A. INTRODUCTION

On October 29, 2012, Hurricane Sandy made landfall and the resulting waves and storm surge battered the City's coastline, leading to 43 deaths, the destruction of homes and other buildings, and severe damage to critical infrastructure. During Hurricane Sandy, the east side of Manhattan was greatly impacted, highlighting the need for the City of New York (the City) to increase its efforts to protect vulnerable populations and critical infrastructure during extreme coastal storm events (the 100-year flood events with sea level rise projections to the 2050s[1]), referred to herein as the design storm event. Hurricane Sandy, a presidentially declared disaster, caused extensive coastal flooding, resulting in significant damage to residential and commercial property, open space, and critical transportation, power, and water and sewer infrastructure, which in turn affected medical and other essential services. As part of its plan to address vulnerability to such major flooding, the City is proposing the East Side Coastal Resiliency (ESCR) Project, which involves the construction of a coastal flood protection system along a portion of the east side of Manhattan and related improvements to City infrastructure (the proposed project).

The area that would be protected under the proposed project (the protected area) includes lands within the Federal Emergency Management Agency (FEMA) 100-year special flood hazard area (SFHA), as well as those projected to be within the 100-year flood hazard area in the 2050s, taking into account the 90th percentile projection for sea level rise (see **Figure S-1**). This includes portions of the Lower East Side and East Village neighborhoods, Stuyvesant Town, Peter Cooper Village, as well as the John V. Lindsay East River Park (East River Park) and Stuyvesant Cove Park. Within the project area, the City is proposing to install a flood protection system generally located within City parkland and streets, which would consist of a combination of floodwalls, elevated infrastructure or park areas, closure structures (e.g., floodgates), and other infrastructure improvements to reduce the risk of flooding. In addition to providing a reliable, FEMA accredited coastal flood protection system for this area, another goal of the proposed project is to improve open spaces and enhance access to the waterfront, including East River Park and Stuyvesant Cove Park.

To implement the proposed project, the City and its federal partners have committed approximately $1.45 billion in funding. The City has entered into a grant agreement with the U.S. Department of Housing and Urban Development (HUD) to disburse $338 million of Community Development Block Grant-Disaster Recovery (CDBG-DR) funds for the design and construction of the proposed project. The City is the grantee of CDBG-DR funds related to Hurricane Sandy for the development of a coastal flood protection system, which would be provided to the City

[1] Sea level rise estimate represents the 90th percentile value for 2050 as presented by the New York City Panel on Climate Change. See Chapter 2.0, "Project Alternatives," for additional details on design principals and sea level rise.

Source: 2016 New York State Digital Orthoimagery Program, NYS 2016

Project Area One

Project Area Two

Protected Area

100-year Flood Hazard Area with 90th Percentile 2050s Sea Level Rise

0 1,000 FEET

Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY PROJECT

Proposed Project Area Aerial Map

Figure S-1

through the New York City Office of Management and Budget (OMB), acting under HUD's authority.

This Draft Environmental Impact Statement (DEIS) addresses the requirements of the National Environmental Policy Act (NEPA), the New York State Environmental Quality Review Act (SEQRA), and New York City Environmental Quality Review (CEQR). NEPA is a federal law requiring the analysis of potential environmental effects of actions that are funded or subject to approval by federal agencies, such as HUD which is providing a portion of the funding for this project. SEQRA and CEQR are similar requirements for environmental review of State and City actions.

This DEIS describes the purpose and need for the proposed project and presents the alternative designs that were considered. In addition, the DEIS describes the methodologies and the criteria used to assess the potential for significant adverse effects associated with both the operation and construction of each alternative and presents mitigation measures, where needed. The methodologies and criteria used in the impact analyses are primarily based on the guidance set forth in the City's 2014 *CEQR Technical Manual*, and also draw upon applicable State and federal guidelines.

B. PURPOSE AND NEED

As previously stated, Hurricane Sandy underscored the City's need to advance its resiliency efforts to protect property, vulnerable populations, and critical infrastructure from major coastal storms. This need is intensified when considering projections of more frequent flooding events and aligns with resiliency planning goals described in *OneNYC* and *A Stronger, More Resilient New York*. To address these goals, the purpose of the proposed project is to reduce coastal flooding vulnerability and risk while enhancing waterfront open spaces and access to the waterfront.

The principal objectives of the proposed project are as follows:

- Provide a reliable coastal flood protection system against the design storm event for the protected area;
- Improve access to, and enhance open space resources along, the waterfront, including East River Park and Stuyvesant Cove Park;
- Respond quickly to the urgent need for increased flood protection and resiliency, particularly for the communities that have a large concentration of residents in affordable and public housing units along the proposed project area; and
- Achieve implementation milestones and comply with conditions attached to funding allocations as established by HUD, including scheduling milestones.

C. ENVIRONMENTAL REVIEW PROCESS

The environmental review process provides decision-makers with the necessary information to systematically consider the proposed project's potential adverse environmental effects. This includes evaluating the potential adverse environmental effects from reasonable alternatives, and identifying and mitigating, where practicable, the effects identified as part of this process. The development and evaluation of project alternatives is central to the NEPA and SEQRA and CEQR processes. OMB and New York City Department of Parks and Recreation (NYC Parks), as NEPA and SEQRA/CEQR Lead Agencies, respectively, have determined that the proposed project has the potential to result in significant adverse environmental effects. Therefore, at OMB's request, the U.S. Department of Housing and Urban Development (HUD) issued a Notice of Intent to

Prepare an EIS in accordance with 24 CFR Part 1502.[2] In addition, OMB and NYC Parks prepared a Draft Scope of Work to describe the proposed content of the Draft Environmental Impact Statement (DEIS), to explain the methodologies to be used in the impact analyses, and to allow for public and stakeholder participation in accordance with 24 Code of Federal Regulations (CFR) Part 58, 40 CFR Parts 1500-1508 and 6 NYCRR Part 617.

A Draft Scope of Work for the DEIS was published on October 30, 2015, and a public scoping meeting was held on December 3, 2015, with a public input and review period that remained open until December 21, 2015. A Final Scope of Work, which reflected public comments made on the Draft Scope, was issued on April 5, 2019**.** This DEIS is based upon the Final Scope of Work. As stated above, the DEIS and subsequent Final EIS (FEIS) will serve to fulfill the statutory obligations of NEPA, SEQRA, and CEQR.

A Notice of Availability (pursuant to NEPA) and a Notice of Completion (pursuant to CEQR) for this DEIS were issued on April 5, 2019. Publication of the DEIS and the Notices initiates the public review period. The public review period for the DEIS will remain open for a minimum of 45 days. During this period, the public has the opportunity to comment on the DEIS in writing or at a public hearing. After the DEIS public comment period has closed, an FEIS will be prepared, which will include a summary of the comments received on the DEIS, responses to all substantive comments, and any necessary revisions to the DEIS to address those comments. No sooner than 45 days after publishing the FEIS, OMB, as NEPA Lead Agency, will prepare a Record of Decision that will describe the Preferred Alternative for the proposed project, its environmental impacts, and any required mitigation. Similarly, NYC Parks, as the SEQRA/CEQR Lead Agency, will prepare a Statement of Findings, demonstrating that it has reviewed the impacts, mitigation measures, and alternatives in the FEIS as part of its decision-making process. OMB can proceed with the federal action of requesting release of Community Development Block Grant-Disaster Recovery (CDBG-DR) grant funds from HUD once the environmental review process is concluded.

D. ANALYSIS FRAMEWORK

OVERVIEW

The proposed project area is comprised of two sub areas for the purposes of both design and environmental impact analysis (see **Figure S-1**):

- Project Area One extends from Montgomery Street on the south to the north end of East River Park at about East 13th Street. Project Area One and consists primarily of East River Park as well as the Franklin Delano Roosevelt East River Drive (FDR) Drive right-of-way, a portion of Pier 42 and Corlears Hook Park. The majority of Project Area One is within East River Park and includes four existing pedestrian bridges across the FDR Drive to East River Park

[2] HUD, which grants OMB the authority under 24 CFR Part 58, to serve as the responsible entity under NEPA and in accordance with 24 CFR 58.2(a)(7) as the lead agency responsible for environmental review, decision-making, and action under 42 U.S.C. § 5304(g), determined that the proposed project has the potential to result in significant adverse environmental impacts. Pursuant to the HUD NEPA implementing procedures, OMB, as responsible entity, must certify that it has complied the related laws and authorities identified by 24 C.F.R. § 58.5 and must consider the criteria, standards, policies and regulations of these laws and authorities.

(the Corlears Hook, Delancey Street, East 6th Street, and East 10th Street Bridges) and the East Houston Street overpass.

- Project Area Two extends north and east from Project Area One, from East 13th Street to East 25th Street. In addition to the FDR Drive right-of-way, Project Area Two includes the Con Edison facilities including East River Generating Station, Captain Patrick J. Brown Walk Murphy Brothers Playground, Stuyvesant Cove Park, Asser Levy Recreation Center and Playground, the Veterans Affairs (VA) Medical Center, and in-street segments along East 20th Street, East 25th Street, and along and under the FDR Drive.

This DEIS considers both the short-term (construction) and long-term (operational and, where relevant, maintenance) effects of each alternative under consideration for implementation of the proposed project. These alternatives have been evaluated for potential adverse effects to the project site and applicable study areas during storm and non-storm operational conditions for all relevant potential environmental effect categories.

E. ALTERNATIVES EVALUATED

INTRODUCTION

Alternatives for the proposed project were developed and refined during the public scoping process, which commenced with the issuance of the Draft Scope of Work, included input from the public, agencies, and other stakeholders, and concluded with the development of the Final Scope of Work, issued on April 5, 2019.

The City evaluated and reviewed the proposed alternatives' conceptual design against the purpose and need and principal objectives for the project, including providing a reliable flood protection system for the protected area, improving access to and enhancing open space resources along the waterfront, and meeting HUD funding deadlines for federal spending, along with the goal to minimize potential environmental effects and disruptions to the community.

As described in detail below, the Flood Protection System with a Raised East River Park Alternative best meets the principal objects for the project and therefore was selected as the Preferred Alternative. With the implementation of the Preferred Alternative, the proposed project would reconstruct East River Park to protect this valuable resource from flooding during coastal storm events as well as inundation from sea level rise and enhance its value as a recreational resource in addition to providing flood protection to the inland communities. The Preferred Alternative would raise the majority of East River Park and would limit the length of exposed wall between the community and the waterfront to provide for enhanced neighborhood connectivity and integration. In addition, pedestrian bridges would be reconstructed and 2 embayments would be relocated to improve access and enhance the park user experience. Furthermore, Stuyvesant Cove Park, Murphy Brothers Playground, and Asser Levy Playground would be reconstructed and improved. The Preferred Alternative includes the construction of a shared-use flyover bridge linking East River Park and Captain Patrick J. Brown Walk. This bridge will address a long-standing access deficiency along the East River Greenway at the Con Edison 13th Street Generating Station and would substantially improve the City's greenway network. The selection of this alternative also allows for a shorter construction duration and park closure, earlier deployment of the flood protection system (which is expected to be completed in mid-2023), and reduced construction disruption along the FDR Drive. A summary description of the five alternatives selected for analysis within this DEIS is provided below.

NO ACTION ALTERNATIVE (ALTERNATIVE 1)

The No Action Alternative represents the future condition without the proposed project and assumes that no new comprehensive coastal protection system is installed in the proposed project area. The build year for the proposed project is 2025 and accordingly, the No Action Alternative assumes that projects planned or currently under construction in the project area are completed by 2025. A list of these planned projects is included in **Appendix A1**.

PREFERRED ALTERNATIVE (ALTERNATIVE 4): FLOOD PROTECTION SYSTEM WITH A RAISED EAST RIVER PARK

The Preferred Alternative is a flood protection system comprised of a combination of floodwalls, 18 closure structures (i.e., swing and roller floodgates), and supporting infrastructure improvements that together would reduce risk of damage from coastal storms in the protected area. The inland limits of the protected area are generally along First Avenue, Avenue B, Avenue C, Avenue D, and Columbia Street and includes private and public properties and streets within the Lower East Side, East Village, Stuyvesant Town, Peter Cooper Village and Kips Bay communities that are currently in the East River coastal flood hazard area. The design flood elevation for the project is 16.5 feet NAVD88, which is generally 8 to 9 feet above the existing land surface along the project alignment but diminishes in height along the inland alignments (e.g., along Montgomery Street). This design elevation was developed based on the 100-year Federal Emergency Management Agency (FEMA) flood level and adding to that wave effects and the 90th percentile projection for sea level rise through to the 2050s (30 inches).

As described in greater detail below, a key element of the Preferred Alternative is elevating and reconstructing East River Park to make it more resilient to coastal storms and inundation from sea level rise. The proposed project also includes integrating flood protection with open space improvements at other parks along the flood protection alignment including Murphy Brothers Playground, Stuyvesant Cove Park, and Asser Levy Playground, an improved shared use path (bikeway/walkway), and a new shared-use flyover bridge to address the narrow and substandard waterfront public access near the Con Edison facility (on the east side of the FDR Drive between East 13th and East 15th Streets) known as the "pinch point."

Also proposed are redesigned and enhanced connections to the waterfront and East River Park, with the reconstruction of the Corlears Hook Bridge, the replacement of the Delancey and East 10th Street bridges, and the above-mentioned flyover bridge. These proposed bridge improvements would create more inviting and accessible crossings over the FDR Drive to the reconstructed East River Park and the East River waterfront, including the waterfront shared-use path. With the proposed project, the reconstructed bridges would be designed to provide more community-oriented access that supports and encourages public access to the waterfront with gentler grades that are consistent with the principle of universal access. Within the park, the bridge landings would provide an elevated gateway with expanded views of the reconstructed park and the river.

Flood Protection Alignment and Design

The description below summarizes flood protection alignment and design for the Preferred Alternative. **Figures S-2 through S-20** show the conceptual renderings of the Preferred Alternative.

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Montgomery Street Tie-Back (Reach A)
Conceptual Design

Figure S-2

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Reach A on East River Bikeway near Pier 42
Conceptual Design

Figure S-3

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Reach C at Corlears Hook Bridge Approach
Conceptual Design
Figure S-4

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
East River Park Bikeway/Walkway Conceptual Design
View North to Grand Street
Figure S-5

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Proposed Delancey Street Pedestrian Bridge
Conceptual Design

Figure S-6

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Delancey Street Bridge Landing
Conceptual Design
Figure S-7

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Reach E at Delancey Street
Conceptual Design

Figure S-8

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

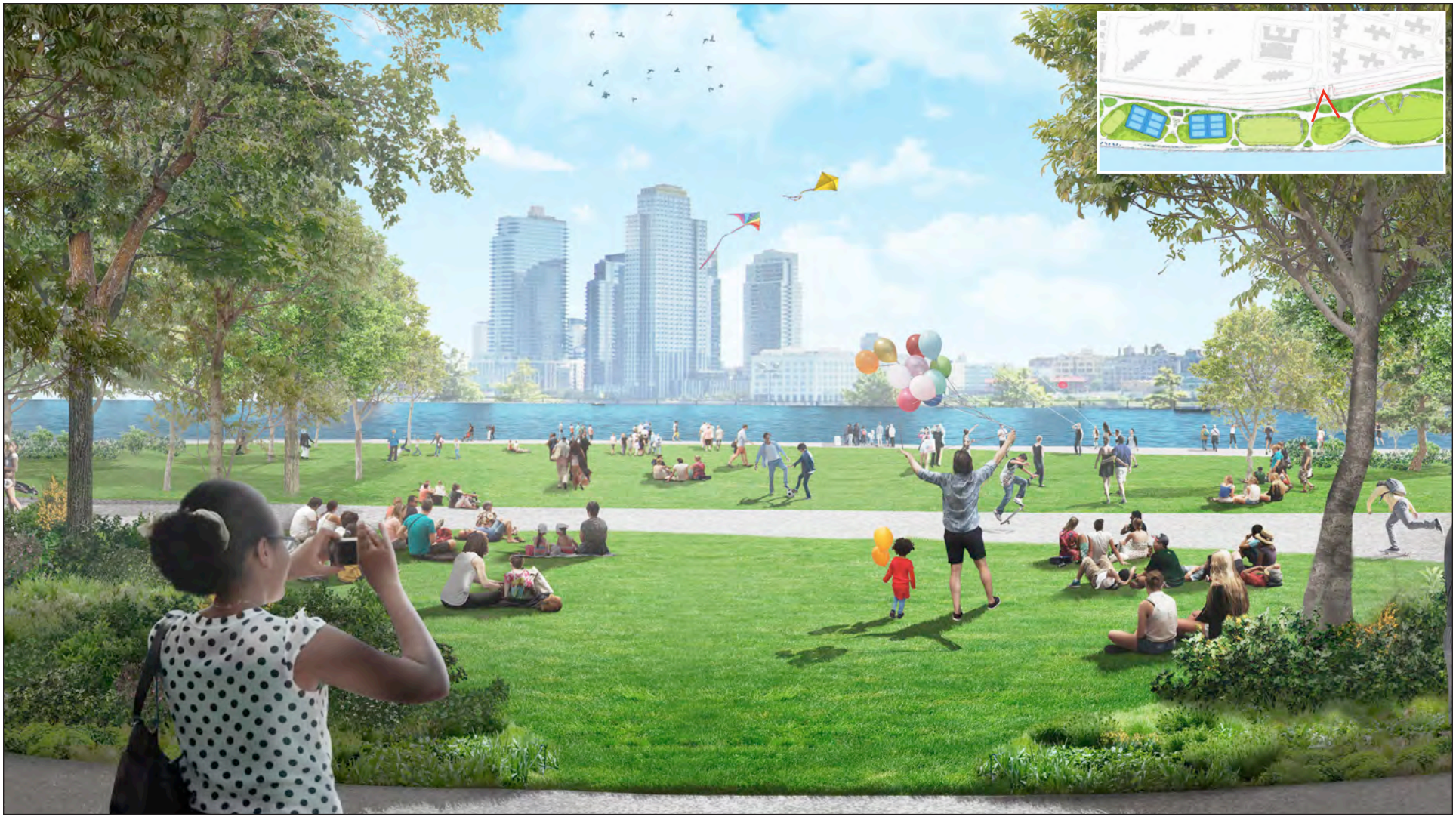
For Illustrative Purposes Only

Preferred Alternative:
Delancey Street Bridge Park Landing
Conceptual Design

Figure S-9

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19



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Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

Preferred Alternative:
East Houston Street Entry
Conceptual Design
Figure S-10

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Reach G at East Houston Street
Conceptual Design

Figure S-11

Capital Project SANDRESM1

EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Reach H near East 8th Street
Conceptual Design
Figure S-12

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Proposed East 10th Street Pedestrian Bridge
Conceptual Design

Figure S-13

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
East 10th Street Approach
Conceptual Design
Figure S-14

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Reach I and J near East 12th Street
Conceptual Design
Figure S-15

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Reach M at Murphy Brothers Playground
Conceptual Design
Figure S-16

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Reach N at Stuyvesant Cove South Entry
Conceptual Design
Figure S-17

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Stuyvesant Cove Park at the 20th Street Gate
Conceptual Design

Figure S-18

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
View north from East 23rd Street of Asser Levy Playground
Conceptual Design

Figure S-19

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

3.22.19

For Illustrative Purposes Only

Preferred Alternative:
Asser Levy Playground
Conceptual Design
Figure S-20

Capital Project SANDRESM1
EAST SIDE COASTAL RESILIENCY

Project Area One – South of East River Park

The proposed flood protection alignment begins at its southerly tieback along Montgomery about 130 feet west of South Street; at South Street the system turns north along for a distance of about 50 linear feet and then east, crossing under the FDR Drive to the east side of the highway with a pair of swing floodgates. Once on the east side of the highway, the flood protection system turns north and runs adjacent to the FDR Drive, continuing north into East River Park, which generally comprises of the area between the existing amphitheater and East 13th Street.

