



**US Army Corps
of Engineers** ®
Chicago District

**BUBBLY CREEK, SOUTH BRANCH OF THE
CHICAGO RIVER, ILLINOIS INTEGRATED
ECOSYSTEM RESTORATION FEASIBILITY
REPORT & ENVIRONMENTAL ASSESSMENT**

**APPENDIX E
COST ENGINEERING**



MARCH 2020

Certified Total Project Cost assumes NO CERCLA liability associated with immediate or adjacent Operable Units. If waiver of Liability cannot be obtained between USACE and EPA, project contingency and costs will need to be re-calculated and re-certified

**Bubbly Creek, South Branch of the Chicago River
Ecosystem Restoration**

Alternative Formulation Briefing

APPENDIX E –Cost Estimate

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1 Project Scope

The purpose of this Feasibility Study is to identify ecosystem restoration measures that meet these criteria and to document and recommend either 1) “no action” or 2) a project that would restore important wetland habitat at Bubbly Creek.

The National Ecosystem Restoration (NER) Plan is the recommended plan. This alternative consists of seven (7) measures: (SR) Substrate Restoration – Option 1, (ST) Substrate Restoration – Option 2, (RB) Riparian Planting – Option 1, (EA) Emergent Planting, (SP) Submergent Planting, (WD) Woody Debris, (CB) Pebble/Cobble Beds. The implementation of all of these measures will restore a backwater shrub swamp community to Bubbly Creek.

Site Preparation – The first task would be to install safety fencing, signage and other safety features in order to keep the public out of the site during heavy construction. Staging areas and access roads would be demarcated.

Substrate / Amendment Placement – Channel and turning basin substrates would be placed as soon as site preparation is completed. A small barge would be used to place substrate. Sand would be placed in a 6 inch thick layer within the channel and turning basin. This would then be followed by the placement of a 6 inch thick layer of rounded river rock or limestone. Cobbles and boulders would then be placed around any structures or non-conformities (e.g. bridge abutments, outfalls, protruding revetments, etc.) to provide additional protection against high flow velocities in and around these structures.

Native Plant Community Establishment – The finishing touch of the project would be to establish native plant communities (e.g. riparian, emergent, and submergent) over the remainder of the construction period. Non-native and invasive vegetation would first be removed by hand cutting and herbiciding. Soil amendments consisting of leaf compost would be incorporated into the top 6 inches of substrate for emergent and submergent plant communities. In addition, approximately 6 inches of leaf compost would need to be placed along the riparian zone prior to native plantings. Once in the 2nd year of restoration and the initial seeding complete, the site may be open back to the public since very few activities would be occurring, which are considered low impact. These include spot herbicide application and planting native plugs, which are very similar to home gardening activities.

Large Woody Debris Additions – Woody debris piles consisting of trees greater than 4 inches in diameter would be placed along designated areas within the stream channel to provide aquatic habitat and protect emergent plantings from high flow velocities. Woody debris would be acquired from the riparian zone where invasive and nonnative species will be removed as part of the native plant community establishment.

Pebble/Cobble Beds - The introduction of pebble/cobble beds measure seeks to provide coarser substrates for native fish spawning and habitat for aquatic macroinvertebrates. A mix of pebble and cobble substrates would be used to fill the existing wood cribs (remnants of former bank

stabilization structures) located longitudinally along portions of the Bubbly Creek channel. The wood cribs would be filled to an approximate depth of 18-inches (0.25 acres).

2 Cost Methodology

2.1 General

The feasibility cost estimate for the preferred plan has been prepared using MCACES 2nd Generation MII Version 4.2. The preparation of the cost estimate is in accordance with guidelines and policies included in: “ER 1110-1-1300 - Cost Engineering Policy and General Requirements, (26 March 1993)”; “ER 1110-2-1302 - Civil Works Cost Engineering, (15 Sept 2008)”; “EI 01D010, Construction Cost Estimates (1 Sept 1997)”; “EM 1110-1-8, Construction Equipment Ownership and Operating Expense Schedule, Region II, (2016)”; and “EM 1110-2-1304, Civil Works Construction Cost Index System (CWCCIS), (30 March 2019)”; “ETL 1110-2-573, Construction Cost Estimating Guide for Civil Works, (30 Sept 2008).” The estimate was completed using the latest guidance from OCE concerning implementation of the Civil Works Breakdown Structure (CWBS) and Chart of Accounts. MII estimate software was used to apply unique crews to detailed work items and obtaining material and supply quotes from prospective vendors/contractors where possible for significant cost items. For the sand /armor stone placement, historical costs from U.S. Environmental Protection Agency projects in the Chicago area were used as a check of the MII estimate.

