

TASK ORDER NO. 11.0
FRANKLIN COUNTY WATER DISTRICT (FCWD)
AND
CAROLLO ENGINEERS, INC.

This Task Order is issued by the OWNER and accepted by ENGINEER pursuant to the mutual promises, covenants, and conditions contained in the Agreement between the above named parties dated the _____ day of _____ 2017, in connection with:

**Preliminary Engineering Report (PER) for
Emergency Spillway Evaluation**

SCOPE OF SERVICES

1.0 MEETINGS, DELIVERABLE PREPARATION, AND PROJECT MANAGEMENT

Engineer will provide Project Management (PM) services to facilitate efficient project completion. The anticipated Engineer's efforts will include the following activities. Effort will be based on the assumptions as stated, where applicable:

1.1 Project Administration

Engineer will prepare professional engineering services contract for Owner's review and execution. The terms of final executed professional engineering services contract will be adhered to throughout the duration of contract term by the Engineer. Engineer will also secure the services of sub-consultant(s) for the performance of specialized tasks associated with the engineering services. This will include development of detailed scopes of work, negotiation, scheduling, coordination, review, and integration of sub-consultant work products into the overall Project.

1.2 Project Status Reports

Engineer will prepare and submit, in electronic PDF format, status reports summarizing the work completed by Engineer, anticipated work, current budget, and schedule status, and any project issues requiring discussion or resolution, as necessary and requested by the Owner.

1.3 Establish Document Management System and Procedures

Engineer will develop and implement a standardized in-house document management system and protocol to be utilized throughout the course of project, to facilitate the storage and tracking

of meeting agendas and summaries, notes and calculations, reports, technical information, contract documents, addenda, recommendations, quality review documentation, etc.

During the final phase of the project, all files and folders inside the document management system will be delivered to the Owner for future use, as needed. This is a cost-saving technique that will be helpful if this project enters a design phase.

1.4 Develop Project Schedule

Engineer will prepare and submit to Owner, in electronic PDF format, a project schedule that includes all phases of the project and the essential tasks associated with each, in order to illustrate Engineer's overall plan for the execution of the work, and its anticipated duration. Engineer will update the project schedule in conjunction with the completion of each major project milestone, and will submit to Owner in electronic PDF format.

1.5 Conduct Project Meetings

Engineer will schedule, attend, and conduct meetings with Owner during the course of the project as outlined below. Anticipated meetings include:

1.5.1 Kick-off Meeting

Engineer will conduct kick-off meeting to include team member introductions, personnel roles, and responsibilities, guidelines for communication, document control procedures, work plan review, design criteria, coordination requirements, review procedures, budget, Owner needs/preferences, project site familiarity, etc. It is assumed that each meeting is attended in-person by two (2) Engineer representatives. Kick-off meeting may be conducted via conference if preferred by client.

1.5.2 Periodic Project Status Meetings

Engineer will conduct periodic project status meetings to be held throughout the duration of the project phase for the purpose of updating Owner regarding project status and as a forum for discussing any questions or outstanding issues identified during the course of the work. Project status meeting are assumed to be via conference.

1.6 Results and Recommendations Presentation

Engineer will conduct a Results and Recommendations Presentation which will involve a presentation to the FCWD Board in Mt. Vernon, TX and consist of results and recommendations outlined in the PER.

1.7 Invoicing

Engineer will prepare and submit monthly invoices to Owner for review and processing. Invoices will be based on a time and materials basis, as completed through the end of the prior month.

2.0 DATA COLLECTION AND REVIEW OF RELEVANT PROJECT DATA

Engineer will request, collect, and review all available data associated with the project from Owner. Engineer will digitize, in electronic PDF format, all information received from Owner, in conjunction with established document management system. Assume timely provision of legible hard copy and/or electronic files by Owner, and that Engineer may reasonably expect to rely upon accuracy and completeness of information provided by Owner.

3.0 PRELIMINARY ENGINEERING REPORT

3.1 Hydraulic Feasibility

Engineer will develop a hydraulic two-dimensional (2D) model of the emergency spillway for three Alternatives. Unlike a 1D model, a 2D model will consider local changes in topography across the entire expanse of the emergency spillway. The model will also show suitability of each of the configurations to convey emergency spills, and will also predict laterally varying velocity and depth patterns. The model will be executed using boundary condition information provided by Engineer. For each condition, this will consist of upstream, downstream water levels and flow conveyed in the spillway.

The following three (3) Alternatives will be evaluated:

3.1.1 Alternative No.1: Existing Conditions / No Action

Carollo will utilize existing survey data completed on the emergency spillway in 2006 to create a baseline 2D elevation grid. The Existing Conditions / No Action Alternative will evaluate the emergency spillway in its existing condition.

