

A. INTRODUCTION

This chapter describes the potential effects on water and sewer infrastructure during construction of the proposed project. The protected area includes existing water and sewer infrastructure, including conveyance, regulators, and outfalls. Any disturbance or alterations to existing infrastructure would require measures to minimize disruptions in service. This chapter compares conditions under the With Action Alternatives (i.e., in the future with the proposed project) against conditions under the No Action Alternative (i.e., in the future without the proposed project) to determine the potential for significant adverse effects to water and sewer infrastructure during construction. The analyses were conducted pursuant to the methodologies outlined in the 2014 *City Environmental Quality Review (CEQR) Technical Manual*.

B. PRINCIPAL CONCLUSIONS

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

C. ENVIRONMENTAL EFFECTS

The No Action Alternative (Alternative 1) assumes that no comprehensive flood protection system is constructed and, therefore, is not analyzed.

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

The Preferred Alternative proposes to move the line of flood protection further into East River Park, thereby protecting both the community and the park from design storm events, as well as increased tidal inundation resulting from sea level rise. The Preferred Alternative would raise the majority of East River Park. This plan would limit the length of wall between the community and the waterfront to provide for enhanced neighborhood connectivity and integration. 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 the Con Edison facility between East 13th Street and East 15th Street, substantially improving the City's greenway network and north-south connectivity in the project area, and reducing the potential for flooding, wave damage, and the resulting scouring and erosion.

The Preferred Alternative would raise the majority of East River Park. This will require the reconstruction of existing park structures and recreational features as well as reconstruction of the park's underground water and sewer infrastructure (including sewers, outfalls, tide gate chambers, and regulators) to withstand the loads of the elevated parkland. In some cases, the sewer infrastructure will be rebuilt with additional capacity compared to existing conditions.

The Preferred Alternative also includes modifications to the existing sewer system to control flow into the protected area from the larger sewershed (i.e., drainage isolation) and manage flooding within the protected area (i.e., drainage management) as described in Chapter 5.8, "Water and Sewer Infrastructure."

Work associated with construction of the floodwalls, levees, raised landscapes, and pedestrian bridge landings may require existing water and sewer infrastructure to be either relocated or replaced. 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. This work would require the use of excavators and loaders for excavation and grading, backfill and placement of utility lines, and trucks to transport materials.

INTERCEPTOR GATES

The work required to install the interceptor gates would include excavating sections of roadway near the intersection of East 20th Street and Avenue C, and the pathway between Corlears Hook Park and the FDR Drive within New York City-owned rights-of-way. Construction of the interceptor gates would begin with site preparation, pavement excavation, support of excavation (installing sheeting 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 gate and associated operators. The chamber may be constructed on piles, as described in Chapter 6.0, "Construction Overview," and would extend from the bottom of 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 would be required while the necessary areas are excavated, and the interceptor gate work is completed. The New York City Department of Transportation (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 installed 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 500 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.

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 sheet piling or excavating to expose and reinforce the exterior of the existing structures' walls. Excavation would follow the approach typical for any deep excavation, as was described for the interceptor gate chambers, and would include installation of support of excavation, dewatering and excavation, and backfill.

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 that currently connects to the combined sewer system that would be located on the unprotected side of the flood protection system would 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 drainage system. Storm drainage that currently connects to the combined sewer system that would be located on the protected side of the flood protection system would maintain its current configuration. Storm drainage that currently outlets downstream of the tide gates or to separate storm sewer outfalls that would be located on the protected side of the flood protection system would be rerouted to convey wet weather flow to the combined sewer system or outfitted with a tide gate to prevent against potential backflow into the protected area storm drain system under a design storm event. The storm drainage modifications would follow the procedures described for tide gate replacement and drainage piping construction. For storm drainage modifications, 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. The new drainage piping would connect to the existing or reconstructed tide gate chambers or outfall pipes (as described below). In conjunction, some existing storm drainage structures and pipes would be capped and abandoned in place while others would be removed.

