



ENGINEERING APPENDIX A

APPENDIX 10

COST ESTIMATE

**GIWW BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS
SYSTEMS FEASIBILITY STUDY
COST ENGINEERING APPENDIX**

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**GIWW BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS
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Brazos River Floodgates and Colorado River Locks Systems

1.1 General

1.1.1 Cost estimate development

The project cost estimate was developed in the latest TRACES MII cost estimating software and used the standard approaches for a feasibility estimate structure regarding labor, equipment, materials, crews, unit prices, 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 quotes, bid data, and A-E estimates. The intent was to provide or convey a “fair and reasonable” estimate that which depicts the local market conditions. The estimates assume a typical application of tiering subcontractors. All of the construction work (e.g., sector gate structures, dredging, excavation, dewatering, pilings, rock, etc.) is common to the gulf coast region. The construction sites are accessible from land and water. Access is easily provided from the Gulf of Mexico, GIWW, or various local highways.

1.1.2 Estimate Structure

The estimates are structured to reflect the projects performed. The estimates have been subdivided by alternative and USACE feature codes.

1.1.3 Bid Competition

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

1.1.4 Contract Acquisition Strategy

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

1.1.5 Labor Shortages

It is assumed there will be a normal labor market.

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1.1.6 Labor Rates

Local labor market wages are above the local Davis-Bacon Wage Determination and actual rates have been used. Local payroll information was not available, therefore regional gulf coast information was used from the New Orleans District Construction Representatives and estimators with experiences in past years.

1.1.7 Materials

Cost quotes are used on major construction items when available. Recent quotes may include concrete, steel and concrete piling, rock, gravel and sand. The assumption is that materials will be purchased as part of the construction contract. The estimate does not anticipate government furnished materials. Prices include delivery of materials.

1.1.8 Quantities

Quantities provided for Colorado River Locks by MVN Structures Branch and for Brazos River Floodgates by TXDOT.

1.1.9 Equipment

Rates used are based from the latest USACE EP-1110-1-8, Region VI. 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. Equipment was chosen based on historical knowledge of similar projects.

1.1.10 Severe and Rental Rates

Severe equipment rates were used for various pieces of equipment in the hydraulic dredging crews where they may come in contact with a saltwater environment.

Rental rates were used for various pieces of marine and marsh equipment where rental is typical such as marsh backhoes.

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1.1.11 Fuels

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.

1.1.12 Crews

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 gulf coast area and New Orleans District cost engineers. The crews and productivities were checked by local MVN estimators, discussions with contractors and comparisons with historical cost data. Major crews include haul, earthwork, piling, concrete, and hydraulic dredging.

Most crew work hours are assumed to be 10 hrs 6 days/wk which is typical to the area. Marine based bucket excavation/dredging operations are assumed to work 2-12 hours shifts 7 days / week.

A 10% “markup on labor for weather delay” is selectively applied to the labor in major earthwork placing detail items and associated items that would be affected by small amounts of weather making it unsafe or difficult to place (trying to run dump trucks on a wet levee) or be detrimental/non-compliant to the work being done (trying to place/compact material in the rain). The 10% markup is to cover the common practice of paying for labor “showing up” to the job site and then being sent home due to minor weather which is part of known average weather impacts as reflected within the standard contract specifications. The markup was not applied to small quantities where this can be scheduled around.

1.1.13 Unit Prices

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 (trucked or barged), small or large business markups, subcontracted items, designs and estimates by others.

1.1.14 Relocation Costs

Relocation costs are defined as the relocation of public roads, bridges, railroads, and utilities required for project purposes. In cases where potential significant impacts were known, costs were included within the cost estimate.

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1.1.15 Mobilization

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/demob which are in the range of 5% of the construction costs. With undefined acquisition strategies and assumed individual project limits, the estimate utilizes a slightly more comprehensive approx. 6% value (min) applied at each contract rather than risking minimizing mob/demob costs by detailing costs based on an assumed number of contracts. This value also matches well with values previously prescribed by Walla Walla District, which has studied historical rates.

1.1.16 Field Office Overhead

The estimate used a field office overhead rate of 13%, 12% for the prime contractor's base operations plus an additional 1% for access support since the project is located on the opposite side of the GIWW from land access. Based on historical studies and experience, Walla Walla District has recommended typical rates ranging from 9% to 11% for large civil works projects; however, the 9-11% rate does not consider possible incentives such as camps, allowances, travel trailers, meals, etc. which have been used previously to facilitate large or remote projects. With undefined acquisition strategies and assumed individual project limits, 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.

1.1.17 Overhead Assumptions

Overhead assumptions may include 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/facility/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.

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1.1.18 Home Office Overhead

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. Different percents are used when considering the contract acquisition strategy regarding small business 8(a), competitive small business and large business, high to low respectively. The applied rates were previously discussed among numerous USACE District cost engineers including Walla Walla, Vicksburg, Norfolk, Huntington, St. Paul and New Orleans.

1.1.19 Taxes

Local taxes will be applied based on the counties that contain the work. Reference the tax rate website for Texas: <http://www.salestaxstates.com>.

1.1.20 Bond

Bond is assumed 1% applied against the prime contractor, assuming large contracts. No differentiation was made between large and small businesses.

1.1.21 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 a rate of approximately 12% for E&D plus small percentages for other support features is 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% for E&D. Additional support features might include project management, engineering, planning, designs, investigations, studies, reviews, and value engineering.

1.1.22 Supervision & Administration (S&A)

Historically 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. S&A costs are percentage based.

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1.1.23 Contingencies

Contingencies at the alternative stage were developed using the USACE Abbreviated Cost Risk Analysis (ARA) program based on cost risks determined by the PDT. A separate ARA was prepared for each alternative to help differentiate between the alternatives. For the Recommended Plan, a full Cost and Schedule Risk Analysis (CSRA) was developed on the complete project using the Crystal Ball program. See Cost and Schedule Report for details.

1.1.24 Escalation

Escalation used is based upon the latest version of the US Army Corps of Engineers Engineering Manual (EM) 1110-2-1304 Civil Works Construction Cost Index System (CWCCIS).

1.1.25 HTRW

The estimate does not include costs for any potential Hazardous, Toxic, and Radioactive Waste (HTRW) due to lack of any concerns.

1.2 Cost Estimate and Schedule – Recommended Plan

1.2.1 Schedule – Recommended Plan

The schedule for each of the project sites was developed based on the construction line items for each feature of work. Detailed schedules attached at end of Appendix.

TSP Feature	Construction Duration (year)
Brazos Alt 3a.1 - Move gate back East + Open channel West	2.20
Colorado Alt 4b.1 - Replace Inland gates + Remove Riverside gates	2.30

New construction durations. Do Not include contingency

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1.2.2 Cost Estimates – Recommended Plan

Table 1 and 2 show the baseline project cost for each project site. This information is taken from the Total Project Cost Sheet (TPCS).

Table 1 Brazos River – Alt 3a.1

Feature	Cost	Contingency	Total
01 Lands & Damages	\$159,000	\$40,000	\$199,000
02 Relocations			
05 Locks			
06 Fish & Wildlife Facilities	\$544,000	\$152,000	\$696,000
11 Levees & Floodwalls			
15 Fldwy Control & Div Str	\$91,404,000	\$25,593,000	\$116,997,000
30 PED	\$18,366,000	\$5,142,000	\$23,508,000
31 Construction Management	\$10,054,000	\$2,815,000	\$12,869,000
TOTAL	\$120,527,000	\$33,743,000	\$154,270,000

Table 2 Colorado River – Alt 4b.1

Feature	Cost	Contingency	Total
01 Lands & Damages	\$36,000	\$9,000	\$45,000
02 Relocations			
05 Locks	\$146,330,000	\$40,972,000	\$187,302,000
06 Fish & Wildlife Facilities	\$29,000	\$8,000	\$37,000
11 Levees & Floodwalls			
15 Fldwy Control & Div Str			
30 PED	\$29,272,000	\$8,196,000	\$37,468,000
31 Construction Management	\$16,097,000	\$4,507,000	\$20,604,000
TOTAL	\$191,764,000	\$53,693,000	\$245,457,000

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1.2.3 Cost Estimates – Recommended Plan Mii Summary

Mii project summary for each project site attached at end of Appendix.

