Inner Harbor Navigational Canal Lock Replacement- Shallow Draft General Reevaluation Report

Annex 3: COST ENGINEERING

July 2019

Prepared by MVN EDD Cost Engineering Section

INNER HARBOR NAVIGATION CANAL

LOCK REPLACEMENT SHALLOW DRAFT LOCK

FEASIBILITY STUDY

COST ENGINEERING APPENDIX

Contents

Cost Estimate

Section 1. Cost estimate development

a) The project cost estimate was developed in the MCACES MII cost estimating software and used the standard approaches for a feasibility estimate structure regarding labor, equipment, materials, crews, unit prices, production rates, material quotes, sub and prime contractor markups. This philosophy was taken wherever practical within the time constraints. It was supplemented with estimating information from other sources where necessary such as the 1997 Evaluation Report, recent material quotes, current published estimating information, historic bid data, and updated A/E estimates. The intent was to provide or convey a "fair and reasonable" estimate that depicts the local market conditions. The estimate assumes a typical application of tiering subcontractors for certain project construction features. Given the long span over which this project/program is to be constructed and the unknown economic status during that time, demands from non-governmental civil works projects were not considered to dampen the competition and increase prices.

   After the Agency Decision Milestone and during the design of the selected plan (TSP) in early 2019, the MII cost estimate was updated due to the 2 year age limit for the cost estimate. The MII 900' x 110' x 22' cost estimate was fully updated June 2019 incorporating revised quantities prepared and furnished by MVN Engineering Division's Structures Branch and updated material pricing, labor rates, equipment rates, fuel prices, sales tax, markups, etc..

Section 2. Estimate Structure:

a) The estimate is structured to reflect the projects performed. The estimate has been subdivided by USACE feature codes that include levees, floodwalls, lock structure, relocations, channels and canals and a bridge.

Section 3. Bid competition:

a) It is assumed that there will not be an economically saturated market and that bidding competition will be present.

Section 4. Contract Acquisition Strategy:

a) It is assumed that the contract acquisition strategy will be similar to past projects with large unrestricted design/bid/build contracts. There are no declared contract acquisition plan/types at this time.

Section 5. Labor Shortages:

a) It is assumed there will be a normal labor market.

Section 6. Labor Rates:

a) Local labor market wages are above the local Davis-Bacon Wage Determination and actual rates have been used. This is based upon local information and payroll data received from the New Orleans District Construction Representatives and estimators with experiences in past years.

Section 7. Materials:

a) Cost quotes are used on major construction items when available. Recent quotes may include concrete, steel and concrete piling, rock, gravel, sand, mechanical hydraulic systems, pre-stressed precast concrete bridge girders.

b) Assumptions include:
   i) Borrow - Materials will be purchased as part of the construction contract. The estimate does anticipate contractor furnished materials for borrow. Prices include delivery of materials.
   ii) Concrete - will be purchased from commercial batch plants.
   iii) Steel – Material will be fabricated by know suppliers.

c) The borrow quantity calculations followed the MVN Geotechnical guidance:

   i) Hauled Levee: 10 BCY of borrow material = 12 LCY hauled = 8 ECY compacted.

   ii) An assumed average one-way haul distance of 21 miles was used based upon the local Contractor Furnished pit.

   iii) Haul speeds are estimated using 40 mph speed average given the long distances and rural areas.

d) Rock and stone - The New Orleans delta area has no rock sources. Historically, rock is transported by barge from northern sources on the Mississippi River. This decision is based upon local knowledge, experience and supported with cost quotes.

Section 8. Equipment:

a) Rates used are based from the latest USACE EP-1110-1-8, Region III. Adjustments are made for fuel and facility capital cost of money (FCCM). Judicious use of owned verses rental rates was considered based on typical contractor usage and local equipment availability. Only a few select pieces of marine \ marsh equipment are considered rental. Full FCCM/Cost of Money rate is latest available; MII program takes EP recommended discount, no other adjustments have been made to the FCCM.

   i) Trucking: The estimate assumed independent self-employed trucking subcontractors due to the large numbers of trucks required.

   ii) Dozers: dozers of the D-5/D-6 variety were chosen based on historical knowledge. Heavier equipment gets mired in the mud and soft soils.

   iii) Rental Rates: Rental rates were used for marsh equipment and select equipment for dredging where rental is typical such as marsh backhoes, tugs, barges.

Section 9. Fuel:

a) Fuels (gasoline, on and off-road diesel) were based on local market averages for on-road and off-road for the Gulf Coast area. The Team found that fuels fluctuate irrationally; thus, used an average.

Section 10. Crews:

a) Major crew and productivity rates were developed and studied by senior USACE estimators familiar with the type of work. All of the work is typical to the New Orleans District. The crews and productivities were checked by local MVN estimators, discussions with contractors and comparisons with historical cost data. Major crews include clearing and grubbing, hauling, earthwork, piling and concrete.

b) Most crew work hours are assumed to be 8 hrs 5 days/wk which is typical to the area.

Section 11. Unit Prices:

a) The unit prices found within the various project estimates will fluctuate within a range between similar construction units such as floodwall concrete, earthwork, and piling. Variances are a result of differing haul distances, small or large business markups, subcontracted items, designs and estimates by others.

Section 12. Relocation Cost:

a) Relocation costs are defined as the relocation of utilities required for project purposes. In cases where potential significant impacts were known, costs were included within the cost estimate. Costs related to relocations were based upon quantities and utility site location information furnished by MVN Relocations Sections and the information included the utility owner, type of utility, size, location and number of utilities.
Pricing was based upon a 2019 utility relocation project within the MVN district which included various types and dimensions of utilities.

Section 13. Mobilization:

a) Contractor mobilization and demobilization are based on the assumption that most of the contractors will be coming from within the Gulf Coast/Southern region. Mob/demob costs are based on historical studies of detailed Government estimate mob/demobs. With undefined acquisition strategies and assumed individual project limits for the large number of potential contracts in this program, the estimate mobilization and demobilization is based upon a 2018 MVN mega project which included similar construction scope of work, multiple construction sites and land and marine based construction methods.

Section 14. Field Office Overhead:

a) The estimate used a field office overhead rate of 12% for the prime contractors at budget level development. Based on historical studies and experience, Walla Walla District has

recommended typical rates ranging from 7% to 11% for large civil works projects; however, the range does not consider possible incentives such as camps, allowances, travel trailers, meals, etc. which have been used previously to facilitate projects. With undefined acquisition strategies and assumed individual project limits for the multiple number of potential contracts in this program, the estimate utilizes a more comprehensive percentage based approach applied at each contract rather than risking minimizing overhead costs by detailing costs based on an assumed number of contracts. The applied rates were previously discussed among numerous USACE District cost engineers including Walla Walla, Vicksburg, Norfolk, Huntington, St. Paul and New Orleans.

Section 15. Overhead assumptions may include:

a) Superintendent, office manager, pickups, periodic travel, costs, communications, temporary offices (contractor and government), office furniture, office supplies, computers and software, as-built drawings and minor designs, tool trailers, staging setup, camp and kitchen maintenance and utilities, utility service, toilets, safety equipment, security and fencing, small hand and power tools, project signs, traffic control, surveys, temp fuel tank station, generators, compressors, lighting, and minor miscellaneous.

Section 16. Home Office Overhead:

a) Estimate percentages range based upon consideration of 8(a), small business and unrestricted prime contractors. The rates are based upon estimating and negotiating experience, and consultation with local construction representatives. The applied rates were previously discussed among numerous USACE District cost engineers including Walla Walla, Vicksburg, Norfolk, Huntington, St. Paul and New Orleans.

Section 17. Taxes:

a) Local taxes will be applied, using an average between the parishes that contain the work. Reference the LA parish tax rate website: http://www.laota.com/pta.htm

Section 18. Bond:

a) Bond is assumed 1% applied against the prime contractor, assuming large contracts.

Section 19. E&D and S&A:

a) USACE Costs to manage design (PED) and construction (S&A) are based on New Orleans District Programmatic Cost Estimate guidance:

    i) Planning, Engineering & Design (PED): The PED cost includes such costs as project management, engineering, planning, designs, investigations, studies, reviews, value engineering and engineering during construction (EDC). Historically New Orleans District has used an approximate 12% rate for E&D/EDC, applied against the estimated construction costs. Other USACE civil works districts such as St. Paul, Memphis and St. Louis have reported values ranging from 10-15%. Additional costs were added for project management, engineering, planning, designs, investigations, studies, reviews, value engineering. Specific PED costs were originally calculated and then that same percentage was carried forward on all future updates.

ii) Supervision & Administration (S&A): Historically, New Orleans District used a range from 5% to 15% depending on project size and type applied against the estimated construction costs. Other USACE civil works districts such as St. Paul, Memphis and St. Louis report values ranging from 7.5-10%. Consideration includes that a portion of the S&A effort could be performed by contractors. Based on discussions with MVN Construction Division, an S&A cost based on contract durations was developed. Specific S&A costs were originally calculated and then that same percentage was carried forward on all future updates.

Section 20. Contingencies:

a) Contingencies were developed using the USACE Cost and Schedule Risk Analysis (CSRA) cost related risks. See summary in Cost Schedule Risk Analysis (CSRA) section.

Section 21. Escalation:

a) Escalation used in the TPCS is based upon the US Army Corps of Engineers Engineering Manual (EM) 1110-2-1304 Civil Works Construction Cost Index System (CWCCIS) revised 31 March 2018.

   After the Agency Decision Milestone and during the GRR of TSP in early 2019, the MII cost estimate was updated due to the 2 year age limit for the cost estimate. The MII 900' x 110' x 22' cost estimate was updated May 2019 to incorporate the CWCCIS version, 31 March 2018.

Section 22. HTRW:

a) The estimate includes no costs for any potential Hazardous, Toxic, and Radioactive Waste (HTRW) concerns. Some material to be removed from the canal is assumed to be contaminated and will be contained in a Confined Disposal Facility (CDF).

Section 23. Cost Estimate for TSP:

a) The TSP MII cost estimate was developed during the design of the TSP in early 2019. The costs estimated for the TSP is shown in the section TSP Cost Summary. The project costs include contingency calculated using the USACE MCX Cost and Schedule Risk Analysis program.

Schedule 24. Construction Schedule for TSP:

a) The project schedule was developed using the Primavera P6 software and is based on the construction of the individual features of work which includes the dredging of a channel bypass, canal excavation, construction of a cofferdam, the new IHNC lock, a temporary and new bridge for St Claude, demolition of the existing lock and St Claude bridge, earthen levees and floodwalls.

Total Project Cost Summary

PROJECT: **New Industrial Canal Lock and Connecting Channels** **DISTRICT:** **New Orleans District** **PREPARED:** **6/13/2019**
PROJECT NO: P2 451219 **POC:** **CHIEF, COST ENGINEERING, John B. Petitbon**
LOCATION: Orleans Parish, Louisiana

This Estimate reflects the scope and schedule in report; Final General Re-evaluation Report & Final Supplemental, Environmental Impact Statement

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
						Program Year (Budget EC): 2019									
						Effective Price Level Date: 1 OCT 18									
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Spent Thru: 1-Oct-18 ($K)	TOTAL FIRST COST ($K)	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J		K	L	M	N	O
02	RELOCATIONS	$38,825	$14,365	37.0%	$53,190	0.0%	$38,825	$14,365	$53,190	$0	$53,190	12.0%	$43,486	$16,090	$59,576
05	LOCKS	$408,274	$151,061	37.0%	$559,335	0.0%	$408,274	$151,061	$559,335	$0	$559,335	24.2%	$507,275	$187,692	$694,966
08	ROADS, RAILROADS & BRIDGES	$65,773	$24,336	37.0%	$90,109	0.0%	$65,773	$24,336	$90,109	$0	$90,109	39.8%	$91,979	$34,032	$126,011
09	CHANNELS & CANALS	$39,826	$14,736	37.0%	$54,562	0.0%	$39,826	$14,736	$54,562	$0	$54,562	29.8%	$51,712	$19,134	$70,846
11	LEVEES & FLOODWALLS	$160,231	$59,285	37.0%	$219,516	0.0%	$160,231	$59,285	$219,516	$0	$219,516	22.4%	$196,110	$72,561	$268,670
	CONSTRUCTION ESTIMATE TOTALS:	$712,929	$263,784		$976,713	0.0%	$712,929	$263,784	$976,713	$0	$976,713	24.9%	$890,562	$329,508	$1,220,069
01	LANDS AND DAMAGES	$2,362	$591	25.0%	$2,953	0.0%	$2,362	$591	$2,953	$0	$2,953	16.2%	$2,746	$686	$3,432
30	PLANNING, ENGINEERING & DESIGN	$92,752	$9,275	10.0%	$102,027	0.0%	$92,752	$9,275	$102,027	$0	$102,027	21.1%	$112,337	$11,234	$123,570
31	CONSTRUCTION MANAGEMENT	$71,293	$7,129	10.0%	$78,422	0.0%	$71,293	$7,129	$78,422	$0	$78,422	39.7%	$99,584	$9,958	$109,542
	PROJECT COST TOTALS:	$879,336	$280,779	31.9%	$1,160,115		$879,336	$280,779	**$1,160,115**	$0	**$1,160,115**	25.6%	$1,105,227	$351,386	$1,456,613

CHIEF, COST ENGINEERING, John B. Petitbon

ESTIMATED TOTAL PROJECT COST: **$1,456,613**

PROJECT MANAGER, Jasmin M. Smith

CHIEF, REAL ESTATE, Judith Y. Gutierrez

CHIEF, RPEDS, Troy G. Constance

CHIEF, ENGINEERING, Jean S. Vossen

CHIEF, OPERATIONS, Michael F. Park

CHIEF, CONSTRUCTION, Stuart Waits

CHIEF, CONTRACTING, Deborah L. Logan

CHIEF, PM-PB, Carol S. Burdine

CHIEF, DPM, Mark R. Wingate

****** CONTRACT COST SUMMARY ******

PROJECT: New Industrial Canal Lock and Connecting Channels
LOCATION: Orleans Parish, Louisiana
This Estimate reflects the scope and schedule in report; Final General Re-evaluation Report & Final Supplemental, Environmental Impact Statement