Project Area One – East River Park

Once in East River Park, the proposed flood protection alignment starts to turn east towards the East River, near the existing amphitheater. From here, the alignment continues north and the system parallels the East River Park bulkhead.

Within East River Park, the proposed project includes the following key design elements:

- Installing a below-grade flood protection structure (i.e., floodwall) running parallel to the existing East River Park bulkhead coupled with the elevation of a majority of East River Park (with the exception of the Fireboat House), generally beginning at the existing amphitheater and continuing northward to the northern end of the park near East 13th Street, thereby protecting park facilities and recreational spaces from design storm events and sea level rise inundation;
- Installing the floodwall below-grade to soften the visual effect of the flood protection system;
- Raising the majority of park grade with an increase in elevation from west (the FDR Drive) to east (the East River bulkhead) to attain the flood protection design elevation, accompanied by the reconstruction of the park open space including all fields and passive spaces, and incorporating resilient landscaping and substantial tree replanting that envisions a more diverse, resilient, and ecologically robust habitat;
- Reconstructing the Tennis House, Track and Field House and comfort stations;
- Reconstructing the East River Esplanade to increase the deck elevation to match the raised park and protect the esplanade from design storms and sea level rise;
- Improving north/south access along the waterfront with a new shared-use flyover bridge connecting the north end of East River Park with Captain Patrick J. Brown Walk;
- Improving access to the waterfront by reconstructing the Corlears Hook Bridge over the FDR Drive and replacing the existing Delancey Street and East 10th Street Bridges to be universally accessible;
- Creating an expanded and reconfigured park-side East Houston Street landing and entryway to the waterfront;
- Relocating the two existing embayments in the park with the objective of repurposing the filled areas as open space that allows for improved recreational programming and creating two new compensatory embayments that will allow for a closer river access opportunity for the public than the existing embayments with the designed steps off the esplanade;
- Reconstructing the amphitheater as an outdoor theater space; and
- Reconstructing all water and sewer infrastructure in the park, some of which is reaching the end of the serviceable life, including the outfalls and associated pipes that cross the park to the East River bulkhead.

It is an objective of the design to improve the ecology of East River Park, which is susceptible to the effects of sea level rise, storm surge, and heavy rainfall events. Storm surge from severe events like Hurricane Sandy can overwhelm the park. Moreover, the threat from gradually increasing sea level rise adds to the risk of more frequent flooding from everyday storms or high tides. This flooding not only interrupts the ability for parks visitors to enjoy and utilize the amenities within East River Park, but also affects its ecology. In 2014, NYC Parks removed 258 trees from East River Park due to salt water damage from Hurricane Sandy.

The existing landscaping and planting plan is reflective of the popular styles of the late 1930s, when the park was first designed and completed. The existing planting design is formal, with a focus on tree geometry and placement that maximizes open spaces for active recreation. Species diversity and ecology were not priorities of the original landscape design: over half of the current tree canopy is comprised of just two species. In the original design, plant selection relied heavily on canopy trees, such as London plane, a non-native species, and oaks. London plane trees in particular were significantly affected by salt inundation post Hurricane Sandy and have comprised most of the tree removals in East River Park since then.

In contrast, the proposed landscaping plan incorporates park resiliency through a design that can withstand a changing climate and consideration of species diversity, habitat, salt spray, wind, maintenance, and care. The proposed landscape plan includes over 50 different species, reflecting research around the benefits of diversifying species to increase resiliency and adaptive capacity in a plant ecosystem. The design also focuses on creating a more layered planting approach, allowing for informal planting areas that have flexibility and plant communities that together improve ecological richness. By elevating the majority of the park and its landscape, and diversifying plant species, the landscape in the park will be more resistant to salt spray exposure and improve resiliency and post-storm functionality over the long term.

Project Area Two

North of East River Park, the proposed flood protection system includes a closure structure across the FDR Drive near East 13th Street. Two swing floodgates that when deployed would close this segment of the flood protection system across the highway, but in non-storm conditions would be recessed to the sides of the highway. From there, the floodwall continues northward and aligns along the west (southbound) side of the FDR Drive, connecting into the existing flood protection system at the Con Edison East River Generating Station (between East 14th and East 15th Streets). A closure structure adjacent to East 14th Street near the FDR Drive would also be installed to allow Con Edison operational access. North of the East River Generating Station, a closure structure is proposed across the FDR Drive East 15th Street ramp, and the floodwall continues northward along the FDR Drive to Murphy Brothers Playground.

At Murphy Brothers Playground, the proposed floodwall is aligned along the east side of the park, which would also be reconstructed with new ballfields, active recreational spaces, grading, and landscaping.

Beginning at the northeast corner of Murphy Brothers Playground, the proposed flood protection system turns east along Avenue C, heading towards the East River, crossing the FDR Drive ramps (two swing gate closure structures are proposed here) and under the elevated FDR Drive into Stuyvesant Cove Park. Within Stuyvesant Cove Park, the proposed flood protection system turns northward, where it is comprised of a combination of floodwalls with closure structures (roller gates) at the southerly entrance (from Avenue C) and at the East 20th Street entrance to allow public access into the park and to the waterfront esplanade during non-storm conditions; design

of this segment is also being coordinated with the new design for Solar One Environmental Education Center and existing Citywide Ferry Service ferry landing.

North of Stuyvesant Cove Park, the system again turns west and back under the elevated FDR Drive at East 23rd Street. In this segment, a combination of floodwalls and closure structures i.e., roller and swing gates) are needed to maintain vehicular and pedestrian circulation through this intersection during non-storm conditions, including: vehicle access to the FDR Drive ramps and service roads; pedestrian and cyclist access to and along the East River shared-use path; and, vehicle and pedestrian access to Waterside Plaza (including the U.N. School and the British International School of New York), the Skyport Marina and parking garage, and a BP service station. These closure structures are to be recessed except under storm conditions when they would be deployed to provide flood protection.

North of East 23rd Street and west of the FDR Drive, the proposed flood protection system continues northward along the sidewalk of the southbound FDR Drive service road. The proposed system then turns westward into and across the Asser Levy Park Playground (between the Asser Levy Recreation Center and the outdoor recreational space). Similar to Murphy Brothers Playground, the outdoor recreational space at Asser Levy Playground would be redesigned and reconstructed and a roller floodgate is proposed to connect to the VA Medical Center floodwall. The floodgate would maintain the connection between the playground and the Asser Levy Recreation Center and during a storm condition it would be deployed. The VA Medical Center flood protection system extends north and then west along East 25th Street to complete the northern tieback at First Avenue.

Drainage System Modifications

Drainage system modifications are also proposed as part of the Preferred Alternative, including measures to control flow into the drainage protected area[3] from the larger sewershed (i.e., drainage isolation) and measures to manage flooding within the drainage protected area (i.e., drainage management). These modifications would reduce the risk of flooding in the protected area during extreme storm events coincident with rainfall events. As part of the Preferred Alternative, the water and sewer infrastructure in East River Park would be reconstructed and reconfigured where necessary to ensure that it could withstand the additional loading from the added fill materials once the park is raised. A summary of each of these measures is provided below.

Drainage Isolation

Measures to isolate the drainage protected area from the unprotected portions of the larger sewershed would be implemented to eliminate potential pathways for storm surge waters to inundate the existing sewer system and flood inland areas. The measures include: (1) installing interceptor gates on the existing 108-inch diameter interceptor at the northern and southern extremes of the drainage protected area sewershed, generally in the vicinity of East 20th Street and Avenue C to the north and between Corlears Hook Park and the FDR Drive to the south; (2) floodproofing the regulators, manholes, and other combined sewer infrastructure on the unprotected side of the flood protection system; (3) replacing existing tide gates on the combined sewer outfall pipes that serve the drainage protected area and rerouting storm drainage; and (4) installing one isolation gate valve in the existing Regulator M-39, located within Asser Levy

[3] The drainage protected area encompasses the project protected area as well as the lateral sewers, regulators, outfalls, and other sewer infrastructure that serve or are tributary to those that serve the project protected area.

Playground, to isolate a branch interceptor that crosses the flood protection system alignment at the northern boundary of the drainage protected area. These measures would prevent storm surge water from entering the sewer system through existing combined sewers, the outfall pipes, or through at-grade access points (i.e., manholes and hatches) for existing sewer infrastructure on the portion of the drainage protected area that is unprotected from overland coastal surge events.

Drainage Management

In addition to the isolation measures outlined above, the Preferred Alternative includes drainage management elements to ameliorate the reduced sewer capacity due to outfall closure during a design storm event. The proposed drainage management would reduce the risk of sewer backups and associated flooding within the drainage protected area during a design storm. These drainage elements include installing additional combined sewers, termed "parallel conveyance," within the drainage protected area to augment the capacity of the existing sewer system. Specifically, nine parallel conveyance connections are proposed.

Parallel conveyance pipes are proposed at 9 locations to convey excess combined sewer flows to the interceptor. Each parallel conveyance pipe would consist of a new upstream connection to a regulator or lateral sewer, a downstream connection to the interceptor, and a connecting length of pipe. The parallel conveyance pipes would range in diameter from 18 to 48 inches and require no above ground features. The parallel conveyance would be sited within City rights-of-way with two exceptions where some parallel conveyance infrastructure is proposed on private property. The parallel conveyance pipes and connections would include manholes for access, similar to the existing sewer pipes, generally every 200 to 250 feet, at pipe bends, and at all connections to allow access for maintenance and repairs, as needed, and would be sited within streets and paved surfaces (e.g., parking), where possible.

In addition, similar to the parallel conveyance, the Preferred Alternative also proposes to increase the size of the branch interceptor in order to increase the conveyance capacity to the Manhattan Pump Station for three sub-drainage areas within the protected area.

These proposed drainage management system improvements would not alter daily operation of existing sewer infrastructure under non-storm conditions. Under rainfall events or periods of high sewer flow, combined sewer flow would be conveyed to the interceptor via the existing branch interceptors and potentially also via the parallel conveyance.

East River Park Infrastructure Reconstruction

The Preferred Alternative also includes reconstructing the water and sewer infrastructure within the portion of East River Park that would be elevated, including the outfalls, regulators, and sewers and water supply infrastructure, to withstand the added loads of the proposed flood protection system and elevated parkland. The outfalls and regulators within the portion of East River Park to be elevated are also proposed for replacement. In most cases, the existing infrastructure would be abandoned in place and the new infrastructure would be reconstructed adjacent to the existing locations, although the outfalls would be relocated slightly along the East River Park bulkhead. Of the existing 11 outfalls, two would be combined as part of the outfall reconstruction effort.

System Operation and Maintenance

An operations and maintenance manual will be developed for the proposed system to identify the procedures for deploying, inspecting, testing, and maintaining each element of the proposed flood protection system to ensure that the floodwalls and closure structures remain in proper working order and are ready to perform in advance of a design storm event.

Operation and maintenance of the proposed parallel conveyance and interceptor gates would require periodic inspection and maintenance of the piping and mechanical equipment. These inspections would be in accordance with standard operation and maintenance procedures for the City's sewer infrastructure and a pre-approved operations and maintenance protocol developed for the proposed project.

Upon completion of construction of the proposed project, the City would submit engineering plans, design modifications during construction, supporting materials (i.e., design criteria, geotechnical data, hydraulic modeling, etc.), a final operations and maintenance plan, and relevant construction data to FEMA to demonstrate compliance with requirements listed in Chapter 44 of the Federal Code of Regulations, Section 65.10 for FEMA accreditation (recognition of the proposed project on Flood Insurance Rate Maps [FIRMs]).

Construction

The flood protection system and raised East River Park proposed under this alternative would be constructed in 3.5 years and completed in 2023. The foundations for the shared-use flyover bridge would also be completed in 2023. Subsequently, a prefabricated bridge span would be installed and completed in 2025. East River Park is anticipated to be closed for the entire 3.5-year construction duration. The City is committed to the outdoor recreational needs for these communities and is currently identifying opportunities to open portions of East River Park as work is completed, however, to be conservative, the analysis assumes a full close of the park for 3.5 years. Access to the Corlears Hook and Stuyvesant Cove ferry landings would be maintained during construction. Construction activities would require the use of barges and trucks for material deliveries. Approximately 600,000 cubic yards of fill is estimated to be required for the construction under the Preferred Alternative, and an average of 3 barge trips per day are anticipated throughout the 3.5-year construction period.

OTHER ALTERNATIVE (ALTERNATIVE 2): FLOOD PROTECTION SYSTEM ON THE WEST SIDE OF EAST RIVER PARK – BASELINE

Alternative 2 would provide flood protection in Project Areas One and Two using a combination of floodwalls, levees, and closure structures (i.e., deployable gates) from Montgomery Street to East 25th Street. In Project Area One, the line of flood protection would generally be located on the west side of East River Park. Protection would be provided by a concrete floodwall starting at Montgomery Street within the sidewalk adjacent to the Gouverneur Gardens Cooperative Village. The floodwall would then cross under the FDR Drive with closure structures across the FDR Drive's South Street off- and on-ramps. A combination of floodwalls and levees would then run along the west side of East River Park for the length of the entire park. The park-side landings for the Delancey Street and East 10th Street bridges would be rebuilt within East River Park to accommodate the flood protection system. As with the Preferred Alternative, a shared-use flyover bridge linking East River Park and Captain Patrick J. Brown Walk would be built cantilevered over the northbound FDR Drive to address the narrowed pathway (pinch point) near the Con Edison facility between East 13th Street and East 15th Street, substantially improving the City's greenway network and north-south connectivity in the project area.

In Project Area Two, the flood protection alignment would be similar to that proposed in the Preferred Alternative. However, portions of Murphy Brothers and Asser Levy Playgrounds that are affected during construction under this alternative would be replaced in kind instead of reconstructed and improved.

This alternative also includes modifications of the existing sewer system similar to the Preferred Alternative, including installing gates underground near the northern and southern extents of the project area within the existing large capacity sewer pipe (interceptor) and flood-proofing manholes and regulators located on the unprotected side of the proposed project alignment to control flow into the project area from the larger combined sewer drainage area. Installation of additional sewer pipes and, in one location, enlarging existing sewer pipes, is also proposed within and adjacent to the project area to reduce the risk of street and property flooding within the protected area during a design storm event.

The flood protection alignment proposed in Alternative 2 would require that the majority of flood protection construction be performed during night-time single-lane closures of the FDR Drive and in proximity to sensitive Con Edison transmission lines. Given the related construction complexities and logistical considerations, the flood protection system and associated components under this alternative are assumed to be constructed in 5 years and completed in 2025.

OTHER ALTERNATIVE (ALTERNATIVE 3): FLOOD PROTECTION SYSTEM ON THE WEST SIDE OF EAST RIVER PARK – ENHANCED PARK AND ACCESS

Alternative 3 provides flood protection using a combination of floodwalls, levees, and closures structures in Project Areas One and Two. As with Alternative 2, the line of protection in Project Area One would be generally located on the western side of East River Park. However, under Alternative 3, there would be more extensive use of levees and other earthwork in association with the flood protection along the FDR Drive compared to Alternative 2 to provide for more integrated access, soften the visual effect of the floodwall on park users, and introduce new types of park experience. The landscape would generally gradually slope down from high points along the FDR Drive towards the existing at-grade esplanade at the water's edge. Due to the extent of the construction of the flood protection system, compared to Alternative 2, this alternative would include a more extensive reconfiguration and reconstruction of the bulk of East River Park and its programming, including landscapes, recreational fields, playgrounds, and amenities. In addition, the existing pedestrian bridges and bridge landings at Delancey and East 10th Streets would be completely reconstructed to provide universal access, and a new raised and landscaped park-side plaza landing would be created at the entrance to the park from the East Houston Street overpass.

In Project Area Two, the flood protection alignment would be similar to that proposed in the Preferred Alternative and, as with the Preferred Alternative, would include the reconstruction and improvements to Murphy Brothers and Asser Levy Playgrounds.

As proposed in the Preferred Alternative, this alternative would include drainage components to reduce the risk of interior flooding and the shared-use flyover bridge to address the Con Edison pinch point.

