

SUPPLEMENTAL AGREEMENT FOR ASSIGNED PROJECT

Consultant: CDM SMITH, INC.

Project Name: Praed Booster Hydraulic Transient and Station Surge Issues


The Scope of Services for the Praed Booster Hydraulic Transient and Station Surge Issues ("Project"), a copy of which is attached hereto as Exhibit "A" and incorporated herein by this reference, shall constitute a supplemental to the Master Agreement for Professional Consultant Services for Engineering and Related Services for Water Resources, Engineering Planning and Design, Construction Management, Supervisory Control and Data Acquisition (SCADA), Landscape Architectural Design, and Water Conservation Services for Various Water Projects by and between the City and Consultant dated September 12, 2018 ("Agreement"). Consultant agrees to perform the services described in Exhibit "A" within the time set forth in the Notice to Proceed for a not-to-exceed amount of \$82,370.00, unless otherwise modified by change order. All charges shall be consistent with the Compensation Schedule and Hourly Fee Rate Schedule which is attached as Exhibit "B" and incorporated herein by this reference. Performance of the services shall be subject to the terms and conditions contained in the Agreement. Dated this _____ day of _____, 2019.

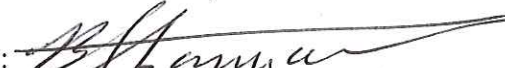
CITY OF RIVERSIDE, a California
charter city and municipal corporation

By: _____
City Manager

By: _____
City Clerk

CDM SMITH, INC.,
a Massachusetts corporation authorized to
do business in California

By: 
Thomas C. Falk, Client Service Leader

By: 
Sam Abi-Samra, Delivery Manager

CERTIFIED AS TO AVAILABILITY OF FUNDS:

By: _____
Director of Finance

APPROVED AS TO FORM:

By: _____
Assistant City Attorney

CA #18-0327.1 SDW 12/20/19
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EXHIBIT “A”

Scope of Work

Consistent with the scope outlined in the City's Request for Proposal, we propose the following detailed scope of services that corresponds with our level of effort / fee estimate:

Task 1 – Praed Station Operational Evaluation

Task 1.1 Data Collection: CDM Smith will prepare a data request and will review City-furnished data (anticipated most recent, 1 year) on the existing Praed BPS and tributary distribution system. This work includes collecting and reviewing pump curves, control logic, VFD product data and programming parameters, pipeline data, control valve data, and historical flows and system demands. This data is necessary to understand the current function of the system. Task includes one (1) four-hour site visit to collect data and discuss operational issues with the RPU's operations staff.

Task 1.2 Pump Hydraulic Coverage Analysis: Using the data collected in the previous steps, CDM Smith will evaluate the speed and flow coverage of the existing pumping equipment in an attempt to identify any hydraulic deficiencies that may be contributing to the problem. Anticipated potential issues could include gaps in the H vs. Q coverage with current pump configuration, oversized or undersized pumping units, or ineffective pump sequences.

Task 1.3 Data Collection Review Meeting: CDM Smith will prepare for and attend a meeting with RPU to discuss the data and background information that has been collected and results of the pump hydraulic coverage analysis. Additional data gaps will be identified. If RPU is not able to provide the missing data, reasonable assumptions will be presented to allow the analysis to continue. A key outcome of the meeting will be a determination if the root cause of the problem appears to be predominately hydraulic or control in nature. This determination will guide whether or not the following optional tasks are necessary. The Review Meeting is anticipated to be two hours in length; CDM Smith will prepare meeting materials and provide meeting minutes.

Task 2 – Pump Control Logic Upgrades

CDM Smith will prepare a process control narrative (PCN) for the current control program, indicating program changes proposed based on the operational evaluation in Task 1.

Following the City's concurrence of the proposed programming changes, as documented in the PCN, CDM Smith's programmer(s) will modify the pump station control logic in accordance with the approved process control narrative. Following a City-witnessed factory acceptance test (FAT), we will support the City in loading the revised program and conducting onsite testing.

For budgeting purposes, we have assumed the programming effort will be limited to the pump station local control panel (LCP). Any SCADA system changes will be done by City staff. CDM Smith will provide the list of PLC Registers or Tag-Names needed for the SCADA system monitoring and controls. Any SCADA network information needed or changes by CDM Smith for pump station Local Area Network will be coordinated through the City staff.

Task 2.1 Evaluate Existing Hardware/Software Components. CDM Smith will review the current state of all hardware/software being used for compatibility level required for the new PLC program. This will also include evaluating the network communication between the VFD and the PLC for improvements. If PLC hardware upgrade is required, this will reflect on the evaluation report. Costs for new equipment, hardware, or software is not included as part of this proposal.

Task 2.2 Load New Process Control Narrative. Load with all PLC and VFD hardware/software and network communications at the correct level for the new PLC programming. CDM Smith will program the PLC with the new algorithm per the new RPU-approved PCN. The new PLC program will define all process I/O that will be used and all parameters required for PLC Controls as defined in the PCN. The PLC Program will provide logic and functionalities per PCN to provide correct zone pressure at different levels of demand. This will require fine tuning of all control signals between the PLC and the VFDs. The new program will also provide all operator-adjustable setpoints and alarm setpoints required to safely operate the pump station. All pump station operating setpoints will be defined in the PCN.

