
Table of Contents

Executive Summary.....	S-1
1.0: Purpose and Need	1.0-1
A. Introduction.....	1.0-1
B. Background of the Proposed Project.....	1.0-2
C. Purpose and Need for the Proposed Project.....	1.0-4
2.0: Project Alternatives.....	2.0-1
A. Introduction	2.0-1
B. Background of Design and Alternatives Development.....	2.0-1
Introduction	2.0-1
Pre-Hurricane Sandy Waterfront Planning.....	2.0-1
Post-Hurricane Sandy Waterfront Planning and Design	2.0-2
Examination of Potential Coastal Flood Protection Approaches	2.0-5
Development of Coastal Flood Protection Designs.....	2.0-7
Development of Preferred Alternative	2.0-11
C. Alternatives Analyzed in the EIS	2.0-11
No Action Alternative (Alternative 1).....	2.0-12
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	2.0-15
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	2.0-22
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Drive – Enhanced Park and Access.....	2.0-23
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive.....	2.0-24
D. Operations and Maintenance Program	2.0-25
3.0: Process, Agency Coordination, and Public Participation	3.0-1
A. Introduction	3.0-1
B. Environmental Review Process.....	3.0-1
C. Agency Consultation.....	3.0-2
Federal.....	3.0-2
State of New York.....	3.0-3
City of New York.....	3.0-3
Authorities	3.0-4
D. Public Participation	3.0-4
Community Engagement Plan (CEP).....	3.0-4
Public Participation Program.....	3.0-5
Community Engagement Meetings/Workshops.....	3.0-6
Targeted Stakeholder Meetings.....	3.0-10

East Side Coastal Resiliency Project EIS

Communication Media	3.0-11
Public Scoping.....	3.0-12
Action Plan Amendment.....	3.0-13
E. Public Review and Comment on the DEIS.....	3.0-13
4.0: Analysis Framework.....	4.0-1
A. Introduction	4.0-1
B. Organization of the Environmental Impact Statement	4.0-2
Storm and Non-Storm Conditions	4.0-2
Categories of Environmental Effects.....	4.0-3
C. Proposed Project Area (Protected Area).....	4.0-3
D. Analysis Year	4.0-4
E. Study Areas	4.0-4
F. Methodologies for Technical Analyses	4.0-4
Affected Environment	4.0-4
No Action Alternative (Alternative 1).....	4.0-5
5.1: Land Use, Zoning, and Public Policy	5.1-1
A. Introduction	5.1-1
Project Area One.....	5.1-1
Project Area Two.....	5.1-1
Land Use, Zoning, and Public Policy Study Area	5.1-1
B. Principal Conclusions	5.1-2
No Action Alternative (Alternative 1).....	5.1-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	5.1-2
Other Alternatives.....	5.1-3
C. Regulatory Context.....	5.1-3
Federal	5.1-3
New York State	5.1-3
New York City.....	5.1-4
Local	5.1-7
D. Methodology.....	5.1-8
E. Affected Environment	5.1-8
Land Use.....	5.1-8
Project Area One.....	5.1-9
Project Area Two.....	5.1-9
Study Area	5.1-10
Zoning.....	5.1-13
Project Area One.....	5.1-13
Project Area Two.....	5.1-13
Study Area	5.1-13
Public Policy and Plans	5.1-16
F. Environmental Effects	5.1-17
No Action Alternative (Alternative 1).....	5.1-17
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	5.1-18
Land Use and Zoning.....	5.1-18

Table of Contents

Public Policy	5.1-19
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	5.1-20
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	5.1-21
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive.....	5.1-21
5.2: Socioeconomic Conditions	5.2-1
A. Introduction	5.2-1
Study Area.....	5.2-1
B. Principal Conclusions.....	5.2-2
No Action Alternative (Alternative 1).....	5.2-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.2-2
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	5.2-3
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	5.2-3
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive.....	5.2-3
C. Regulatory Context	5.2-4
Federal.....	5.2-4
New York State	5.2-4
New York City	5.2-4
D. Methodology	5.2-5
Analysis Format	5.2-6
Data Sources.....	5.2-7
E. Affected Environment.....	5.2-8
Population.....	5.2-8
Households and Income	5.2-9
Housing Profile	5.2-10
Recent Residential Trends.....	5.2-13
Investments in Affordable Housing	5.2-14
Economic Profile.....	5.2-16
Economic Profile of the Socioeconomic Study Area.....	5.2-18
F. Environmental Effects.....	5.2-20
No Action Alternative (Alternative 1).....	5.2-20
Preferred Alternative (Alternative 4) – Flood Protection System with a Raised East River Park	5.2-22
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	5.2-24
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	5.2-25
Alternative 5 – Flood Protection System East of FDR Drive	5.2-26
5.3: Open Space.....	5.3-1
A. Introduction	5.3-1
Study Area.....	5.3-1
B. Principal Conclusions.....	5.3-1

East Side Coastal Resiliency Project EIS

No Action Alternative (Alternative 1)	5.3-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	5.3-2
Other Alternatives.....	5.3-2
C. Regulatory Context.....	5.3-3
D. Methodology.....	5.3-3
Open Space User Populations.....	5.3-4
Inventory of Open Space Resources.....	5.3-4
Adequacy of Open Space Resources	5.3-4
E. Affected Environment	5.3-4
Open Space User Population	5.3-4
Open Space Inventory.....	5.3-5
Project Area One.....	5.3-7
Project Area Two.....	5.3-8
Open Space Study Area.....	5.3-9
NYC Parks Operated Open Spaces.....	5.3-9
DOE Operated Open Spaces.....	5.3-11
Jointly Operated Open Spaces	5.3-11
Privately Operated Open Spaces	5.3-11
Adequacy of Open Spaces	5.3-11
F. Environmental Effects	5.3-12
No Action Alternative (Alternative 1).....	5.3-12
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.3-15
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline	5.3-17
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	5.3-19
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive	5.3-20
Mitigation	5.3-21
5.4: Historic and Cultural Resources	5.4-1
A. Introduction	5.4-1
B. Principal Conclusions	5.4-1
Archaeological Resources	5.4-1
Architectural Resources.....	5.4-2
Mitigation	5.4-4
C. Regulatory Context.....	5.4-5
National Historic Preservation Act (Section 106)	5.4-5
New York State Historic Preservation Act	5.4-7
New York City Landmarks Law.....	5.4-7
D. Methodology.....	5.4-7
Definition of the Area of Potential Effect.....	5.4-7
Identification of Historic Properties within the APE.....	5.4-8
Evaluation of Potential Effects on Historic Properties	5.4-11
E. Affected Environment	5.4-11
Archaeological Resources	5.4-11
Architectural Resources.....	5.4-16

Table of Contents

F. Environmental Effects.....	5.4-25
No Action Alternative (Alternative 1).....	5.4-25
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.4-28
Other Alternative (Alternative 2): Flood Protections System on the West Side of East River Park – Baseline.....	5.4-34
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	5.4-36
Alternative 5 – Flood Protection System East of FDR Drive	5.4-38
Mitigation	5.4-40
5.5: Urban Design and Visual Resources.....	5.5-1
A. Introduction	5.5-1
B. Principal Conclusions.....	5.5-1
No Action Alternative (Alternative 1).....	5.5-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.5-1
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	5.5-3
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	5.5-3
Alternative 5 – Flood Protection System East of FDR Drive	5.5-4
Mitigation	5.5-5
C. Regulatory Context	5.5-5
<i>CEQR Technical Manual Guidelines</i>	5.5-6
NYSDEC Guidelines.....	5.5-6
D. Methodology	5.5-10
E. Affected Environment.....	5.5-11
Urban Design.....	5.5-11
Views, Aesthetic and Visual Resources, and Viewer Groups.....	5.5-21
F. Environmental Effects.....	5.5-25
No Action Alternative (Alternative 1).....	5.5-25
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.5-28
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	5.5-35
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	5.5-40
Other Alternative (Alternative 5): Flood Protection East of FDR Drive	5.5-44
Mitigation	5.5-46
5.6: Natural Resources.....	5.6-1
A. Introduction	5.6-1
Study Area.....	5.6-1
B. Principal Conclusions.....	5.6-1
No Action Alternative (Alternative 1).....	5.6-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.6-1

