

FLOOD RISK MANAGEMENT

SOUTH SHORE STATEN ISLAND COASTAL STORM RISK MANAGEMENT

VALIDATION REPORT

APPENDIX C – COST APPENDIX



**US Army Corps of Engineers
New York District**

SEPTEMBER 2023

SOUTH SHORE STATEN ISLAND
VALIDATION REPORT
STATEN ISLAND, NY
APPENDIX C - COST ESTIMATES

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INTRODUCTION

This Appendix presents the detailed cost estimates for South Shore Staten Island as generally described in the Final Feasibility Report dated October 2016. The certified construction cost estimate represents the updated quantities and features based on all current requirements as of August 2023.

The purpose of this validation study is to determine if the project is still feasible as authorized in the October 2016 Final Feasibility Report.

South Shore Staten Island consists of seven (7) construction contracts that provides solutions to reduce the impact of flood in the region, which was subjected to much of fatalities during Hurricane Sandy. The features for the seven (7) construction contracts along with its respective first cost are shown on Table C1 below:

Table C1 – List of Contracts

Contracts	Features	First Cost (FY23 PL)
Area E	Interior drainage features for Area E includes wingwalls, junction chambers, culverts, outfall structures, and excavated ponds. Utility relocation, pavement replacement, gravel access road, landscaping, and erosion and sediment control. All excavated material is assumed to include phragmite.	\$111,746,318
Area C	Interior drainage features for Area C includes excavation of ponds, landscaping, and removal and capping of existing utilities.	\$127,569,527
Miller Field Offset	Forest enhancement	\$3,211,580
Oakwood Beach to Miller Field	13,528 LF of double sheet pile seawall runs along from the tidal wetlands to the natural flood storage and transitions to the existing promenade. The contract also includes reinforced concrete promenade, promenade hardscaping and furniture, underground utility relocation, bridging over existing sewers under seawall, service road, bicycle pathway, pond B1 tide gate, pond B2 tide gate, outfall structures, tidal culverts, swale culverts, tidal wetlands, erosion and control measures, civil demolition, dune vegetation, electrical work, and landscaping	\$875,790,887

Midland Beach to Fort Wadsworth	The alignment follows the footprint of the existing promenade and boardwalk. This contract includes features such as double sheet pile seawall, outlet structures, outfalls, access ramps, access stairs, underground utility relocations, reinforced concrete boardwalk, expansion of promenade/boardwalk area, boardwalk hardscaping and furniture, bicycle pathway, erosion and control measures, interior drainages, dune vegetation, remove & rebuild of DPR facilities, etc.	\$690,702,262
Floodwall	307 LF of earthen levee transitions to a vertical concrete I-shaped floodwall which then transitions to a vertical concrete T-shaped floodwall due to the limited area between Oakwood Creek and the Oakwood Beach Waste Water Treatment Plant (WWTP). The 1,569 LF of T-wall and 543 LF of I-wall protect the west and the south sides of the WWTP. The contract also includes construction of drainage structures, swing gates, sluice gate chamber, new panel board for the WWTP, utility relocation, site civil improvements, electrical upgrades, and landscaping.	\$79,373,939
Hyland Blvd. Closure Gate, Levee, Tide Gate	Starting from Oakwood Beach, the earthen levee ties into high ground on the northwest of Hyland Boulevard. A closure gate along Hyland Boulevard will be proposed and deployed during coastal storm events to prevent the flanking tidal surge waters to the project area. The earthen levee continues southeast through Oakwood Beach parallel to Oakwood Creek and Buffalo Street until the levee crosses over Oakwood Creek. A tide gate structure is proposed at this location with the deep mixing method (DMM) panels located within the proximity. The contract also includes high performance turf reinforcement mat, new monitoring well, utility replacement, sheet piles, interior drainage A, earthwork, and 268 MSF of site restoration and seeding.	\$86,437,094

BASIS OF COST

The construction cost estimate was developed in MCACES, Second Generation (MII) using the appropriate Work Breakdown Structure (WBS) and based on current estimated quantities provided by the Architect/Engineers. The cost estimate was developed from these quantities using cost resources such as RSMeans, historical data from similar construction features, vendor quotes, and MII Cost Libraries. The contingencies were developed based on input to the Cost Schedule Risk Analysis (CSRA) (template provided by the Cost Mandatory Center of Expertise, MCX, Walla Walla District). These contingencies were applied to the construction cost estimates to develop the Total Project First Cost.

The Total Project First Cost for the entire South Shore Staten Island project is presented in Table C2 on the following page. The First Cost table for each contract is presented from Table C3 through C9 from page C5 through C11.

Table C2 –First Cost Table
South Shore Staten Island Validation Study
October 2022 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 80,052,889	17%	\$ 13,469,078	\$ 93,521,966
	Total Lands & Damages	\$ 80,052,889		\$ 13,469,078	\$ 93,521,966
02	Relocations	\$ 50,524,345	47%	\$ 23,746,442	\$ 74,270,787
	Total Relocations	\$ 50,524,345		\$ 23,746,442	\$ 74,270,787
08	Roads, Railroads & Bridges	\$ 118,947,569	47%	\$ 55,905,357	\$ 174,852,926
	Total Roads, Railroads & Bridges	\$ 118,947,569		\$ 55,905,357	\$ 174,852,926
10	Breakwater & Seawalls	\$ 556,253,943	47%	\$ 261,439,353	\$ 817,693,296
	Total Breakwater & Seawalls	\$ 556,253,943		\$ 261,439,353	\$ 817,693,296
11	Levees & Floodwalls	\$ 33,398,545	47%	\$ 15,697,316	\$ 49,095,861
	Total Levees & Floodwalls	\$ 33,398,545		\$ 15,697,316	\$ 49,095,861
15	Floodway Control & Diversion Structure	\$ 274,022,864	47%	\$ 128,790,746	\$ 402,813,610
	Total Floodway Control & Diversion Str	\$ 274,022,864		\$ 128,790,746	\$ 402,813,610
16	Bank Stabilization	\$ 49,395,143	47%	\$ 23,215,717	\$ 72,610,860
	Total Bank Stabilization	\$ 49,395,143		\$ 23,215,717	\$ 72,610,860
18	Cultural Resource	\$ 4,161,600	47%	\$ 1,955,952	\$ 6,117,552
	Total Cultural Resource	\$ 4,161,600		\$ 1,955,952	\$ 6,117,552
19	Buildings, Grounds & Utilities	\$ 453,580	47%	\$ 213,183	\$ 666,763
	Total Buildings, Grounds & Utilities	\$ 453,580		\$ 213,183	\$ 666,763
30	Planning, Engineering & Design	\$ 78,493,887	47%	\$ 36,892,127	\$ 115,386,013
31	Construction Management	\$ 114,151,000	47%	\$ 53,650,970	\$ 167,801,970
Total First Cost		\$ 1,359,855,364		\$ 614,976,241	\$ 1,974,831,606

Table C3 –First Cost: Area E

South Shore Staten Island Validation Study

Area E

October 2022 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 5,633,344	16%	\$ 898,419	\$ 6,531,763
	Total Lands & Damages	\$ 5,633,344		\$ 898,419	\$ 6,531,763
02	Relocations	\$ 1,372,571	47%	\$ 645,108	\$ 2,017,679
	Total Relocations	\$ 1,372,571		\$ 645,108	\$ 2,017,679
08	Roads, Railroads & Bridges	\$ 3,238,159	47%	\$ 1,521,935	\$ 4,760,094
	Total Roads, Railroads & Bridges	\$ 3,238,159		\$ 1,521,935	\$ 4,760,094
15	Floodway Control & Diversion Structure	\$ 48,587,439	47%	\$ 22,836,096	\$ 71,423,535
	Total Floodway Control & Diversion Str	\$ 48,587,439		\$ 22,836,096	\$ 71,423,535
16	Bank Stabilization	\$ 9,147,592	47%	\$ 4,299,368	\$ 13,446,960
	Total Bank Stabilization	\$ 9,147,592		\$ 4,299,368	\$ 13,446,960
30	Planning, Engineering & Design	\$ 2,681,766	47%	\$ 1,260,430	\$ 3,942,196
31	Construction Management	\$ 6,547,000	47%	\$ 3,077,090	\$ 9,624,090
Total First Cost		\$ 77,207,871		\$ 34,538,447	\$ 111,746,318