1.2.4 Cost Estimates – Recommended Plan CSRA Summary

Cost and Schedule Risk Analysis (CSRA) summary and risk register for the project attached at end of Appendix.

1.3 Cost Estimate and Schedules - Alternatives

1.3.1 Schedule - Alternatives

The project schedule for each alternative was developed based on the construction line items for each feature of work.

Brazos - Colorado Alternatives Durations

27-Mar-18

Alternative	Construction Duration (year)
Brazos Alt 2a - Rehab	1.25
Brazos Alt 3a - Move gates back	2.50
Brazos Alt 3a.1 - Move gate back East + Open channel West	2.25
Brazos Alt 9a - Open channel	1.00
Brazos Alt 9b - New gates Align C w/o Sediment Control	2.25
Brazos Alt 9c - New gates Align C with Sediment Control	3.00
Colorado Alt 4b.1 Hybrid - Rehab Inland gate + Remove Riverside gate	1.75
Colorado Alt 2b - Rehab w/ Guidewall	1.50
Colorado Alt 3B - Open channel	1.25

New construction durations. Do Not include contingency

**GIWW BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS
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1.3.2 Cost Estimates - Alternatives

Table 1 through 9 show the baseline project cost for each alternative. This information is taken from the Total Project Cost Sheet (TPCS).

Table 1 Brazos River – Alt 2a Rehab

Feature	Cost	Contingency	Total
01 Lands & Damages	\$28,000	\$6,000	\$33,000
02 Relocations			
05 Locks			
06 Fish & Wildlife Facilities			
11 Levees & Floodwalls			
15 Fldwy Control & Div Str	\$24,579,000	\$10,323,000	\$34,902,000
30 PED	\$5,002,000	\$2,101,000	\$7,102,000
31 Construction Management	\$2,751,000	\$1,155,000	\$3,907,000
TOTAL	\$32,359,000	\$13,585,000	\$45,944,000

Table 2 Brazos River – Alt 3a

Feature	Cost	Contingency	Total
01 Lands & Damages	\$28,000	\$6,000	\$33,000
02 Relocations			
05 Locks			
06 Fish & Wildlife Facilities	\$311,000	\$131,000	\$442,000
11 Levees & Floodwalls			
15 Fldwy Control & Div Str	\$161,982,000	\$68,033,000	\$230,015,000
30 PED	\$33,033,000	\$13,874,000	\$46,907,000
31 Construction Management	\$18,169,000	\$7,631,000	\$25,799,000
TOTAL	\$213,523,000	\$89,674,000	\$303,197,000

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Table 3 Brazos River – Alt 3a.1

Feature	Cost	Contingency	Total
01 Lands & Damages	\$28,000	\$6,000	\$33,000
02 Relocations			
05 Locks			
06 Fish & Wildlife Facilities	\$306,000	\$122,000	\$429,000
11 Levees & Floodwalls			
15 Fldwy Control & Div Str	\$91,359,000	\$36,543,000	\$127,902,000
30 PED	\$18,657,000	\$7,463,000	\$26,119,000
31 Construction Management	\$10,262,000	\$4,105,000	\$14,367,000
TOTAL	\$120,611,000	\$48,239,000	\$168,850,000

Table 4 Brazos River – Alt 9a

Feature	Cost	Contingency	Total
01 Lands & Damages	\$1,803,000	\$448,000	\$2,251,000
02 Relocations			
05 Locks			
06 Fish & Wildlife Facilities	\$1,556,000	\$591,000	\$2,148,000
09 Channels & Canals	\$14,220,000	\$5,404,000	\$19,624,000
15 Fldwy Control & Div Str			
30 PED	\$3,211,000	\$1,220,000	\$4,431,000
31 Construction Management	\$1,766,000	\$671,000	\$2,436,000
TOTAL	\$22,556,000	\$8,334,000	\$30,890,000

Table 5 Brazos River – Alt 9b

Feature	Cost	Contingency	Total
01 Lands & Damages	\$1,803,000	\$448,000	\$2,251,000
02 Relocations			
05 Locks			
06 Fish & Wildlife Facilities	\$1,454,000	\$582,000	\$2,036,000
11 Levees & Floodwalls			
15 Fldwy Control & Div Str	\$146,851,000	\$58,740,000	\$205,592,000
30 PED	\$30,188,000	\$12,075,000	\$42,263,000
31 Construction Management	\$16,603,000	\$6,641,000	\$23,245,000
TOTAL	\$196,900,000	\$78,487,000	\$275,386,000

**GIWW BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS
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Table 6 Brazos River – Alt 9c

Feature	Cost	Contingency	Total
01 Lands & Damages	\$1,803,000	\$448,000	\$2,251,000
02 Relocations			
05 Locks			
06 Fish & Wildlife Facilities	\$1,454,000	\$596,000	\$2,050,000
15 Fldwy Control & Div Str	\$145,277,000	\$59,563,000	\$204,840,000
15 Fldwy Control & Div Str	\$8,629,000	\$3,538,000	\$12,167,000
30 PED	\$31,621,000	\$12,965,000	\$44,586,000
31 Construction Management	\$17,393,000	\$7,131,000	\$24,524,000
TOTAL	\$206,176,000	\$84,241,000	\$290,418,000

Table 7 Colorado River – Alt 4b.1 Hybrid

Feature	Cost	Contingency	Total
01 Lands & Damages	\$16,000	\$3,000	\$20,000
02 Relocations			
05 Locks	\$33,758,000	\$14,178,000	\$47,936,000
06 Fish & Wildlife Facilities	\$36,000	\$15,000	\$51,000
11 Levees & Floodwalls			
15 Fldwy Control & Div Str			
30 PED	\$6,879,000	\$2,889,000	\$9,769,000
31 Construction Management	\$3,785,000	\$1,589,000	\$5,374,000
TOTAL	\$44,474,000	\$18,675,000	\$63,149,000

Table 8 Colorado River – Alt 2b Rehab w/ Guidewall

Feature	Cost	Contingency	Total
01 Lands & Damages	\$16,000	\$3,000	\$20,000
02 Relocations			
05 Locks	\$46,428,000	\$20,428,000	\$66,856,000
06 Fish & Wildlife Facilities			
09 Channels & Canals			
15 Fldwy Control & Div Str			
30 PED	\$9,449,000	\$4,157,000	\$13,606,000
31 Construction Management	\$5,197,000	\$2,287,000	\$7,484,000
TOTAL	\$61,090,000	\$26,876,000	\$87,966,000

**GIWW BRAZOS RIVER FLOODGATES AND COLORADO RIVER LOCKS
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Table 9 Colorado River – Alt 3b Open Channel

Feature	Cost	Contingency	Total
01 Lands & Damages	\$16,000	\$3,000	\$20,000
02 Relocations			
05 Locks			
06 Fish & Wildlife Facilities	\$36,000	\$15,000	\$51,000
09 Channels & Canals	\$18,840,000	\$8,101,000	\$26,941,000
15 Fldwy Control & Div Str			
30 PED	\$3,841,000	\$1,651,000	\$5,492,000
31 Construction Management	\$2,112,000	\$908,000	\$3,021,000
TOTAL	\$24,845,000	\$10,680,000	\$35,524,000

**WALLA WALLA COST ENGINEERING
MANDATORY CENTER OF EXPERTISE**

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For Project No. 451958

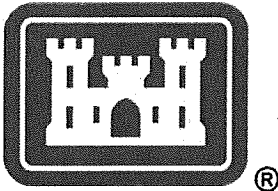
**SWG – GIWW
Brazos River Floodgates and Colorado River Locks
Feasibility Study TSP**

The GIWW Brazos River Floodgates and Colorado River Locks Feasibility Study TSP, as presented by Galveston District, has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Mandatory Center of Expertise (Cost MCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of February 11, 2019, the Cost MCX certifies the estimated total project cost:

FY17 Project First Cost: \$399,727,000
Fully Funded Amount: \$455,092,000

It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management through the period of Federal Participation.