Alternative 3 would involve construction of the flood protection system alignment along the FDR Drive and in proximity to sensitive Con Edison transmission lines. Given the associated complexities and logistical considerations involved when working in and around these facilities, a 5-year construction duration is assumed, with the proposed project estimated to be completed in 2025.

OTHER ALTERNATIVE (ALTERNATIVE 5): FLOOD PROTECTION SYSTEM EAST OF FDR DRIVE

Alternative 5 proposes a flood protection alignment similar to the Preferred Alternative, except for the approach in Project Area Two between East 13th Street and Avenue C. This alternative

would raise the northbound lanes of the FDR Drive in this area by approximately six feet to meet the design flood elevation then connect to closure structures at the south end of Stuyvesant Cove Park. Maintaining the flood protection alignment along the east side of the FDR Drive would eliminate the need for gates crossing the FDR Drive near East 13th Street as well as the need to install floodwalls adjacent to the New York City Housing Authority (NYCHA)'s Jacob Riis Houses, Con Edison property, and Murphy Brothers Playground.

As with the Preferred Alternative, this alternative would also include drainage components to reduce the risk of interior flooding and construction of the shared-use flyover bridge to address the Con Edison pinch point.

Alternative 5 is anticipated to be constructed in 5 years and completed in 2025 and this duration is driven by construction of the raised northbound lanes of the FDR Drive and the adjacent shared-use flyover bridge in this same footprint.

F. AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

The following sections contain a description of the principal conclusions for each DEIS technical analysis. These technical analyses include~~:~~ land use, zoning and public policy, socioeconomic conditions, open space, historic and cultural resources, urban design and visual resources, natural resources, hazardous materials, water and sewer infrastructure, transportation, neighborhood character, and environmental justice. The analysis of construction related effects included the following technical areas: socioeconomic conditions, open space, historic and cultural resources, urban design and visual resources, natural resources, hazardous materials, water and sewer infrastructure, energy, transportation, air quality, greenhouse gas, noise and vibration, and public health. **Table S-1** provides a summary of the potential effects for each of technical areas under each of the project alternatives.

Table S-1
Summary of Environmental Effects by Alternative[1]

	Preferred Alternative: Flood Protection System with a Raised East River Park (Alternative 4)	Flood Protection System on the West Side of East River Park - Baseline (Alternative 2)	Flood Protection System on the West Side of East River Park - Enhanced Park & Access (Alternative 3)	Flood Protection System East of FDR Drive (Alternative 5)
Principal Objectives of the Proposed Project	1) Provide a reliable coastal flood protection system against the design storm event for the protected area; 2) Improve access to and enhance open space resources along the waterfront, including East River Park and Stuyvesant Cove Park; 3) Respond quickly to the urgent need for increased flood protection and resiliency, particularly for communities that have a large concentration of residents in affordable and public housing units along the proposed project area; and 4) Achieve implementation milestones and comply with the conditions attached to funding allocations as established by HUD, including scheduling milestones			
Project Components that Meet the Principal Objectives of the Proposed Project	1) Protects community and East River Park 2) Elevation of a majority of East River Park with new and improved park experience (step downs/water access, etc.) and enhanced neighborhood connectivity and integration; reconstruction of esplanade, Corlears Hook, East 10th Street and Delancey Bridges; improvements of the park-side landings of the East 6th Street Bridge and East Houston Street entrance; construction of a shared-use flyover bridge; open space improvements at Murphy Brothers Playground, Stuyvesant Cove Park, and Asser Levy Playground; improve ecology of East River Park 3) Flood protection in place by mid-2023 and reduce construction risks, with flyover bridge completed in 2025. 4) Implementation milestones will be achieved	1) Protects community 2) Construction of a shared-use flyover bridge 3) Flood protection in place by 2025 4) Implementation milestones will be achieved	1) Protects community 2) Reconstruction of East 10th Street and Delancey Bridges; improvements of the park-side landings of the East 6th Street Bridge and East Houston Street entrance; construction of a shared-use flyover bridge; open space improvements at Murphy Brothers Playground, Stuyvesant Cove Park, and Asser Levy Playground; reconfiguration of bulk of East River Park and its programming 3) Flood protection in place by 2025 4) Implementation milestones will be achieved	1) Protects community and East River Park 2) Elevation of a majority of East River Park with new and improved park experience (step downs/water access, etc.) and enhanced neighborhood connectivity and integration; reconstruction of esplanade, Corlears Hook, East 10th Street and Delancey Bridges; improvements of the park-side landings of the East 6th Street Bridge and East Houston Street entrance; construction of a shared-use flyover bridge; open space improvements at Stuyvesant Cove Park and Asser Levy Playground; improve ecology of East River Park 3) Flood protection in place by 2025 4) Implementation milestones will be achieved
Note: [1]The No Action Alternative (Alternative 1) assumes that no new comprehensive coastal protection system is installed in the proposed project area and therefore has been excluded from this table.				
ENVIRONMENTAL EFFECTS DURING THE OPERATIONAL PERIOD				
Land Use, Zoning and Public Policy	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
Socioeconomic Conditions	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
Open Space	**No significant adverse effects** **Impact avoidance measures: NYC Parks Tree Restoration Plan**	**No significant adverse effects** **Impact avoidance measures: NYC Parks Tree Restoration Plan**	**No significant adverse effects** **Impact avoidance measures: NYC Parks Tree Restoration Plan**	**No significant adverse effects** **Impact avoidance measures: NYC Parks Tree Restoration Plan**
Historic and Cultural Resources	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
Urban Design and Visual Resources	**Significant adverse effects** - Views of the East River would be blocked on Grand Street **Mitigation measures -** Unmitigatable and unavoidable visual context effects from blocked waterfront views	**Significant adverse effects** - Views of the East River and existing waterfront would be blocked on Grand Street. Views of the existing waterfront would be blocked in the Cherry Street, East 6th Street, and East 10th Street view corridors and from within the Bernard Baruch, Lillian Wald, and Jacob Riis Houses, portions of the FDR Drive and FDR Drive Service Road **Mitigation measures -** Unmitigatable and unavoidable visual context effects from blocked waterfront views	**Significant adverse effects** - Views of the East River and existing waterfront would be blocked on Grand Street. Views of the existing waterfront would be blocked in the Cherry Street, East 6th Street, and East 10th Street view corridors and from within the Bernard Baruch, Lillian Wald, and Jacob Riis Houses, portions of the FDR Drive and FDR Drive Service Road **Mitigation measures -** Unmitigatable and unavoidable visual context effects from blocked waterfront views	**Significant adverse effects** - Views of the East River would be blocked on Grand Street **Mitigation measures -** Unmitigatable and unavoidable visual context effects from blocked waterfront views
Natural Resources	**No significant adverse effects** **Impact avoidance measures:** NYC Parks Tree Restoration Plan; wetland restoration design that meets all NYSDEC and USACE permit conditions	**No significant adverse effects** **Impact avoidance measures:** NYC Parks Tree Restoration Plan	**No significant adverse effects** **Impact avoidance measures:** NYC Parks Tree Restoration Plan	**No significant adverse effects** **Impact avoidance measures:** NYC Parks Tree Restoration Plan; wetland restoration design that meets all NYSDEC and USACE permit conditions
Hazardous Materials	**No significant adverse effects** **Impact avoidance measures:** Implementation of Site Management Plans (SMPs), that address long-term management of residual hazardous materials	**No significant adverse effects** **Impact avoidance measures:** Implementation of Site Management Plans (SMPs), that address long-term management of residual hazardous materials	**No significant adverse effects** **Impact avoidance measures:** Implementation of Site Management Plans (SMPs), that address long-term management of residual hazardous materials	**No significant adverse effects** **Impact avoidance measures:** Implementation of Site Management Plans (SMPs), that address long-term management of residual hazardous materials
Water and Sewer Infrastructure	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
Transportation	**No significant adverse effects** **Impact avoidance measures:** Traffic Management Plans during the deployment, testing, and maintenance of the closure structures	**No significant adverse effects** **Impact avoidance measures:** Traffic Management Plans during the deployment, testing, and maintenance of the closure structures	**No significant adverse effects** **Impact avoidance measures:** Traffic Management Plans during the deployment, testing, and maintenance of the closure structures	**No significant adverse effects** **Impact avoidance measures:** Traffic Management Plans during the deployment, testing, and maintenance of the closure structures
Neighborhood Character	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
Environmental Justice	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
ENVIRONMENTAL EFFECTS DURING THE CONSTRUCTION PERIOD				
Construction Socioeconomics	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
Construction Open Space	**Significant adverse effects -** Temporary displacement of recreational facilities and open space amenities, including East River Park, over the 3.5-year construction period; significant adverse noise effects at the Asser Levy Recreation Center **Mitigation measures -** Potential on-site or off-site measures to mitigate the effect to the greatest extent practicable are being explored by the city, including accommodating permit users at existing facilities; identify recreational resources that can be available to the community; providing alternative recreational opportunities; implementing improvements (e.g., lighting) to parks and playgrounds in the study area; rerouting greenway users to the most direct alternative route; supporting bicycle projects in the study area. In addition, the City is assessing opportunities to open parts of East River Park as work is completed. Refer to "Construction - Noise and Vibration" below for potential noise mitigation measures	**Significant adverse effects -** Temporary displacement of recreational facilities and open space amenities, including East River Park, over the 5-year construction period; significant adverse noise effects at the Asser Levy Recreation Center **Mitigation measures -** Potential on-site or off-site measures to mitigate the effect to the greatest extent practicable are being explored by the city, including accommodating permit users at existing facilities; identify recreational resources that can be available to the community; providing alternative recreational opportunities; implementing improvements (e.g., lighting) to parks and playgrounds in the study area; rerouting greenway users to the most direct alternative route; supporting bicycle projects in the study area. In addition, the City is assessing opportunities to open parts of East River Park as work is completed. Refer to "Construction - Noise and Vibration" below for potential noise mitigation measures	**Significant adverse effects -** Temporary displacement of recreational facilities and open space amenities, including East River Park, over the 5-year construction period; significant adverse noise effects at the Asser Levy Recreation Center **Mitigation measures -** Potential on-site or off-site measures to mitigate the effect to the greatest extent practicable are being explored by the city, including accommodating permit users at existing facilities; identify recreational resources that can be available to the community; providing alternative recreational opportunities; implementing improvements (e.g., lighting) to parks and playgrounds in the study area; rerouting greenway users to the most direct alternative route; supporting bicycle projects in the study area. In addition, the City is assessing opportunities to open parts of East River Park as work is completed. Refer to "Construction - Noise and Vibration" below for potential noise mitigation measures	**Significant adverse effects -** Temporary displacement of recreational facilities and open space amenities, including East River Park, over the 3.5-year construction period; significant adverse noise effects at the Asser Levy Recreation Center **Mitigation measures -** Potential on-site or off-site measures to mitigate the effect to the greatest extent practicable are being explored by the city, including accommodating permit users at existing facilities; identify recreational resources that can be available to the community; providing alternative recreational opportunities; implementing improvements (e.g., lighting) to parks and playgrounds in the study area; rerouting greenway users to the most direct alternative route; supporting bicycle projects in the study area. In addition, the City is assessing opportunities to open parts of East River Park as work is completed. Refer to "Construction - Noise and Vibration" below for potential noise mitigation measures

Table S-1
Summary of Environmental Effects by Alternative[1]

	Preferred Alternative: Flood Protection System with a Raised East River Park (Alternative 4)	Flood Protection System on the West Side of East River Park - Baseline (Alternative 2)	Flood Protection System on the West Side of East River Park - Enhanced Park & Access (Alternative 3)	Flood Protection System East of FDR Drive (Alternative 5)
Construction - Historic and Cultural Resources	**No significant adverse effects** **Impact avoidance measures:** Archaeological testing and Construction Protection Plans (CPPs) to be stipulated in a Programmatic Agreement (PA)	**No significant adverse effects** **Impact avoidance measures:** Archaeological testing and CPPs to be stipulated in a PA	**No significant adverse effects** **Impact avoidance measures:** Archaeological testing and CPPs to be stipulated in a PA	**No significant adverse effects** **Impact avoidance measures:** Archaeological testing and CPPs to be stipulated in a PA
Construction - Urban Design and Visual Resources	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
Construction - Natural Resources	**No significant adverse effects** **Impact avoidance measures:** Trees would be replaced or replanted in accordance with a NYC Parks-approved Tree Restoration Plan; a Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention, Control, and Countermeasure Plan (SPCCP) would be implemented; cushion block, turbidity curtains employed; all conservation measures required by NMFS would be used.	**No significant adverse effects** **Impact avoidance measures:** Trees would be replaced or replanted in accordance with a NYC Parks-approved Tree Restoration Plan; a Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention, Control, and Countermeasure Plan (SPCCP) would be implemented; cushion block, turbidity curtains employed; all conservation measures required by NMFS would be used.	**No significant adverse effects** **Impact avoidance measures:** Trees would be replaced or replanted in accordance with a NYC Parks-approved Tree Restoration Plan; a Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention, Control, and Countermeasure Plan (SPCCP) would be implemented; cushion block, turbidity curtains employed; all conservation measures required by NMFS would be used.	**No significant adverse effects** **Impact avoidance measures:** Trees would be replaced or replanted in accordance with a NYC Parks-approved Tree Restoration Plan; a Stormwater Pollution Prevention Plan (SWPPP) and a Spill Prevention, Control, and Countermeasure Plan (SPCCP) would be implemented; cushion block, turbidity curtains employed; all conservation measures required by NMFS would be used.
Construction - Hazardous Materials	**No significant adverse effects** **Impact avoidance measures:** Implementation of all applicable regulatory requirements and a Remedial Action Plan (RAP), a Construction Health and Safety Plan (CHASP), and a Mitigation Work Plan (MWP)	**No significant adverse effects** **Impact avoidance measures:** Implementation of all applicable regulatory requirements and a Remedial Action Plan (RAP), a Construction Health and Safety Plan (CHASP), and a Mitigation Work Plan (MWP)	**No significant adverse effects** **Impact avoidance measures:** Implementation of all applicable regulatory requirements and a Remedial Action Plan (RAP), a Construction Health and Safety Plan (CHASP), and a Mitigation Work Plan (MWP)	**No significant adverse effects** **Impact avoidance measures:** Implementation of all applicable regulatory requirements and a Remedial Action Plan (RAP), a Construction Health and Safety Plan (CHASP), and a Mitigation Work Plan (MWP)
Construction - Water and Sewer Infrastructure	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**
Construction - Energy	**No significant adverse effects** **Impact avoidance measures:** measures would be taken to minimize vibration, to carefully control excavation around existing infrastructure, and to manage the placement of fill and soil stockpiles.	**No significant adverse effects** **Impact avoidance measures:** measures would be taken to minimize vibration, to carefully control excavation around existing infrastructure, and to manage the placement of fill and soil stockpiles.	**No significant adverse effects** **Impact avoidance measures:** measures would be taken to minimize vibration, to carefully control excavation around existing infrastructure, and to manage the placement of fill and soil stockpiles.	**No significant adverse effects** **Impact avoidance measures:** measures would be taken to minimize vibration, to carefully control excavation around existing infrastructure, and to manage the placement of fill and soil stockpiles.
Construction - Transportation	**Significant adverse effects:** Significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the 6:00 to 7:00 AM construction analysis peak traffic hour; temporary significant adverse effects for users of the East River bikeway/walkway **Mitigation measures:** Traffic effects could be fully mitigated with standard traffic mitigation measures (e.g., signal timing changes); pedestrian/bicyclist rerouting plan	**Significant adverse effects:** Significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the 6:00 to 7:00 AM construction analysis peak traffic hour; temporary significant adverse effects for users of the East River bikeway/walkway **Mitigation measures:** Traffic effects could be fully mitigated with standard traffic mitigation measures (e.g., signal timing changes); pedestrian/bicyclist rerouting plan	**Significant adverse effects:** Significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the 6:00 to 7:00 AM construction analysis peak traffic hour; temporary significant adverse effects for users of the East River bikeway/walkway **Mitigation measures:** Traffic effects could be fully mitigated with standard traffic mitigation measures (e.g., signal timing changes); pedestrian/bicyclist rerouting plan	**Significant adverse effects:** Significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the 6:00 to 7:00 AM construction analysis peak traffic hour; temporary significant adverse effects for users of the East River bikeway/walkway; significant adverse traffic effects that could occur due to the closure of the FDR Drive (a temporary full 24-hour closure of the FDR Drive in the northbound direction and one-lane closure in the southbound direction for two consecutive months or partial closure in both directions) **Mitigation measures:** Traffic intersection effects could be fully mitigated with standard traffic mitigation measures (e.g., signal timing changes); pedestrian/bicyclist rerouting plan; the potential extensive FDR Drive closure would require the use of Traffic Enforcement Agents (TEAs)
Construction - Air Quality	**No significant adverse effects** **Impact avoidance measures:** Measures would be taken to reduce pollutant emissions, including dust suppression measures, idling restriction, and the use of ultra-low sulfur diesel (ULSD) fuel and best available tailpipe reduction technologies	**No significant adverse effects** **Impact avoidance measures:** Measures would be taken to reduce pollutant emissions, including dust suppression measures, idling restriction, and the use of ultra-low sulfur diesel (ULSD) fuel and best available tailpipe reduction technologies	**No significant adverse effects** **Impact avoidance measures:** Measures would be taken to reduce pollutant emissions, including dust suppression measures, idling restriction, and the use of ultra-low sulfur diesel (ULSD) fuel and best available tailpipe reduction technologies	**No significant adverse effects** **Impact avoidance measures:** Measures would be taken to reduce pollutant emissions, including dust suppression measures, idling restriction, and the use of ultra-low sulfur diesel (ULSD) fuel and best available tailpipe reduction technologies
Construction - Greenhouse Gas	**No significant adverse effects** **Impact avoidance measures:** Potential measures for further reductions of emissions under consideration may include the use of biodiesel, expanded use of recycled steel and aluminum, and construction waste reduction.	**No significant adverse effects** **Impact avoidance measures:** Potential measures for further reductions of emissions under consideration may include the use of biodiesel, expanded use of recycled steel and aluminum, and construction waste reduction.	**No significant adverse effects** **Impact avoidance measures:** Potential measures for further reductions of emissions under consideration may include the use of biodiesel, expanded use of recycled steel and aluminum, and construction waste reduction.	**No significant adverse effects** **Impact avoidance measures:** Potential measures for further reductions of emissions under consideration may include the use of biodiesel, expanded use of recycled steel and aluminum, and construction waste reduction.
Construction - Noise and Vibration	**Significant adverse noise effects:** Predicted at sensitive receptor locations near the flood protection alignment and the reconstructed pedestrian bridges. Maximum construction noise levels at receptors nearest floodwall construction within East River Park for the Preferred Alternative would be slightly lower than Alternatives 2 and 3, because pile driving would occur further from the receptors. **Mitigation measures:** Potential to partially mitigate the effects to the greatest extent practicable are being explored by the City; measures being considered include the use of the quieter hydraulic press-in pile installation method, noise barriers around the pile driving head, enclosures on concrete operations, increases usage of barges of materials deliveries, and selection of quieter equipment models **No significant adverse vibration effects**	**Significant adverse noise effects:** Predicted at sensitive receptor locations near the flood protection alignment **Mitigation measures:** Potential to partially mitigate the effects to the greatest extent practicable are being explored by the City; measures being considered include the use of the quieter hydraulic press-in pile installation method, noise barriers around the pile driving head, enclosures on concrete operations, increases usage of barges of materials deliveries, and selection of quieter equipment models **No significant adverse vibration effects**	**Significant adverse noise effects:** Predicted at sensitive receptor locations near the flood protection alignment and reconstructed bridges **Mitigation measures:** Potential to partially mitigate the effects to the greatest extent practicable are being explored by the City; measures being considered include the use of the quieter hydraulic press-in pile installation method, noise barriers around the pile driving head, enclosures on concrete operations, increases usage of barges of materials deliveries, and selection of quieter equipment models **No significant adverse vibration effects**	**Significant adverse noise effects:** Predicted at sensitive receptor locations near the flood protection alignment and the reconstructed pedestrian bridges. Maximum construction noise levels at receptors nearest floodwall construction within East River Park for the Preferred Alternative would be slightly lower than Alternatives 2 and 3, because pile driving would occur further from the receptors. **Mitigation measures:** Potential to partially mitigate the effects to the greatest extent practicable are being explored by the City; measures being considered include the use of the quieter hydraulic press-in pile installation method, noise barriers around the pile driving head, enclosures on concrete operations, increases usage of barges of materials deliveries, and selection of quieter equipment models **No significant adverse vibration effects**
Public Health	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**	**No significant adverse effects**

