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**UPPER PASSAIC RIVER FLOOD CONTROL  
LONG HILL TOWNSHIP, NEW JERSEY  
N.Y. DISTRICT, U.S. ARMY CORPS OF ENGINEERS**

**DETAILED PROJECT REPORT  
APPENDIX D – DRAFT COST ESTIMATE**

**February 2004**

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**UPPER PASSAIC RIVER FLOOD CONTROL  
FEASIBILITY STUDY  
LONG HILL TOWNSHIP, NEW JERSEY**

**APPENDIX D**

**MCACES COST ESTIMATE**

## **INTRODUCTION**

### **General**

D1. This appendix outlines the development of, and contains the total first and fully funded costs for the Recommended Plan for flood damage protection and ecosystem restoration along the banks of the Upper Passaic River, particularly in the Township of Long Hill, in Morris County, NJ. Cost development for the various project elements of the recommend plan are discussed.

D2. The cost estimate for storm damage reduction is comprised of four (4) individual construction elements, namely (1) Levee and Floodwalls for the Western Segment of the line of protection, (2) Three Sluice gate closure structures on two streams in the Western segment and one stream in the Eastern Segment, (3) three road raisings, two in the western segment to provide access and one in the eastern segment to have the road act as a short levee section and (4) Fish & Wildlife Facilities (wetlands mitigation). The MCACES cost summary pages for storm damage reduction is displayed at the end of this cost appendix.

### **Basis of Cost**

D3. Cost estimates are based on May 2003 price levels for labor, material, and equipment and 2001 topographic surveys. The quantities for the Recommended Plan have been developed from the detailed plans shown in the Main Body and Engineering & Design Appendix in this Feasibility Report, as well as detailed design data in the Engineering & Design Appendix.

### **Work Breakdown Structure**

D4. The detailed cost estimate was compiled using MCACES Gold and patterned after the Civil Works Template as a model. At this feasibility stage the estimate uses Levels 1, 2 and 3 of 6 available reporting levels available in the following format:

Level 1	Construction Element	One of five major account codes used to estimate the total project cost
Level 2	Sub Element/Segment	An individual segment of construction activity comprising one or more categories of work or features (cost accounts)
Level 3	Feature	A sub component of a major type of work (cost accounts)
Level 4-6	Sub Feature, Bid Item, And Assembly	Increasingly detailed levels of descriptions and estimating dependent on the information and design level developed for the Feasibility Report.

## Project Description for Storm Damage Reduction

D5. The project area is located in the watershed of the Passaic River in Middlesex County, New Jersey, in Long Hill Township. The Recommended Plan generally consists of one levee/floodwall construction with two sluice gate closure structures on the western side of the township and a sluice gate closure structure and a road raising on the eastern side of the town. Improvements are designed to provide protection against flooding up to a 100-year recurrence interval. Two top of protection elevations are utilized; the 100-year flood elevation at +216.2 NGVD and +216.7 NGVD. In the event of overtopping of the line of protection, overflow will initially occur in paved areas with backyards and homes remaining protected from erosion damages. The two elements of the project are designated as: the Western Segment and the Eastern Segment. Protected areas are not subject to interior flooding from surface runoff from rainfall, therefore no interior drainage facilities are provided other than drainage swales associated with the floodwall. The location of each of the elements and associated features are shown in Figures 1 through 10 of the Main Report and are described in the following sections. Wetland mitigation areas included as part of the project are shown in the environmental Appendix.

D6. **Western Segment.** The Western Segment of the line of protection is located south of Passaic Valley Road and running roughly parallel to it between the Loudenberry Meadow Senior Condominium Development and Poplar Avenue. Top of protection is at elevation +216.7 ft and 216.2 ft NGVD, depending on location. The grade elevations along the entire line of protection range between +210.8 and +214 ft. NGVD exclusive of the ends. The height of protection above grade ranges between 2.2 feet and 5.4 feet going to 0 at either end. The levee has a 12-ft. wide crest with side slopes of 3 ft. horizontal to 1.0 ft. vertical and a maximum height of 4.5 feet. Due to its relatively low height, no core or cutoff wall is required. The floodwall reaches consist of continuous watertight sheet pile driven 10 feet into the soil. Two Flood Panels will be installed at the doors of a building at the Sewage Treatment Plant to protect it from floodwaters.

D7. The line of protection, with a total of 3996 feet of floodwall and 61 feet of levee, begins Station 0+00 at the northwestern end as a levee starting at a point approximately 280 feet south of Passaic Valley Road in the Loudenberry Meadow Senior Condominium Development. There will be a maintenance vehicle access to the top of the levee at this point. The levee then extends in an easterly direction to a stream channel which is also the edge of the condominium property. The top of levee is at +216.7 NGVD. Adjacent to the levee is a sluice gate structure housing a 4ft x 4ft sluice gate in a concrete structure, which extends through the channel to a point approximately 15 feet east of the channel. At that location is the start of the vinyl floodwall, which was selected to minimize damage to wetlands. The wall runs in an easterly direction for approximately 210 feet where it turns to the northeast and continues on for 90 feet. The wall then turns back to an easterly direction for approximately 400 feet before turning back to the northeast for approximately 170 feet. At that point, the wall turns north for approximately 135 feet to a point 15 feet south of Passaic Valley Road. Up to this point, the top of wall elevation is +216.7 NGVD. Upon reaching this point, the wall turns east for 220 feet before turning south. This segment of the wall is at elevation +216.2 NGVD and is an overflow section. After turning south, the wall elevation returns to +216.7 NGVD and continues south for 180 feet then turns east for 245 feet, crossing South Main Street. At South Main Street, the road is raised to cross over the wall to provide vehicular access. The elevation of the road crossing is +216.2 NGVD. Fifteen feet east of South Main, the wall turns to the southeast for 30 feet before

turning back to an easterly direction for 270 feet. At this point, the wall elevation changes to +216.2 NGVD and turns to a southerly direction for 25 feet then turning in an easterly direction for 140 feet. The wall then turns to the northeast for 175 feet then turning in an easterly direction for 265 feet through the PSE&G easement. Upon entering the Transco Gas Pipeline easement, the wall ends and a 40 foot levee segment crosses the easement, running in a southeasterly direction. The levee segment allows crossing of the pipeline and is at elevation +216.7 to limit damage due to erosion in the event of an overtopping. Upon exiting the easement, the floodwall resumes, in a southerly direction for 125 feet, parallel to Warren Avenue. The wall elevation is +216.2 NGVD. The wall then turns easterly for 270 feet to a 16 foot wide concrete sluice gate structure containing 2 5ft x 7ft sluice gates. Warren Avenue is raised over the wall to provide access to Municipal facilities south of the wall. The floodwall resumes heading south from the sluice gate structure for 195 feet along the western edge of the supermarket parking lot. The wall then turns in an easterly direction for the final 714 feet, generally following the edge of the parking lot with the exception of a shift to the south to allow the inclusion of an electric transformer.