JACOBS.MICHAEL.PIERRE
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ou=DoD, ou=PKI, ou=USA,
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Michael P. Jacobs, PE, CCE
Chief, Cost Engineering MCX
Walla Walla District

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

Printed: 2/12/2019
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PROJECT: GIWW Brazos River Floodgates and Colorado River Locks Feasibility Study Recommended Plan
PROJECT NO PN 451958
LOCATION: Brazora and Matagorda Counties, Texas

DISTRICT: Galveston District
POC: CHIEF, COST ENGINEERING, John B. Petitbon, P.E., CCE - MVN
PREPARED: 2/6/2019

This Estimate reflects the scope and schedule in report;

GIWW Brazos River Fldgts and Colorado River Locks 2018

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)						TOTAL PROJECT COST (FULLY FUNDED)			
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	Program Year (Budget EC): Effective Price Level Date:				2019 1 OCT 18 Spent Thru: 1-Oct-18 (\$K) K	TOTAL FIRST COST (\$K) L	INFLATED (%) M	COST (\$K) N	CNTG (\$K) O	FULL (\$K) O
						ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J						
02	RELOCATIONS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
05	LOCKS	\$146,330	\$40,972	28.0%	\$167,302	0.0%	\$146,330	\$40,972	\$187,302	\$0	\$187,302	12.1%	\$164,001	\$45,920	\$209,921
06	FISH & WILDLIFE FACILITIES	\$573	\$160	28.0%	\$733	0.0%	\$573	\$160	\$733	\$0	\$733	12.1%	\$642	\$180	\$822
09	CHANNELS & CANALS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
15	FLOODWAY CONTROL & DIVERSION STRU	\$91,404	\$25,593	28.0%	\$116,997	0.0%	\$91,404	\$25,593	\$116,997	\$0	\$116,997	12.1%	\$102,442	\$28,684	\$131,126
15	FLOODWAY CONTROL & DIVERSION STRU	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	-	\$0	\$0	\$0
CONSTRUCTION ESTIMATE TOTALS:		\$238,307	\$66,726		\$305,033	0.0%	\$238,307	\$66,726	\$305,033	\$0	\$305,033	12.1%	\$267,085	\$74,784	\$341,869
01	LANDS AND DAMAGES	\$195	\$49	25.1%	\$244	0.0%	\$195	\$49	\$244	\$0	\$244	6.7%	\$208	\$52	\$260
30	PLANNING, ENGINEERING & DESIGN	\$47,638	\$13,339	28.0%	\$60,977	0.0%	\$47,638	\$13,339	\$60,977	\$0	\$60,977	15.9%	\$55,206	\$15,458	\$70,664
31	CONSTRUCTION MANAGEMENT	\$26,151	\$7,322	28.0%	\$33,473	0.0%	\$26,151	\$7,322	\$33,473	\$0	\$33,473	26.4%	\$33,045	\$9,253	\$42,298
PROJECT COST TOTALS:		\$312,291	\$87,436	28.0%	\$399,727		\$312,291	\$87,436	\$399,727	\$0	\$399,727	13.9%	\$355,545	\$99,547	\$455,092

PETITBON JOHN.BAP Digitally signed by
TISTE.1230865910 Date: 2019.02.13 17:41:32 -0500

Franchelle Craft
John B. Petitbon

CHIEF, COST ENGINEERING, John B. Petitbon, P.E., CCE - MVN

ESTIMATED TOTAL PROJECT COST: \$455,092

PROJECT MANAGER, Franchelle Craft - SWG

CHIEF, REAL ESTATE, Timothy J. Nelson - SWG

CHIEF, PLANNING, xxx

CHIEF, ENGINEERING, xxx

CHIEF, OPERATIONS, xxx

CHIEF, CONSTRUCTION, xxx

CHIEF, CONTRACTING, xxx

CHIEF, PM-PB, xxx

CHIEF, DPM, xxx

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

Printed:2/12/2019
Page 2 of 7

PROJECT: GIWW Colorado River - Alt 4b1 Recommended Plan Replace Inland + Remove Riverside
PROJECT NO PN 451958
LOCATION: Brazora and Matagorda Counties, Texas

DISTRICT: Galveston District
POC: CHIEF, COST ENGINEERING, John B. Petitbon, P.E., CCE - MVN
PREPARED: 2/6/2019

This Estimate reflects the scope and schedule in report: GIWW Brazos River Fldgts and Colorado River Locks 2018

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)					
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	Program Year (Budget EC): Effective Price Level Date: 2019 1 OCT 18				Spent Thru: 1-Oct-18 (\$K) K	TOTAL FIRST COST (\$K) L	INFLATED (%) M	COST (\$K) N	CNTG (%) O	FULL (\$K) P
						ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J						
02	RELOCATIONS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
05	LOCKS	\$146,330	\$40,972	28.0%	\$187,302	0.0%	\$146,330	\$40,972	\$187,302	\$0	\$187,302	12.1%	\$164,001	\$45,920	\$209,921
06	FISH & WILDLIFE FACILITIES	\$29	\$8	28.0%	\$37	0.0%	\$29	\$8	\$37	\$0	\$37	12.1%	\$33	\$9	\$42
09	CHANNELS & CANALS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
15	FLOODWAY CONTROL & DIVERSION STRU	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
15	FLOODWAY CONTROL & DIVERSION STRU	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0		\$0	\$0	\$0
CONSTRUCTION ESTIMATE TOTALS:		\$146,359	\$40,981		\$187,340	0.0%	\$146,359	\$40,981	\$187,340	\$0	\$187,340	12.1%	\$164,034	\$45,929	\$209,963
01	LANDS AND DAMAGES	\$36	\$9	25.0%	\$45	0.0%	\$36	\$9	\$45	\$0	\$45	6.7%	\$38	\$10	\$48
30	PLANNING, ENGINEERING & DESIGN	\$29,272	\$8,196	28.0%	\$37,468	0.0%	\$29,272	\$8,196	\$37,468	\$0	\$37,468	15.9%	\$33,923	\$9,499	\$43,422
31	CONSTRUCTION MANAGEMENT	\$16,097	\$4,507	28.0%	\$20,604	0.0%	\$16,097	\$4,507	\$20,604	\$0	\$20,604	26.4%	\$20,341	\$5,695	\$26,036
PROJECT COST TOTALS:		\$191,764	\$53,693	28.0%	\$245,457		\$191,764	\$53,693	\$245,457	\$0	\$245,457	13.9%	\$218,336	\$61,133	\$279,469

PETITBON, JOHN BAPTISTE Digitally signed by
.1230865910 Date: 2018.04.13 14:02:30 -0500

CHIEF, COST ENGINEERING, John B. Petitbon, P.E., CCE - MVN

ESTIMATED TOTAL PROJECT COST: \$279,469

PROJECT MANAGER, Franchelle Craft - SWG

CHIEF, REAL ESTATE, Timothy J. Nelson - SWG

CHIEF, PLANNING, xxx

CHIEF, ENGINEERING, xxx

CHIEF, OPERATIONS, xxx

CHIEF, CONSTRUCTION, xxx

CHIEF, CONTRACTING, xxx

CHIEF, PM-PB, xxx

CHIEF, DPM, xxx

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

Printed: 2/12/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: GIWW Colorado River - Alt 4b1 Recommended Plan Replace Inland + Remove Riverside
LOCATION: Brazoria and Matagorda Counties, Texas
This Estimate reflects the scope and schedule in report.