OPERATIONAL CONDITIONS

LAND USE, ZONING, AND PUBLIC POLICY

No Action Alternative (Alternative 1)

The No Action Alternative would not result in significant adverse effects to any existing or planned land use, zoning, or public policies within the study area. Projects proposed within the study area would continue as planned. However, the No Action Alternative would not meet the project goal of providing comprehensive coastal flood protection for the protected area. During a coastal storm event similar to the design storm, the protected area could experience effects similar to Hurricane Sandy. Targeted resiliency measures may reduce the effects of storms in certain locations but would not provide protection for the larger protected area or East River Park.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative proposes to move the line of flood protection in East River Park into the park, thereby protecting both the community and the park from design storm events, as well as increased tidal inundation resulting from sea level rise. The Preferred Alternative would raise the majority of East River Park except the southern end and western pathway. This plan would limit the length of wall between the community and the waterfront to provide for enhanced neighborhood connectivity and integration. In addition, two existing embayments would be relocated within the project area to provide adequate space to site heavily utilized active recreation facilities and to allow for an Americans with Disabilities Act (ADA) accessible path to improve accessibility to, and enjoyment of, the waterfront for all Park users. The two proposed embayments would be comparable or larger in size, would be similarly located within East River Park, and would be designed to provide enhanced aesthetic and experiential value in addition to improved ecological function. A shared-use flyover bridge linking East River Park and Captain Patrick J. Brown Walk would be built cantilevered over the northbound FDR Drive to address the narrowed pathway (pinch point) near the Con Edison facility between East 13th Street and East 15th Street, substantially improving the City's greenway network and north-south connectivity in the project area.

This alternative would not result in significant adverse effects to any existing or planned land use, zoning, or public policies within the study area. Land use actions resulting from the Preferred Alternative include acquisition of real property, amendments to the City Map for changes related to existing and proposed pedestrian bridges following construction, and a zoning text amendment; however, these actions would not result in any adverse effects on land uses and would be consistent with zoning and public policies including the City's Waterfront Revitalization Program (WRP). Since the Preferred Alternative provides resiliency and protection for East River Park against design storm events and periodic inundation from projected sea level rise coupled with the enhanced public access, this alternative would ensure that East River Park provides improved public access, operations, and functionality, during pre- and post-storm periods compared to the No Action Alternative.

Other Alternatives

Alternatives 2, 3, and 5 would similarly be consistent with existing and planned land use and zoning, although Alternatives 2 would require fewer land use actions than the Preferred Alternative (i.e., City Map change would not be required for Alternative 2). The alternatives would vary in the degree to which they advanced public policies pertaining to improving open spaces

and access to open spaces as well incorporate resiliency features, but all alternatives would be consistent with public policies.

SOCIOECONOMIC CONDITIONS

No Action Alternative (Alternative 1)

Under the No Action Alternative, in the absence of the flood protection system, the existing neighborhoods would remain at risk to coastal flooding during design storm events. Thus, for the No Action Alternative, there is the potential for adverse socioeconomic effects within the study area due to potential flood damage created by design storm events. Socioeconomic effects would include the direct physical damages associated with a design storm event, displacement, human impacts, and loss of services. In addition, the open space amenities included in the With Action Alternatives would not be implemented within the study area.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative would result in park and neighborhood connection improvements, and does not present new uses or activities to the project area that could markedly influence the study area's residential or commercial market. Therefore, the Preferred Alternative would not result in the direct displacement of any residents or businesses.

Under the Preferred Alternative, residents and businesses within the 100-year floodplain in the socioeconomic study area would be less vulnerable to flooding during storm events. Under the Preferred Alternative, there would be positive socioeconomic benefits due to the avoided costs associated with flood damage that would otherwise be incurred during storm events.

Other Alternatives

Alternatives 2, 3, and 5 would not result in the direct displacement of any residents or businesses. In addition, none of the With Action Alternatives would result in significant indirect residential or business displacement pressures within the study area for the same reasons as the Preferred Alternative.

OPEN SPACE

No Action Alternative (Alternative 1)

The No Action Alternative would not alter the size or use of existing open spaces; the open space projects identified in **Appendix A1** would continue to be implemented as planned. However, the No Action Alternative would not provide comprehensive coastal flood protection for the protected area. During a design event, the protected area, including open spaces, could be adversely impacted, potentially experiencing effects similar to that of Hurricane Sandy or other extreme coastal storm events. Targeted resiliency measures may reduce the effects of storms in certain locations but would not provide comprehensive flood protection for the protected area.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative would not result in significant adverse effects to existing or planned open spaces within the study area. Overall, the Preferred Alternative would not alter the amount of open space, nor would this alternative introduce new worker and residential populations to the study area. By elevating East River Park and reconstructing Stuyvesant Cove Park, Murphy Brothers Playground, and Asser Levy Playground, the Preferred Alternative provides the opportunity for a holistic reconstruction, reimagining, and expansion of the types of user experiences in the park, while also enhancing neighborhood connectivity and resiliency. Increased

improvements to landscaping along the waterfront and to the waterfront esplanade itself would also be included in this alternative. These benefits would ensure improved resiliency, operations, usability, and functionality of East River Park during pre- and post-storm periods. In addition, the Preferred Alternative would alleviate shared-use path congestion at the Con Edison facility with the construction of a flyover bridge (which would be complete by 2025). The Preferred Alternative also provides inland flood protection and allows these benefits to be available sooner than other alternatives as flood protection construction is expected to be complete in 2023. A total of 981 trees would require removal throughout the project area but would be replaced or replanted in accordance with a NYC Parks-approved tree replanting plan such that there would be a net overall increase in the number of trees within the park, and would also protect the long-term viability of trees and ecological resources by protecting them from damaging salt water inundation and providing for planting that is more appropriate for the park.

Other Alternatives

Alternatives 2, 3, and 5 would not result in significant adverse effects to any existing or planned open spaces within the study area. None of the With Action Alternatives would substantially alter the size or use of existing open spaces, nor would they introduce new worker and residential populations to the study area. Each alternative would slightly alter the ratio of active to passive recreation space. Trees within the study area—specifically within East River Park, Stuyvesant Cove Park, Murphy Brothers Playground, and Asser Levy Playground—would be removed in support of the construction of the proposed flood protection system. Trees would be replaced or replanted in accordance with a NYC Parks-approved tree replanting plan as part of the restoration of each park.

HISTORIC AND CULTURAL RESOURCES

Archaeological Resources

Two Phase 1A Archaeological Documentary Studies were prepared for the Area of Potential Effects (APE) in March 2016, and a Supplemental Phase IA Archaeological Documentary Study was prepared in March 2019. The March 2016 reports identified the following broad categories of historic-period archaeological resources that could be located in the APE—river bottom remains, landfill retaining structures and landfill deposits, historic streetbed resources, and former city block resources. Because of the potential presence of these resources, as mitigation, additional archaeological investigation will be performed in accordance with Section 106 regulations, based on a scope of work reviewed and approved by New York City Landmarks Preservation Commission (LPC) and the State Historic Preservation Office (SHPO); this archaeological investigation would include pre-construction testing and/or monitoring during project construction performed in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology, the Advisory Council on Historic Preservation (ACHP)'s Section 106 Archaeological Guidance, and the New York Archaeological Council's Standards for Cultural Resource Investigations and Curation of Archaeological Collections. The scope of work for additional archaeology would include: a sampling strategy that will select specific areas of the APE to be further investigated; identification of those areas that are believed to be most sensitive for recovering landfill retaining structures across the overall APE; a description of the basis for the proposed sampling design, including a tabulation of the various archaeological contexts within the APE and a quantification of the sample fraction for each context; and an unanticipated discoveries protocol. If significant archaeological resources are identified during testing and/or monitoring, further archaeology and/or mitigation would be completed in accordance with Section 106 regulations and the guidelines in the CEQR Technical Manual. In written communications

dated April and May 2016, representatives of the Delaware Nation, Delaware Tribe of Indians, and Stockbridge-Munsee Community Band of Mohicans requested, in the case of an unanticipated discovery of an archaeological site or artifacts, that work be halted until the tribe is notified and the artifact can be evaluated by an archaeologist. The additional archaeological investigation will be stipulated in a Programmatic Agreement (PA) that is being prepared and will be included in the FEIS. It is expected that the PA will be executed among HUD, OMB, NYC Parks, SHPO, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, and ACHP.

Architectural Resources

There are 17 architectural resources within the Primary Area of Potential Effects (APE). In addition, there are 42 known architectural resources located within the Secondary APE beyond the boundaries of the project area.

No Action Alternative (Alternative 1)

One planned NYC Parks project within Project Area One could affect architectural resources that have been determined eligible for listing on the State and National Registers of Historic Places (S/NR)—construction of an exterior entrance ramp to the former Marine Engine Co. 66 Fireboat House (#4). This architectural resource would be offered some protection from accidental damage through Building Code Section BC 3309: Protection of Adjoining Property.

In addition, three projects within the 400-foot portion of the Primary APE could affect architectural resources in the No Action Alternative—reconstruction of the Baruch Playground within the Bernard Baruch Houses (#9, S/NR-eligible), resiliency measures at the Baruch Houses (#9, S/NR-eligible), and rehabilitation work at the Asser Levy Public Baths (#12, NYCL, S/NR).

In the absence of a comprehensive flood protection system, architectural resources located within the APEs would remain at risk to flooding, with the exception of the Bernard Baruch and Jacob Riis Houses, which would be protected by resiliency measures being implemented by NYCHA.

Preferred Alternative (Alternative 4): Flood Protection System with A Raised East River Park

The Preferred Alternative would directly affect the FDR Drive (#1, S/NR-eligible) through the installation of closure structures. As will be stipulated in the PA, construction affecting the FDR Drive would be coordinated with the New York City Department of Transportation (NYCDOT) to ensure that it is protected during construction of the Preferred Alternative.

Construction of the Preferred Alternative would occur within 90 feet of the Asser Levy Public Baths (#12, S/NR, NYCL) and a small portion of the Jacob Riis Houses (#15, S/NR-eligible). In addition, construction of the drainage management components would occur within 90 feet Construction under the Preferred Alternative would occur within 90 feet of the following architectural resources: the FDR Drive (#1, S/NR-eligible); Williamsburg Bridge (#2, S/NR-eligible); Engine Co. 66 Fireboat House (#4, S/NR-eligible); Gouverneur Hospital (#5, S/NR); Gouverneur Hospital Dispensary (#6, S/NR-eligible); a portion of the Vladeck Houses within the Lower East Side Historic District (#7, S/NR); a portion of the Baruch Houses (#9, S/NR-eligible); the Asser Levy Public Baths (#12, S/NR, NYCL); a portion of the Jacob Riis Houses (#15, S/NR-eligible); a portion of Stuyvesant Town (#16, S/NR-eligible); and a portion of Peter Cooper Village (#17, S/NR-eligible). Therefore, as will be stipulated in the PA, the City, in consultation with LPC and SHPO, would develop and implement Construction Protection Plans (CPPs) for these architectural resources to avoid inadvertent construction-period damage from ground-borne vibrations, falling debris, collapse, dewatering, subsidence, or construction equipment.

It is not expected that the Preferred Alternative would result in any contextual effects on architectural resources. As will be stipulated in the PA, an effort would be made to design the floodwalls adjacent to the Asser Levy Public Baths (#12, S/NR, NYCL) so that they are compatible with the historic building, and the design would be coordinated with LPC.

In a future storm condition, the following two S/NR-eligible architectural resources could experience adverse direct effects from storm surge and flooding: the Williamsburg Bridge (#2) and East River Bulkhead (#3) from Whitehall Street to Jackson Street.

The portion of the FDR Drive (#1, S/NR-eligible) that runs through Project Area One would be located on the landward side of the flood protection system that would be constructed under the Preferred Alternative. It would, therefore, be protected from damage that could result from storm surge and flooding in a future storm condition. The portion of the FDR Drive (#1, S/NR-eligible) that runs through Project Area Two, however, would not be protected. Therefore, in a future storm condition, that portion of the FDR Drive could experience adverse direct effects from storm surge and flooding.

The architectural resources located within the 400-foot portion of the Primary APE and within the Secondary APE are landward of the flood protection system that would be constructed under the Preferred Alternative. Therefore, they would be protected from damage that could result from storm surge and flooding in a future storm condition.

Other Alternatives

Effects to architectural resources in both the non-storm and storm conditions would be similar to Alternatives 2, 3, and 5 as described above for the Preferred Alternative.

Unlike the Preferred Alternative and Alternatives 2 and 3, Alternative 5 would reconstruct the section of the FDR Drive (#1, S/NR-eligible) between approximately East 13th and East 18th Streets. However, it is not expected that this work would have adverse effects on the FDR Drive, as only an approximately 6-block section of the 9.44-mile-long FDR Drive would be reconstructed. Further, because the FDR Drive currently has elevated sections, raising the northbound lanes within a portion of Project Area Two would not affect the overall appearance of the highway, and it would still convey its historic significance. Also, the FDR Drive has been altered over time. Further, Alternative 5, unlike the Preferred Alternative and Alternatives 2 and 3, would protect the section of the FDR Drive between East 13th and Avenue C from storm surge and flooding.

MITIGATION

Archaeological Resources

As will be stipulated in the PA, additional archaeological investigation prior to or during construction will be performed in accordance with Section 106 regulations. Such scope of work will be prepared in consultation with LPC and SHPO, and this further phase of archaeological work would include testing and/or monitoring conducted in consultation with LPC and SHPO and in accordance with the Secretary of the Interior's *Standards and Guidelines for Archaeology*, ACHP's *Section 106 Archaeological Guidance*, and the New York Archaeological Council's *Standards for Cultural Resource Investigations and Curation of Archaeological Collections*. The testing and/or monitoring would not be done during the EIS process but would occur before and/or during project construction. The scope of work for additional archaeology would include: a sampling strategy that will select specific areas of the APE to be further investigated; identification of those areas that are believed to be most sensitive for recovering landfill retaining structures

across the overall APE; a description of the basis for the proposed sampling design, including a tabulation of the various archaeological contexts within the APE and a quantification of the sample fraction for each context; and an unanticipated discoveries protocol. If significant archaeological resources are identified during testing and/or monitoring, further archaeology and/or mitigation would be completed as per the *CEQR Technical Manual*.

Architectural Resources

The City, in consultation with LPC and SHPO, would develop and implement CPPs for the following architectural resources, or portions of multi-building resources, located within 90 feet of project construction: for the FDR Drive (#1, S/NR-eligible); Gouverneur Hospital (#5, S/NR); Gouverneur Hospital Dispensary (#6, S/NR-eligible); a portion of the Vladeck Houses within the Lower East Side Historic District (#7, S/NR); a portion of the Baruch Houses (#9, S/NR-eligible); the Asser Levy Public Baths (#12, S/NR, NYCL); a portion of the Jacob Riis Houses (#15, S/NR-eligible); Stuyvesant Town (#16, S/NR-eligible); and a portion of Peter Cooper Village (#17, S/NR-eligible) to avoid inadvertent construction-period damage to these architectural resources. The development and implementation of the CPPs will be stipulated in the PA. In addition, as will be stipulated in the PA, an effort would be made to design the floodwalls that would be located adjacent to the Asser Levy Public Baths (#12, NYCL, S/NR), so that they are compatible with the architectural resource, and the design of the floodwalls would be coordinated with LPC.