D8. **Eastern Segment.** The Eastern Segment of the line of protection is located along Valley Road, east of Western Boulevard. This segment consists of a 12 foot long concrete sluice gate structure on the stream with vinyl sheet piling to tie it into the road embankment. Valley Road is raised to a minimum elevation of +216.2 NGVD to act as a levee. In order to achieve proper roadway vertical curve geometry, 780 feet of Valley Road will be repaved, along with portions of two driveways and a parking area. The two sheet pile walls are each approximately 45 feet long. With a top elevation of +216.2 NGVD, the height of protection will be approximately 8 feet.

### **Formulation of Project First Costs for Storm Damage Reduction**

D9. **First Costs.** First costs include the charges arising from the construction, as well as costs of contingencies, engineering during construction, construction management, real estate assessment, administration and processing (refer to the Real Estate Appendix for more detail).

A summary of the project first costs for the recommended plan of protection for storm damage protection/mitigation is given in Table D-1. The first Cost estimates for the recommended plan are broken out by the Sub element level. Table D – 2 presents the fully funded costs escalated through the midpoint of construction, June 2007.

D10. **Unit Costs.** Feasibility level unit costs were jointly developed by NYD and A/E consultants, and are based on: historic actual costs of previous similar COE projects, quotes from equipment manufacturers, dealers, distributors, material suppliers, and construction contractors in the vicinity of the proposed project, standard cost estimating references such as R S Means Cost Data, and judgment based on experience.

D11. **Lump Sum Items.** Based on experience, certain items of costs such as mobilization and demobilization were assigned a lump sum cost due to the multiplicity of activities required to accomplish such items.

D12. **Contingencies.** General contingency factors (25%) assigned to the various project/construction elements vary throughout this estimate increasing with the incompleteness of design detail for a particular element. They identify the uncertainty associated with an item of work or task, forecast the risk/cost relationship, and assign a value that would limit the cost risk to an acceptable degree of confidence.

### **Estimates of Project Features for Storm Damage Reduction**

D13. **Lands and Damages.** In order to construct the proposed flood damage reduction plan, the non-Federal sponsor will be required to provide lands and easements and rights-of-way. The extent and value of the lands required for project implementation are outlined in Appendix J – Real Estate.

D14. **Fish and Wildlife Mitigation.** Fish and Wildlife issues associated with the project are fully outlined in the Draft Environmental Assessment.

D15. **Levees and Floodwalls.** Levees and floodwalls comprise the majority of the line of protection for the Upper Passaic River project, and represent one of the most significant construction features of the project.

D16. **Levees.** The estimate for the construction of the levee was approached from the viewpoint of light to moderate earthwork operations. The earthen levee segments are constructed by placing select structural fill in 12" maximum lifts and compacting to 95% MDD using vibratory equipment. These fills are reinforced with geotextile fabric. In addition to the western end, earthen levees are also constructed at two road crossings, South Main Ave and Warren Ave and at the crossing of the Transco gas main where sheet piling is interrupted.

D17. **Floodwalls.** The Western Segment contains 3996 LF floodwall in order to minimize impacts to wetlands. The Eastern Segment has two short floodwall segments of approximately 45 LF each, which tie the sluice gate structure into the roadway berm. A watertight jointed vinyl sheet pile floodwall will be driven 10 feet into the dense clay soil which makes up most of the area. A single sheet pile driving crew will install the sheeting. Material pricing and productivity was solicited from vendor sources and compared with production rates for steel sheeting. Although efficiencies were quoted for the lighter PVC material, the installation rate was conservatively estimated, equivalent to steel sheeting. 16 foot long sheets are used with an average driven depth of 11 feet. No cap or waler system is included. Sheets are cut off at a uniform top elevation. Since this is a feasibility level design, the wall material will be reviewed in the Final Design Phase and possibly replaced with steel sheet piling. The construction costs used for the vinyl were conservative, allowing steel to be used for the same cost. Therefore, a change in material should have little impact on costs.

D18. **Sluice Gate Closure Structures.** Sluice gate structures are constructed on the three tributary streams feeding the Passaic River. Prior to performing any construction, wetlands protection will be established consisting of staked hay bales and filter fabric. A diversion trench will be dug to provide continuous stream flow. It will be necessary to drive timber friction piles to support the structures. The concrete structures consisting of a reinforced concrete pile cap/footing and a vertical supporting wall are formed and poured prior to driving sheet piling. Sections of sheet piling are embedded in the concrete structure and act as terminus points for

the sheet pile wall. Sluice gates are thru bolted through the wall after the concrete has attained sufficient strength to support the dead load. The sluice gates are operated with an electric wrench. Power for the wrench is provided at an electric power drop/pole proximate to each gate. The actual gates vary in size. Vendor quotes were solicited for each size gate.

D19. **Interior Drainage**. Work classified as Interior Drainage consists of drainage inlets, pipes and manholes, and sluice and flap gates necessary to permit drainage from areas behind levees and floodwalls to drain to the exterior side of the line of protection. This work will generally be done just prior, during, or concurrent with construction of the levee and floodwalls.

D 20. **Drainage Swale Excavation**. This is excavation necessary to provide a grassed ditch along the toe of the protected side of the floodwall to direct interior runoff to the drainage streams. It is assumed that most of the material from this excavation (90%) is suitable for further use. Approximately 10% must be hauled from the site and disposed of.

### **Estimates of Additional Costs**

D21. **Engineering and Design**. Costs were developed for all activities associated with the engineering and design effort. These costs include pre-construction monitoring, plans and specifications, and engineering support through project construction.

D22. **Construction Management**. Costs were developed for all construction management activities from pre-award requirements through final contract closeout. This cost was based on approximately 8% of the direct construction cost based on previous experience with similar type construction projects.

**Army Corps of Engineers  
Flood Control Feasibility Study  
Longhill Township  
Morris County, New Jersey  
Northern End of Passaic River  
Table D - 1 First Costs**