2.2 Direct Costs

Direct costs are based on anticipated equipment, labor and materials necessary to construct this project. Direct costs have been calculated independent of the contractor assigned to perform the tasks. Following formulation of the direct cost, a determination is made as to whether the work would be performed by the prime contractor or a subcontractor.

2.2.1 Quantities

The estimate is based on detailed quantity take-offs prepared from the drawings as used as the basis of the estimate and augmented by spot checks performed by re-taking-off the original drawings. Quantities for substrate restoration include a 25% contingency built in for allowances around bridges and outfalls.

2.2.2 Vendor Quotes

Vendor quotes have been acquired and documented for the large volume material prices associated with significant features of work including sand, stone and plantings.

2.2.3 Crews

Project specific crews have been developed for use in estimating the direct costs for invasive species removal and planting items. Crew members consist of selected components of labor classifications and equipment pieces assembled to perform specific tasks. Productivity has been assigned to each crew reflective of the expected output per unit of measure for the specific activities listed in the cost estimate. Foremen have also been considered in the crews.

2.2.4 Work Schedules/Overtime

The estimate assumes a 5 day/week 10 hr/day work schedule to optimize production of mobilized equipment.

2.2.5 Productivity

Crew productivity for plantings were based on past ecosystem restoration project production rates with a 50% reduction for working from barges/pontoon boats in Bubbly Creek. No further adjustments or reductions were made.

2.2.6 EPA Substrate Restoration Costs

The estimate for the substrate restoration was developed on a crew basis with quotes for the materials. The costs were cross checked against information received from the U.S. E.P.A. on projects in the Chicago area, in particular the Grand Calumet River in northwest Indiana. Actual bid prices were used as a check of the detailed crew and material costs for this work.

2.2.7 Sales Tax

No sales tax is included in the estimate since all materials will be incorporated (sand, armor stone, plantings, etc.).

2.3 Indirect Costs

2.3.1 Acquisition Strategy

At this stage the acquisition strategy has not been determined. It is assumed that this work will be performed in two contracts. The first contract is assumed to be a construction contract for the installation of the sand and armor stone and also includes submergent plantings. Given the larger dollar value of the work it is assumed to be an open competitively bid contract.

The second contract is assumed to be a service contract for the stream bank work (invasive species clearing and plantings). Given the smaller size it was assumed to be most likely a competitively bid small business set aside.

2.3.2 Home Office, Job Office and Profit Markups

A typical rate for Home Office (HOOH) percentage was used for the construction contract. A slightly higher HOOH was used on the service contract to account for a small business set aside. The percentages used are typical of those seen on projects recently through audited rates on modifications.

Job Office Overheads were calculated for each contract based on the projected schedule.

Profit is included.

2.3.3 Bond

For the construction contract bond was added as a contractor markup for the prime contractor and applied as a running percentage to prime's own work.

For the service contract bond was added as a contractor markup for the prime contractor planting applied as a running percentage to prime's own work.

2.3.4 Subcontractors

For the construction contract it was assumed the prime contractor will place the cap and stone. A subcontractor was assumed for the submergent planting work. For the service contract, all work was assumed to be done by the prime given the work consists of invasive species removal, soil prep work and plantings.

2.4 Project Feature Accounts

The Bubbly Creek baseline cost estimate was prepared and organized according to the Civil Works Breakdown Structure (CWBS). As such, the estimate includes the following feature accounts:

2.4.1 (9) Channels and Canals

This feature account includes the cost for the construction contract. Key items of work include: placement of the sand and rounded river stone layer as well as other in water work such as organic material placement, submergent planting and placement of large woody debris.

2.4.2 (16) Bank Stabilization

This feature account includes the cost for the service contract. Key items of work include: removal of invasive species from the stream bank, soil preparation, emergent plantings and riparian plantings.

2.4.3 (30) Planning, Engineering, and Design

The work covered under this account includes project management, project planning, preliminary design, final design, preparation of plans, preparation of specifications, engineering during construction, advertisement, opening of bids, and contract award.

