

Cost Estimate

The following cost estimate was prepared by Shabica and Associates, Inc., Coastal Consulting. It reflects the Hyde Park Community's preservation plan, and relies on the same unit prices and contingencies that STS did in putting together their cost estimate for the city's proposal.

Cost Estimate

Description	Item	Quantity	Units	Unit Price	Amount
MOBILIZATION AND DEMOBILIZATION	001	1	LS	\$1,400,000.00	\$1,400,000.00
TEMPORARY FIELD OFFICE, PROJECT SIGN AND SAFETY SIGN	002	1	LS	\$578,532.50	\$578,532.50
SITE PREPARATION AND DEMOLITION					
Existing Structure Removal	003	1	LS	\$179,523.25	\$179,523.25
Reset Existing Armor "Bedford" Stone as Toe - Segments ABEFD	004	6,285	TON	\$110.00	\$691,350.00
Reclaim Existing Toe Stone	005	12,000	TON	\$50.00	\$600,000.00
EARTH WORK AND EMBANKMENT					
Earth Fill	006	5,000	CY	\$8.00	\$40,000.00
Topsoil Placement	007	7,625	CY	\$11.00	\$83,875.00
SEPARATION/FILTRATION GEOTEXTILE					
Geotextile (Above Water)	008	75,000	SF	\$0.23	\$17,250.00
Geotextile (Below Water)	009	37,500	SF	\$3.35	\$125,625.00
STONE PLACEMENT AND CONSTRUCTION					
Type A- Stone (Saw cut "Bedford" Stone Elliott Quarry)	010	5,300	TON	\$150.00	\$795,000.00
Type A- Stone "Bedford" (Elliott Quarry)	011	5,400	TON	\$135.00	\$729,000.00
Type B- Stone (200 to 800 lbs.)	012	2,140	TON	\$60.00	\$128,400.00
Type C- Stone (1 to 150 lbs.)	013	3,900	TON	\$55.00	\$214,500.00
Select Stone (IDOT CA-7 crushed limestone)	014	16,630	TON	\$22.55	\$375,006.50
Bedding Stone Special (IDOT CA-1 gradation)	015	48,000	TON	\$22.00	\$1,056,000.00
SOD	016	114,942	SF	\$0.40	\$45,976.80
BITUMINOUS CONCRETE PAVEMENT	017	26,300	SF	\$4.30	\$113,090.00
CAST-IN-PLACE REINFORCED STRUCTURAL CONCRETE					
Furnish and Place Reinforced Concrete for Promenade Level Including Stair Sections, ramps, storm gaps	018	5,921	CY	\$380.00	\$2,249,980.00
Grout - below C Promenade, E Stepstones	019	2,500	CY	\$125.00	\$312,500.00
STEEL H-PILES					
Battered HP 12x53	020	6,150	FT	\$35.90	\$220,785.00
Battered HP 14x73	021	12,470	FT	\$41.90	\$522,493.00
Vertical HP 12x74	022	18,415	FT	\$27.60	\$508,254.00
Test Pile Load Test	023	1	LS	\$45,000.00	\$45,000.00
WOOD PILES (Ironwood Lumber, WI)	024	1,430	FT	\$110.00	\$157,300.00
METAL SHEET PILING, WALERS AND STRUTS					
Steel Sheet Pile (PZ27)	025	142,495	SF	\$17.30	\$2,465,163.50
Steel Walers and Struts for Steel Sheet Pile	026	1	LS	\$794,000.00	\$794,000.00
Steel Walers and Channels for Wood Piling	027	1,430	FT	\$225.00	\$321,750.00
Stainless Steel Railing	028	960	FT	\$110.00	\$105,600.00
SUBTOTAL					\$14,875,954.55
CONTINGENCY 15%					\$2,231,393.18
GRAND TOTAL					\$17,107,347.73
Cost estimate assumes a 2 year construction schedule					