URBAN DESIGN AND VISUAL RESOURCES

No Action Alternative (Alternative 1)

Under the No Action Alternative, the future condition without the proposed project assumes that no new comprehensive coastal protection system is installed in the project area. However, there are a number of projects planned, projected, or under construction in the project area and 400-foot study area that are expected to be complete by 2025. Projects to be built by 2025 within the project area, including the proposed project, aim to enhance recreational resources and access to East River Park, Pier 42, and Stuyvesant Cove Park. Projects within the 400-foot study area include resiliency projects at NYCHA complexes. The resiliency projects are not likely to change the visual character of the area. Other expected development activity in the No Action condition includes the continuing redevelopment of the Lower East Side with mixed-used development, which is expected to change the visual character of the area by continuing an existing trend of new residential and mixed-use development adding to the area's mix of low and high-rise structures. Over time, East River Park's tree canopy and landscaping would likely be diminished due to storm surge and rising sea level.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Urban Design

It is not expected that the floodwalls and closure structures installed under the Preferred Alternative would have adverse urban design effects to the southern end of Project Area One, Project Area Two, or the surrounding portions of the 400-foot study area. While the shared use flyover bridge would be a new urban design feature, it would have beneficial urban design effects by elevating pedestrians and bicyclists above the Con Edison pier and the FDR Drive. In this area, pedestrians and bicyclists would no longer be immediately adjacent to vehicular traffic on the FDR Drive, but would be above it. Further, the flyover bridge would enhance pedestrian and bicyclist safety by bypassing the narrowed walkway.

In general, the floodwalls, closure structures, and interceptor gate buildings would be new features to the public realm, but they would be installed in locations where there are existing fences and walls and where the FDR Drive runs on a viaduct.

Under this alternative, East River Park would be raised and completely reconstructed. While it would have a new design, the park would maintain the visual character of a landscaped, recreational waterfront park with paths, lawns, and athletic fields, and it would add improved entrances to the park from Corlears Hook Park and at Delancey Street, East Houston Street, and East 10th Street.

This alternative would result in a temporary adverse effect from the removal of existing trees in East River Park, and with this alternative 784 of the existing trees in the park would be removed. To lessen that adverse effect, the design of the alternative includes the planting of new trees and the potential transplantation of some existing trees into the raised and reconstructed park. Over time, the new tree canopy, comprised of diverse and resilient species, would fill in and would represent an improved habitat over the existing conditions.

Although Stuyvesant Cove Park would be reconstructed, which would involve the removal of 45 existing trees, the new design would reference the design of the existing park and would include new trees and multiple planting elements, and there would not be an adverse effect.

While the flyover bridge would be a new urban design feature, it would have beneficial urban design effects by elevating pedestrians and bicyclists above the Con Edison pier and the FDR Drive. In this area, pedestrians and bicyclists would no longer be immediately adjacent to vehicular traffic on the FDR Drive, but would be above it. Further, the flyover bridge would enhance pedestrian and bicyclist safety by bypassing the narrowed walkway.

Views, Aesthetic and Visual Resources, and Viewer Groups

The Preferred Alternative would maintain the visual connectivity between the waterfront and the adjacent upland neighborhoods. In Project Area One, the design of East River Park to slope down to the level of the FDR Drive would maintain views of East River Park from the adjacent neighborhoods. However, by raising East River Park, this alternative would potentially block some views of the East River. On Grand Street, views of the East River would be blocked, resulting in a significant adverse impact, but these eastward views would be of East River Park with Brooklyn in the distance. The raised park would alter views of East River Park and Brooklyn in the East 6th Street and East 10th Street view corridors and from within the Bernard Baruch, Lillian Wald, and Jacob Riis Houses compared to existing views, but these views would be of a landscaped waterfront park and there would be no potential significant adverse effects to these views. At East 6th and East 10th Streets, views to the waterfront would continue to be of East River Park. From the portions of the FDR Drive and FDR Drive service road that run through Project Area One, views would be of East River Park, similar to existing views, although occasional views of the East River would no longer be available. There are no view corridors to the waterfront between East 13th and East 18th Streets and, therefore, the flyover bridge would not block any views from the study area.

Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline

Urban Design

As under the Preferred Alternative, it is not expected that the flood protection components of Alternative 2 would have adverse urban design effects to the southern end of Project Area One

and the surrounding portion of the 400-foot study area, or in Project Area Two and the surrounding portion of the study area.

Alternative 2 would maintain large portions of East River Park as would the No Action Alternative and would install a combination of floodwalls and levees generally along the west edge of the park, creating a hard, visually impermeable edge. However, these resiliency measures would not affect the experience of most users within the park, and it is not expected that this alternative would have overall adverse effects on the visual character of East River Park. Unlike under the Preferred Alternative, the existing Corlears Hook, Delancey Street, and East 10th Street bridges would not be reconstructed under Alternative 2 and access to the park at those points would not be improved.

Views, Aesthetic and Visual Resources, and Viewer Groups

Overall, Alternative 2 would result in a lengthy and monolithic floodwall between the waterfront and the adjacent, upland neighborhoods, reducing the visual connectivity between those neighborhoods and the waterfront and diminishing visual quality. In comparison, the Preferred Alternative would maintain the visual connections between the upland neighborhoods and East River Park. In addition, the levees, floodwalls, and closure structures constructed under this alternative would likely block existing waterfront and East River views in the Cherry Street, Grand Street, East 6th Street, and East 10th Street view corridors and from within the Bernard Baruch, Lillian Wald, and Jacob Riis Houses, potentially resulting in significant adverse effects. This alternative would also potentially result in significant adverse effects to waterfront and river views seen from the portions of the FDR Drive and FDR Drive Service Road that run through Project Area One. As with the Preferred Alternative, the flood protection measures constructed in Project Area Two are not expected to result in significant adverse visual effects.

Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access

Urban Design

Under Alternative 3, the flood protection systems installed at the southern end of Project Area One and in Project Area Two would be similar to those that would be installed under the Preferred Alternative and Alternative 2, and it is not expected that the floodwalls, levees, and closure structures would have adverse urban design effects to the southern end of Project Area One, Project Area Two, or the surrounding portions of the 400-foot study area.

With the exception of the removal of 590 trees, it is not expected that Alternative 3 would have overall significant adverse effects on the visual character of East River Park, as the alternative would maintain the park's visual character as a landscaped, waterfront park with paths and recreational facilities, and it would add improved entrances to the park at Delancey, East Houston, and East 10th Streets.

Removal or alteration of certain existing park features would not result in adverse effects to its visual character. Throughout the park, where athletic fields would be moved and reoriented, they would be replaced, with the exception of Ball Fields Nos. 7 and 8, which will be reoriented and transformed into one multi-use field. At Grand Street, the play area with the multiple seal statues would be replaced with a new water and nature exploration play area. At the northern end of the park, as under the Preferred Alternative, the existing barbecue and picnic area would be removed for the new park-side landing of the reconstructed East 10th Street Bridge and a grassed amphitheater, but a replacement barbecue and picnic area would be located in the immediate vicinity. More trees would be removed throughout East River Park under Alternative 3 than under

Alternative 2, and this alternative, like the Preferred Alternative, would result in a temporary adverse effect, but the landscape plan for this alternative includes the planting of new trees that would result in a net increase of trees to the park to lessen this effect. Over time, the new tree canopy, comprised of diverse and resilient species, would fill in and would represent an improved habitat over the existing conditions. Views through the park would be altered by this alternative, but the park would retain its overall character of a recreational, waterfront park with paths, lawns, and athletic fields.

Views, Aesthetic and Visual Resources, and Viewer Groups

Views to the waterfront would be largely the same with this alternative as with Alternative 2, with reduced visual connectivity between the waterfront and the adjacent, upland neighborhoods, and there would potentially be significant adverse effects from blocked views of the East River on Cherry and Grand Streets; blocked waterfront views in the East 6th Street and East 10th Street view corridors; blocked waterfront views from within the Bernard Baruch, Lillian Wald, and Jacob Riis Houses; and blocked waterfront and river views seen from the portions of the FDR Drive and FDR Drive Service Road that run through Project Area One. On Grand Street, views to the river would be blocked; views would instead be of the redesigned park, which would lessen the impact on this view corridor. As with the Preferred Alternative and Alternative 2, the floodwalls, levees, raised landscape, and closure structures constructed in Project Area Two are not expected to result in significant adverse visual effects.

Other Alternative (Alternative 5) – Flood Protection System East of FDR Drive

Urban Design

The flood protection measures provided in Project Area One under this alternative would be the same as provided under the Preferred Alternative. Therefore, this alternative would result in the same adverse urban design effects to East River Park as the Preferred Alternative and Alternative 3 from the removal of existing trees. Over time, the new tree canopy, comprised of diverse and resilient species, would fill in and would represent an improved habitat over the existing conditions.

In general, it is not expected that Alternative 5 would have adverse urban design effects in Project Area Two or on the surrounding portions of the 400-foot study area. The section of the northbound FDR that would be elevated is a short 6-block-long section primarily adjacent to the Con Edison East River Generating Facility, a portion of the study area where pedestrians are confined to the existing walkway along the Con Edison pier and to Captain Patrick J. Brown Walk. The raised FDR Drive would not adversely affect the pedestrian experience of those users, because they would be elevated above it on the new flyover bridge between East River Park and East 16th Street. Between East 16th and East 18th Streets where users of Captain Patrick J. Brown walk would be adjacent to the elevated northbound FDR Drive, the raised platform and floodwall would create a buffer between vehicular traffic on the FDR Drive and users of Captain Patrick J. Brown Walk, resulting in beneficial effects to the pedestrian experience. North of the proposed raised platform, the floodwalls and closure structures would be installed in locations where there are existing fences and walls, and where the FDR Drive is elevated on a viaduct.

Views, Aesthetic and Visual Resources, and Viewer Groups

In Project Area One, views to the waterfront would be the same with this alternative as with the Preferred Alternative. In Project Area Two, the proposed floodwall along the east side of the raised portion of the FDR Drive would obscure views of the waterfront as seen from the FDR Drive.

MITIGATION

As described above, the Preferred Alternative and Alternatives 2, 3, and 5 could potentially result in significant adverse visual effects by blocking views to the waterfront and East River from multiple locations within the study area. These potential significant adverse effects would not be visually mitigated, resulting in unavoidable significant adverse effects. Lowering the floodwalls, levees and/or raised landscape under the With Action Alternatives to allow continued views to the waterfront and East River would impair the ability of the proposed project to provide adequate flood protection to the surrounding communities and would not meet the project goals. Although views to East River Park would be blocked under Alternatives 2 and 3, Alternative 3 would provide enhanced and more direct connections to the park, improving accessibility and the pedestrian experience. The Preferred Alternative and Alternative 5 would maintain views to East River Park, because the park would slope down to the grade of the FDR Drive and there would be no floodwalls along the park's western edge; these alternatives would also improve accessibility to the park. While the finishes of floodwalls would not mitigate the significant adverse effects of blocked views to the East River in Project Area One under Alternatives 2 and 3 or in Project Area Two under Alternative 5, the aesthetics of the finishes would affect the experience of pedestrians, residents, motorists, and bicyclists. Therefore, floodwalls are expected to be finished with board form concrete to create alternating smooth and textured surfaces to provide visual interest and relieve the monotony of an untextured blank wall. In addition, planting and landscape treatment can be used to mitigate the visual impact of floodwalls.

NATURAL RESOURCES

No Action Alternative (Alternative 1)

Future storms would be expected to cause further damage to natural resources within the parks, beyond the effects caused by Hurricane Sandy. Hundreds of trees in East River Park have been removed due to salt water inundation, and additional trees are still in decline and will likely require removal in the near future. Targeted resiliency measures described in Appendix A1 may reduce the effects in certain locations but would not provide comprehensive protection against the design storm (the 100-year flood events with sea level rise projections to the 2050s).

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative would result in temporary adverse effects to trees, with a total of 981 trees to be removed for the proposed flood protection system, of which 784 are located within East River Park. The project would implement a comprehensive planting program as part of a landscape restoration plan and restoration for the tree removals would be provided in compliance with Chapter 5 of Title 56 of the Rules of New York (NYC Department of Parks and Recreation Rules) and Local Law 3 of 2010. This landscape restoration plan includes over 50 different species, reflecting research around the benefits of diversifying species to increase resilience and adaptive capacity in a plant ecosystem and also pays special attention to species that can handle salt spray, strong winds, and extreme weather events. The landscape restoration plan would ultimately result in a net increase of 399 total trees within the project area. While these trees would not be as mature as some existing trees, over time, the new tree canopy would fill in and represent an improved habitat over the existing conditions, which is largely dominated by London plane trees, known for their poor response to salt-water inundation.

The Preferred Alternative also includes in-water elements such as support foundations for the shared-use flyover bridge to connect the north end of East River Park to Captain Patrick J. Brown Walk to the north as well as relocating the two existing embayments and reconstructing water and

sewer infrastructure within the park. Installation of the structural supports for the flyover bridge and relocation of the embayments would result in adverse effects to 24,085 square feet of New York State Department of Environmental Conservation (NYSDEC) littoral zone tidal wetlands and U.S. Army Corps of Engineers (USACE) Waters of the United States within the East River.

Adverse effects to the littoral zone wetland have the potential to affect Essential Fish Habitat (EFH) and habitat for epifaunal benthic organisms that may provide a foraging habitat for certain fish that are protected under the Fish and Wildlife Coordination Act (FWCA). However, for fish species that would not be considered rare or transient within the study area, the EFH and habitat with the potential to be affected by the Preferred Alternative constitutes a very small portion of the available EFH and habitat within the New York Harbor Estuary waters (<0.1 percent). In addition, the installation of new embayments may constitute not only a replacement in kind within the study area, but an improvement over the existing embayments. The proposed embayments would be of comparable or larger size with improved habitat conditions, including the elimination of bridges that shade aquatic habitat, which can reduce benthic organism productivity and biomass. Moreover, the provision of habitat enhancements designed for the recruitment of shellfish and other aquatic life along East River Park is also being explored as design advances. Lastly, additional habitat would be created within the NY Harbor Estuary through the creation of off-site tidal wetland habitat or purchase of wetland mitigation credits. A consultation with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA NMFS) as required by the FWCA, Magnuson Stevens Fishery Conservation and Management Act, the Endangered Species Act, and the Clean Water has been reinitiated. Any conservation measures identified as a result of that consultation will be identified in the Final EIS. No significant adverse effects to natural resources are anticipated.

Other Alternatives

The natural resources that would be affected under Alternatives 2, 3, and 5 would be similar to the Preferred Alternative, though to varying extents. During storm conditions, the flood protection systems of Alternatives 2 and 3 would largely limit storm surge effects to East River Park and Stuyvesant Cove Park to the unprotected side of the flood protection system. This inundation would affect soil and other vegetated areas such as tree pits, landscape beds, all existing horticulture, and other park resources. Alternative 5 includes the same flood protection alignment as the Preferred Alternative, including protection of East River Park, except for the area between East 13th Street and Avenue C where the northbound lanes of the FDR would be raised.

Alternatives 2 and 3 would require the removal of trees but would leave any remaining or newly planted trees in East River Park susceptible to the effects of future storms. Alternative 5 would require the same number of tree removals as the Preferred Alternative and would include the long-term protection of these terrestrial resources accomplished through the raising of East River Park proposed under the Preferred Alternative. For Alternatives 2, 3 and 5, the tree removals would also constitute a temporary adverse effect to terrestrial resources and a NYC Parks approved landscape restoration plan would be implemented to improve the landscape. Alternatives 3 and 5 would result in a net increase of trees within the project area (342 and 399, respectively) while Alternative 2 would result in no net loss of trees. Over time, the new tree canopy would fill in and represent an improved habitat over the existing condition; however, the number of trees that would remain susceptible to future storm events would be significantly higher under Alternatives 2 and 3 than under the Preferred Alternative (944, 433, and 228, respectively).

Similar to the Preferred Alternative, Alternatives 2 and 3 would also adversely affect wetland resources though the footprint of disturbance would be limited to the placement of footings and

shafts for the flyover bridge within the East River. Compared to the Preferred Alternative, Alternative 5 would result in a slightly larger footprint of adverse effects to these resources due to the placement of shafts for the raised FDR Drive within NYSDEC littoral zone tidal wetlands and USACE Waters of the United States in addition to the in-water elements described for the Preferred Alternative. These alternatives are not anticipated to result in significant adverse effects to natural resources.

MITIGATION

Adverse effects to aquatic resources would be mitigated for with the creation of approximately 26,000 square feet new embayments within the project area and off-site wetland restoration or through the purchase of credits from the Saw Mill Creek Wetland Mitigation Bank operated by New York City Economic Development Corporation (EDC) and located on Staten Island, New York, pursuant to NYSDEC and USACE permit requirements, and would not be considered significant. The mitigatory elements of the Preferred Alternative are consistent with the City's WRP policies of protecting water quality, sensitive habitats, and the aquatic ecosystem.

HAZARDOUS MATERIALS

No Action Alternative (Alternative 1)

Under the No Action Alternative, no new comprehensive coastal protection system would be implemented. However, the No Action Alternative assumes that projects planned or currently under construction near the project area are completed by the 2025 analysis year. These planned projects might disturb the subsurface and any hazardous materials present there, and potentially increase pathways for human or environmental exposure, but these projects would need to comply with applicable regulatory requirements.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative would involve demolition and excavation activities and would have the potential to disturb hazardous materials in existing structures and the subsurface. However, with the implementation of appropriate protection measures the potential for significant adverse effects related to hazardous materials would be avoided. Following construction, with the capping layer in landscaped areas and the implementation of Site Management Plans (SMPs) that address long-term management of residual hazardous materials, there would be no pathways for exposure to park users from remaining subsurface contaminants beneath the project construction areas. Therefore, the Preferred Alternative would not have the potential for significant adverse effects related to hazardous materials during the operational stage of the proposed project. In addition, as the alignment of the Preferred Alternative includes areas that have not been fully characterized (e.g., the line of protection in East River Park, two interceptor gate house locations), additional soil and groundwater testing is also to be implemented in both Project Areas One and Two, in accordance with a work plan and Construction Health and Safety Plan (CHASP) submitted to the New York City Department of Environmental Protection (DEP) for review and approval for the purposes of identifying any soil groundwater contamination at these locations.