2.4.4 (31) Supervision and Administration

The work covered under this account includes contract supervision, contract administration, construction administration, technical management activities, and District office supervision and administration costs.

2.5 Risk-Based Contingency Development

An Abbreviated Risk Analysis was performed on this project. The results of the analysis for construction are 26%, 12% for E&D and 9% for S&A.

The project type selected was Moderate Risk: Typical project or possible life safety. This work involves considerable in-water work for the contractor which is considered typical. Work is not complex in nature or considered high risk.

2.6 ESTIMATED COST

The PDT developed a project implementation schedule for project that supports the development of the fully funded cost estimates. The baseline cost estimate at PL 1 Oct 2020 is \$17,934,000.

2.7 FULLY FUNDED COST ESTIMATE

The fully funded cost estimate including inflation to the mid-point of construction is \$19,137,000 as shown in the Total Project Cost Summary. The fully funded table distributes the base level cost estimate across the appropriate years according to the schedule. Each feature account is inflated to the mid-point of expenditure activity using CWCCIS factors. These inflated feature account totals are summed to yield a total fully funded project cost.

Bubbly Creek
Ecosystem Restoration Feasibility Study

Appendix E – Cost Estimate

**** TOTAL PROJECT COST SUMMARY ****

Printed: 3/12/2020
Page 1 of 3

PROJECT: Bubbly Creek - NER Plan
PROJECT NIP2 113805
LOCATION: Chicago, IL

DISTRICT: Chicago District
POC: CHIEF, COST ENGINEERING, R. Mishra

PREPARED: 7/19/2019

This Estimate reflects the scope and schedule in report:

Final Feasibility Report 2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	Program Year (Budget EC): Effective Price Level Date:				Spent Thru: 1-Oct-18 (\$K) K	TOTAL FIRST COST (\$K) K	INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
						ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J						
09	CHANNELS & CANALS	\$6,852	\$2,061	30.1%	\$8,913	5.7%	\$7,242	\$2,178	\$9,421	\$0	\$9,421	8.5%	\$7,858	\$2,364	\$10,222
16	BANK STABILIZATION	\$3,621	\$611	16.9%	\$4,232	5.7%	\$3,827	\$645	\$4,473	\$0	\$4,473	4.2%	\$3,986	\$675	\$4,662
CONSTRUCTION ESTIMATE TOTALS:		\$10,473	\$2,672		\$13,145	5.7%	\$11,069	\$2,824	\$13,893	\$0	\$13,893	7.1%	\$11,844	\$3,039	\$14,883
01	LANDS AND DAMAGES	\$606	\$152	25.0%	\$758	5.7%	\$641	\$160	\$801	\$0	\$801	0.0%	\$641	\$160	\$801
30	PLANNING, ENGINEERING & DESIGN	\$1,885	\$217	11.5%	\$2,102	7.4%	\$2,024	\$233	\$2,257	\$0	\$2,257	5.3%	\$2,130	\$245	\$2,375
31	CONSTRUCTION MANAGEMENT	\$838	\$78	9.3%	\$916	7.4%	\$900	\$84	\$983	\$0	\$983	9.6%	\$986	\$92	\$1,078
PROJECT COST TOTALS:		\$13,802	\$3,118	22.6%	\$16,920		\$14,633	\$3,300	\$17,934	\$0	\$17,934	6.7%	\$15,601	\$3,536	\$19,137