Table C4 –First Cost: Area C

South Shore Staten Island Validation Study

Area C

October 2022 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 35,450,435	16%	\$ 5,815,837	\$ 41,266,272
	Total Lands & Damages	\$ 35,450,435		\$ 5,815,837	\$ 41,266,272
02	Relocations	\$ 129,535	47%	\$ 60,881	\$ 190,416
	Total Relocations	\$ 129,535		\$ 60,881	\$ 190,416
08	Roads, Railroads & Bridges	\$ 2,884,296	47%	\$ 1,355,619	\$ 4,239,915
	Total Roads, Railroads & Bridges	\$ 2,884,296		\$ 1,355,619	\$ 4,239,915
15	Floodway Control & Diversion Structure	\$ 43,995,806	47%	\$ 20,678,029	\$ 64,673,835
	Total Floodway Control & Diversion Str	\$ 43,995,806		\$ 20,678,029	\$ 64,673,835
16	Bank Stabilization	\$ 3,086,000	47%	\$ 1,450,420	\$ 4,536,420
	Total Bank Stabilization	\$ 3,086,000		\$ 1,450,420	\$ 4,536,420
30	Planning, Engineering & Design	\$ 3,354,060	47%	\$ 1,576,408	\$ 4,930,469
31	Construction Management	\$ 5,260,000	47%	\$ 2,472,200	\$ 7,732,200
Total First Cost		\$ 94,160,132		\$ 33,409,395	\$ 127,569,527

Table C5 –First Cost: Miller Field Offset

South Shore Staten Island Validation Study

Miller Field Offset

October 2022 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 774,035	19%	\$ 148,307	\$ 922,342
	Total Lands & Damages	\$ 774,035		\$ 148,307	\$ 922,342
16	Bank Stabilization	\$ 1,286,665	47%	\$ 604,733	\$ 1,891,398
	Total Bank Stabilization	\$ 1,286,665		\$ 604,733	\$ 1,891,398
30	Planning, Engineering & Design	\$ 135,640	47%	\$ 63,751	\$ 199,391
31	Construction Management	\$ 135,000	47%	\$ 63,450	\$ 198,450
Total First Cost		\$ 2,331,340		\$ 880,240	\$ 3,211,580

Table C6 –First Cost: Oakwood Beach to Miller Field Seawall

**South Shore Staten Island Validation Study
Oakwood Beach to Miller Field Seawall (21')**

October 2022 Price Level

Feat.	Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01		Lands & Damages	\$ 24,307,174	17%	\$ 4,192,435	\$ 28,499,608
		Total Lands & Damages	\$ 24,307,174		\$ 4,192,435	\$ 28,499,608
02		Relocations	\$ 7,989,673	47%	\$ 3,755,146	\$ 11,744,819
		Total Relocations	\$ 7,989,673		\$ 3,755,146	\$ 11,744,819
08		Roads, Railroads & Bridges	\$ 76,602,348	47%	\$ 36,003,104	\$ 112,605,452
		Total Roads, Railroads & Bridges	\$ 76,602,348		\$ 36,003,104	\$ 112,605,452
10		Breakwater & Seawalls	\$ 286,193,110	47%	\$ 134,510,762	\$ 420,703,872
		Total Breakwater & Seawalls	\$ 286,193,110		\$ 134,510,762	\$ 420,703,872
15		Floodway Control & Diversion Structure	\$ 105,879,578	47%	\$ 49,763,402	\$ 155,642,980
		Total Floodway Control & Diversion Str	\$ 105,879,578		\$ 49,763,402	\$ 155,642,980
16		Bank Stabilization	\$ 10,714,902	47%	\$ 5,036,004	\$ 15,750,906
		Total Bank Stabilization	\$ 10,714,902		\$ 5,036,004	\$ 15,750,906
30		Planning, Engineering & Design	\$ 37,834,014	47%	\$ 17,781,986	\$ 55,616,000
31		Construction Management	\$ 51,175,000	47%	\$ 24,052,250	\$ 75,227,250
Total First Cost			\$ 600,695,798		\$ 275,095,088	\$ 875,790,887

Table C7 –First Cost: Midland Beach to Ft. Wadsworth Seawall

**South Shore Staten Island Validation Study
Midland Beach to Ft. Wadsworth Seawall (21')**

October 2022 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 7,090,427	19%	\$ 1,352,085	\$ 8,442,512
	Total Lands & Damages	\$ 7,090,427		\$ 1,352,085	\$ 8,442,512
02	Relocations	\$ 39,852,854	47%	\$ 18,730,841	\$ 58,583,695
	Total Relocations	\$ 39,852,854		\$ 18,730,841	\$ 58,583,695
08	Roads, Railroads & Bridges	\$ 35,014,451	47%	\$ 16,456,792	\$ 51,471,243
	Total Roads, Railroads & Bridges	\$ 35,014,451		\$ 16,456,792	\$ 51,471,243
10	Breakwater & Seawalls	\$ 270,060,833	47%	\$ 126,928,592	\$ 396,989,425
	Total Breakwater & Seawalls	\$ 270,060,833		\$ 126,928,592	\$ 396,989,425
15	Floodway Control & Diversion Structure	\$ 43,109,491	47%	\$ 20,261,461	\$ 63,370,952
	Total Floodway Control & Diversion Str	\$ 43,109,491		\$ 20,261,461	\$ 63,370,952
16	Bank Stabilization	\$ 252,429	47%	\$ 118,642	\$ 371,071
	Total Bank Stabilization	\$ 252,429		\$ 118,642	\$ 371,071
18	Cultural Resource	\$ 4,161,600	47%	\$ 1,955,952	\$ 6,117,552
	Total Cultural Resource	\$ 4,161,600		\$ 1,955,952	\$ 6,117,552
30	Planning, Engineering & Design	\$ 30,463,621	47%	\$ 14,317,902	\$ 44,781,522
31	Construction Management	\$ 41,207,000	47%	\$ 19,367,290	\$ 60,574,290
Total First Cost		\$ 471,212,705		\$ 219,489,556	\$ 690,702,262

Table C8 –First Cost: Floodwall

South Shore Staten Island Validation Study

Floodwall

October 2022 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 1,209,984	19%	\$ 225,747	\$ 1,435,731
	Total Lands & Damages	\$ 1,209,984		\$ 225,747	\$ 1,435,731
02	Relocations	\$ 832,038	47%	\$ 391,058	\$ 1,223,096
	Total Relocations	\$ 832,038		\$ 391,058	\$ 1,223,096
08	Roads, Railroads & Bridges	\$ 1,208,315	47%	\$ 567,908	\$ 1,776,223
	Total Roads, Railroads & Bridges	\$ 1,208,315		\$ 567,908	\$ 1,776,223
11	Levees & Floodwalls	\$ 24,427,230	47%	\$ 11,480,798	\$ 35,908,028
	Total Levees & Floodwalls	\$ 24,427,230		\$ 11,480,798	\$ 35,908,028
15	Floodway Control & Diversion Structure	\$ 12,293,474	47%	\$ 5,777,933	\$ 18,071,407
	Total Floodway Control & Diversion Str	\$ 12,293,474		\$ 5,777,933	\$ 18,071,407
16	Bank Stabilization	\$ 6,969,082	47%	\$ 3,275,469	\$ 10,244,551
	Total Bank Stabilization	\$ 6,969,082		\$ 3,275,469	\$ 10,244,551
19	Buildings, Grounds & Utilities	\$ 453,580	47%	\$ 213,183	\$ 666,763
	Total Buildings, Grounds & Utilities	\$ 453,580		\$ 213,183	\$ 666,763
30	Planning, Engineering & Design	\$ 1,986,470	47%	\$ 933,641	\$ 2,920,111
31	Construction Management	\$ 4,849,000	47%	\$ 2,279,030	\$ 7,128,030
Total First Cost		\$ 54,229,173		\$ 25,144,766	\$ 79,373,939

