

A. INTRODUCTION

Hurricane Sandy underscored the City’s need to bolster its resiliency efforts to protect property, vulnerable populations, and critical infrastructure during major storm events. To address this need, the City is proposing the East Side Coastal Resiliency (ESCR) Project (the proposed project), which would construct a coastal flood protection system along a portion of the east side of Manhattan and make related improvements to City infrastructure. Depending on the project alternatives, this flood protection system would include a combination of floodwalls, levees, elevated infrastructure or park areas, and/or closure structures, along with other infrastructure improvements to reduce flooding.

This chapter establishes the framework used to assess potential effects from construction of the proposed project. The preliminary construction schedule is described along with construction activities and practices likely to occur.

The proposed project is divided into two project areas, 16 reaches for design, and six construction segments for analysis purposes (see **Figure 6.0-1**), described in detail in Chapter 2.0, “Project Alternatives.”

Construction of the proposed project is projected to start in spring 2020 with Alternatives 2, 3, and 5 projected to be completed in 2025 and the Preferred Alternative expected to be completed in 2023. This shorter construction duration for the Preferred Alternative is primarily due to relocation of the line of protection further east into East River Park, minimizing the need for coordination of construction efforts with, and disruption to, the Franklin Delano Roosevelt East River Drive (FDR Drive). The Preferred Alternative as well as Alternatives 3 and 5 assume full closure of East River Park during construction.

B. ANALYSIS FRAMEWORK

This chapter describes the different alternatives and construction options considered. It also outlines the methodology used to establish the reasonable worst-case construction phasing and schedules, which inform the analysis of potential environmental effects during the construction period. The analyses in the subsequent construction-related chapters focus on 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. Construction of the proposed project would be temporary and have limited effects on land uses near the project area, and would not result in the displacement of community facilities and services such as schools, libraries, child care facilities, healthcare facilities, or fire and police protection, and would not alter the character of the neighborhoods surrounding the project area. As such, the following areas were not determined to warrant construction period analyses: land use, zoning, and public policy; community facility and services; and neighborhood character.



- Project Area One
- Project Area Two
- Construction Limits of Work/Active Construction
- Segment

0 1,000 FEET

This section focuses on the framework used to assess the temporary construction effects for each alternative. As no construction associated with the proposed project is assumed as part of the No Action Alternative (Alternative 1), no analysis of potential construction effects is included. This chapter describes the construction options, including materials transport with trucks and/or barges and pile installation method. It also outlines the methodology used to establish the preliminary construction schedule used to evaluate the potential environmental effects during construction.

PROJECT ALTERNATIVES

A detailed description of the alternatives analyzed in this chapter is presented in Chapter 2.0, “Project Alternatives.”

NO ACTION ALTERNATIVE (ALTERNATIVE 1)

The No Action Alternative (Alternative 1) 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 build year for the proposed project is 2025 and accordingly, Alternative 1 assumes that projects planned or currently under construction in the project area are completed by the 2025 analysis year (i.e., No Action projects).¹ A list of these planned projects is included in **Appendix A1**.

PREFERRED ALTERNATIVE (THE PREFERRED ALTERNATIVE): 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 (the 100-year flood events with sea level rise to 2050s), as well as increased tidal inundation resulting from sea level rise.

In Project Area One, the proposed flood protection alignment begins at its southerly tieback along Montgomery Street 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. Once in East River Park, the proposed flood protection alignment starts to turn east towards the East River near the existing East River Park Compost Yard. From here, the alignment continues north and the system parallels the East River Park bulkhead. The Preferred Alternative would raise the majority of East River Park from the amphitheater to approximately East 13th Street, excluding the Fireboat House. This plan would reduce the length of exposed wall between the community and the waterfront to provide for enhanced neighborhood connectivity and integration. Between the amphitheater and East 13th Street, the park would be raised by an average of approximately eight-feet with the floodwall installed below-grade to meet the design flood elevation criteria. The Delancey Street, East 10th Street, and Corlears Hook Bridges would be reconstructed to be universally accessible. A portion of the park’s underground water and drainage infrastructure and bulkhead are reaching the end of their serviceable life and are in need of repair. Therefore, this park infrastructure would be reconstructed, along with existing park structures and

¹ Note that although the superstructure of the shared-use flyover bridge, which is a common component across each of Alternatives 2 through 5, would be completed in 2025, the flood protection and enhanced park and access features under Alternative 4 (the preferred alternative) would be anticipated to be completed in 2023.

recreational features, including the esplanade, amphitheater, track facility, and tennis house, as part of the raised park. In addition, two existing embayments would be relocated within the project area to maximize community connectivity to the water, and to provide adequate space to site heavily utilized active recreation facilities. The two proposed embayments would be comparable in size, would be similarly located within East River Park, and would be designed to provide enhanced ecological value to the aquatic environment compared to the existing embayments. A shared-use pedestrian/bicyclist flyover bridge linking East River Park and Captain Brown Walk would be built cantilevered over the northbound FDR Drive to address the narrowed pathway (pinch point) near Con Edison's East River Dock 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 line of flood protection would cross the FDR Drive with closure structures near East 13th Street, and continue along the west side of the FDR Drive, bordering the eastern boundary of NYCHA's Jacob Riis Houses, Con Edison's East River Complex at East 13th, East 14th, and East 15th Streets (including closure structures that cross at East 13th, East 14th, and East 15th Streets), and Murphy Brothers Playground. The system would then cross under the FDR Drive at Avenue C with closure structures, and run along the western edge of Stuyvesant Cove Park. Stuyvesant Cove Park would be reconstructed and redesigned to include elevated pathways, seating, and planted areas along the rear of the park and a pedestrian esplanade along the water's edge. The system would then traverse under the FDR Drive at East 23rd Street with a series of closure structures, and would run adjacent to the eastern edge of Asser Levy Recreation Center along the FDR Drive off-ramp then turn in along the northern edge of the building to cross Asser Levy Playground. The portions of Murphy Brothers Playground and Asser Levy Playground that are affected by construction of the floodwall would be reconstructed and reconfigured. A closure structure then connects to the VA Medical Center's flood protection system to close the compartment along East 25th Street to First Avenue.

The Preferred Alternative also includes modifications of the existing sewer system, 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.

Since the flood protection under this alternative is primarily along the existing esplanade of East River Park, there would be less construction disruption and delay along the FDR Drive, which would require temporary nighttime single-lane closures of the FDR Drive to allow construction. Therefore, the flood protection system and raised East River Park proposed under this alternative would be constructed in 3.5 years and would provide the flood protection in an accelerated timeframe before the hurricane season of 2023, compared to the 5-year construction duration and a completion year of 2025 anticipated under Alternatives 2, 3, and 5. In addition, as described in Chapter 6.12, "Construction—Noise," compared to Alternatives 2 and 3, maximum construction noise levels at locations west of the FDR Drive nearest floodwall construction within East River Park under this alternative would be lower, because pile driving would occur further from these locations. This alternative would have an increased usage of barges compared to Alternatives 2 and 3 due to the amount of fill materials required to raise East River Park and the reconstruction of the esplanade. However, the use of barges instead of trucks would reduce truck traffic in inland

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neighborhoods. Based on preliminary estimates, approximately 775,000 cubic yards of fill would be required for the construction of the Preferred Alternative. The sources of clean soils or fill materials to be used anywhere on the project site would be determined by the construction contractors with review and approval by DEC and are dictated by a number of factors, including composition, certification of suitability of intended use, quality, availability, cost, and the proximity of the soil/clean fill provider's loading site to the project area. The foundations for the shared-use flyover bridge under this alternative would be completed in 2023, with a prefabricated bridge span installed and completed in 2025.

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

Alternative 2 provides 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. The flood protection system in Project Area Two would be the same as the Preferred Alternative except that the portions of Murphy Brothers Playground and Asser Levy Playground that are affected by construction of the floodwall would be replaced in kind.

As with the Preferred Alternative, Alternative 2 would 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.

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 close 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.

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 closure 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 berms and other earthwork compared to Alternative 2 in association with the flood protection along the FDR Drive 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, this alternative would include a more extensive reconfiguration and reconstruction of the bulk of East River Park and its programming (i.e., landscapes, recreational fields, playgrounds, and amenities) as compared to Alternative 2 but not as extensive as those proposed under the Preferred Alternative as described above. 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 the same to that proposed in the Preferred Alternative.

As with 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 close 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.

ALTERNATIVE 5 – FLOOD PROTECTION SYSTEM EAST OF FDR DRIVE

The 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 closures structures crossing the FDR Drive near East 13th Street as well as the need to install floodwalls adjacent to NYCHA Jacob Riis Houses, Con Edison's East River Complex, and Murphy Brothers Playground.

As with the Preferred Alternative, this alternative would 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.

Anticipated project completion under this alternative is driven by construction of the raised northbound lanes of the FDR Drive and the adjacent shared-use flyover bridge in this same footprint, therefore Alternative 5 is anticipated to be constructed in five years and completed in 2025.

C. CONSTRUCTION ACCESS AGREEMENTS

Temporary construction agreements would be pursued with property owners where access and staging during construction are required.

D. CONSTRUCTION OF PROPOSED PROJECT COMPONENTS

A discussion of construction approaches to the components of the proposed project (i.e., how floodwalls, levees, closure structures, drainage management elements, etc., would be constructed) is provided below. In addition, potential construction methods, including materials transport and pile installation methods, are described.

As described in details in Chapter 6.10, “Construction—Air Quality,” 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 (LSD) fuel and best

available tailpipe reduction technologies. In addition, as described in details in Chapter 6.12, “Construction—Noise and Vibration,” construction of the proposed project would not only include noise control measures as required by the *New York City Noise Control Code*, but would include additional measures such as the use of quieter equipment.

FLOODWALLS AND LEVEES

As discussed in Chapter 2.0, “Project Alternatives,” floodwalls are narrow, vertical structures with a below-grade foundation that are designed to withstand both tidal storm surge and waves. They are typically constructed of steel, reinforced concrete, or a combination of materials with a reinforced concrete cap. The floodwalls would consist of I-walls and/or L-walls, which provide protection to withstand tidal surge and wave forces. Floodwalls can be incorporated into a berm to reduce the amount of wall exposure in areas where there are horizontal space limitations making a levee infeasible. For the Preferred Alternative, East River Park would generally be raised by approximately eight feet and floodwalls would generally be installed below-grade within the raised park and would therefore not be visible. In addition, the Preferred Alternative would include the construction of a subgrade seepage barrier to provide protection to East River Park.

Levees, which are part of the flood protection elements under Alternatives 2 and 3 only, are flood protection elements where the existing topography is elevated to reach or exceed the design flood elevation to form a line of coastal flood protection and, therefore, require a relatively wide footprint to be installed. They are typically constructed of a core of compacted fill material, capped by stiff clay to withstand storm waves, with a stabilizing landscaped cover. Construction of floodwalls and levees would typically require excavation, installation of sheet piles and pile foundations, forming and pouring concrete walls, and/or placement of earth fill.

Existing water and sewer infrastructure would be protected, supported, and maintained in place throughout the duration of work where relocation or replacement is not proposed. Prior to excavation, any interference with existing water and sewer infrastructure would be identified. Utility work associated with the construction of floodwalls and raised landscapes may also include relocation or replacement of existing water mains and combined sewer lines within East River and Stuyvesant Cove Parks. This work would require the use of excavators and loaders for excavation, backfill and placement of utility lines, and trucks to transport materials. Relocation of water mains or combined sewer lines would be undertaken without affecting the conveyance of flow through the existing water supply and sewer system. All relocation work would be performed in accordance with methods and standards approved by the New York City Department of Environmental Protection (DEP).