TIDE GATES

For all existing outfalls within the project protected area that would remain as part of the proposed project, the existing tide gates would be replaced for each of the outfalls 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. Construction of these tide gates would follow the same construction approach as the regulators 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 installation of a new gate to replace the existing gate. Closure of stop logs on outfall pipes is a typical procedure performed during regular replacement of existing tide gates. Depending on the configuration of the existing tide gate and outfall pipe, an additional concrete chamber may be constructed around the outfall pipe to house the new gate. Following gate installation, the excavated site would be backfilled and restored, and the stop logs would be removed. Under the Preferred Alternative, the majority of the tide gates in East River Park will be constructed anew as part of the infrastructure reconstruction effort, as described below.

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

The Preferred Alternative 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 and properties along Avenue C, Avenue D, Columbia Street, Delancey Street, South Street, Water Street, and Jackson Street.

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. Construction of the upstream connection would involve a shallow excavation around the existing sewer or regulator, as described for the interceptor gate. The existing sewer or regulator would

be supported while connecting the drainage management piping. 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 can be used if needed. 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 during the construction of the connection between the regulator and the new pipe. 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.

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 as described for the upstream connection, by supporting the existing manhole structure while the connection is made. Additional structural modifications or enlargements may also be required to provide personnel access to the inside of the manhole and to direct flow to the interceptor. If a new downstream 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 changes to sewer service. All excavated sites would be backfilled and restored after construction. All utilities in the construction zone of influence would be supported, replaced or relocated. Construction of each drainage management component is anticipated to require about three to seven 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. Therefore, no disruption to existing water or sewer services is anticipated, and no adverse impacts to water or sewer infrastructure would occur.

INFRASTRUCTURE RECONSTRUCTION

To reconstruct the water and sewer infrastructure within East River Park, open-cut excavation would be used to prepare for construction of the new structures (e.g., regulators, tide gate chambers, etc.) and piping. Support of excavation and dewatering, as described for the interceptor gates, would be used to hold the excavation open during construction. The water and sewer infrastructure would be constructed with reinforced concrete and would be built in a similar configuration as the existing infrastructure. The new piping would be installed in open-cut shallow trenches on pipe supports and piles, with the exception of any pipe that crosses the FDR Drive, which would require microtunneling or similar trenchless construction method, for installation, and would be completed in coordination with NYCDOT. Other infrastructure (e.g., regulators, tide gate chambers, etc.) would also be constructed on pile foundations.

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.

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 under this alternative. Connecting the reconstructed infrastructure to the existing infrastructure would require bypass pumping. Once completed, the existing infrastructure would be filled and abandoned in place.

For the remainder of the project construction, any conflicts with existing water and sewer infrastructure would be identified. Depending on the nature of the conflict, water and sewer infrastructure would be protected, supported, and maintained in place throughout the duration of work. Where appropriate, relocation of water mains or combined sewer lines would be undertaken without affecting the conveyance of flow through the existing water and sewer supply system. All water and sewer work would be performed in accordance with methods and standards approved by the DEP. Therefore, no disruption to existing water supply or combined sewer services is anticipated, and no impacts to water and sewer infrastructure would occur.

OTHER ALTERNATIVES

Under Alternatives 2 and 3, reconstruction of the water and sewer infrastructure would be less extensive, compared to the Preferred Alternative. However, due to the line of protection being located closer to the FDR Drive than the East River under these alternatives, there is the need to floodproof some additional sewer infrastructure beyond what is described above for the Preferred Alternative. The process for floodproofing this infrastructure would be the same as described above and would not result in additional effects to the sewer system or sewer service during construction.

Alternative 5 would increase the extent of construction in the segment between East 13th and 18th Streets but would otherwise be the same as described for the Preferred Alternative. Effects on water and sewer infrastructure would be the same as described for the Preferred Alternative. As described in the construction of the alternatives above, prior to any excavation, interferences with existing water and sewer infrastructure would be identified. Depending on the nature of the conflict, existing water and sewer infrastructure would be protected, supported, and maintained in place throughout the duration of work. Utility work associated with the elevation of the FDR Drive or construction of the flyover bridge would likely also include relocation of existing water mains and combined sewer lines where protection, support, and maintenance in place is not feasible. 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 DEP. These methods would be maintained until the work is complete. Therefore, no disruption to existing water supply or combined sewer services is anticipated, and no impacts to water and sewer infrastructure would occur. *