Table C9 –First Cost: Hyland Blvd. Closure Gate, Levee & Tide Gate

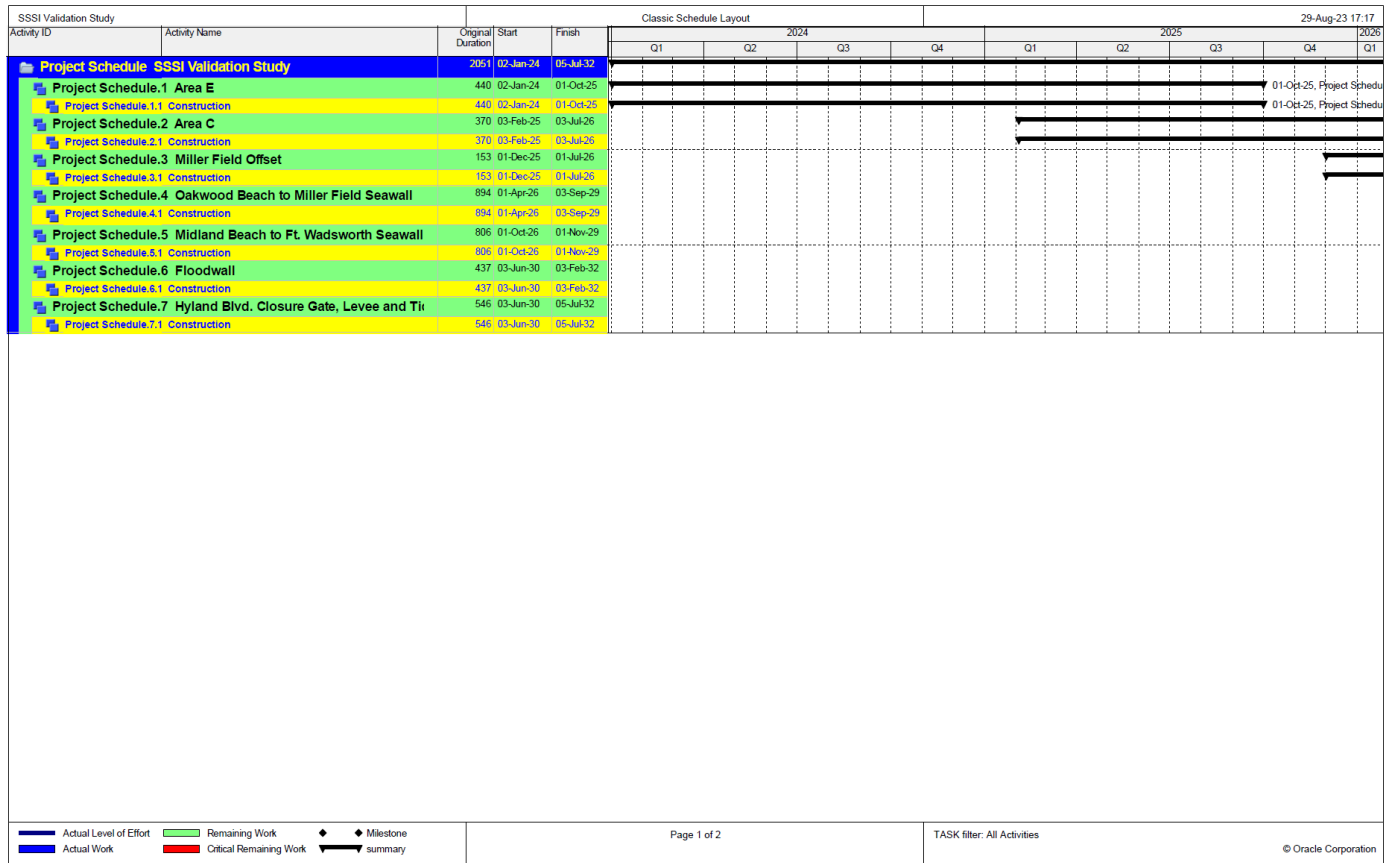
South Shore Staten Island Validation Study
Hyland Blvd. Closure Gate, Levee & Tide Gate
 October 2022 Price Level

Feat. Acct.	Description	Subtotal	Cont. %	Cont \$\$	Total Cost
01	Lands & Damages	\$ 5,587,490	15%	\$ 836,248	\$ 6,423,738
	Total Lands & Damages	\$ 5,587,490		\$ 836,248	\$ 6,423,738
02	Relocations	\$ 347,674	47%	\$ 163,407	\$ 511,081
	Total Relocations	\$ 347,674		\$ 163,407	\$ 511,081
11	Levees & Floodwalls	\$ 8,971,315	47%	\$ 4,216,518	\$ 13,187,833
	Total Levees & Floodwalls	\$ 8,971,315		\$ 4,216,518	\$ 13,187,833
15	Floodway Control & Diversion Structure	\$ 20,157,076	47%	\$ 9,473,826	\$ 29,630,902
	Total Floodway Control & Diversion Str	\$ 20,157,076		\$ 9,473,826	\$ 29,630,902
16	Bank Stabilization	\$ 17,938,473	47%	\$ 8,431,082	\$ 26,369,555
	Total Bank Stabilization	\$ 17,938,473		\$ 8,431,082	\$ 26,369,555
30	Planning, Engineering & Design	\$ 2,038,316	47%	\$ 958,009	\$ 2,996,325
31	Construction Management	\$ 4,978,000	47%	\$ 2,339,660	\$ 7,317,660
Total First Cost		\$ 60,018,344		\$ 26,418,749	\$ 86,437,094

CONSTRUCTION SCHEDULE

The construction duration for the entire South Shore Staten Island project is estimated at 8 years and 6 months, as shown in Figure C1 on the following page. The construction schedule for each one of the seven (7) contracts was developed based on discussions with the construction field personnel, as well as the crew outputs referenced from RSMeans with assumption that multiple crews would work simultaneously.

Figure C1 – Construction Schedule



CONTINGENCIES

As stated in ER 1110-2-1302, the goal in contingency development is to identify the uncertainty associated with an item of work or task to an acceptable degree of confidence. Consideration must be given to the detail available at each stage of planning, design, or construction for which a cost estimate is being prepared. Contingency may vary throughout the cost estimate and could constitute a significant portion of the overall costs when data or design details are unavailable. Final contingency development and assessment of the potential for cost growth is included in this cost estimate. To develop the Total Project First Cost, contingencies developed in the CSRA were applied. The construction cost contingency developed per CSRA is shown in Table C13.

Table C10 – Contingencies

Element	Contingency Factor
Relocation	47.00%
Roads, Railroads & Bridges	47.00%
Breakwater & Seawalls	47.00%
Levees & Floodwalls	47.00%
Floodway Control & Diversion Structure	47.00%
Bank Stabilization	47.00%
Cultural Resource Preservation	47.00%
Buildings, Grounds & Utilities	47.00%
Total Construction Contingency	47.00%
Lands & Damages	17.00%
Planning, Engineering, and Design	47.00%
Construction Management	47.00%

LANDS AND DAMAGES

To construct the proposed plan, local stakeholders are required to provide certain lands and easements. Studies were conducted by the Real Estate Division to determine the estimated value of lands and easements needed for construction. Seven types of easements are required for the coastal risk management project: Flood Protection Levee Easement – in locations where the construction, operation, maintenance, patrol, and repair and replacement of the LOP are required. Temporary Work Area Easement – to allow right-of-way, in, and over and across the land for the planned construction schedule; Restrictive Easement – to protect against future development; Ponding Easement – Portions of land to be subjected to permanent inundation and portions to be subjected to occasional flooding; Pipeline Easement – for construction, O&M of underground storm water drainage structure; Road Easement – to construct and maintain road and maintenance vehicle access ramps; Wetland Easement – to construction and/or enhance existing wetland features.

PLANNING, ENGINEERING AND DESIGN

The cost was developed for all activities associated with the planning, engineering and design effort. The cost for this account includes the preparation of Design Documentation Reports, plans, and specifications for South Shore Staten Island and engineering support during construction through project completion. It includes all the in-house labor based upon work-hour requirements, material and facility costs, travel, and overhead. The percentage breakdown in the Total Project Cost Summary (TPCS), as shown in Figure C2 on page C16 through page C19, was developed based on input from respective offices in accordance with the CWBS.

CONSTRUCTION MANAGEMENT

The cost was developed for all construction management activities from pre-award requirements through final contract closeout. This cost includes the in-house labor based upon work-hour requirements, materials, facility costs, support contracts, travel and overhead. The cost was developed based on the input from the construction division in accordance with the Civil Works Breakdown Structure (CWBS) and includes, but is not limited to, anticipated items such as the salaries of the resident engineer and staff, surveyors, inspectors, drafters, clerical, and custodial personnel; operation, maintenance and fixed charges for transportation and for other field equipment; field supplies; construction management, general construction supervision; and project office administration, distributive cost of area office and general overhead charged to the project.

INTEREST DURING CONSTRUCTION

Interest during construction (IDC) is the amount of interest the construction cost would earn were it invested from the beginning of construction until the accumulation of benefits begins. IDC cost has been added to the project cost to determine investment cost. Average annual cost was determined based on investment cost, which includes IDC. The pre-base year costs were estimated using the Federal interest rate of 2.50 percent (FY23).