East Side Coastal Resiliency Project EIS

Other Alternatives.....	5.6-3
C. Regulatory Context.....	5.6-4
Federal	5.6-4
New York State	5.6-7
New York City.....	5.6-9
D. Methodology.....	5.6-9
Geologic and Soil Resources	5.6-10
Groundwater Resources.....	5.6-10
Wetlands	5.6-10
E. Affected Environment	5.6-13
Geologic and Soil Resources	5.6-13
Groundwater Resources.....	5.6-13
Wetland Resources	5.6-14
Special Flood Hazard Area.....	5.6-15
Surface Water Resources.....	5.6-15
Aquatic Resources	5.6-17
Endangered, Threatened, and Special Concern Species	5.6-30
Terrestrial Resources	5.6-33
F. Environmental Effects	5.6-35
No Action Alternative (Alternative 1).....	5.6-35
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	5.6-36
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline	5.6-51
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	5.6-53
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive	5.6-54
G. Mitigation	5.6-54
H. References	5.6-57
5.7: Hazardous Materials	5.7-1
A. Introduction	5.7-1
Project Area	5.7-1
B. Principal Conclusions	5.7-2
No Action Alternative (Alternative 1).....	5.7-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	5.7-3
Other Alternatives.....	5.7-3
C. Regulatory Context.....	5.7-3
EO 13045 – Protection of Children from Environmental Health Risks and Safety Risks.....	5.7-4
HUD Policy – Related Federal Laws and Authorities (24 CFR § 58.5).....	5.7-4
D. Methodology.....	5.7-4
Potential Contaminants of Concern	5.7-4
Soil and Groundwater Investigations.....	5.7-7
E. Affected Environment	5.7-8
Topography, Geology, and Groundwater	5.7-8
Soil and Groundwater Conditions	5.7-8
Asbestos-Containing Materials and Lead-Containing Paint.....	5.7-12

Table of Contents

F. Environmental Effects.....	5.7-13
No Action (Alternative 1)	5.7-13
Preferred Alternative: Flood Protection System with a Raised East River Park (Alternative 4)	5.7-13
Other Alternatives	5.7-14
5.8: Water and Sewer Infrastructure.....	5.8-1
A. Introduction	5.8-1
Study Area.....	5.8-1
B. Principal Conclusions.....	5.8-2
No Action Alternative (Alternative 1).....	5.8-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.8-2
Other Alternatives	5.8-3
C. Regulatory Context	5.8-3
Federal.....	5.8-3
New York State	5.8-4
New York City	5.8-4
D. Methodology	5.8-5
Water and Sewer Infrastructure Overview	5.8-5
Impact Assessment Approach	5.8-7
E. Affected Environment.....	5.8-8
F. Environmental Effects.....	5.8-10
No Action Alternative (Alternative 1).....	5.8-10
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.8-11
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	5.8-17
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	5.8-17
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive.....	5.8-17
5.9: Transportation.....	5.9-1
A. Introduction	5.9-1
Study Area.....	5.9-1
B. Principal Conclusions.....	5.9-1
No Action Alternative (Alternative 1).....	5.9-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	5.9-2
Other Alternatives	5.9-3
C. Regulatory Context	5.9-3
D. Methodology	5.9-4
Data Collection.....	5.9-4
Vehicular and Pedestrian Safety.....	5.9-5
E. Affected Environment.....	5.9-5
Transportation Elements	5.9-5
Vehicular and Pedestrian Safety Evaluation	5.9-9
F. Environmental Effects.....	5.9-12

East Side Coastal Resiliency Project EIS

No Action Alternative (Alternative 1).....	5.9-12
Preferred Alternative (Alternative 4): Flood Protection System with a Raised Park Alternative	5.9-14
Alternative 2 – Flood Protection System on the West Side of East River Park – Baseline.....	5.9-17
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	5.9-17
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive	5.9-18
Non-Storm Conditions.....	5.9-18
Storm Conditions	5.9-18
5.10: Neighborhood Character.....	5.10-1
A. Introduction	5.10-1
Study Area	5.10-1
B. Principal Conclusions	5.10-1
No Action Alternative (Alternative 1).....	5.10-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	5.10-2
Other Alternatives.....	5.10-2
C. Regulatory Context.....	5.10-2
D. Methodology.....	5.10-2
E. Affected Environment	5.10-3
Project Area One.....	5.10-3
Project Area Two.....	5.10-4
Study Area	5.10-4
F. Environmental Effects	5.10-8
No Action Alternative (Alternative 1).....	5.10-8
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	5.10-9
Other Alternative (Alternative 2): Baseline Flood Protection System on the West Side of East River Park – Baseline	5.10-11
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	5.10-11
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive	5.10-12
5.11: Environmental Justice	5.11-1
A. Introduction	5.11-1
B. Principal Conclusions	5.11-1
C. Regulatory Context.....	5.11-1
Executive Order 12898: Council on Environmental Quality Guidance	5.11-1
EO 13045-Protection of Children from Environmental Health Risks and Safety Risks	5.11-2
NYSDEC Commissioner Policy 29 Guidance.....	5.11-2
D. Methodology.....	5.11-3
Study Area	5.11-3
Identification of Minority and Low-Income Populations	5.11-3
E. Affected Environment	5.11-6
Minority and Low-Income Populations in the Study Area – Overview of Study Area Demographics.....	5.11-6

Table of Contents

Minority Status.....	5.11-7
Low-Income Status	5.11-7
Children.....	5.11-7
Public Participation	5.11-7
F. Environmental Effects.....	5.11-8
Summary of Benefits.....	5.11-8
Summary of Adverse Effects	5.11-8
Analysis of Potential for Disproportionately High and Adverse Effects	5.11-10
6.0: Construction Overview	6.0-1
A. Introduction	6.0-1
B. Analysis Framework	6.0-1
Project Alternatives	6.0-2
C. Construction of Proposed Project Components	6.0-4
Floodwalls and Levees	6.0-4
Closure Structures	6.0-6
East River Park Esplanade Reconstruction	6.0-6
Pedestrian Bridges Reconstruction.....	6.0-6
East River Park Reconstruction.....	6.0-6
Con Edison Utility Carbon Fiber Wrapping.....	6.0-7
Drainage Isolation	6.0-7
Drainage Management	6.0-9
Infrastructure Reconstruction.....	6.0-10
Flyover Bridge.....	6.0-11
Raised FDR Drive Platform With Floodwall Protection.....	6.0-11
Construction Methods	6.0-11
D. Construction Schedule	6.0-13
Alternative 2.....	6.0-14
Alternative 3	6.0-14
Alternative 4.....	6.0-15
Alternative 5	6.0-16
E. Description of Construction Activities.....	6.0-17
Potential Construction Staging Areas.....	6.0-17
Flood Protection System and Access Improvement Elements Construction	6.0-20
F. Construction Practices.....	6.0-24
Hours of Work.....	6.0-24
Tree Removal	6.0-25
Vehicular Access and Circulation	6.0-25
Pedestrian/Bicyclist Access and Circulation.....	6.0-25
Access to East River Park and Stuyvesant Cove Park Facilities.....	6.0-26
Community Outreach	6.0-27
Public Safety	6.0-27
Maintenance and Protection of Traffic (MPT) Plans	6.0-27
Manufactured Gas Plants (MGPs).....	6.0-29
Rodent Control	6.0-29