Account Code	Description	QTY	UOM	Unit Price	Amount	% Cont'g	Cont'g Amt	Total
<b>2</b>	<b>ROADWAY RELOCATIONS</b>							
	Raise Passaic Valley Road	24000	SF	\$ 7.43	\$ 142,661	25.00%	\$ 35,700	\$ 178,400
	Raise Warren & Main over Flood Wall	400	SF	\$ 40.50	\$ 12,965	25.00%	\$ 3,200	\$ 16,200
	Pave Warren & Main Extention	60	TON	\$ 168.33	\$ 8,116	25.00%	\$ 2,000	\$ 10,100
	<b>SUBTOTAL</b>				<b>\$ 163,743</b>		<b>\$ 40,900</b>	<b>\$ 204,643</b>
<b>3</b>	<b>MOBILIZATION AND SITE PREP</b>							
	Layout and Engineering	80	HOURS	\$ 141.25	\$ 9,014	25.00%	\$ 2,300	\$ 11,300
	Demo House and Garage @ Station 4+00	25000	CF	\$ 0.49	\$ 9,755	25.00%	\$ 2,400	\$ 12,200
	Disposal Cost - Includes Foundation Walls	584	CY	\$ 60.27	\$ 28,182	25.00%	\$ 7,000	\$ 35,200
	Utility Shutoff	1	ALLOW	\$ 4,100.00	\$ 3,252	25.00%	\$ 800	\$ 4,100
	Mobilize & Demobilize Equipment	6	PCs	\$ 3,250.00	\$ 15,608	25.00%	\$ 3,900	\$ 19,500
	Office at Works	6	Months	\$ 32,516.67	\$ 156,084	25.00%	\$ 39,000	\$ 195,100
	Prepare Access Road - 50' x 200'	10000	SF	\$ 1.51	\$ 12,055	25.00%	\$ 3,000	\$ 15,100
	<b>SUBTOTAL</b>				<b>\$ 233,951</b>		<b>\$ 58,400</b>	<b>\$ 292,400</b>
<b>6</b>	<b>WETLANDS MITIGATION</b>							
	Erosion & Sediment Control	3000	LF	\$ 8.47	\$ 20,301	25.00%	\$ 5,100	\$ 25,400
	Clear & Grub	1.1	ACR	\$ 23,272.73	\$ 20,472	25.00%	\$ 5,100	\$ 25,600
	Dewater	1	ALLOW	\$ 19,000.00	\$ 15,226	25.00%	\$ 3,800	\$ 19,000
	Excavate	3200	CY	\$ 7.38	\$ 18,949	25.00%	\$ 4,700	\$ 23,600
	Haul & Dispose	1	ALLOW	\$ 74,000.00	\$ 59,215	25.00%	\$ 14,800	\$ 74,000
	Place Compost	1600	CY	\$ 42.25	\$ 54,139	25.00%	\$ 13,500	\$ 67,600
	Woody Plants	1000	EA	\$ 52.90	\$ 42,296	25.00%	\$ 10,600	\$ 52,900
	Herbaceous Plants	1000	EA	\$ 52.90	\$ 42,296	25.00%	\$ 10,600	\$ 52,900
	Water & Mulch	1.1	ACR	\$ 13,727.27	\$ 12,097	25.00%	\$ 3,000	\$ 15,100
	Fence	3000	LF	\$ 16.93	\$ 40,604	25.00%	\$ 10,200	\$ 50,800
	<b>SUBTOTAL</b>				<b>\$ 325,595</b>		<b>\$ 81,400</b>	<b>\$ 407,000</b>

11 LEVEES AND FLOODWALLS							
Clear and Grub - 20' Wide x 4005	1.84 ACR	\$	14,565.22	\$	21,420	25.00%	\$ 5,400 \$ 26,800
Furnish and Install PVC Sheet Piling	57852 SF	\$	28.21	\$	1,305,558	25.00%	\$ 326,400 \$ 1,632,000
Furnish and Install Guardrail behind Shop Rite	250 LF	\$	142.40	\$	28,453	25.00%	\$ 7,100 \$ 35,600
Furnish and Install Dirt Levee Segments	2800 SF	\$	40.54	\$	90,766	25.00%	\$ 22,700 \$ 113,500
4' Wood Fence	4005 LF	\$	21.57	\$	69,113	25.00%	\$ 17,300 \$ 86,400
Loam and Seed along Cutoff Wall	8900 SY	\$	7.88	\$	56,145	25.00%	\$ 14,000 \$ 70,100
Transom At WWTP	2 EA	\$	4,900.00	\$	7,804	25.00%	\$ 2,000 \$ 9,800
<b>SUBTOTAL</b>					<b>\$ 1,579,259</b>		<b>\$ 394,900 \$ 1,974,200</b>

15 TRIBUTARY CLOSURES							
Furnish and Install 48" x 48" Sluice Gate							
Protection of Wetlands - Hay bales Silt Fence	500 LF	\$	5.20	\$	2,120	25.00%	\$ 500 \$ 2,600
Provide Diversion Trench	300 LF	\$	197.00	\$	47,294	25.00%	\$ 11,800 \$ 59,100
Furnish and Install Utility Poles with Electric Service	1 EA	\$	5,900.00	\$	4,749	25.00%	\$ 1,200 \$ 5,900
F&I Tember Friction Piles to 25' Deep	200 VLF	\$	34.50	\$	5,489	25.00%	\$ 1,400 \$ 6,900
Form and Pour Concrete Pile Cap/Footing	10 CY	\$	900.00	\$	7,235	25.00%	\$ 1,800 \$ 9,000
Form and Pour Retaining Wall w/ Embedded Sheeting	8.3 CY	\$	1,132.53	\$	7,515	25.00%	\$ 1,900 \$ 9,400
F&I PVC Sheeting prior to pouring Slab and Wall	180 SF	\$	28.33	\$	4,062	25.00%	\$ 1,000 \$ 5,100
F&I Sluice Gate - 48" x 48" w/ Elec Oper.	1 EA	\$	26,900.00	\$	21,508	25.00%	\$ 5,400 \$ 26,900
Backfill and Restore	1 LS	\$	8,600.00	\$	6,894	25.00%	\$ 1,700 \$ 8,600
Furnish and Install 84"x60" Double Sluice Gate							
Protection of Wetlands - Hay bales Silt Fence	500 LF	\$	5.20	\$	2,120	25.00%	\$ 500 \$ 2,600
Provide Diversion Trench	300 LF	\$	197.00	\$	47,294	25.00%	\$ 11,800 \$ 59,100
Furnish and Install Utility Poles with Electric Service	1 EA	\$	5,900.00	\$	4,749	25.00%	\$ 1,200 \$ 5,900
F&I Tember Friction Piles to 25' Deep	200 VLF	\$	34.50	\$	5,489	25.00%	\$ 1,400 \$ 6,900
Form and Pour Concrete Pile Cap/Footing	12 CY	\$	908.33	\$	8,688	25.00%	\$ 2,200 \$ 10,900
Form and Pour Retaining Wall w/ Embedded Sheeting	6 CY	\$	1,133.33	\$	5,433	25.00%	\$ 1,400 \$ 6,800
F&I PVC Sheeting prior to pouring Slab and Wall	180 SF	\$	28.33	\$	4,062	25.00%	\$ 1,000 \$ 5,100
F&I Sluice Gate - -84" x 60" w/ Elec Oper.	2 EA	\$	58,250.00	\$	93,203	25.00%	\$ 23,300 \$ 116,500
Backfill and Restore	1 LS	\$	8,600.00	\$	6,894	25.00%	\$ 1,700 \$ 8,600
Furnish and Install 144"x48" Sluice Gate							
Protection of Wetlands - Hay bales Silt Fence	500 LF	\$	5.20	\$	2,120	25.00%	\$ 500 \$ 2,600
Provide Diversion Trench	300 LF	\$	197.00	\$	47,294	25.00%	\$ 11,800 \$ 59,100
Furnish and Install Utility Poles with Electric Service	1 EA	\$	5,900.00	\$	4,749	25.00%	\$ 1,200 \$ 5,900
F&I Tember Friction Piles to 25' Deep	225 VLF	\$	34.22	\$	6,175	25.00%	\$ 1,500 \$ 7,700
Form and Pour Concrete Pile Cap/Footing	12 CY	\$	908.33	\$	8,719	25.00%	\$ 2,200 \$ 10,900
Form and Pour Retaining Wall w/ Embedded Sheeting	6 CY	\$	1,133.33	\$	5,433	25.00%	\$ 1,400 \$ 6,800
F&I Sluice Gate - 144" x 48" w/ Elec Oper.	1 EA	\$	89,300.00	\$	71,419	25.00%	\$ 17,900 \$ 89,300