OPERATION AND MAINTENANCE

The Operation and Maintenance (O&M) cost of \$2,004,768 includes the annual inspections and maintenance of the Line of Protection (LOP) including stop-log structure, gate chambers, access ramps, sand/soil cover estimated at a total annual cost of \$944,925, along with the interior facility maintenance and equipment replacement over the 50 years period estimated at an annual cost of \$712,080, and vegetation management of the ponding areas and tidal wetland estimated at an annual cost of \$347,763. Annual LOP costs are shown in Table C11 below.

Table C11 – Annual LOP O&M Costs

Item	Annual O&M Costs
Coastal Monitoring	\$83,850
Sand Cover Maintenance	\$117,175
Dune Grass Maintenance	\$27,950
Levee Mowing	\$4,300
Gate Chamber Maintenance	\$29,025
Line of Protection O&M Total	\$262,300
Interior Facility Maintenance	\$483,750
Equipment Replacement	\$198,875
Total Interior Maintenance Cost	\$682,625
Total O&M	\$944,925

The O&M costs also include annual inspections and maintenance of the interior drainage features and include the annualized cost of replacement of interior drainage appurtenant structures (e.g., gates, backflow valves, sluice gates, etc.) at the end of their useful project life of approximately 25 years. Area-specific interior drainage O&M costs are shown in Table C12 on the following page.

Table C12 – Annual Interior Drainage O&M Costs

Interior Drainage	Annual O&M Costs
Area A	\$ 126,098
Area B	\$ 207,583
Area C	\$ 225,750
Area D	\$ 46,010
Area E	\$ 106,640
Total O&M	\$ 712,080

ESTIMATED ANNUAL COST

Annual costs are based on an economic period of analysis of 50 years and an interest rate of 2.50%. The annual costs include the annualized investment cost along with annual operation and maintenance cost. A detailed breakdown of annual costs for South Shore Staten Island is presented in Table C13 below.

Table C13 – Annualized Cost

South Shore Staten Island Validation Study Annualized Cost Summary	
First Cost	\$ 1,974,831,606
Sunk Cost	\$ 46,525,721
Investment Cost	
Interest During Construction ^(a)	\$ 71,519,877
Total Investment Cost:	\$ 2,092,877,203
Annual Costs	
Annualized Investment Cost ^(b)	\$ 72,150,377
Annualized Operation & Maintenance Cost ^(c)	\$ 2,004,768
Total Annual Cost*	\$ 74,155,145
*October 2022 Price Level	
(a) Based on 101 months of construction @ 2.5% (IDC, E&D, RE and Sunk costs calculated separately and included in this total)	
(b) Annualized investment cost only includes the remaining features. For annualized investment cost with the sunk cost, please see the economic appendix. I = 2.5% and n = 50 yrs	
(c) Summation of annual LOP O&M costs on Table C11 and annual interior drainage O&M costs on Table C12. Developed in 8/2022. Using 2.5% Discount Rate and the OMRR cost has been escalated from FY22 to FY23.	

COST SUMMARY

The Total Fully Funded Project cost is \$2,347,724,000. The project is cost-shared between the Corps, State of New York, and City of New York. Project costs up to the original executed PPA amount of \$615M are cost-shared at 65% federal and 35% non-federal. All project costs above \$615M will be cost-shared at 90% federal and 10% non-federal per WRDA 2022.

Figure C2 – Total Project Cost Summary

PROJECT: **South Shore Staten Island**
PROJECT NO: **463769**
LOCATION: **Staten Island, NY**

DISTRICT: **NAN**

PREPARED: **8/21/2023**

POC: **CHIEF, COST ENGINEERING, Jeffery Gross**

This Estimate reflects the scope and schedule in report;

Validation Study

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)			
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	Program Year (Budget EC): Effective Price Level Date: 2023 1-Oct-22				TOTAL FIRST COST (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
						ESC (%)	COST (\$K)	CNTG (\$K)	REMAINING COST (\$K)					
02	RELOCATIONS	\$50,524	\$23,746	47%	\$74,271		\$50,524	\$23,746	\$74,271		16.9%	\$59,040	\$27,749	\$86,788
08	ROADS, RAILROADS & BRIDGES	\$118,948	\$55,905	47%	\$174,853		\$118,948	\$55,905	\$174,853		16.0%	\$137,976	\$64,849	\$202,825
10	BREAKWATER & SEAWALLS	\$556,254	\$261,439	47%	\$817,693		\$556,254	\$261,439	\$817,693		16.5%	\$647,980	\$304,550	\$952,530
11	LEVEES & FLOODWALLS	\$33,399	\$15,697	47%	\$49,096		\$33,399	\$15,697	\$49,096		26.7%	\$42,310	\$19,886	\$62,195
15	FLOODWAY CONTROL & DIVERSION STRUCTURE	\$274,023	\$128,791	47%	\$402,814		\$274,023	\$128,791	\$402,814		14.9%	\$314,908	\$148,007	\$462,914
16	BANK STABILIZATION	\$49,395	\$23,216	47%	\$72,611		\$49,395	\$23,216	\$72,611		19.2%	\$58,903	\$27,684	\$86,587
18	CULTURAL RESOURCE PRESERVATION	\$4,162	\$1,956	47%	\$6,118		\$4,162	\$1,956	\$6,118		17.1%	\$4,873	\$2,290	\$7,164
19	BUILDINGS, GROUNDS & UTILITIES	\$454	\$213	47%	\$667		\$454	\$213	\$667		26.7%	\$575	\$270	\$845
CONSTRUCTION ESTIMATE TOTALS:		\$1,087,158	\$510,964		\$1,598,122		\$1,087,158	\$510,964	\$1,598,122		16.5%	\$1,266,563	\$595,285	\$1,861,848
01	LANDS AND DAMAGES	\$80,053	\$13,469	17%	\$93,522	0.0%	\$80,053	\$13,469	\$93,522		10.1%	\$88,155	\$14,834	\$102,989
30	PLANNING, ENGINEERING & DESIGN	\$78,494	\$36,892	47%	\$115,386		\$78,494	\$36,892	\$115,386	\$46,526	16.7%	\$91,599	\$43,051	\$181,176
31	CONSTRUCTION MANAGEMENT	\$114,151	\$53,651	47%	\$167,802		\$114,151	\$53,651	\$167,802		20.2%	\$137,219	\$64,493	\$201,712
PROJECT COST TOTALS:		\$1,359,855	\$614,976	45%	\$1,974,832		\$1,359,855	\$614,976	\$1,974,832	\$46,526	16.5%	\$1,583,536	\$717,663	\$2,347,724

CHIEF, COST ENGINEERING, Jeffery Gross

PROJECT MANAGER, Frank Verga

CHIEF, REAL ESTATE, Helen Luke

ESTIMATED TOTAL PROJECT COST: \$2,347,724
ESTIMATED FEDERAL COST: **65%** \$1,526,021
ESTIMATED NON-FEDERAL COST: **35%** \$821,704

**** CONTRACT COST SUMMARY ****

PROJECT: **South Shore Staten Island**
LOCATION: **Staten Island, NY**

DISTRICT: **NAN**

PREPARED: **8/21/2023**

This Estimate reflects the scope and schedule in report;