East Side Coastal Resiliency Project EIS

6.1: Construction—Socioeconomics.....	6.1-1
A. Introduction	6.1-1
Socioeconomic Study Area.....	6.1-1
B. Principal Conclusions.....	6.1-1
No Action Alternative (Alternative 1).....	6.1-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.1-2
Other Alternatives.....	6.1-3
C. Regulatory Context.....	6.1-3
D. Methodology.....	6.1-3
Potential Significant Adverse Socioeconomic Effects Assessment.....	6.1-3
Economic Benefits Analysis.....	6.1-3
E. Environmental Effects	6.1-4
No Action Alternative (Alternative 1).....	6.1-4
Preferred Alternative: Flood Protection System with a Raised East River Park (Alternative 4).....	6.1-4
Other Alternative: Flood Protection System on the West Side of East River Park – Baseline (Alternative 2).....	6.1-6
Other Alternative: Flood Protection System on the West Side of East River Park – Enhanced Park and Access (Alternative 3).....	6.1-7
Other Alternative: Flood Protection System East of FDR Drive (Alternative 5)	6.1-9
6.2: Construction—Open Space.....	6.2-1
A. Introduction	6.2-1
B. Principal Conclusions.....	6.2-1
No Action Alternative (Alternative 1).....	6.2-1
Preferred Alternative (Alternative 4): Flood Protection System with A Raised East River Park.....	6.2-2
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline	6.2-3
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	6.2-4
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive	6.2-4
Mitigation	6.2-4
C. Regulatory Context.....	6.2-5
D. Methodology.....	6.2-5
Direct Effects.....	6.2-5
Indirect Effects	6.2-6
E. Affected Environment	6.2-7
Directly Affected Areas.....	6.2-7
Study Area	6.2-8
F. Environmental Effects	6.2-11
No Action Alternative – (Alternative 1).....	6.2-11
Preferred Alternative: Flood Protection System with A Raised East River Park (Alternative 4).....	6.2-12
Other Alternative: Flood Protection System on the West Side of East River Park – Baseline (Alternative 2).....	6.2-16

Table of Contents

Other Alternative: Flood Protection System on the West Side of East River Park – Enhanced Park and Access (Alternative 3)	6.2-16
Other Alternatives– Flood Protection System East of FDR Drive (Alternative 5)	6.2-20
G. Mitigation of Effects	6.2-20
Potential Mitigation Measures.....	6.2-21
Improvement of Non-Motorized Access to Parks	6.2-22
6.3: Construction—Historic and Cultural Resources.....	6.3-1
A. Introduction	6.3-1
B. Principal Conclusions.....	6.3-1
Archaeological Resources	6.3-1
Architectural Resources	6.3-2
Mitigation	6.3-3
C. Regulatory Context/Methodology.....	6.3-3
D. Environmental Effects.....	6.3-4
No Action Alternative (Alternative 1).....	6.3-4
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	6.3-5
Other Alternative (Alternative 2): Flood Protections System on the West Side of East River Park – Baseline.....	6.3-7
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	6.3-8
Other Alternative: Flood Protection System East of FDR Drive (Alternative 5).....	6.3-8
Mitigation	6.3-9
6.4: Construction—Urban Design and Visual Resources	6.4-1
A. Introduction	6.4-1
B. Principal Conclusions.....	6.4-1
No Action Alternative (Alternative 1).....	6.4-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	6.4-1
Other Alternatives	6.4-1
C. Regulatory Context	6.4-2
D. Methodology	6.4-2
E. Environmental Effects.....	6.4-2
No Action Alternative (Alternative 1).....	6.4-2
Preferred Alternative: Flood Protection System with a Raised East River Park (Alternative 4)	6.4-3
Other Alternative: Flood Protection System on the West Side of East River Park – Baseline (Alternative 2)	6.4-4
Other Alternative: Flood Protection System on the West Side of East River Park – Enhanced Park and Access (Alternative 3)	6.4-4
Other Alternative: Flood Protection System East of FDR Drive (Alternative 5).....	6.4-4

6.5: Construction—Natural Resources.....	6.5-1
A. Introduction	6.5-1
B. Principal Conclusions	6.5-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.5-1
Other Alternatives.....	6.5-3
C. Environmental Effects	6.5-3
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.5-3
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline	6.5-14
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	6.5-16
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive	6.5-16
D. Mitigation	6.5-16
6.6: Construction—Hazardous Materials	6.6-1
A. Introduction	6.6-1
B. Principal Conclusions	6.6-1
No Action Alternative (Alternative 1).....	6.6-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.6-2
Other Alternatives.....	6.6-2
C. Environmental Effects	6.6-2
No Action Alternative (Alternative 1).....	6.6-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.6-2
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline	6.6-9
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	6.6-9
Alternative 5 – Flood Protection System East of FDR Drive	6.6-10
D. Mitigation Measures	6.6-10
6.7: Construction—Water and Sewer Infrastructure.....	6.7-1
A. Introduction	6.7-1
B. Principal Conclusions	6.7-1
C. Environmental Effects	6.7-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park Alternative	6.7-1
Other Alternatives.....	6.7-6
6.8: Construction—Energy.....	6.8-1
A. Introduction	6.8-1
B. Principal Conclusions	6.8-1
No Action Alternative (Alternative 1).....	6.8-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	6.8-1

Table of Contents

Other Alternatives	6.8-1
C. Regulatory Context	6.8-2
D. Environmental Effects.....	6.8-2
No Action Alternative (Alternative 1).....	6.8-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	6.8-2
Other Alternatives	6.8-3
6.9: Construction—Transportation.....	6.9-1
A. Introduction	6.9-1
B. Principal Conclusions.....	6.9-1
No Action Alternative (Alternative 1).....	6.9-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	6.9-2
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	6.9-3
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	6.9-3
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive.....	6.9-4
Mitigation.....	6.9-4
C. Regulatory Context	6.9-5
D. Methodology	6.9-5
Transportation Planning Assumptions	6.9-6
Transportation Assessment	6.9-7
E. Affected Environment/Existing Conditions	6.9-8
Existing Conditions	6.9-8
Traffic Conditions	6.9-10
Levels of Service.....	6.9-11
F. Environmental Effects.....	6.9-12
No Action Alternative (Alternative 1).....	6.9-13
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	6.9-16
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline.....	6.9-27
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access	6.9-28
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive.....	6.9-35
G. Swing Gate Construction Across the FDR Drive.....	6.9-37
H. Potential Barging Operations	6.9-39
I. Mitigation.....	6.9-39
Traffic.....	6.9-39
Pedestrians.....	6.9-42
Raised FDR Drive	6.9-42
6.10: Construction—Air Quality	6.10-1
A. Introduction	6.10-1
B. Principal Conclusions.....	6.10-1
No Action Alternative (Alternative 1).....	6.10-1