DISTRICT: New Orleans District
POC: CHIEF, COST ENGINEERING, John B. Petitbon
PREPARED: 6/13/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
		Estimate Prepared: 13-Jun-19 Effective Price Level: 1-Oct-18				Program Year (Budget EC): 2019 Effective Price Level Date: 1 OCT 18								
				RISK BASED										
WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	Mid-Point Date	INFLATED (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*I*	*J*	*P*	*L*	*M*	*N*	*O*
02	RELOCATIONS	$38,825	$14,365	37.0%	$53,190	0.0%	$38,825	$14,365	$53,190	2023Q1	12.0%	$43,486	$16,090	$59,576
05	LOCKS	$408,274	$151,061	37.0%	$559,335	0.0%	$408,274	$151,061	$559,335	2026Q3	24.2%	$507,275	$187,692	$694,966
08	ROADS, RAILROADS & BRIDGES	$65,773	$24,336	37.0%	$90,109	0.0%	$65,773	$24,336	$90,109	2030Q3	39.8%	$91,979	$34,032	$126,011
09	CHANNELS & CANALS	$39,826	$14,736	37.0%	$54,562	0.0%	$39,826	$14,736	$54,562	2028Q1	29.8%	$51,712	$19,134	$70,846
11	LEVEES & FLOODWALLS	$160,231	$59,285	37.0%	$219,516	0.0%	$160,231	$59,285	$219,516	2026Q1	22.4%	$196,110	$72,561	$268,670
	CONSTRUCTION ESTIMATE TOTALS:	$712,929	$263,784	37.0%	**$976,713**		$712,929	$263,784	$976,713			$890,562	$329,508	$1,220,069
01	LANDS AND DAMAGES	$2,362	$591	25.0%	$2,953	0.0%	$2,362	$591	$2,953	2024Q2	16.2%	$2,746	$686	$3,432
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	$7,129	$713	10.0%	$7,842	0.0%	$7,129	$713	$7,842	2022Q2	12.8%	$8,045	$804	$8,849
0.5%	Planning & Environmental Compliance	$3,565	$356	10.0%	$3,921	0.0%	$3,565	$356	$3,921	2022Q2	12.8%	$4,022	$402	$4,425
4.5%	Engineering & Design	$32,082	$3,208	10.0%	$35,290	0.0%	$32,082	$3,208	$35,290	2022Q2	12.8%	$36,202	$3,620	$39,822
0.5%	Reviews, ATRs, IEPRs, VE	$3,565	$356	10.0%	$3,921	0.0%	$3,565	$356	$3,921	2022Q2	12.8%	$4,022	$402	$4,425
1.0%	Life Cycle Updates (cost, schedule, risks)	$7,129	$713	10.0%	$7,842	0.0%	$7,129	$713	$7,842	2022Q2	12.8%	$8,045	$804	$8,849
0.5%	Contracting & Reprographics	$3,565	$356	10.0%	$3,921	0.0%	$3,565	$356	$3,921	2022Q2	12.8%	$4,022	$402	$4,425
3.0%	Engineering During Construction	$21,388	$2,139	10.0%	$23,527	0.0%	$21,388	$2,139	$23,527	2028Q1	39.7%	$29,875	$2,988	$32,863
1.0%	Planning During Construction	$7,129	$713	10.0%	$7,842	0.0%	$7,129	$713	$7,842	2028Q1	39.7%	$9,958	$996	$10,954
0.0%	Adaptive Management & Monitoring	$71	$7	10.0%	$78	0.0%	$71	$7	$78	2028Q1	39.7%	$100	$10	$110
1.0%	Project Operations	$7,129	$713	10.0%	$7,842	0.0%	$7,129	$713	$7,842	2022Q2	12.8%	$8,045	$804	$8,849
31	CONSTRUCTION MANAGEMENT													
8.0%	Construction Management	$57,034	$5,703	10.0%	$62,738	0.0%	$57,034	$5,703	$62,738	2028Q1	39.7%	$79,667	$7,967	$87,634
1.0%	Project Operation:	$7,129	$713	10.0%	$7,842	0.0%	$7,129	$713	$7,842	2028Q1	39.7%	$9,958	$996	$10,954
1.0%	Project Management	$7,129	$713	10.0%	$7,842	0.0%	$7,129	$713	$7,842	2028Q1	39.7%	$9,958	$996	$10,954
	CONTRACT COST TOTALS:	$879,336	$280,779		$1,160,115		$879,336	$280,779	**$1,160,115**			$1,105,227	$351,386	**$1,456,613**

Cost and Schedule Risk Analysis

Cost:

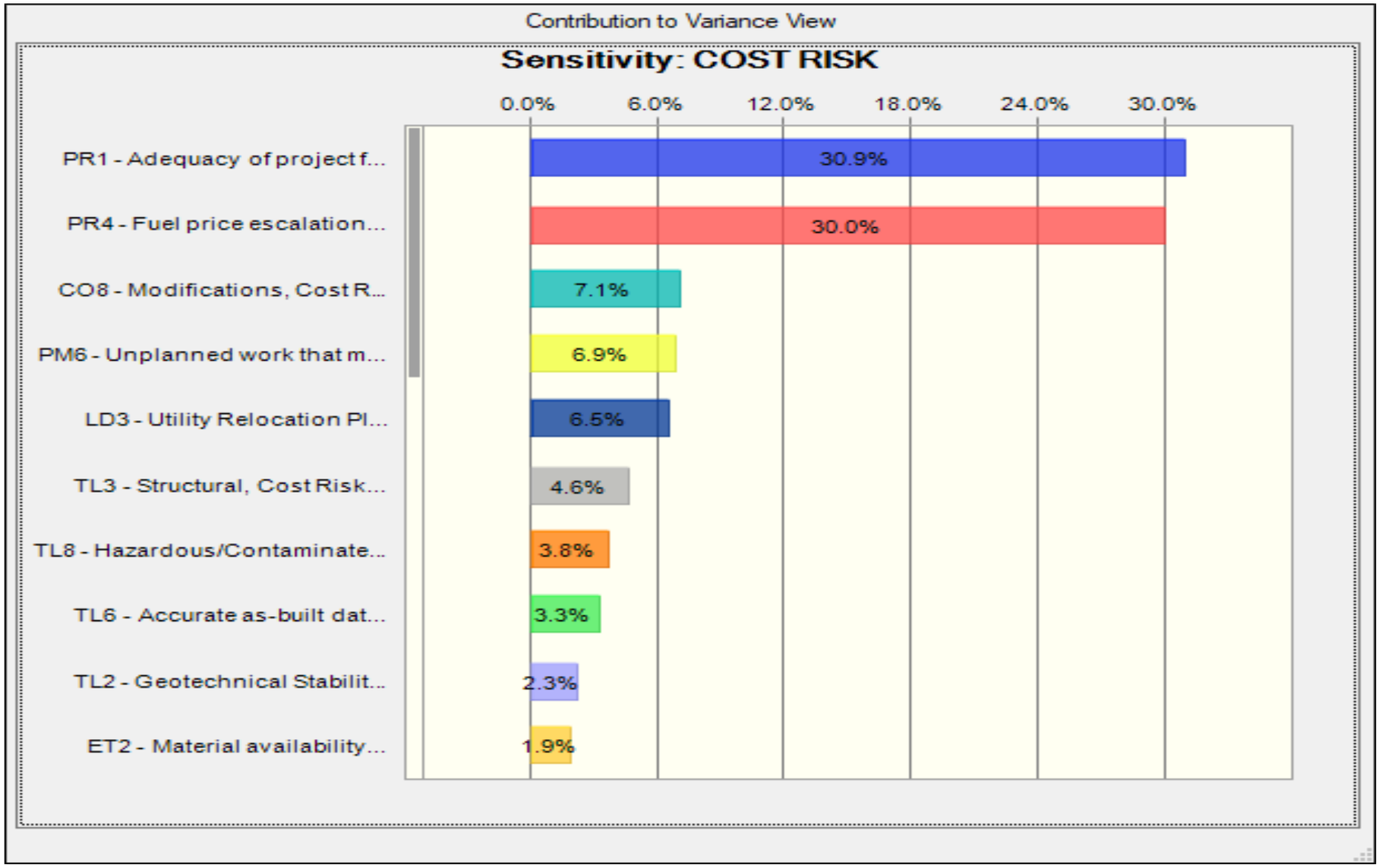
Contingency Analysis

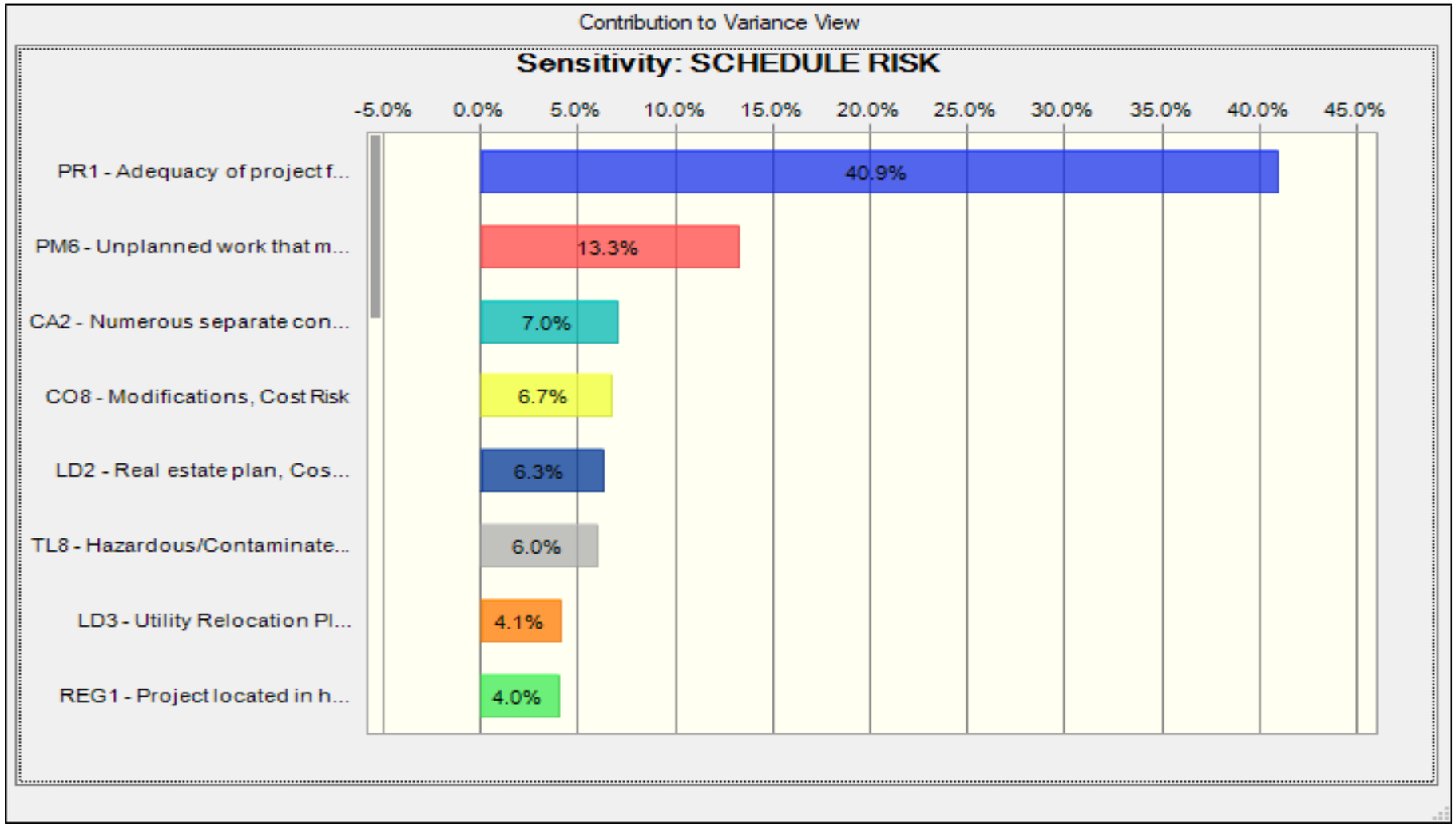
Most Likely Cost Estimate	$879,821,000	
Confidence Level	**Value**	**Contingency**
0%	**959,004,890**	**9.00%**
5%	**1,055,785,200**	**20.00%**
10%	**1,073,381,620**	**22.00%**
15%	**1,082,179,830**	**23.00%**
20%	**1,090,978,040**	**24.00%**
25%	**1,099,776,250**	**25.00%**
30%	**1,117,372,670**	**27.00%**
35%	**1,126,170,880**	**28.00%**
40%	**1,126,170,880**	**28.00%**
45%	**1,134,969,090**	**29.00%**
50%	**1,143,767,300**	**30.00%**
55%	**1,152,565,510**	**31.00%**
60%	**1,161,363,720**	**32.00%**
65%	**1,170,161,930**	**33.00%**
70%	**1,178,960,140**	**34.00%**
75%	**1,187,758,350**	**35.00%**
80%	**1,205,354,770**	**37.00%**
85%	**1,214,152,980**	**38.00%**
90%	**1,231,749,400**	**40.00%**
95%	**1,258,144,030**	**43.00%**
100%	**1,381,318,970**	**57.00%**

Schedule:

Contingency Analysis

Base Case Schedule	126.0 Months	
Confidence Level	**Value**	**Contingency**
0%	**162.5 Months**	**29.00%**
5%	**196.6 Months**	**56.00%**
10%	**204.1 Months**	**62.00%**
15%	**209.2 Months**	**66.00%**
20%	**212.9 Months**	**69.00%**
25%	**216.7 Months**	**72.00%**
30%	**220.5 Months**	**75.00%**
35%	**223.0 Months**	**77.00%**
40%	**225.5 Months**	**79.00%**
45%	**228.1 Months**	**81.00%**
50%	**231.8 Months**	**84.00%**
55%	**234.4 Months**	**86.00%**
60%	**236.9 Months**	**88.00%**
65%	**240.7 Months**	**91.00%**
70%	**243.2 Months**	**93.00%**
75%	**247.0 Months**	**96.00%**
80%	**252.0 Months**	**100.00%**
85%	**257.0 Months**	**104.00%**
90%	**263.3 Months**	**109.00%**
95%	**270.9 Months**	**115.00%**
100%	**323.8 Months**	**157.00%**