CHIEF, COST ENGINEERING, R. Mishra

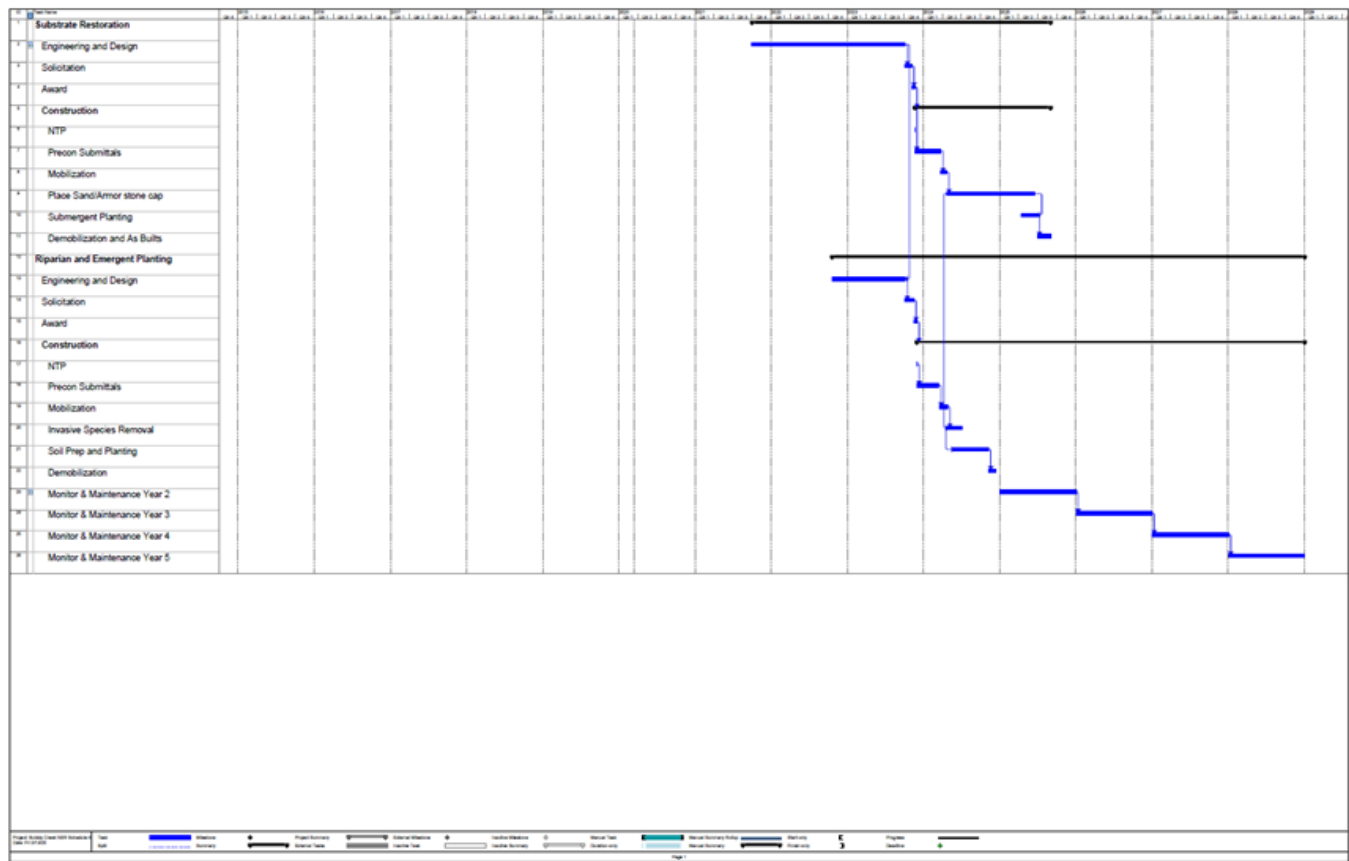
ESTIMATED TOTAL PROJECT COST: \$19,137

PROJECT MANAGER, M. Padilla

3 PROJECT IMPLEMENTATION SCHEDULE

The total project schedule was developed from the current project implementation schedule developed by the PDT and managed by the Project Manager and expanding the construction schedule based on the significant construction activities and durations from the MII cost estimate. The construction schedule calendars include major holidays and non-work weather days.

The bank stabilization work will start slightly before the substrate restoration. This will allow for easier access to the shoreline from Bubbly Creek before the depth is reduced by the additional substrate.



4 RISK ANALYSIS DEVELOPMENT

4.1 Risk Analysis Development

An Abbreviated Risk Analysis was performed on this project to more accurately identify risk and potential impacts to the project. This analysis required participation by the PDT to identify the risks and develop the contingencies.

