall separating The Battery from the sidewalk along Battery Place (see **Figure 3.15-11**). To provide separation and safety between bicyclists and pedestrians, water-filled barriers would be installed to the north of the temporary bikeway along the Battery Place sidewalk.

Figure 3.15-11: Battery Bikeway Detour



Socioeconomic Conditions

The Study Area consists of a combination of residential, commercial, educational and recreational uses. Residential buildings make up the bulk of the area, many of which are within Battery Park City. As the Proposed Action results in no residential, employee or business displacements, includes no retail development, does not create land uses markedly different from existing conditions and does not affect a specific industry, there would be no significant adverse impacts of construction activities on socioeconomic conditions.

Community Facilities

The Proposed Action would not physically impact or displace any community resources, nor result in any increases in resident population. It would not have any impact on public schools, healthcare facilities, publicly funded group early childhood programs, libraries or local police and fire facilities. Accordingly, there would be no significant adverse impacts of construction activities on community facilities.

Land Use, Public Policy, and Neighborhood Character

Construction activities related to the SBPCR Project would not result in the permanent change of the use of the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, or The Battery within the Study Area. The current use of these sites is for recreational, tourism, and educational purposes. In terms of neighborhood character, construction activities would temporarily take place and impact the neighborhood in terms of visual resources, access to Wagner Park, Pier A Plaza, and The Battery, and a measurable, but temporary increase in vehicle traffic. However, overall, these activities would not result in a permanent change in the character of the neighborhood.

Construction fencing would be erected to reduce potentially undesirable views of construction areas and buffer noise emitted from construction activities. Additionally, as the project components involve the installation and enhancement of several resilience measures, the overall project would provide a net positive benefit to the community. No significant adverse impacts to land use and neighborhood character from construction-related activities would occur and no further assessment is warranted.

Water and Sewer Infrastructure

The disruption of existing surface conditions and excavation/pile driving for NSI system construction would have the potential to affect underground infrastructure by direct physical impact. However, such effects would be avoided through BMPs that include One Call mark-outs just prior to construction as well as extensive utility survey and plotting during design so that, to the extent possible, proposed infrastructure and construction activity does not conflict with such infrastructure. In order to avoid potential damage or disruption of the electrical transmission lines during the construction, measures would be taken to control excavation around existing infrastructure and minimize vibration impacts particularly during sheet pile driving activities. Vibration monitoring would be implemented during the sheet pile driving phase. If excavation would occur near existing utilities/infrastructure, manual excavation would be implemented. Continuous real time vibration monitoring to be performed for all existing brick sewers within the project limit that are owned by New York City Environmental Protection as per Section 76.31 indicated in New York City Environmental Protection Sewer and Water Main Specification (2014 Edition). In the event the vibration limits as indicated on Section 76.31 are exceeded, the Contractor shall cease operations and immediately notify the Engineer and discuss the methods to eliminate or reduce the magnitude of subsequent vibrations. With the above BMPs in place, no significant adverse impacts to water and sewer infrastructure would occur during construction activities.

Summary

The resources that were analyzed in the DEIS for short-term (construction) impacts concluded that the SBPCR Project would have no significant adverse impact on: transportation, air quality, noise, socioeconomic conditions, community facilities, land use and public policy, neighborhood character, hazardous materials, natural resources, and water and sewer infrastructure. The SBPCR Project would have a temporary significant adverse impact on open space resources during construction and mitigation measures are disclosed in Section 3.15 (Construction – Open Space).

3.16 Unavoidable Significant Adverse Impacts

This section summarizes the unavoidable significant adverse impacts that could not be avoided and could not be practicably mitigated. SEQR requires that an EIS include the identification and assessment of impacts that cannot be avoided or adequately mitigated. Unavoidable significant adverse impacts resulting from the Proposed Action have been identified in the areas of analysis under operational conditions: historic architectural resources, urban design and visual resources, and under construction conditions: open space.