Contribution to Variance View
Sensitivity: COST RISK
0.0%
6.0%
12.0%
18.0%
24.0%
30.0%
PR1 - Adequacy of project f...
30.9%
PR4 - Fuel price escalation...
30.0%
CO8 - Modifications, Cost R...
7.1%
PM6 - Unplanned work that m...
6.9%
LD3 - Utility Relocation Pl...
6.5%
TL3 - Structural, Cost Risk...
4.6%
TL8 - Hazardous/Contaminate...
3.8%
TL6 - Accurate as-built dat...
3.3%
TL2 - Geotechnical Stabilit...
2.3%
ET2 - Material availability...
1.9%


Contribution to Variance View
Sensitivity: SCHEDULE RISK
-5.0%
0.0%
5.0%
10.0%
15.0%
20.0%
25.0%
30.0%
35.0%
40.0%
45.0%
PR1 - Adequacy of project f...
PM6 - Unplanned work that m...
CA2 - Numerous separate con...
CO8 - Modifications, Cost Risk
LD2 - Real estate plan, Cos...
TL8 - Hazardous/Contaminate...
LD3 - Utility Relocation Pl...
REG1 - Project located in h...
40.9%
13.3%
7.0%
6.7%
6.3%
6.0%
4.1%
4.0%

MII Cost Estimate

Estimated by	Darrell Normand, Eric Salamone, Miguel Ramos
Designed by	MVN Structures Branch
Prepared by	Darrell Normand, Eric Salamone, Miguel Ramos
Preparation Date	6/6/2019
Effective Date of Pricing	6/6/2019
Estimated Construction Time	Days

Description	Quantity	UOM	ProjectCost
New Section			
IHNC Lock Replacement - Shallow Draft, 110' x 900' x 22' Lock			
Lands and Damages			
Lands and Damages	1.0000	JOB	2,362,400.00
Relocations			
Utility Relocations			
Cox Cable 5" pipe cable	2,500.0000	LF	1,275,000.00
Entergy Gas 2-16" natural gas pipe lines	5,000.0000	LF	10,000,000.00
NOS&WB 20" water line	2,500.0000	LF	5,000,000.00
NOS&WB 2-30" reinforced concrete pipes	5,000.0000	LF	15,000,000.00
NOS&WB 20" C.I. pipe line	2,500.0000	LF	5,000,000.00
Entergy power cables	5,000.0000	LF	2,550,000.00
Locks			
Mobilization and Demobilization			
Mobilization and Demobilzation	1.0000	EA	24,486,465.29
Care and Diversion of Water			
Temporary Cofferdam			
Sheet Piling PS-31			
Remove Piles	940,310.0000	SF	1,281,540.34
Unloading Piling	11,900.0000	EA	596,219.08
Driving Sheetpile - PS-31	940,310.0000	SF	3,076,518.23
PS 31 Material Price (includes delivery)	940,310.0000	LB	1,376,799.29
PS-31 splicing	5,950.0000	EA	3,100,644.35
Sand Fill			
Excavation, bulk, dragline, bank measure, unclassified soil, 3 C.Y. bucket, excavate	72,975.0000	BCY	117,986.91
Granular Fill	72,975.0000	CY	1,444,147.10
18" Thick Stone Cap			
Rip-rap and rock lining, random, broken stone, machine placed for slope protection	8,515.5000	TON	323,554.25
Jet Grout			
Grout for riprap	297,230.0000	CY	63,035,730.49
Dewatering/Rewatering System			
Dewatering/Rewatering System	1.0000	EA	2,297,503.89
Well Point System	1.0000	EA	24,742,349.55
Wells and piezometers	1.0000	EA	3,534,621.36
Temporary Protective Dolphins			
36" Dia. Pipe w/ 9/16" wall			
Pile Unloading	80.0000	EA	7,245.87
Pile Installation	12,000.0000	VLF	170,807.73
Paint Piles, Coal-Tar Epoxy	15,072.0000	SFC	64,485.53
36" Pipe Pile, 9/16" thk (includes delivery)	2,835,600.0000	LB	4,044,036.66
Structural steel W30x191			

Description	Quantity	UOM	ProjectCost
Structural steel member, 100-ton project, 1 to 2 story building, W30x191, A992 steel, shop fabricated, incl shop primer, bolted connections	462.0000	LF	247,341.78
Structural steel C12x30			
Structural steel member, channels, C & MC, 11 to 20 plf, A992 steel, shop fabricated, incl shop primer, bolted connections	5.4600	TON	36,560.42
Miscellaneous Metals			
Steel Plates installation (Corner Protection, Vertical Seals, Walkways)	32,750.0000	LB	329,204.57
Energy Absorption Fenders			
Jetties, dock accessories, fender, vinyl, corner piece	200.0000	EA	7,174.18
Permanent Access Road and Parking and Landscaping			
Roadway and Parking, Asphaltic			
Asphalt Paving, plant mixed asphaltic base courses for roadways and large paved areas, bituminous concrete, 6" thick	5,000.0000	SY	226,470.98
Metal Guardrails			
Guard rail transitions, double thrie beam, includes delivery and installation	900.0000	LF	95,434.78
Semi-Compacted Fill			
Purchase and Deliver Material			
Hauling Operation to NOV-06 from Plaquemines Dirt and Clay	11,721.0000	LCY	388,579.75
Embankment Placement			
Placing Compacted Fill	7,814.0000	ECY	53,771.05
Testing			
Testing- Atterberg	10.0000	EA	883.66
Testing- In-place Density, Organic, Moisture Control	44.0000	EA	8,942.59
Testing- Compaction Curves	2.0000	EA	441.83
Testing- Sand Content	44.0000	EA	3,499.28
Settlement Gages	4.0000	EA	5,655.39
Landscaping - 27 Acres			
39 Hydro or air seeding with mulch and fertilizer, installed price	27.0000	ACR	71,576.08
watering, turf establishment	40.2800	DAY	64,068.55
Fert & seed Mob/Demob	5.0350	EA	8,898.41
Buildings, Project Operations:			
Reservation Site Work			
Special Systems	1.0000	LS	88,365.53
Intercom	1.0000	LS	26,509.66
Office Building (1,350 SF)			
Piles			
Piling special costs, cutoffs, concrete piles, plain	19.0000	EA	2,399.43
Prestressed concrete piles, square, 40' long, 12" square, priced using 200 piles, excludes pile caps or mobilization	1,672.0000	VLF	78,960.53
Concrete			
Structural concrete, in place, elevated slab, flat plate, 125 psf superimposed load, 25' span, includes forms(4 uses), reinforcing steel, and finishing	40.0000	CY	34,417.61
Brick Facade			
Brick veneer masonry, standard brick, select common, running bond, T.L. lots, 6.75/S.F., 4" x 2-2/3" x 8", includes 3% brick and 25% mortar waste, excludes scaffolding, grout and reinforcing	1,650.0000	SF	28,807.54
Scaffolding, steel tubular, regular, labor only to erect & dismantle, bldg ext, wall face, 6'-4" x 5' frames, 13 to 20 stories, excl. planks	13.0000	CSF	4,958.10
Scaffolding, steel tubular, regular, rent/month only for complete system for interior spaces, 6' -4" x 5' frames, excl. planks	13.0000	CCF	326.96

Description	Quantity	UOM	ProjectCost
Metal Roof			
Roof truss, using galv LB metal studs, fink (W) or King Post type, to 4:12 pitch, 18 ga x 4" chords, 28' span, excl erection, bridging & bracing, fabrication only of trusses on-site	30.0000	EA	10,551.86
Steel roofing panels, on steel frame, flat profile, 1-3/4" standing seams, standard finish, 12" wide, 24 gauge	2,300.0000	SF	25,674.89
Interior Walls			
Partition Wall, interior, standard, taped both sides, installed on & incl.25 ga, NLB metal studs, 6" wide, 16" O.C., 8' to 12' high, 1/2" gypsum drywall	3,000.0000	SF	19,883.61
Doors			
Doors, commercial, steel, insulated, half glass, 18 ga., 3'-0" x 7'-0" x 1-3/4" thick	4.0000	EA	5,686.99
Door frames, steel channels with anchors and bar stops, 6" channel@ 8.2 lb/LF, 3' x 7' door, weighs 150 lb	12.0000	EA	7,860.95
Door hardware, lockset, heavy duty, cylindrical, with sectional trim, keyed, single cylinder function	4.0000	EA	1,709.49
Door hardware, hinges, full mortise, high frequency, steel base, US26, 4-1/2" x 4-1/2"	18.0000	PR	2,437.69
Door hardware, lockset, heavy duty, cylindrical, with sectional trim, residential, interior door, minimum	8.0000	EA	687.79
Doors, commercial, steel, flush, half glass, hollow core, hollow metal, 20 ga., 3'-0" x 7'-0"	8.0000	EA	10,404.48
Window and Shutters			
Windows, aluminum, commercial grade, stock units, projected, with screen, enamel finish, insulating glass, 4'-5" x 5'-3", incl. frame and glazing	8.0000	EA	7,447.90
Exterior Shutters, metal, louvered	8.0000	PR	6,111.87
Insulation			
Wall Insulation, Rigid, fiberglass, foil faced, 1" thick, R4.3, 6#/CF	1,804.0000	SF	8,256.57
Blanket insulation, for walls or ceilings, foil faced fiberglass, 12" thick, R38, 15" wide	1,425.0000	SF	4,031.11
Finish			
Paints & Coatings, walls & ceilings, interior, concrete, drywall or plaster, oil base, 3 coats, smooth finish, roller	3,500.0000	SF	5,260.27
Moldings, exterior, trim, built-up, pine, three piece, maximum	800.0000	LF	15,761.04
Kitchen			
Custom Cabinets, kitchen base cabinets, hardwood, prefinished, range or sink base, 2 doors below, 24" deep, 35" high, 42" wide, excl. countertops	2.0000	EA	1,804.14
Custom Cabinets, kitchen wall cabinets, hardwood, prefinished, 2 doors, 12" deep, 12" high, 30" wide	2.0000	EA	1,060.02
Custom Cabinets, kitchen base cabinets, hardwood, prefinished, 2 top drawers, 2 doors below, 24" deep, 35" high, 48" wide, excl. countertops	1.0000	EA	1,108.55
Microwave ovens, residential appliances, 1.5 C.F., maximum	1.0000	EA	1,415.48
Sink, kitchen, counter top style, stainless steel, self rimming, double bowl, 43" x 22", includes faucet and drain	1.0000	EA	2,473.55
Faucets/fittings, kitchen sink, single control lever handle, polished brass, with pull out spray	1.0000	EA	655.22
Refrigerator, residential appliances, no frost, 6 C.F.	1.0000	EA	478.15
Misc Plumbing	1.0000	EA	2,860.00
Bathroom			
Water closet, tank type, vitreous china, floor mounted, combination, one piece, includes seat, supply pipe with stop	2.0000	EA	9,164.50
Faucets/fittings, Bathroom sink, single control lever handle	2.0000	EA	6,224.51
Plumbing			
Plumbing, Piping, sewage vent, cast iron, B & S, 4" diameter, excludes excavation or backfill	500.0000	LF	27,439.72
HVAC			
Rooftop air conditioner, single zone, electric cool, gas heat SEER 13, 4 ton cooling, 95 MBH heating, 4 ton cooling, 95 MBH heating SHEER 13, includes, standard controls, curb and economizer	4.0000	EA	60,486.64
Kitchen Hood Venting			
Range hood, residential appliances, vented, custom, 2 speed, 42" wide	1.0000	EA	3,415.26
Bathroom Venting			
Bathroom vent fan, resi, hook-up, (use w/above hook-up), custom model, 50 CFM	2.0000	EA	649.82
Electrical Wiring			
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	1,330.0000	LF	21,513.54