Other Alternatives

Alternatives 2, 3, and 5 would be similar in that they all include the potential to disturb hazardous materials in existing structures and the subsurface, as they all involve demolition and excavation activities. Any potential for operational-phase effects would be avoided in the same manner as described above for the Preferred Alternative.

WATER AND SEWER INFRASTRUCTURE

No Action Alternative (Alternative 1)

The No Action Alternative is the future condition without the proposed project and assumes that no new comprehensive coastal protection system is installed in the proposed project area. The No Action Alternative would not change existing water and sewer infrastructure in the study area. Projects independent of the proposed project that are planned or ongoing would continue as planned. During a design storm, the protected area would be subject to overland flooding (which refers to flooding that exceeds the elevation of the coastal topography) from storm surge and rainfall and there would potentially be sewer infrastructure surcharge.[4] Targeted resiliency measures proposed in the protected area may reduce the effects of coastal flooding in specific locations but would not provide comprehensive flood protection.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative proposes to move the line of flood protection in East River Park into the park, thereby protecting both the community and the majority of the park from design storm events, as well as increased tidal inundation resulting from sea level rise. The existing sewer system would be modified to isolate the drainage protected area[5] from the larger sewershed during design storm events to prevent coastal floodwaters from inundating the drainage protected area. The existing sewer system would also be modified to increase its capacity to convey wet-weather flows during design storm events with coincident rainfall events, thereby managing flooding within the drainage protected area. The Preferred Alternative would also reconstruct and reconfigure the park's underground sewer and water infrastructure, including outfalls and their tide gates within the park, to withstand the loads of the proposed flood protection system and elevated parkland. The Preferred Alternative would be consistent with the Clean Water Act, CSO Control Policy, and the CSO Abatement Program and CSO Long-Term Control Plan. Therefore, there would be no adverse effects to sewer infrastructure as a result of implementation of the Preferred Alternative.

Other Alternatives

Alternatives 2, 3, and 5 would include the same modifications to the sewer system to isolate the drainage protected area and increase hydraulic capacity as the Preferred Alternative. Alternatives 2 and 3 would not include reconstruction of the drainage infrastructure within East River Park and would require more floodproofing of existing sewer infrastructure within the park compared to the Preferred Alternative. These alternatives would be consistent with the Clean Water Act, CSO Control Policy, and the CSO Abatement Program and CSO Long-Term Control Plan. Therefore, there would be no adverse effects to sewer infrastructure as a result of implementation.

[4] Surcharge refers to the condition in which combined sewer flow exceeds the capacity of sewer pipes and/or drainage infrastructure, potentially resulting in backups in sewer pipes and, ultimately, above-grade flooding.

[5] The drainage protected area encompasses the project protected area as well as the lateral sewers, regulators, outfalls, and other sewer infrastructure that serve or are tributary to those that serve the project protected area

TRANSPORTATION

No Action Alternative (Alternative 1)

The No Action Alternative assumes that projects planned or currently under construction in the project area are completed by the 2025 analysis year. These planned projects include Pier 42, Brookdale Campus, One Manhattan Square/Extell, Alexandria Phase 3, and the Two Bridges Large Scale Residential Development. Traffic, transit, pedestrian, and parking demand in the study area is expected to increase only as a result of background growth and these proposed developments.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative is a reconstruction of the existing recreational elements in the park; therefore, the proposed project would not generate any new travel demand upon its completion or significantly affect traffic, transit, or pedestrian operations within the project area. Modifications to the streets attributable to the proposed project (e.g., conversion of East 10th Street from two-way to one-way eastbound) would also not significantly affect vehicle or pedestrian circulation patterns. Therefore, the Preferred Alternative would not result in significant adverse traffic, transit, and pedestrian effects during non-storm conditions. The *CEQR Technical Manual* states that if a quantified traffic analysis is not required, it is likely that a parking assessment is also not warranted. Therefore, a quantified parking analysis is not warranted, and the proposed project would similarly not be expected to result in any significant adverse parking effects during non-storm conditions.

During a storm event and the periodic testing and maintenance of closure structures, certain streets, FDR Drive ramps, and segments of the FDR Drive adjacent to the closure structures would need to be temporarily closed to traffic/pedestrian use. The periodic testing and maintenance of closure structures would be temporary in nature and where feasible, would occur during off-peak hours with the necessary traffic management systems in place and therefore would not result in significant adverse effects on transportation systems. During testing and maintenance of the closure structures or under a design storm condition, access and circulation near the project area, including the Waterside Plaza complex, would be temporarily affected. Any testing and maintenance of the closure structures would be coordinated between NYCDOT, New York Police Department (NYPD), the New York City Fire Department (FDNY), and NYC Parks, to ensure emergency access routes are maintained in a coordinated manner using alternate routes.

Other Alternatives

As with the conclusions presented above for the Preferred Alternative, Alternatives 2, 3, and 5 would not result in significant adverse traffic, transit, pedestrian, and parking effects in both the non-storm and storm conditions.

NEIGHBORHOOD CHARACTER

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system is installed in the proposed project area. There are a number of projects planned or currently under construction in the project area, including the Pier 42 project and the Solar One Environmental Education Center project in Stuyvesant Cove Park. During a coastal storm event similar to the design storm, the protected area could experience effects similar to Hurricane Sandy. Targeted resiliency measures may reduce the effects of storms in certain locations, but they would not provide protection for the larger protected area.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Flood Protection System with a Raised East River Park Alternative (Preferred Alternative) would not result in significant adverse effects to neighborhood character within the study area. The Preferred Alternative would provide flood protection, increased access, and enhanced and reconfigured open spaces. The Preferred Alternative would provide additional protection for the majority of East River Park from coastal surge events and periodic inundation as a result of sea level rise. These resiliency measures, including elevating East River Park, would enhance park public access, operations, functionality, and usability during pre- and post-storm periods. These additional resiliency measures would not negatively alter or affect current uses or other features that define the character of neighborhoods within the study area but would enhance the long-term resiliency of a critical neighborhood asset. Therefore, the Preferred Alternative is not expected to result in substantial changes to neighborhood character.

Other Alternatives

Alternatives 2, 3, and 5 would similarly not result in significant adverse effects to neighborhood character within the study area. These alternatives deviate from the Preferred Alternative in the extent to which they enhance open space and access to open spaces and in the exact alignment of the flood protection, but none of these alternatives would significantly adversely affect any of the various elements that contribute to the character of the neighborhood.

ENVIRONMENTAL JUSTICE

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system would be constructed in the proposed project area.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Based on the environmental analyses performed for the Preferred Alternative, no minority or low-income communities would be disproportionately or adversely impacted. In addition, all residents in the project area including minority and low-income populations would benefit from the proposed coastal flood protection. Therefore, it is concluded that the proposed project would not result in any adverse effects with respect to environmental justice.

Other Alternatives

Alternatives 2, 3, and 5 would similarly not result in significant adverse effects to with respect to environmental justice.

CONSTRUCTION

A preliminary construction schedule was developed to determine the potential construction phasing and timing for project components under each of the With Action Alternatives. The purpose in developing the construction schedule was to determine preliminary project phasing with a conservative analysis of the range of potential environmental effects anticipated during construction of the build alternatives.

Construction activities would involve earthwork (excavation and grading); drilling shafts; installation of piles, foundations, and piers; installation, replacement, and relocation of water and sewer infrastructure; paving and pouring of concrete; fabrication and installation of steel gates; flood-proofing; and installation of park amenities. Upon completion of construction activities, site restoration and decommissioning activities would commence, including final grading, installation

of erosion control or slope stabilization measures, as needed, removing barriers, seeding and planting, and replacement or reinstallation of fences and other temporarily removed obstructions. All work would be performed in accordance with applicable methods and standards approved by NYC Parks for parks in its jurisdiction and construction near street trees, the New York City Department of Environmental Protection (DEP) and the New York City Department of Design and Construction (DDC). Any required temporary lane and road closures would be coordinated with NYCDOT to ensure compliance with applicable restrictions and employment of proper methods.

The construction activities would involve the use of numerous types of equipment and vehicles. As applicable to each phase of construction, earthwork would necessitate the use of excavators, loaders, dump trucks, bulldozers, graders, and vacuum trucks. Cranes, vibratory or impact pile drivers, hydraulic press-in hammers, concrete mixers, and concrete pumps would support installation of project components. Delivery trucks would be utilized throughout the construction period to support a variety of construction activities. Barges are also expected to be used for delivery and removal of materials, and flaggers would assist with traffic control at entry and exit points.

CONSTRUCTION—SOCIOECONOMIC CONDITIONS

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system is constructed in the proposed project area. Therefore, under the construction phase, no changes to socioeconomic conditions are expected to occur with the No Action Alternative.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Construction activities would not directly displace businesses, nor would they require the temporary closure of businesses within or surrounding the project area, including businesses on routes of access to/from construction sites. Construction activities would, at times, affect pedestrian and vehicular access in the immediate vicinity of construction activities. However, construction activities in the project area are located at a sufficient distance from businesses such that access to businesses would not be impeded. Lane and/or sidewalk closures and construction staging areas would not obstruct entrances to any existing businesses, or obstruct major thoroughfares used by customers. Businesses would not be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities. Therefore, construction activities associated with the Preferred Alternative would not generate significant adverse socioeconomic effects.

Other Alternatives

Alternatives 2, 3, and 5 would be similar to the Preferred Alternative in that they would not directly displace businesses, nor would they require the temporary closure of businesses within or surrounding the project area, including businesses on routes of access to/from construction sites. Overall, construction activities associated with these alternatives would not generate significant adverse socioeconomic effects.

CONSTRUCTION—OPEN SPACE

No Action Alternative (Alternative 1)

Direct Effects

With the planned construction of Pier 42 Park, Pier 35, East River Waterfront Esplanade-Phase IV, and the Rutgers Slip Open Space, the open space acreage within the ½-mile study area will increase from 85.15 acres under existing conditions to approximately 92.53 acres by the 2025 analysis year. Under the No Action Alternative, with no new comprehensive coastal protection system installed in the project area, East River Park and other open space resources in the protected area would remain vulnerable to storm damage.

Indirect Effects

Under the No Action Alternative, total open space ratios are below the Citywide Community District median ratio of 1.5 acres per 1,000.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Direct Effects

There is the potential for temporary adverse direct effects under the Preferred Alternative over multiple analysis years due to the extent of displacement of recreational facilities and open space amenities in East River Park over the 3.5-year construction period. However, once completed, the Preferred Alternative would positively affect East River Park, Stuyvesant Cove Park, Murphy Brothers Playground and Asser Levy Playground, by enhancing their design and increasing their accessibility to the public.

Predicted noise level increases during construction at these open space locations would be noticeable; however, the total noise levels would be in the range considered typical for Manhattan, and for this area in general. Many New York City parks and open space areas located near heavily trafficked roadways and/or near construction sites, experience comparable, and sometimes higher noise levels. Maximum construction noise levels at receptors nearest floodwall construction with the Preferred Alternative would be slightly lower because pile driving at the Preferred Alternative would generally occur further from to the receptors. East River Park, Asser Levy Playground and Murphy Brothers Playground would be closed under the Preferred Alternative during the times when construction activities would occur at these park resources. Therefore, the duration of construction noise would be limited at any given area of open space that would remain open in proximity to construction activities. Furthermore, the construction noise predictions are conservative in that they consider the area of open space that remains open and accessible closest to the construction area. While construction would likely disturb the Asser Levy outdoor pool temporarily, it is anticipated that construction would take place during the off-season of the pool (mid-September to early June) and not affect the operational season of the pool. Based on these factors, the Preferred Alternative construction noise on these open space resources would not result in a significant adverse effect. However, at Asser Levy Recreation Center, construction activity including pile driving that would occur west of the FDR Drive immediately adjacent to this building would produce noise level increases considered high for this area. While the duration of maximum noise levels at this location would be limited and the receptor is typically used for active recreation with a lower sensitivity to noise, the maximum noise levels predicted by the construction noise analysis are high (i.e., in the “clearly unacceptable” range according to CEQR noise exposure guidance). Consequently, the Asser Levy Recreation Center is predicted to experience a significant adverse noise effect as a result of construction.

Construction of the Preferred Alternative would be required to follow the requirements of the *New York City Noise Control Code* and would use additional measures, including both path control (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors) and source control (i.e., reducing noise levels at the source or during the most sensitive time periods) to minimize the effects of the Preferred Alternative's construction activities on the surrounding community.

Construction of the proposed project under the Preferred Alternative would adhere to Local Law 77 of 2003 for emissions reductions on non-road construction engines, *New York City Air Pollution Control Code* regulations regarding construction-related dust emissions, and *New York City Administrative Code* limitations on construction-vehicle idling time. With the implementation of these measures, the detailed analysis presented in Chapter 6.10, "Construction—Air Quality," showed there would be no significant adverse air quality effects on sensitive receptors, including open space areas near the construction activities.

Indirect Effects

As a result of the extended open space closures due to construction, the total open space ratios within the study area would decrease in the Preferred Alternative from the No Action Alternative. The proposed project would reduce open space ratios by a minimum of 42.57 percent in 2023 and a maximum of 49.64 percent in 2020, and therefore would result in potential temporary significant adverse indirect effects on open space resources within the study area under the Preferred Alternative. There are no significant adverse indirect effects for the 2024 and 2025 analysis years, as any remaining construction would be minimal, and the vast majority of displaced open space areas would be restored and reopened to the public with new and enhanced park features.

Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline

Alternative 2 would involve less construction in City parkland (e.g., East River Park), resulting in less temporary displacement of recreational facilities than the Preferred Alternative. Therefore, the temporary significant adverse direct and indirect open space effects under Alternative 2 would be less than the Preferred Alternative.

Similar to the Preferred Alternative, construction activity under Alternative 2 would include pile driving that would occur west of the FDR Drive immediately adjacent to the Asser Levy Recreation Center. These activities would produce noise level increases considered high for this area and in the "clearly unacceptable" range according to CEQR noise exposure guidance. Consequently, the Asser Levy Recreation Center is predicted to experience a significant adverse noise effect during construction.

Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access

Alternative 3 would involve a similar level of temporarily displaced open space as the Preferred Alternative and would therefore result in a similar significant adverse effect as compared to the Preferred Alternative for the 2020 to 2023 analysis years. However, Alternative 3 would involve a longer construction duration, resulting in prolonged significant adverse effects. As a result of the extended open space closures due to construction, the total open space ratios within the study area would decrease in Alternative 3 from the No Action Alternative. Since the open space ratios would be reduced by a minimum of 44.03 percent in 2025 and a maximum of 48.18 percent in 2022, the proposed project would result in potential temporary significant adverse indirect effects on open space resources within the study area under Alternative 3. Therefore, the temporary significant

adverse direct and indirect open space effects under Alternative 3 would be greater than the Preferred Alternative.

Similar to the Preferred Alternative, construction activity under Alternative 3 would include pile driving that would occur west of the FDR Drive immediately adjacent to the Asser Levy Recreation Center. These activities would produce noise level increases considered high for this area and in the "clearly unacceptable" range according to CEQR noise exposure guidance. Consequently, the Asser Levy Recreation Center is predicted to experience a significant adverse noise effect during construction.

Other Alternative (Alternative 5): Flood Protection System East of FDR Drive

The displacement of open space necessary to accommodate construction under Alternative 5 would be comparable to the Preferred Alternative. Therefore, any potential temporary significant adverse direct and indirect open space effects identified under Alternative 5 would be of comparable magnitude as the Preferred Alternative. However, Murphy Brothers Playground would not be affected under this alternative. Similar to the Preferred Alternative, the Asser Levy Recreation Center is predicted to experience a significant adverse noise effect during construction.

Mitigation

The proposed project would introduce potential temporary significant adverse direct and indirect effects on open space during the construction period. Therefore, potential on-site or off-site measures to mitigate the effect to the greatest extent practicable are being explored by the City. The mitigation measures being explored for the Preferred Alternative include accommodating permit users at other existing facilities; identify recreational resources that can be available to the community during construction; providing alternative recreational opportunities (e.g., programs like Shape-Up classes, walking clubs, Arts, greening programs); implementing improvements (e.g., lighting) to parks and playgrounds in the study area; rerouting greenway users to the most direct alternative route; and supporting bicycle projects in the study area. In addition, the City is assessing opportunities to open parts of East River Park as work is completed. The introduction of new publicly accessible open space—such as Pier 42 Park, Pier 35, and Phase IV of the East River Waterfront Esplanade project, totaling 4.81 acres—could be considered a potential mitigation effort. In addition, there has been funding allocated for the demolition of LaGuardia Bathhouse and interim recreation improvements which will create approximately 7,000 square feet of new publicly accessible open space. The feasibility of utilizing quieter construction methods (i.e., press in pile) in the vicinity of the Asser Levy Recreation Center are being explored as potential mitigation measures. However, these measures, would only partially mitigate construction effects on open space resources.

According to the *CEQR Technical Manual*, on-site improvements are considered a mitigation measure. Although construction would temporarily displace open space resources in East River Park, Stuyvesant Cove Park, Murphy Brothers Playground, Asser Levy Playground, and Captain Patrick J. Brown Walk, the end result would be a refurbished open space resource. After construction, East River Park would be newly landscaped and raised park with pathways for the Preferred Alternative, which would enhance the user experience of the park. In addition, the upland open space resources in the ½-mile study area would be protected against future storm events, thus increasing the utility and safety of those resources. The Preferred Alternative would be especially beneficial for the open space resources in East River Park, as this alternative includes reconstruction of the park, raising it by approximately eight feet to meet the design flood protection criteria while also reducing the risk for effects from future storm events. The flood

protection measures proposed to be integrated into park features aim to reduce the effects from future storm events on the community. The Preferred Alternative proposes the replacement of pedestrian crossings at Delancey Street, East 10th Street, and Corlears Hook bridges. The enhancement of pedestrian bridges to East River Park would improve the east-west connectivity for residents in the ½-mile study area to East River Park upon project completion. The improvements to these open space resources under the proposed project would be considered partial mitigation. Additionally, as stated in the *CEQR Technical Manual*, the implementation of missing segments of the City's greenway network would be considered a mitigation strategy. By remedying a long-standing narrowed pathway at the Con Edison "pinch-point," the proposed project under all alternatives would significantly improve the usability and access to the greenway with the construction of the shared-use flyover bridge.