Validation Study

POC: **CHIEF, COST ENGINEERING, Jeffery Gross**

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: Estimate Price Level:		13-Jul-23 1-Oct-22		Program Year (Budget EC): Effective Price Level Date:		2023 1-Oct-22						
WBS NUMBER	Civil Works Feature & Sub-Feature Description	RISK BASED				ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
		COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)									
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	R60% Area E													
02	RELOCATIONS	\$1,373	\$645	47.0%	\$2,018		\$1,373	\$645	\$2,018	2025Q1	7.3%	\$1,473	\$692	\$2,165
08	ROADS, RAILROADS & BRIDGES	\$3,238	\$1,522	47.0%	\$4,760		\$3,238	\$1,522	\$4,760	2025Q1	7.3%	\$3,475	\$1,633	\$5,109
15	FLOODWAY CONTROL & DIVERSION STRUCTURE	\$48,587	\$22,836	47.0%	\$71,424		\$48,587	\$22,836	\$71,424	2025Q1	7.3%	\$52,145	\$24,508	\$76,653
16	BANK STABILIZATION	\$9,148	\$4,299	47.0%	\$13,447		\$9,148	\$4,299	\$13,447	2025Q1	7.3%	\$9,817	\$4,614	\$14,431
CONSTRUCTION ESTIMATE TOTALS:		\$62,346	\$29,303	47.0%	\$91,648		\$62,346	\$29,303	\$91,648			\$66,910	\$31,448	\$98,358
01	LANDS AND DAMAGES	\$5,633	\$898	15.9%	\$6,532		\$5,633	\$898	\$6,532	2024Q2	4.4%	\$5,879	\$938	\$6,817
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$31	\$15	47.0%	\$46		\$31	\$15	\$46	2024Q2	6.4%	\$33	\$16	\$49
0.5%	Planning & Environmental Compliance	\$31	\$15	47.0%	\$46		\$31	\$15	\$46	2024Q2	6.4%	\$33	\$16	\$49
6.5%	Engineering & Design	\$405	\$190	47.0%	\$596		\$405	\$190	\$596	2024Q2	6.4%	\$431	\$203	\$634
0.5%	Reviews, ATRs, IEPRs, VE	\$31	\$15	47.0%	\$46		\$31	\$15	\$46	2024Q2	6.4%	\$33	\$16	\$49
0.5%	Life Cycle Updates (cost, schedule, risks)	\$312	\$147	47.0%	\$459		\$312	\$147	\$459	2024Q2	6.4%	\$332	\$156	\$488
0.5%	Contracting & Reprographics	\$312	\$147	47.0%	\$459		\$312	\$147	\$459	2025Q1	8.9%	\$340	\$160	\$499
1.5%	Engineering During Construction	\$935	\$439	47.0%	\$1,374		\$935	\$439	\$1,374	2025Q1	8.9%	\$1,018	\$479	\$1,497
0.5%	Planning During Construction	\$312	\$147	47.0%	\$459		\$312	\$147	\$459	2024Q2	6.4%	\$332	\$156	\$488
0.5%	Adaptive Management & Monitoring	\$312	\$147	47.0%	\$459		\$312	\$147	\$459	2025Q1	8.9%	\$340	\$160	\$499
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$6,235	\$2,930	47.0%	\$9,165		\$6,235	\$2,930	\$9,165	2025Q1	8.9%	\$6,789	\$3,191	\$9,980
0.5%	Project Operation:													
0.5%	Project Management	\$312	\$147	47.0%	\$459		\$312	\$147	\$459	2025Q1	8.9%	\$340	\$160	\$499
CONTRACT COST TOTALS:		\$77,208	\$34,538		\$111,746		\$77,208	\$34,538	\$111,746			\$82,811	\$37,096	\$119,907

**** CONTRACT COST SUMMARY ****

PROJECT: South Shore Staten Island
LOCATION: Staten Island, NY
This Estimate reflects the scope and schedule in report;

Validation Study

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Jeffery Gross

PREPARED: 8/21/2023

WBS Structure		ESTIMATED COST				PROJECT FIRST COST Dollar Basis (Constant)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 13-Jul-23 Estimate Price Level: 1-Oct-22				Program Year (Budget EC): 2023 Effective Price Level Date: 1-Oct-22								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	100% Floodwall	\$832	\$391	47.0%	\$1,223		\$832	\$391	\$1,223	2031Q3	26.7%	\$1,054	\$495	\$1,549
08	RELOCATIONS	\$1,208	\$568	47.0%	\$1,776		\$1,208	\$568	\$1,776	2031Q3	26.7%	\$1,531	\$719	\$2,250
11	ROADS, RAILROADS & BRIDGES	\$24,427	\$11,481	47.0%	\$35,908		\$24,427	\$11,481	\$35,908	2031Q3	26.7%	\$30,945	\$14,544	\$45,489
15	LEVEES & FLOODWALLS	\$12,293	\$5,778	47.0%	\$18,071		\$12,293	\$5,778	\$18,071	2031Q3	26.7%	\$15,574	\$7,320	\$22,893
16	FLOODWAY CONTROL & DIVERSION STRUCTURE	\$6,969	\$3,275	47.0%	\$10,245		\$6,969	\$3,275	\$10,245	2031Q3	26.7%	\$8,829	\$4,149	\$12,978
19	BANK STABILIZATION	\$454	\$213	47.0%	\$667		\$454	\$213	\$667	2031Q3	26.7%	\$575	\$270	\$845
	BUILDINGS, GROUNDS & UTILITIES													
CONSTRUCTION ESTIMATE TOTALS:		\$46,184	\$21,706	47.0%	\$67,890		\$46,184	\$21,706	\$67,890			\$58,506	\$27,498	\$86,004
01	LANDS AND DAMAGES	\$1,210	\$226	18.7%	\$1,436		\$1,210	\$226	\$1,436	2030Q3	23.4%	\$1,493	\$279	\$1,772
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$23	\$11	47.0%	\$34		\$23	\$11	\$34	2030Q3	28.7%	\$30	\$14	\$44
0.5%	Planning & Environmental Compliance	\$23	\$11	47.0%	\$34		\$23	\$11	\$34	2030Q3	28.7%	\$30	\$14	\$44
6.5%	Engineering & Design	\$300	\$141	47.0%	\$441		\$300	\$141	\$441	2030Q3	28.7%	\$386	\$182	\$568
0.5%	Reviews, ATRs, IEPs, VE	\$23	\$11	47.0%	\$34		\$23	\$11	\$34	2030Q3	28.7%	\$30	\$14	\$44
0.5%	Life Cycle Updates (cost, schedule, risks)	\$231	\$109	47.0%	\$340		\$231	\$109	\$340	2030Q3	28.7%	\$297	\$140	\$437
0.5%	Contracting & Reprographics	\$231	\$109	47.0%	\$340		\$231	\$109	\$340	2031Q3	32.6%	\$306	\$144	\$450
1.5%	Engineering During Construction	\$693	\$326	47.0%	\$1,019		\$693	\$326	\$1,019	2031Q3	32.6%	\$919	\$432	\$1,351
0.5%	Planning During Construction	\$231	\$109	47.0%	\$340		\$231	\$109	\$340	2030Q3	28.7%	\$297	\$140	\$437
0.5%	Adaptive Management & Monitoring	\$231	\$109	47.0%	\$340		\$231	\$109	\$340	2031Q3	32.6%	\$306	\$144	\$450
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$4,618	\$2,170	47.0%	\$6,788		\$4,618	\$2,170	\$6,788	2031Q3	32.6%	\$6,125	\$2,879	\$9,003
	Project Operation:													
0.5%	Project Management	\$231	\$109	47.0%	\$340		\$231	\$109	\$340	2031Q3	32.6%	\$306	\$144	\$450
CONTRACT COST TOTALS:		\$54,229	\$25,145		\$79,374		\$54,229	\$25,145	\$79,374			\$69,032	\$32,022	\$101,054

**** CONTRACT COST SUMMARY ****

PROJECT: South Shore Staten Island
LOCATION: Staten Island, NY
This Estimate reflects the scope and schedule in report;