FLOODWALL (L-WALL)

Construction of the L-wall would require trench excavation, which would require conventional excavation equipment such as excavators, loaders, and dump trucks. After excavation, sheet pile walls would be installed using a vibratory or impact pile driver and/or a hydraulic press-in hammer in areas where vibration control is critical. Following installation of the steel piles reinforced cast-in-place (CIP) L-walls would be cast on the supporting piles. Construction would likely require a crane capable of handling a pile hammer and lifting and positioning the formwork, steel reinforcing cages, and steel piles. A concrete pump would be used to convey ready-mix concrete.

FLOODWALL (I-WALL)

I-wall construction would require installation of steel sheet piles using a vibratory or impact pile driver and/or a hydraulic press-in hammer in areas where vibration control is critical. Following

installation of the sheet piles, a CIP concrete pile cap would be poured on top of the portion of sheet pile exposed above the existing grade. The concrete pile cap provides water-tightness, corrosion protection, and a softer visual aesthetic.

LEVEES

The levees would be constructed using bulldozers and graders for placement, compaction, and grading, and would require fill material. Following construction of the levees, disturbed areas would be landscaped and reestablished for public use. Landscaping, which would also occur in all areas of the reconstructed East River Park, would first involve soil and plant procurement as well as soil mixing and testing. Then, plantings would take place during the planting windows in the spring and the fall. Typical equipment used for landscaping activities include excavators and loaders.

CLOSURE STRUCTURES

As discussed in Chapter 2.0, “Project Alternatives,” in many flood protection systems it is necessary to provide an opening to accommodate day-to-day vehicular or pedestrian circulation along a street or sidewalk. In these instances, closure structures (i.e., gates) are used. Construction of the closure structures would consist of excavation, foundation and cut-off wall installation, jet grouting, forming and pouring CIP concrete, and steel gate installation. For areas with extensive subsurface electrical lines and manholes within the roadways, excavation would involve a mixture of equipment such as excavators, loaders, and dump trucks, and careful hand excavation to protect or relocate these utilities. Installation of the closure structures located in proximity of the FDR Drive or within existing roadways or ramps would require maintenance and protection of traffic plans.

EAST RIVER PARK ESPLANADE RECONSTRUCTION

As discussed in Chapter 2.0, “Project Alternatives,” the Preferred Alternative would include the reconstruction of the esplanade to raise it to a higher elevation and the relocation of the two existing embayments at the esplanade would be relocated within the project area to maximize community connectivity to the water, and to provide adequate space to site heavily utilized active recreation facilities. Esplanade reconstruction activities would generally consist of the removal of the existing esplanade concrete deck, excavation, installation of sheet pile bulkhead (cut-off wall), backfill, and the installation of girders and deck structure. Esplanade reconstruction activities would be constructed waterside and would involve barges, cranes, and excavators.

PEDESTRIAN BRIDGES RECONSTRUCTION

Replacing pedestrian bridge landings (i.e., Corlears Hook, Delancey, and/or East 10th Street Bridges) would first require demolition of the existing ramp surface using a small excavator and a skid steer to move the material. Following this, the steel structure of the pedestrian bridges would be cut into sections and removed using a crane. Steel sections would then be loaded in large pieces onto trucks for removal.

Removal of the existing foundations and construction of new foundations would require excavation, pile foundations, concrete pours and backfill. Structural steel or precast concrete structural members would then be placed with a crane and a concrete deck would be added by pouring it in place using a concrete pump. The placement of the spans across the FDR Drive is anticipated to require limited FDR Drive full lane closures in both directions. The closures would occur during the night and would follow requirements set forth by the New York City Department of Transportation (NYCDOT) and would be limited to a maximum of 6 hours of full lane closures

per night. To ensure public safety, access to pedestrian bridges would be closed during reconstruction activities, and pedestrian traffic would be rerouted to the nearest open pedestrian bridge.

Similar to the construction of floodwalls and levees described above, utility work associated with the construction of the bridge landings may require existing water and sewer lines to be protected, supported, and maintained in place or relocated/replaced. This construction would not affect water or sewer service. All maintenance or relocation activities would be performed in accordance with methods and standards approved by DEP.

EAST RIVER PARK RECONSTRUCTION

Construction of the new flood protection will require the disturbance and reconstruction of most of East River Park, Murphy Brothers Park and Asser Levy Playground. As discussed above, under The Preferred Alternative and Alternative 5, East River Park would be raised by approximately eight feet to meet the design flood protection criteria, providing flood protection for both the park and the inland community. The reconstruction of East River Park under Alternatives 4 and 5 would include replacing the East 10th Street comfort station, Tennis House and Track and Field Complex, the New York City Parks and Recreation (NYC Parks) maintenance facilities, reconstruction of the existing amphitheater, and relocation of two existing embayments.

Elevating East River Park would consist primarily of earthwork to place, compact, and grade earth fill in these areas, as well as demolition of the existing buildings with the park. Landscaping would first involve soil and plant procurement as well as soil mixing and testing. Then, plantings would take place during the planting windows in the spring and the fall. Activities for the comfort station, the maintenance facilities would require earthwork and concrete work for the replacement structure where applicable.

CON EDISON UTILITY CARBON FIBER WRAPPING

Con Edison high-voltage transmission lines within the project area present a variety of challenges to the design and construction of the proposed project. These conduits, critical to the transmission of electricity in Lower Manhattan, are currently buried in the fill and natural soils in the area at a depth that allows effective heat dissipation from the lines, which is critical to the efficient function of the system, and at which they are accessible to Con Edison for maintenance and repair. Where possible, considerations have been made in the design of the flood protection system and flyover bridge to: minimize the depth of additional fill to be placed above the conduits to minimize detrimental effects on transmission; revise the alignment of the system to reduce conflicts and crossings of the conduits by the flood protection elements; reduce potential effects of construction vibration; reduce hydrostatic pressure on the transmission lines; limit the movement of heavy construction equipment and material over transmission lines; wrap the lines with carbon fiber to provide enhanced corrosion protection.

During construction of the proposed project, Con Edison would undertake the wrapping of their existing live transmission lines located belowground in a protective carbon fiber material. Carbon fiber wrapping activities would be performed in conjunction with the installation of the flood protection measures and would involve the use of handtools. The City would continue to coordinate with Con Edison on implementation of these protective measures.

DRAINAGE ISOLATION

As noted in Chapter 5.8, “Water and Sewer Infrastructure,” modifications to the existing sewer system would be implemented to control flow into the protected area from the larger sewershed

and to eliminate potential pathways for storm surge waters to inundate the protected area sewer system and flood inland areas (i.e., drainage isolation). The measures include: (1) installing interceptor gates on the existing 108-inch diameter interceptor at East 20th Street and Avenue C to the north and between Corlears Hook Park and the FDR Drive to the south; (2) flood-proofing regulators and manholes on the unprotected side of the flood protection system (mainly within East River Park); (3) replacing existing tide gates on the combined sewer outfall pipes that serve the drainage protected area; and (4) installing one isolation gate valve in Regulator M-39, located within Asser Levy Playground, to isolate a branch interceptor that crosses the flood protection system alignment at the northern boundary of the drainage protected area.

INTERCEPTOR GATES

The work required to install interceptor gates would include excavating sections of roadway near the intersection of East 20th Street and Avenue C, and in the pathway between Corlears Hook Park and the FDR Drive within New York City owned right-of-way (see Figures 5.8-4 and 5.8-5). Installation of the interceptor gates would begin with site preparation, pavement excavation, support of excavation (installing drilled secant piles and grouting to hold open the excavation during construction), dewatering, and excavation to fully expose the interceptor where the interceptor gate chambers are to be constructed. Once the excavation is complete, the crown of the interceptor would be opened to install a temporary flume within the interceptor to allow flow to pass uninhibited during construction. Next, a concrete chamber would be constructed around the existing interceptor to house the primary and secondary gates and associated operators. The chamber would be constructed on piles, as described in Chapter 5.8, “Water and Sewer Infrastructure,” and the finished chamber would extend from beneath the interceptor to the ground surface.

Installation of the interceptor gates would be followed by removal of the flume, backfill of the excavation and site restoration, including patching and restoring the street surface. Closure of lanes to local traffic and a temporary lane shift within the FDR would be required while the necessary areas are excavated, and the interceptor gate work is completed. NYCDOT has provided work stipulations for road closures as discussed in Chapter 6.9, “Construction—Transportation.” Construction of each interceptor gate is anticipated to require approximately one year. Following this construction, the two gate chambers would be complete and tested for proper operation during low sewer flow periods without affecting the conveyance of sanitary flow through the combined sewer system.

In conjunction with the construction of the below-grade interceptor gate chambers, a building would be constructed adjacent to each chamber to house the controls, electrical panels, and other components to support the interceptor gates. These single-story buildings would be approximately 680 square feet, sited within the right-of-way. Pedestrian walkways and roadway curbs would be realigned as needed to maintain adequate clearance for pedestrian, bike, and/or vehicular traffic during the following construction. The design of the interceptor gates is ongoing and, as such, the extents of roadway excavation and required utility relocations in the right-of-way will be finalized as design progresses.

REGULATORS, DRAINAGE STRUCTURES, AND MANHOLES

The construction proposed for the regulator chambers and other combined sewer structures would begin with an inspection of each structure to determine existing structural capacity and methods of floodproofing, which may include lining, patching, jet-grouting, or excavating to reinforce existing walls. Excavation would be similar to as was described for the interceptor gate chambers,

and would include site preparation, pavement/ground cover excavation, installation of support of excavation, excavation, dewatering, and backfill following floodproofing.

Any vented hatches or manholes on the unprotected side of the flood protection alignment, through which stormwater or floodwater could infiltrate, would be replaced with water-tight hatches or manhole covers. These hatches and manholes are located on both the existing regulators and on the combined sewers and sewer infrastructure. The watertight covers would consist of an inner pressure cover and outer traffic cover. The inner cover could be positioned to allow the sewer to vent as under existing conditions. In advance of a design storm, the inner covers would be engaged to effectively seal them to prevent water entry. Following the design storm event, covers that were locked would be unsealed and returned to the venting position. In addition, durable accessways designed for heavy work vehicle loads (H-20 loading) would be installed to allow for future maintenance access. Following construction, the area would be backfilled and restored.

The amount of work required to make these manholes watertight would depend on the structural stability of the manhole. The manholes that are less structurally stable would be either partially or fully reconstructed in addition to the replacement of the frame and cover. Manholes requiring additional support would follow the methods described above for the regulators. Minimally, to make any manhole watertight, excavation of the top one-to-two feet of asphalt, concrete, or soil would need to be removed. At that time, the manhole frame and cover would be replaced with the watertight cover and the area would be restored to its previous condition or better.

Storm drainage collection on the unprotected side of the flood protection system is proposed to be rerouted and connected to the outfalls downstream of the tide gates, therefore isolating them from the combined sewer system and eliminating the need to floodproof those portions of the proposed park drainage system. Open-cut excavation would be used, in which shallow trenches would be excavated, to facilitate construction of pipe supports and piles and installation of new storm drainage piping. In conjunction, some existing storm drainage structures and pipes would be capped and abandoned in place while others would be removed.

TIDE GATES

Existing tide gates would be replaced for each of the outfalls within the project protected area and new tide gates would be installed on outfalls without tide gates in the existing condition. These gates would isolate the protected area from flow entering from the river side of the flood protection system during a design storm surge event. Installation of these tide gates would be done within the existing tide gate chambers, for cases in which the tide gate chambers are structurally stable and/or reinforced as part of regulator floodproofing (described above). Installation of stop logs (temporary barriers that are used to isolate the area of work) upstream and downstream of the tide gate would prevent flow to the outfall and allow for removal of the existing tide gate and installation of a new gate of the same size within the chamber. The stop logs would be removed following gate replacement. Closure of stop logs on outfall pipes is a typical procedure performed during regular replacement and maintenance of existing tide gates. Depending on the configuration and condition of the existing tide gate and outfall pipe, an additional concrete chamber may be constructed around the outfall pipe to house the new tide gate. This chamber construction would follow the site preparation and excavation procedures described for the regulator floodproofing. The portion of the outfall within the new chamber would be removed and the existing outfall would be temporarily bulkheaded to prevent flow from entering the construction area. Following the tide gate chamber installation, the excavated site would be backfilled and restored, and the bulkhead would be removed.