3.16.1 Historic Architectural Resources

The SBPCR Project would result in an unavoidable adverse impact on National Register-eligible Wagner Park. The Proposed Action would redesign and reconfigure Wagner Park at a higher elevation, and would alter the characteristics of the property that qualify it for inclusion in the National Register. SEQRA and CEQR require that adverse impacts to National Register-listed and/or eligible resources be resolved through mitigation. Therefore, it is anticipated that a LOR that stipulates mitigation strategies be drafted and executed between BPCA and SHPO. Potential stipulations could possibly include, but not be limited to:

- HALS Documentation of Wagner Park prior to construction. Documentation would include a physical description, historic overview, statement of significance, project information, high-quality digital or large-format photographs, and reproduction of select original plans and historic photographs.
- Interpretive panels installed at the new Wagner Park; panels could describe the original park, and the reasons why it was deemed an exceptionally significant National Register-eligible resource.
- Website publicized on-site or QR codes that could be activated on-site, and direct user to a history of Wagner Park, and the reasons why it was deemed an exceptionally significant National Register-eligible resource; the content could be similar to the panels.

Ultimately, mitigation recommendations that are agreeable to all parties would be incorporated into the LOR as stipulations.

3.16.2 Urban Design and Visual Resources

The SBPCR Project would have a significant adverse impact on Wagner Park for views along Battery Place towards the Hudson River Waterfront because of the proposed elevation of Wagner Park. In order to meet the SBPCR Project purpose and need, Wagner Park would have to be elevated and redesigned. To minimize the adverse impacts on views from Battery Place to the Hudson River Waterfront and the Statue of Liberty, the Proposed Action would redesign Wagner Park between Battery Place and the Battery Park City Esplanade, construct a new Pavilion on the plateau of the elevated Wagner Park, recreate the framed and unobstructed view of the Hudson River Waterfront and Statue of Liberty through the new Pavilion, reconstruct and enhance the northern and southern entrances to Wagner Park, and improve the pedestrian experience on the walkway along Battery Place.

3.16.3 Open Space During Construction

The SBPCR Project would have a temporary significant adverse impact on open space near the Museum of Jewish Heritage, Wagner Park, Pier A Plaza, and The Battery during construction. Portions of the Battery Park City Esplanade near the Museum of Jewish Heritage, entirety of Wagner Park, portions of Pier A Plaza, and portions of The Battery within the Project Area would be closed for the entire 24-month construction duration from July 2022 to July 2024.

Construction of the Proposed Action would occur concurrently with construction of the Battery Park Underpass and West Street Underpass Project in 2024 and the Battery Park Coastal Resilience Project in from 2023 through 2024. During this period, the Proposed Action would displace a minimum of 5.72 acres and a maximum of 5.88 acres of open space in the Project Area. The Proposed Action would have an open space ratio of a minimum of 4.14 acres and a maximum of 4.38 acres per every 1,000 residents, and it would decrease the amount of open space during construction from 11.65 percent to 12.00 percent. A decrease of open space greater than five percent would constitute a substantial change according to CEQR.

To continue to provide public programs and events which have traditionally taken place at Wagner Park, BPCA would be temporarily relocate all of the programs and events from Wagner Park to other parks and open spaces within Battery Park City for the duration of the Proposed Action's construction. However, even with this replacement programming, the impacts to open space during construction would not be fully mitigated. BPCA will continue to consider potential options to mitigate these temporary significant adverse impacts during construction. Should other mitigation options be identified, they will be included as part of the Final Environmental Impact Statement.

During construction in The Battery, the existing Battery Bikeway would remain in service; however, a portion of the existing Battery Bikeway would be rerouted to maintain connectivity along the City's bikeway network in Lower Manhattan. The Battery Bikeway would be rerouted along The Battery's northern boundary from State Street to West Street. The temporary bikeway would be located to the north of the fixed wall separating The Battery from the sidewalk along Battery Place (see **Figure 3.15-11**). To provide separation and safety between bicyclists and pedestrians, water-filled barriers would be installed to the north of the temporary bikeway along the Battery Place sidewalk.

3.17 Growth Inducing Aspects of the Proposed Action

This section focuses on whether the Proposed Action has the potential to induce new development within the study area, by supporting or encouraging such development. Typically, growth induced impacts occur when a project:

- Attracts significant increases in local population by creating or relocating employment or by providing support facilities or services; and/or
- Increases development potential of an area due to the introduction of roads, water and sewer infrastructure, or other utilities.