East Side Coastal Resiliency Project EIS

Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.10-2
Other Alternatives.....	6.10-2
C. Regulatory Context.....	6.10-2
Pollutants for Analysis.....	6.10-2
Air Quality Standards, Regulations, and Benchmarks	6.10-5
Conformity with State Implementation Plans.....	6.10-9
D. Methodology.....	6.10-9
Analysis Period.....	6.10-9
Emission Reduction Measures.....	6.10-11
Dispersion Modeling	6.10-13
E. Affected Environment	6.10-14
F. Environmental Effects	6.10-14
No Action Alternative (Alternative 1)	6.10-14
Preferred Alternative (Alternative 4): Flood Protection System with A Raised East River Park.....	6.10-14
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline	6.10-16
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	6.10-16
Other Alternative (Alternative 5): Flood Protection System East of FDR Drive	6.10-19
6.11: Construction—Greenhouse Gas Emissions	6.11-1
A. Introduction	6.11-1
B. Principal Conclusions	6.11-1
No Action Alternative (Alternative 1)	6.11-2
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.11-2
Other Alternatives.....	6.11-2
C. Regulatory Context.....	6.11-2
Pollutants of Concern	6.11-2
Policy, Regulations, Standards, and Benchmarks for Reducing GHG Emissions.....	6.11-4
D. Methodology.....	6.11-6
On-Road Emissions	6.11-7
Non-Road Emissions	6.11-8
Material Emissions	6.11-9
Tree Removal	6.11-9
E. Environmental Effects	6.11-10
No Action Alternative (Alternative 1)	6.11-10
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.11-10
Other Alternative (Alternative 2): Flood Protection System on the West Side of East River Park – Baseline	6.11-11
Other Alternative (Alternative 3): Flood Protection System on the West Side of East River Park – Enhanced Park and Access.....	6.11-12
Alternative 5 – Flood Protection System East of FDR Drive	6.11-13
F. Evaluation of Measures for Reducing GHG Emissions and Consistency with City GHG Goals	6.11-14

Table of Contents

Reduce Construction Operation Emissions.....	6.11-14
Use Building Materials with Low Carbon Intensity.....	6.11-15
Biogenic Emissions	6.11-16
Conclusions	6.11-16
6.12: Construction—Noise and Vibration	6.12-1
A. Introduction.....	6.12-1
B. Principal Conclusions.....	6.12-1
No Action Alternative (Alternative 1).....	6.12-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	6.12-1
Other Alternatives	6.12-2
Mitigation	6.12-3
C. Noise Fundamentals	6.12-3
“A”-Weighted Sound Level (dBA)	6.12-4
Effects of Distance On Sound	6.12-4
Sound Level Descriptors	6.12-5
D. Regulatory Context	6.12-5
New York CEQR Noise Standards	6.12-5
Impact Definition	6.12-6
Federal Development Guidelines	6.12-7
E. Methodology	6.12-7
Construction Noise Modeling	6.12-8
General Noise Analysis Methodology	6.12-8
Determination of No Action and Non-Construction Noise Levels	6.12-10
Analysis Periods.....	6.12-10
Noise Reduction Measures.....	6.12-10
Noise Receptor Sites	6.12-12
F. Affected Environment – Noise Measurement Results	6.12-14
Equipment Used During Noise Survey	6.12-14
Noise Survey Results	6.12-15
G. Environmental Effects.....	6.12-15
Mobile Source Screening Analysis	6.12-15
Cumulative On-Site Equipment and Construction Truck Noise Analysis	6.12-17
Other Construction Option	6.12-47
H. Vibration	6.12-47
Introduction	6.12-47
I. Mitigation.....	6.12-49
6.13: Construction—Public Health	6.13-1
A. Introduction.....	6.13-1
B. Principal Conclusions.....	6.13-1
No Action Alternative (Alternative 1).....	6.13-1
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park	6.13-1
Other Alternatives	6.13-2
C. Regulatory Context	6.13-2
EO 13045-Protection of Children from Environmental Health Risks and Safety Risks	6.13-2

East Side Coastal Resiliency Project EIS

D. Methodology.....	6.13-2
E. Environmental Effects	6.13-3
No Action Alternative (Alternative 1).....	6.13-3
Preferred Alternative (Alternative 4): Flood Protection System with a Raised East River Park.....	6.13-3
Other Alternatives.....	6.13-5
EO 13045-Protection of Children from Environmental Health and Safety Risks	6.13-6
7.0: Indirect and Cumulative Effects.....	7.0-1
A. Introduction	7.0-1
Lower Manhattan Coastal Resiliency (LMCR)-Two Bridges	7.0-1
B. Principal Conclusions	7.0-1
C. Indirect Effects	7.0-1
Indirect Social and Economic Effects.....	7.0-2
Indirect Hazardous Materials Effects	7.0-4
D. Cumulative Effects	7.0-6
Lower Manhattan Coastal Resiliency (LMCR)-Two Bridges Project.....	7.0-8
Land Use, Zoning, and Public Policy	7.0-9
Socioeconomic Conditions	7.0-10
Open Space	7.0-11
Historic and Cultural Resources	7.0-12
Urban Design and Visual Resources	7.0-14
Natural Resources.....	7.0-16
Hazardous Materials	7.0-18
Water and Sewer Infrastructure	7.0-19
Transportation.....	7.0-20
Neighborhood Character.....	7.0-22
Environmental Justice.....	7.0-23
Cumulative Construction Effects.....	7.0-24
8.0: Unavoidable Adverse Impacts	8.0-1
A. Introduction	8.0-1
B. Urban Design and Visual Resources	8.0-1
C. Natural Resources.....	8.0-1
Terrestrial Resources	8.0-1
Wetland Resources	8.0-2
Conclusion.....	8.0-3
D. Construction—Open Space	8.0-3
Partial Mitigation of Effects	8.0-4
E. Construction—Noise and Vibration	8.0-6

Table of Contents

9.0: Irretrievable and Irreversible Commitment of Resources	9.0-1
10.0: List of Preparers	10.0-1
11.0: Glossary of Terms.....	11.0-1
12.0: List of Acronyms.....	12.0-1
13.0: ESCR Project DEIS Referenced Documents	13.0-1

Appendices

Appendix A1: List of No Action Projects

Appendix B: CEQR Screening Analyses

Appendix C: Conceptual Engineering Design Plans

Appendix C1a: Preferred Alternative – Title, Legend, and Key Map

Appendix C1b: Preferred Alternative – Bridge Plans, Elevation, and Sections

Appendix C1c: Preferred Alternative – Civil Plans

Appendix C1d: Preferred Alternative – Floodwalls and Structural Plans

Appendix C1e: Preferred Alternative – Esplanade Structural Plan and Cross Sections

Appendix C1f: Preferred Alternative – Flood Protection and Cross Sections

Appendix C1g: Preferred Alternative – Closure Structures

Appendix C1h: Preferred Alternative – Shared Use Path Plan

Appendix C1i: Preferred Alternative – Stuyvesant Cove Plan

Appendix C1j: Preferred Alternative – Parallel Conveyance Civil Plan and Profile

Appendix C1k: Preferred Alternative – Interceptor Gate Plans

Appendix C1l: Preferred Alternative – Flyover Bridge Plan

Appendix C1m: Preferred Alternative – Tree Removal and Protection Plan

Appendix C1n: Preferred Alternative – Tree Mitigation Schedule

Appendix C1o: Preferred Alternative – Landscaping Plan and Section

Appendix C2: Alternative 2 – Conceptual Plans

Appendix C3: Alternative 3 – Conceptual Plans

Appendix D: New York City Waterfront Revitalization Program (WRP)