4.2 Risk Register

Abbreviated Risk Analysis

Project (less than \$40M): **Bubbly Creek**
Project Development Stage: **Feasibility (Recommended Plan)**
Risk Category: **Moderate Risk: Typical Project or Possible Life Safety**

Total Construction Contract Cost = \$ 10,472,000

	CWWBS	Feature of Work	Contract Cost	% Contingency	\$ Contingency	Total
01	LANDS AND DAMAGES	Real Estate	\$ 199,000	40.00%	\$ 79,600	\$ 278,600.00
2	09 01 CHANNELS	Substrate Restoration	\$ 6,852,000	30.08%	\$ 2,060,800	\$ 8,912,800.01
7	16 BANK STABILIZATION	Invasive Species Removal	\$ 352,000	24.66%	\$ 86,815	\$ 438,815.02
8	16 BANK STABILIZATION	Plantings (Riparian, Emergent, Submergent)	\$ 2,983,000	15.38%	\$ 458,693	\$ 3,441,692.69
9	16 BANK STABILIZATION	Monitoring and Maintenance	\$ 286,000	22.73%	\$ 65,013	\$ 351,013.28
12		Remaining Construction Items	\$ (1,000)	0.0%	\$ (263)	\$ (1,263.42)
13	30 PLANNING, ENGINEERING, AND DESIGN	Planning, Engineering, & Design 18%	\$ 1,885,000	11.50%	\$ 216,754	\$ 2,101,754.03
14	31 CONSTRUCTION MANAGEMENT	Construction Management 8%	\$ 838,000	9.13%	\$ 76,488	\$ 914,488.01
Totals						
		Real Estate	\$ 199,000	40.00%	\$ 79,600	\$ 278,600.00
		Total Construction Estimate	\$ 10,472,000	25.51%	\$ 2,671,058	\$ 13,143,058
		Total Planning, Engineering & Design	\$ 1,885,000	11.50%	\$ 216,754	\$ 2,101,754
		Total Construction Management	\$ 838,000	9.13%	\$ 76,488	\$ 914,488
		Total	\$ 13,394,000		\$ 3,043,900	\$ 16,437,900

Bubbly Creek
Feasibility (Recommended Plan)
Abbreviated Risk Analysis

Meeting Date: 22-Jul-19

Risk Level					
Very Likely	2	3	4	5	5
Likely	1	2	3	4	5
Possible	0	1	2	3	4
Unlikely	0	0	1	2	3
	Negligible	Marginal	Significant	Critical	Crisis

Risk Element	Feature of Work	Concerns Pull Down Tab (ENABLE MACROS THRU TRUST CENTER) (Choose ALL that apply)	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
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Project Scope Growth							Max Potential Cost Growth	75%
PS-2	Substrate Restoration	• Potential for scope growth, added features and quantities?	• Investigations sufficient to support design assumptions? • Potential for scope growth, added features and quantities?	Substrate restoration work (qty) already has contingency included. Depth of 12in is at high end of requirement from ERDC and could potentially be reduced. Potential during adaptive management phase for modifications to increase substrate stone size in areas of elevated velocities due to racine avenue pumping station discharge events eroding current design. Modeling has been performed to size current stone size - modification to increase stone size is unlikely *****	Possible	Significant	2	
PS-7	Invasive Species Removal	• Investigations sufficient to support design assumptions?	• Investigations sufficient to support design assumptions?	Existing conditions, and area of removal are well developed by Envir. Planning. Qlys and scope not anticipated to vary significantly. Clearing of banks may vary as this is very site specific.	Possible	Significant	2	
PS-8	Plantings (Riparian, Emergent, Submergent)	• Investigations sufficient to support design assumptions?	• Investigations sufficient to support design assumptions?	Plantings are fairly well developed by Envir. Planning. Qlys and scope will vary somewhat but not anticipated to change significantly.	Possible	Marginal	1	
PS-9	Monitoring and Maintenance	• Potential for scope growth, added features and quantities?	• Potential for scope growth, added features and quantities?	Monitoring and maintenance hasn't been scoped out in any detail. Using information from previous projects. Need to determine O&M debris removal responsibilities from CSO events.	Likely	Marginal	2	
PS-12	Remaining Construction Items	• Potential for scope growth, added features and quantities?	• Potential for scope growth, added features and quantities?	These are small dollar items, but additional and incidental scope would likely fall into this category. May have other things come up during design stage.	Likely	Significant	3	
PS-13	Planning, Engineering, & Design 18%	• Potential for scope growth, added features and quantities?	• Potential for scope growth, added features and quantities?	Additional PED would be needed if scope changes. Impact of scope growth on PED shouldn't be significant.	Possible	Marginal	1	
PS-14	Construction Management 8%	• Potential for scope growth, added features and quantities?	• Potential for scope growth, added features and quantities?	Scope will be known prior to S&A work and would only be affected if differing site conditions occur or scope changes during construction. Impact of scope growth on CM shouldn't be significant.	Possible	Negligible	0	