APPENDIX 1 - Promontory Park step stone revetment and promenade, assumptions

1. Contract Plans *Chicago Shoreline Damage Reduction 54th Street to 57th Street, Specifications and Contract Documents, 2001, 50% and 75% Submittals*, City of Chicago, and Drawings i, iii and iv in *Promontory Point in Burnham Park 54th to 57th Streets in Chicago, Illinois* dated March 12, 2003, have been used as a basis to provide construction cost estimates for the restoration of the stepped limestone revetment system at Promontory Park. In several cases, the Community's Preservation Plan drawings were altered to conform to modern structural and coastal engineering practices. For instance, the toe stone and promenade designs have been modified in order to assure structural stability and allow for better estimates for quantities of steel, stone and concrete (see revisions 7/2003). There are other design modifications that will need to be made if it is decided to proceed with the Community's Preservation Plan.
2. Available limestone blocks to be reused have dimensions as measured by Cyril Galvin (average dimensions from 250 blocks, measured June 2002).
3. Lengths of sections (NX through SX) are indicated by coordinate system in feet.
4. No work is to be done at sections NX and SX and no work on step stones at sections E and F.
5. 75% of existing Bedford stones can be reused.
6. Second (lower) tier of stone in original promenade as shown by "Burnham Park Permanent Shore Protection at 55th Street, May 16, 1936 (Sheet H-12)" are not incorporated in the estimates but can be reused for a credit to the client.
7. Although the step revetment designs show a single armor layer, this can be modified to a 2 armor layer structure. This will require sawcutting one side (bottom) of all top layer step stones, an additional 4,610 tons of (top-side sawcut) bottom layer step stones, filter-layer stone, bedding stone and additional geotextile. This will increase the estimated construction cost by \$812,000.
8. Steel sheeting and battered piles will be driven lakeward of existing wood pile and stone structure (typically 15 feet). At locations where the plans call for closer sheet piles (for example Segment C, "Coffins"), precautions should be taken to avoid collapse of the wood and concrete when toe stones are rehandled. Options include but are not limited to driving a temporary sheet pile wall farther off the existing wood piles or grouting the voids under the concrete prior to rehandling toe stone and driving piles.

APPENDIX 2 Estimation of available Bedford Stone for reuse in new structures

1. Method 1 Use original Park District design cross-section from "Burnham Park Permanent Shore Protection at 55th Street, May 16, 1936, sheet H-12" to find total volume (ft³) of Bedford stones in step structure, 3400 feet in length (*includes lower tier of 5 Bedford stones not estimated in methods 2 and 3*).

Cross-sectional area 130 ft² x length 3400 ft. = 442,000 ft³ total volume

Calculate volume of stones replaced by 720 ft. long concrete "coffin" structure at east end of Promontory Point shown in "55th Street Promontory New Concrete Walk Plans & Section, July 16, 1964," coordinates 1218+80 to 1226+00"

4ft thick x 18ft wide x 720ft long = 51,840 ft³ volume

Subtract volume of stone replaced by concrete "coffin" structure from total volume

442,000 ft³ - 51,840 ft³ = 390,160 ft³

Assume limestone density of 144 lbs./ft³ (Associated Geologists, Inc. (AGI) report, 4/4/2001) and porosity of 30%.

$$\frac{144 \text{ lbs./ft}^3 \times 390,160 \text{ ft}^3 \times 0.7}{2000 \text{ lbs./ton}} = 19,664 \text{ tons Bedford stone}$$

The estimated weight of the lower tier of 5 stone is

$$\frac{(4 \times 4 \text{ ft.} \times 2.75 \text{ ft. plus } 1 \times 3 \text{ ft} \times 2.25 \text{ ft}) \times 3400 \text{ ft} \times 144 \text{ lb/ft}^3 \times 0.7}{2000 \text{ lb.}} = 8696 \text{ tons}$$

If it is assumed that none of the lower tier stones are available, then the total is reduced to **10,967 tons Bedford Stone**

2. Method 2 Use average dimensions for 250 blocks, measured June, 2002 (Cyril Galvin report, 11/18/02), to calculate volume (ft³) for 3400 foot structure (Shabica Figure 1). *Lower tier of Bedford stones shown in May 16, 1936 drawings not used for area due to unknown sizes and condition of blocks.* This is based on 4 step stone blocks at 4 ft. by 2.25 ft. plus 4 promenade blocks at 4 ft. by 2.25 ft.

$$80 \text{ ft}^2 \text{ cross-sectional area} \times 3400 \text{ ft. length} = 256,000 \text{ ft}^3$$