Description	Quantity	UOM	ProjectCost
Wire, copper, stranded, 600 volt, #12, type THWN-THHN, in raceway	53.2000	CLF	5,310.64
Rigid galvanized steel conduit, 3" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	20.0000	LF	1,264.54
Wire, copper, stranded, 600 volt, 250 kcmil, type THWN-THHN, in raceway	1.2000	CLF	1,594.10
Wire, copper, stranded, 600 volt, 1/0, type THWN-THHN, in raceway	0.3000	CLF	201.01
Terminal lugs, solderless, 250 kcmil	8.0000	EA	815.08
Terminal lugs, solderless, 1/0 to 2/0	2.0000	EA	113.54
Specialty Systems			
Detection Systems, ultrasonic motion detector, 12 volt, excl. wires & conduit	3.0000	EA	2,337.43
Detection Systems, door switches, hinge switch, excl. wires & conduit	4.0000	EA	1,130.90
Intrusion Detection Systems, misc. equipment, switch, electric strike	4.0000	EA	2,640.06
Detection Systems, siren, excl. wires & conduit	1.0000	EA	496.86
Access Control Panel	1.0000	EA	7,064.47
Alarm control panel	1.0000	EA	2,776.20
Intercom w/ manual release	1.0000	EA	258.01
Access Control Equipment, entrance card reader, proximity	4.0000	EA	4,654.35
Fiber optics, rack housing, 4 rack spaces, 12 panels (144 fibers)	1.0000	EA	1,492.86
Workstation	1.0000	EA	9,507.65
Ethernet switch	1.0000	EA	132.55
Alarm Keypad	1.0000	EA	441.83
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	650.0000	LF	10,514.14
Low voltage switching, control wire, 2 conductor	7.0000	CLF	1,413.32
Fire Protection			
Fire Alarm, pull station, manual, standard	4.0000	EA	880.28
Fire Alarm & Detection, detectors, photoelectric smoke, releasing unit, single stage, 120V	2.0000	EA	522.52
Detection Systems, strobe & horn, ADA type, excl. wires & conduit	2.0000	EA	911.76
Detection Systems, strobe, excl. wires & conduit	2.0000	EA	578.50
Fire Alarm & Detection, control panel, 4 zone	1.0000	EA	2,144.77
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	300.0000	LF	4,852.68
Low voltage switching, control wire, 2 conductor	3.5000	CLF	706.66
Operation Maintenance Building (6,816 SF)			
Piles			
Piling special costs, cutoffs, concrete piles, plain	64.0000	EA	8,082.29
Prestressed concrete piles, square, 40' long, 12" square, priced using 200 piles, excludes pile caps or mobilization	5,632.0000	VLF	265,972.33
Concrete			
Structural concrete, in place, elevated slab, flat plate, 125 psf superimposed load, 25' span, includes forms(4 uses), reinforcing steel, and finishing	230.0000	CY	197,901.24
Brick Facade			
Brick veneer masonry, standard brick, select common, running bond, T.L. lots, 6.75/S.F., 4" x 2-2/3" x 8", includes 3% brick and 25% mortar waste, excludes scaffolding, grout and reinforcing	6,000.0000	SF	104,754.70
Scaffolding, steel tubular, regular, rent/month only for complete system for interior spaces, 6' -4" x 5' frames, excl. planks	29.0000	CCF	729.37
Scaffolding, steel tubular, regular, labor only to erect & dismantle, bldg ext, wall face, 6'-4" x 5' frames, 13 to 20 stories, excl. planks	29.0000	CSF	11,060.38
Metal Roof			
Steel roofing panels, on steel frame, flat profile, 1-3/4" standing seams, standard finish, 12" wide, 24 gauge	6,500.0000	SF	72,559.47
Roof Deck Insulation, extruded polystyrene, 2" thick, R10, 25 PSI compressive strength	6,500.0000	SF	18,351.15
Interior Walls			
Partition Wall, interior, standard, taped both sides, installed on & incl.25 ga, NLB metal studs, 6" wide, 16" O.C., 8' to 12' high, 1/2" gypsum drywall	4,800.0000	SF	31,813.77
Doors			

Description	Quantity	UOM	ProjectCost
Doors, commercial, steel, insulated, half glass, 18 ga., 3'-0" x 7'-0" x 1-3/4" thick	8.0000	EA	11,373.98
Door frames, steel channels with anchors and bar stops, 6" channel@ 8.2 lb/LF, 3' x 7' door, weighs 150 lb	10.0000	EA	6,550.80
Door hardware, lockset, heavy duty, cylindrical, with sectional trim, keyed, single cylinder function	8.0000	EA	3,418.98
Door hardware, hinges, full mortise, high frequency, steel base, US26, 4-1/2" x 4-1/2"	18.0000	PR	2,437.69
Door hardware, lockset, heavy duty, cylindrical, with sectional trim, residential, interior door, minimum	2.0000	EA	171.95
Doors, commercial, steel, flush, half glass, hollow core, hollow metal, 20 ga., 3'-0" x 7'-0"	2.0000	EA	2,601.12
Doors, overhead, commercial, stock, fiberglass and aluminum, heavy duty, sectional, 12' x 12' high, excl. frames	2.0000	EA	13,653.71
Doors, overhead, commercial, stock, steel, heavy duty, sectional, manual, 24 gauge, 10' x 10' high	2.0000	EA	6,283.45
Window and Shutters			
Windows, aluminum, commercial grade, stock units, projected, with screen, enamel finish, insulating glass, 4'-5" x 5'-3", incl. frame and glazing	2.0000	EA	1,861.97
Exterior Shutters, metal, louvered	2.0000	PR	1,527.97
Insulation			
Wall Insulation, Rigid, fiberglass, foil faced, 1" thick, R4.3, 6#/CF	8,416.0000	SF	38,518.47
Blanket insulation, for walls or ceilings, foil faced fiberglass, 12" thick, R38, 15" wide	3,766.0000	SF	10,653.46
Finish			
Paints & Coatings, walls & ceilings, interior, concrete, drywall or plaster, oil base, 3 coats, smooth finish, roller	4,650.0000	SF	6,988.64
Moldings, exterior, trim, built-up, pine, three piece, maximum	800.0000	LF	15,761.04
Kitchen			
Custom Cabinets, kitchen base cabinets, hardwood, prefinished, range or sink base, 2 doors below, 24" deep, 35" high, 42" wide, excl. countertops	4.0000	EA	3,608.28
Unit kitchen, combination range, refrigerator and sink, average, 72" wide	1.0000	EA	12,945.51
Fire Protection			
Fire Alarm, pull station, manual, standard	6.0000	EA	1,320.42
Detection Systems, strobe & horn, ADA type, excl. wires & conduit	7.0000	EA	3,191.15
Fire Alarm & Detection, control panel, 8 zone	1.0000	EA	4,687.70
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	390.0000	LF	6,308.48
Low voltage switching, control wire, 2 conductor	4.5000	CLF	908.57
Specialty Systems			
Detection Systems, ultrasonic motion detector, 12 volt, excl. wires & conduit	4.0000	EA	3,116.58
Detection Systems, door switches, hinge switch, excl. wires & conduit	7.0000	EA	1,979.08
Intrusion Detection Systems, misc. equipment, switch, electric strike	4.0000	EA	2,640.06
Detection Systems, siren, excl. wires & conduit	1.0000	EA	496.86
Access Control Panel	1.0000	EA	7,064.47
Alarm control panel	1.0000	EA	2,776.20
Access Control Equipment, entrance card reader, proximity	4.0000	EA	4,654.35
Ethernet switch	1.0000	EA	132.55
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	710.0000	LF	11,484.67
Low voltage switching, control wire, 2 conductor	7.5000	CLF	1,514.28
Electrical Wiring			
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	3,040.0000	LF	49,173.82
Wire, copper, stranded, 600 volt, #12, type THWN-THHN, in raceway	121.6000	CLF	12,138.61
Kitchen wiring	1.0000	LS	17,673.11
Rigid galvanized steel conduit, 4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	20.0000	LF	1,689.50
Wire, copper, stranded, 600 volt, 600 kcmil, type THWN-THHN, in raceway	1.2000	MLF	10,594.15
Wire, copper, stranded, 600 volt, 3/0, type THWN-THHN, in raceway	0.3000	CLF	279.93
Terminal lugs, solderless, 600 kcmil	8.0000	EA	1,326.82
Terminal lugs, solderless, 3/0	2.0000	EA	156.67

Description	Quantity	UOM	ProjectCost
Bathroom Venting			
Bathroom vent fan, resi, hook-up, (use w/above hook-up), custom model, 50 CFM	2.0000	EA	649.82
Kitchen Hood Venting			
Range hood, residential appliances, vented, custom, 2 speed, 42" wide	1.0000	EA	3,415.26
HVAC			
Rooftop air conditioner, single zone, electric cool, gas heat, 12.5 ton cooling, 230 MBH heating, includes, standard controls, curb and economizer	1.0000	EA	23,513.80
Bathroom			
Water closet, tank type, vitreous china, floor mounted, combination, one piece, includes seat, supply pipe with stop	3.0000	EA	13,746.75
Faucets/fittings, Bathroom sink, single control lever handle	4.0000	EA	12,449.01
Lavatory, wall hung, vitreous china, white, with backsplash, wheelchair type, single bowl, 27" x 20", includes trim	2.0000	EA	3,502.85
Lavatory, wall hung, vitreous china, white, with backsplash, single bowl, for wall carrier, add	3.0000	EA	2,364.83
Faucets/fittings, lavatory faucet, center set with pop-up drain	8.0000	EA	2,294.79
Plumbing			
Plumbing, Piping, sewage vent, cast iron, B & S, 4" diameter, excludes excavation or backfill	500.0000	LF	27,439.72
Bridge Crane			
Overhead Bridge Cranes, under hung hoist, electric operating, 1 girder, 5 ton, 30' span	1.0000	EA	60,395.64
Crane Rail, box beam bridge, running track only, 105 lb per yard, 20' piece, excl. equipment	162.0000	LF	9,744.91
Generation Building			
Piles			
Piling special costs, cutoffs, concrete piles, plain	28.0000	EA	3,536.00
Prestressed concrete piles, square, 40' long, 12" square, priced using 200 piles, excludes pile caps or mobilization	2,464.0000	VLF	116,362.89
Concrete			
Structural concrete, in place, elevated slab, flat plate, 125 psf superimposed load, 25' span, includes forms(4 uses), reinforcing steel, and finishing	35.0000	CY	30,115.41
Brick Facade			
Brick veneer masonry, standard brick, select common, running bond, T.L. lots, 6.75/S.F., 4" x 2-2/3" x 8", includes 3% brick and 25% mortar waste, excludes scaffolding, grout and reinforcing	1,400.0000	SF	24,442.76
Scaffolding, steel tubular, regular, rent/month only for complete system for interior spaces, 6' -4" x 5' frames, excl. planks	39.5000	CCF	993.46
Scaffolding, steel tubular, regular, labor only to erect & dismantle, bldg ext, wall face, 6'-4" x 5' frames, 13 to 20 stories, excl. planks	39.5000	CSF	15,065.00
Metal Roof			
Steel roofing panels, on steel frame, flat profile, 1-3/4" standing seams, standard finish, 12" wide, 24 gauge	1,800.0000	SF	20,093.39
Roof Deck Insulation, extruded polystyrene, 2" thick, R10, 25 PSI compressive strength	1,800.0000	SF	5,081.86
Roof truss, using galv LB metal studs, fink (W) or King Post type, to 4:12 pitch, 18 ga x 4" chords, 32' span, excl erection, bridging & bracing, fabrication only of trusses on-site	29.0000	EA	11,041.71
Doors			
Doors, commercial, steel, insulated, half glass, 18 ga., 3'-0" x 7'-0" x 1-3/4" thick	8.0000	EA	11,373.98
Door frames, steel channels with anchors and bar stops, 6" channel@ 8.2 lb/LF, 3' x 7' door, weighs 150 lb	2.0000	EA	1,310.16
Door hardware, lockset, heavy duty, cylindrical, with sectional trim, keyed, single cylinder function	2.0000	EA	854.74
Door hardware, hinges, full mortise, high frequency, steel base, US26, 4-1/2" x 4-1/2"	3.0000	PR	406.28
Louvers, Fans Etc			
Louvers, aluminum, 24" x 30"	1.0000	EA	572.14
Fans, centrifugal, backward inclined, V-belt driven, 230 V, 3 phase, 1/2" S.P., 1-1/2 H.P., 8350 CFM, 30" diameter wheel	2.0000	EA	13,966.92
Fuel Tank			
Storage Tanks, steel, above ground, double wall, 3,000 gallons	1.0000	EA	21,825.76
Electrical			

Description	Quantity	UOM	ProjectCost
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	180.0000	LF	2,911.61
Wire, copper, stranded, 600 volt, #12, type THWN-THHN, in raceway	7.2000	CLF	718.73
Specialty Systems			
Detection Systems, ultrasonic motion detector, 12 volt, excl. wires & conduit	4.0000	EA	3,116.58
Detection Systems, door switches, hinge switch, excl. wires & conduit	7.0000	EA	1,979.08
Intrusion Detection Systems, misc. equipment, switch, electric strike	4.0000	EA	2,640.06
Detection Systems, siren, excl. wires & conduit	1.0000	EA	496.86
Access Control Panel	1.0000	EA	7,064.47
Alarm control panel	1.0000	EA	2,776.20
Access Control Equipment, entrance card reader, proximity	4.0000	EA	4,654.35
Ethernet switch	1.0000	EA	132.55
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	710.0000	LF	11,484.67
Low voltage switching, control wire, 2 conductor	7.5000	CLF	1,514.28
Fire Protection System			
Fire Alarm, pull station, manual, standard	1.0000	EA	220.07
Detection Systems, strobe & horn, ADA type, excl. wires & conduit	1.0000	EA	455.88
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	100.0000	LF	1,617.56
Low voltage switching, control wire, 2 conductor	1.0000	CLF	201.90
Mechanical Building			
Sector Gate North			
Fire Alarm, pull station, manual, standard	1.0000	EA	220.07
Detection Systems, strobe & horn, ADA type, excl. wires & conduit	1.0000	EA	455.88
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	100.0000	LF	1,617.56
Low voltage switching, control wire, 2 conductor	1.0000	CLF	201.90
Sector Gate South			
Fire Alarm, pull station, manual, standard	1.0000	EA	220.07
Detection Systems, strobe & horn, ADA type, excl. wires & conduit	1.0000	EA	455.88
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	100.0000	LF	1,617.56
Low voltage switching, control wire, 2 conductor	1.0000	CLF	201.90
Shops Buidling			
Fire Alarm, pull station, manual, standard	1.0000	EA	220.07
Detection Systems, strobe & horn, ADA type, excl. wires & conduit	1.0000	EA	455.88
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	100.0000	LF	1,617.56
Low voltage switching, control wire, 2 conductor	1.0000	CLF	201.90
Control House			
Concrete			
Structural concrete, in place, elevated slab, flat plate, 125 psf superimposed load, 25' span, includes forms(4 uses), reinforcing steel, and finishing	40.0000	CY	34,417.61
Brick Facade			
Scaffolding, steel tubular, regular, rent/month only for complete system for interior spaces, 6' -4" x 5' frames, excl. planks	20.0000	CCF	503.02
Scaffolding, steel tubular, regular, labor only to erect & dismantle, bldg ext, wall face, 6'-4" x 5' frames, 13 to 20 stories, excl. planks	20.0000	CSF	7,627.85
Brick veneer masonry, standard brick, select common, running bond, T.L. lots, 6.75/S.F., 4" x 2-2/3" x 8", includes 3% brick and 25% mortar waste, excludes scaffolding, grout and reinforcing	2,002.0000	SF	34,953.15
Metal Roof			
Steel roofing panels, on steel frame, flat profile, 1-3/4" standing seams, standard finish, 12" wide, 24 gauge	1,800.0000	SF	20,093.39
Roof Deck Insulation, extruded polystyrene, 2" thick, R10, 25 PSI compressive strength	1,800.0000	SF	5,081.86