ISOLATION GATE VALVE

An isolation gate valve is proposed to be installed within regulator M-39 on a sewer that crosses the alignment of the flood protection system. This isolation gate valve would reduce the risk of floodwaters from outside the protected area inundating the protected area. This valve would be anchored to the wall within the existing regulator and would be operated manually from the ground surface. The isolation gate valve could be installed using bypass pumping to redirect flow around the construction area while maintaining service. Alternatively, the work could be performed by professionals capable of installing the isolation gate valve while the sewer is in service. Neither method would result in changes to sewer service. Construction of the isolation gate valve is anticipated to require approximately one to three months. The regulator is located within Asser Levy Playground. The construction will require minor excavation and resurfacing of the park in the vicinity of the regulator.

DRAINAGE MANAGEMENT

In addition to the floodproofing and isolation measures outlined above, the proposed project includes drainage management elements to manage potential sewer surcharge and above-grade flooding within the protected area. This flooding could occur during a coastal flood event as a result of rainfall coincident with a storm surge. These drainage elements include installing parallel conveyance pipes for 9 regulators and upsizing branch interceptor sewers for three additional regulator tributary areas.

Parallel conveyance pipes would be constructed for regulators M-22, M-23, M-27, M-28, M-31, M-37, M-38, M-38A, and M-38B and upsized branch interceptor pipes would be constructed downstream of regulators M-33, M-34, M-35 to increase and support the full flow capacity of the main interceptor. This construction would take place primarily in the right-of-way, in the roadways along Avenue C, Avenue D, Columbia Street, Delancey Street, South Street, Water Street, and Jackson Street. One parallel conveyance, M-27, would be constructed on private property owned by the East River Housing Corporation. The proposed acquisition area is within the parking lot that is accessory to the East River Housing Complex. The proposed acquisition would enable the City to have access to the property to operate, inspect, and maintain the regulator M-27 parallel conveyance system proposed to be sited on this lot.

As described in Chapter 5.8, “Water and Sewer Infrastructure,” the drainage management infrastructure consists of three components: (1) an upstream connection to a lateral sewer or regulator; (2) a length of piping; and (3) a downstream connection to the interceptor.

Parallel conveyance construction, including M-27 on East River Housing Corporation, would begin with site preparation and clearing for the excavation and construction activities. Utilities requiring relocation to accommodate the new infrastructure would be excavated and relocated prior to construction of the parallel conveyance. Once site preparation is complete, construction of the parallel conveyance upstream connection would involve a shallow excavation to expose the existing sewer or regulator, to which the parallel conveyance connection would be made. The existing sewer or regulator would be supported during excavation and while connecting the new piping. This may involve construction of a new manhole chamber at the connection location. The parallel conveyance would be installed during dry weather conditions, above the regular flow level in the lateral sewers, so as not to interfere with operation of the existing sewer infrastructure. Bypass pumping or flumes can be used if needed. To install the drainage management piping, open-cut excavation would be used, in which shallow trenches would be excavated to facilitate construction of pipe supports and piles, as needed, and installation of piping.

The downstream connection to the interceptor would be constructed either by connecting to an existing manhole on the interceptor or by constructing a new manhole on the interceptor. Connection to an existing manhole would be constructed by first excavating to expose the existing manhole riser. Interceptor manholes are structures that extend up to 40 feet deep; as such, the excavation support system would consist of secant piles, sheeting, and/or jet grouting to maintain a deep, water-tight excavation for the duration of construction. To accommodate the new piping connection and to provide personnel access to the inside of the manhole, the existing manhole riser would be reinforced or partially reconstructed. As described for the upstream connection, the existing manhole structure would be supported and sewer flow in the interceptor would be maintained throughout construction. For parallel conveyance systems in which a new downstream interceptor connection manhole is required, a new manhole would be constructed for the drainage management pipe to tie into, using the same method described for the interceptor gate chamber construction. Neither of these construction methods would result in interruptions or alterations to sewer service.

For the sewer upsizing for regulators M-33, M-34, and M-35, the existing downstream pipes would be excavated and demolished and the new upsized pipes would be installed at the same elevations as the existing sewers. This work would require bypass pumping and a temporary flume during the construction of the connection between the regulator and the new pipe and during portions of the construction of new piping where it replaces existing in the same footprint. To install the drainage management piping, open-cut excavation would be used, in which shallow trenches would be excavated to facilitate construction of pipe supports and piles and installation of piping. The branch interceptor for M-33, M-34, and M-35 would also require tunneling below the FDR Drive near East 10th Street to install piping. This tunneling work would be constructed according to DDC and DEP specifications with approvals by NYCDOT. After construction of each parallel conveyance system, all excavated sites would be backfilled and restored. Construction of each drainage management component is anticipated to require about eight to fifteen months on average, depending on the location, size of conveyance, type of downstream interceptor connection, and complexity of construction. This work would require lane closures to local traffic throughout the duration of construction. NYCDOT has provided work stipulations for road closures as discussed in Chapter 6.9, “Construction—Transportation.” All construction activity associated with drainage isolation, drainage management, 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.

INFRASTRUCTURE RECONSTRUCTION

To reconstruct the water and sewer infrastructure within East River Park as proposed under the Preferred Alternative and Alternative 5, open-cut excavation would be used to prepare for construction of the new structures and piping. Support of exaction and dewatering, as described for parallel conveyance piping, would be used during construction. The new sewer infrastructure would be constructed on piles and new structures would be constructed with reinforced concrete, similar to the existing infrastructure. The new piping would be installed in open-cut shallow trenches on pipe supports and foundations (e.g., piles or cradles). The new sewer infrastructure would be constructed with reinforced concrete and would be built in a similar configuration as the existing sewer infrastructure. The new piping would be installed in open-cut shallow trenches on pipe supports and piles with the exception of any line crossing the FDR Drive, which would require microtunneling, or a similar trenchless construction method, for installation. Structures

such as tide gate chambers, junction chambers and regulators would also be built on pile foundations. DEP and DDC standards and specifications will be used where applicable for design.

Throughout construction, the existing sewer infrastructure would remain in service until the new infrastructure is completed and ready to be connected to the portions of the existing sewer system that will remain. Connecting the reconstructed infrastructure to the existing infrastructure would require bypass pumping. Once completed, the existing infrastructure that is replaced would be filled and abandoned in place.

To reconstruct the outfalls, a watertight cofferdam would be installed adjacent to the bulkhead and the work area would be dewatered. The top of the cofferdam would be above the mean higher-high water line to isolate the work area from tidal influence. The work area would not contain standing water and approved dewatering measures would be installed, as necessary, and would discharge below the mean higher-high water line. A portable sediment tank or approved equivalent would be used to treat dewatering effluent.

FLYOVER BRIDGE

A shared-use flyover bridge is proposed to address the pedestrian/bicycle pinch point near Con Edison's East River Dock between East 13th Street and East 15th Street. As currently contemplated, the proposed shared-use flyover bridge would be a steel thru-truss superstructure supported on footings placed adjacent to the eastern edge of the northbound FDR Drive lanes, within the limits of the existing East River Bikeway. The proposed flyover bridge would be cantilevered over the northbound FDR Drive. The thru-truss bridge would be approximately 1,000 feet long and 15 feet wide and approximately 19 feet tall from the surface of the bridge deck to the top of the truss. The bridge would have a 16-foot minimum clearance above the elevated roadway between East 13th and East 15th Streets adjacent to Con Edison's East River Dock. The total height of the flyover bridge would be approximately 40 feet above grade. The flyover bridge would slope down to connect to East River Park on the south and to Captain Patrick J. Brown Walk around East 16th Street on the north.

RAISED FDR DRIVE PLATFORM WITH FLOODWALL PROTECTION

As discussed above, under Alternative 5, the northbound lanes of the FDR Drive would be raised approximately 6 feet between East 13th Street and East 18th Street. To create the platform, drilled shafts would be installed generally in the middle lane of the FDR Drive northbound lanes and would extend to bedrock at intervals of approximately 125 feet (with possibly just one shaft needed between Con Edison's intake tunnels). It is estimated that approximately 12 to 15 shafts would be necessary. A precast pre-stressed box structure/raised platform would then sit on the piers supported by the shafts, and a new paved roadway for the northbound FDR Drive would then be supported on the box structure.

Prior to elevating this portion of the FDR Drive, utility infrastructure would be protected, supported, or relocated. Construction of the raised northbound lanes would include drilling shafts, and placement of concrete to provide for the foundation of the structure, installation of piers, and placement of the raised platform. To connect the new elevated roadway and the existing elevated roadway abutment, approximately 200 linear feet of the existing roadway would likely need to be modified or reinforced. This work would require cranes and typical earthwork equipment such as excavators and loaders. On the east side of the elevated roadway, a floodwall would be installed to protect the protected area from flooding, replacing the existing parapet wall of the abutment.

Construction associated with the raised FDR Drive platform would require work within and/or near the FDR Drive that would necessitate temporary FDR Drive closures, as detailed below under “Construction Schedule.”

CONSTRUCTION METHODS

MATERIALS TRANSPORT

Construction materials would be delivered to and removed from the project area by a combination of trucks and barges. For the Preferred Alternative, since a substantial amount of fill would be required to raise East River Park approximately 8 feet to meet the design flood elevation, most of the fill materials are anticipated to be transported by barges, with the exception of specialty top soils that are required for planting. Based on preliminary estimates, it is anticipated that approximately 775,000 cubic yards of fill would be required for construction under the Preferred Alternative. The sources of clean soils or fill materials to be used anywhere on the project site would be determined by the construction contractors with review and approval by DEP and/or DEC and are dictated by a number of factors, including composition, certification of suitability of intended use, quality, availability, cost, and the proximity of the soil/clean fill provider's loading site to the project area.

Truck Transport

Construction materials (e.g., top soil, rebar, concrete) that are transported by trucks (e.g., dump trucks, flatbed trucks, concrete trucks) would adhere to strict schedules as a result of site constraints and limited vehicular access to the different construction areas along the project alignment (e.g., within East River Park, along the FDR Drive, near Con Edison's East River Complex). To adhere to delivery schedules, flaggers would be employed where necessary, pursuant to standard procedure for construction in the City. The flaggers could be supplied by the contractor on site at that time or by the construction manager. The flaggers would manage trucks traffic into and out of the project area. In addition, the flaggers would aid trucks entering and exiting the on-street traffic streams in order to ensure the safety of the public passing through the area.

The area under the Williamsburg Bridge is currently cordoned off to restrict access to the six 30-foot by 30-foot bridge footings, but additional safety measures such as additional fencing and flaggers would be implemented, where necessary, during construction to protect the footings from the construction traffic streams passing through this area.

Barge Transport

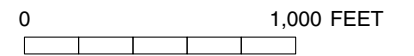
Under the scenario in which barges supplement truck deliveries, the potential barge mooring locations considered the following factors: proximity to the Federal Navigation Channel; proximity to the Williamsburg Bridge, existing water depth, location of ferry landings, proximity to Con Edison's East River Dock, and shoreline features (e.g., pedestrian bridges) that cannot support truck weights.

The shorefront area north of the Fireboat House to the north end of East River Park, with the exception of the areas immediately adjacent to the Williamsburg Bridge, is potentially a suitable location for barge mooring, loading, and unloading to support construction operations (see **Figure 6.0-2**). In addition, construction barges used for storage may be sited along the bulkhead in up to three other locations: between Pier 36 and Pier 42, at the northern end of East River Park, and/or along Captain Patrick J. Brown Walk.