DISTRICT: Galveston District
POC: CHIEF, COST ENGINEERING, John B. Pettibon, P.E., CCE - MVN
PREPARED: 2/6/2019

GIWW Brazos River Fldgts and Colorado River Locks 2018

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	RISK BASED				Program Year (Budget EC): 2019 Effective Price Level Date: 1 OCT 18				Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
		COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)					
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Alt 4b1 Recommended Plan Replace Inland Remove Riverside													
02	RELOCATIONS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
05	LOCKS	\$146,330	\$40,972	28.0%	\$187,302	0.0%	\$146,330	\$40,972	\$187,302	2024Q4	12.1%	\$164,001	\$45,920	\$209,921
06	FISH & WILDLIFE FACILITIES	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
09	CHANNELS & CANALS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
15	FLOODWAY CONTROL & DIVERSION STRU	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
15	FLOODWAY CONTROL & DIVERSION STRU	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
CONSTRUCTION ESTIMATE TOTALS:		\$146,330	\$40,972	28.0%	\$187,302		\$146,330	\$40,972	\$187,302			\$164,001	\$45,920	\$209,921
01	LANDS AND DAMAGES	\$36	\$9.0	25.0%	\$45	0.0%	\$36	\$9	\$45	2022Q2	6.7%	\$38	\$10	\$48
30	PLANNING, ENGINEERING & DESIGN													
1.0%	Project Management	\$2,195	\$615	28.0%	\$2,810	0.0%	\$2,195	\$615	\$2,810	2022Q2	14.0%	\$2,503	\$701	\$3,204
1.0%	Planning & Environmental Compliance	\$1,463	\$410	28.0%	\$1,873	0.0%	\$1,463	\$410	\$1,873	2022Q2	14.0%	\$1,688	\$467	\$2,155
12.0%	Engineering & Design	\$17,560	\$4,917	28.0%	\$22,477	0.0%	\$17,560	\$4,917	\$22,477	2022Q2	14.0%	\$20,026	\$5,607	\$25,633
1.0%	Reviews, ATRs, IEPFRs, VE	\$1,463	\$410	28.0%	\$1,873	0.0%	\$1,463	\$410	\$1,873	2022Q2	14.0%	\$1,688	\$467	\$2,155
0.5%	Life Cycle Updates (cost, schedule, risks)	\$732	\$205	28.0%	\$937	0.0%	\$732	\$205	\$937	2022Q2	14.0%	\$835	\$234	\$1,069
0.5%	Contracting & Reprographics	\$732	\$205	28.0%	\$937	0.0%	\$732	\$205	\$937	2022Q2	14.0%	\$835	\$234	\$1,069
2.0%	Engineering During Construction	\$2,927	\$820	28.0%	\$3,747	0.0%	\$2,927	\$820	\$3,747	2024Q4	28.4%	\$3,699	\$1,036	\$4,734
1.0%	Planning During Construction	\$1,463	\$410	28.0%	\$1,873	0.0%	\$1,463	\$410	\$1,873	2024Q4	28.4%	\$1,849	\$518	\$2,366
0.5%	Project Operations	\$732	\$205	28.0%	\$937	0.0%	\$732	\$205	\$937	2022Q2	14.0%	\$835	\$234	\$1,069
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$14,633	\$4,097	28.0%	\$18,730	0.0%	\$14,633	\$4,097	\$18,730	2024Q4	28.4%	\$18,491	\$5,177	\$23,668
0.5%	Project Operation:	\$732	\$205	28.0%	\$937	0.0%	\$732	\$205	\$937	2024Q4	28.4%	\$925	\$259	\$1,184
0.5%	Project Management	\$732	\$205	28.0%	\$937	0.0%	\$732	\$205	\$937	2024Q4	28.4%	\$925	\$259	\$1,184
CONTRACT COST TOTALS:		\$191,730	\$53,683		\$245,413		\$191,730	\$53,683	\$245,413			\$218,298	\$61,122	\$279,420

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

Printed: 2/12/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: GIWW Colorado River - Alt 4b1 Recommended Plan Replace Inland + Remove Riverside
LOCATION: Brazoria and Matagorda Counties, Texas
This Estimate reflects the scope and schedule in report; GIWW Brazos River Fldgts and Colorado River Locks 2018

DISTRICT: Galveston District
POC: CHIEF, COST ENGINEERING, John B. Pettibon, P.E., CCE - MVN
PREPARED: 2/6/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	Estimate Prepared: Effective Price Level:		TOTAL (\$K)	Program Year (Budget EC): Effective Price Level Date:		TOTAL (\$K)	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)		
		COST (\$K)	CNTG (\$K)		CNTG (%)	2019 1 OCT 18							ESC (%)	COST (\$K)
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	Alt 4b1 Recommended Plan Replace Inland Remove Riverside - mitigation													
03	RESERVOIRS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
04	DAMS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
06	FISH & WILDLIFE FACILITIES	\$29	\$8	28.0%	\$37	0.0%	\$29	\$8	\$37	2024Q4	12.1%	\$33	\$9	\$42
06	FISH & WILDLIFE FACILITIES	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
07	POWER PLANT	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
08	ROADS, RAILROADS & BRIDGES	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
09	CHANNELS & CANALS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
10	BREAKWATER & SEAWALLS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$29	\$8	28.0%	\$37		\$29	\$8	\$37			\$33	\$9	\$42
01	LANDS AND DAMAGES	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
30	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning & Environmental Compliance	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering & Design	\$5	\$1	28.0%	\$6	0.0%	\$5	\$1	\$6	2022Q2	14.0%	\$6	\$2	\$7
0.0%	Reviews, ATRs, IEPs, VE	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Life Cycle Updates (cost, schedule, risks)	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Contracting & Reprographics	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering During Construction	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning During Construction	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Operations	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
31	CONSTRUCTION MANAGEMENT													
0.0%	Construction Management	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Operation:	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Management	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONTRACT COST TOTALS:	\$34	\$10		\$44		\$34	\$10	\$44			\$38	\$11	\$49

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

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PROJECT: GIWW Brazos River - Alt 3a.1 Recommended Plan Open west Move back east
PROJECT NO PN 451958
LOCATION: Brazoria and Matagorda Counties, Texas

DISTRICT: Galveston District
POC: CHIEF, COST ENGINEERING, John B. Petitbon, P.E., CCE - MVN
PREPARED: 2/6/2019

This Estimate reflects the scope and schedule in report; GIWW Brazos River Rdgts and Colorado River Locks 2018

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)					
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	Program Year (Budget EC): Effective Price Level Date: 2019 1 OCT 18				Spent Thru: 1-Oct-18 (\$K) K	TOTAL FIRST COST (\$K) L	INFLATED (%) M	COST (\$K) N	CNTG (\$K) O	FULL (\$K) O
						ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J						
02	RELOCATIONS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
05	LOCKS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
06	FISH & WILDLIFE FACILITIES	\$544	\$152	28.0%	\$696	0.0%	\$544	\$152	\$696	\$0	\$696	12.1%	\$810	\$171	\$780
09	CHANNELS & CANALS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	FLOODWAY CONTROL & DIVERSION STRU	\$91,404	\$25,593	28.0%	\$116,997	0.0%	\$91,404	\$25,593	\$116,997	\$0	\$116,997	12.1%	\$102,442	\$28,684	\$131,126
15	FLOODWAY CONTROL & DIVERSION STRU	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CONSTRUCTION ESTIMATE TOTALS:		\$91,948	\$25,745		\$117,693	0.0%	\$91,948	\$25,745	\$117,693	\$0	\$117,693	12.1%	\$103,052	\$28,855	\$131,906
01	LANDS AND DAMAGES	\$159	\$40	25.2%	\$199	0.0%	\$159	\$40	\$199	\$0	\$199	6.7%	\$170	\$43	\$212
30	PLANNING, ENGINEERING & DESIGN	\$18,366	\$5,142	28.0%	\$23,508	0.0%	\$18,366	\$5,142	\$23,508	\$0	\$23,508	15.8%	\$21,283	\$5,959	\$27,242
31	CONSTRUCTION MANAGEMENT	\$10,054	\$2,815	28.0%	\$12,869	0.0%	\$10,054	\$2,815	\$12,869	\$0	\$12,869	26.4%	\$12,705	\$3,557	\$16,262
PROJECT COST TOTALS:		\$120,527	\$33,743	28.0%	\$154,270		\$120,527	\$33,743	\$154,270	\$0	\$154,270	13.8%	\$137,209	\$38,414	\$175,623