Description	Quantity	UOM	ProjectCost
Roof truss, using galv LB metal studs, fink (W) or King Post type, to 4:12 pitch, 18 ga x 4" chords, 32' span, excl erection, bridging & bracing, fabrication only of trusses on-site	29.0000	EA	11,041.71
Doors			
Doors, commercial, steel, insulated, half glass, 18 ga., 3'-0" x 7'-0" x 1-3/4" thick	5.0000	EA	7,108.74
Door frames, steel channels with anchors and bar stops, 6" channel@ 8.2 lb/LF, 3' x 7' door, weighs 150 lb	5.0000	EA	3,275.40
Door hardware, lockset, heavy duty, cylindrical, with sectional trim, keyed, single cylinder function	5.0000	EA	2,136.86
Door hardware, hinges, full mortise, high frequency, steel base, US26, 4-1/2" x 4-1/2"	7.5000	PR	1,015.70
Finish			
Paints & Coatings, walls & ceilings, interior, concrete, drywall or plaster, oil base, 3 coats, smooth finish, roller	1,932.0000	SF	2,903.67
Moldings, exterior, trim, built-up, pine, three piece, maximum	800.0000	LF	15,761.04
Insulation			
Wall Insulation, Rigid, fiberglass, foil faced, 1" thick, R4.3, 6#/CF	1,932.0000	SF	8,842.40
Blanket insulation, for walls or ceilings, foil faced fiberglass, 12" thick, R38, 15" wide	1,105.0000	SF	3,125.88
Window and Shutters			
Windows, aluminum, commercial grade, stock units, projected, with screen, enamel finish, insulating glass, 4'-5" x 5'-3", incl. frame and glazing	7.0000	EA	6,516.91
Exterior Shutters, metal, louvered	7.0000	PR	5,347.89
Hand Rail			
Railing, pipe, aluminum, dark anodized finish, 3 rails, 1-1/2" dia, shop fabricated	522.0000	LF	106,999.98
Stairs			
Stair, shop fabricated, steel, 4'-0" W, incl picket railing, stringers, metal pan treads, excl concrete for pan treads, per riser	42.0000	RSR	49,010.55
Kitchen			
Custom Cabinets, kitchen base cabinets, hardwood, prefinished, range or sink base, 2 doors below, 24" deep, 35" high, 42" wide, excl. countertops	4.0000	EA	3,608.28
Unit kitchen, combination range, refrigerator and sink, average, 72" wide	1.0000	EA	12,945.51
Kitchen Hood Venting			
Range hood, residential appliances, vented, custom, 2 speed, 42" wide	1.0000	EA	3,415.26
Bathroom			
Water closet, tank type, vitreous china, floor mounted, combination, one piece, includes seat, supply pipe with stop	3.0000	EA	13,746.75
Faucets/fittings, Bathroom sink, single control lever handle	3.0000	EA	9,336.76
Lavatory, wall hung, vitreous china, white, with backsplash, wheelchair type, single bowl, 27" x 20", includes trim	3.0000	EA	5,254.28
Faucets/fittings, lavatory faucet, center set with pop-up drain	3.0000	EA	860.55
Bathroom Venting			
Bathroom vent fan, resi, hook-up, (use w/above hook-up), custom model, 50 CFM	3.0000	EA	974.72
HVAC			
Rooftop air conditioner, single zone, electric cool, gas heat, 2 ton cooling, 55 MBH heating, includes, standard controls, curb and economizer	1.0000	EA	7,704.73
Electrical			
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	1,150.0000	LF	18,601.94
Wire, copper, stranded, 600 volt, #12, type THWN-THHN, in raceway	46.0000	CLF	4,591.91
Rigid galvanized steel conduit, 2" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	20.0000	LF	682.96
Wire, copper, stranded, 600 volt, 1/0, type THWN-THHN, in raceway	1.2000	CLF	804.03
Wire, copper, stranded, 600 volt, #2, type THWN-THHN, in raceway	0.3000	CLF	130.30
Terminal lugs, solderless, 1/0 to 2/0	8.0000	EA	454.18
Terminal lugs, solderless, #2 to #1	2.0000	EA	81.95
Special System			
Detection Systems, ultrasonic motion detector, 12 volt, excl. wires & conduit	1.0000	EA	779.14

Description	Quantity	UOM	ProjectCost
Detection Systems, door switches, hinge switch, excl. wires & conduit	2.0000	EA	565.45
Intrusion Detection Systems, misc. equipment, switch, electric strike	2.0000	EA	1,320.03
Detection Systems, siren, excl. wires & conduit	1.0000	EA	496.86
Access Control Panel	1.0000	EA	7,064.47
Alarm control panel	1.0000	EA	2,776.20
Access Control Equipment, entrance card reader, proximity	2.0000	EA	2,327.17
Ethernet switch	1.0000	EA	132.55
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	330.0000	LF	5,337.95
Low voltage switching, control wire, 2 conductor	4.0000	CLF	807.61
Fire Protection System			
Fire Alarm, pull station, manual, standard	2.0000	EA	440.14
Detection Systems, strobe & horn, ADA type, excl. wires & conduit	4.0000	EA	1,823.52
Detection Systems, strobe, excl. wires & conduit	3.0000	EA	867.75
Fire Alarm & Detection, control panel, 4 zone	1.0000	EA	2,144.77
Rigid galvanized steel conduit, 3/4" diameter, to 15' H, incl 2 terminations, 2 elbows, 11 beam clamps, and 11 couplings per 100 LF	330.0000	LF	5,337.95
Low voltage switching, control wire, 2 conductor	4.0000	CLF	807.61
Automatic Extinguishing System	1.0000	LS	17,673.11
Fire Extinguishing System			
Sprinkler Systems, preaction, water & detector grid systems only, ordinary hazard, 2,000 SF, sched. 40 steel pipe	1,710.0000	SF	22,583.71
Elevator			
Electric traction freight elevators, base unit, standard finish, 4000 lb, 200 fpm, 3 stop	1.0000	EA	213,456.99
Ergo-compliant Storage Container Pad			
Piles			
Piling special costs, cutoffs, concrete piles, plain	4.0000	EA	505.14
Prestressed concrete piles, square, 40' long, 12" square, priced using 200 piles, excludes pile caps or mobilization	1,672.0000	VLF	78,960.53
Concrete			
Structural concrete, in place, chimney foundation, industrial, maximum, includes forms(4 uses), reinforcing steel, and finishing	6.0000	CY	4,206.11
Water Supply and Distribution System			
Reservation Yard Potable Water Piping			
Public Water Utility Distribution Piping, polyvinyl chloride pressure pipe, 1", class 200, SDR 21, includes trenching to 3' deep	4,600.0000	LF	49,655.25
Water Utility Distribution Fire Hydraunts, yard hydrant, flush, non-freeze, above ground, 1" connection, 4' depth of bury, excludes excavation and backfill	3.0000	EA	1,098.90
Structural concrete, in place, equipment pad, 3' x 3' x 6", includes forms, reinforcing steel, concrete, and finishing	3.0000	EA	528.87
Public Water Service			
Public Water Utility Distribution Piping, fitting, 45 degree bend, ductile iron, cement lined, mechanical joint, 6" diameter, class 50 water piping	2.0000	EA	1,100.10
Public Water Utility Distribution Piping, butterfly valves cast iron, with extension box, 6" diameter	3.0000	EA	4,467.93
Water Service Connection, ductile iron, cement lined, 8" main, 6" branch, class 50 water piping, drill and tap pressurized main (labor only), excludes excavation or backfill	1.0000	EA	668.72
Water Service Connection, tapping crosses with rubber gaskets, 8" x 6", excludes excavation and backfill	1.0000	EA	2,987.99
Structural excavation for minor structures, bank measure, for spread and mat footings, elevator pits, and small building foundations, sandy clay or loam, 1/2 C.Y. bucket, machine excavation, hydraulic backhoe	20.0000	BCY	521.72
Compaction, around structures and trenches, 2 passes, 18" wide, 6" lifts, walk behind, vibrating plate	20.0000	ECY	36.47
Concrete Pipe Kicker	4.0000	EA	38.69
Fire Hydrants			
Fire hydrants, two way, breakable, 5'-0" depth, 6", includes mechanical joints, excludes excavation and backfill	1.0000	EA	4,681.79
Concrete Pipe Kicker	4.0000	EA	38.69
Sanitary Sewer and Distribution System			

Description	Quantity	UOM	ProjectCost
Sanitary Sewer and Distribution System			
Pump, grinder system, simplex, 9 GPM at 60 PSIG, 91 gallon tank, includes check valve, tank, standard controls, alarm/disconnect panel with wire, excludes excavation	1.0000	EA	6,529.53
Pump, grinder system with manway, 18 GPM at 60 PSIG, 43" ID, 48" high, for 150 gallon tank, includes check valve, tank, standard controls, alarm/disconnect panel with wire, excludes excavation	1.0000	EA	16,154.54
Sanitary Treatment and Distribution System- WBV90			
Sewage Treatment Systema and Yard/Bridge Piping to Building	1.0000	LS	801,043.38
Earthwork for Structures			
Lock Site-Backfill			
Granular Backfill	467,320.0000	CY	9,193,134.58
Clay Backfill	65,710.0000	CY	2,052,712.51
Foundation Protection			
Rip-rap and rock lining, random, broken stone, machine placed for slope protection	60,000.0000	TON	2,279,755.16
Surfacing	12,000.0000	TON	633,892.73
Geosynthetic soil stabilization, geotextile fabric, woven, heavy duty, 600 lb. tensile strength	36,000.0000	SY	240,522.94
Foundation Work			
Sheet Piling PZ-22			
Remove Piles	33,000.0000	SF	39,964.86
Unloading Piling	421.0526	EA	16,684.56
Driving Sheetpile	33,000.0000	SF	68,878.75
PZ 22 Material Price (includes delivery)	726,000.0000	LB	1,063,007.18
Chamber Monoliths 24" PPC Piles			
Concrete Pile Unloading	792.0000	EA	71,734.07
Cutoff Drive heads	792.0000	EA	44,987.40
Precast Concrete Pile Installation	120,750.0000	VLF	2,320,316.29
Pre-Cast Concrete Pile - 24"x24"	120,750.0000	VLF	11,618,404.93
Gatebay Monoliths 24" PPC Piles			
Concrete Pile Unloading	933.0000	EA	84,504.91
Cutoff Drive heads	933.0000	EA	52,996.52
Precast Concrete Pile Installation	223,920.0000	VLF	4,302,817.60
Pre-Cast Concrete Pile - 24"x24"	223,920.0000	VLF	21,545,285.57
Storage Platform 24" PPC Piles			
Concrete Pile Unloading	16.0000	EA	1,449.17
Cutoff Drive heads	16.0000	EA	908.84
Precast Concrete Pile Installation	1,600.0000	VLF	30,745.39
Pre-Cast Concrete Pile - 24"x24"	1,600.0000	VLF	153,949.88
Lock Gates & Operating Machinery			
Metals			
Sector Gates			
Fabricated Steel	1,335,000.0000	LB	4,881,475.24
Maintenance Bulkheads			
Fabricated Steel	1,960,000.0000	LB	7,166,810.08
Structural steel marine placement	176.0000	HR	150,537.83
Composite Timber Fenders 8"X 12" (On Gates)			

Description	Quantity	UOM	ProjectCost
Wood framing, heavy mill timber, beams, built from 8" lumber, multiple 4" x 12"	2.9040	MBF	19,117.65
Machinery			
Gate Operating Machinery			
Gate machinery	1.0000	EA	1,413,848.55
Concrete Floating Guidewall			
Cofferdam			
Sheetpile			
Unloading steel sheet piling PZ-35	26,880.0000	SF	1,270,016.22
driving sheet piling	26,880.0000	SF	234,518.37
pulling sheet piling	26,880.0000	SF	117,259.18
Bracing			
Structural steel member, 100-ton project, 1 to 2 story building, W27x94, A992 steel, shop fabricated, incl shop primer, bolted connections	3,723.0000	LF	993,505.39
Guidewall			
HP 14X73			
HP 14 X 73	744,600.0000	LB	1,061,923.29
Pile Unloading	410.0000	EA	37,135.06
H Pile Installation	10,200.0000	VLF	145,186.57
Paint H Piles, Coal-Tar Epoxy	42,804.0000	SFC	183,136.84
Precast Concrete Pontoons			
Precast Concrete Pontoons	2,500.0000	CY	4,342,639.15
Concrete, In Place			
Concrete Wall	1,666.0000	CY	1,100,209.45
Sand Fill			
Excavation, bulk, dragline, bank measure, unclassified soil, 3 C.Y. bucket, excavate	600.0000	BCY	1,393.69
Granular Fill	600.0000	CY	16,062.63
Pontoon Timbers (12 x 12)			
Wood framing, heavy mill timber, girders, structural grade, 12" x 12"	31.2000	MBF	144,621.37
Miscellaneous Metals			
Steel Plates installation (Corner Protection, Vertical Seals, Walkways)	135,000.0000	LB	1,357,026.49
Timber Guidewalls			
Guidewalls			
Timber piles, friction or end bearing, treated, 12 lb. creosote/C.F., 13" butts, 6" points, 60 - 69' long, ASTM class B, excludes mobilization or demobilization	44,500.0000	VLF	2,932,904.97
Wood framing, heavy mill timber, girders, structural grade, 12" x 12"	6.9200	MBF	32,076.28
Piling, connection hardware	55.3600	LB	105.27
Wood framing, heavy mill timber, beams, built from 3" lumber, multiple 3" x 12"	16.6800	MBF	67,879.86
End Cells			
Sheet Piling PS-31			
Remove Piles	0.0000	SF	0.00
Unloading Piling	794.4569	EA	39,804.23
Driving Sheetpile - PS-31	73,000.0000	SF	238,842.33
PS 31 Material Price (includes delivery)	2,263,000.0000	LB	3,313,478.31