- Potential Barge Mooring Locations
- Bulkhead & Pierhead
- HS20 Loading
- Federal Navigation Channel

Note: Potential barge mooring locations would be further developed during construction design.



One potential barge delivery option would involve using a harbor barge to transport equipment and materials (e.g., excavated materials, fill) to/from the project area. Under this option, the harbor barge would be transported to the project area by a tug boat. The harbor barge would be moored along the shoreline and a crane would be used to load/unload the materials to East River Park. When the harbor barge is emptied or filled, a new barge would take its place, and a tug boat would transport the emptied or full barge off-site.

Another potential barge delivery option would involve using both transit barges, which may be employed to supplement truck deliveries, and storage barges. With this technique, temporary unloading barges would be installed parallel to the bulkhead in water of sufficient depth to preclude any need for dredging. The anchoring of construction barges would be accomplished with spuds (vertical steel shafts) located on the barges. Monopile dolphins (a cluster of piles used as a fender for the bulkhead) could also be installed to control the transverse movements of transit barges to ensure safe barging operations. Transit barges would then deliver materials and equipment to the unloading barges. The unloading barges, typically used to support excavators and small crawler cranes used for transferring materials from transit barges to the shoreline, would be sited along the bulkhead and moved as necessary between the East River Park amphitheater and the north end of the park.

Depending on the construction contractor means and methods, a concrete batch plant may be mounted on a barge/vessel or within the closed East River Park to supply the concrete needed for the construction at East River Park. For this option, concrete trucks would be used to deliver the concrete from the barge to the inland areas and would travel only within East River Park, which would reduce truck traffic in nearby roadway networks.

Barging operations would primarily require the installation of steel spud piles, monopile dolphins, and/or barge ramps and gangways. Construction would likely involve the use of construction barges with barge-mounted cranes and a vibratory or impact pile hammer or other drilling equipment to place the piles. Access from the landing barge to East River Park could be accomplished by using a ramp or gangway.

PILE INSTALLATION METHOD

It is assumed that the steel piles for the proposed project would be installed with hydraulic or diesel impact hammers for the reasonable worst-case construction noise and vibration analysis presented in Chapter 6.12, “Construction—Noise and Vibration.” However, the proximity to and sensitivity of the existing Con Edison transmission lines to movement may require construction methods that minimize vibrations during installation. In addition, construction would take place adjacent to a densely populated residential neighborhood. Moreover, pile installation would be required for the construction of the floodwall within the project area which extends from Montgomery Street to East 25th Street and would likely take considerable time to complete. Therefore, a method that would reduce the noise created by pile driving has been considered.

One alternative method for installation of the steel sheet piles for the northern and southern ends of East River Park and between Con Edison’s East River Complex and Murphy Brothers Playground is the “press-in” hydraulic pile driver. The “press-in” method is quieter, limits vibrations, and requires smaller staging areas and overhead clearance than traditional methods, but is not suitable for pile installation should large subsurface obstructions be encountered.

E. CONSTRUCTION SCHEDULE

Construction of the proposed project is anticipated to be completed in 2025. Under the Preferred Alternative, the flood protection, reconstruction of three existing pedestrian bridges, foundations for a new shared-use flyover bridge, and park access features are expected to be completed in 2023, which would provide the flood protection in an accelerated timeframe before the hurricane season of 2023 compared to other alternatives that would have flood protection installed by 2025. Under the Preferred Alternative, the superstructure of the shared-use flyover bridge would then be completed in 2025.

This shorter construction duration for the flood protection under the Preferred Alternative is primarily due to less construction disruption and delay along to the FDR Drive (which would require temporary nighttime single-lane closures of the FDR Drive to allow construction) and reduced Con Edison transmission line complexity since the flood protection alignment under this alternative is primarily along the existing esplanade of East River Park. Closures of the FDR Drive would need to meet requirements set forth by NYCDOT and would be limited to approximately 6 hours of single-lane closure of the FDR Drive per night. The Preferred Alternative, as well as Alternatives 3 and 5 also assume full closure of East River Park during construction. The City is committed to the outdoor recreational needs for these communities and is currently identifying opportunities to safely keeping parts of East River Park open and will reopen parts of the East River Park as quickly as possible, however, to be conservative, the analysis assumes a full close of the park for 3.5 years. The construction schedule serves as the basis of the technical analyses presented in the subsequent construction chapters.

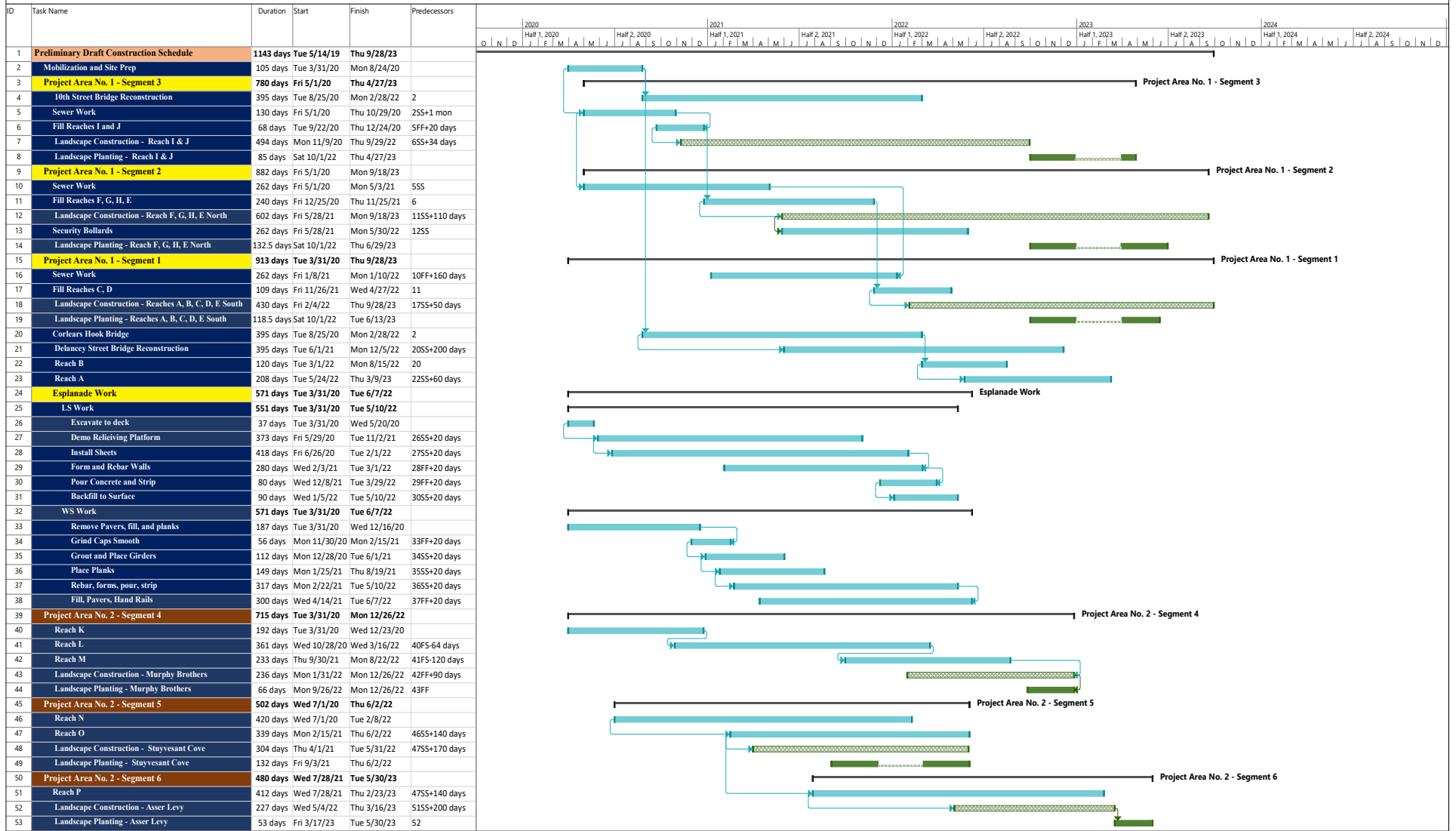
Due to the length corridor of the proposed project, construction activities in Project Area One are separated into three primary segments: Segment 1 encompasses construction from Montgomery Street to the Williamsburg Bridge; Segment 2 encompasses construction from the Williamsburg Bridge to the northern end of the Track and Field Complex; and Segment 3 encompasses construction from the northern end of the Track and Field Complex to the northern end of East River Park (see **Figure 6.0-1**).

Similarly, construction activities in Project Area Two are also separated into three segments: Segment 4 encompasses construction from south of Con Edison's East River Complex at approximately East 14th Street to Murphy Brothers Playground and includes the closure structure across the FDR Drive; Segment 5 encompasses construction within and immediately adjacent to Stuyvesant Cove Park; and Segment 6 encompasses construction at and near Asser Levy Playground, including the gate spanning the playground and connecting to the VA Medical Center (see **Figure 6.0-1**).

PREFERRED ALTERNATIVE

The preliminary construction schedule for the Preferred Alternative is shown on **Figure 6.0-3** and **Table 6.0-1**. The schedule assumes 5 workdays per week with one 8-hour day shift and when necessary, one 6-hour night shift per workday. The night shift would accommodate pile installation activity in proximity of the FDR Drive. Construction of the Preferred Alternative is anticipated to occur at all segments more or less simultaneously during a majority of the construction period, with limited or no access to the park resources (i.e., East River Park, Murphy Brothers Playground, Stuyvesant Cove Park, and Asser Levy Playground) until work is completed at that resource. However, the flood protection system and raised East River Park proposed under this alternative would be constructed in 3.5 years and completed in 2023 compared to the 5-year construction duration anticipated under Alternatives 2, 3, and 5. The foundations for the shared-

ESCR - Preliminary Draft Construction Schedule
December 2018



use flyover bridge would also be completed in 2023, with the prefabricated bridge span installed and completed in 2025. The Preferred Alternative would result in less disruption to the FDR Drive because the floodwall would be primarily below-grade along the East River instead of along the FDR Drive in Project Area One.

As discussed above, the Preferred Alternative would raise East River Park by an average of approximately eight-feet with the floodwall installed below-grade to meet the design flood elevation criteria. In addition, the Delancey Street, East 10th Street, and Corlears Hook Bridges would be reconstructed. Furthermore, existing park infrastructures including a portion of the park’s underground water and drainage infrastructure and bulkhead and esplanade would be reconstructed, along with existing park structures and recreational features, including the amphitheater, track facility, and tennis house, as part of the raised park. Relocation of two existing embayments along the East River Park esplanade is also proposed under this plan to facilitate a direct connection to the water, increase the type and quality of park user experiences, and allow for the retention of extremely heavily utilized active recreation fields within the park.

**Table 6.0-1
Preliminary Construction Schedule for Preferred Alternative**

Project Element	Start Month	Finish Month	Approximate duration (months)
Project Area One			
Segment 3 [Northern End of Track and Field Complex to Northern End of East River Park]	May 2020	April 2023	36
Segment 2 [Williamsburg Bridge to Northern End of East River Park]	May 2020	September 2023	41
Segment 1 [Montgomery Street to Williamsburg Bridge]	March 2020	September 2023	42
Esplanade Work	March 2020	June 2022	28
Project Area Two			
Segment 4 [South of Con Edison Complex to Murphy Brothers Playground]	March 2020	December 2022	34
Segment 5 [Stuyvesant Cove Park]	July 2020	June 2022	23
Segment 6 [Area around Asser Levy Park]	July 2021	May 2023	23
Flyover Bridge	-	-	42
Drainage Elements¹			
Interceptor Gates	-	-	12 per gate
Regulators, Drainage Structures, and Manholes	-	-	4 to 6
Tide Gates	-	-	2 to 3
Isolation Gate Valve	-	-	1 to 3
Parallel Conveyance	-	-	8 to 15 per element
Lateral Sewer Upsizing	-	-	21
Infrastructure Reconstruction	-	-	6 to 12 per segment
Note:			
¹ Construction activities related to the drainage management elements may occur at any time over the 3.5-year construction period.			
Source: AKRF-KSE Joint Venture, December 2018			
* This table has been updated for the FEIS.			