	Backfill and Restore	1 LS	\$ 8,600.00	\$ 6,894	25.00%	\$ 1,700	\$ 8,600
	<b>SUBTOTAL</b>			<b>\$ 437,600</b>		<b>\$ 109,400</b>	<b>\$ 547,000</b>
	<b>TOTAL CONSTRUCTION COST</b>			<b>\$ 2,740,147</b>		<b>\$ 685,000</b>	<b>\$ 3,425,243</b>
<b>1</b>	LANDS AND DAMAGES			\$ 324,400	25.00%	\$ 81,100	\$ 405,500
<b>30</b>	ENGINEERING AND DESIGN	1 EA		\$ 750,000	25.00%	\$ 187,500	\$ 937,500
<b>31</b>	CONSTRUCTION MANAGEMENT	1 EA		\$ 300,000	25.00%	\$ 75,000	\$ 375,000
	<b>TOTAL PROJECT FIRST COST</b>			<b>\$ 4,114,547</b>		<b>\$ 1,028,600</b>	<b>\$ 5,143,243</b>

**Longhill Township  
Morris County, New Jersey  
Northern End of Passaic River  
Table D - 2 Fully Funded Costs**

\*\*\* TOTAL FEDERAL COST-SHARED SUMMARIES \*\*\*

Project:

District:

Location:

POC:

					.....Fully Funded Estimate.....					
					Feature Mid Point:					
Effective Pricing Level: May 2003										
Acct. No.	Feature Description	Cost (\$K)	Cont. (\$K)	Cont. (%)	Total (\$K)	%	Date	Cost (\$K)	Cont. (\$K)	Total (\$K)
02	Roadway Relocations	163.7	40.9	25%	\$205	11.24%	Jun-07	182.2	45.5	227.7
03	Mobe & Site Prep	234.0	58.4	25%	\$292	11.25%	Jun-07	260.3	65.0	325.2
6	Wetlands Mitigation	325.6	81.4	25%	\$407	11.65%	Jun-07	363.5	90.9	454.4
11	Levees And FloodWalls	1,579.3	394.9	25%	\$1,974	11.25%	Jun-07	1756.9	439.3	2,196.2
15	Tributary Closures	437.6	109.4	25%	\$547	11.24%	Jun-07	486.8	121.7	608.5
<b>Total</b>		<b>2,740.1</b>	<b>685.0</b>		<b>3,425.1</b>			<b>3049.6</b>	<b>762.4</b>	<b>3,812.0</b>
01---	Lands and Damages	324.4	81.1	25%	405.5	10.24%	Jan-07	357.6	89.4	447.0
30---	Engineering and Design	750.0	187.5	25%	937.5	16.54%	Jan-07	874.0	218.5	1,092.5
31---	Construction Management	300.0	75.0	25%	375.0	18.58%	Jun-07	355.7	88.9	444.7
<b>Total Federal Cost Summary</b>		<b>4,114.5</b>	<b>1,028.6</b>		<b>5,143.1</b>			<b>4,637.0</b>	<b>1,159.2</b>	<b>5,796.2</b>

Note: Inflation was developed using EC11-2-184 dtd 31 Mar 2003

Total Federal Costs(\$K): 3,767.5  
Total Non-Federal Costs(\$K): 2,028.7

Updated

21-May-03

Escalation Factor Computation from EC 11-2-184 dated 31 Mar 03 Table 1 for Acct codes 1, 30, & 31								
	May					Jan	June	Inflation to
	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 07	Feature Mid Point
Class 1 - Acct 30 Engg & Design	4.60%	2.08%	5.54%	3.53%	3.57%	0.88%		16.54%
Class 1 - Acct 31 Constn Mgmt	4.60%	2.08%	5.54%	3.53%	3.57%		2.65%	18.58%
Class 2 - Acct 1 Lands & Damages	3.30%	1.13%	2.73%	2.65%	2.68%	0.67%		10.24%

Escalation Factor Computation from Table A1 EM 1110-2-1304	Revised 30 Sep 2002		Inflation to Feature Mid Point
	May-03	Jun-07	
Account Code 6 Fish & Wildlife	521.45	582.21	11.65%
Account Code 8 Roads & Bridges	543.00	604.06	11.24%
Account Code 11 Levees	548.94	610.67	11.25%
Account Code 15 Flood Diversion Struct	521.45	580.08	11.24%

Order of Magnitude Estimate  
Upper Passaic River Flood  
Control Project Feasibility  
Study

Designed By: Baker Engineering  
Estimated By: Keville Enterprises/Baker

Prepared By: Jeff Rubin

Preparation Date: 05/23/03  
Effective Date of Pricing: 05/19/03  
Est Construction Time: 210 Days

Sales Tax: 6.0%

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The Upper Passaic River Flood Control Feasibility Study involves a project to control flood damage in the Longhill Township of Morris County, New Jersey. The proposed flood control methodology consists of creating a levee/sheet pile wall system with three integral sluice gate structures.

The wall commences at Passaic Ave at the Western extreme and extends eastward to Poplar Ave adjacent to a Shop Rite shopping center. The wall is located behind residences at the western end and behind commercial structures including stores and a bar and grill as the wall progresses east following Passaic Valley Road. The wall is irregular in shape with numerous corner points. The overall developed length is about 4000 lineal feet.

The design concept is driven PVC sheet piling. The soil conditions are well consolidated clays. The installation method is assumed to be by vibratory hammer. Depth of embedment ranges from 10 to 12 feet. Top of panel will be cut off at 216.2 feet Existing ground contours range from 212 at the western end to 216 at the eastern end. Low points occur proximate to two tributary streams where existing grade is 210. Therefore, fifteen foot long sections of PVC sheet pile are envisioned, extending 2 to 4 feet above grade. Sheet tops will be cut off at a uniform grade. The wall will be protected with a wood spaced board fence along the entire length located on the Passaic Valley Road or high side.

At two locations, earthen levees will be constructed to allow local streets to cross over the flood wall. The first one is a paved street, Warren Ave. Here, existing grade will be raised from 213.1 feet to 216.1 allowing the road to transit the wall. Other minor work at this location involves reconfiguring a private drive.