As discussed above, the Asser Levy Recreation Center is predicted to experience a significant adverse noise effect as a result of construction. The feasibility of utilizing less impactful construction methods (i.e., press in pile) are being explored to mitigate this noise effect.

CONSTRUCTION—HISTORIC AND CULTURAL RESOURCES

Archaeological Resources

Two Phase 1A Archaeological Documentary Studies were prepared for the APE in March 2016, and a Supplemental Phase 1A Archaeological Documentary Study was prepared in March 2019. The March 2016 reports identified the following broad categories of historic-period archaeological resources that could be located in the APE—river bottom remains, landfill retaining structures and landfill deposits, historic streetbed resources, and former city block resources. Because of the potential presence of these resources, as mitigation, additional archaeological investigation will be performed in accordance with Section 106 regulations, based on a scope of work reviewed and approved by LPC and SHPO; this archaeological investigation would include pre-construction testing and/or monitoring during project construction performed in accordance with the Secretary of the Interior's *Standards and Guidelines for Archaeology*, ACHP's *Section 106 Archaeological Guidance*, and the New York Archaeological Council's *Standards for Cultural Resource Investigations and Curation of Archaeological Collections*. The scope of work for additional archaeology would include: a sampling strategy that will select specific areas of the APE to be further investigated; identification of those areas that are believed to be most sensitive for recovering landfill retaining structures across the overall APE; a description of the basis for the proposed sampling design, including a tabulation of the various archaeological contexts within the APE and a quantification of the sample fraction for each context; and an unanticipated discoveries protocol. If significant archaeological resources are identified during testing and/or monitoring, further archaeology and/or mitigation would be completed in accordance with Section 106 regulations and the guidelines in the *CEQR Technical Manual*. In written communications dated April and May 2016, representatives of the Delaware Nation, Delaware Tribe of Indians, and Stockbridge-Munsee Community Band of Mohicans requested, in the case of an unanticipated discovery of an archaeological site or artifacts, that work be halted until the tribe is notified and the artifact can be evaluated by an archaeologist. The additional archaeological investigation will be stipulated in a PA that is being prepared and will be included in the FEIS. It is expected that the PA will be executed among HUD, OMB, NYC Parks, SHPO, the Delaware Nation, the Delaware Tribe of Indians, the Shinnecock Nation, the Stockbridge-Munsee Community Band of Mohicans, and the Advisory Council on Historic Preservation (ACHP).

Architectural Resources

No Action Alternative (Alternative 1)

One planned NYC Parks project within Project Area One could affect architectural resources that have been determined eligible for listing on the S/NR is the construction of an exterior entrance ramp to the former Marine Engine Co. 66 Fireboat House (#4). This architectural resource would be offered some protection from accidental damage through Building Code Section BC 3309: Protection of Adjoining Property.

In addition, three projects within the 400-foot portion of the Primary APE could affect architectural resources in the No Action Alternative—reconstruction of the Baruch Playground within the Bernard Baruch Houses (#9, S/NR-eligible), resiliency measures at the Baruch Houses (#9, S/NR-eligible), and rehabilitation work at the Asser Levy Public Baths (#12, NYCL, S/NR).

Preferred Alternative (Alternative 4): Flood Protection System with A Raised East River Park

Construction of the Preferred Alternative would directly affect the FDR Drive, which is an architectural resource that has been determined eligible for listing on the S/NR (#1, S/NR-eligible). Therefore, as will be stipulated in the PA, the City, in consultation with LPC and SHPO, would develop and implement a CPP for the FDR Drive to avoid inadvertent construction-period damage from ground-borne vibrations (i.e., from pile driving), falling debris, collapse, dewatering, subsidence, or construction equipment. The plan would be expected to follow the guidelines of DOB's *TPPN #10/88*, which "requires a monitoring program to reduce the likelihood of construction damage to adjacent historic structures and to detect at an early stage the beginnings of damage so that construction procedures can be changed." It is expected that the CPP will also be prepared in accordance with LPC's guidance document *Protection Programs for Landmarked Buildings* and the National Park Service's *Preservation Tech Notes, Temporary Protection #3: Protecting a Historic Structure during Adjacent Construction*. In addition, construction affecting the FDR Drive would be coordinated with NYCDOT to ensure that it is protected during construction of the Preferred Alternative.

Construction under the Preferred Alternative would occur within 90 feet of the following architectural resources: the FDR Drive (#1, S/NR-eligible); Williamsburg Bridge (#2, S/NR-eligible); Engine Co. 66 Fireboat House (#4, S/NR-eligible); Gouverneur Hospital (#5, S/NR); Gouverneur Hospital Dispensary (#6, S/NR-eligible); a portion of the Vladeck Houses within the Lower East Side Historic District (#7, S/NR); a portion of the Baruch Houses (#9, S/NR-eligible); the Asser Levy Public Baths (#12, S/NR, NYCL); a portion of the Jacob Riis Houses (#15, S/NR-eligible); a portion of Stuyvesant Town (#16, S/NR-eligible); and a portion of Peter Cooper Village (#17, S/NR-eligible). Therefore, as will be stipulated in the PA, the City, in consultation with LPC and SHPO, would develop and implement Construction Protection Plans (CPPs) for these architectural resources to avoid inadvertent construction-period damage from ground-borne vibrations, falling debris, collapse, dewatering, subsidence, or construction equipment.

Other Alternatives

As under the Preferred Alternatives, construction under Alternatives 2, 3, and 5 would directly affect the FDR Drive and within 90 feet of the following architectural resources: the FDR Drive (#1, S/NR-eligible); Williamsburg Bridge (#2, S/NR-eligible); Engine Co. 66 Fireboat House (#4, S/NR-eligible); Gouverneur Hospital (#5, S/NR); Gouverneur Hospital Dispensary (#6, S/NR-eligible); a portion of the Vladeck Houses within the Lower East Side Historic District (#7, S/NR); a portion of the Baruch Houses (#9, S/NR-eligible); the Asser Levy Public Baths (#12, S/NR, NYCL); a portion of the Jacob Riis Houses (#15, S/NR-eligible); Stuyvesant Town (#16, S/NR-eligible); and a portion of Peter Cooper Village (#17, S/NR-eligible). Therefore, as will be

stipulated in the PA, the City, in consultation with LPC and SHPO, would develop and implement CPPs for these architectural resources under the Other Alternatives to avoid inadvertent construction-period damage from ground-borne vibrations, falling debris, collapse, dewatering, subsidence, or construction equipment.

Mitigation

Archaeological Resources

As will be stipulated in the PA, additional archaeological investigation prior to or during construction will be performed in accordance with the Secretary of the Interior's *Standards and Guidelines for Archaeology*, ACHP's *Section 106 Archaeological Guidance*, and the New York Archaeological Council's *Standards for Cultural Resource Investigations and Curation of Archaeological Collections*, and such scope of work will be prepared in consultation with LPC and SHPO, and the City will complete any further phase of archaeological work If significant archaeological resources are identified during testing and/or monitoring, further archaeological testing and/or mitigation would be completed.

Architectural Resources

As will be stipulated in the PA, the City, in consultation with LPC and SHPO, would develop and implement CPPs for architectural resources located within 90 feet from the construction area of the proposed project to avoid inadvertent construction-period damage from ground-borne vibrations, falling debris, collapse, dewatering, subsidence, or construction equipment.

CONSTRUCTION—URBAN DESIGN AND VISUAL RESOURCES

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system is installed in the proposed project area. No changes to views or view corridors are expected to occur with the No Action Alternative during construction.

Preferred Alternative (Alternative 4): Flood Protection System with A Raised East River Park

Construction of the Preferred Alternative would require the closure of East River Park for the 3.5-year construction duration, although the City is investigating opening portions of the park as completed. It is anticipated that the entirety of East River Park would be fenced off for construction to keep the public out of the working areas. The closed and fenced East River Park during construction would obstruct views from the FDR Drive and the upland neighborhood towards the East River. Therefore, construction of the Preferred Alternative could detract the experience of pedestrians in the vicinity and would have temporary adverse visual effects. In addition, the pedestrian experience in the vicinity of the existing bridge landings would temporarily be adversely affected during construction and views of the East River would be temporarily blocked. Murphy Brothers Playground, Stuyvesant Cove Park, Asser Levy Playground, and a portion of Captain Patrick J. Brown Walk would be closed and temporarily fenced off during construction. Closure of these open space resources would detract from the experience of pedestrians in the immediate vicinity and would also cause temporary adverse effects on the urban visual context.

Other Alternatives

Alternatives 2, 3, and 5 would be similar in terms of their potential to obstruct views from the FDR Drive and the upland neighborhood towards the East River and detract the experience of pedestrians in the vicinity and would have temporary adverse visual effects during construction. However, since the flood protection and enhanced park and access features for these alternatives are expected to be completed over a 5-year construction period as compared to the 3.5-year period

for the Preferred Alternative, the temporary adverse visual effects during construction would be longer for these alternatives.

CONSTRUCTION—NATURAL RESOURCES

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system is installed in the proposed project area. Therefore, no changes to natural resources are expected to occur with the No Action Alternative during construction.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Construction of the Preferred Alternative would be performed in accordance with all applicable rules and regulations of USACE, EPA, National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), NYSDEC, DEP, DDC, and other regulatory agencies and procedures, as applicable.

Construction of the Preferred Alternative includes the following in-water elements: the use of construction barges, the installation of shafts and footings to support a shared-use flyover bridge, the reconstruction of sewer outfalls, the demolition of the existing bulkhead for the installation of a new cut-off wall, and the demolition of the existing embayments and existing piles and formwork associated with the esplanade in these areas. These construction activities have the potential to result in temporary adverse effects to NYSDEC littoral zone tidal wetlands and USACE Waters of the United States, surface water resources, benthic resources, essential fish habitat (EFH), and threatened and endangered species. Turbidity curtains, water-tight cofferdams, and debris nets would be used as applicable to minimize the potential for these effects.

Although consultation with NOAA's National Marine Fisheries Service (NMFS) identified both shortnose sturgeon and Atlantic sturgeon as potentially occurring within the study area, shortnose sturgeon rarely leave tidal river habitat (e.g., the Hudson River) and on the rare occasions when shortnose sturgeon have been documented migrating to other tidal rivers such as the Connecticut River, their presence in the East River would be transient (see **Appendix G**). Additionally, the East River contains no submerged aquatic vegetation and limited benthic resources. Therefore, due to the transient nature of shortnose sturgeon in the East River, the lack of suitable habitat, and the sturgeon's ability to avoid the affected area, no significant adverse effects to shortnose sturgeon from construction activities under any alternative are anticipated.

The Atlantic sturgeon is known to utilize the East River as a migratory route between spawning grounds in the Hudson River and suitable marine habitats, primarily between the months of March through October. Atlantic sturgeon is uncommon in the East River (Tomechik et. al., 2015). When present, Atlantic sturgeon may forage opportunistically; however, there are limited benthic resources and submerged aquatic vegetation in the East River, thus their presence would primarily be transient. The potentially affected area represents a small portion of overall habitat available in the East River.

Construction of the in-water elements associated with the Preferred Alternative produces noise that has been known to affect Atlantic sturgeon. To minimize the noise effects on Atlantic sturgeon, conservation measures would be implemented that would reduce the noise or the likelihood that sturgeon would be exposed to the construction activities. These conservation measures include, to the greatest extent practicable, the use of a cushion block, and gradually ramping up pile driving. With these conservation measures in place, Atlantic sturgeon may be discouraged from utilizing the near-shore environment in the East River, and the proposed project

would not be anticipated to significant adversely affect the Atlantic sturgeon population. A consultation has been reinitiated with NOAA NMFS and any conservation measures identified as a result of that consultation will be included in the Final EIS.

Upon completion of construction, the spuds, barges, turbidity curtains and debris nets would be removed, and the affected area would be allowed to naturally restore to pre-construction conditions. Therefore, while there would be adverse effects to NYSDEC and USACE regulated tidal wetlands resulting from construction of the Preferred Alternative, they would not significantly adversely affect natural resources in the area.

In addition, temporary adverse effects to terrestrial resources due to the removal of trees are anticipated as a result of both construction of the proposed project and to accommodate the proposed design for the Preferred Alternative. The project would implement a comprehensive planting program as part of a landscape restoration plan and restoration for the tree removals would be provided in compliance with Chapter 5 of Title 56 of the Rules of New York (NYC Department of Parks and Recreation Rules) and Local Law 3 of 2010. Therefore, no significant adverse effects to terrestrial resources are anticipated as a result of construction of the Preferred Alternative. No significant adverse effects to other natural resources are anticipated.

Other Alternatives

Construction of all With Action Alternatives would be performed in accordance with all applicable rules and regulations as stated for the Preferred Alternative. Alternatives 2 and 3 do not propose the reconstruction of the sewer outfalls, the removal of the existing bulkhead to be replaced by a new cut-off wall, or the relocation of two embayments within East River Park. The in-water construction elements are limited to the installation of the flyover bridge shafts and footings and the use of construction barging. In addition, tree removals under these alternatives would be reduced compared to the Preferred Alternative, although East River Park would remain vulnerable to design storm events and sea level rise inundation over the long-term. Therefore, no significant adverse effects to natural resources are anticipated.

Alternative 5 includes all the components of the Preferred Alternative and increases the potential for temporary adverse effects to tidal wetlands (littoral zone), surface water resources, benthic and essential fish habitat, and Atlantic sturgeon habitat due to the installation of the support structure for the raised FDR Drive. This additional adverse effect to NYSDEC and USACE regulated tidal wetlands would be subject to the same regulatory permitting process and would be mitigated for in accordance with NYSDEC and USACE permit conditions.

CONSTRUCTION—HAZARDOUS MATERIALS

No Action Alternative (Alternative 1)

Under the No Action Alternative, no new comprehensive coastal flood protection systems would be implemented within the project area. However, several projects planned or under construction in the project area might disturb the subsurface and any hazardous materials present there, and potentially increase pathways for human or environmental exposure. These projects are subject to applicable regulatory requirements.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative has the potential to disturb subsurface hazardous materials, as it would involve demolition and excavation activities. However, with the implementation of appropriate measures governing the construction (such as air monitoring, proper storage and handling of

materials, and, if required, odor suppression), the potential for significant adverse effects related to hazardous materials would be avoided.

Other Alternatives

Alternative 2, 3, and 5 would be similar in terms of all having the potential to disturb hazardous materials in existing structures and the subsurface, as they all involve demolition and excavation activities. Any potential for construction-phase effects would be avoided in the same manner as described for the Preferred Alternative. However, the level of disturbance within East River Park and the importation of fill materials would be substantially less for Alternatives 2 and 3 as compared to the Preferred Alternative.

CONSTRUCTION—WATER AND SEWER INFRASTRUCTURE

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system would be constructed in the proposed project area. Therefore, no changes to water and sewer infrastructure are expected to occur with the No Action Alternative during construction.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Construction of the Preferred Alternative would be performed in accordance with all methods and standards approved by NYSDEC, DEP, DDC and other appropriate regulatory agencies and procedures. Prior to excavation, interferences with existing water and sewer infrastructure would be identified. Existing water and sewer infrastructure would be protected, supported, and maintained in place throughout the duration of work. Water mains and sewers will be replaced, where required, per DEP and DDC standards. All construction activity associated with drainage isolation, drainage management, infrastructure reconstruction, or relocation/replacement of existing water and sewer infrastructure would be undertaken without affecting the conveyance of flow through the water or combined sewer system. This work would be performed throughout the duration of construction in accordance with methods and standards approved by DEP and DDC. Therefore, no disruption to existing water or sewer services is anticipated, and no adverse impacts to water or sewer infrastructure would occur.

Other Alternatives

Similar to the Preferred Alternative, no significant adverse effects to the existing water supply or combined sewer services is anticipated, and no impacts to water and sewer infrastructure would occur under Alternatives 2, 3, and 5 during construction.

CONSTRUCTION—ENERGY

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system is installed in the proposed project area. No changes to energy are expected to occur with the No Action Alternative during construction.

Preferred Alternative (Alternative 4): Flood Protection System with A Raised East River Park

The Preferred Alternative would involve excavation, pile driving, and other potentially disruptive construction activities in proximity to existing energy transmission and generation infrastructure. To avoid potential adverse effects, protective measures would be implemented to ensure that construction of the proposed project would not disrupt the function of this infrastructure and the electrical supply in Lower Manhattan.

Other Alternatives

Alternative 2, 3, and 5 would be similar in terms of their potential to disturb existing energy transmission and generation infrastructure, as they all involve excavation, pile driving, and other potentially disruptive construction activities. Any potential for construction-phase effects would be avoided in the same manner as described for the Preferred Alternative.

CONSTRUCTION—TRANSPORTATION

No Action Alternative (Alternative 1)

Under the No Action Alternative, no new comprehensive coastal protection system is installed in the proposed project area, and no new trips are generated by the proposed project. There are a number of projects planned or under construction within a ½-mile of the project area that are expected to be complete by 2025. These projects will generate traffic, transit, pedestrian trips, and parking demands that are background growth not associated with the proposed project.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Traffic

Construction of the Preferred Alternative would generate 251 passenger car equivalents (PCEs) during the 6:00 to 7:00 AM peak hour and 131 PCEs during the 3:00 to 4:00 PM peak hour, exceeding the *CEQR Technical Manual* analysis threshold of 50 vehicle trips. Based on this trip generation, traffic assignments were prepared and six intersections for the AM peak hour and one intersection for the PM peak hour were selected for detailed traffic analysis. The analysis disclosed temporary significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the AM peak hour. However, these effects could be fully mitigated by implementing standard traffic mitigation measures (e.g., signal timing changes). Additionally, with the full reconstruction of East River Park under this alternative, barging of fill materials to East River Park could be employed, thereby reducing the volume of truck trips from what would otherwise be needed to reconstruct and raise the park.