Task 2.3 Testing and Startup. CDM Smith will conduct a City-witnessed Factory Acceptance Test, develop a Transition Plan for approval by the City, and support Site Acceptance Test of the new program and train City Staff on the new program will be part of the project scope.

Task 2.4 Review and Respond; PLC Panel and VFD. CDM Smith, following satisfactory factory testing, will support the RPU staff in updating the modified programming in the field and conducting field testing. If after reviewing the current state of the PLC Panel and VFDs hardware/software and an upgrade is required, the Factory Testing of the new PLC and VFD hardware/software may be determined to be necessary. Designing, selecting, procuring, or furnishing new hardware or software licenses can be provided by CDM Smith through amendment, if determined necessary.

Task 3 – Evaluation Report

Task 3.1 Prepare and Submit a Summary Report. Following completion of Task 1 and Task 2, CDM Smith will prepare a concise letter report documenting the hydraulics and pump station performance evaluation, documenting findings and summarizing recommendations. Recommendations may include additional hydraulic modeling and analysis (including field testing and calibration), additional control modifications, pumping equipment modifications, or conceptual siting and sizing of gravity or hydro-pneumatic tanks.

Task 3.2 Draft Report Review Meeting. CDM Smith staff will prepare for and attend a meeting with RPU staff to review and receive comments from staff regarding the Draft Report.

Task 3.3 Final Report. CDM Smith will revise the draft report to reflect any changes required by receipt of comments and discussion received from RPU staff that require modifications to the draft report. A hard copy and electronic versions will be submitted.

Scope Assumptions

- Detailed distribution system hydraulic and surge modeling is not included. If these analyses are determined to be necessary, recommendations for that scope and modeling objectives will be noted in the Task 3 report.
- No field performance testing or model calibration will be provided. Any pump performance curves provided will be verified only using available online data. If further field verification is determined to be beneficial it will be recommended in the Task 3 report.
- Recommendations for new equipment or facilities (e.g. storage tanks, hydro-pneumatic tanks, electrical equipment, PLC hardware, etc.) will be conceptual in nature and limited to general locations and sizing criteria. Detailed design has not been included in this task order proposal.
- Implementation costs associated with any recommendations will be qualitative for purposes of comparing alternatives.

Project Budget & Schedule

In accordance with the attached fee estimate, we propose to complete the above scope of work on a time and materials basis, not to exceed a maximum fee of \$82,370.

We propose to complete the above scope of work within three (3) months of notice to proceed.

We look forward to the opportunity to discuss how CDM Smith can support the City with the Praed Pump Station improvement recommendations. If you have questions in the meantime, please do not hesitate to contact me at (760) 415-4338 or falktc@cdmsmith.com.

Sincerely,



Tom Falk, PE
Client Services Leader
CDM Smith Inc.

Attachments:

1. Fee Estimate
2. Resumes of Key Staff: Bob Carley, Chris Ott, Tavita Solomona, Matt Rooks

EXHIBIT “B”

Praed Pump Station
Task Order Fee Estimate

Task	Task Description	CDM Smith											CDM Smith		ODCs	Total
		Principal/ Associate	QA/QC	Project Mgr	Sr. Engr	Grade 7	Grade 4	Support Services	Task Manager	Electrician	Sr. Programmer	Programmer				
		Tom Falk	Sam Abi-Samra	Bob Carley	Chris Ott	Matt Rooks	Prof I M Owen	Admin	Chris Avina	Colin Millett	Tavita Solomona	Phisal Ly	Hours	Labor		
		\$ 250	\$ 250	\$ 250	\$ 210	\$ 175	\$ 150	\$ 100	\$ 200	\$ 170	\$ 170	\$ 100				
Task 1																
1.1	Data collection	1	1	6	8	4	16						36	\$ 6,780	\$ 300	\$ 7,080
1.2	Pump hydraulic coverage analysis	1	1	2	4	2	24						34	\$ 5,790	\$ -	\$ 5,790
1.3	Data collection review meeting	2		6	6	6	16	4					40	\$ 7,110	\$ 300	\$ 7,410
		4	2	14	18	12	56	4	0	0	0	0	110	\$ 19,680	\$ 600	\$ 20,280
Task 2																
2.1	Evaluate Existing Hardware/Software Components								12	12			24	\$ 4,440	\$ 300	\$ 4,740
2.2	Load New Process Control Narrative										24	80	104	\$ 12,080	\$ -	\$ 12,080
2.3	Testing and Startup									16		16	32	\$ 4,320	\$ 300	\$ 4,620
2.4	Review and Respond; PLC Panel and VFD										40		40	\$ 6,800	\$ -	\$ 6,800
		0	0	0	0	0	0	0	12	28	64	96	200	\$ 27,640	\$ 600	\$ 28,240
Task 3																
3.1	Draft Report	2	4	8	16	8	50	8					96	\$ 16,560	\$ 500	\$ 17,060
3.2	Draft Report Review Meeting	2		6	6	6	16	2					38	\$ 6,910	\$ 300	\$ 7,210
3.3	Final Report	2	2	4	8	4	24	8					52	\$ 8,780	\$ 800	\$ 9,580
		6	6	18	30	18	90	18	0	0	0	0	186	\$ 32,250	\$ 1,600	\$ 33,850
	TOTAL	10	8	32	48	30	146	22	12	28	64	96	496	\$ 79,570	\$ 2,800	\$ 82,370