PETITBON, JOHN, BAPTISTE
TEL 1230865910
Date: 02/12/2019 11:43:13 AM

CHIEF, COST ENGINEERING, John B. Petitbon, P.E., CCE - MVN

ESTIMATED TOTAL PROJECT COST: **\$175,623**

PROJECT MANAGER, Franchelle Craft - SWG

CHIEF, REAL ESTATE, Timothy J. Nelson - SWG

CHIEF, PLANNING, xxx

CHIEF, ENGINEERING, xxx

CHIEF, OPERATIONS, xxx

CHIEF, CONSTRUCTION, xxx

CHIEF, CONTRACTING, xxx

CHIEF, PM-PB, xxx

CHIEF, DPM, xxx

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

Printed: 2/12/2019
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**** CONTRACT COST SUMMARY ****

PROJECT: GIWW Brazos River - Alt 3a.1 Recommended Plan Open west Move back east
LOCATION: Brazos and Matagorda Counties, Texas
This Estimate reflects the scope and schedule in report; GIWW Brazos River Flights and Colorado River Locks 2018

DISTRICT: Galveston District
POC: CHIEF, COST ENGINEERING, John B. Pettibon, P.E., CCE - MVN
PREPARED: 2/6/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	Estimate Prepared: 31-Jan-19 Effective Price Level: 1-Oct-18				Program Year (Budget EC): 2019 Effective Price Level Date: 1 OCT 18				Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
		COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)					
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
	Alt 3a.1 Recommended Plan Open West Move back East													
02	RELOCATIONS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
05	LOCKS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
06	FISH & WILDLIFE FACILITIES	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
09	CHANNELS & CANALS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
15	FLOODWAY CONTROL & DIVERSION STRU	\$91,404	\$25,593	28.0%	\$116,997	0.0%	\$91,404	\$25,593	\$116,997	2024Q4	12.1%	\$102,442	\$28,684	\$131,126
15	FLOODWAY CONTROL & DIVERSION STRU	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
CONSTRUCTION ESTIMATE TOTALS:		\$91,404	\$25,593	28.0%	\$116,997		\$91,404	\$25,593	\$116,997			\$102,442	\$28,684	\$131,126
01	LANDS AND DAMAGES	\$169	\$40.0	25.2%	\$199	0.0%	\$169	\$40	\$199	2022Q2	6.7%	\$170	\$43	\$212
30	PLANNING, ENGINEERING & DESIGN													
1.5%	Project Management	\$1,371	\$384	28.0%	\$1,755	0.0%	\$1,371	\$384	\$1,755	2022Q2	14.0%	\$1,564	\$438	\$2,001
1.0%	Planning & Environmental Compliance	\$914	\$256	28.0%	\$1,170	0.0%	\$914	\$256	\$1,170	2022Q2	14.0%	\$1,042	\$292	\$1,334
12.0%	Engineering & Design	\$10,968	\$3,071	28.0%	\$14,039	0.0%	\$10,968	\$3,071	\$14,039	2022Q2	14.0%	\$12,508	\$3,502	\$16,010
1.0%	Reviews, ATRs, IEPs, VE	\$914	\$256	28.0%	\$1,170	0.0%	\$914	\$256	\$1,170	2022Q2	14.0%	\$1,042	\$292	\$1,334
0.5%	Life Cycle Updates (cost, schedule, risks)	\$457	\$128	28.0%	\$585	0.0%	\$457	\$128	\$585	2022Q2	14.0%	\$521	\$146	\$667
0.5%	Contracting & Reprographics	\$457	\$128	28.0%	\$585	0.0%	\$457	\$128	\$585	2022Q2	14.0%	\$521	\$146	\$667
2.0%	Engineering During Construction	\$1,828	\$512	28.0%	\$2,340	0.0%	\$1,828	\$512	\$2,340	2024Q4	26.4%	\$2,310	\$647	\$2,957
1.0%	Planning During Construction	\$914	\$256	28.0%	\$1,170	0.0%	\$914	\$256	\$1,170	2024Q4	26.4%	\$1,155	\$323	\$1,478
0.5%	Project Operations	\$457	\$128	28.0%	\$585	0.0%	\$457	\$128	\$585	2022Q2	14.0%	\$521	\$146	\$667
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	\$9,140	\$2,559	28.0%	\$11,699	0.0%	\$9,140	\$2,559	\$11,699	2024Q4	26.4%	\$11,550	\$3,234	\$14,784
0.5%	Project Operation:	\$457	\$128	28.0%	\$585	0.0%	\$457	\$128	\$585	2024Q4	26.4%	\$577	\$162	\$739
0.5%	Project Management	\$457	\$128	28.0%	\$585	0.0%	\$457	\$128	\$585	2024Q4	26.4%	\$577	\$162	\$739
CONTRACT COST TOTALS:		\$119,897	\$33,567		\$153,464		\$119,897	\$33,567	\$153,464			\$136,501	\$38,216	\$174,717

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

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**** CONTRACT COST SUMMARY ****

PROJECT: GIWW Brazos River - Alt 3a.1 Recommended Plan Open west Move back east
LOCATION: Brazoria and Matagorda Counties, Texas
This Estimate reflects the scope and schedule in report, GIWW Brazos River Fldgts and Colorado River Locks 2018

DISTRICT: Galveston District
POC: CHIEF, COST ENGINEERING, John B. Pettibon, P.E., CCE - MVN
PREPARED: 2/6/2019

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)				TOTAL PROJECT COST (FULLY FUNDED)				
WBS NUMBER	Civil Works Feature & Sub-Feature Description	Estimate Prepared:		31-Jan-19	Program Year (Budget EC):		2019	Mid-Point Date	INFLATED (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)		
		Effective Price Level:	1-Oct-18	Effective Price Level Date:	1 OCT 18									
A	B	COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	ESC (%)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	P	L	M	N	O
	Alt 3a.1 Recommended Plan Open West Move back East - mitigation													
03	RESERVOIRS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
04	DAMS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
06	FISH & WILDLIFE FACILITIES	\$544	\$152	28.0%	\$696	0.0%	\$544	\$152	\$696	2024Q4	12.1%	\$610	\$171	\$780
06	FISH & WILDLIFE FACILITIES	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
07	POWER PLANT	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
08	ROADS, RAILROADS & BRIDGES	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
09	CHANNELS & CANALS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
10	BREAKWATER & SEAWALLS	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONSTRUCTION ESTIMATE TOTALS:	\$544	\$152	28.0%	\$696		\$544	\$152	\$696			\$610	\$171	\$780
01	LANDS AND DAMAGES	\$0	\$0	0.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
30	PLANNING, ENGINEERING & DESIGN													
0.0%	Project Management	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning & Environmental Compliance	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering & Design	\$86	\$24	28.0%	\$110	0.0%	\$86	\$24	\$110	2022Q2	14.0%	\$98	\$27	\$126
0.0%	Reviews, ATRs, IEPs, VE	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Life Cycle Updates (cost, schedule, risks)	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Contracting & Reprographics	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Engineering During Construction	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Planning During Construction	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Operations	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
31	CONSTRUCTION MANAGEMENT													
0.0%	Construction Management	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Operaton:	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
0.0%	Project Management	\$0	\$0	28.0%	\$0	0.0%	\$0	\$0	\$0	0	0.0%	\$0	\$0	\$0
	CONTRACT COST TOTALS:	\$630	\$176		\$806		\$630	\$176	\$806			\$708	\$198	\$906

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

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PROJECT: GIWW Brazos River Floodgates and Colorado River Locks Feasibility Study Recommended Plan
PROJECT NO PN 451958
LOCATION: Brazora and Matagorda Counties, Texas

DISTRICT: Galveston District
POC: CHIEF, COST ENGINEERING, John B. Petitbon, P.E., CCE - MVN
PREPARED: 2/6/2019