Table of Contents

Appendix E: Historic and Cultural Resources Consultation

Appendix F1: Natural Resources Survey

Appendix F2: Jurisdictional Determination

Appendix G: NOAA NMFS Section 7 and EFH

Appendix H1: NYNHP Consultation

Appendix H2: USFWS Section 7 Consultation

Appendix I: Tree Survey

Appendix J: Transportation Study

Appendix K1: Construction Air Quality

Appendix K2: Construction Noise

Appendix L: Eight-Step Planning Process for Floodplains and Wetlands

List of Tables

3.0-1	Community Engagement and Joint Waterfront Task Force Meetings (in 2015)	3.0-8
3.0-2	Community Engagement and Joint Waterfront Task Force Meetings (in 2016 through 2019).....	3.0-9
3.0-3	Public Scoping Meetings Ads	3.0-12
5.1-1	Zoning Designations within the Land Use, Zoning, and Public Policy Study Area ...	5.1-9
5.2-1	Population: 2006–2010 and 2012–2016.....	5.2-8
5.2-2	Household Characteristics: 2006–2010 and 2012–2016.....	5.2-9
5.2-3	Income Characteristics and Trends	5.2-10
5.2-4	Median Home Value and Gross Rent: 2006–2010 and 2012–2016.....	5.2-13
5.2-5	Current Rental Rates in the Socioeconomic Study Area and Manhattan.....	5.2-13
5.2-6	Recent Condo and Co-Op Sales in the Socioeconomic Study Area and Manhattan.	5.2-14
5.2-7	New York City Housing Authority Developments in the Study Area	5.2-15
5.2-8	Estimated Businesses in the Socioeconomic Study Area, Manhattan, and New York City	5.2-19
5.2-9	Estimated Employment in the Study Area, Manhattan, and New York City.....	5.2-20
5.3-1	Existing Residential Population in the Open Space Study Area	5.3-5
5.3-2	Project Area One and Project Area Two Open Space Study Area Inventory	5.3-6
5.3-3	½-Mile Study Area Existing Conditions	5.3-12
5.3-4	½-Mile Study Area No Action Conditions.....	5.3-13
5.3-5	½-Mile Study Area Preferred Alternative Conditions.....	5.3-17
5.3-6	½-Mile Study Area Alternative 2 Conditions	5.3-18
5.3-7	½-Mile Study Area Alternative 3 Conditions	5.3-20
5.4-1	Primary APE—Architectural Resources	5.4-17
5.4-2	Secondary APE—Architectural Resources	5.4-24
5.6-1	Comparison of Anticipated Adverse Effects to Natural Resources	5.6-4
5.6-2	New York State Water Quality Standards for Class I Waterbodies.....	5.6-16
5.6-3	Fish Species with the Potential to Occur in the East River	5.6-20
5.6-4	Species with Essential Fish Habitat within the Natural Resources Study Area	5.6-21

List of Tables

5.6-5	Endangered and Threatened Species with the Potential to Occur in the Study Area	5.6-30
5.6-6	USFWS List of Migratory Birds within the Study Area.....	5.6-32
5.6-7	Adverse Effects to Tidal Wetlands under the Preferred Alternative.....	5.6-38
5.6-8	Potential Effects to EFH and FWCA Species under the Preferred Alternative	5.6-47
5.6-9	Summary of Tree Effects under the Preferred Alternative	5.6-50
5.6-10	Tree Removals by Location under the Preferred Alternative	5.6-51
5.6-11	Summary of Tree Effects under Alternative 2.....	5.6-52
5.6-12	Tree Removals by Location under Alternative 2	5.6-52
5.6-13	Summary of Tree Effects under Alternative 3.....	5.6-53
5.6-14	Tree Removals by Location under Alternative 3	5.6-54
5.9-1	Pedestrian Bridge/Overpass Counts.....	5.9-5
5.9-2	NYCT Local Bus Routes Serving the Study Area.....	5.9-9
5.9-3	Crash Summary.....	5.9-11
5.9-4	Vehicle and Pedestrian Crash Details	5.9-12
5.11-1	Study Area Race and Ethnicity and Poverty.....	5.11-4
6.1-1	Economic Benefits from Construction by Alternative – New York City	6.1-2
6.1-2	Economic Benefits from Construction – Preferred Alternative.....	6.1-5
6.1-3	Economic Benefits from Construction – Alternative 2.....	6.1-7
6.1-4	Economic Benefits from Construction – Alternative 3.....	6.1-8
6.2-1	Alternative 1: Open Space in ½-Mile Study Area (Acres) No Action Alternative...	6.2-11
6.2-2	Open Space Ratios for ½-Mile Study Area with Future Residential Population No Action Alternative.....	6.2-12
6.2-3	Construction Open Space Direct Effects Analysis the Preferred Alternative: Summary Table	6.2-12
6.2-4	Construction Open Space Indirect Effects Analysis the Preferred Alternative: Summary Table	6.2-16
6.2-5	Construction Open Space Direct Effects Analysis Alternative 3: Summary Table..	6.2-17
6.2-6	Construction Open Space Indirect Effects Analysis Alternative 3: Summary Table	6.2-19
6.5-1	Potential Construction Related Effects to EFH and FWCA under the Preferred Alternative	6.5-10
6.9-1	Level of Service Criteria for Signalized Intersections	6.9-7
6.9-2	Summary of Existing Traffic Analysis Conditions.....	6.9-11
6.9-3	Existing Conditions Level of Service Analysis	6.9-12
6.9-4	Summary of 2022 and 2023 No Action Traffic Analysis Results	6.9-14

East Side Coastal Resiliency Project EIS

6.9-5	2022 No Action Alternative Level of Service Analysis – Preferred Alternative	6.9-15
6.9-6	2023 No Action Alternative Level of Service Analysis – Alternative 3	6.9-16
6.9-7	Average Number of Daily Workers and Trucks by Year and Quarter Project Area One – the Preferred Alternative	6.9-18
6.9-8	Average Number of Daily Workers and Trucks by Year and Quarter Project Area Two – Preferred Alternative	6.9-19
6.9-9	Schedule for Permitted FDR Drive Lane Closures Brooklyn Bridge to East 125th Street	6.9-20
6.9-10	Peak Construction Vehicle Trip Projections Project Area One – Preferred Alternative.....	6.9-20
6.9-11	Peak Construction Vehicle Trip Projections Project Area Two – Preferred Alternative.....	6.9-21
6.9-12	Total Peak Construction Vehicle Trip Projections – Preferred Alternative	6.9-21
6.9-13	Traffic Level 2 Screening Analysis Results Selected Analysis Locations – Preferred Alternative.....	6.9-22
6.9-14	Summary of Preferred Alternative’s Traffic Analysis Results.....	6.9-23
6.9-15	No Action and the Preferred Alternative’s Level of Service Analysis.....	6.9-25
6.9-16	Average Number of Daily Workers and Trucks by Year and Quarter Project Area One – Alternative 3.....	6.9-29
6.9-17	Average Number of Daily Workers and Trucks by Year and Quarter Project Area Two – Alternative 3.....	6.9-29
6.9-18	Peak Construction Vehicle Trip Projections Project Area One – Alternative 3.....	6.9-30
6.9-19	Peak Construction Vehicle Trip Projections Project Area Two – Alternative 3	6.9-30
6.9-20	Total Peak Construction Vehicle Trip Projections—Alternative 3	6.9-31
6.9-21	Traffic Level 2 Screening Analysis Results—Selected Analysis Locations (Alternative 3)	6.9-32
6.9-22	Summary of Alternative 3’s Traffic Analysis Results	6.9-33
6.9-23	No Action and Alternative 3’s Level of Service Analysis	6.9-34
6.9-24	Estimated Construction Duration for Gate Closure Structure	6.9-38
6.9-25	Recommended Mitigation Measures: Proposed Project Weekday AM Peak Hour ..	6.9-40
6.9-26a	Level of Service Analysis Weekday Am Peak Hour – Alternative 3.....	6.9-40
6.9-26b	Level of Service Analysis Weekday Am Peak Hour – Preferred Alternative.....	6.9-41
6.10-1	National Ambient Air Quality Standards (NAAQS).....	6.10-6
6.10-2	Maximum Background Pollutant Concentrations	6.10-14
6.10-3	Pollutant Concentrations from Construction Site Sources ($\mu\text{g}/\text{m}^3$) Preferred Alternative	6.10-15