ALTERNATIVE 2

Alternative 2 would provide the requisite flood protection for the protected area, but lacks elements proposed as part of Alternative 3 as described below, including reconstruction of the Delancey and East 10th Streets Bridges, the reconstruction of Murphy Brothers and Asser Levy Playgrounds, the creation of a park-side plaza landing at the East Houston Street overpass, the implementation of certain resiliency measures in East River Park and a shared-use flyover bridge

between the northern end of East River Park and Captain Patrick J. Brown Walk. As such, Alternative 2 would require less construction activity/earthwork and material deliveries and East River Park is not anticipated to be fully closed during construction under this alternative. However, the construction and duration of Alternative 2 would be expected to be similar to Alternative 3 (see **Table 6.0-2**), described below, since the line of flood protection under Alternative 2 would also be generally located on the west side of East River Park where construction would require FDR Drive lane closure that is limited to overnight hours. Therefore, for the purposes of the EIS analysis, construction of Alternative 2 is assumed to have a similar phasing sequence and a construction duration that is comparable to or shorter than Alternative 3, described below.

ALTERNATIVE 3

The preliminary construction schedule for Alternative 3 is shown on **Table 6.0-2**. The schedule assumes 5 workdays per week with one 8-hour day shift and when necessary, one 6-hour night shift per workday. The night shift would accommodate pile installation activity in proximity of the FDR Drive.

Construction activities are anticipated to proceed from north to south in Project Area One and would begin first with Segments 2 and 3. The primary reason for this phasing approach is that Montgomery Street is the only existing vehicular access point to East River Park. Using the north to south phasing, once a construction phase is completed, construction-related vehicles would no longer need to travel on the newly constructed shared-use pathway. During construction of Alternative 3, East River Park is anticipated to be closed during the project's construction period, with limited or no access to this park resource until construction is completed.

As with Alternative 2, Alternative 3 includes the shared-use flyover bridge and drainage elements to modify the existing sewer system to isolate the protected area from the larger sewershed during design storm events to prevent coastal floodwaters from inundating the protected area. The existing sewer system would also be modified to increase its capacity to convey flows during design storm events with coincident rainfall, thereby managing flooding within the protected area. These modifications include installation of two interceptor gates, an isolation gate valve, replacing existing tide gates on outfalls, floodproofing sewer infrastructure on the unprotected side of the flood protection system, installing parallel conveyance and upsizing one branch interceptor. The durations of construction for each of these modifications is presented in **Table 6.0-2** and could be included at any time during the five-year construction period.

**Table 6.0-2
Preliminary Construction Schedule for Alternative 3**

Project Element	Start Month	Finish Month	Approximate duration (months)
Project Area One			
Segment 3 [Northern End of Track and Field Complex to Northern End of East River Park]	March 2020	March 2022	25
Segment 2 [Williamsburg Bridge to Northern End of East River Park]	March 2020	March 2023	37
Segment 1 [Montgomery Street to Williamsburg Bridge]	June 2022	March 2025	34
Project Area Two			
Segment 4 [South of Con Edison Complex to Murphy Brothers Playground]	March 2020	March 2023	37
Segment 5 [Stuyvesant Cove Park]	May 2021	April 2023	23
Segment 6 [Area around Asser Levy Park]	March 2023	March 2025	25
Flyover Bridge			42
Drainage Management Elements¹			
Interceptor Gates	-	-	12 per gate
Regulators, Drainage Structures, and Manholes	-	-	4 to 6
Tide Gates	-	-	2 to 3
Isolation Gate Valve	-	-	1 to 3
Parallel Conveyance	-	-	8 to 15 per element
Lateral Sewer			21
Note: ¹ Construction activities related to the drainage management elements may occur at any time over the 5-year construction period. Source: Turner Construction Company, December 2015; AKRF-KSE Joint Venture, revised December 2018. * This table has been updated for the FEIS.			

ALTERNATIVE 5

Flood protection features and connectivity improvements for Alternative 5 would remain largely the same as the Preferred Alternative. However, under this alternative, the northbound lanes of the FDR Drive would be raised approximately 6 feet between East 13th Street and East 18th Street. **Tables 6.0-3 and 6.0-4** presents the preliminary construction schedule for this alternative, assuming one drilling crew for the installation of raised platform shafts and one drilling crew for the installation of flyover bridge shafts. As shown in **Table 6.0-4**, the construction duration of shaft installation may be accelerated if multiple crews are able to work simultaneously.

**Table 6.0-3
Preliminary Construction Schedule for Alternative 5**

Project Element	Start Month	Finish Month	Approximate duration (months)
Raised Platform/Flood Protection System			
Mobilization and Site Preparation	Month 1	Month 2	2
Installation of Raised Platform Shafts ¹	Month 3	Month 8	6
Installation of Raised Platform and Paving ²	Month 9	Month 10	2
Construction Closeout	Month 11	Month 12	2
Notes: ¹ Assumes weekend closure of northbound lanes (and possibly a southbound lane) of the FDR Drive. ² Assumes closure of all FDR Drive northbound lanes and potentially one southbound lane. Source: NYCDOT, February 2016			

Table 6.0-4

Preliminary Construction Schedule for Shaft Installation

Project Element	Number of Shafts Required	Installation Pace per Crew	Approximate Construction Duration for the Raised Platform for Flyover Bridge (in months)		
			With 1 Crew	With 2 Crews	With 3 Crews
Raised Platform / Flood Protection System					
Installation of Raised Platform Shafts	12 to 15	3 to 4 weekends per shaft (includes drilling, rebar and concrete placement)	4 to 6	2 to 4	1.5 to 3
Source: NYCDOT, March 2016					

Construction of this alternative would require work within the FDR Drive. Assumptions for construction phasing and implementation include:

- Weekend closure of northbound lanes (and possibly a southbound lane) of the FDR Drive during the installation of the raised platform shafts (approximately 12 to 24 successive weekends, or 1 to 2 weekends per shaft; the installation of each shaft would also require additional time for rebar and concrete placement);
- Weekend closure of the bikeway/walkway between Stuyvesant Cove Park and East River Park during installation of the flyover bridge shafts and diversion of bicycle and pedestrian traffic;
- Closure of all FDR Drive northbound lanes and potentially one southbound lane for installation of the proposed raised platform and paving (approximately two months); and
- Closure of the bikeway/walkway between Stuyvesant Cove Park and East River Park for installation of the proposed bridge structure (approximately two months).

F. DESCRIPTION OF CONSTRUCTION ACTIVITIES

Construction activities are based on the preliminary Preferred Alternative, and the associated construction requirements may change as the project design progresses and is finalized.

POTENTIAL CONSTRUCTION STAGING AREAS

In Project Area One, since the majority of East River Park would be reconstructed and activities would occur simultaneously across all segments, construction staging for activities within East River Park could occur anywhere within the park to allow for optimal construction efficiency.

Tables 6.0-5 show the locations that are in consideration for the temporary staging of construction materials, equipment, and trucks as well as truck loading/unloading activities in Project Area Two. After construction is complete, these areas would be reconstructed and where applicable, the active use amenities would be replaced or restored. The construction staging areas would be used to facilitate the construction of the proposed project.

**Table 6.0-5
Potential Staging Area Locations for Construction within Project Area Two**

Affected Resource	Existing Uses	Description of Construction Activities	Potentially Affected Area (sq. ft.)
Murphy Brothers Playground	Baseball Fields, Basketball Court, Handball Court, Playground	Construction staging area for proposed flood protection system at Murphy Brothers Playground	43,600
Stuyvesant Cove Park	Picnic Areas, Bicycle Path, Solar One	Construction staging area for proposed flood protection system in Stuyvesant Cove Park	82,800
Asser Levy Playground	Basketball Court, Handball courts, Playground, Recreation Building, Outdoor Pools	Construction staging area for proposed flood protection system in Asser Levy Playground	27,300
Con Edison Area 1 (East 14th Street)	Existing roadway with restricted access	Construction staging area for proposed flood protection system (Segment 4 construction west of the FDR Drive near <u>East River Complex</u>)	6,000
Con Edison Area 2 (East 15th Street)	Existing roadway with restricted access	Construction staging area for proposed flood protection system (Segment 4 construction west of the FDR Drive near <u>East River Complex</u>)	8,500
Con Edison Area 3 (Workout Facility)	Service center for Con Edison's electric, gas, construction, and steam operations	Construction staging area for proposed flood protection system (Segment 4 construction west of the FDR Drive near <u>East River Complex</u>)	25,000
EDC Area 1	Parking Lot	Construction staging area for proposed flood protection system (Segment 5 construction west of the FDR Drive near Con Edison <u>East River Complex</u>)	50,000
EDC Area 2	Parking Lot	Construction staging area for proposed flood protection system (Segment 5 construction west of the FDR Drive near Con Edison <u>East River Complex</u>)	35,000
Note: * This table has been updated for the FEIS.			

- 1. Murphy Brothers Playground.** Murphy Brothers Playground is the proposed construction staging area to support construction activities within this site. The playground is not anticipated to be used to support the construction of the proposed flood protection system from the south of Con Edison's East River Complex (at East 13th Street) to south of the playground.
- 2. Stuyvesant Cove Park.** Stuyvesant Cove Park is the proposed construction staging area to support construction activities within this site. However, access to the ferry landing near the southern end of the park and the Solar One Environmental Education near the northern end of the park would be maintained throughout the construction period.
- 3. Asser Levy Playground.** Asser Levy Playground is the proposed construction staging area to support the construction of the proposed flood protection system and playground reconstruction at this site.
- 4. Con Edison Area 1 (East 14th Street).** This area is proposed to be used for storage, access, and construction of the floodwall and floodgates across East 14th Street. Without access through this area, the construction of the floodwall and floodgates would need to be staged from the FDR Drive side. Materials and equipment used for the construction would have to be brought in from the East 20th Street FDR Drive entrance and exit the FDR Drive at East Houston Street at the end of every shift. This restriction may substantially affect construction productivity. The use of this area would permit easier access to the construction zone along

the FDR Drive in Reach K (floodwall, roller gate, and pedestrian gates at the end of East 14th Street). If this area is used, coordination with Con Edison would be made to ensure that access to Con Edison's East River Complex and transmission lines as well as any associated facilities, equipment, and infrastructure would be maintained at all time during construction.