Description	Quantity	UOM	ProjectCost
Concrete Cap			
Concrete	4,000.0000	CY	2,641,559.31
Sand Fill			
Excavation, bulk, dragline, bank measure, unclassified soil, 3 C.Y. bucket, excavate	26,000.0000	BCY	60,393.05
Granular Fill	26,000.0000	CY	696,047.12
Lock Structure			
Concrete			
Chamber Monoliths			
Concrete Stabilization Slab	7,280.3500	CY	2,259,109.96
Gatebay Monoliths			
Concrete Stabilization Slab	13,632.3000	CY	4,230,135.18
Storage Platform			
Concrete	200.0000	CY	95,580.85
Metals			
Wall Armor			
Steel Plates installation (Corner Protection, Vertical Seals, Walkways)	400,000.0000	LB	2,907,930.00
Floating Mooring Bits			
Steel Plates installation (Corner Protection, Vertical Seals, Walkways)	115,000.0000	LB	836,029.88
Miscellaneous Metals			
Steel Plates installation (Corner Protection, Vertical Seals, Walkways)	700,000.0000	LB	5,088,877.51
Culvert Valves & Oper. Mach.:			
Metals			
Culvert Roller Gates (4)			
RxR Roller Gates	1.0000	EA	54,571.92
Fabricated Steel, RxR Roller Gate	104,000.0000	LB	1,307,840.30
Culvert Maint. Bulkhead (4)			
Fabricated Steel	88,000.0000	LB	321,775.15
Culvert Invert Screens (4)			
Fabricated Steel	118,000.0000	LB	431,471.22
Mechanical			
Culvert Valve Machinery			
Hydraulic system, materials	1.0000	EA	279,367.07
Installation of sector gate machinery	320.0000	HR	596,994.58
Piping Systems			
Mechanical			
Washdown System	1.0000	EA	44,182.77
Power and Lighting Systems:			
Electrical			

Description	Quantity	UOM	ProjectCost
Panelboards, etc			
Panelboards, 1 phase 3 wire, main circuit breaker, 120/240 V, 225 amp, 30 circuits, NQOD, incl 20 A 1 pole plug-in breakers	1.0000	EA	6,536.76
Panelboards, 1 phase 3 wire, main circuit breaker, 120/240 V, 400 amp, 30 circuits, NQOD, incl 20 A 1 pole plug-in breakers	1.0000	EA	8,690.06
Panelboards, 1 phase 3 wire, main circuit breaker, 120/240 V, 400 amp, 42 circuits, NQOD, incl 20 A 1 pole plug-in breakers	1.0000	EA	9,572.93
Panelboards, 3 phase 4 wire, main circuit breaker, 120/208 V, 100 amp, 30 circuits, NQOD, incl 20 A 1 pole plug-in breakers	1.0000	EA	4,900.87
Disconnect switch, 3 pole fusible, 200 amp, to 125 HP motor, 600 volt	3.0000	EA	9,088.97
Junction Box/Pull Box	8.0000	EA	8,678.47
Exhaust fan	3.0000	EA	11,651.22
Magnetic Motor Starter	7.0000	EA	29,422.65
Limit Switch	8.0000	EA	58,239.54
Lights			
Emergency light units, battery pack, w/two 6 V floodlights, (Type 603)	1.0000	EA	514.08
Floodlights, exterior, induction lamp, 150 watt, floor mtd, mount with swivel bracket, incl ballast and lamp	4.0000	EA	10,623.35
Fluorescent fixture, interior, troffer parabolic lay-in, 2-U32 W T8, 2' W x 2' L, incl lamps, mounting hardware and connections	1.0000	EA	372.94
Fluorescent fixture, interior, troffer parabolic lay-in, 3-32 W T8, 2' W x 4' L, incl lamps, mounting hardware and connections	11.0000	EA	4,610.71
High pressure sodium fixture, interior, surface, round, 100 W, incl lamps, and mounting hardware	4.0000	EA	6,134.91
LED fixtures, interior, strip, surface mounted, 40 watt, one light bar 4' long, incl lamps, mounting hardware and connections	3.0000	EA	1,286.38
Lightning Protection System			
Lightning Protection System	2.0000	EA	26,509.66
Navigation			
Marine Lantern	1.0000	EA	7,192.31
Navigation Signal	1.0000	EA	2,655.50
Fog Detector	1.0000	EA	949.38
Traffic Signal	1.0000	EA	2,722.45
Conduit and Wiring			
Allow $200,000 for conduits and wiring for all items	1.0000	EA	353,462.14
Web Camera System			
Install Cameras	2.0000	EA	2,691.22
Web Camera System	1.0000	LS	79,262.12
Emergency Power			
Generator set, diesel, 3 phase 4 wire, 277/480 V, 1000 kW, incl battery, charger, muffler, automatic transfer switch & day tank, excl conduit, wiring, & concrete	1.0000	EA	363,791.57
Traffic Signals			
Traffic signals, intersection,LED, mast, programmable,R/L lane control, includes all labor, material and equipment for complete installation	2.0000	EA	1,038.93
Program Logic Control (PLC), Hardware Backup Controls			
Program Logic Control (PLC), Hardware Backup Controls	1.0000	EA	1,087,779.72
Assosciated General Items			
Demolition of Existing Lock, St Claude bridge			
Lock Wall Demolition	1.0000	LS	3,628,288.83
Debris Removal	1.0000	LS	4,195,595.56
Bridge Demolition & Removal	1.0000	LS	1,021,505.57
Guidewall & Dolphin Removal	1.0000	LS	712,226.20
Tree Removal			
Tree Removal	1.0000	LS	53,019.32

Description	Quantity	UOM	ProjectCost
Site Work			
Permanent Mooring Facil. Cells			
Timber piles, friction or end bearing, treated, 12 lb. creosote/C.F., 13" butts, 6" points, 60 - 69' long, ASTM class B, excludes mobilization or demobilization	48,000.0000	VLF	3,161,564.85
Wood framing, heavy mill timber, girders, structural grade, 12" x 12"	22.0000	MBF	99,917.57
Piling, connection hardware	176.0000	LB	340.50
Wood framing, heavy mill timber, beams, built from 3" lumber, multiple 3" x 12"	28.0000	MBF	112,026.73
Demolition of Coast Guard Facility			
Coast Guard Facility	1.0000	LS	3,497,507.84
Tow Assistance Tugs			
Tug Low Usage LONG TERM RENTAL	175,104.0000	HR	60,345,318.10
Roads, Railroads & Bridges			
St. Claude Bridge Replacement			
Bascule Bridges - Main and Temporary Channel			
Demolition (Ramps only)			
Demolition (Ramps only)	1.0000	JOB	636,762.04
Structural Steel, Bascule Gate Leafs			
Decking Installation	106.1900	TON	427,746.82
Decking Steel	11,480.0000	SF	1,218,546.05
Concrete, Gate Leaf Piers			
4" Stabilization Slab Concrete, In Place, Includes Forming, Placement, Concrete	281.9600	CY	69,899.95
Piling, 18" Diameter Pipe Piles, Bridge Piers 1, 2, 3			
Pile Unloading - 18" pipe piles (Landbased)	336.0000	EA	30,432.64
Pile Installation (Landbased)	40,488.0000	VLF	576,305.29
18" Pipe Pile, 1/2" thk (includes delivery)	3,815,002.8000	LB	5,440,827.75
18" Pipe Pile Splicing	336.0000	EA	291,825.35
Paint Steel Pipe Piling, CTE	79,128.0000	SFC	413,782.13
Concrete, Approach Ramps, Bents			
Pile Unloading - 18" pipe piles (Landbased)	486.0000	EA	30,657.57
Pile Installation (Landbased)	51,030.0000	VLF	512,778.90
18" Pipe Pile, 1/2" thk (includes delivery)	4,814,170.0000	LB	5,103,474.39
18" Pipe Pile Splicing	486.0000	EA	313,757.71
Paint Steel Pipe Piling, CTE	45,781.0000	SFC	177,951.32
Concrete, Decking, Barriers, Girders			
Guardrail, 1-1/2" Diameter Pipe	2,160.0000	EA	177,369.33
Steel Sheet Piling, PZ-40 Retaining Wall Sheetpile			
Unloading Sheet Piles (Landbased)	426.0000	EA	16,880.60
Driving Sheetpile - PZ-40 (Landbased)	70,000.0000	SF	133,633.93
PZ-40 Material Price (includes delivery)	2,800,000.0000	LB	4,099,752.21
PZ-40 Splicing	426.0000	EA	221,995.71
Cutting Sheet Piling	700.0000	LF	12,159.39
Remove Sheet Piles (Landbased)	35,000.0000	SF	42,386.97
Temporary Retaining Structures (TRS) for Bridge Piers - Assume PZ-35 Sheetpile - Piers 1, 2, 3			

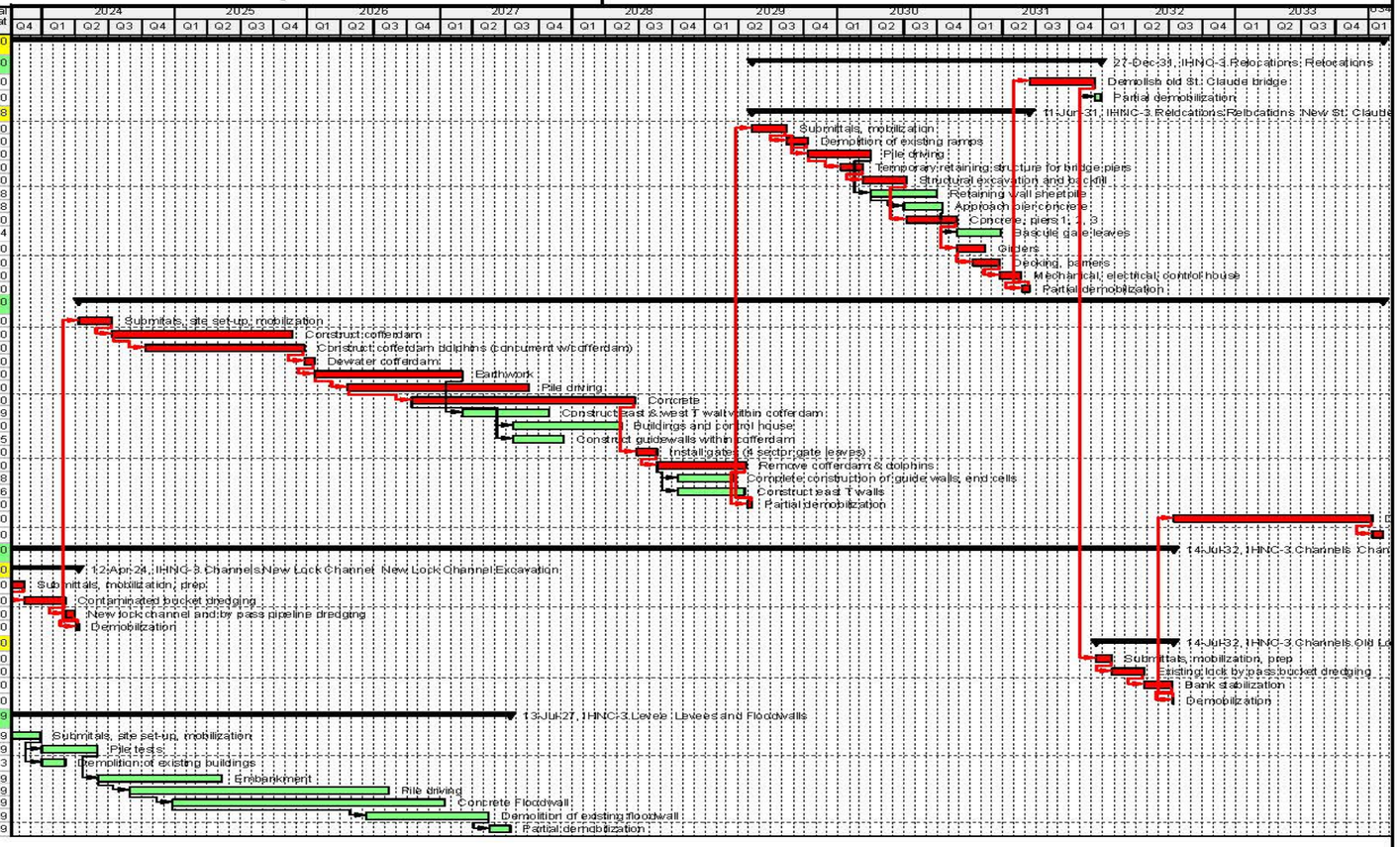
Description	Quantity	UOM	ProjectCost
Fabricated Steel Installation	50.0000	TON	136,223.99
Fabricated Steel	100,000.0000	LB	359,393.86
Fabricated Steel Removal	50.0000	TON	68,112.00
Structural Excavation and Granular Backfill for Bridge Piers 1, 2, 3			
Structural Excavation, Bridge Piers	33,000.0000	CY	139,193.95
Structural Granular Backfill, Bridge Piers	16,000.0000	CY	144,698.83
Structural Granular Backfill, Material	16,000.0000	CY	158,307.42
Structural excavation, hauling	33,000.0000	CY	240,170.69
Channels and Canals			
Canals			
Canals - Dredging (Excavation)			
Canals - Dredging (Excavation)			
10 CY Bucket	80.1714	DAY	716,703.29
Scow Hauling	80.1714	DAY	2,724,318.06
Bank Stabilization			
Site Work-North Bypass			
Geosynthetic soil stabilization, geotextile fabric, woven, heavy duty, 600 lb. tensile strength	22,000.0000	SY	199,977.59
Levees and Floodwalls			
Associated General Items:			
Floodwalls (West & East IHNC)			
T-Wall Concrete			
Concrete Slab	27,061.0000	CY	16,051,989.79
Concrete Stabilization Slab	2,909.0000	CY	973,595.30
Expansion Joint	41,735.5400	SF	130,354.91
3-Bulb Waterstop - 3/8" thk x 9" wide	18,831.8900	LF	266,676.74
Concrete Wall	20,926.0000	CY	17,754,959.81
18" Dia. Steel Pipe Piles			
Pile Unloading	5,887.0000	EA	533,205.13
Pile Installation	672,245.0000	VLF	9,568,720.36
Paint Piles, Coal-Tar Epoxy	831,834.0000	SFC	3,559,000.41
18" Pipe Pile, 1/2" thk (includes delivery)	62,854,907.5000	LB	89,641,539.70
Sheet Piling PZ-22			
Remove Piles	342,490.0000	SF	414,774.67
Unloading Piling	5,700.0000	EA	225,867.21
Driving Sheetpile	342,490.0000	SF	714,857.03
PZ 22 Material Price (includes delivery)	7,534,780.0000	LB	11,032,403.92
Paint Piles, Coal-Tar Epoxy	256,500.0000	SFC	1,097,434.83
Pile Tests			
Pile test Setup	1.0000	LS	260,558.35
Tension/Compression Tests	24.0000	EA	1,459,126.75
Levee Setback			
Reshaping	50,000.0000	CY	116,305.48