This Estimate reflects the scope and schedule in report: GIWW Brazos River Fldgts and Colorado River Locks 2018

Civil Works Work Breakdown Structure		ESTIMATED COST				PROJECT FIRST COST (Constant Dollar Basis)					TOTAL PROJECT COST (FULLY FUNDED)			
WBS NUMBER A	Civil Works Feature & Sub-Feature Description B	COST (\$K) C	CNTG (\$K) D	CNTG (%) E	TOTAL (\$K) F	Program Year (Budget EC): Effective Price Level Date: 2019 1 OCT 18					INFLATED (%) L	COST (\$K) M	CNTG (\$K) N	FULL (\$K) O
						ESC (%) G	COST (\$K) H	CNTG (\$K) I	TOTAL (\$K) J	Spent Thru: 1-Oct-18 (\$K) K				
02	RELOCATIONS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
05	LOCKS	\$146,330	\$40,972	28.0%	\$187,302	0.0%	\$146,330	\$40,972	\$187,302	\$0	\$187,302	\$164,001	\$45,920	\$209,921
06	FISH & WILDLIFE FACILITIES	\$573	\$160	28.0%	\$733	0.0%	\$573	\$160	\$733	\$0	\$733	\$642	\$180	\$822
09	CHANNELS & CANALS	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
15	FLOODWAY CONTROL & DIVERSION STRU	\$91,404	\$25,593	28.0%	\$116,997	0.0%	\$91,404	\$25,593	\$116,997	\$0	\$116,997	\$102,442	\$28,684	\$131,126
15	FLOODWAY CONTROL & DIVERSION STRU	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ALL	COMPOSITE INDEX (WEIGHTED AVERAGE	\$0	\$0	-	\$0	-	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CONSTRUCTION ESTIMATE TOTALS:		\$238,307	\$66,726		\$305,033	0.0%	\$238,307	\$66,726	\$305,033	\$0	\$305,033	\$267,085	\$74,784	\$341,869
01	LANDS AND DAMAGES	\$195	\$49	25.1%	\$244	0.0%	\$195	\$49	\$244	\$0	\$244	\$208	\$52	\$260
30	PLANNING, ENGINEERING & DESIGN	\$47,638	\$13,339	28.0%	\$60,977	0.0%	\$47,638	\$13,339	\$60,977	\$0	\$60,977	\$55,206	\$15,458	\$70,664
31	CONSTRUCTION MANAGEMENT	\$26,151	\$7,322	28.0%	\$33,473	0.0%	\$26,151	\$7,322	\$33,473	\$0	\$33,473	\$33,045	\$9,253	\$42,298
PROJECT COST TOTALS:		\$312,291	\$87,436	28.0%	\$399,727		\$312,291	\$87,436	\$399,727	\$0	\$399,727	\$355,545	\$99,547	\$455,092

PETITBON JOHN.BAP
TISTE.1230865910

Digitally signed by
PETITBON JOHN.BAP
DN: cn=PETITBON JOHN.BAP, o=TPCS

CHIEF, COST ENGINEERING, John B. Petitbon, P.E., CCE - MVN

ESTIMATED TOTAL PROJECT COST: \$455,092

PROJECT MANAGER, Franchelle Craft - SWG

CHIEF, REAL ESTATE, Timothy J. Nelson - SWG

CHIEF, PLANNING, xxx

CHIEF, ENGINEERING, xxx

CHIEF, OPERATIONS, xxx

CHIEF, CONSTRUCTION, xxx

CHIEF, CONTRACTING, xxx

CHIEF, PM-PB, xxx

CHIEF, DPM, xxx

Colorado-Brazos Locks Feasibility Study - TSP post ATR

The recommended system TSP for this study is alternative 3a.1 for BRFG and alternative 4b.1 for CRL.

The BRFG alternative would be in the same basic channel alignment with removal of the southern portion of existing structures after completion of the new sector gate structure on the east side. Create an open channel on the west side and a new gate structure (125-feet) on the east side, shifted slightly north and east of the existing east side location.

The CRL alternative would be in the same basic channel alignment as the current locks but shifted to the south and constructing one new 125 foot sector gate on each side of the river with longer forebays (converting from a locks to just one sector gate on each side). It would include removal of the south side of East Lock GIWW side Gatebay (walls only) and approach walls of south side of East Gate bay (all other existing sector gate/lock structures and walls to be left in place).

Estimated by
Designed by Colorado - MVN Structures Br; Brazos - TxDOT
Prepared by John Petitbon

Preparation Date 9/11/2018
Effective Date of Pricing 9/11/2018
Estimated Construction Time Days

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<u>Description</u>	<u>Quantity</u>	<u>UOM</u>	<u>ContractCost</u>	<u>Contingency</u>	<u>Escalation</u>	<u>ProjectCost</u>
bid schedule summary			237,733,369.21	0.00	0.00	237,733,369.21
			<i>146,329,616.83</i>			<i>146,329,616.83</i>
1 Colorado River Locks	1.0000	EA	146,329,616.83	0.00	0.00	146,329,616.83
			<i>146,329,616.83</i>			<i>146,329,616.83</i>
1 Alt 4b.1 TSP - Riverside Gate removal and inland gate replacement	1.0000	EA	146,329,616.83	0.00	0.00	146,329,616.83
			<i>146,329,616.83</i>			<i>146,329,616.83</i>
15 Floodway Control and Diversion Structures	1.0000	EA	146,329,616.83	0.00	0.00	146,329,616.83
			<i>146,329,616.83</i>			<i>146,329,616.83</i>
15 01 CLR Floodgates	1.0000	EA	146,329,616.83	0.00	0.00	146,329,616.83
			<i>91,403,752.38</i>			<i>91,403,752.38</i>
2 Brazos River Floodgates	1.0000	EA	91,403,752.38	0.00	0.00	91,403,752.38
			<i>91,403,752.38</i>			<i>91,403,752.38</i>
1 Alt 3a.1 TSP - Brazos River - Open channel west side and Move gate back further in Existing Channel on East side	1.0000	EA	91,403,752.38	0.00	0.00	91,403,752.38
			<i>91,403,752.38</i>			<i>91,403,752.38</i>
15 Floodway Control and Diversion Structures	1.0000	EA	91,403,752.38	0.00	0.00	91,403,752.38
			<i>91,403,752.38</i>			<i>91,403,752.38</i>
15 01 Brazos Floodgates	1.0000	EA	91,403,752.38	0.00	0.00	91,403,752.38

Description	Page
bid schedule summary	1
1 Colorado River Locks	1
1 Alt 4b.1 TSP - Riverside Gate removal and inland gate replacement	1
15 Floodway Control and Diversion Structures	1
15 01 CLR Floodgates	1
2 Brazos River Floodgates	1
1 Alt 3a.1 TSP - Brazos River - Open channel west side and Move gate back further in Existing Channel on East side	1
15 Floodway Control and Diversion Structures	1
15 01 Brazos Floodgates	1

EXECUTIVE SUMMARY

The US Army Corps of Engineers (USACE), Galveston District presents this cost and schedule risk analysis (CSRA) report prepared by the New Orleans District regarding the risk findings and recommended contingencies for the Brazos Floodgates -Colorado Locks Project. In compliance with the Engineer Regulation (ER) 1110-2-1302 CIVIL WORKS COST ENGINEERING, dated June 30, 2016, a *Monte-Carlo* based risk analysis was conducted by the Project Development Team (PDT) on remaining costs. The purpose of this risk analysis study is to present the cost and schedule risks considered, those determined and respective project contingencies at a recommended 80% confidence level of successful execution to project completion.

The scope of the Brazos River Floodgate TSP project consists of constructing a 125' wide flood gate on the east side and an open channel on the west side. The Colorado River Locks TSP project consists of constructing two 125 foot wide sector gate structures, one each side of the Colorado River. Both projects serve to control flood flows from the Brazos and Colorado Rivers to the GIWW, improve navigation safety by controlling traffic flow and currents at the intersection with the GIWW, and aid in preventing sand and silt deposition into the GIWW.