5. **Con Edison Area 2 (East 15th Street).** This area is proposed to be used for storage, access, and construction of the floodwall and floodgates across E15th Street. Without access through this area, the construction of the floodwall and floodgates would need to be staged from the FDR Drive side. Materials and equipment used for the construction would have to be brought in from the East 20th Street FDR Drive entrance and exit the FDR Drive at East Houston Street at the end of every shift. This restriction could substantially affect construction productivity. The use of this area would permit easier access to the construction zone along the FDR Drive in Reach L (floodwall, swing gate, and pedestrian gate from the end of E15th Street to Murphy Brothers Playground). If this area is used, coordination with Con Edison would be made to ensure that access to Con Edison's East River Complex and transmission lines as well as any associated facilities, equipment, and infrastructure would be maintained at all time during construction.
6. **Con Edison Area 3 (Workout Facility).** This area is proposed to be used for storage, access, and construction of the floodwall along the Con Ed Workout Facility from the end of East 15th Street to Murphy Brothers Playground. Without access through this area, the construction of the floodwall would need to be staged completely from the FDR Drive side. Materials and equipment used for the construction would have to be brought in from the East 20th Street FDR Drive entrance and exit the FDR Drive at East 15th Street or East Houston Street at the end of every shift. The currently closed off exit lane and striped area from the East 20th Street ramp would be used to facilitate construction of the floodwall but it is anticipated that additional space within the Con Edison Workout Facility would still be needed. If this area is used, coordination with Con Edison would be made to ensure that access to Con Edison's East River Complex and transmission lines as well as any associated facilities, equipment, and infrastructure would be maintained at all time during construction.
7. **EDC Area 1.** This area, which is currently under the jurisdiction of SBS and maintained by EDC, is proposed to be used for the storage of materials and equipment to facilitate construction of the flood protection system and associated park improvements within Stuyvesant Cove Park. Use of the existing parking area would help reduce the storage area required within Stuyvesant Cove Park itself (which would be under construction) and would also minimize interference with the ferry landing at East 20th Street. Portions of the floodwall and closure structures which run underneath the FDR Drive viaduct would require the parking lot area located below the elevated FDR Drive for their construction. Where the floodwall and closure structures are outside of the FDR Drive viaduct alignment, the parking lot area would be used to stage construction materials and equipment. The availability of the parking lot area is crucial for the construction of the project due to the narrow width of Stuyvesant Cove Park for staging and restrictions on staging materials.
8. **EDC Area 2.** This area, which is currently under the jurisdiction of SBS and maintained by EDC, is also proposed to be used for the storage of materials and equipment to facilitate construction of the flood protection system and associated park improvements within Stuyvesant Cove Park. In addition, this area would be needed to stage materials and equipment for the construction of two proposed roller floodgates in this area. Use of the existing parking area would help reduce the storage area required within Stuyvesant Cove Park itself (which would be under construction). This would help minimize interference with access to the existing

ferry landing. The availability of the parking lot area is crucial for the construction of the project due to the narrow width of Stuyvesant Cove Park for staging, restrictions on staging materials, and the need to maintain access to the ferry landing.

CONSTRUCTION ACTIVITIES BY SEGMENT

The description below summarizes the elements that are specific to the Preferred Alternative, which reflects the current design. The construction elements in Project Area Two is the same for Alternatives 3 through 5.

PROJECT AREA ONE

Segment 1

This segment would include the construction of a series of concrete I-walls and swing floodgates at street crossings (Montgomery Street and the FDR Drive on-ramp). A concrete I-wall that extends along the interior edge of the southern portion of East River Park adjacent to the FDR Drive would be constructed. Moving northward, the flood protection alignment would cross under the shared-use path south of the existing amphitheater and continue towards the esplanade. The Corlears Hook Bridge would be reconstructed to accommodate pedestrian, bicycle, and park maintenance vehicle access. The existing amphitheater would be relocated closer to the waterfront and reconstructed with landscaping features. From north of the amphitheater within this segment, the park would be raised with the placement of filled material to a minimum elevation of 16.5 feet NAVD88 with the installation of a below-grade floodwall, followed by the construction of the proposed park and landscaping features. This segment would also include the reconstruction of the relocated (south) Delancey Street Bridge. The East River Promenade would be modified and reconfigured to raise the elevation of the deck and introduce new hardscape features. Furthermore, the existing water and sewer infrastructure within East River Park would be reconstructed and hardened, and the waterfront embayment would be relocated and reconstructed near the amphitheater to accommodate the proposed park programming.

Segment 2

Similar to Segment 1, East River Park within this segment would be raised with the placement of filled material to a minimum elevation of 16.5 feet NAVD88 with the installation of a below-grade floodwall, the East River Promenade would be modified and reconfigured to raise the elevation of the deck and introduce new hardscape features, and the existing water and sewer infrastructure would be reconstructed and hardened. Segment 2 would also include the construction of the 12 relocated tennis courts and meandering paths. The existing oval plaza and Reflections Labyrinth would both be removed and a secondary path would be raised to meet the apex of the new earthen slope at the East Houston Street overpass. Ball Fields Nos. 3 through 6 would be reconfigured and relocated to allow for the new park entrance at East Houston Street. The existing embayment area in south of Track and Field Complex would be relocated to south of Ball Fields Nos. 3 and 6 to accommodate the proposed park programming. In addition, the existing Track and Field Complex as well as the existing Tennis House, Track and Field building, and comfort stations at the tennis courts and adjacent to the track would be reconstructed and raised.

Segment 3

Similar to Segments 1 and 2, East River Park within this segment would be raised with the placement of filled material to a minimum elevation of 16.5 feet NAVD88 with the installation of a below-grade floodwall, the East River Promenade would be modified and reconfigured to raise the elevation of the deck and introduce new hardscape features, and the existing water and sewer

infrastructure would be reconstructed and hardened. In addition, within this segment, the existing East 10th Street Bridge would be replaced with a widened bridge slightly southward, the existing playground and picnic and barbecue areas would be rebuilt and expanded, the basketball courts (to be relocated to South of the Williamsburg Bridge) would be replaced with picnic lawns, and Ball Fields Nos. 7 and 8 would be reconfigured and combined into one multiuse field. This segment would also include the construction of footings for the proposed shared-use flyover bridge between the north end of East River Park and Captain Patrick J. Brown Walk, and subsequently the superstructure of the flyover bridge. A pair of swing floodgates would be constructed across the FDR Drive to connect the park-side floodwall to a city-side floodwall that begins the Project Area Two flood protection system (as described in more detail below for Segment 4).

East River Park Restoration

The proposed project would require activities to restore East River Park following construction. These activities would include planting trees in disturbed areas, removing construction barriers, and seeding and planting remaining disturbed areas. These activities would primarily entail landscaping work and final grading, though some staging areas may require replacing or reinstalling temporary fences or other features such as benches and lighting that had been temporarily removed. Seeding and planting activities may also include installing erosion control or slope stabilization measures in some areas.

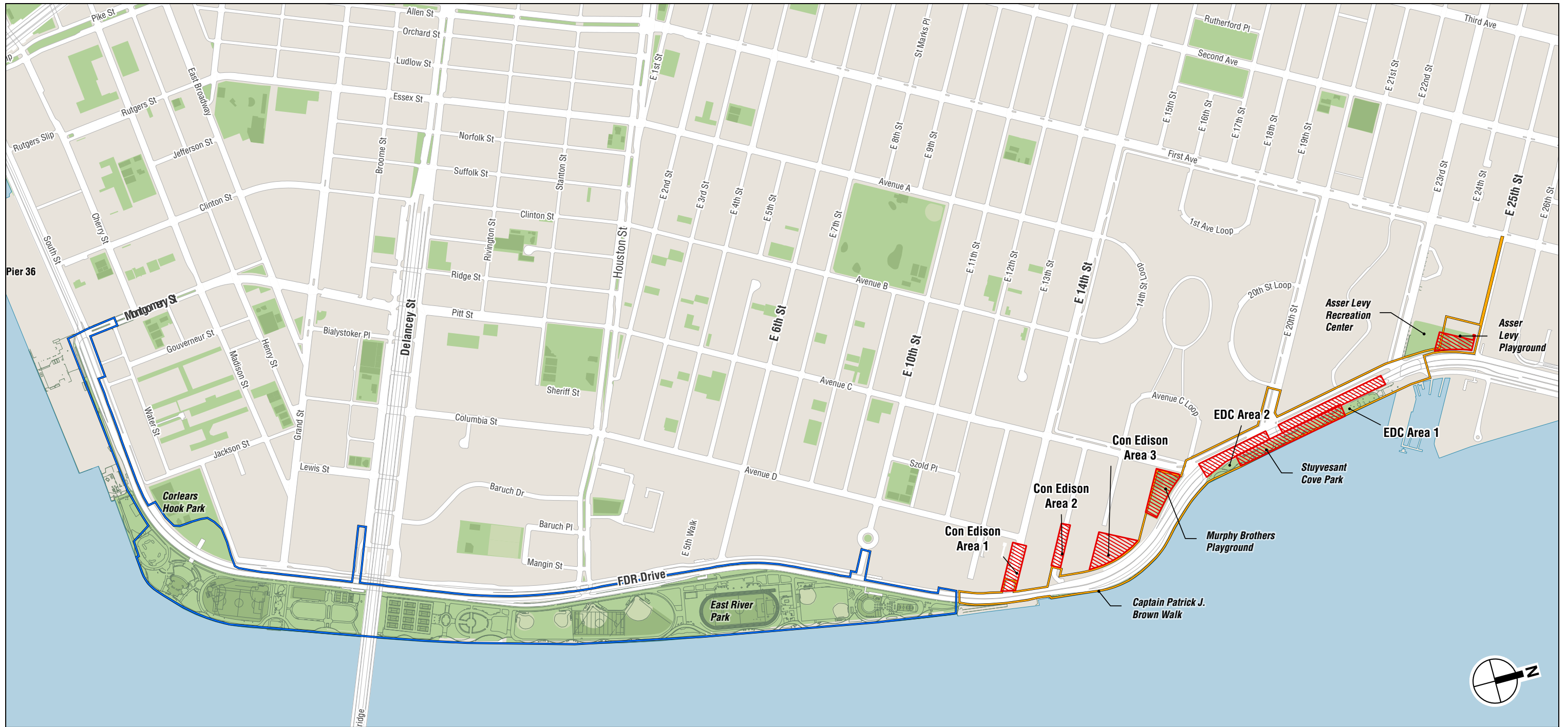
PROJECT AREA TWO




Segment 4

Site preparation activities for Segment 4 would primarily entail: installing construction fencing within Con Edison's Workout Facility and at Murphy Brothers Playground; removing the existing playground; clearing and grubbing plants and trees; protecting trees to remain during construction; and preparing the ballfields at Murphy Brothers Playground (including removing fencing and backstops) for use as a storage and staging area (see **Figure 6.0-4**).


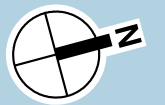
The primary construction activity in Segment 4 would include installing the steel sheet pile I-wall along the FDR Drive from East 13th Street to the Con Edison East 13th Street Substation and from East 15th Street—adjacent to the Con Edison Workout Facility—to the west of Murphy Brothers Playground at Avenue C. Along the Riis Houses, north of East 13th Street, construction of these elements may require the use of cranes positioned on the FDR Drive, necessitating overnight construction during NYCDOT-approved road closure periods. North of East 15th Street, within the Con Edison East River Complex, pile driving operations would be performed by cranes stationed within the former East 14th Street exit lane or from within the existing Con Edison Workout Facility. At Murphy Brothers Playground, pile installation would be performed from within the ball fields and playground. At the roadway crossings at East 14th Street and East 15th Street, construction work would consist of excavation, foundation and cut-off wall installation, jet grouting, forming and pouring CIP concrete, and steel gate fabrication and installation. Gate installation at the site would require special handling due to proximity to the elevated FDR Drive.

Segment 4 would also include constructing two pairs of swing floodgates across the FDR Drive near the Con Edison East River Complex, which is anticipated to take approximately one year to complete. Construction of the proposed project at this section is comprised of the following key elements:



-  Project Area One
-  Project Area Two
-  Potential Construction Staging Areas

0 1,000 FEET

- A floodwall with a foundation and gate columns that would be constructed in the center median of the FDR Drive;
- Cut-off walls, foundation slabs, and approach slabs for the proposed floodgates that would be installed within the north and southbound lanes of the FDR Drive
- A gate-column structure west of the FDR Drive southbound lanes that would be installed in the area between the existing highway barrier and the sidewalk;
- A gate-column structure east of the FDR Drive northbound lanes that would be installed in East River Park;
- Installation of prefabricated floodgates; and
- A deployment test.

The transportation effects of constructing the swing floodgates across the FDR Drive are discussed in detail in Chapter 6.9, “Construction—Transportation.”

This segment would also include the construction of footings for the proposed shared-use flyover bridge between Captain Patrick J. Brown Walk and the north end of East River Park, and subsequently the superstructure of the flyover bridge.

Segment 5

Site preparation activities for Segment 5 would primarily entail the following: creating new pedestrian and bicycle circulation routes along Avenue C; installing construction fencing; creating a vehicular access point at East 20th Street; removing park furniture and features; and clearing and grubbing plants and trees throughout the park.