The second location is on a dirt road extending from Main Ave and serving as a PSE&G transmission line right of way. Here grade must be raised from 212.5 to 216.5. It is a single lane dirt road which will receive a bituminous top coat for erosion protection along the altered section.

The remaining major elements consist of three sluice gate structures constructed of reinforced concrete and equipped with steel sluice gates, electrically operated. A power drop has been estimated at each of these locations for powering dewatering pumps and to provide interruptable power to operate sluice gates either using a portable drive or removeable cord to an installed operator.

Two of these structures are integral with the wall. The first is at station 0+50, the second is at station 31+00 at a stream between Warren Ave and a Shop Rite Shopping center.

The third is at the eastern end of the Project between Morristown Road and Western Blvd. Here a stream passes under Passaic Valley Road in a concrete pipe culvert. Along here, Passaic Valley Road is to be raised 1'-0", extending 780 feet along the roadway (average 6" raising).

The account structure follows the Civil Works Templates, as follows:

Account 01, Lands and Damages includes the taking of a single family house at

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the western extreme for creation of a construction access and the securing of 13 easements along the alignment.

Project contingency has been established for all elements at 25%

Account 02 Relocations includes the raising of Passaic Valley Road between STA 46+85 to 54+65, and the two street crossings of the flood wall. Passaic Valley Road is raised over a 780 feet distance an average of 6" overall (1'-0" at low point tapering to zero in each direction). the construction methodology assumed is to pulverize the road surface over this distance, regrade and re pave, A sub estimate was developed based on these assumptions and a review of photographs of the existing road construction.

The two street crossings consist of simple earthen fills over laid with bituminous pavement.

Fill at the street crossings is estimated to be 190 cubic yards, each.

(no design exists for these items)

There are also earthen levees at each terminus including an interruption in the wall at a Gas Pipe Line. See Account 11, Levees for these items.

Account 03 is mobilization and site preparation; Includes Demolition of the House and Garage and Construction of the Gravel Access Road. Move in and Move out of assumed pile driving equipment and earth grading/excavating equipment is included. Trucks are rented. Office at works costs are included for six months of field construction.

Account 06 Wetlands Mitigation involves the creation of a 1 acre replication at an undefined location. Estimate for this work provided by ACOE. A separate subcontractor is assumed for this work.

Account 11 is the Flood wall, mostly PVC sheet pile with earthen levee at each end and at the gas line. This also includes Wood Fencing. The fence ranges from 2 to 4 feet high. A telephone quote was solicited for installed 4 foot high wood spaced board fence.

The earthen levees at each end of the flood wall and at the gas line have no design detail. For the levees at each end, assumptions were made that an area 16 feet by 40 feet wood be excavated at each location or approximately 50 cubic yards of material wood be removed and disposed, geotextile fabric would be buried in a perimeter trench, where an additional 80 cubic yards of material would be excavated to below frostline. Reinforced earthen fills would be created, each of approximately 200 cubic yards. Fill material could be borrow from trench or Wetlands replication work but is assumed to be imported.

At the gas line a similar detail is developed however here the prepared area measures 25 feet by 60 feet.

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Account 15 is the three sluice gate structures. We assumed a day each would be required to set the sluice gates at the structures using a crane crew. The sluice gate frames are cast in the concrete headwall. The cost for installing the frames is included in the headwall cost.

Account 30 is Engineering and Design

Account 31 is Construction Management

The estimate is provided at an Order of Magnitude level. Vendor quotes have been solicited for major elements including PVC sheet piling, sluice gates and wood fence.

Davis Bacon Prevailing Wage Rates were obtained for Laborers, Operating Engineers and Teamsters, State Wide. Morris County rates were examined for Carpenters and Pile Drivers.

Productivity, crew sizing and equipment costs employed are mainly proprietary. Labor cost was adjusted +10% to adjust Boston area prevailing wage rates to New Jersey. All other costs and productivity factors were assumed equivalent.

It is assumed all work will be performed by one contractor with limited sub contracting. Sheet piling if sub contracted would greatly unbalance the bid. Likewise roadway work.

Subcontracted items include wetlands replication and the furnishing of electrical power service.

The fence is assumed to be provided on a furnish and install purchase order basis.

Quantities and Costs are based on conceptual design as supplied by Baker. Quantity take offs were performed from working drawings, sketches and assumptions regarding details of construction.

Work duration is 90 days with 60 days of site prep/mobilization demobilization either side of the actual work.

Mid Point of Constuction is 7/15/07

An escalation factor of 25.7 % was supplied by the economist and later adjusted by Baker and the ACOE

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SUMMARY REPORTS	SUMMARY PAGE
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30. Engineering and Design.....	11
31. Construction Management.....	12

No Backup Reports...

\* \* \* END TABLE OF CONTENTS \* \* \*

	QUANTY	UOM	CONTRACT	CONTINGN	ESCALATN	TOTAL COST	UNIT
01	1.00	EA	324,400	81,100	0	405,500	405500
02	1.00	EA	163,738	40,934	0	204,672	204672
03	1.00	EA	233,950	58,488	0	292,438	292438
06	1.00	EA	325,592	81,398	0	406,991	406991
11	1.00	EA	1,579,258	394,815	0	1,974,073	1974073
15	1.00	EA	437,602	109,400	0	547,002	547002
30	1.00	EA	750,000	187,500	0	937,500	937500
31	1.00	EA	300,000	75,000	0	375,000	375000
TOTAL Order of Magnitude Estimate			4,114,541	1028635	0	5,143,176	5143176

	QUANTY	UOM	DIRECT	FIELD	OH	HOME	OFC	PROFIT	BOND	TOTAL COST	UNIT
01	Lands and Damages	1.00	EA	324,400	0	0	0	0	0	324,400	324400
02	Roadway Relocations	1.00	EA	125,884	12,588	6,924	16,721	1,621	163,738	163738	
03	Mobe & Site Prep	1.00	EA	179,864	17,986	9,893	23,890	2,316	233,950	233950	
06	Wetlands Mitigation	1.00	EA	250,320	25,032	13,768	33,249	3,224	325,592	325592	
11	Levees And Floodwalls	1.00	EA	1,214,157	121,416	66,779	161,270	15,636	1,579,258	1579258	
15	Tributary Closures	1.00	EA	336,435	33,643	18,504	44,687	4,333	437,602	437602	
30	Engineering and Design	1.00	EA	750,000	0	0	0	0	750,000	750000	
31	Construction Management	1.00	EA	300,000	0	0	0	0	300,000	300000	
TOTAL Order of Magnitude Estimate			1.00	EA	3,481,061	210,666	115,866	279,817	27,130	4,114,541	4114541
Contingency										1,028,635	
TOTAL INCL OWNER COSTS										5,143,176	