Acquisition Strategy									
								Max Potential Cost Growth	30%
AS-2	Substrate Restoration	• Contracting plan firmly established?	No current acquisition plan.	At this time it is assumed this work will be broken down into 2 contracts. The first will be a construction contract (assumed IFB low bid) for the substrate restoration, excavation, demolition, and grading of the banks. The second contract will be a service contract for plantings and 5 year monitoring and maintenance. This is how this work has been historically awarded. Given the relative size of the capping/excavation/demo work it is unlikely to be a small business setaside.	Unlikely	Significant	1		
AS-7	Invasive Species Removal	• Contracting plan firmly established?	No current acquisition plan.	At this time it is assumed this work will be broken down into 2 contracts. The first will be a construction contract (assumed IFB low bid) for the substrate restoration, excavation, demolition, and grading of the banks. The second contract will be a service contract for plantings and 5 year monitoring and maintenance. This is how this work has been historically awarded. Given the relative size of the planting work it is unlikely to be a small business setaside but possible.	Possible	Marginal	1		
AS-8	Plantings (Riparian, Emergent, Submergent)	• Contracting plan firmly established?	No current acquisition plan.	At this time it is assumed this work will be broken down into 2 contracts. The first will be a construction contract (assumed IFB low bid) for the substrate restoration, excavation, demolition, and grading of the banks. The second contract will be a service contract for plantings and 5 year monitoring and maintenance. This is how this work has been historically awarded. Given the relative size of the planting work it is unlikely to be a small business setaside but possible.	Possible	Marginal	1		
AS-9	Monitoring and Maintenance	• Contracting plan firmly established?	No current acquisition plan.	At this time it is assumed this work will be broken down into 2 contracts. The first will be a construction contract (assumed IFB low bid) for the substrate restoration, excavation, demolition, and grading of the banks. The second contract will be a service contract for plantings and 5 year monitoring and maintenance. This is how this work has been historically awarded. Given the relative size of the planting work it is unlikely to be a small business setaside but possible.	Possible	Marginal	1		
AS-12	Remaining Construction Items	• Contracting plan firmly established?	No current acquisition plan.	At this time it is assumed this work will be broken down into 2 contracts. The first will be a construction contract (assumed IFB low bid) for the substrate restoration, excavation, demolition, and grading of the banks. The second contract will be a service contract for plantings and 5 year monitoring and maintenance. This is how this work has been historically awarded. Given the relative size of the planting work it is unlikely to be a small business setaside but possible.	Possible	Marginal	1		
AS-13	Planning, Engineering, & Design 18%	• Contracting plan firmly established?	No current acquisition plan.	At this time it is assumed this work will be broken down into 2 contracts. The first will be a construction contract (assumed IFB low bid) for the substrate restoration, excavation, demolition, and grading of the banks. The second contract will be a service contract for plantings and 5 year monitoring and maintenance. This is how this work has been historically awarded. Given the relative size of the capping work it is unlikely to be a small business setaside. Shouldn't effect PED.	Unlikely	Negligible	0		
AS-14	Construction Management 8%	• Contracting plan firmly established?	No current acquisition plan.	At this time it is assumed this work will be broken down into 2 contracts. The first will be a construction contract (assumed IFB low bid) for the substrate restoration, excavation, demolition, and grading of the banks. The second contract will be a service contract for plantings and 5 year monitoring and maintenance. This is how this work has been historically awarded. Given the relative size of the capping work it is unlikely to be a small business setaside. Shouldn't effect CM.	Unlikely	Negligible	0		
Quantities for Current Scope									
								Max Potential Cost Growth	20%
Q-2	Substrate Restoration	• Level of confidence based on design and assumptions?	Quantity may vary from current plan.	Current plan for substrate restoration has a 12in sand/gravel layer over turning basin and channel which is already at high end of ERDC design. Qty also includes a 25% contingency. This should limit chances for overrun on qty. Note: For contract use SF price, put burden on contractor for QC and then we don't pay for overage qty.	Possible	Marginal	1		
Q-7	Invasive Species Removal	• Level of confidence based on design and assumptions?	Quantity may vary from current plan. Qty of material that will be removed from banks is best estimate as of now.	Actual qty of material (plants, brush, trees, debris) will most likely vary.	Likely	Significant	3		
Q-8	Plantings (Riparian, Emergent, Submergent)	• Level of confidence based on design and assumptions?	Quantities are fairly well developed.	Environmental planner has determined planting list, qty's, etc. These should not change significantly.	Unlikely	Marginal	0		
Q-9	Monitoring and Maintenance	• Level of confidence based on design and assumptions?	May need more extensive maintenance than typically seen.	Magnitude of monitoring and maintenance may be more extensive. In overall scope/costs of project this shouldn't be a large impact item.	Possible	Marginal	1		
Q-12	Remaining Construction Items	• Level of confidence based on design and assumptions?	No concerns at this time	Any qty changes shouldn't significantly impact overall costs/scope.	Possible	Negligible	0		
Q-13	Planning, Engineering, & Design 18%	• Level of confidence based on design and assumptions?	No concerns at this time	Any qty changes shouldn't significantly impact PED.	Possible	Negligible	0		
Q-14	Construction Management 8%	• Level of confidence based on design and assumptions?	No concerns at this time	Any qty changes shouldn't significantly impact CM.	Possible	Negligible	0		