Parking

An inventory of on- and off-street parking within a ¼-mile radius of the project area showed approximately 70 on-street parking spaces available near Project Area One and 30 on-street parking spaces available near Project Area Two. The off-street survey showed approximately 60 spaces available near Project Area One and 800 spaces available near Project Area Two.

Construction under the Preferred Alternative is anticipated to generate a maximum parking demand of 92 spaces for Project Area One and 52 spaces for Project Area Two. The Project Area Two parking demand would be fully accommodated by the large inventory of available on- and off-street parking spaces near the project area. The Project Area One demand would not be fully accommodated within ¼-mile and could result in a parking shortfall of up to approximately 35 spaces. It is expected that excess parking demand within Project Area One would need to be accommodated by on-street parking or off-street parking beyond a ¼-mile walk from the project area. Alternatively, motorists could choose other modes of transportation. As stated in the *CEQR Technical Manual*, a parking shortfall resulting from a project located in Manhattan does not constitute a significant adverse parking impact, due to the magnitude of available alternative modes of transportation. Therefore, construction of the preferred Alternative would not result in any significant adverse parking effects.

Transit

Construction of the Preferred Alternative would generate 144 transit trips (total of Project Area One and Project Area Two) during the peak hour of the peak construction period, below the *CEQR Technical Manual* analysis threshold of 200 transit trips. Therefore, construction of this alternative would not result in any significant adverse transit effects.

Pedestrians

Construction under the Preferred Alternative would generate 200 pedestrian trips for Project Area One and 112 pedestrian trips for Project Area Two. Given the number of available pedestrian routes to/from area parking facilities and transit services and the various access/egress points to the East River Park, no sidewalks or crosswalks are expected to experience 200 or more pedestrian trips during an hour. However, because this alternative would require a rerouting of the bikeway/walkway along the proposed project area to inland routes, it is concluded to result in temporary significant adverse effects for users of the East River bikeway/walkway. Thus, the Preferred Alternative would require the development and implementation of a rerouting plan.

Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline

Alternative 2 is expected to yield comparable worker and truck estimates during peak construction as the Preferred Alternative, therefore would have the potential to result in significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the 6:00 to 7:00 AM construction peak hour. However, these significant adverse effects could be fully mitigated by implementing standard traffic mitigation measures (e.g., signal timing changes). This alternative would not have any significant adverse transit, pedestrian, or parking effects.

Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access

Traffic

Peak construction activities under Alternative 3 would generate 153 passenger car equivalents (PCEs) during the 6:00 to 7:00 AM peak hour and 85 PCEs during the 3:00 to 4:00 PM peak hour, exceeding the *CEQR Technical Manual* analysis threshold of 50 vehicle trips during the peak hour. Based on this trip generation, traffic assignments were prepared and six intersections for the AM peak hour and one intersection for the PM peak hour were selected for detailed traffic analysis. Similar to the Preferred Alternative, significant adverse traffic effects were identified at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C during the AM peak hour. However, these effects could be fully mitigated by implementing standard traffic mitigation measures (e.g., signal timing changes).

Parking

Construction under Alternative 3 is estimated to generate a maximum parking demand of 55 spaces for Project Area One and 31 spaces for Project Area Two. Similar to the Preferred Alternative, the Project Area Two parking demand would be fully accommodated by the large inventory of available on- and off-street parking spaces near the project area and the Project Area One demand could result in a parking shortfall within ¼-mile. As stated in the *CEQR Technical Manual*, a parking shortfall resulting from a project located in Manhattan does not constitute a significant adverse parking impact, due to the magnitude of available alternative modes of transportation. Therefore, it is concluded that construction of Alternative 3 would not result in any significant adverse parking effects.

Transit

Construction of Alternative 3 would generate 86 peak hour transit trips (total for Project Areas One and Two) during the peak construction period, which is well below the *CEQR Technical Manual* analysis threshold of 200 transit trips. Therefore, construction under Alternative 3 would not result in any significant adverse transit effects.

Pedestrians

Construction of Alternative 3 would generate 188 peak hour pedestrian trips during the peak construction period, below the *CEQR Technical Manual* analysis threshold of 200 pedestrian trips. Therefore, construction under Alternative 3 would not result in any significant adverse pedestrian effects. However, because this alternative may require a rerouting of the bikeway/walkway along the proposed project area to inland routes, it is concluded to have the potential to result in temporary significant adverse effects for users of the East River bikeway/walkway. Thus, Alterative 3 would require the development and implementation of a rerouting plan for the full 5-year construction duration through 2025.

Other Alternative (Alternative 5): Flood Protection System East of FDR Drive

Alternative 5 aligns the flood protection system on the east side of the FDR Drive between East 13th Street and Captain Patrick J. Brown Walk to the north and raises the northbound lanes of the FDR Drive by approximately six feet between East 13th Street and Avenue C, thereby placing the line of protection generally on the east side of the FDR Drive in this segment. Construction of Alternative 5, would require either a temporary full 24-hour closure of the FDR Drive in the northbound direction and one-lane closure in the southbound direction for two consecutive months or partial closure in both directions. Both of these scenarios have the potential to result in significant adverse traffic effects beyond those identified above for the Preferred Alternative. The use of Traffic Enforcement Agents (TEAs) would help mitigate any additional significant adverse traffic effects that could occur due to the closure of the FDR Drive; however, as a result of the closure, some effects could remain unmitigatable.

Mitigation

As described above, the proposed project would require mitigation for temporary construction traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Avenue C, temporary closures of bikeway/walkway along the proposed project area to inland routes and closure of the FDR Drive under Alternative 5.

For the proposed project, the temporary significant adverse traffic effects at the intersections of East 23rd Street and First Avenue and East 23rd Street and Second Avenue could be fully mitigated by implementing standard traffic mitigation measures (e.g., signal timing changes).

Because the proposed project may require a rerouting of the bikeway/walkway along the proposed project area to inland routes, it is concluded to have the potential to result in temporary significant adverse effects for users of the East River bikeway/walkway. Thus, the proposed project would require the development and implementation of a rerouting plan.

For Alternative 5, the effects due to the closure of the FDR Drive would be mitigated through the development of a detailed NYCDOT-approved Traffic Management Plan and deployment of NYPD TEAs that would manage traffic and pedestrian circulation at the intersections that are temporarily and significantly affected near the project area. Additional mitigation measures are expected to include transportation management on an area-wide level with public outreach and the use of variable message signs and other measures to alert motorists. If a construction plan can

be developed that does not require full closure of the FDR Drive, the potential significant adverse transportation effects could be reduced. Since the Preferred Alternative and Alternatives 2 and 3 would not require a 24-hour closure of the FDR Drive, a Traffic Management Plan is not needed for those alternatives.

CONSTRUCTION—AIR QUALITY

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system would be constructed in the proposed project area. No changes to air quality are expected to occur with the No Action Alternative during construction.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes as well as New York City Local Law 77. These include dust suppression measures, idling restriction, and the use of ultra-low sulfur diesel (ULSD) fuel and best available tailpipe reduction technologies. With the implementation of these emission reduction measures, construction of the Preferred Alternative would not result in any predicted concentrations above the National Ambient Air Quality Standards (NAAQS) for nitrogen dioxide (NO_2), carbon monoxide (CO), and particulate matter (PM_{10} or the *de minimis* thresholds for $PM_{2.5}$) from nonroad and on-road sources. Therefore, no significant adverse air quality impacts are predicted from the construction of the Preferred Alternative.

Annual emissions from nonroad and on-road sources over the scheduled construction duration would not exceed any of the *de minimis* criteria defined in the general conformity regulations. Therefore, construction of the Preferred Alternative would conform to the relevant State Implementation Plan (SIP) and does not require a general conformity determination.

Other Alternatives

Alternative 2, 3, and 5 would implement measures to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes as well as New York City Local Law 77. With the implementation of these emission reduction measures, construction would not result in significant adverse effects with respect to air quality. As with the Preferred Alternative, construction under these alternatives would conform to the relevant SIP and does not require a general conformity determination.

The magnitude of construction activities during the peak construction period of Alternative 2 would be the same or lower than the Preferred Alternative and any air quality effects identified under Alternative 3 would be similar to those identified under the Preferred Alternative. Alternative 5 would require extensive work within and adjacent to the FDR Drive and could require full closure of the FDR Drive northbound lanes for a period of two months. Therefore, construction activities under Alternative 5 may have the potential for short-term effects on local air quality due to changes in traffic patterns and diversions.

CONSTRUCTION—GREENHOUSE GAS

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system would be constructed in the proposed project area. No changes to greenhouse gases are expected to occur with the No Action Alternative during construction.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The total fossil fuel use in all forms associated with construction under the Preferred Alternative would result in up to approximately 48,889 metric tons of CO_2e emissions. Potential measures for further reductions of emissions from construction of the Preferred Alternative are under consideration and may include the use of biodiesel, expanded use of recycled steel and aluminum, as well as expanded construction waste reduction.

Other Alternatives

The magnitude of construction activities for Alternative 2 would be substantially lower than the Preferred Alternative, resulting in fewer on-road trips and on-site use of nonroad engines, requiring less materials, and resulting in the removal of fewer trees. Overall, less greenhouse gases would be emitted under Alternative 2 as compared to the Preferred Alternative.

The total fossil fuel use in all forms associated with construction under Alternative 3 would result in up to approximately 48,652 metric tons of CO_2e emissions. This estimate is similar to the total fossil fuel use projected for the Preferred Alternative.

Alternative 5 aligns the flood protection system on the east side of the FDR Drive between East 13th Street and Avenue C to the north as opposed to the west side of the FDR Drive for the Preferred Alternative and is expected to result in similar greenhouse gas emissions as the Preferred Alternative. However, Alternative 5 would require extensive work within the FDR Drive and could require full closure of the FDR Drive northbound lanes for a period of two months, which could result in increased congestion and ensuing greenhouse gas emissions as compared to the Preferred Alternative.

CONSTRUCTION—NOISE AND VIBRATION

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system would be constructed in the proposed project area. No changes to noise and vibration are expected to occur with the No Action Alternative during construction.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

Construction of the Preferred Alternative is predicted to result in significant adverse noise effects at 621 Water Street, 605 Water Street, 315-321 Avenue C, 620 East 20th Street, 601 East 20th Street, 8 Peter Cooper Road, 7 Peter Cooper Road, 530 East 23rd Street, 765 FDR Drive, 819 FDR Drive, 911 FDR Drive, 1023 FDR Drive, 1115 FDR Drive, 1141 FDR Drive, 1223 FDR Drive, 570 Grand Street, 455 FDR Drive, 71 Jackson Street, 367 FDR Drive, 645 Water Street, 322 FDR Drive, 525 FDR Drive, 555 FDR Drive, 60 Baruch Drive, 132 Avenue D, 465 East 10th Street, 520 East 23rd Street, 123 Mangin Street, and the Asser Levy Recreation Center. The predicted significant adverse construction noise effects would be of limited duration and would be up to the mid 80s dBA during daytime construction and up to the mid 70s dBA during nighttime construction. Noise levels in this range are typical in many parts of Manhattan along heavily trafficked roadways. The buildings at 315-321 Avenue C, 620 East 20th Street, 601 East 20th Street, 8 Peter Cooper Road, 7 Peter Cooper Road, 530 East 23rd Street, 911 FDR Drive, 1023 FDR Drive, 1115 FDR Drive, 1141 FDR Drive, 1223 FDR Drive, 570 Grand Street, 455 FDR Drive, 71 Jackson Street, 367 FDR Drive, 645 Water Street, 322 FDR Drive, 525 FDR Drive, 555 FDR Drive, 60 Baruch Drive, and 520 East 23rd Street already have insulated glass windows and an alternative means of ventilation (i.e., air conditioning), and would consequently be expected to experience interior $L_{10(1)}$ values less than 45 dBA during much of the construction period, which

would be considered acceptable according to CEQR criteria. The buildings at 621 Water Street, 605 Water Street, 765 FDR Drive, 819 FDR Drive, 132 Avenue D, 465 Avenue D, 123 Mangin Street, and the Asser Levy Recreation Center appear to have monolithic glass (i.e., non-insulating) and would consequently be expected to experience interior $L_{10(1)}$ values up to the high 60s dBA, which is up to approximately 23 dBA higher than the 45 dBA threshold recommended for residential use according to CEQR noise exposure guidelines.

Construction of the Preferred Alternative is expected to occur over a 3.5-year duration as compared to the 5-year duration for Alternatives 2, 3, and 5. This shorter construction duration for the Preferred Alternative primarily due to less disruption to the FDR Drive since flood protection in East River Park would be primarily along the East River rather than along the FDR Drive. In addition, compared to Alternatives 2 and 3, maximum construction noise levels at receptors nearest floodwall construction within East River Park for the Preferred Alternative would be slightly lower, because pile driving for the Preferred Alternative would occur further from the receptors.

At other receptors near the project area, including open space, residential, school, and hospital receptors, noise resulting from construction of the proposed project may at times be noticeable, but would be temporary and would generally not exceed typical noise levels in the general area and so would not rise to the level of a significant adverse noise effect.

Vibration resulting from construction of the proposed project would not result in exceedances of the acceptable limit, including for historic structures. However, vibration monitoring would be required for all historic structures within 90 feet of the project work areas according to the project's Construction Protection Plan (CPP) to ensure vibration does not exceed the acceptable limit at any of these historic structures. In terms of potential vibration levels that would be perceptible and annoying, the pieces of equipment that would have the most potential for producing levels that exceed the 65 VdB limit are pile drivers. They would produce perceptible vibration levels (i.e., vibration levels exceeding 65 VdB) at receptor locations within a distance of approximately 230 feet. However, the operation would only occur for limited periods of time at a particular location. While the vibration may be noticeable at times, it would be temporary and would consequently not rise to the level of a significant adverse effect.

Other Alternatives

Construction of Alternative 3 is predicted to result in significant adverse noise effects at 621 Water Street, 605 Water Street, 309 Avenue C Loop, 315-321 Avenue C, 620 East 20th Street, 601 East 20th Street, 8 Peter Cooper Road, 7 Peter Cooper Road, 530 East 23rd Street, 765 FDR Drive, 819 FDR Drive, 911 FDR Drive, 1023 FDR Drive, 1115 FDR Drive, 1141 FDR Drive, 1223 FDR Drive, 132 Avenue D, 465 East 10th Street, and 520 East 23rd Street, and Asser Levy Recreation Center. The predicted significant adverse construction noise effects would be of limited duration and would be up to the high 80s dBA during daytime construction and up to the mid 70s during nighttime construction. Noise levels in this range are typical in many parts of Manhattan along heavily trafficked roadways. The buildings at 315-321 Avenue C, 620 East 20th Street, 601 East 20th Street, 8 Peter Cooper Road, 7 Peter Cooper Road, 530 East 23rd Street, 911 FDR Drive, 1023 FDR Drive, 1115 FDR Drive, 1141 FDR Drive, 1223 FDR Drive, and 520 East 23rd Street already have insulated glass windows and an alternative means of ventilation (i.e., air conditioning), and would consequently be expected to experience interior $L_{10(1)}$ values less than 45 dBA during much of the construction period, which would be considered acceptable according to City Environmental Quality Review (CEQR) criteria. Under Alternatives 2 and 5, significant adverse construction noise effects are expected to be similar to those under Alternative 3 and the Preferred Alternative, respectively.

Any potential vibration effects for Alternatives 2, 3, and 5 are expected to be similar to those identified for the Preferred Alternative.

Mitigation

Source or path controls beyond code requirements would be considered and implemented during construction of the proposed project to minimize the effects of noise. To that end, the mitigation measures being explored by the City include:

- Using a hydraulic press-in pile installation method instead of the standard impact pile driving provides a large reduction in noise from pile installation, which would result in a substantial reduction in overall construction noise because pile installation is the dominant source of construction noise at most receptors.
- Hanging noise barriers or curtains made from mass-loaded vinyl around the pile driving head to shield receptors from noise of impact pile driving.
- Enclosing the concrete pump and concrete mixer trucks at any time that the mixer barrels would be spinning in a shed or tunnel including 2 or 3 walls and a roof, with the opening or openings facing away from receptors.
- Using barging for deliveries of construction materials (including concrete) and importing of fill to the project sites, rather than trucks on roadways to from the construction work areas.
- Selecting quieter equipment models for equipment (i.e., cranes, generators, compressors, and lifts).

CONSTRUCTION—PUBLIC HEALTH

No Action Alternative (Alternative 1)

The No Action Alternative assumes that no new comprehensive coastal protection system would be constructed in the proposed project area. No changes to public health are expected to occur with the No Action Alternative during construction.

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park

The Preferred Alternative would not result in unmitigated significant adverse effects in air quality, water quality, or hazardous materials, but could potentially result in unmitigated significant adverse construction-period noise effects at receptors in the vicinity of the proposed project's construction work areas. However, construction of the proposed project would not result in chronic exposure to high levels of noise, prolonged exposure to noise levels above 85 dBA, or episodic and unpredictable exposure to short-term effects of noise at high decibel levels, as per the *CEQR Technical Manual*. Consequently, construction of the proposed project would not result in a significant adverse public health effect.

Other Alternatives

Similar to the Preferred Alternative, no significant adverse public health effects would occur under Alternatives 2, 3, and 5 during construction.

INDIRECT AND CUMULATIVE EFFECTS

The proposed project would not result in indirect adverse effects generated by induced or secondary growth. In consideration of the range of technical analyses presented in this EIS, the proposed project has little or no potential to result in any cumulative effects, except in the following areas: visual resources—by blocking views to the waterfront and East River from multiple locations—and open space during construction periods by temporarily displacing open space resources. ✷