	QUANTITY	UOM	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT		
01	1.00	EA	0	0	0	0	324,400	324,400	324400		
02	1.00	EA	0	35,458	22,408	68,018	0	125,884	125884		
03	1.00	EA	6,400	12,650	7,550	25,164	134,500	179,864	179864		
06	1.00	EA	0	0	0	0	250,320	250,320	250320		
11	1.00	EA	0	228,348	258,689	721,121	6,000	1,214,157	1214157		
15	1.00	EA	0	101,690	58,149	176,596	0	336,435	336435		
30	1.00	EA	0	0	0	0	750,000	750,000	750000		
31	1.00	EA	0	0	0	0	300,000	300,000	300000		
TOTAL Order of Magnitude Estimate			1.00	EA	6,400	378,146	346,795	990,899	1765220	3,481,061	3481061
Prime Contractor's Field Overhead								210,666			
SUBTOTAL								3,691,727			
Prime's Home Office Expense								115,866			
SUBTOTAL								3,807,593			
Prime Contractor's Profit								279,817			
SUBTOTAL								4,087,411			
Prime Contractor's Bond								27,130			
TOTAL INCL INDIRECTS								4,114,541			
Contingency								1,028,635			
TOTAL INCL OWNER COSTS								5,143,176			

	DIRECT	FIELD	OH	HOME	OFC	PROFIT	BOND	TOTAL COST	UNIT
<<< Non-Contracted Work >>>	1,374,400		0		0	0	0	1,374,400	1374400
AA General Contractor									
DD electrical sub	8,460	846			465	1,075	108	10,955	10955
BB Wetlands Sub	192,450	19,245			10,585	25,562	2,478	250,320	250320
CC Fence Sub	40,851	4,085			2,247	5,426	526	53,135	8033.89
Subtotal Subcontract Work	241,761	24,176			13,297	32,063	3,113	314,410	47538
Indirect on Subcontracts	314,410	31,441			17,293	41,762	4,049	408,954	61833
Indirect on Own Work	1,792,251	179,225			98,574	238,056	23,081	2,331,187	352470
AA General Contractor	2,106,661	210,666			115,866	279,817	27,130	2,740,141	414303

Fri 06 Feb 2004  
Eff. Date 05/19/03  
ERROR REPORT

Tri-Service Automated Cost Engineering System (TRACES)  
PROJECT UPR3PB: Order of Magnitude Estimate - Upper Passaic River Flood  
Upper Passaic River Flood Control Feasibility St

TIME 15:31:40

ERROR PAGE 1

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No errors detected...

\* \* \* END OF ERROR REPORT \* \* \*

	QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
TOTAL Overhead Items - AA	6.61	TON			0	0	0	0	120,000	120,000	18144

			QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
01. Lands and Damages													
See Detailed Estimate supplied by ACOE Real Estate Specialist for further break down,													
USR	<	> See detailed estimate supplied by Real Estate Specialist	1.00	LS		0.00	0	0.00	0	0.00	0	0.00	0.00
USR	<	> Acquisitions	1.00	LS		0.00	0	0.00	0	0.00	0	0.00	0.00
USR	<	> Acquisitions-Surveys	1.00	LS		0.00	0	0.00	0	0.00	20500.00	20500.00	20500
USR	<	> Acquisitions-Titles	1.00	LS		0.00	0	0.00	0	0.00	14700.00	14700.00	14700
USR	<	> Acquisitions-Negotiations	1.00	LS		0.00	0	0.00	0	0.00	25000.00	25000.00	25000
USR	<	> Acquisitions-Meetings w NFS	1.00	LS		0.00	0	0.00	0	0.00	6000.00	6000.00	6000.00
USR	<	> Acquisitions- NFS Surveys	1.00	LS		0.00	0	0.00	0	0.00	6250.00	6250.00	6250.00
USR	<	> Acquisitions- NFS titles	1.00	LS		0.00	0	0.00	0	0.00	6250.00	6250.00	6250.00
USR	<	> Aquisitions NFS Negotiations	1.00	LS		0.00	0	0.00	0	0.00	2700.00	2700.00	2700.00
USR	<	> Condemnations NFS	1.00	LS		0.00	0	0.00	0	0.00	6000.00	6000.00	6000.00
USR	<	> Condemnations Review	1.00	LS		0.00	0	0.00	0	0.00	500.00	500.00	500.00
USR	<	> Appraisals-NFS	1.00	LS		0.00	0	0.00	0	0.00	34700.00	34700.00	34700
USR	<	> Appraisals-NFS Meetings	1.00	LS		0.00	0	0.00	0	0.00	6000.00	6000.00	6000.00
USR	<	> Appraisals-NFS Reviews	1.00	LS		0.00	0	0.00	0	0.00	18750.00	18750.00	18750
USR	<	> Payments	1.00	LS		0.00	0	0.00	0	0.00	0	0.00	0.00
USR	<	> Payments NFS	1.00	LS		0.00	0	0.00	0	0.00	146500	146500.00	146500

		QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
USR	<			> Payments NFS Reviews		0.00	0.00	0.00	0.00	3750.00	3750.00	
		1.00	LS		0.00	0	0	0	0	3,750	3,750	3750.00
USR	<			> Damage Payments NFS		0.00	0.00	0.00	0.00	26800.00	26800.00	
		1.00	LS		0.00	0	0	0	0	26,800	26,800	26800
				TOTAL Lands and Damages			0	0	0	324,400	324,400	324400

		QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
02. Roadway Relocations												
Includes Dirt Levees over flood wall and gas line												
Includes raising Passaic Valley Road over 780 lineal feet by pulverizing, regrading and paving												
See detail estimate by KEI												
USR AA <	> Raise Passaic Valley Road Grade.	24000	SF		0.00	0	1.32 31,680	0.78 18,720	2.47 59,275	0.00 0	4.57 109,675	4.57
Source of data, historical estimates including CA/T, Pulverize, regrade and repave Detail estimate in Excel												
USR AA <	> Raise Warren & Main over Flood Wall	400.00	SF		0.00	0	5.32 2,128	1.72 688	17.88 7,153	0.00 0	24.92 9,969	24.92
This is earthen fill to level of flood wall. Source of pricing historical estimate, CA/T. Labor adjusted to NJ												
USR AA <	> Pave Warren Ave and Main Extension	60.00	TON		0.00	0	27.50 1,650	50.00 3,000	26.50 1,590	0.00 0	104.00 6,240	104.00
Source of data historical estimate, CA/T and Mass Highway unit price book. Labor adjusted to NJ												
TOTAL Roadway Relocations		1.00	EA			0	35,458	22,408	68,018	0	125,884	125884

		QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
03. Mobe & Site Prep												
Includes demolition, access road construction and equipment move in												
USR AA <	>	Layout & Engineering. Includes a 2 man survety crew - 1 week duration.	80.00	HRS	0.00	80.00 6,400	70.00 5,600	10.00 800	6.63 530	0.00 0	86.63 6,930	86.63
USR AA <	>	Demo House & Garage. Means Building Cons. Cost Data page 35 - 0700 - \$.25/CF. No foundation, Large Urban Project Pricing. Our pricing is taken from the SWNAS Project which includes the demolition of multiple structures and includes the foundation demolition.	25000	CF	0.00	0.00 0	0.15 3,750	0.15 3,750	0.00 0	0.00 0	0.30 7,500	0.30
USR AA <	>	Disposal. Cost taken from SWNAS Project which is normal tipping fee for disposal of demolition material.	584.00	CY	0.00	0.00 0	0.00 0	0.00 0	37.10 21,666	0.00 0	37.10 21,666	37.10
USR AA <	>	Utility Shut Off. An allowance carried.	1.00	EA	0.00	0.00 0	0.00 0	0.00 0	0.00 0	2500.00 2,500	2500.00 2,500	2500.00
USR AA <	>	Access Road/Construction Move in. Includes a grading crew for 8 hours, and furnishing and installing 280 Ton of Crushed Stone - 6" thick.	10000	SF	0.00	0.00 0	0.33 3,300	0.30 3,000	0.30 2,968	0.00 0	0.93 9,268	0.93
USR AA <	>	Mobilize & Demobe Sheet Pile/Grading Equipment 40T RT Hyd Crane, Elec Hammer w/ Gen Set, Lull  Dozer, FEL, Hyd Excavator each piece 1 truck move in, 1 move out, 12 moves at \$1000	6.00	PCS	0.00	0.00 0	0.00 0	0.00 0	0.00 0	2000.00 12,000	2000.00 12,000	2000.00
USR AA <	>	Office at Works Office Trailer, TL&P, Sanitary, water, rubbish, etc	6.00	MTH	0.00	0.00 0	0.00 0	0.00 0	0.00 0	20000.00 120,000	20000.00 120,000	20000
		TOTAL Mobe & Site Prep	1.00	EA		6,400	12,650	7,550	25,164	134,500	179,864	179864

		QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
06. Wetlands Mitigation												
Wetlands mitigation estimate provided by Wetlands scientist												
USR BB <	> E&SC.					0.00	0.00	0.00	0.00	4.00	4.00	
	Supplied by Baker and ACOE-NYD	3000.00	LF		0.00	0	0	0	0	15,608	15,608	5.20
USR BB <	> clear & Grub.					0.00	0.00	0.00	0.00	11000.00	11000.00	
	Supplied by Baker and ACOE NYD	1.10	AC		0.00	0	0	0	0	15,739	15,739	14308
USR BB <	> Dewater.					0.00	0.00	0.00	0.00	9000.00	9000.00	
	Supplied by Baker and ACOE NYD	1.00	LS		0.00	0	0	0	0	11,706	11,706	11706
USR BB <	> Excavate, Machine.					0.00	0.00	0.00	0.00	3.50	3.50	
	Supplied by Baker and ACOE NYD.	3200.00	CY		0.00	0	0	0	0	14,568	14,568	4.55
USR BB <	> Haul & Dispose.					0.00	0.00	0.00	0.00	35000.00	35000.00	
	Supplied by Baker and ACOE NYD	1.00	LS		0.00	0	0	0	0	45,525	45,525	45525
USR BB <	> Place Compost.					0.00	0.00	0.00	0.00	20.00	20.00	
	Supplied by Baker and ACOE NYD.	1600.00	CY		0.00	0	0	0	0	41,623	41,623	26.01
USR BB <	> Woody Plants.					0.00	0.00	0.00	0.00	25.00	25.00	
	Supplied by Baker and ACOE NYD.	1000.00	EA		0.00	0	0	0	0	32,518	32,518	32.52
USR BB <	> Herbaceous Plants.					0.00	0.00	0.00	0.00	25.00	25.00	
		1000.00	EA		0.00	0	0	0	0	32,518	32,518	32.52
USR BB <	> Water & Mulch.					0.00	0.00	0.00	0.00	6500.00	6500.00	
		1.10	AC		0.00	0	0	0	0	9,300	9,300	8454.57
USR BB <	> Fence.					0.00	0.00	0.00	0.00	8.00	8.00	
		3000.00	LF		0.00	0	0	0	0	31,217	31,217	10.41
TOTAL Wetlands Mitigation		1.00	EA			0	0	0	0	250,320	250,320	250320

		QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
11. Levees And FloodWalls												
Material Quote and advice on productivity from supplier of PVC Sheet Pile. Says spec'd material is more than sufficient for application, could go w/ lighter weight												
Fence pricing from Armstrong Fence Co, verbal quote												
USR AA <	> Clear & Grub 20 Ft Strip. 5 Days of Work Calculated in Estimate. Means Pg. 44 shows 2.6 days production.	1.84	ACR		0.00	0	4950.00 9,108	4000.00 7,360	0.00 0	0.00 0	8950.00 16,468	8950.00
USR AA <	> F&I PVC Sheet pile. Pricing and Production from Sheet Pile Manufacturer.	57852	SF		0.00	0	2.75 159,093	4.00 231,408	10.60 613,231	0.00 0	17.35 1,003,732	17.35
USR AA <	> F&I Guard Rail At Shop Rite Source of estimate MassHighway Unit Price Book, labor adjusted for NJ	250.00	LF		0.00	0	11.00 2,750	50.00 12,500	26.50 6,625	0.00 0	87.50 21,875	87.50
USR AA <	> Loam & Seed R.S. Means Pricing, Adjusted to NJ Labor.	8900.00	SY		0.00	0	2.20 19,580	0.00 0	2.65 23,585	0.00 0	4.85 43,165	4.85
USR CC <	> 4' Wood Fence Vendor quote, Verbal Armstrong Fence Co, adjusted for NJ labor	4005.00	LF		0.00	0	4.40 22,921	0.50 2,605	5.30 27,609	0.00 0	10.20 53,135	13.27
USR AA <	> Construct Dirt Levee See Roadway Relocations 02.	2800.00	SF		0.00	0	5.32 14,896	1.72 4,816	17.88 50,070	0.00 0	24.92 69,782	24.92
USR AA <	> Transom at WWTP is a flood plte, non structural. Vendor Quote received by Baker Transom is a removable aluminum plate placed in a channel and protects the lower portion of two doorway openings at a Waste Water Treatment Plant  (Walz & Kenzer, fabricator, quoe installed complete w/ frame and gasket)	2.00	EA		0.00	0	0.00 0	0.00 0	0.00 0	3000.00 6,000	3000.00 6,000	3000.00
TOTAL Levees And FloodWalls		1.00	EA			0	228,348	258,689	721,121	6,000	1,214,157	1214157