Specific to the Brazos-Colorado Locks Project, the current project base cost estimate, pre-contingency, approximates \$238M excluding Real Estate. This CSRA study excludes "spent" costs, excludes contingencies, and is expressed in FY 2019 dollars. The real estate requirements have not been included in this CSRA since the USACE Real Estate office provides a 25% contingency to be used. Based on the results of the analysis, the Cost Engineering Mandatory Center of Expertise for Civil Works (MCX located in Walla Walla District) recommends a contingency value of approximately \$66M or 28% of base project cost excluding Real Estate at an 80% confidence level of successful execution. This contingency applied to construction costs, PED, and construction management.

Table ES-1. Contingency Results

Base Case Construction Cost Estimate	\$237,733,369	
Confidence Level	Construction Value (\$\$) w/ Contingencies	Contingency (%)
50%	\$290,513,833	22%
80%	\$303,927,433	28%
90%	\$311,200,875	31%

Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions	Project Cost			Project Schedule			
				Likelihood*	Impact*	Risk Level*	Rough Order Impact (\$)	Likelihood*	Impact*	Risk Level*
Contract Risks (Internal Risk Items are those that are generated, caused, or controlled within the PDT's sphere of influence.)										
	PROJECT & PROGRAM MGMT									
PPM-1	Scope Objectives	Objectives - No ship simulations have been conducted.	A ship simulation will be conducted during the PED phase therefore a scope change can occur to improve navigation safety. Some of the changes that can occur will be a change in alignment which can cause a change in the dredging quantities. A change in gate size is likely not to happen because the current design is based on similar site conditions and historical data of similar projects. Any dredging and other unforeseen scope changes due to the ship simulation will be determined by a percentage. This can affect the schedule.	Likely	Significant	HIGH		Likely	Marginal	MODERATE
PPM-2	Adequate Staff/Study	A joint venture of Texas Department of Transportation (TXDOT) and USACE	TXDOT are developing Brazos portion of the study and USACE is developing the Colorado River Portion and the combined system integration. Issues at any organization could affect the priority to address design issues. Many work items have been completed for the study.	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW
PPM-3	Political Impacts	Political support	Friends of San Bernard Group desire a gate closure on the western side of the Brazos crossing due to perceived negative impacts of the open channel. H&H analysis conducted for open channel indicates negligible affects to the mouth of the San Bernard River. These facts are public.	Very Unlikely	Negligible	LOW		Unlikely	Marginal	LOW
PPM-4	Adequate Staff/P+S	Development of Plans and Specifications	Whatever organization develops the plans and specifications during times of emergency a professional labor shortage could occur.	Very Unlikely	Negligible	LOW		Likely	Marginal	MODERATE
PPM-4	Port of Freeport	Concerns regarding Port of Freeport's comments	All comments have been addressed. Very negligible affect from the proposed structures impacting the Port of Freeport.	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW
PPM-5	Port of Freeport	Concerns regarding Port of Freeport's comments	All comments have been addressed. Very negligible affect from the proposed structures impacting the Port of Freeport.	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW
	CONTRACT ACQUISITION RISKS									

CA-1	Contract Acquisition Impacts	Acquisition strategy	The acquisition strategy is undefined at this time. A Request For Proposal is likely for a large portion of the work. Portions of the work can be split up into small business and possibly 8a. Estimate assumes typical sub-contracting.	Likely	Significant	HIGH	15%	Likely	Negligible	LOW
CA-2	Contract Acquisition Impacts	Brazos location and Colorado River locations	Contracts could be divided between locations requiring additional mobilizations. Estimate included multiple mobs per location.	Unlikely	Negligible	LOW	5%	Likely	Negligible	LOW
	TECHNICAL RISKS									
TL-1	Geotechnical Information	Soil Borings and Testing	More borings are required at several locations. More testing at these design specific locations is required. Currently GLO data base was used for the design in the study phase. Deeper boring will be required, no ground surface elevations available on some. More specific appropriate testing will be required. Design currently reflects conservative design methods. The cost could decrease with more adequate information. Cost would affect data collection and pile designs. Foundation cost could vary from 5% to 8%.	Likely	Marginal	MODERATE		Unlikely	Marginal	LOW
TL-2	Site Facilities	Buildings Constructed at each site.	Galveston Operations Division has provided there needs for the necessary building at each site.	Likely	Negligible	LOW		Unlikely	Marginal	LOW
TL-3	Dredging and Fill Quantities	Adequate surveys for site preparation	Low resolution LIDAR surveys and channel surveys that provide confidence in the Civil quantities. Quantity revision will occur however the changes would be negligible.	Likely	Negligible	LOW		Unlikely	Marginal	LOW
TL-4	Site Facilities	Demolished at each site.	Adequate information is available describing the types of material and quantities for the demolition of existing sites. Some hazardous materials have been identified and addressed in the estimate. However, if additional hazardous material or features of construction are encountered significant impact on demolition of the existing sites would occur. The demolition cost could be increased by 100%. Not affecting critical path; therefore, no affect to overall duration.	Likely	Significant	HIGH		Likely	Negligible	LOW

TL-5	Structural Design	Limited Structural Design	Projects of similar design were incorporated into the preliminary structural design for this project. Thus quantities reflect use from previous feasibility projects. Design are determined to be conservative for the concrete and steel superstructure. Concrete and steel quantities could increase 8% and be decreased by 5%. No impact to schedule.	Likely	Marginal	MODERATE		Very Unlikely	Negligible	LOW
TL-6	Colorado River PZ-22 piling and stone	No Hydraulic Modeling Performed	No AdH modeling was performed for the rock training berm for the eastern gate structure of the Colorado River structure. Final dimension will determined with modeling during the PED phase. The training berm could get wider or longer or higher.	Likely	Marginal	MODERATE		Unlikely	Negligible	LOW
TL-7	Mechanical and Electrical	Fluctuations in mechanical and electrical requirements	From discussion there is little variance in the mechanical and electrical needs for these structures. Therefore the current design/estimate has adequately address the needs	Very Unlikely	Negligible	LOW		Unlikely	Negligible	LOW
TL-8	Administration Building	Required Features of the Building	Revisions to the required buildings may occur due to changing needs of operations. Electrical system revisions, size requirements, air handling, tracking systems etc. From discussion from the PDT a +15% or -15% change in building cost could occur	Very Unlikely	Negligible	LOW		Unlikely	Negligible	LOW
TL-9	Site Access	Possible restricted / difficult site access.	Site access will be primarily via floating plant. There should be no issue. Land access to CRL west is not available. Only Marine access is available on that end.	Likely	Negligible	LOW		Likely	Negligible	LOW
	LANDS AND DAMAGES RISKS									
LD-1	Real Estate Plan	Do we have a RE plan?	No real-estate issues with the Colorado river. The Brazos river south of the structure footprint is in litigation therefore the disposal area PA-89 is not currently available. Matt Mahoney confirmed that PA-88 will be available for use. PA-88 is a mile away from PA-89; therefore, negligible cost and schedule risk. PA-88 is estimated to have 6,984,000 cy of dredged volume. CLR will use PA 108.	Likely	Negligible	LOW		Likely	Negligible	LOW
LD-2	Relocation Plan	Utilities affected by project	Design of project was developed to avoid relocations. Brine Mound pipeline avoided.	Unlikely	Marginal	LOW		Unlikely	Marginal	LOW
	REGULATORY AND ENVIRONMENTAL RISKS									