The primary construction activities within Segment 5 consist of excavation, foundation and cut-off wall installation, Con Edison utility carbon fiber wrap construction, forming and pouring concrete, and steel gate fabrication and installation. Construction would likely begin on one end of park (i.e., the northern end or the southern end) and proceed linearly to allow continuous movement of operations along the area. Constructing gate foundations and cut-off walls crossing the FDR Drive exit ramp and on-ramp would require excavation and pile installation in the roadway, which would be performed during overnight hours. All roadway closures would be coordinated with NYCDOT. At the north end of the construction segment adjacent to the existing fuel station, excavation to install wall and gate foundations would require careful excavation to minimize risk to the subsurface fuel tanks. Utility work would likely include relocation of existing water mains within Stuyvesant Cove Park. Work and staging areas for access, materials, equipment, and construction activities would occur within Stuyvesant Cove Park; public access would be limited during construction. However, access to the proposed ferry landing and near the southern end of the park and the Solar One Environmental Education Center near the northern end of the park would be maintained throughout the construction period.

Segment 6

Site preparation activities for Segment 6 would primarily entail: installing construction fencing within Asser Levy Playground and beneath the elevated FDR Drive; removing existing playground and handball courts at Asser Levy Playground, clearing and grubbing of plants and trees within the primary construction zone, protection of trees to remain in the area of disturbance, and the preparation—including removal of features, fencing and walls—of the playground and handball courts at Asser Levy Playground to make ready for use as a storage and staging area (see **Figure 6.0-4**).

The primary construction activities required within Segment 6 consist of excavation; foundation and cut-off wall installation; pile installation for a proposed L-wall along the Asser Levy Recreation Center; concrete formation and pouring; and steel gate fabrication and installation. Constructing gate foundations and cut-off walls crossing Avenue C would require excavation and pile installation in the roadway, which would be performed during overnight hours. All roadway closures would be coordinated with NYCDOT. Installing the closure structures would require special handling due to proximity to the elevated FDR Drive and the historic Asser Levy Bathhouse. Work and staging areas for access, materials, equipment, and construction activities would limit public access to Asser Levy Playground during construction. It is expected that pile installation would be scheduled outside of the summer months when the Recreation Center's pool would be in use.

G. CONSTRUCTION PRACTICES

This section describes the construction practices that would be employed for the construction of the proposed project, including hours of work, material deliveries, vehicular access and circulation, pedestrian/bicyclist access and circulation, public safety, Maintenance and Protection of Traffic (MPT) plans, and rodent control. The construction practices described below would be applicable for Alternatives 2 through 5 unless otherwise noted.

HOURS OF WORK

New York City laws and regulations, allows construction activities between 7:00 AM and 6:00 PM on weekdays. However, in order to factor in potential weather delays and/or other possible construction delays and to meet the project construction schedule as determined by the City, this FEIS assumes additional evening and overnight construction and Saturday construction as part of the project implementation. To undertake this work, all the necessary work permits would be obtained outside of the permissible construction hours (7:00 AM to 6:00 PM on weekdays) for weekend or overnight work.

In addition, night and weekend work requires approval of a noise mitigation plan from DEP under the City's Noise Code. The New York City Noise Control Code, as amended in December 2005 and effective July 1, 2007, limits construction (other than circumstances described below) to weekdays between the hours of 7:00 AM and 6:00 PM and sets noise limits for certain pieces of construction equipment. Construction activities occurring after hours (weekdays between 6:00 PM and 7:00 AM and on weekends) may be permitted only to accommodate one or more of the following: (1) emergency conditions; (2) public safety; (3) construction projects by or on behalf of City agencies; (4) construction activities with minimal noise effects; and (5) undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts, and/or financial considerations. Appropriate work permits would be obtained for any necessary work outside of normal construction hours and no work outside of normal construction hours would be performed until such permits are obtained. The numbers of workers and pieces of equipment in operation for weekend work would be limited to those needed to complete the authorized task. Therefore, the level of activity for weekend work would typically be less than a normal workday.

The construction schedules presented above in **Table 6.0-1** and **Table 6.0-2** assumes five workdays per week with one 8-hour day shift and one 6-hour night shift. The night shift work would be to complete activities that require FDR Drive lane closures, which are only permitted at night. Specifically, the proximity of the proposed project alignment to the FDR Drive, the proposed swing gates across the FDR Drive, and the southern interceptor gate infrastructure adjacent to and below the FDR would require FDR Drive lane closures for excavation, pile driving,

and concrete activities. Appropriate work permits from NYCDOT would be obtained for any nighttime work. **Table 6.0-6** shows the schedule for FDR Drive lane closures currently permitted by NYCDOT’s Office of Construction Mitigation and Coordination (OCMC).

**Table 6.0-6
Schedule for Permitted FDR Drive Lane Closures
Brooklyn Bridge to East 125th Street**

Day of Week	One Lane	Two Lanes¹
Weekdays	11:00 PM to 5:30 AM	1:00 AM to 5:00 AM
Saturday	12:00 AM to 6:00AM	1:00 AM to 5:00 AM
Sunday	1:00 AM to 11:00 AM	1:00 AM to 5:00 AM
Note: ¹ OCMC generally allows for closure of up to two lanes of traffic for 4 hours beginning at 1:00 AM, with clearance, and full re-opening by 5:00 AM; full closure (3 lanes) is generally limited to 15 minutes. Source: NYCDOT comment letter, April 22, 2015.		

TREE REMOVAL

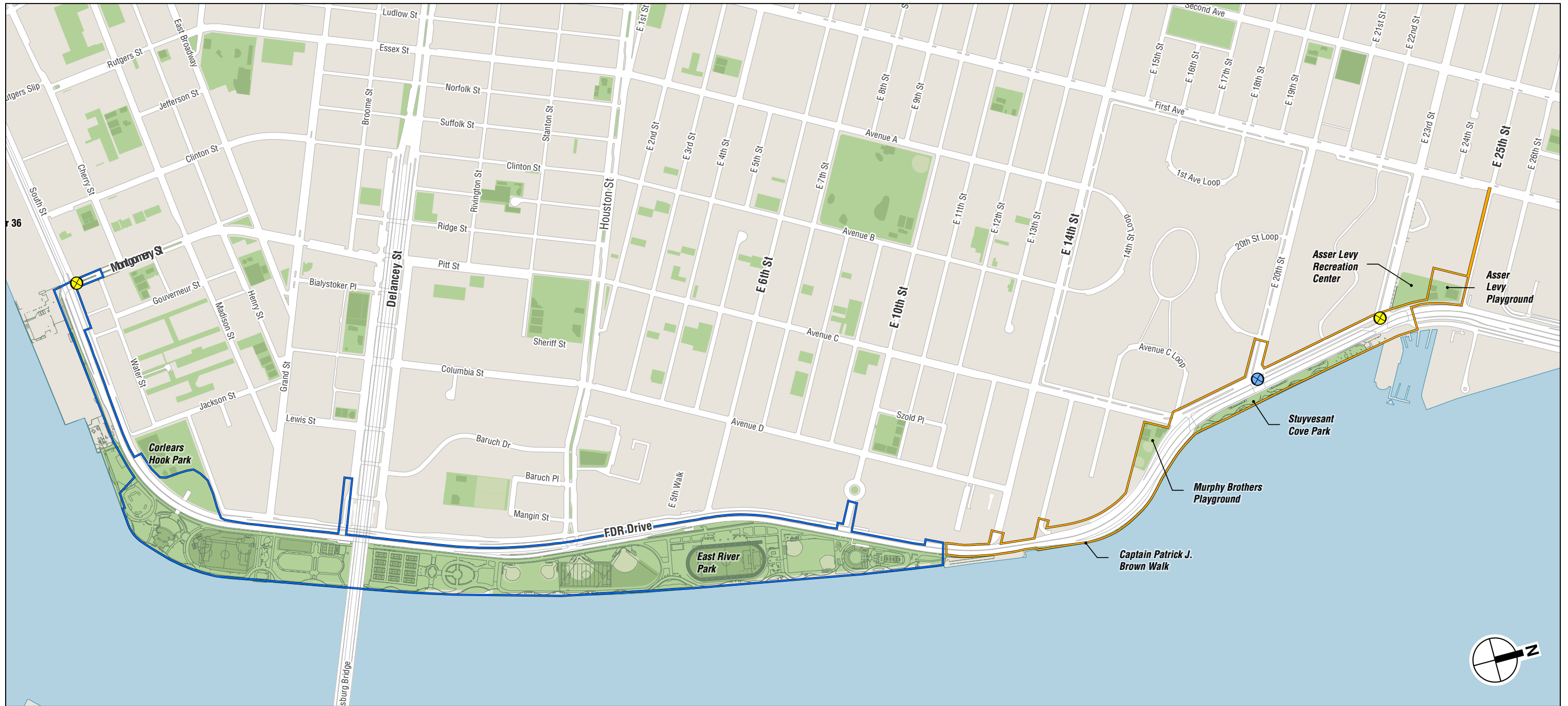
Construction of the proposed project would result in the removal of between approximately 265 to 991 trees from East River Park, Stuyvesant Cove Park, Murphy Brothers Playground, and Asser Levy Playground, and the broader study area. Specific details on the number of trees to be retained, removed, and transplanted for each of these alternatives are presented and discussed in details in Chapter 5.6, “Natural Resources,” and **Appendix I. The proposed project would implement a comprehensive planting program as part of a landscape restoration plan and would be provided in compliance with Chapter 5 of Title 56 of the Rules of New York (NYC Parks Rules) and Local Law 3 of 2010.**

VEHICULAR ACCESS AND CIRCULATION

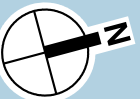
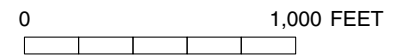
Figure 6.0-5 shows the existing and potential vehicular access/egress locations to Project Areas One and Two. There is one existing vehicular access/egress location to East River Park at Montgomery Street and the FDR on-ramp. This location would serve as the access/egress point to East River Park for construction vehicles as well as emergency and NYC Parks maintenance vehicles during construction of the proposed project in Project Area One.

Construction trucks are anticipated to enter/exit through available access point(s) and travel on an internal park access road that runs parallel to the FDR Drive (from Montgomery Street to the northern end of East River Park) to transport materials to/from the active construction areas within the park. The drivable path would be of a width sufficient to allow for efficient transit of construction vehicles traversing the park. Emergency vehicles and NYC Parks maintenance vehicles would also be able to use this road during construction. A potential new construction truck access/egress point via the northbound FDR Drive off-ramp/on-ramp near East Houston Street may also be established during construction.

The proposed design of the flood protection system in Project Area Two would include elements within Stuyvesant Cove Park. There is one existing vehicular access/egress location to Stuyvesant Cove Park at East 23rd Street, but a potential new vehicular access/egress point at East 20th Street may be temporarily available during construction of the proposed project if the barrier within the existing NYCEDC parking lot under the FDR Drive is removed.