Calculate volume of stones replaced by 720 ft. long concrete "coffin" structure at east end of Promontory Point based on Galvin measurements

$$4 \text{ stones} \times 2.75 \text{ ft} \times 4 \text{ ft. stone cross-section} \times 720 \text{ft} = 31,680 \text{ ft}^3$$

$$256,000 \text{ ft}^3 - 31,680 \text{ ft}^3 = 224,320 \text{ ft}^3$$

Assume limestone density of 144 lbs./ft³ and porosity of 30%

$$144 \text{ lbs./ft}^3 \times 224,320 \text{ ft}^3 \times 0.7 = 11,305 \text{ tons Bedford stone}$$

3. Method 3 Use Stone Block Inventory from 54th to 57th street by Associated Geologists, Inc. report, April 4, 2001. Individual limestone blocks were measured onsite and listed by row (from promenade-row 1 to upper step-stone row 6). The weight, in tons, for an average stone in a 100 ft long row was calculated by AGI using average stone dimensions and 143.9 lbs./ft³. These per/stone weights were multiplied by the number of stones AGI counted in each row and added together for the 3000 ft. section of revetment measured. The total weight of Bedford stones reported by AGI is approximately **10,000 tons** or 3.333 tons per linear foot of revetment. If this average stone weight per foot is multiplied by the 400 foot section not measured, 1,333 additional tons can be added for a total stone weight of **11,333 tons Bedford stone**.

Conclusion

Based on the above comparisons, we recommend using 11,000 tons as a conservative estimate for existing Bedford stone. This number should be reduced by approximately 1965 tons to **9035 tons** as the stone at sections NX and SX and steps at sections E and F will not be reused. If it is assumed that only 75% of these can be reused in the proposed promenade or steps then the amount of existing Bedford stone available is **6,776 tons**.

It is our opinion that the actual stone available to be reused on site is closer to 8,700 tons if 75% of one-third of the lower promenade tier of Bedford stone shown on sheet H-12 is recovered. In the AGI report it is stated, "In the few instances where the blocks in Row 2 or Row 3 have collapsed, and the interior or the block design can be viewed, additional blocks were observed in about one-third of the cases."

APPENDIX 3 Steel Estimates for Promontory Point Concepts-March 12, 2003 Proposal

STEEL SHEET

Coordinates	Length (ft.)	Sheet Pile Type/ Min. Length	Area (ft.2)	Unit Price	Amount
1207+25 to 1217+51	1026	PZ27/40 feet	41040		
1217+51 to 1228+50	1099	PZ27/45 feet	49455		
1228+50 to 1239+00	1050	PZ27/40 feet	42000		
1212+25 to 1214+50	250	PZ27/40 feet	10000		
Total	3175 ft.		142,495 ft2	\$17.30 per ft2	\$2,462,463.50

BATTERED PILES

Coordinates	Length (ft.)	Battered Pile Type/ Min. Length	Spacing	Total Piles Needed	Total Linear Feet	Unit Price	Amount
1207+25 to 1214+45	720	HP 12x53/50 feet	9'-0" centers	80 +1 for end	4050	\$35.90 per foot	\$145,395
1214+45 to 1228+50	1405	HP 14x73/60 feet	9'-0" centers	156 +1 for end	9420	\$41.90 per foot	\$394,698
1228+50 to 1234+49	599	HP 14x73/50 feet	9'-0" centers (233 feet) 11'-0" centers (366 feet)	26 +1 for end 33 +1 for end	1350 1700	\$41.90 per foot	\$127,795
1234+49 to 1239+00	451	HP 12x53/50 feet	11'-0" centers	41 +1 for end	2100	\$35.90 per foot	\$75,390
Total	3175 ft.			341 piles	18620 feet		\$734,278.00

VERTICAL PILES

Coordinates	Length (ft.)	Vertical Pile Type/ Min. Length	Spacing	Total Piles Needed	Total Linear Feet	Weight (Tons)	Unit Price	Amount
1207+25 to 1217+51	1026	HP 12x74/50 feet	Max. 9'-0" centers	114 +1 for end	5750			
1217+51 to 1228+50	1099	HP 12x74/55 feet	Max. 9'-0" centers	122 +1 for end	6765			
1228+50 to 1239+00	1050	HP 12x74/50 feet	Max. 9'-0" centers	117 +1 for end	5900			
Total	3175 ft.			355 piles	18415 feet		\$27.60 per foot	\$508,254.00