Validation Study

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Jeffery Gross

PREPARED: 8/21/2023

WBS Structure		ESTIMATED COST				PROJECT FIRST COST Dollar Basis (Constant)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 13-Jul-23 Estimate Price Level: 1-Oct-22				Program Year (Budget EC): 2023 Effective Price Level Date: 1-Oct-22								
		RISK BASED												
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	30% Area C	\$130	\$61	47.0%	\$190		\$130	\$61	\$190	2026Q1	10.1%	\$143	\$67	\$210
08	RELOCATIONS	\$2,884	\$1,356	47.0%	\$4,240		\$2,884	\$1,356	\$4,240	2026Q1	10.1%	\$3,176	\$1,493	\$4,669
15	ROADS, RAILROADS & BRIDGES	\$43,996	\$20,678	47.0%	\$64,674		\$43,996	\$20,678	\$64,674	2026Q1	10.1%	\$48,445	\$22,769	\$71,214
16	FLOODWAY CONTROL & DIVERSION STRUCTURE	\$3,086	\$1,450	47.0%	\$4,536		\$3,086	\$1,450	\$4,536	2026Q1	10.1%	\$3,398	\$1,597	\$4,995
	BANK STABILIZATION													
CONSTRUCTION ESTIMATE TOTALS:		\$50,096	\$23,545	47%	\$73,641		\$50,096	\$23,545	\$73,641			\$55,161	\$25,926	\$81,087
01	LANDS AND DAMAGES	\$35,450	\$5,816	16.4%	\$41,266		\$35,450	\$5,816	\$41,266	2025Q2	7.3%	\$38,042	\$6,241	\$44,283
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$100	\$47	47.0%	\$147		\$100	\$47	\$147	2025Q2	9.7%	\$110	\$52	\$162
0.5%	Planning & Environmental Compliance	\$100	\$47	47.0%	\$147		\$100	\$47	\$147	2025Q2	9.7%	\$110	\$52	\$162
6.5%	Engineering & Design	\$1,302	\$612	47.0%	\$1,915		\$1,302	\$612	\$1,915	2025Q2	9.7%	\$1,429	\$672	\$2,101
0.5%	Reviews, ATRs, IEPs, VE	\$100	\$47	47.0%	\$147		\$100	\$47	\$147	2025Q2	9.7%	\$110	\$52	\$162
0.5%	Life Cycle Updates (cost, schedule, risks)	\$250	\$118	47.0%	\$368		\$250	\$118	\$368	2025Q2	9.7%	\$274	\$129	\$403
0.5%	Contracting & Reprographics	\$250	\$118	47.0%	\$368		\$250	\$118	\$368	2026Q1	12.3%	\$281	\$132	\$413
1.5%	Engineering During Construction	\$751	\$353	47.0%	\$1,104		\$751	\$353	\$1,104	2026Q1	12.3%	\$843	\$396	\$1,239
0.5%	Planning During Construction	\$250	\$118	47.0%	\$368		\$250	\$118	\$368	2025Q2	9.7%	\$274	\$129	\$403
0.5%	Adaptive Management & Monitoring	\$250	\$118	47.0%	\$368		\$250	\$118	\$368	2026Q1	12.3%	\$281	\$132	\$413
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$5,010	\$2,355	47.0%	\$7,365		\$5,010	\$2,355	\$7,365	2026Q1	12.3%	\$5,624	\$2,643	\$8,268
	Project Operation:													
0.5%	Project Management	\$250	\$118	47.0%	\$368		\$250	\$118	\$368	2026Q1	12.3%	\$281	\$132	\$413
CONTRACT COST TOTALS:		\$94,160	\$33,409		\$127,570		\$94,160	\$33,409	\$127,570			\$102,820	\$36,687	\$139,507

*** CONTRACT COST SUMMARY ***

PROJECT: South Shore Staten Island
LOCATION: Staten Island, NY
This Estimate reflects the scope and schedule in report;

Validation Study

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Jeffery Gross

PREPARED: 8/21/2023

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 13-Jul-23 Estimate Price Level: 1-Oct-22				Program Year (Budget EC): 2023 Effective Price Level Date: 1-Oct-22								
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	RISK BASED				ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	ESC (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F									
02	100% Levee & Tide Gate. 30% Hyland Blvd.													
	RELOCATIONS	\$348	\$163	47.0%	\$511		\$348	\$163	\$511	2031Q3	26.7%	\$440	\$207	\$647
11	LEVEES & FLOODWALLS	\$8,971	\$4,217	47.0%	\$13,188		\$8,971	\$4,217	\$13,188	2031Q3	26.7%	\$11,365	\$5,342	\$16,707
15	FLOODWAY CONTROL & DIVERSION STRUCTURE	\$20,157	\$9,474	47.0%	\$29,631		\$20,157	\$9,474	\$29,631	2031Q3	26.7%	\$25,535	\$12,002	\$37,537
16	BANK STABILIZATION	\$17,938	\$8,431	47.0%	\$26,370		\$17,938	\$8,431	\$26,370	2031Q3	26.7%	\$22,725	\$10,681	\$33,405
CONSTRUCTION ESTIMATE TOTALS:		\$47,415	\$22,285	47.0%	\$69,699		\$47,415	\$22,285	\$69,699			\$60,065	\$28,231	\$88,296
01	LANDS AND DAMAGES	\$5,587	\$836	15.0%	\$6,424		\$5,587	\$836	\$6,424	2030Q3	23.4%	\$6,896	\$1,032	\$7,928
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$24	\$11	47.0%	\$35		\$24	\$11	\$35	2030Q3	28.7%	\$31	\$14	\$45
0.5%	Planning & Environmental Compliance	\$24	\$11	47.0%	\$35		\$24	\$11	\$35	2030Q3	28.7%	\$31	\$14	\$45
6.5%	Engineering & Design	\$308	\$145	47.0%	\$453		\$308	\$145	\$453	2030Q3	28.7%	\$397	\$186	\$583
0.5%	Reviews, ATRs, IEPs, VE	\$24	\$11	47.0%	\$35		\$24	\$11	\$35	2030Q3	28.7%	\$31	\$14	\$45
0.5%	Life Cycle Updates (cost, schedule, risks)	\$237	\$111	47.0%	\$348		\$237	\$111	\$348	2030Q3	28.7%	\$305	\$143	\$448
0.5%	Contracting & Reprographics	\$237	\$111	47.0%	\$348		\$237	\$111	\$348	2031Q3	32.6%	\$314	\$148	\$462
1.5%	Engineering During Construction	\$711	\$334	47.0%	\$1,045		\$711	\$334	\$1,045	2031Q3	32.6%	\$943	\$443	\$1,386
0.5%	Planning During Construction	\$237	\$111	47.0%	\$348		\$237	\$111	\$348	2030Q3	28.7%	\$305	\$143	\$448
0.5%	Adaptive Management & Monitoring	\$237	\$111	47.0%	\$348		\$237	\$111	\$348	2031Q3	32.6%	\$314	\$148	\$462
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$4,741	\$2,228	47.0%	\$6,969		\$4,741	\$2,228	\$6,969	2031Q3	32.6%	\$6,288	\$2,955	\$9,243
	Project Operation:													
0.5%	Project Management	\$237	\$111	47.0%	\$348		\$237	\$111	\$348	2031Q3	32.6%	\$314	\$148	\$462
CONTRACT COST TOTALS:		\$60,018	\$26,419		\$86,437		\$60,018	\$26,419	\$86,437			\$76,233	\$33,621	\$109,854

*** CONTRACT COST SUMMARY ***

PROJECT: South Shore Staten Island
LOCATION: Staten Island, NY
This Estimate reflects the scope and schedule in report;

Validation Study

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Jeffery Gross

PREPARED: 8/21/2023

WBS Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 13-Jul-23 Estimate Price Level: 1-Oct-22				Program Year (Budget EC): 2023 Effective Price Level Date: 1-Oct-22								
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	RISK BASED				ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Mid-Point Date P	ESC (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
		COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F									
02	10% Oakwood Beach to Miller Field + Pond Area B													
	RELOCATIONS	\$7,990	\$3,755	47.0%	\$11,745		\$7,990	\$3,755	\$11,745	2028Q1	15.9%	\$9,261	\$4,353	\$13,614
08	ROADS, RAILROADS & BRIDGES	\$76,602	\$36,003	47.0%	\$112,605		\$76,602	\$36,003	\$112,605	2028Q1	15.9%	\$88,791	\$41,732	\$130,523
10	BREAKWATER & SEAWALLS	\$286,193	\$134,511	47.0%	\$420,704		\$286,193	\$134,511	\$420,704	2028Q1	15.9%	\$331,732	\$155,914	\$487,647
15	FLOODWAY CONTROL & DIVERSION STRUCTURE	\$105,880	\$49,763	47.0%	\$155,643		\$105,880	\$49,763	\$155,643	2028Q1	15.9%	\$122,727	\$57,682	\$180,409
16	BANK STABILIZATION	\$10,715	\$5,036	47.0%	\$15,751		\$10,715	\$5,036	\$15,751	2028Q1	15.9%	\$12,420	\$5,837	\$18,257
CONSTRUCTION ESTIMATE TOTALS:		\$487,380	\$229,068	47.0%	\$716,448		\$487,380	\$229,068	\$716,448			\$564,932	\$265,518	\$830,450
01	LANDS AND DAMAGES	\$24,307	\$4,192	17.2%	\$28,500		\$24,307	\$4,192	\$28,500	2026Q3	11.0%	\$26,981	\$4,654	\$31,635
30	PLANNING, ENGINEERING & DESIGN													
0.5%	Project Management	\$1,298	\$610	47.0%	\$1,909		\$1,298	\$610	\$1,909	2026Q3	14.0%	\$1,480	\$696	\$2,176
0.5%	Planning & Environmental Compliance	\$1,298	\$610	47.0%	\$1,909		\$1,298	\$610	\$1,909	2026Q3	14.0%	\$1,480	\$696	\$2,176
6.5%	Engineering & Design	\$16,880	\$7,933	47.0%	\$24,813		\$16,880	\$7,933	\$24,813	2026Q3	14.0%	\$19,241	\$9,043	\$28,285
0.5%	Reviews, ATRs, IEPs, VE	\$1,298	\$610	47.0%	\$1,909		\$1,298	\$610	\$1,909	2026Q3	14.0%	\$1,480	\$696	\$2,176
0.5%	Life Cycle Updates (cost, schedule, risks)	\$2,437	\$1,145	47.0%	\$3,582		\$2,437	\$1,145	\$3,582	2026Q3	14.0%	\$2,778	\$1,306	\$4,084
0.5%	Contracting & Reprographics	\$2,437	\$1,145	47.0%	\$3,582		\$2,437	\$1,145	\$3,582	2028Q1	19.3%	\$2,908	\$1,367	\$4,275
1.5%	Engineering During Construction	\$7,311	\$3,436	47.0%	\$10,747		\$7,311	\$3,436	\$10,747	2028Q1	19.3%	\$8,724	\$4,100	\$12,825
0.5%	Planning During Construction	\$2,437	\$1,145	47.0%	\$3,582		\$2,437	\$1,145	\$3,582	2026Q3	14.0%	\$2,778	\$1,306	\$4,084
0.5%	Adaptive Management & Monitoring	\$2,437	\$1,145	47.0%	\$3,582		\$2,437	\$1,145	\$3,582	2028Q1	19.3%	\$2,908	\$1,367	\$4,275
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$48,738	\$22,907	47.0%	\$71,645		\$48,738	\$22,907	\$71,645	2028Q1	19.3%	\$58,161	\$27,335	\$85,496
	Project Operation:													
0.5%	Project Management	\$2,437	\$1,145	47.0%	\$3,582		\$2,437	\$1,145	\$3,582	2028Q1	19.3%	\$2,908	\$1,367	\$4,275
CONTRACT COST TOTALS:		\$600,696	\$275,095		\$875,791		\$600,696	\$275,095	\$875,791			\$696,760	\$319,450	\$1,016,210