- Project Area One
- Project Area Two
- ✕ Existing Construction Vehicle Access/Egress Points
- ✕ Potential Construction Vehicle Access/Egress Points



PEDESTRIAN/BICYCLIST ACCESS AND CIRCULATION

As discussed in Chapter 5.9, “Transportation,” pedestrians and bicyclists can currently access East River Park at Montgomery Street as well as at five pedestrian crossings, including the Corlears Hook, Delancey Street, East 6th Street, and East 10th Street Bridges, the East Houston Street overpass, as well as from the north–south East River Greenway. Construction workers would access East River Park at these locations during construction. However, Alternatives 3 through 5 would include the reconstruction of the Delancey Street and East 10th Street Bridges; Alternatives 4 and 5 also include the reconstruction of the Corlears Hook Bridge. Based on the preliminary construction schedule, these bridges would each be closed for approximately one and a half years during construction for Alternative 2, and for the full duration of the construction period for Alternatives 3, 4, and 5, East River Park would be temporarily closed to accommodate the construction of the proposed project, during which time the public would not have access or limited access to this public park. Therefore, pedestrian and bicyclist circulation through East River Park would be rerouted inland. As described in Chapter 6.9, “Construction—Transportation,” the following measures would be implemented to accommodate pedestrians and bicyclists at this area during construction:

- During construction, the East River Greenway would be closed from 23rd Street to Montgomery Street. NYCDOT would re-route bicyclists to the on-street bike network, primarily the protected bicycle lanes along First and Second Avenues, as well as those on Allen Street/Pike Street and Clinton Street (see Figure 6.9-20). These protected bicycle lanes would provide a reasonable alternative for many of those bicyclists who use the Greenway as a transportation route, as they are proximate to numerous destinations in the neighborhoods that run alongside the Greenway, and may actually provide a more direct route for many trips. NYCDOT is currently upgrading a number of intersections along these corridors with offset crossings to provide a more comfortable riding experience on these routes. In addition, signs would also be installed one block west of the East River Greenway to inform pedestrians of the closure.
- NYCDOT is committed to expanding the City’s bicycle network, including adding more protected bicycle lanes. In July 2019, Mayor de Blasio unveiled the Green Wave Bicycle Plan, which, amongst other improvements, increases the number of planned protected bicycle lane miles to be installed each year to thirty miles city-wide. As part of these ongoing efforts to expand the bicycle lane network, NYCDOT is currently evaluating the feasibility of installing new north–south protected bicycling lanes in the East Village that would provide additional options for bicyclists during the Greenway closure and beyond.
- Access to the ferry landings at Stuyvesant Cove Park from First and Second Avenues would be maintained via the two-way protected bicycle lane along 20th Street.

ACCESS TO EAST RIVER PARK AND STUYVESANT COVE PARK FACILITIES

Pedestrians and bicyclists’ access to certain existing Park facilities (i.e., Ferry landings in East River Park and Stuyvesant Cove Park, Solar One Environmental Education Center, Pier 42) would be maintained during construction of the proposed project. As discussed in further details below in “Public Safety,” construction fences would be erected, and flaggers would be employed where necessary to ensure safe passage of pedestrians and bicyclists during construction.

Pedestrians and bicyclists can access Stuyvesant Cove Park at three locations, including Avenue C loop and East 18th Street, Avenue C and East 20th Street, and Avenue C and East 23rd Street. However, these locations may be temporarily closed for a portion of the construction period to

accommodate construction in this area. The proposed project would also include the temporary closure of Captain Patrick J. Brown Walk during a portion of the construction period to accommodate activities associated with the flyover pedestrian bridge.

COMMUNITY OUTREACH

DDC maintains an Office of Community Outreach and Notification to conduct community outreach for projects managed by DDC. A team of Community Construction Liaisons (CCLs) would be available from pre-construction through the completion of the proposed project to serve as contacts for the community and local leaders, and would be available to address concerns or problems that may arise during construction. The CCLs would maintain direct communication with the construction project managers and would be able to quickly troubleshoot and respond to construction-related inquiries. The CCLs would keep the communities informed during the entire construction period and send out email advisories and notifications, weekly construction bulletins, newsletters, and other forms of information through the Neighborhood Network Notification (NNN) list. The CCLs would also attend meetings held by District Service Cabinet, Community Boards, Elected Officials and other types of community meetings as necessary. The CCLs are managed and staffed by a Borough Outreach Coordinator. In addition, New York City maintains a 24-hour telephone hotline (311) so that concerns can be registered with the City.

PUBLIC SAFETY

A variety of measures would be employed to ensure public safety during construction of the proposed project. A construction fence would be erected around active construction areas to provide a safe path for pedestrians and bicyclists, including commuter access to the ferry landings at the East River Park Promenade near Grand Street and at Stuyvesant Cove Park, during construction. Construction safety signs would be posted to alert the public of ongoing construction activities. Flaggers would be employed to control trucks entering and exiting the construction work areas, to provide guidance to pedestrians and bicyclists, and/or to alert or slow down any on-site vehicular traffic. Further, as discussed above, the area under the Williamsburg Bridge is currently cordoned off to restrict access to the six 30-foot by 30-foot footings but additional safety measures such as additional fencing and flaggers would be implemented where necessary during project construction to protect the footings from the construction traffic streams passing through this area.

All safety requirements would be followed, and construction of the proposed project would be conducted with care to minimize the disruption to the community. In addition, DDC is committed to safe construction sites. For the proposed project, as on all projects, the contractor will be required to develop a Construction Health and Safety Plan (CHASP) prior to initiating construction. This plan will guide all contractor activities to ensure emergency plans are in place in the event of a number of emergency conditions, including a storm event. In the event of a storm, the contractor will be required to safely secure all construction equipment and contain any fill that is stockpiled on site using applicable Best Management Practices (BMPs), including impervious surface covers or temporary seeding for any fill that would be held on site for extended periods of time. These measures would reduce erosion or runoff potential to the community or East River in the event of a storm and would provide dust control in dry weather.

MAINTENANCE AND PROTECTION OF TRAFFIC (MPT) PLANS

Similar to other construction projects in New York City, temporary curb-lane and sidewalk closures would be required at specific locations during construction of the proposed project. MPT plans would be developed for any temporary curb-lane and sidewalk closures as required by

NYCDOT. Measures specified in the MPT plans that are anticipated to be implemented may include but not be limited to the following: sidewalk closures; curbside moving lane closures; safety signs; safety barriers; and construction fencing. Approval of these plans and implementation of the closures would be coordinated with NYCDOT OCMC. Potential traffic effects during construction of the proposed project would be short-term and temporary and would be minimized with the implementation of MPT plans. Additional MPT requirements would be required for Alternative 5 since, as discussed above, the FDR Drive would need to be closed temporarily during construction activities under this alternative.

Temporary curb-lane closures and/or the development of MPT plans are expected to be required immediately adjacent to the planned construction work for the proposed project, including the following locations:

- **Project Area One – Reach A:** A floodwall would be constructed in the public right of way on the sidewalk beginning at Water Street and Montgomery Street that would extend east on Montgomery Street and north on South Street before transitioning to a roller gate at South Street. Temporary curb-lane and/or sidewalk closures would likely be required on the portion of Montgomery Street and South Street adjacent to the floodwall. In addition, MPT plans would be developed for the construction of the swing gates at South Street and the FDR Drive on-ramp.
- **Project Area Two – Reach K:** Two pairs of swing gates are proposed across FDR Drive, crossing where Project Area Two begins. The flood protection system then transitions to an I-wall installed along the western edge of the FDR Drive along the public right-of-way (sidewalk). The floodwall continues north along the west side of the FDR Drive before tying into the existing reinforced brick façade wall that surrounds Con Edison’s East 13th Street Substation. MPT plans would be developed for the construction of the closure structures across the FDR Drive.
- **Project Area Two – Reaches K to M:** In Project Area Two, the line of flood protection would continue along the west side of the FDR Drive, bordering the eastern boundary of NYCHA’s Jacob Riis Houses, Con Edison’s East River Complex at East 13th, East 14th, and East 15th Streets (including closure structures that cross at East 13th, East 14th, and East 15th Streets), and Murphy Brothers Playground. MPT plans would be developed for the temporary disruption to local traffic on the FDR Drive to accommodate these construction activities.
- **Project Area Two – Reach N:** In this reach, the flood protection system turns east (from east of Murphy Brothers Playground), crossing Avenue C under the elevated FDR Drive to Stuyvesant Cove Park. A series of three swing gates are proposed here to allow both vehicular and pedestrian circulation at the intersection of Avenue C and the FDR Drive service roads and ramps. MPT plans would be developed for the construction of the closure structures at the intersection of Avenue C and the FDR Drive service roads and ramps.
- **Project Area Two – Reach P:** The floodwall would continue north past East 23rd Street along the Asser Levy Playground property line, and then would turn west to continue just north of Asser Levy Recreation Center, where a roller gate system would span the large opening. The roller gate would tie into the VA Medical Center flood protection system. Temporary curb-lane and/or sidewalk closures would likely be required on the portion of the FDR Drive service roads and near East 23rd Street adjacent to the flood protection system.
- **Project Areas One and Two (FDR Drive):** As discussed above in “Hours of Work,” the FDR Drive may need to be temporarily closed during construction due to the proximity of the proposed project alignment to the FDR Drive and location of the southern interceptor gate

adjacent to and below the FDR Drive. In addition, the proposed project would include the construction of two pairs of swing gates across the FDR Drive where Project Area Two begins near the Con Edison East River Complex. MPT plans would be developed for any temporary lane closures on the FDR Drive to ensure the safety of the construction workers and public vehicles passing through the area.

- **Pedestrian Bridges Reconstruction and Flyover Bridge Construction:** The Delancey Street, East 10th Street, and Corlears Hook Bridges would be reconstructed to be universally accessible. In addition, the foundations for the shared-use flyover bridge would be constructed. MPT plans would be developed for the temporary disruption to local traffic on Delancey Street, East 10th Street, and the FDR Drive for these construction activities to ensure the safety of the construction workers and public vehicles passing through the area.
- **Interceptor Gates Installation:** The work required to install interceptor gates at East 20th Street and Avenue C to the north and between Corlears Hook Park and the FDR Drive to the south and would include excavating sections of these roadways. Temporary closure of lanes to local traffic would be required while the necessary areas are excavated and the interceptor gate work is completed.
- **Parallel Conveyance Pipes:** Parallel conveyance pipes and upsized branch interceptor pipes would be constructed to increase and support the full flow capacity of the main interceptor. This construction would take place primarily in the right-of-way, in the roadways and properties along Avenue C, Avenue D, Columbia Street, Delancey Street, South Street, Water Street, and Jackson Street. Temporary closure of lanes to local traffic would be required at these locations to accommodate these activities.

MANUFACTURED GAS PLANTS (MGPS)

The project area has a long history of commercial/industrial and residential uses. Based on the area's history, subsurface contaminants would be expected to include those related to gasoline and petroleum, manufactured gas plants (MGPs) that were historically located nearby, as well as other subsurface contamination (in the fill, soil, and/or groundwater). As discussed in further details in Chapter 6.6, "Construction—Hazardous Materials," in an effort to reduce the potential migration of MGP-related contamination associated with the former MGPs and identified during the project area subsurface investigations, a number of product recovery wells are anticipated to be installed in these affected areas prior to, or in conjunction with, construction of the proposed project, along the landward (western) side of the proposed flood protection alignment. These recovery wells would be used to recover (i.e., actively pump/vacuum or hand bail) free product from the subsurface for disposal. A Mitigation Work Plan (MWP)² proposing these activities was previously submitted to NYSDEC for implementation prior to and/or during construction of the proposed project. However, it will be revised based upon project design changes since the previous version was submitted, and resubmitted to NYSDEC for approval. The associated MWP design plans would include additional details pertaining to the recovery well locations and construction specifications. These would be submitted to NYSDEC for review and approval, likely concurrent with a MGP Waste MMP and associated CHASP.

² Mitigation Work Plan for Manufactured Gas Plant-Related Non-Aqueous Phase Liquid Contamination, prepared for DDC, by AKRF, Inc., October 30, 2017.

RODENT CONTROL

Construction contracts may include provisions for a rodent (i.e., mouse and rat) control program. Before the start of construction, the contractor would survey and bait the appropriate areas and provide for proper site sanitation. During construction, the contractor would carry out a maintenance program, as necessary. Signage would be posted, and coordination would be conducted with appropriate public agencies. Only rodenticides registered with the United States Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (NYSDEC) would be permitted. The contractor would be required to implement the rodent control program in a manner that is not hazardous to the general public, domestic animals, and non-target wildlife. *