Specialty Fabrication or Equipment							Max Potential Cost Growth		75%
FE-2	Substrate Restoration	• Unusual parts, material or equipment manufactured or installed?	River stone for armor layer.	This project will require a large amount of rounded river rock. USACE has prices from previous projects for much smaller qbs at a high costs. Sources identified may have limited quantities available as it is specialty stone. River rounded stone accounts for approximately \$2.5M of the \$6M substrate costs. However it is possible the river rounded rock may be substituted for a more commercially available stone type during PED.	Possible	Significant	2		
FE-7	Invasive Species Removal	• Unusual parts, material or equipment manufactured or installed?	None at this time.	No specialty equipment or unusual material/parts are needed for this project.	Unlikely	Negligible	0		
FE-8	Plantings (Riparian, Emergent, Submergent)	• Unusual parts, material or equipment manufactured or installed?	None at this time.	No specialty equipment or unusual material/parts are needed for this project.	Unlikely	Negligible	0		
FE-9	Monitoring and Maintenance	• Unusual parts, material or equipment manufactured or installed?	None at this time.	No specialty equipment or unusual material/parts are needed for this project.	Unlikely	Negligible	0		
FE-12	Remaining Construction Items	• Unusual parts, material or equipment manufactured or installed?	None at this time.	No specialty equipment or unusual material/parts are needed for this project.	Unlikely	Negligible	0		
FE-13	Planning, Engineering, & Design 18%	• Unusual parts, material or equipment manufactured or installed?	None at this time.	No specialty equipment or unusual material/parts are needed for this project.	Unlikely	Negligible	0		
FE-14	Construction Management 8%	• Unusual parts, material or equipment manufactured or installed?	None at this time.	No specialty equipment or unusual material/parts are needed for this project.	Unlikely	Negligible	0		
Cost Estimate Assumptions							Max Potential Cost Growth		35%
CT-2	Substrate Restoration	• Reliability and number of key quotes?	Use of EPA unit price costs for substrate restoration.	In discussions with S. Cieslawski of the EPA, this work is typical of what they have been doing for several years. The range of prices typically seen is \$60 to \$100/cy. For Bubbly the high end of the range was used due to limited access and shallow depth of channel. Material prices are based on quotes, although the River Rounded stone may be difficult to obtain in larger quantities.	Possible	Marginal	1		
CT-7	Invasive Species Removal	• Assumptions regarding crew, productivity, overtime?	• Assumptions regarding crew, productivity, overtime?	Assume all of this work by prime (service contract). Accessible primarily from water. Decreased productivity for that reason included in current estimate.	Possible	Marginal	1		
CT-8	Plantings (Riparian, Emergent, Submergent)	• Assumptions regarding crew, productivity, overtime?	• Assumptions regarding crew, productivity, overtime?	Assume all of this work by prime (service contract). Accessible primarily from water. Decreased productivity for that reason included in current estimate.	Possible	Marginal	1		
CT-9	Monitoring and Maintenance	• Assumptions regarding crew, productivity, overtime?	• Assumptions regarding crew, productivity, overtime?	Assume all of this work by prime (service contract). Accessible primarily from water. Decreased productivity for that reason included in current estimate.	Possible	Marginal	1		
CT-12	Remaining Construction Items	• Assumptions regarding crew, productivity, overtime?	• Assumptions regarding crew, productivity, overtime?	Assume all of this work by prime (service contract). Accessible primarily from water. Decreased productivity for that reason included in current estimate.	Possible	Marginal	1		
CT-13	Planning, Engineering, & Design 18%	• Reliability and number of key quotes?	None at this time.	Standard percentages used for PED. This project is fairly typical and percentages shouldn't vary considerably.	Possible	Marginal	1		
CT-14	Construction Management 8%	• Reliability and number of key quotes?	None at this time.	Standard percentages used for PED. This project is fairly typical and percentages shouldn't vary considerably.	Possible	Marginal	1		
EX-2	Substrate Restoration	• Political influences, lack of support, obstacles?	• Potential for severe adverse weather? • Political influences, lack of support, obstacles?	Adverse weather shouldn't impact work significantly Potential HTRW issues but should be minimized at this point, real estate issues, potential funding issues could cause delays.	Possible	Significant	2		
EX-7	Invasive Species Removal	• Political influences, lack of support, obstacles?	• Potential for severe adverse weather? • Political influences, lack of support, obstacles?	If schedule is delayed for project implementation, costs could go up if scope is changed.	Possible	Marginal	1		
EX-8	Plantings (Riparian, Emergent, Submergent)	• Potential for severe adverse weather?	• Potential for severe adverse weather?	If schedule is delayed due to adverse weather, costs could go up if scope is changed.	Possible	Marginal	1		
EX-9	Monitoring and Maintenance	• Potential for severe adverse weather?	• Potential for severe adverse weather?	If schedule is delayed for project implementation, costs could go up if scope is changed. Discharges from the Racine Ave. Pumping station could damage plants during establishment period. WMRO is responsible for debris clean-up in the event of discharges.	Possible	Significant	2		
EX-12	Remaining Construction Items	• Potential for severe adverse weather?	• Potential for severe adverse weather?	If schedule is delayed for project implementation, costs could go up if scope is changed.	Possible	Marginal	1		
EX-13	Planning, Engineering, & Design 18%	• Political influences, lack of support, obstacles?	• Political influences, lack of support, obstacles?	If schedule is delayed for project implementation, PED costs could go up if scope is changed.	Possible	Marginal	1		
EX-14	Construction Management 8%	• Political influences, lack of support, obstacles?	• Political influences, lack of support, obstacles?	If schedule is delayed for project implementation, PED costs could go up if scope is changed.	Possible	Marginal	1		