List of Tables

6.10-4	Emissions from Construction Activities (ton/yr) Preferred Alternative	6.10-16
6.10-5	Pollutant Concentrations from Construction Site Sources ($\mu\text{g}/\text{m}^3$) Alternative 3... 6.10-17	
6.10-6	Emissions from Construction Activities (ton/yr) Material Deliveries by Trucks Only	6.10-18
6.10-7	Emissions from Construction Activities (ton/yr) Material Deliveries by Trucks and Barges	6.10-18
6.11-1	Global Warming Potential (GWP) for Major GHGs	6.11-4
6.11-2	Total Construction Truck Trips and Distances	6.11-8
6.11-3	Trees Removed Due to Design	6.11-9
6.11-4	Total Transportation Emissions (Metric Tons CO ₂ e)	6.11-10
6.11-5	Total On-Site Emissions (Metric Tons CO ₂ e)	6.11-10
6.11-6	Summary of GHG Emissions (Metric Tons CO ₂ e).....	6.11-11
6.11-7	Total Transportation Emissions (Metric Tons CO ₂ e)	6.11-12
6.11-8	Total On-Site Emissions (Metric Tons CO ₂ e)	6.11-12
6.11-9	Summary of GHG Emissions (Metric Tons CO ₂ e).....	6.11-13
6.12-1	Common Noise Levels.....	6.12-4
6.12-2	Noise Exposure Guidelines for Use in City Environmental Impact Review	6.12-6
6.12-3	Typical Construction Equipment Noise Emission Levels (dBA)	6.12-11
6.12-4	Noise Receptor Locations	6.12-13
6.12-5	Existing Noise Levels at Noise Measurement Locations in dBA	6.12-16
6.12-6	Construction Mobile-Source Noise Analysis Results for 6AM Hour in dBA	6.12-17
6.12-7	Construction Noise Analysis Results (in dBA)	6.12-19
6.12-8	Construction Noise Analysis Results (in dBA)	6.12-35
6.12-9	Vibration Source Levels for Construction Equipment.....	6.12-48
7.0-1	No Action Projects with the Potential for Cumulative Effects	7.0-7
7.0-2	Summary of Cumulative Effects.....	7.0-8

List of Figures

On or following page:

S-1	Proposed Project Area Aerial Map.....	ES-1
S-2	Preferred Alternative: Montgomery Street Tie-Back (Reach A) Conceptual Design .	ES-5
S-3	Preferred Alternative: Reach A on East River Bikeway near Pier 42 Conceptual Design	ES-5
S-4	Preferred Alternative: Reach C at Corlears Hook Bridge Approach Conceptual Design	ES-5
S-5	Preferred Alternative: East River Park Bikeway/Walkway Conceptual Design View North to Grand Street	ES-5
S-6	Preferred Alternative: Proposed Delancey Street Pedestrian Bridge Conceptual Design	ES-5
S-7	Preferred Alternative: Delancey Street Bridge Landing Conceptual Design	ES-5
S-8	Preferred Alternative: Reach E at Delancey Street Conceptual Design.....	ES-5
S-9	Preferred Alternative: Delancey Street Bridge Park Landing Conceptual Design.....	ES-5
S-10	Preferred Alternative: East Houston Street Entry Conceptual Design	ES-5
S-11	Preferred Alternative: Reach G at East Houston Street Conceptual Design	ES-5
S-12	Preferred Alternative: Reach H near East 8th Street Conceptual Design.....	ES-5
S-13	Preferred Alternative: Proposed East 10th Street Pedestrian Bridge Conceptual Design	ES-5
S-14	Preferred Alternative: East 10th Street Approach Conceptual Design	ES-5
S-15	Preferred Alternative: Reach I and J near East 12th Street Conceptual Design.....	ES-5
S-16	Preferred Alternative: Reach M at Murphy Brothers Playground Conceptual Design	ES-5
S-17	Preferred Alternative: Reach N at Stuyvesant Cove South Entry Conceptual Design	ES-5
S-18	Preferred Alternative: Stuyvesant Cove Park at the 20th Street Gate Conceptual Design	ES-5
S-19	Preferred Alternative: View north from East 23rd Street of Asser Levy Playground Conceptual Design	ES-5
S-20	Preferred Alternative: Asser Levy Playground Conceptual Design.....	ES-5
1.0-1	Regional Location	1.0-1

List of Figures

1.0-2	Protected Area Aerial Map	1.0-1
1.0-3	Proposed Project Area Aerial Map	1.0-2
1.0-4	Extent of Hurricane Sandy Flooding	1.0-2
1.0-5	FEMA Preliminary Flood Hazard Areas (2015).....	1.0-4
2.0-1	Proposed Project Area and Design Reaches	2.0-8
2.0-2	Typical Floodwall (Illustrative)	2.0-10
2.0-3	Typical Levee (Illustrative).....	2.0-10
2.0-4	Swing Gate.....	2.0-10
2.0-5	Roller Gate.....	2.0-10
2.0-6	Study Area Sewershed and Associated Regulators.....	2.0-10
2.0-7	Lower Manhattan Coastal Resiliency (LMCR) – Two Bridges Project Location and Land Use	2.0-14
2.0-8	Shared-Use Flyover Bridge – Aerial View	2.0-16
2.0-9	Shared-Use Flyover Bridge – Plan View.....	2.0-16
2.0-10	Schematic of Alternative 4: Flood Protection System with a Raised East River Park ...	2.0-16
2.0-11	Schematic of Alternative 2 – Flood Protection System on the West Side of East River Park – Baseline	2.0-22
2.0-12	Schematic of Alternative 3: Flood Protection System on the West Side of East River Park – Enhanced Park and Access	2.0-23
2.0-13	Schematic of Alternative 5: Flood Protection System East of FDR Drive	2.0-24
2.0-14	Alternative 5: Typical Cross Section of the proposed FDR Drive	2.0-25
5.1-1	Land Use, Zoning, and Public Policy Study Area	5.1-2
5.1-2	Land Use, Zoning, and Public Policy Study Area and FEMA Preliminary Flood Hazard Areas (2015)	5.1-3
5.1-3	Existing Land Use in Study Area.....	5.1-8
5.2-1	Socioeconomic Conditions Study Area	5.2-1
5.2-2	2012–2016 Age Distribution.....	5.2-9
5.2-3	Housing Characteristics and Trends: 2006–2010 and 2012–2016.....	5.2-11
5.2-4	Units per Residential Structure: 2012–2016	5.2-12
5.2-5	New York City Housing Authority Developments.....	5.2-14
5.2-6	Retail Corridors in ¼-Mile Local Study Area	5.2-17
5.3-1	Open Space Study Area	5.3-1
5.4-1	Historic and Cultural Resources Inventory: Area of Potential Effect.....	5.4-8