The SBPCR Project would provide flood control measures that will safeguard the area from the 100-year storm event. While the landscape of the Study Area would be changed by the flood technology implemented (buried floodwall, flip-up deployables, etc.), the use of the Study Area would not be altered. After the SBPCR Project is constructed, 1st Place, the Museum of Jewish Heritage, Wagner Park, Pier A Plaza and The Battery would all continue to function as they currently do. This important lower Manhattan waterfront resource already attracts a consistent and large volume of residents and visitors, which would not change after the SBPCR Project is implemented.

As a highly developed urban area, there is limited, if any, space available for future development. Nonetheless, the SBPCR Project would not incorporate new roads, water or sewer infrastructure or other utilities that would increase the development potential of the area.

As such, the SBPCR Project does not have the potential to induce future growth within the Study Area.

3.18 Irreversible and Irretrievable Commitments of Resources

This section provides identification of whether the Proposed Action would cause permanent loss of one or more environmental resources including natural or manmade resources. Such resources would be made unavailable for further use due to construction or operation of the Proposed Action.

Both natural and manmade resources would be expended in the construction and operation of the SBPCR Project, including:

- building materials used for construction;
- energy through consumption of gas and electricity during construction activities; and,
- human labor needed to construct and operate the flood protection system.

These are considered irretrievable commitments because their reuse for another purpose is not likely. The SBPCR Project also constitutes a long-term commitment of land, thereby rendering this land unusable for other purposes. Lastly, funds committed to the design, construction and operation of the Proposed Action would be unavailable to other projects.

These commitments of resources and materials are weighed against the Proposed Action's purpose and need/goals and objectives, as identified in Section 1.2 (Purpose and Need for the Proposed Action) of this DEIS. The Proposed Action's fulfillment of the project purpose and need and goals/objectives outweighs the irreversible and irretrievable commitment of resources.

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4.2 List of Acronyms

A

A-weighted Decibels (dBA)
Aboveground Storage Tank (AST)
Advisory Council on Historic Preservation (ACHP)
Americans with Disabilities Act (ADA)
American National Standards Institute (ANSI)
Area of Potential Effects (APE)

B

Battery Park City Authority (BPCA)
below grade surface (bgs)
Best Available Technology (BAT)
Best Management Practices (BMPs)
Business Improvement Districts (BIDs)
British Thermal Units (BTUs)
Brooklyn Bridge-Montgomery Coastal Resilience Project (BMCR)

C

Central Business District (CBD)
City Environmental Quality Review (CEQR)
Clean Air Act (CAA)
Clean Water Act (CWA)
Climate Leadership and Community Protection Act (CLCPA)
Coastal Zone Management Act of 1972 (CZMA)
Combined Sewer Overflow (CSO)
Combined Sewer System (CSS)
Community Air Monitoring Plan (CAMP)
Construction Health and Safety Plan (CHASP)
Construction Protection Plan (CPP)
Council on Environmental Quality (CEQ)
Cultural Resource Information System (CRIS)

D

Design Flood Elevations (DFE)
Draft Environmental Impact Statement (DEIS)

E

Eastbound (EB)
East River Waterfront Esplanade (ERE or Esplanade)
East Side Coastal Resiliency Project (ESCR)
Endangered Species Act (ESA)
Energy Use Intensity (EUI)
Environmental Assessment (EA)
Environmental Conservation Law (ECL)
Environmental Impact Statement (EIS)
Environmental Resource Mapper (ERM)
Environmental Site Assessment (ESA)

Essential Fish Habitat (EFH)
Estuarine Living Marine Resources (ELMR)
Executive Order (EO)

F
Federal Emergency Management Agency (FEMA)
Federal Highway Administration (FHWA)
Final Environmental Impact Statement (FEIS)
Fish and Wildlife Coordination Act (FWCA)

G
Geographic Information System (GIS)
Greenhouse Gas (GHG)

H
Heating, Ventilation and Air Conditioning (HVAC)
Height of Intervention (HOI)
Historic American Landscape Survey (HALS)
Hydraulic power units (HPUs)

I
Information for Planning and Consultation (IPaC)
International Living Future Institute (ILFI)
Interim Flood Protection Measures (IFPM)
Isolation gate (IG)
J