3.1.2 Alternative No 2: Return Emergency Spillway to Design

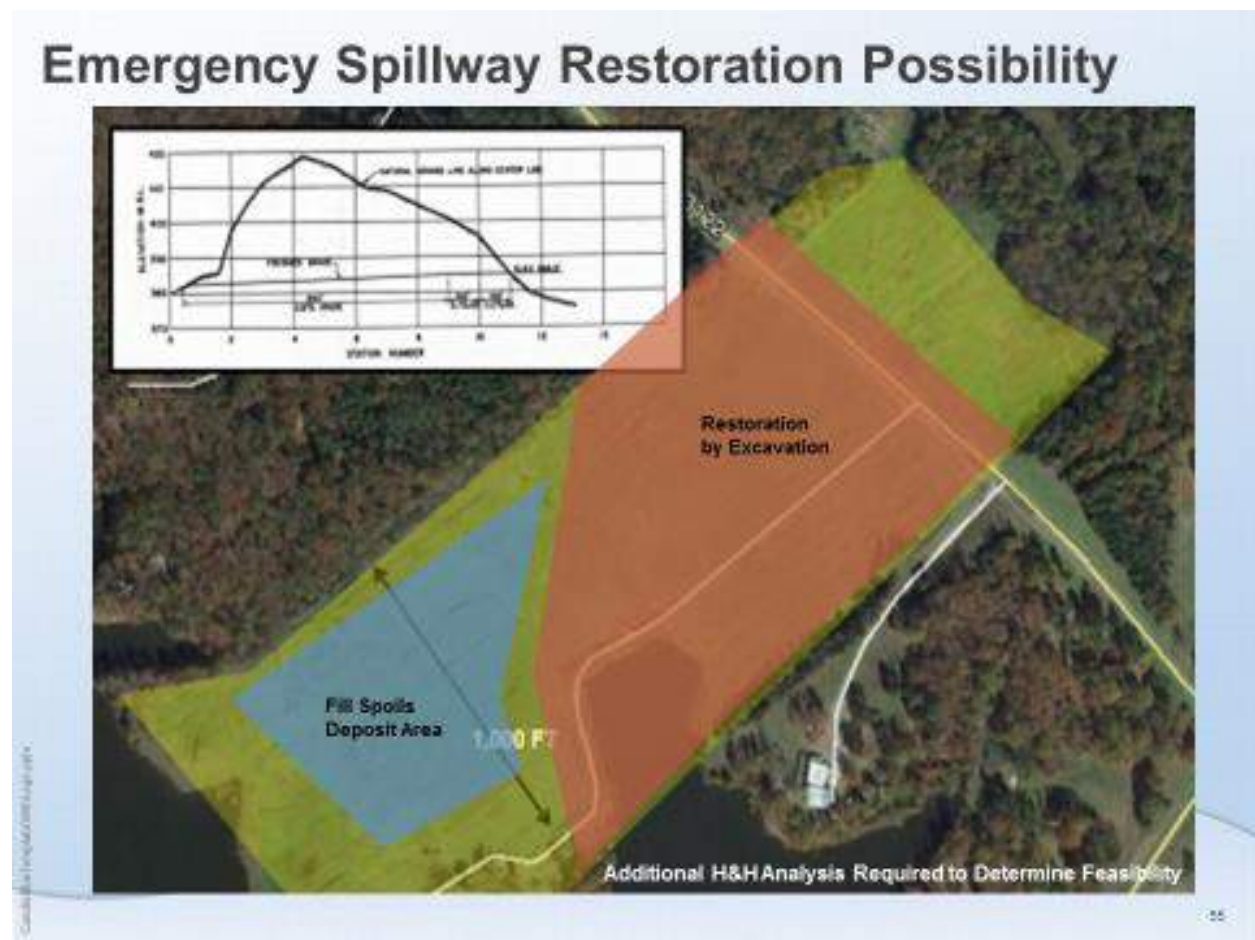
Carollo will utilize the original 1966 as-built dam plans, provided by FCWD, to create a baseline 2D elevation grid. The Design Alternative will evaluate the emergency spillway as intended in the 1966 design.

3.1.3 Alternative No. 3: Evaluation of Alternative Restoration

In evaluating the hydraulics of Lake Cypress Springs in previous authorizations, Carollo

discovered a possible alternative to fully restoring the emergency spillway to design. This alternative was presented in a conceptual nature in the Flood Relief Project Alternatives PER presentation on 3/6/2017. Below is the slide from that presentation that showcases a concept that could be a cost savings to the District. It involves the restoration of the emergency spillway on the north-east side by moving spoil deposits to the south-west side. By restoring only one half of the spillway, the District saves money on excavation, and by putting soil deposits on the other half of the spillway, the District saves money on offsite haul.

Carollo will utilize the original 1966 as-built dam plans paired with the 2006 survey to create the 2D baseline elevation grid. This alternative will evaluate the emergency spillway as intended in the 1966 design for the north-east half of the spillway, while removing the conveyance ability of the south-west half.



3.2 Cost Feasibility

Engineer will develop a high-level Opinion of Probable Construction Cost (OPCC) estimate for

all the three (3) Alternatives. This cost estimate will estimate costs associated with the design (including survey, geotechnical, etc.), bidding, and construction of each Alternative.