5 DETAILED MII REPORT

MII Cost Estimate Report – Definition of Terms

Contract Cost

Contract Cost (sometimes referred to as “cost to owner”) takes the cost to prime and then adds to that the cost for the contractor’s PTI as well as any allowance, such as small tools, for the contractor’s work. Then the contractor’s own markups for JOOH, HOOH profit, bond, and excise tax and/or any miscellaneous adjustments are included. Any special markups are included in the cost but are not passed on to the owner’s markup cost. Therefore, the special markups are not compounded but are treated as an additional cost.

Project Cost

The project cost takes the contract cost and then adds any escalation, contingencies and/or any miscellaneous owner costs. It should be noted that for this project escalation factors and contingencies are applied in the TPCS spreadsheet and not applied in the MII cost estimating software.

Description	ProjectCost
Project Items	10,472,408.47
09 - CHANNELS AND CANALS - Substrate Restoration	6,851,696.91
Substrate Restoration	6,851,696.91
Channel and Turning Basin (SR)	6,851,696.91
16 - BANK STABILIZATION - Streambank Restoration	3,620,711.56
Invasive Species Removal	352,042.08
Riparian Area Removal	352,042.08
Streambank Restoration	2,982,601.60
Submergent Planting (SP)	483,285.83
Riparian Planting - Option 2 (RB)	2,272,669.06
Emergent Planting - Option 1 (EA)	161,661.67
Large Wood Debris Areas (WD)	64,985.04
Monitoring and Maintenance	286,067.87
Riparian Area	113,747.14
Emergent Area	27,866.78
Garbage Pickup from CSO Events	144,453.95