RE-1	Pile Driving Activities	Marine Life Impacts	Implement a "soft start" for up to 20 minutes to allow sea turtles to leave the project vicinity before sound pressure increases above injury thresholds. Once the noise level is above the 166 dB RMS threshold for behavioral, sea turtles are expected to leave the area and not re-enter. Soft Start will need to occur every time pile driving stops for a few hours or stops overnight. The use of vibratory hammer or cushioned impact hammers can help to reduce the noise. This can have an effect on cost and schedule.	Likely	Marginal	MODERATE		Likely	Marginal	MODERATE
RE-2	Water Quality	Construction impacting water quality	Dredging has been done in this area before, there should be negligible impact.	Likely	Negligible	LOW		Very Unlikely	Negligible	LOW
	CONSTRUCTION RISKS									
CON-1	Methodology	Traditional versus innovative construction methods.	Traditional construction methods were assumed within the estimate. Therefore construction in the dry with cofferdams installed and removed to facilitate construction. Risk is lowered by using the traditional method versus a float in structure. Therefore cofferdam cost versus shipyard cost. Tried and True method. Historical data not available for float in of 125' gate.	Unlikely	Marginal	LOW		Very Likely	Negligible	LOW
CON-2	Accelerated Construction Schedule	Is an accelerated Construction Schedule necessary?	Due to unforeseen circumstances an accelerated schedule could be desired to finish this project. Cost would increase while the schedule would decrease. Therefore mobilization cost would increase.	Likely	Marginal	MODERATE		Likely	Negligible	LOW
CON-3	Construction Contract Modifications	Construction contract modifications can impact construction cost and schedule growth.	Technical complexities and site conditions could result in increased risk of contract modifications. This will impact costs and schedule.	Very Likely	Significant	HIGH		Very Likely	Marginal	MODERATE
CON-4	Work location/condition	Work will be over/on water	Common South LA work condition, water related work already assumed in costs and schedule.	Very Likely	Negligible	LOW		Very Likely	Negligible	LOW
CON-5	WEATHER	Impacts to project	Long overall project schedule so flexibility included. Typical conditions are already included in the schedule and costs.	Likely	Negligible	LOW		Likely	Negligible	LOW
CON-6	Navigation Traffic	Navigation Traffic may disrupt construction	Contractor will have to work around navigation traffic and account for delays.	Likely	Negligible	LOW		Likely	Negligible	LOW
	ESTIMATE AND SCHEDULE RISKS									
EST-1	LABOR AVAILABILITY/PRICING	Labor shortages and increase rates	Economy currently has very low unemployment. Assuming labor cost could increase.	Likely	Marginal	MODERATE		Unlikely	Negligible	LOW

EST-2	MATERIAL AVAILABILITY/PRICING	Material shortages and increased cost	Projects are using standard materials, quotes for all major materials. Material Prices could increase will improving economy and tariffs.	Likely	Marginal	MODERATE		Unlikely	Negligible	LOW
	Other									
OTH-1	All other Quantity	Quantities for all other work not discussed in the risk register.	Quantities for all other work not discussed in the risk register may have risk.	Likely	Marginal	MODERATE		Unlikely	Negligible	LOW
Programmatic Risks (External Risk Items are those that are generated, caused, or controlled exclusively outside the PDT's sphere of influence.)										
PR-1	Funding Availability	Funding Priority	The Inland Waterways Trust Fund provides funding for 50% the construction of the project. The Inland Waterways User Board sets the priority for the trust fund. Other projects may have priority. The US Army Corps of Engineers possess the other 50% of this funding stream and is subject to the same stipulations. The possibility of delayed funding can directly affect the cost and schedule.	Likely	Marginal	MODERATE		Likely	Marginal	MODERATE
PR-2	Adequate competition	adequate competition	Due to the availability of skilled contractors to accomplish this work bids on features of work could vary -5% below to 25% above the estimate.	Likely	Significant	HIGH		Very Unlikely	Marginal	LOW
PR-3	fuel cost	potential for escalating fuel prices	If fuel prices escalate dramatically due to disasters or other factors, it could increase costs of constructing project	Likely	Marginal	MODERATE		Likely	Negligible	LOW

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	Classic Schedule Layout																																			
						Qtr 4, 2022			Qtr 1, 2023			Qtr 2, 2023			Qtr 3, 2023			Qtr 4, 2023			Qtr 1, 2024			Qtr 2, 2024			Qtr 3, 2024			Qtr 4, 2024			Qtr 1, 2025			Qtr 2, 2025					
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
Total		500	02-Jan-23	23-Feb-25	0	→ 23-Feb-25, Total																																			
A1000	Mobilization and Submittal	60	02-Jan-23	02-Mar-23	0	Mobilization and Submittal																																			
A1010	Dredge Channel for Structure	48	03-Mar-23	19-Apr-23	0	Dredge Channel for Structure																																			
A1020	Drive Piles for Structure	66	19-Apr-23	05-Jul-23	0	Drive Piles for Structure																																			
A1030	Cofferdam	110	05-Jul-23	10-Nov-23	0	Cofferdam																																			
A1040	Construct Gate Structure	55	10-Nov-23	13-Jan-24	0	Construct Gate Structure																																			
A1050	Remove Cofferdam	68	13-Jan-24	02-Apr-24	0	Remove Cofferdam																																			
A1060	Construct End Cells	112	09-May-23	16-Sep-23	450	Construct End Cells																																			
A1070	Construct Guidewall	51	02-Mar-24	01-May-24	0	Construct Guidewall																																			
A1080	Dredging	78	01-May-24	31-Jul-24	0	Dredging																																			
A1090	Transfer Navigation Traffic	2	31-Jul-24	03-Aug-24	0	Transfer Navigation Traffic																																			
A1100	Construct Levee Access	149	03-Aug-24	24-Jan-25	0	Construct Levee Access																																			
A1110	Remove Gates	77	03-Aug-24	01-Nov-24	98	Remove Gates																																			
A1120	Demobilization and Cleanup	30	24-Jan-25	23-Feb-25	0	Demobilization and Cleanup																																			

TOTAL DURATION: 783 CD or 2.2 Years. Included Adverse weather, Holidays, and weekends.

█ Actual Work █ Critical Remaining Work ▶ Su...
█ Remaining Work ◆ Milestone

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	Classic Schedule Layout																														
						Qtr 1, 2023			Qtr 2, 2023			Qtr 3, 2023			Qtr 4, 2023			Qtr 1, 2024			Qtr 2, 2024			Qtr 3, 2024			Qtr 4, 2024			Qtr 1, 2025			Qtr 2, 2025			
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Total		585	02-Jan-23	29-Mar-25	0	29-Mar-25, Total																														
A1000	Mobilization and Submittal	60	02-Jan-23	02-Mar-23	0	Mobilization and Submittal																														
A1010	Dredging Access for Cranes	22	03-Mar-23	24-Mar-23	0	Dredging Access for Cranes																														
A1020	Drive Production Piling for Gate Str.	64	24-Mar-23	07-Jun-23	0	Drive Production Piling for Gate Str.																														
A1030	Place Cofferdam	110	07-Jun-23	13-Oct-23	0	Place Cofferdam																														
A1040	Construct Gate Structure	55	13-Oct-23	16-Dec-23	0	Construct Gate Structure																														
A1050	Remove Cofferdam	68	16-Dec-23	05-Mar-24	0	Remove Cofferdam																														
A1060	Construct Guide Walls	99	09-Jan-24	03-May-24	0	Construct Guide Walls																														
A1070	End Cell	112	23-Jun-23	01-Nov-23	440	End Cell																														
A1075	Construct Training Berm	96	03-May-24	23-Aug-24	0	Construct Training Berm																														
A1080	Dredging	9	03-May-24	14-May-24	274	Dredging																														
A1090	Transfer Navigation	2	23-Aug-24	27-Aug-24	0	Transfer Navigation																														
A1100	Construct Levee Access	27	27-Aug-24	27-Sep-24	157	Construct Levee Access																														
A1110	Demolition of Sector Gate	154	27-Aug-24	22-Feb-25	0	Demolition of Sector Gate																														
A1120	Demobilization and Cleanup	30	22-Feb-25	29-Mar-25	0	Demobilization and Cleanup																														

TOTAL DURATION: 817 CD or 2.3 Years. Included Adverse weather, Holidays, and weekends.

█ Actual Work
 █ Critical Remaining Work
 Su...

█ Remaining Work
 ◆ Milestone