Note: In examining items with regard to cost, because this estimate is for the purpose of planning, estimated costs will include a contingency factor. Also, costs should be considered a moderate level of accuracy and subject to change as detailed information (survey, geotechnical, environmental, land acquisition, etc.) is updated. Methods of analysis used in the development of this cost estimate will be consistent with a planning level of this detail.

3.3 Benefit-Cost (BC) Ratio

In the event the emergency spillway is engaged in a large flood event, each alternative would have a different hydraulic response. Carollo, through the use of the hydraulic modeling and the OPCC, will develop a benefit-cost (BC) ratio for each alternative. This BC ratio will provide the District a clear path for understanding the effect of each alternative on the reservoir and the corresponding benefit to the community.

3.4 Conclusion and Development of the Recommendations

Engineer will summarize the analysis performed for all three Alternatives in the tasks above and provide the Owner with recommendations and concluding remarks for future decisions on Alternatives.

3.5 Quality Review of the PER

Engineer will perform technical quality review of the PER before submitting to the Owner.

4.0 SUMMARY OF RESULTS AND CONCLUSION

Engineer will summarize the analysis performed for the Alternatives in the tasks above and provide the Owner concluding remarks for future decisions on alternatives.

DELIVERABLES

Engineer will deliver to the Owner the completed Preliminary Engineering Report (PER) documenting and summarizing our findings in the study.

SCHEDULE

In completing this PER emergency spillway evaluation, Carollo will accomplish the basic services tasks, as described in the “Scope of Services” section above, in an anticipated 5 Month time period from the authorization date.

PROPOSED FEE

In completing this PER to analyze restoration alternatives for the emergency spillway, Carollo will accomplish the basic services tasks, as described in the "Scope of Services" section above, for a proposed time and materials not to exceed **\$62,900**. A detailed fee breakdown, outlining the proposed budgetary allocation for each identified task is provided in Attachment A.

Enclosures: Attachment A - Detailed Cost Breakdown

CAROLLO ENGINEERS, INC.

OWNER

Accepted this _____ day of _____, 2017

By: _____



David K. Harkins
Vice President
P.E. # 87732

By: _____

Owner

Preliminary Engineering Report (PER) for Emergency Spillway Evaluation

BUDGET													
Carollo Proj. #: 10070A.00 TO-11													
				Personnel:	Principal	Lead Engineer (PM)	Engineer in Training (EIT)	CADD Technician	Document Processing / Clerical				Totals
				Hourly Rate:	\$247	\$194	\$153	\$115	\$98	\$0	\$0	\$0	Cost Hrs.
1.0 MEETINGS, DELIVERABLE PREPARATION, AND PROJECT MANAGEMENT													
	1.1	Project Administration		2	6	4							\$2,270 12
	1.2	Project Status Reports			2								\$388 2
	1.3	Establish Document Management System and Procedures			2								\$388 2
	1.4	Develop Project Schedule and Work Plan			2								\$388 2
	1.5	Conduct Project Meetings			2								\$388 2
	1.5.1	Kick-off Meeting		2	2								\$882 4
	1.5.2	Periodic Project Status Meetings			2								\$388 2
	1.6	Results and Recommendations Presentation		8	10								\$3,916 18
	1.7	Invoicing			1	2		2					\$696 5
2.0 DATA COLLECTION AND REVIEW OF RELEVANT PROJECT DATA													
3.0 PRELIMINARY ENGINEERING REPORT (PER)													
	3.1	Hydraulic Feasibility		2	6	4							\$2,270 12
	3.1.1	Alternative 1- No Action			4	*Task primarily completed by AquaStrategies							\$776 4
	3.1.1	Alternative 2- Return Emergency Spillway to Design			4	*Task primarily completed by AquaStrategies							\$776 4
	3.1.3	Alternative 3- Evaluation of Alternative Restoration			4	*Task primarily completed by AquaStrategies							\$776 4
	3.2	Cost Feasibility			32	20	4						\$9,728 56
	3.3	Benefit-Cost (BC) Ratio			20	8							\$5,104 28
	3.4	Conclusion and Development of the Recommendations		3	8	25		2					\$6,314 38
	3.5	Quality Review of the PER		4	2	2							\$1,682 8
4.0 SUMMARY OF RESULTS AND CONCLUSION													
Total Hours:				21	121	74	4	15	0	0	0	0	
Total Labor:				\$5,187	\$23,474	\$11,322	\$460	\$1,470	\$0	\$0	\$0	\$0	\$41,900 235

Subconsultants		Fee	% Mark-Up	Totals
	AquaStrategies	\$20,000.00	0%	\$20,000
				\$0
				\$0
Total Subs				\$20,000.00

Expenses		Fee	% Mark-Up	Totals
	Travel	\$1,000.00	0%	\$1,000
				\$0
				\$0
Total Expenses				\$1,000.00

Totals		
	Total Hours	235.0
	Total Labor	\$41,900
	Total Subconsultants	\$20,000
	Total Expenses	\$1,000
	Project Total	\$62,900