**** CONTRACT COST SUMMARY ****																
PROJECT: South Shore Staten Island LOCATION: Staten Island, NY This Estimate reflects the scope and schedule in report;					Validation Study					DISTRICT: NAN POC: CHIEF, COST ENGINEERING, Jeffery Gross					PREPARED: 8/21/2023	
WBS Structure		ESTIMATED COST				PROJECT FIRST COST Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)						
		Estimate Prepared: 13-Jul-23 Estimate Price Level: 1-Oct-22				Program Year (Budget EC): 2023 Effective Price Level Date: 1-Oct-22										
		RISK BASED														
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)		
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O		
02	10% Midland Beach to Ft. Wadsworth															
08	RELOCATIONS	\$39,853	\$18,731	47.0%	\$58,584		\$39,853	\$18,731	\$58,584	2028Q3	17.1%	\$46,669	\$21,934	\$68,603		
08	ROADS, RAILROADS & BRIDGES	\$35,014	\$16,457	47.0%	\$51,471		\$35,014	\$16,457	\$51,471	2028Q3	17.1%	\$41,003	\$19,271	\$60,274		
10	BREAKWATER & SEAWALLS	\$270,061	\$126,929	47.0%	\$396,989		\$270,061	\$126,929	\$396,989	2028Q3	17.1%	\$316,247	\$148,636	\$464,883		
15	FLOODWAY CONTROL & DIVERSION STRUCTURE	\$43,109	\$20,261	47.0%	\$63,371		\$43,109	\$20,261	\$63,371	2028Q3	17.1%	\$50,482	\$23,727	\$74,209		
16	BANK STABILIZATION	\$252	\$119	47.0%	\$371		\$252	\$119	\$371	2028Q3	17.1%	\$296	\$139	\$435		
18	CULTURAL RESOURCE PRESERVATION	\$4,162	\$1,956	47.0%	\$6,118		\$4,162	\$1,956	\$6,118	2028Q3	17.1%	\$4,873	\$2,290	\$7,164		
CONSTRUCTION ESTIMATE TOTALS:		\$392,452	\$184,452	47.0%	\$576,904		\$392,452	\$184,452	\$576,904			\$459,569	\$215,998	\$675,567		
01	LANDS AND DAMAGES	\$7,090	\$1,352	19.1%	\$8,443		\$7,090	\$1,352	\$8,443	2027Q1	13.0%	\$8,010	\$1,528	\$9,538		
30	PLANNING, ENGINEERING & DESIGN															
0.5%	Project Management	\$1,046	\$491	47.0%	\$1,537		\$1,046	\$491	\$1,537	2027Q1	15.7%	\$1,210	\$569	\$1,779		
0.5%	Planning & Environmental Compliance	\$1,046	\$491	47.0%	\$1,537		\$1,046	\$491	\$1,537	2027Q1	15.7%	\$1,210	\$569	\$1,779		
6.5%	Engineering & Design	\$13,592	\$6,388	47.0%	\$19,980		\$13,592	\$6,388	\$19,980	2027Q1	15.7%	\$15,732	\$7,394	\$23,126		
0.5%	Reviews, ATRs, IEPRs, VE	\$1,046	\$491	47.0%	\$1,537		\$1,046	\$491	\$1,537	2027Q1	15.7%	\$1,210	\$569	\$1,779		
0.5%	Life Cycle Updates (cost, schedule, risks)	\$1,962	\$922	47.0%	\$2,884		\$1,962	\$922	\$2,884	2027Q1	15.7%	\$2,271	\$1,067	\$3,338		
0.5%	Contracting & Reprographics	\$1,962	\$922	47.0%	\$2,884		\$1,962	\$922	\$2,884	2028Q3	21.2%	\$2,377	\$1,117	\$3,495		
1.5%	Engineering During Construction	\$5,887	\$2,767	47.0%	\$8,654		\$5,887	\$2,767	\$8,654	2028Q3	21.2%	\$7,133	\$3,353	\$10,486		
0.5%	Planning During Construction	\$1,962	\$922	47.0%	\$2,884		\$1,962	\$922	\$2,884	2027Q1	15.7%	\$2,271	\$1,067	\$3,338		
0.5%	Adaptive Management & Monitoring	\$1,962	\$922	47.0%	\$2,884		\$1,962	\$922	\$2,884	2028Q3	21.2%	\$2,377	\$1,117	\$3,495		
31	CONSTRUCTION MANAGEMENT															
10.0%	Construction Management	\$39,245	\$18,445	47.0%	\$57,690		\$39,245	\$18,445	\$57,690	2028Q3	21.2%	\$47,553	\$22,350	\$69,902		
0.5%	Project Operation: Project Management	\$1,962	\$922	47.0%	\$2,884		\$1,962	\$922	\$2,884	2028Q3	21.2%	\$2,377	\$1,117	\$3,495		
CONTRACT COST TOTALS:		\$471,213	\$219,490		\$690,702		\$471,213	\$219,490	\$690,702			\$553,302	\$257,815	\$811,117		

**** CONTRACT COST SUMMARY ****

PROJECT: South Shore Staten Island
LOCATION: Staten Island, NY
This Estimate reflects the scope and schedule in report;