Description	Quantity	UOM	ProjectCost
Compacted Embankment Fill For Floodwalls			
Embankment	167,900.0000	CY	5,245,022.52
Compacted Embankment Fill for Levee Access Roads			
Embankment	20,000.0000	CY	624,779.34
Demolition of Existing Floodwall			
Demolition of Concrete Floodwall			
Building demolition, commercial building, reinforced concrete, with pneumatic tools, includes 20 mile haul, excludes foundation demolition, dump fees	12,627.0000	CY	251,183.41
Landfill Disposal Fee	12,627.0000	CY	84,038.26
Extract Steel Sheet Piling			
Remove Sheet Piles (Landbased)	26,500.0000	SF	32,092.99
Unloading Sheet Piles (Landbased)	662.5000	EA	26,252.11
Extract 12" Concrete Piles			
Concrete Pile Loading (Landbased)	36.0000	EA	3,260.64
Precast Concrete Pile Removal (Landbased)	2,700.0000	VLF	25,941.42
Backfill			
Embankment	3,200.0000	CY	137,177.23

Project Construction Schedule

Shallow Draft Lock Replacement w St Claude Bridge 3 — ssic Schedule Layout — 15-Jun-19 07:29

#	Activity ID	Activity Name	Original Duration	Remaining Duration	Schedule % Complete	Start	Finish	Total Float
1		**IHNC-3 Shallow Draft Lock Replacement w St Clau**	3788	3788	0%	01-Oct-23	13-Feb-34	0
2		**IHNC-3.Relocations Relocations**	960	960	0%	11-May-29	27-Dec-31	780
3	A1230	Demolish old St. Claude bridge	131	131	0%	12-Jun-31	11-Dec-31	0
4	A1380	Partial demobilization	15	15	0%	11-Dec-31	27-Dec-31	780
5		**IHNC3.Relocations.Relocations New St. Claude Bridge**	544	544	0%	11-May-29	11-Jun-31	698
6	A1510	Submittals, mobilization	67	67	0%	11-May-29	13-Aug-29	0
7	A1530	Demolition of existing ramps	42	42	0%	14-Aug-29	10-Oct-29	0
8	A1420	Pile driving	123	123	0%	11-Oct-29	01-Apr-30	0
9	A1430	Temporary retaining structure for bridge piers	45	45	0%	09-Jan-30	12-Mar-30	0
10	A1440	Structural excavation and backfill	84	84	0%	13-Mar-30	08-Jul-30	0
11	A1460	Retaining wall sheetpile	131	131	0%	02-Apr-30	01-Oct-30	28
12	A1470	Approach pier concrete	78	78	0%	01-Jul-30	16-Oct-30	28
13	A1450	Concrete, piers 1, 2, 3	100	100	0%	09-Jul-30	26-Nov-30	0
14	A1500	Bascule gate leaves	86	86	0%	26-Nov-30	25-Mar-31	754
15	A1540	Girders	55	55	0%	26-Nov-30	10-Feb-31	0
16	A1480	Decking, barriers	55	55	0%	07-Jan-31	24-Mar-31	0
17	A1490	Mechanical, electrical, control house	42	42	0%	25-Mar-31	21-May-31	0
18	A1520	Partial demobilization	15	15	0%	22-May-31	11-Jun-31	0
19		**IHNC-3.Locks Locks**	3594	3594	0%	12-Apr-24	13-Feb-34	0
20	A1040	Submtials, site set-up, mobilization	65	65	0%	12-Apr-24	12-Jul-24	0
21	A1050	Construct cofferdam	353	353	0%	12-Jul-24	19-Nov-25	0
22	A1045	Construct cofferdam dolphins (concurrent w/cofferdam)	312	312	0%	10-Oct-24	22-Dec-25	0
23	A1400	Dewater cofferdam	20	20	0%	23-Dec-25	19-Jan-26	0
24	A1060	Earthwork	293	293	0%	20-Jan-26	04-Mar-27	0
25	A1070	Pile driving	359	359	0%	20-Apr-26	02-Sep-27	0
26	A1080	Concrete	441	441	0%	15-Oct-26	22-Jun-28	0
27	A1350	Construct east & west T wall within cofferdam	239	239	0%	04-Mar-27	29-Oct-27	2299
28	A1085	Buildings and control house	213	213	0%	22-Jul-27	15-May-28	1500
29	A1410	Construct guidewalls within cofferdam	98	98	0%	22-Jul-27	06-Dec-27	1615
30	A1090	Install gates (4 sector gate leaves)	42	42	0%	23-Jun-28	21-Aug-28	0
31	A1095	Remove cofferdam & dolphins	176	176	0%	22-Aug-28	24-Apr-29	0
32	A1100	Complete construction of guide walls, end cells	110	110	0%	19-Oct-28	21-Mar-29	1278
33	A1360	Construct east T walls	132	132	0%	19-Oct-28	20-Apr-29	1256
34	A1110	Partial demobilization	12	12	0%	25-Apr-29	10-May-29	0
35	A1340	Demolition of existing lock walls	391	391	0%	14-Jul-32	12-Jan-34	0
36	A1390	Final site clean up, demobilization	22	22	0%	12-Jan-34	13-Feb-34	0
37		**IHNC-3.Channels Channels and Canals**	3210	3210	0%	01-Oct-23	14-Jul-32	0
38		**IHNC3.Channels.New Lock Channel New Lock Channel Excav**	195	195	0%	01-Oct-23	12-Apr-24	0
39	A1240	Submittals, mobilization, prep	45	45	0%	01-Oct-23	14-Nov-23	0
40	A1250	Contaminated bucket dredging	110	110	0%	15-Nov-23	03-Mar-24	0
41	A1260	New lock channel and by pass pipeline dredging	30	30	0%	04-Mar-24	02-Apr-24	0
42	A1280	Demobilization	10	10	0%	03-Apr-24	12-Apr-24	0
43		**IHNC3.Channels.Old Lock Channel Old Lock Channel Excava**	216	216	0%	12-Dec-31	14-Jul-32	0
44	A1290	Submittals, mobilization, prep	45	45	0%	12-Dec-31	25-Jan-32	0
45	A1310	Existing lock by pass bucket dredging	90	90	0%	26-Jan-32	24-Apr-32	0
46	A1320	Bank stabilization	78	78	0%	25-Apr-32	11-Jul-32	0
47	A1330	Demobilization	3	3	0%	12-Jul-32	14-Jul-32	0
48		**IHNC-3.Levee Levees and Floodwalls**	987	987	0%	02-Oct-23	13-Jul-27	1719
49	A1120	Submittals, site set-up, mobilization	65	65	0%	02-Oct-23	29-Dec-23	1719
50	A1130	Pile tests	110	110	0%	01-Jan-24	31-May-24	1719
51	A1190	Demolition of existing buildings	48	48	0%	01-Jan-24	06-Mar-24	2593
52	A1140	Embankment	245	245	0%	03-Jun-24	09-May-25	1719
53	A1150	Pile driving	510	510	0%	30-Aug-24	13-Aug-26	1719
54	A1160	Concrete Floodwall	535	535	0%	27-Dec-24	14-Jan-27	1719
55	A1180	Demolition of existing floodwall	241	241	0%	12-Jun-26	14-May-27	1719
56	A1200	Partial demobilization	42	42	0%	17-May-27	13-Jul-27	1719



Actual Work — Critical Remaining Work — Remaining Work — Milestone

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TASK filter: All Activities

Cost and Schedule Risk Analysis

Risk No.	Risk/Opportunity Event	Concerns	PDT Risk Conclusions, Justification	Project Cost				Project Schedule				Variance Distribut
				Likelihood*	Impact*	Risk Level*	Rough Order Impact ($)	Likelihood*	Impact*	Risk Level*	Rough Order Impact (mo)	
Contract Risks (Internal Risk Items are those that are generated, caused, or controlled within the PDT's sphere of influence.)												
	PROJECT & PROGRAM MGMT											
PM1	Scope incomplete	possible addition of new Florida Ave Bridge	At this time there is no possibility the bridge is not included in the project. This addition would require reauthorization of the project.	Very Unlikely	Significant	LOW		Very Unlikely	Marginal	LOW		
PM2	Adequate staff during PED	critical staff changes at crucial points of the project	The current workforce in MVN is nimble enough to absorb fluctuations in work load.	Unlikely	Negligible	LOW		Unlikely	Negligible	LOW		
PM3	Project delivery on an accelerated schedule	reduced QC, cost and schedule savings not analyzed due to time restraints	MVN is accustomed to accelerated schedules however the cost to PED can increase to obtain necessary quality to the project documents. Since the schedule is accelerated it will not be impacted. Use 15% of PED.	Likely	Marginal	MODERATE	$16,478,782	Unlikely	Negligible	LOW		
PM4	Scope objectives	are objectives finalized	The lock size is finalized however some modeling needs to occur to finalize design. No scope changes are anticipated. Hydraulics modeling needs to be completed.	Very Unlikely	Negligible	LOW		Very Unlikely	Negligible	LOW		
PM5	Project development by several sources	coordination/QC of design features on multiple project features	Coordination between Federal and Private organization during PED cause impacts to quality control and completion of the product. For more than a decade A/E's have been imbedded in MVN projects performing adequately.	Unlikely	Negligible	LOW		Unlikely	Negligible	LOW		
PM6	Unplanned work that must be accommodated	additional work to appease maritime, civic, city, business	Additional features such as bike paths, sound proofing, green spaces, guide walls, lighting, light rail transportation, and mitigation projects could be included. This would have impacts on cost and schedule. Use 10% of construction cost for the ROM cost value and 36 months for the ROM schedule value.	Likely	Marginal	MODERATE	$71,292,804	Likely	Significant	HIGH	36 Months	
PM7	Dredging Scope	Excavation of bypass channel under bridges	Bridge clearances in this area will require land based equipment under the bridges to excavate the by pass channel.	Likely	Negligible	LOW	$200,000	Likely	Negligible	LOW		
	CONTRACT ACQUISITION RISKS											
CA1	Undefined acquisition strategy	type of contracts resulting in delayed awards	Negotiated Procurements, Small Business, low bid, Design Bid Build, Early Contractor Involvement are possible vehicles to award features of work. The resulting impacts will be low to cost and schedule.	Unlikely	Marginal	LOW	$35,646,402	Unlikely	Marginal	LOW	1 Months	

CA2	Numerous separate contracts	numerous contracts impacts qualified contractor pool, mobilization cost	Obtaining qualified contractors to complete a project of this scope additional contracts on smaller features. Having numerous contracts can spread thin the Contracting Offices resources to respond. Use 50% of construction mobilization costs.	Likely	Marginal	MODERATE	$15,032,354	Likely	Marginal	MODERATE	24 Months	
CA3	Limited Competition on Dredging	Due to the small dredge quantity (~ 500,000 cy), competition will be limited.	Lack of competition foregoes the lowest bid process and hinders achieving the lowest cost to the government for this project. Therefore we can anticipate dredge cost can be 25% higher than the IGE.	Likely	Significant	HIGH	$9,956,417	Likely	Negligible	LOW	3 Months	
CA4	Competition for Structural Contracts	lack of competition between bidders on structural contracts	From MVN historical data, there will be healthy competition between bidders	Very Unlikely	Marginal	LOW		Very Unlikely	Marginal	LOW		
	TECHNICAL RISKS											
TL1	Geotechnical	additional borings/testing changes design	The borings for the structure are adequate for the current design. Confidence is high. A pile optimization study will be conducted to reduce cost. Borings for the bridge and floodwall will have to be revisited to refine the design. A cost savings in construction is anticipated because of a conservative design.	Very Unlikely	Negligible	LOW		Very Unlikely	Negligible	LOW		
TL2	Geotechnical Stability Analysis	No analysis on T-wall design in General Re-evaluation Report	Stability analysis performed during PED MAY reveal some unbalanced loads, requiring increases in T wall pile foundation cost. The cost for pile foundations can have up to a 25% increase to foundation cost may be obtained if unbalanced are found.	Likely	Marginal	MODERATE	$38,421,267	Unlikely	Marginal	LOW		
TL3	Structural	refined design, changes design, construction sequence, revise design to account for RSLR	Once the design is refined and the floodwalls are broken up into reaches, there will be some changes to the quantities. Bridge design will be refined in PED with the use of an A/E expert for the bridge which equates to a cost savings. The cofferdam design is based upon good soils investigation and testing but some assumptions will need to be refined. Jet grouting will need to be refined and may change the scope of that work. Reference RSLR: Technical Point of Contacts/Lead Designers state that the RSLR impact to redesign and additional quantities is likely with marginal impact to cost and likely with negligible impact to schedule.	Likely	Marginal	MODERATE	$60,000,000	Likely	Negligible	LOW	12 Months	
TL4	Mechanical/electrical design	refined design changes design	No design was performed. Data was used from other projects with similar elements. Detailed design will be done during PED.	Very Likely	Marginal	MODERATE	$6,548,432	Very Likely	Negligible	LOW		
TL5	Design by others	E&D impacts due to re-designs/revisions	High quality design firms that have the technical capabilities to perform the work. Over the shoulder review will be performed to maintain QA. Other Districts will be utilized . Inland Navigation Design Center will be involved with the design and will used a qualified pool on designers with inland navigation experiences that will be used.	Very Unlikely	Marginal	LOW		Very Unlikely	Marginal	LOW		