East Side Coastal Resiliency Project EIS

5.4-2a	Montgomery Street to Gouverneur Slip East: Area of Potential Effect – Montgomery to Rivington Streets: Areas of Archaeological Sensitivity	5.4-14
5.4-2b	Gouverneur Slip East to Jackson Street: Area of Potential Effect – Montgomery to Rivington Streets: Areas of Archaeological Sensitivity	5.4-14
5.4-2c	East River Park Amphitheater: Area of Potential Effect – Montgomery to Rivington Streets: Areas of Archaeological Sensitivity	5.4-14
5.4-2d	Grand Street: Area of Potential Effect – Montgomery to Rivington Streets: Areas of Archaeological Sensitivity	5.4-14
5.4-2e	Delancey Street: Area of Potential Effect – Montgomery to Rivington Streets: Areas of Archaeological Sensitivity	5.4-14
5.4-2f	Rivington Street: Area of Potential Effect – Montgomery to Rivington Streets: Areas of Archaeological Sensitivity	5.4-14
5.4-2g	Area of Potential Effect – East 23rd to East 25th Streets: Areas of Archaeological Sensitivity.....	5.4-15
5.4-3	Area of Potential Effect – Upland Drainage Components	5.4-16
5.4-4	Primary APE – Project Area 1	5.4-17
5.4-5	Primary APE – Project Area 1	5.4-18
5.4-6	Primary APE – Project Area 1	5.4-18
5.4-7	Primary APE – Project Area 2	5.4-19
5.4-8	Primary APE – 400-Foot Area.....	5.4-19
5.4-9	Primary APE – 400-Foot Area.....	5.4-19
5.4-10	Primary APE – 400-Foot Area.....	5.4-20
5.4-11	Primary APE – 400-Foot Area.....	5.4-21
5.4-12	Primary APE – 400-Foot Area.....	5.4-21
5.4-13	Primary APE – 400-Foot Area	5.4-21
5.4-14	Primary APE – 400-Foot Area	5.4-22
5.4-15	Primary APE – 400-Foot Area	5.4-23
5.4-16	Historic and Cultural Resources: Construction Limits of Work – Preferred Alternative, Project Area One	5.4-30
5.4-17	Historic and Cultural Resources: Construction Limits of Work – Preferred Alternative, Project Area 2.....	5.4-31
5.4-18	Historic and Cultural Resources: Construction Limits of Work – Alternative 2, Project Area 1	5.4-34
5.4-19	Historic and Cultural Resources: Construction Limits of Work – Alternative 2, Project Area 2	5.4-35
5.5-1	Urban Design and Visual Resources Analysis Study Area.....	5.5-1

List of Figures

5.5-2	Urban Design: Project Area One	5.5-11
5.5-3	Urban Design: Project Area One	5.5-12
5.5-4	Urban Design: Project Area One	5.5-12
5.5-5	Urban Design: Project Area One	5.5-12
5.5-6	Urban Design: Project Area One	5.5-12
5.5-7	Urban Design: Project Area One	5.5-13
5.5-8	Urban Design: Project Area One	5.5-13
5.5-9	Urban Design: Project Area One	5.5-13
5.5-10	Urban Design: Project Area One	5.5-14
5.5-11	Urban Design: Project Area One	5.5-14
5.5-12	Urban Design: Project Area One	5.5-14
5.5-13	Urban Design: Project Area One	5.5-14
5.5-14	Urban Design: Project Area One	5.5-14
5.5-15	Urban Design: Project Area One	5.5-14
5.5-16	Urban Design: Project Area One	5.5-14
5.5-17	Urban Design: Project Area One	5.5-14
5.5-18	Urban Design: Project Area One	5.5-15
5.5-19	Urban Design: Project Area One	5.5-15
5.5-20	Urban Design: Project Area One	5.5-15
5.5-21	Urban Design: Project Area One	5.5-15
5.5-22	Urban Design: Project Area One	5.5-15
5.5-23	Urban Design: Project Area One	5.5-15
5.5-24	Urban Design: Project Area Two.....	5.5-15
5.5-25	Urban Design: Project Area Two.....	5.5-15
5.5-26	Urban Design: Project Area Two.....	5.5-15
5.5-27	Urban Design: Project Area Two.....	5.5-15
5.5-28	Urban Design: Project Area Two.....	5.5-16
5.5-29	Urban Design: Project Area Two.....	5.5-16
5.5-30	Urban Design: Project Area Two.....	5.5-16
5.5-31	Urban Design: Project Area Two.....	5.5-16
5.5-32	Urban Design: Study Area.....	5.5-16
5.5-33	Urban Design: Study Area.....	5.5-16
5.5-34	Urban Design: Study Area.....	5.5-17

East Side Coastal Resiliency Project EIS

5.5-35	Urban Design: Study Area	5.5-18
5.5-36	Urban Design: Study Area	5.5-18
5.5-37	Urban Design: Study Area	5.5-18
5.5-38	Urban Design: Study Area	5.5-20
5.5-39	Urban Design: Study Area	5.5-20
5.5-40	Urban Design: Study Area	5.5-21
5.5-41	Views and Visual Resources	5.5-22
5.5-42	Views and Visual Resources	5.5-22
5.5-43	Views and Visual Resources	5.5-22
5.5-44	Views and Visual Resources	5.5-22
5.5-45	Views and Visual Resources	5.5-22
5.5-46	Views and Visual Resources	5.5-22
5.5-47	Views and Visual Resources	5.5-22
5.5-48	Views and Visual Resources	5.5-22
5.5-49	Views and Visual Resources	5.5-22
5.5-50	Views and Visual Resources	5.5-22
5.5-51	Views and Visual Resources	5.5-23
5.5-52	Views and Visual Resources	5.5-23
5.5-53	Views and Visual Resources	5.5-23
5.5-54	Visual Simulations Key Map	5.5-28
5.5-55	View south on Montgomery Street from Water Street.....	5.5-28
5.5-56	View northeast at Montgomery and South Streets.....	5.5-28
5.5-57	View east within East River Park from Gouverneur Slip West	5.5-28
5.5-58	View east on FDR Drive west of Jackson Street.....	5.5-28
5.5-59	View east within East River Park near Jackson Street	5.5-28
5.5-60	View south on Jackson Street from Water Street.....	5.5-28
5.5-61	View north on FDR Drive to Corlears Hook Park pedestrian bridge.....	5.5-28
5.5-62	View north within East River Park from Corlears Hook Park pedestrian bridge park-side landing.....	5.5-28
5.5-63	View north toward amphitheater from East River Park esplanade	5.5-28
5.5-64	View east on Cherry Street near FDR Drive service road.....	5.5-28
5.5-65	View east on Grand Street near FDR Drive service road.....	5.5-28
5.5-66	View north on FDR Drive to Delancey Street pedestrian bridge	5.5-28

List of Figures

5.5-67	View north within East River Park at Delancey Street pedestrian bridge park-side landing	5.5-28
5.5-68	View west from East River Park esplanade to Delancey Street pedestrian bridge ...	5.5-28
5.5-69	View east on Delancey Street to new pedestrian bridge street landing	5.5-28
5.5-70	View southwest on Delancey Street of new pedestrian bridge stair landing	5.5-28
5.5-71	View north on FDR Drive between Rivington and Stanton Streets.....	5.5-28
5.5-72	View north to East Houston Street within East River Park near Stanton Street.....	5.5-28
5.5-73	View south within East River Park at East Houston Street	5.5-28
5.5-74	View north on FDR Drive to East 6th Street pedestrian bridge.....	5.5-28
5.5-75	View east on East 6th Street near FDR Drive.....	5.5-28
5.5-76	View west within East River Park to East 6th Street pedestrian bridge	5.5-28
5.5-77	View north on FDR Drive to East 10th Street pedestrian bridge.....	5.5-28
5.5-78	View southeast on East 10th Street at traffic circle	5.5-28
5.5-79	View east on East 10th Street to new pedestrian bridge	5.5-28
5.5-80	View north within East River Park from East 10th Street pedestrian bridge park-side landing	5.5-28
5.5-81	View south at entrance to East River Park near East 13th Street	5.5-28
5.5-82	View north on Captain Patrick J. Brown Walk to Stuyvesant Cove Park	5.5-28
5.5-83	View north on Avenue C at Murphy Brothers Playground	5.5-28
5.5-84	View east on Avenue C of Murphy Brothers Playground	5.5-28
5.5-85	View north on Captain Patrick J. Brown Walk East of Avenue C	5.5-28
5.5-86	View east on Avenue C Loop	5.5-28
5.5-87	View west in Stuyvesant Cove Park at East 20th Street.....	5.5-28
5.5-88	View east on East 20th Street near FDR Drive.....	5.5-28
5.5-89	View north in Stuyvesant Cove Park from south of East 23rd Street.....	5.5-28
5.5-90	View southwest in Stuyvesant Cove Park at East 23rd Street	5.5-28
5.5-91	View north on Avenue C at East 23rd Street.....	5.5-28
5.5-92	View east on East 23rd Street adjacent to Asser Levy Recreation Center.....	5.5-28
5.5-93	View south from East 25th Street at Asser Levy Place	5.5-28
5.5-94	View south on FDR Drive at East 25th Street	5.5-28
5.5-95	View north on FDR Drive at East 13th Street	5.5-28
5.5-96	View north within East River Park at East 13th Street.....	5.5-28
5.5-97	View south on Captain Patrick J. Brown Walk at East 16th Street	5.5-28

