Appendix Q

Conceptual Estimates of
Engineering Design and Construction Costs

THE CONCRETE EXTENSION OF THE HIGH BATTERY SEAWALL
(approximately 120 linear feet)

Project mobilization/demobilization	$ 10,000
Project superintendent and field office expenses	$ 60,000
Barge and crane for 6 months	$ 48,000
Construct a temporary cofferdam around the seaward perimeter of the seaward seawall	$ 172,000
Construct a temporary sheet pile retaining wall system around the landside perimeter of the landside seawall	$ 36,000
Remove existing concrete walkway panels	$ 9,000
Excavate and remove from the site the existing earth fill remaining between the seaward and landside seawalls	$ 7,000
Excavate and remove from the site the earth between the landside seawall and the temporary steel sheet pile retaining wall system as necessary	$ 7,000
Demolish and remove the concrete deck beams	$ 5,000
Demolish and remove the concrete seaward seawall, interior counterfort walls, any projecting concrete veil structure, and the concrete landside seawall	$ 83,000
Test existing timber piles with sonic testing procedure	$ 5,000
Drive new supplemental prestressed concrete piles	$ 167,000
Reinforce the existing earth subgrade with crushed stone	$ 3,000
Construct a new concrete seaward seawall with its base extending several feet below the mud line	$ 232,000
Construct a new concrete landside seawall	$ 53,000
Replace the concrete deck beams	$ 15,000
Place new earth fill between the seawalls and install new concrete walkway	$ 16,000
panels	$ 10,000
Install new railing system and replace stairs	
Place new earth fill between the landside seawall and the temporary steel sheet pile retaining wall system and remove steel sheet piles	$ 15,000
Place additional stone riprap around the seaward perimeter of the new seawall and remove the cofferdam system	$ 59,000
Subtotal Estimated Field Construction Costs	$ 1,012,000
Contractor Overhead and Profit (20% x $1,012,000)…(rounded value)	$ 202,000
Subtotal Estimated Construction Costs	$ 1,214,000
Permit application with federal and state regulatory agencies	$ 10,000
Surveys, soil borings, geotechnic engineering (1.5% x $1,214,000)…(rounded value)	$ 18,000
Engineering design, inspection, and project management	$ 121,000
(10% x $1,214,000)…(rounded value)	$ 12,000
Reimbursable expenses (1% x $1,214,000)…(rounded value)	$ 161,000
Subtotal estimated engineering design costs	

Subtotal estimated engineering design and construction costs	$ 1,375,000
Contingency factor of conceptual estimate phase (30% x $ 1,375,000)…(rounded value)	$ 413,000
Total estimated engineering design and construction costs	**$ 1,788,000**
Total Estimated Engineering Design and Construction Costs (rounded) **For The Concrete Extension of the High Battery Seawall**	**$ 1,800,000**

THE LOW BATTERY SEAWALL
(approximately 4,825 linear feet)

Project superintendent and field office expenses (assumes a 24 month project)	$ 200,000
Various trucks and equipment (assumes a 24 month project)	$ 40,000
Temporarily remove stone rip rap located immediately adjacent to the seawall and above the top of the protective concrete veils	$ 86,000
Pressure wash the seaward face of the seawall	$ 36,000
Remove the zones of soft and weaken of concrete along the seaward face of the seawall (estimated at 24,125 cubic feet)	$ 1,303,000
Drill top face of concrete veil sections as necessary to reinstall and epoxy grout new steel reinforcing dowels	$ 215,000
Sand blast or water blast the new interface surface of the existing concrete substrate to achieve satisfactory bond preparation	$ 118,000
Install the necessary quantities of repair concrete compatible with the existing concrete	$ 464,000
Reinstall the displaced place stone rip rap	$ 86,000
Remove and replace the concrete coping along the top of the seawall and perform other necessary minor concrete repairs to the seaward face of the seawall	$ 145,000
Remove and replace the sidewalks adjacent to the Low Battery seawall from the foot of King Street to Tradd Street and raise the granite curb (assumes 3,925 l.f.)	$ 424,000
Subtotal Estimated Field Construction Costs	$ 3,117,000
Contractor Overhead and Profit (20% x 3,117,000)… (rounded)	$ 623,000
Subtotal Estimated Construction Costs	$ 3,740,000
Permit application with federal and state regulatory agencies	$ 10,000
Surveys, core samples, existing concrete petrography testing (1% x 3,740,000)…(rounded value)	$ 37,000
Engineering design, inspection, and project management (10% x 3,740,000)…(rounded value)	$ 374,000
Reimbursable expenses (1% x 3,740,000)…(rounded value)	$ 37,000
Subtotal estimated engineering design costs	$ 458,000
Subtotal estimated engineering design and construction costs	$ 4,198,000
Contingency factor of conceptual estimate phase (30% x $4,198,000)…(rounded value)	$ 1,259,000
Total estimated engineering design and construction costs	**$ 5,457,000**
Total Estimated Engineering Design and Construction Costs (rounded) For The Low Battery Seawall	**$ 5,500,000**