K

L
Littoral Zone (LZ)
Local Waterfront Revitalization Programs (LWRP)
Lower Manhattan Coastal Resiliency Project (LMCR)
Lower Manhattan Development Corporation (LMDC)

M
Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)
Manhattan Pumping Station (MPS)
Mean High Water (MHW)
Mid-Atlantic Fisheries Management Council (MAFMC)
Migratory Bird Treaty Act (MBTA)
Municipal Separate Storm Sewer System (MS4)
Municipal Solid Waste (MSW)

N
National Ambient Air Quality Standards (NAAQS)
National Disaster Resiliency (NDR)
National Environmental Policy Act (NEPA)
National Historic Landmarks (NHLs)

National Historic Preservation Act of 1966 (NHPA)
National Marine Fisheries Service (NMFS)
National Oceanic and Atmospheric Administration (NOAA)
National Register of Historic Places (National Register)
National Wetlands Inventory (NWI)
Near Surface Isolation (NSI)
New York City Department of Buildings (NYCDOB)
New York City Department of City Planning (NYCDCP)
New York City Department of Environmental Protection (NYCDEP)
New York City Department of Environmental Protection (NYCDEP) Bureau of Environmental Planning and Analysis (BEPA)
New York City Department of Finance (NYCDOF)
New York City Department of Health (NYCDOH)
New York City Department of Parks & Recreation (NYC Parks)
New York City Department of Sanitation (DSNY)
New York City Department of Small Business Services (NYCSBS)
New York City Department of Transportation (NYCDOT)
New York City Economic Development Corporation (NYCEDC)
New York City Emergency Management Department (NYCEM)
New York City Environmental Quality Review Act (CEQR)
New York City Fire Department (FDNY)
New York City Landmarks Preservation Commission (NYC LPC)
New York City Transit Authority (NYCTA)
New York City Police Department (NYPD)
New York Power Authority (NYPA)
New York State Coastal Management Program (CMP)
New York State Department of Environmental Conservation (NYSDEC)
New York State Department of Health (NYSDOH)
New York State Department of State (NYSDOS)
New York State Environmental Review Act (SEQR)
New York State Historic Preservation Act (SHPA)
New York State Historic Preservation Office (SHPO)
North American Vertical Datum (NAVD88)
NYCDOT's Office of Construction Management and Coordination (OCMC)

O

Occupational Safety and Health Administration (OSHA)

P

passenger car equivalents (pces)
Phase I Environmental Site Assessment (ESA)
Phase 2 Environmental Site Investigation (ESI)
Polynuclear Aromatic Hydrocarbons (PAHs)
Polychlorinated Biphenyls (PCBs)
Preliminary Flood Insurance Rate Maps (PFIRMs)
Primary Land Use Tax Lot Output (PLUTO)

Q

R

Rapid Transit Company (IRT)
Recognized Environmental Conditions (RECs)
Remedial Action Plan (RAP)
Restricted Residential Soil Cleanup Objectives (RRSCOs)
Right-of-way (ROW)
Roadway Construction Noise Model (RCNM)

S

Semi-volatile Organic Compounds (SVOCs)
Solid Waste Management Plan (SWMP)
South Battery Park City Resiliency Project (SBPCR)
Special Initiative for Rebuilding and Resiliency (SIRR)
State Implementation Plan (SIP)
State Pollutant Discharge Elimination System (SPDES)
Submerged Aquatic Vegetation (SAV)

T

Transportation Planning Assumptions (TPA)
Triborough Bridge and Tunnel Authority (TBTA)

U

Underground Storage Tank (UST)
US Army Corps of Engineers (USACE)
US Environmental Protection Agency (USEPA)
US Fish and Wildlife Service (USFWS)

V

Variable Refrigerant Flow (VRF)
vehicles per hour (vph)
velocity levels in decibels (VdB)
Volatile Organic Compounds (VOCs)

W

Wastewater Treatment Plant (WWTP)
Waterfront Revitalization of Coastal Areas and Inland Waterways Act (WRCRA)
Waterfront Revitalization Program (WRP)
Waterfront Edge Design Guidelines (WEDG)
Westbound (WB)

X

Y

Z