15. Tributary Closures

Quote rec'd from sluice gate manufacturer, Rodney Hunt Company

		QUANTY	UOM	CREW	ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
USR AA <	> B1 Sluice Gate w/L protection Mass Highway Unit Prices as well as R.S. Means.	500.00	LF			0.00	0	2.20 1,100	0.00 0	1.06 530	0.00 0	3.26 1,630	3.26
USR AA <	> B1 Sluice Gate Diversion Trench Pricing taken from Estimates developed using CA/T, Mass Highway and other Developed Estimates adjusted to NJ labor rates.	300.00	LF			0.00	0	55.00 16,500	45.00 13,500	21.20 6,360	0.00 0	121.20 36,360	121.20
USR DD <	> B1 Sluice Gate Electric Service R.S. Means Pricing	1.00	EA			0.00	0	1980.00 2,564	45.00 58	795.00 1,029	0.00 0	2820.00 3,652	3651.53
USR AA <	> B1 Sluice Gate Timber Pile Means page 61 - \$18.20/LF. Price does not include Mob/Demob. and Pile Tip, which is included in our developed price.	200.00	LF			0.00	0	5.50 1,100	5.00 1,000	10.60 2,120	0.00 0	21.10 4,220	21.10
USR AA <	> B1 Sluice Pile Cap Means page 115-5900 - \$194/CY. Productivity 54.14 CY/Day. Our pricing is adjusted to small quantity daily output.	10.00	CY			0.00	0	314.60 3,146	36.00 360	205.64 2,056	0.00 0	556.24 5,562	556.24
USR AA <	> B1 Sluice Head Wall Means Pg. 115-6250 - \$177/CY - Productivity 125CY/Day. Our pricing is adjusted to small quantity daily output and also includes the installation of the Sluice Gate Frame.	8.30	CY			0.00	0	470.00 3,901	83.00 689	143.10 1,188	0.00 0	696.10 5,778	696.10
USR AA <	> B1 Sluice Gate Embed PVC Sheet Pricing and Production Rates from Manufacturer.	180.00	SF			0.00	0	2.75 495	4.00 720	10.60 1,908	0.00 0	17.35 3,123	17.35
USR AA <	> B1 Sluice Gate 48 x 48 Rodney Hunt Quote for Material. Crane Crew cost for 1 day installation.	1.00	EA			0.00	0	1650.00 1,650	1000.00 1,000	13886 13,886	0.00 0	16536.00 16,536	16536

		QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
USR AA <	> B1 Sluice Gate Backfill & Restore	1.00	LS		0.00	0	1650.00 1,650	1000.00 1,000	2650.00 2,650	0.00 0	5300.00 5,300	5300.00
	Includes removing diversion stream with SOE, Includes approx. 200 CY of Gravel Fill.											
USR AA <	> B6 Sluice Gate W/L Protecton	500.00	LF		0.00	0	2.20 1,100	0.00 0	1.06 530	0.00 0	3.26 1,630	3.26
USR AA <	> B6 Sluice Gate Diversion Trench	300.00	LF		0.00	0	55.00 16,500	45.00 13,500	21.20 6,360	0.00 0	121.20 36,360	121.20
USR DD <	> B6 Sluice Gate Electric Service	1.00	LS		0.00	0	1980.00 2,564	45.00 58	795.00 1,029	0.00 0	2820.00 3,652	3651.53
USR AA <	> B6 Sluice Gate Timber Pile	200.00	VLF		0.00	0	5.50 1,100	5.00 1,000	10.60 2,120	0.00 0	21.10 4,220	21.10
USR AA <	> B6 Sluice Gate Pile Cap	12.00	CY		0.00	0	315.00 3,780	36.00 432	205.64 2,468	0.00 0	556.64 6,680	556.64
USR AA <	> B6 Sluice Gate Head Wall	6.00	CY		0.00	0	470.00 2,820	83.00 498	143.10 859	0.00 0	696.10 4,177	696.10
USR AA <	> B6 Sluice Gate PVC Embed Sheetl	180.00	SF		0.00	0	2.75 495	4.00 720	10.60 1,908	0.00 0	17.35 3,123	17.35
USR AA <	> B6 Sluice Gate 84 x 60	2.00	EA		0.00	0	3300.00 6,600	2000.00 4,000	30528 61,056	0.00 0	35828.00 71,656	35828
USR AA <	> B6 Sluice Gate Back fill & Restore	1.00	EA		0.00	0	1650.00 1,650	1000.00 1,000	2650.00 2,650	0.00 0	5300.00 5,300	5300.00
USR AA <	> B8 Sluice Gate W/L Protection	500.00	LF		0.00	0	2.20 1,100	0.00 0	1.06 530	0.00 0	3.26 1,630	3.26
USR AA <	> B8 Sluice Gate Diversion Trench	300.00	LF		0.00	0	55.00 16,500	45.00 13,500	21.20 6,360	0.00 0	121.20 36,360	121.20
USR DD <	> B8 Sluice Gate Electric Service	1.00	EA		0.00	0	1980.00 2,564	45.00 58	795.00 1,029	0.00 0	2820.00 3,652	3651.53
USR AA <	> B8 Sluice Gate Timber Pile	225.00	VLF		0.00	0	5.50 1,238	5.00 1,125	10.60 2,385	0.00 0	21.10 4,748	21.10
USR AA <	> B8 Sluice Gate Pile Cap	12.00	CY		0.00	0	317.00 3,804	36.00 432	205.64 2,468	0.00 0	558.64 6,704	558.64

		QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
USR AA <	> B8 Sluice Gate Head Wall	6.00	CY		0.00	0	470.00	83.00	143.10	0.00	696.10	
							2,820	498	859	0	4,177	696.10
USR AA <	> B8 Sluice Gate 144 x 48	1.00	EA		0.00	0	3300.00	2000.00	49608	0.00	54908.00	
							3,300	2,000	49,608	0	54,908	54908
USR AA <	> B8 Sluice Gate Backfill	1.00	EA		0.00	0	1650.00	1000.00	2650.00	0.00	5300.00	
							1,650	1,000	2,650	0	5,300	5300.00
	TOTAL Tributary Closures	1.00	EA			0	101,690	58,149	176,596	0	336,435	336435

		QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT		
30. Engineering and Design														
From Baker Eng														
USR	<			> Engineering & Design Baker Engineering.	1.00	LS	0.00	0	0	0	0	750,000	750,000	750000
				TOTAL Engineering and Design	1.00	EA	0	0	0	0	750,000	750,000	750000	

			QUANTY	UOM	CREW ID	OUTPUT	MANHRS	LABOR	EQUIPMN	MATERIA	OTHER	TOTAL COST	UNIT
31. Construction Management													
From Baker Eng													
USR	<	> Construction Supervision USACE.					0.00	0.00	0.00	0.00	225000	225000.00	
		ACOE - NYD	1.00	LS		0.00	0	0	0	0	225,000	225,000	225000
USR	<	> Biologist					0.00	0.00	0.00	0.00	75000.00	75000.00	
		ACOE - NYD	1.00	LS		0.00	0	0	0	0	75,000	75,000	75000
		TOTAL Construction Management	1.00	EA			0	0	0	0	300,000	300,000	300000
		TOTAL Order of Magnitude Estimate	1.00	EA			6,400	378,146	346,795	990,899	1765220	3,481,061	3481061