TL6	Accurate as-built data	impacts to design of project features, demolition of existing lock system, existing buildings	As built drawing may not capture possible utilities near the St Claude bridge and lock structure. Buildings may contain possible contaminated materials that need special handling and disposal.	Very Likely	Marginal	MODERATE	$50,000,000	Very Likely	Marginal	MODERATE	12 Months	
TL7	Accurate existing utility data	scope revisions to capture additional utilities		Very Unlikely	Negligible	LOW		Very Unlikely	Negligible	LOW		
TL8	Hazardous/Contaminated Material	impacts of additional HW in dredged and excavated materials	There is a possibility of HTRW material being wasted in the lock area due to the amount of vessel traffic currently using the facility. The last sampling was taken in 2007.	Unlikely	Significant	MODERATE	$50,000,000	Likely	Significant	HIGH	24 Months	
TL9	Lack of subsurface info for under water/ in water work	sufficient info for cofferdam, demolition, dredging work	There is current accurate info and as built drawings that have sufficient subaqueous.	Very Unlikely	Marginal	LOW		Very Unlikely	Marginal	LOW		
TL10	Dredging and Bank Stabilization Quantities	accuracy of design/quantities	Design quantities have not been assessed by Civil Branch at this time. Therefore quantities can vary greatly until final alignments and surveys have been completed. This quantity variation will affect the dredging and the bank stabilization quantities. As per the PDT a 15% increase in quantities will be used. The increase in time to the contract for this quantity increase is 1.5 months which is negligible.	Likely	Marginal	MODERATE	$4,912,309	Likely	Negligible	LOW		
TL11	Dredge Scope	Changes in disposal plan, location and capacity.	Currently the disposal plan features all dredge material to be placed in the Mississippi River. If the current location is adjusted assume an additional 5,000 LF of dredge pipeline. There is a quantity of contaminated material that is barge hauled to Venice, LA for final disposal. If this facility is unavailable another facility 50 more miles away can be used. A change in scope only adds 1 month to the schedule, negligible.	Likely	Marginal	MODERATE	$3,541,684	Likely	Negligible	LOW		
TL12	Hydraulic ship simulation of construction by pass channel	The simulation was last done in 1997 report but no new one has been completed. The simulation will be done during PED.	The ship simulation will be completed during PED. Tug assist may be show as necessary from the simulator.	Unlikely	Marginal	LOW		Unlikely	Negligible	LOW		
TL13	Hydraulic filling and emptying system	Physical model is required during PED to validate Hawser forces on barge tows.	If excessive Hawser forces are found during modeling significant changes will need to be made to port system and or sill elevation in the chamber.	Very Unlikely	Significant	LOW		Very Unlikely	Significant	LOW		
	LANDS AND DAMAGES RISKS											
LD1	Real estate/easement acquisition	property ownership/objections to appraisals	Only acquiring in fee 3 properties on the west side of the project. Relocation assistance i.e., new home, moving expenses, etc. If the properties cannot be obtained condemnation would ensure impacting the schedule.	Very Unlikely	Negligible	LOW	$0	Likely	Marginal	MODERATE	12 Months	
LD2	Real estate plan	has the RE plan been defined?	Awaiting information regarding compensable interest for utility relocations. Traffic plans impact to right of entry for landowners. Some homeowners shall be temporarily relocated for safety and access concerns for 6 months at a time. Roughly 25 residents and two business can have temporary access issues. From discussions an impact of $500,000 would impact the project.	Very Unlikely	Negligible	LOW	$0	Likely	Significant	HIGH	24 Months	

LD3	Utility Relocation Plan	delays to relocations impact project features, known utilities locations differ and impact design/construction, abandoned utility locations impact design/construction	Waterlines, communications, power lines, sewer lines, private gas and petroleum lines. During the Katrina reconstruction, many project site utilities were verified and some were capped, removed and abandoned. This results in less utilities than was quantified during the 1997 report. Therefore an unknown utility is unlikely. Known utilities without verified survey information to determine below channel elevations are real.	Likely	Marginal	MODERATE	$70,000,000	Likely	Marginal	MODERATE	18 Months	
	REGULATORY AND ENVIRONMENTAL RISKS											
REG1	Project located in high sensitivity area to air/water/land/noise impacts	additional costs to not exceed environmental thresholds	Due to the proximity of residence construction activities can disturb the surrounding area. Truck hauling, pile driving, dredging and other construction activities may be restricted to certain times of the day for short time periods to limit impacts. Work schedule for construction is 5 days per week, 8 hours per day. Likelihood of a less aggressive work schedule is possible. Activities that do not impact the surrounding area can continue for longer periods of the day. A 1% increase of cost on heavy construction items could be impacted resulting in a $5M increase. Currently the dredging is executed during the daylight hours and a possible 7 days per week. This schedule has occurred in the past. Reduction in dredge plant running times occurs in ET-5.	Likely	Negligible	LOW		Likely	Marginal	MODERATE	18 Months	
REG2	Containments of concern	cost and schedule impacts for project foot print materials	If dredged material is consistent with assumed characteristics then minimal changes are anticipated. No reason to assume changes have occurred.	Very Unlikely	Negligible	LOW		Very Likely	Negligible	LOW		
REG3	Multi agency review of permits	delays to permit approvals	Schedule or cost changes are not a concern. A Storm Water Protection Plan Section 402 Clean Water Act (permit) and a Bridge Permit with the US Coast Guard (a memorandum). Products would be developed in MVN and processed accordingly	Very Unlikely	Negligible	LOW		Very Unlikely	Negligible	LOW		
REG4	Historic/cultural site	unexpected find of historic/cultural significance delays project	The St. Claude Ave. Bridge, The Holy Cross National Register Historic District, Bywater National Register Historic District, Sewerage and Water Board, Sewerage Pump Station B and the Judge Seeber Bridge/LA 39/ N. Claiborne Ave. are the identified at this time. However some project features have not been explored. After investigation additional cost and schedule impacts can occur.	Likely	Marginal	MODERATE	$5,000,000	Likely	Marginal	MODERATE	18 Months	
REG5	Environmental and water quality issues	environmental impacts from dredging and disposal of industrial corridor channel bottom	A water quality certificate has been obtained. Unless features of the project change substantially an amended certificate will have to be crafted. The dredge material disposal plan is not likely to change.	Very Unlikely	Negligible	LOW		Very Unlikely	Negligible	LOW		
	CONSTRUCTION RISKS											

CO1	Adequate staging areas	possible multiple concurrent construction contracts strain available site staging areas	Current available vacant land and warehouse areas surrounding the project site should be of sufficient size and quantity to support multiple contractor's needs.	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW		
CO2	Critical fabrication and delivery	specialized fabrication/materials/delivery of vital lock and bridge components may increase cost and delay construction	Some specialized fabrication may be needed for the lock and bridge construction but the fabrication materials and methods are not unique and have been successfully completed on previous projects. The construction schedule is flexible to allow for sufficient lead time for fabrication and delivery of such items.	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW		
CO3	Transportation/haul routes constricted or unusable during periods of time		There will be reduced transportation facilities available but minimal impacts	Likely	Negligible	LOW		Likely	Negligible	LOW		
CO4	Innovative project construction	innovative construction methods increase cost and time	The construction methods are similar to what have been successfully used on previous local major structural projects. MVN Corps personnel and contractors are versed in necessary construction methods.	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW		
CO5	Navigation traffic	constant marine traffic impacting project construction efficiency	Cofferdam, channel dredging and lock construction will not be impacted by marine traffic. The new St Claude Bascule bridge construction may be impacted by marine traffic.	Likely	Marginal	MODERATE	$5,000,000	Likely	Negligible	LOW	6 Months	
CO6	Marine construction	marine based construction may be more expensive and create longer construction durations	The marine based construction needed for this project is typical for the MVN District and has been successfully deployed before by contractors on minor and major construction projects.	Very Unlikely	Negligible	LOW		Very Unlikely	Negligible	LOW		
CO7	Inefficient contractors	cost and schedule impacts occur due to poorly performing contractors	The procurement process should be able to select the most highly qualified contractors with a proven track record of performance.	Very Unlikely	Significant	LOW		Very Unlikely	Significant	LOW		
CO8	Modifications	large scope will produce modifications	The large scope of the project will result in numerous modifications	Very Likely	Marginal	MODERATE	$70,000,000	Very Likely	Marginal	MODERATE	24 Months	
	ESTIMATE AND SCHEDULE RISKS											
ET1	Labor availability/wages	labor pool shortage and wage increases during construction	A ten year project will see fluctuations in the availability of trained and qualified labor pools but if necessary, some labor training can be done by the contractors. Wage increases will occur over the life of the project and the costs should reflect escalations.	Very Likely	Marginal	MODERATE	$23,814,038	Unlikely	Marginal	LOW		
ET2	Material availability/escalation	material shortage and price increases	A ten year project might see fluctuations in the availability of certain materials and material price escalation will occur.	Very Likely	Significant	HIGH	$37,734,255	Unlikely	Marginal	LOW		

ET3	Cost and schedule estimate construction phasing	variations in construction sequencing and/or phasing may impact cost, duration	construction sequencing changes might impact cost and durations but such changes will have minor impacts	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW		
ET4	Estimate reasonableness of crews and productivity	crew and productivity revisions impacts cost and schedule	estimate of cost and schedule will be based upon historical crew sizes and production rates for similar types of work. MVN has a wealth of third type of data concerning heavy civil construction	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW		
ET5	Dredge Plant Running Time	Fluctuation in dredge plant running time may occur due to various factors.	Unknown underground obstructions and debris could impact dredge plant running time thus impacting dredging cost. Dredging shall occur only during daytime hours to lower noise levels. We will assume a 25% reduction in dredge running times.	Likely	Marginal	MODERATE	$2,624,504	Likely	Negligible	LOW	2 Months	
ET6	Dredge Production Rates	Dredge plant production can vary.	Dredge production can vary from the ones used in the estimate. A dredge plant of lower capacity could actually construct the work. Assume a 30% reduction in production rates.	Likely	Significant	HIGH	$9,384,162	Likely	Negligible	LOW		
	Programmatic Risks	(External Risk Items are those that are generated, caused, or controlled exclusively outside the PDT's sphere of influence.)										
PR1	Adequacy of project funding/ funding stream	level of project funding priority / yearly allocation	historic data shows that long term programs have received funding cuts, Inland Waterway Trust Fund has a limited fund balance remaining and other ongoing projects share the funding	Very Likely	Critical	HIGH	$150,000,000	Very Likely	Critical	HIGH	60 Months	
PR2	Local community opposition	project opposition impacts project construction	Because of the cultural and historical concerns the local community can oppose the demolition of portions of the project and stymie construction startup	Very Likely	Marginal	MODERATE	$10,000,000	Very Likely	Marginal	MODERATE	12 Months	
PR3	Political factors at all levels of government	politicians opposed to project delay construction	currently, the political crowd is in favor of the project but civic opposition may change mindsets	Likely	Marginal	MODERATE	$10,000,000	Likely	Marginal	MODERATE	12 Months	
PR4	Fuel price escalation	Fuel is a volatile cost and can greatly affect the cost of this project.	A ten year project will see fluctuations in fuel prices. Fuel could increase or decrease altering the cost. We assume an increase of $2.25 or a decrease of $0.75 based price fluctuation in the past years.	Very Likely	Marginal	MODERATE	$73,200,606	Very Unlikely	Negligible	LOW		
PR5	Stakeholders request late changes to project features	late design changes impact cost and duration	significant input from stakeholders thru the years have been addressed and incorporated into the project features	Very Unlikely	Marginal	LOW		Very Unlikely	Marginal	LOW		

*Likelihood, Impact, and Risk Level to be verified through market research and analysis (conducted by cost engineer).

1. Risk/Opportunity identified with reference to the Risk Identification Checklist and through deliberation and study of the PDT.
2. Discussions and Concerns elaborates on Risk/Opportunity Events and includes any assumptions or findings (should contain information pertinent to eventual study and analysis of event's impact to project).
3. Likelihood is a measure of the probability of the event occurring -- **Very Unlikely**, **Unlikely**, **Moderately Likely**, **Likely**, **Very Likely.** The likelihood of the event will be the same for both Cost and Schedule, regardless of impact.
4. Impact is a measure of the event's effect on project objectives with relation to scope, cost, and/or schedule -- **Negligible**, **Marginal**, **Significant**, **Critical**, or **Crisis.** Impacts on Project Cost may vary in severity from impacts on Project Schedule.
5. Risk Level is the resultant of Likelihood and Impact **Low**, **Moderate**, or **High**. Refer to the matrix located at top of page.

6. Variance Distribution refers to the behavior of the individual risk item with respect to its potential effects on Project Cost and Schedule. For example, an item with clearly defined parameters and a solid most likely scenario would probably follow a triangular or norma probability of modeling with respect to effects on cost or schedule (i.e. "anyone's guess") would probably follow a uniform or discrete uniform distribution.
7. The responsibility or POC is the entity responsible as the Subject Matter Expert (SME) for action, monitoring, or information on the PDT for the identified risk or opportunity.
8. Correlation recognizes those risk events that may be related to one another. Care should be given to ensure the risks are handled correctly without a "double counting."
9. Affected Project Component identifies the specific item of the project to which the risk directly or strongly correlates.

10. Project Implications identifies whether or not the risk item affects project cost, project schedule, or both. The PDT is responsible for conducting studies for both Project Cost and for Project Schedule.
11. Results of the risk identification process are studied and further developed by the Cost Engineer, then analyzed through the Monte Carlo Analysis Method for Cost (Contingency) and Schedule (Escalation) Growth.