THE STONE MASONRY PORTION OF THE HIGH BATTERY SEAWALL

(approximately 1425 linear feet)

Project superintendent and field office expenses (assumes a 6 month project)	$ 50,000
Various trucks and equipment (assumes a 6 month project)	$ 10,000
Temporarily remove groupings of adjacent flagstones	$ 71,000
Place geotextile fabric on top of existing earth fill between the seawalls	$ 3,000
Add necessary additional fill between the seawalls to provide additional support to the underside of the flagstones forming the walkway	$ 53,000
Prepare the bearing/bedding surface for the individual flagstones where they are supported by the seaward seawall and landside seawall	$ 43,000
Reinstall flagstones	$ 71,000
Apply mortar to the joints between edges of adjacent stones as necessary to provide transition and limit possible erosion of underlying earth fill	$ 19,000
Apply mortar to the joints between the edges of the flagstones stones and the seaward and landside seawall as necessary to provide transition and limit possible erosion of underlying earth fill	$ 17,000
Point the mortar joints of the seaward face	$ 110,000
Subtotal Estimated Field Construction Costs	$ 447,000
Contractor Overhead and Profit (20% x 447,000)… (rounded)	$ 89,000
Subtotal Estimated Construction Costs	$ 536,000
Permit application with federal and state regulatory agencies	$ 10,000
Surveys, preliminary site work (1% x 536,000)…(rounded value)	$ 5,000
Engineering design, inspection, and project management (10% x 536,000)…(rounded value)	$ 53,000
Reimbursable expenses (1% x 536,000)…(rounded value)	$ 5,000
Subtotal estimated engineering design costs	$ 73,000
Subtotal estimated engineering design and construction costs	$ 609,000
Contingency factor at conceptual estimate phase (30% x $609,000)…(rounded value)	$ 183,000
Total estimated engineering design and construction costs	**$ 792,000**
Total Estimated Engineering Design and Construction Costs (rounded) For The Stone Masonry Portion of The High Battery Seawall	**$ 800,000**

THE MARINA SEAWALL

(approximately 405 linear feet)

Project superintendent and field office expenses (assumes a 6 month project)	$ 50,000
Various trucks and equipment (assumes a 6 month project)	$ 10,000
Remove the existing asphalt parking surface immediately adjacent to the landside of the existing seawall	$ 4,000
Carefully excavate down on the landside of the existing seawall to remove any existing large obstructing debris in the earth fill	$ 16,000
Power wash, water blast and/or sand blast the seaward and the landside faces of the existing seawall to prepare it for the necessary tabby concrete repairs	$ 11,000
Repair the seaward and landside faces of the existing tabby concrete seawall	$ 70,000
Drill the shafts, set in place the steel reinforcing cages, place the concrete into the shafts, and remove from the site the earth excavated by the drilling operation	$ 325,000
Place steel reinforcing bars and pour the concrete for the pile-cap portion of the new landside seawall	$ 81,000
Place steel and pour the concrete for the vertical wall portion of the new landside seawall	$ 86,000
Remove temporary forms between the new and existing seawalls and fill the narrow void between with crushed stone fill to maintain a bond breaker	$ 1,000
Replace earth fill and restore the asphalt parking lot	$ 22,000
Subtotal Estimated Field Construction Costs	$ 676,000
Contractor Overhead and Profit (20% x 676,000)… (rounded)	$ 135,000
Subtotal Estimated Construction Costs	$ 811,000
Permit application with federal and state regulatory agencies	$ 10,000
Surveys, Geotechnic Engineering (1.5% x 811,000)…(rounded value)	$ 12,000
Engineering Design, Inspection, and Project Management (10% x 811,000)…(rounded value)	$ 81,000
Reimbursable Expenses (1% x 811,000)…(rounded value)	$ 8,000
Subtotal estimated engineering design costs	$ 111,000
Subtotal estimated engineering design and construction costs	$ 922,000
Contingency factor of conceptual estimate phase (30% x $922,000)…(rounded value)	$ 277,000
Total estimated engineering design and construction costs	**$ 1,199,000**
Total Estimated Engineering Design and Construction Costs (rounded) For The Marina Seawall	**$ 1 ,200,000**