Validation Study

DISTRICT: NAN
POC: CHIEF, COST ENGINEERING, Jeffery Gross

PREPARED: 8/21/2023

WBS Structure		ESTIMATED COST				PROJECT FIRST COST Dollar Basis)				(Constant	TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 13-Jul-23 Estimate Price Level: 1-Oct-22				Program Year (Budget EC): 2023 Effective Price Level Date: 1-Oct-22									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)		Mid-Point Date	ESC (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
A	B	C	D	E	F	G	H	I	J		P	L	M	N	O
16	Feasibility - Miller Field Offset BANK STABILIZATION	\$1,287	\$605	47.0%	\$1,891		\$1,287	\$605	\$1,891		2026Q2	10.3%	\$1,419	\$667	\$2,086
CONSTRUCTION ESTIMATE TOTALS:		\$1,287	\$605	47.0%	\$1,891		\$1,287	\$605	\$1,891				\$1,419	\$667	\$2,086
01	LANDS AND DAMAGES	\$774	\$148	19.2%	\$922		\$774	\$148	\$922		2026Q1	10.1%	\$852	\$163	\$1,016
30	PLANNING, ENGINEERING & DESIGN														
0.5%	Project Management	\$6	\$3	47.0%	\$9		\$6	\$3	\$9		2026Q1	12.3%	\$7	\$3	\$10
0.5%	Planning & Environmental Compliance	\$6	\$3	47.0%	\$9		\$6	\$3	\$9		2026Q1	12.3%	\$7	\$3	\$10
6.5%	Engineering & Design	\$75	\$35	47.0%	\$111		\$75	\$35	\$111		2026Q1	12.3%	\$85	\$40	\$124
0.5%	Reviews, ATRs, IEPRs, VE	\$6	\$3	47.0%	\$9		\$6	\$3	\$9		2026Q1	12.3%	\$7	\$3	\$10
0.5%	Life Cycle Updates (cost, schedule, risks)	\$6	\$3	47.0%	\$9		\$6	\$3	\$9		2026Q1	12.3%	\$7	\$3	\$10
0.5%	Contracting & Reprographics	\$6	\$3	47.0%	\$9		\$6	\$3	\$9		2026Q2	13.1%	\$7	\$3	\$10
1.5%	Engineering During Construction	\$19	\$9	47.0%	\$28		\$19	\$9	\$28		2026Q2	13.1%	\$21	\$10	\$32
0.5%	Planning During Construction	\$6	\$3	47.0%	\$9		\$6	\$3	\$9		2026Q1	12.3%	\$7	\$3	\$10
0.5%	Adaptive Management & Monitoring	\$6	\$3	47.0%	\$9		\$6	\$3	\$9		2026Q2	13.1%	\$7	\$3	\$10
31	CONSTRUCTION MANAGEMENT														
10.0%	Construction Management	\$129	\$61	47.0%	\$190		\$129	\$61	\$190		2026Q2	13.1%	\$146	\$69	\$214
0.5%	Project Operation: Project Management	\$6	\$3	47.0%	\$9		\$6	\$3	\$9		2026Q2	13.1%	\$7	\$3	\$10
CONTRACT COST TOTALS:		\$2,331	\$880		\$3,212		\$2,331	\$880	\$3,212				\$2,577	\$974	\$3,550

MII Reports

Print Date Tue 29 August 2023
Eff. Date 5/18/2023

U.S. Army Corps of Engineers
Project : South Shore Staten Island (SSSI) Contract 1 Interior Drainage Area E
SSSI Validation Study

Time 17:40:49
Summary Page 1

Description	UOM	Quantity	ProjectCost
Summary			62,345,760.74
Revised 60% CWE	JOB	1.0000	62,345,760.74
02 RELOCATIONS	JOB	1.0000	1,372,570.63
08 ROADS, RAILROADS & BRIDGES	JOB	1.0000	3,238,159.35
15 FLOODWAY CONTROL & DIVERSION STRUCTURE - DRAINAGE STRUCTURES	JOB	1.0000	4,266,740.57
15 FLOODWAY CONTROL & DIVERSION STRUCTURE - PONDING AREA	JOB	1.0000	44,320,697.71
16 BANK STABILIZATION	JOB	1.0000	9,147,592.48

Print Date Tue 29 August 2023
Eff. Date 5/18/2023

U.S. Army Corps of Engineers
Project : South Shore Staten Island Storm Risk Management Project (SSSI) Area C Pond
SSSI Validation Study

Time 17:43:07
Summary Page 1

Description	UOM	Quantity	ProjectCost
Summary			50,095,638.07
South Shore Staten Island Pond C 30%	JOB	1.0000	50,095,638.07
02 RELOCATION	JOB	1.0000	129,535.46
08 ROADS, RAILROADS & BRIDGES	JOB	1.0000	2,884,296.50
15 FLOODWAY CONTROL & DIVERSION STRUCTURES	JOB	1.0000	43,995,806.19
16 BANK STABILIZATION	JOB	1.0000	3,085,999.93

Print Date Tue 28 June 2022
Eff. Date 5/2/2022

U.S. Army Corps of Engineers
Project : South Shore Staten Island Storm Risk Management Project (SSSI) Area C Pond
SSSI Validation Study

Time 18:46:34

Summary Page 1

<u>Description</u>	<u>UOM</u>	<u>Quantity</u>	<u>ProjectCost</u>
Summary			40,160,606.32
South Shore Staten Island Pond C 30%	JOB	1.0000	40,160,606.32
08 ROADS, RAILROADS & BRIDGES	JOB	1.0000	23,633.08
16 BANK STABILIZATION	JOB	1.0000	40,020,518.04
19 BUILDING, GROUNDS & UTILITIES	JOB	1.0000	116,455.20

Print Date Tue 29 August 2023
Eff. Date 7/3/2023

U.S. Army Corps of Engineers
Project : Miller Field Off-Set Alternative B
SSSI Validation Study

Time 18:21:32
Summary Page 1

<u>Description</u>	<u>UOM</u>	<u>Quantity</u>	<u>ProjectCost</u>
Summary			1,286,664.84
Miller Field Off-Set Alternative B	JOB	1.0000	1,286,664.84
0016 BANK STABILIZATION	JOB	1.0000	1,286,664.84

Print Date Tue 29 August 2023
Eff. Date 5/22/2023

U.S. Army Corps of Engineers
Project : SSSI Seawall Alternatives
SSSI Validation Study

Time 18:14:17
Summary Page 1

Description	UOM	Quantity	ProjectCost
Summary			487,379,610.65
Oakwood Beach to Miller Field	LS	1.0000	487,379,610.65
Oakwood Beach to Miller Field	LS	1.0000	487,379,610.65
02 RELOCATIONS	LS	1.0000	7,989,672.75
08 ROADS, RAILROADS & BRIDGES	LS	1.0000	76,602,347.71
10 BREAKWATER & SEAWALLS	LS	1.0000	286,193,110.23
15 FLOODWAY CONTROL & DIVERSION STRUCTURE	LS	1.0000	105,879,577.87
16 BANK STABILIZATION	LS	1.0000	10,714,902.09

Print Date Tue 29 August 2023
Eff. Date 5/22/2023

U.S. Army Corps of Engineers
Project : SSSI Seawall Alternatives
SSSI Validation Study

Time 18:10:41
Summary Page 1

Description	UOM	Quantity	ProjectCost
Summary			392,451,657.93
Midland Beach to Ft. Wadsworth Seawall	LS	1.0000	392,451,657.93
Midland Beach to Ft. Wadsworth	LS	1.0000	392,451,657.93
02 RELOCATIONS	LS	1.0000	39,852,853.61
08 ROADS, RAILROADS & BRIDGES	LS	1.0000	35,014,451.34
10 BREAKWATER & SEAWALLS	LS	1.0000	270,060,832.73
15 FLOODWAY CONTROL & DIVERSION STRUCTURE	LS	1.0000	43,109,490.89
16 BANK STABILIZATION	LS	1.0000	252,429.36
18 CULTURAL RESOURCE PRESERVATION	LS	1.0000	4,161,600.00

Print Date Tue 29 August 2023
Eff. Date 5/18/2023

U.S. Army Corps of Engineers
Project SSSI: SSSI Floodwall
SSSI Validation Study

Time 17:55:19
Summary Page 1

Description	UOM	Quantity	ProjectCost
Summary			46,183,719.99
South Shore Staten Island - Contract 2 - Floodwall 100% Design	LS	1.0000	46,183,719.99
02 RELOCATIONS	JOB	1.0000	832,037.55
08 ROADS & BRIDGES	JOB	1.0000	1,208,315.49
11 LEVEES & FLOODWALLS	JOB	1.0000	24,427,230.31
15 FLOODWAY CONTROL & DIVERSION STRUCTURE	JOB	1.0000	12,293,474.16
16 BANK STABILIZATION	JOB	1.0000	6,969,082.09
19 BUILDINGS, GROUNDS & UTILITIES	JOB	1.0000	453,580.39

Print Date Tue 29 August 2023
Eff. Date 6/20/2023

U.S. Army Corps of Engineers
Project : SSSI Levee & Tide Gate 100% CWE
SSSI Validation Study

Time 17:54:17
Summary Page 1

Description	UOM	Quantity	ProjectCost
Summary			47,414,537.30
SSSI Levee & Tide Gate Contract 4	JOB	1.0000	47,414,537.30
02 RELOCATION	JOB	1.0000	347,674.16
11 LEVEES & FLOODWALLS	LS	1.0000	8,971,314.81
15 FLOODWAY CONTROL & DIVERSION STRUCTURE	LS	1.0000	20,157,075.69
16 BANK STABILIZATION	JOB	1.0000	17,938,472.64

DQC Comments