East Side Coastal Resiliency Project EIS

5.5-98 Preferred Alternative: Proposed Delancey Street Pedestrian Bridge	5.5-28
5.5-99 Preferred Alternative: Reach E at Delancey Street Conceptual Design.....	5.5-28
5.5-100 Preferred Alternative: Delancey Street Bridge Landing View South Conceptual Design	5.5-28
5.5-101 Preferred Alternative: East River Park Bikeway/Walkway Conceptual Design View North to Grand Street	5.5-28
5.5-102 Preferred Alternative: Reach G at East Houston Street Conceptual Design	5.5-28
5.5-103 Preferred Alternative: East Houston Street Entry Conceptual Design.....	5.5-28
5.5-104 Preferred Alternative: Reach H near East 8th Street Conceptual Design.....	5.5-28
5.5-105 Preferred Alternative: Proposed East 10th Street Pedestrian Bridge	5.5-28
5.5-106 Preferred Alternative: Reaches I and J near East 12th Street Conceptual Design	5.5-28
5.6-1 Natural Resources Study Area and FEMA Preliminary Flood Hazard Areas (2015).	5.6-1
5.6-2 Natural Wetlands Inventory Map.....	5.6-14
5.6-3 NYSDEC Tidal Wetlands Map	5.6-14
5.6-4 Depth of Water and East River Channel	5.6-14
5.6-5 Locations of Permanent In-Water Disturbance for the Preferred Alternative.....	5.6-14
5.6-6 Proposed Planting Plan.....	5.6-50
5.6-7 Groves Planting Concept.....	5.6-51
5.6-8 Planting Concept Rendering.....	5.6-51
5.7-1 Soil and Groundwater Testing Locations.....	5.7-8
5.7-2 Soil Boring and Contamination Locations - Project Area One	5.7-8
5.7-3 Soil Boring and Contamination Locations - Project Area Two	5.7-8
5.8-1 Water and Sewer Study Area	5.8-1
5.8-2 Combined Sewer Regulators	5.8-6
5.8-3 Approximate Boundaries of NYC Wastewater Treatment Plant Service Areas	5.8-9
5.8-4 Drainage Isolation and Management Components	5.8-11
5.8-5 Interceptor Gate Concept	5.8-12
5.8-6 Parallel Conveyance Concept.....	5.8-14
5.8-7 Infrastructure Reconstruction, Drainage Isolation, and Drainage Management Components.....	5.8-14
5.9-1 Transportation Analysis Study Area	5.9-1
5.9-2a 2015 Existing Pedestrian and Bicycle Volumes: Project Area One.....	5.9-5
5.9-2b 2015 Existing Pedestrian and Bicycle Volumes: Project Area Two	5.9-5
5.11-1 Environmental Justice Study Area	5.11-3

List of Figures

5.11-2	Environmental Justice Minority Areas	5.11-7
5.11-3	Environmental Justice Low-Income Areas.....	5.11-7
6.0-1	Proposed Project Area, Design Reaches, and Construction Segments	6.0-1
6.0-2	Potential Barge Mooring Locations	6.0-13
6.0-3	Preliminary Construction Schedule: Preferred Alternative	6.0-15
6.0-4	Potential Construction Staging Areas: Project Area One and Project Area Two	6.0-22
6.0-5	Existing and Potential Construction Vehicle Access Points: Project Area One and Project Area Two.....	6.0-25
6.2-1	Preferred Alternative - Construction Segments 2020	6.2-6
6.2-2	Preferred Alternative - Construction Segments 2021	6.2-6
6.2-3	Preferred Alternative - Construction Segments 2022	6.2-6
6.2-4	Preferred Alternative - Construction Segments 2023	6.2-6
6.2-5	Alternative 3 - Construction Segments 2020.....	6.2-6
6.2-6	Alternative 3 - Construction Segments 2021	6.2-6
6.2-7	Alternative 3- Construction Segments 2022-2023.....	6.2-6
6.2-8	Alternative 3 - Construction Segments 2024-2025.....	6.2-6
6.9-1	Existing Traffic Volumes 6-7 AM Peak Hour.....	6.9-11
6.9-2	Existing Traffic Volumes 3-4 PM Peak Hour.....	6.9-11
6.9-3	2022 No Action Traffic Volumes 6-7 AM Peak Hour.....	6.9-13
6.9-4	2022 No Action Traffic Volumes 3-4 PM Peak Hour	6.9-13
6.9-5	2023 No Action Traffic Volumes 6-7 AM Peak Hour	6.9-13
6.9-6	2023 No Action Traffic Volumes 3-4 PM Peak Hour	6.9-13
6.9-7a	Preferred Alternative Total Construction PCE Trips: Project Area One Study Area 6-7 AM Peak Hour.....	6.9-21
6.9-7b	Preferred Alternative Total Construction PCE Trips: Project Area Two Study Area 6-7 AM Peak Hour	6.9-21
6.9-8a	Preferred Alternative Total Construction PCE Trips: Project Area One Study Area 3-4 PM Peak Hour.....	6.9-21
6.9-8b	Preferred Alternative Total Construction PCE Trips: Project Area Two Study Area 3-4 PM Peak Hour.....	6.9-21
6.9-9	Truck Routes.....	6.9-23
6.9-10	Preferred Alternative Total Construction Traffic Increments 6-7 AM Peak Hour ...	6.9-23
6.9-11	Preferred Alternative Total Construction Traffic Increments 3-4 PM Peak Hour....	6.9-23
6.9-12	Preferred Alternative 2022 With Action Traffic Volumes 6-7 AM Peak Hour.....	6.9-23

East Side Coastal Resiliency Project EIS

6.9-13	Preferred Alternative 2022 With Action Traffic Volumes 3-4 PM Peak Hour.....	6.9-23
6.9-14a	Alternative 3 Total Construction PCE Trips: Project Area One Study Area 6-7 AM Peak Hour.....	6.9-31
6.9-14b	Alternative 3 Total Construction PCE Trips: Project Area Two Study Area 6-7 AM Peak Hour.....	6.9-31
6.9-15a	Alternative 3 Total Construction PCE Trips: Project Area One Study Area 3-4 PM Peak Hour.....	6.9-31
6.9-15b	Alternative 3 Total Construction PCE Trips: Project Area Two Study Area 3-4 PM Peak Hour.....	6.9-31
6.9-16	Alternative 3 Total Construction Traffic Increments 6-7 AM Peak Hour	6.9-32
6.9-17	Alternative 3 Total Construction Traffic Increments 3-4 PM Peak Hour	6.9-32
6.9-18	Alternative 3 2022 With Action Traffic Volumes 6-7 AM Peak Hour.....	6.9-32
6.9-19	Alternative 3 2022 With Action Traffic Volumes 3-4 PM Peak Hour.....	6.9-32
6.11-1	Price of B20 v. Regular Diesel per Energy Unit, Central Atlantic PADD.....	6.11-15
6.12-1	Construction Noise Analysis Measurement Locations	6.12-9

*