Ref: 18-5580

AGENDA

ENGINEERING COMMITTEE MEETING
LEUCADIA WASTEWATER DISTRICT
Wednesday, October 4, 2017 – 8:30 a.m.
1960 La Costa Avenue, Carlsbad, CA 92009

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1. **Call to Order**

2. **Roll Call**

3. **Public Comment**

4. **New Business**
   A. Authorize the General Manager to execute Amendment Number 3 to Task Order No. 29 to the Engineering Design Services Agreement with Infrastructure Engineering Corporation (IEC) for the Preliminary Design Report for the Leucadia Pump Station Rehabilitation Project in an amount not to exceed $86,592. (Pages 2 - 8)

5. **Information Items**
   A. Notice of Violation - San Diego County Air Pollution Control District. (verbal)

   B. Update of the Poinsettia Station Gravity Pipeline Project. (verbal)

6. **Directors' Comments**

7. **General Manager's Comments**

8. **Adjournment**

Ref: 18-5581

MEMORANDUM

DATE: September 29, 2017

TO: Engineering Committee

FROM: Paul J. Bushee, General Manager

SUBJECT: **Leucadia Pump Station Rehabilitation Project – Engineering Design Services**

RECOMMENDATION:

Staff requests that the Engineering Committee recommend that the Board of Directors:

1. Authorize the General Manager to execute Amendment Number 3 to Task Order No. 29 to the Engineering Design Services Agreement with Infrastructure Engineering Corporation (IEC) for the Preliminary Design Report for the Leucadia Pump Station Rehabilitation Project in an amount not to exceed $86,592.

2. Discuss and take other action as appropriate.

DISCUSSION:

Tactical Goal: Infrastructure and Technology / Leucadia Pump Station Rehabilitation

In April 2014, Infrastructure Engineering Corporation (IEC) completed the District's pump stations assessment. As a result of that assessment, IEC recommended the rehabilitation and structural assessment of the Leucadia Pump Station (LPS) in Fiscal Years (FY) 2016 and 2019, respectively. However, for efficiency and cost effectiveness staff determined that a prudent approach is to combine both recommended projects into a single rehabilitation project for FY 2017. As you may recall, in September 2016 the Board authorized the execution of Task Order 29 enabling IEC to commence design of the project. The pump station assessment recommended that the following major items be accomplished during the rehabilitation:

- Mechanical:
  - Install suction piping in the emergency overflow wet well for by-pass pumping.
  - Replace diaphragm seals and pressure gauges.
  - Install 1" ports prior to 4" valves on force main drain lines.
  - Repair drain at surge tank.
  - Replace broken valve on surge valve air piping and install unions for disconnection.

- Pump station and site improvements:
  - Replace scrubber fan housing and fan.
  - Install weatherproofing on door to pump station building and around rain gutter area above door.
  - Replace fresh air fan and duct with new Fiberglass Reinforced Plastic (FRP) fan and ductwork.
  - Seal manhole cover at Vapex (odor control) injection point.
  - Field painting.
  - Shop coat pipe stands.

As project design progressed, staff discovered extremely high levels of hydrogen sulfide (H_2S) at the discharge end of the Leucadia (L2) Force Main. Staff and District Engineer (DE) Wilson evaluated and field tested several operational adjustments to reduce the H_2S level. However, no significant H_2S reduction resulted from the field tests. Therefore, staff believes an evaluation and redesign of the mechanical system is required to reduce the H_2S levels. As a result, the project has transformed into a major pump station rehabilitation project requiring revision of the original project scope to include evaluation and replacement of the pumps, piping and check valve configuration. It should be noted that the last major rehabilitation of LPS was completed in July 2006. IEC's previous design effort was put on hold until the new project scope could be determined. Staff, DE Wilson and IEC collaborated to develop and finalize the additional project objectives to be incorporated into the original project scope.

Staff requested a proposal from IEC for the expanded LPS Rehabilitation Project. Their proposal, attached, is to first develop a Preliminary Design Report (PDR) to establish the parameters to complete subsequent project design. The Scope of Work includes:

- Task 1 – Project Management and Administration
  IEC will attend the following coordination meetings:
  - Project Kick-Off
  - Two Progress meetings
  - PDR Review meeting

  Additional coordination will be addressed via e-mail and telephone.

- Task 2 – Preliminary Design Report (PDR)
  The PDR will include:
  - Wet Well Liner Condition Assessment
  - Preparation of Pump Station Base Drawings
  - Pump Capacity / Selection and Configuration Alternatives
  - Preliminary Electrical Design
  - Preliminary Structural Design
  - Instrumentation and Controls Strategy
  - Engineer's Opinion of Probable Construction Cost

IEC's proposed fee for design services is $86,592 which includes subcontracted services to support project design, such as structural and electrical engineering. Staff believes the proposal is fair and reasonable. Therefore, staff recommends that the Board authorize the General Manager to execute Amendment Number 3 Task Order Number 29 with IEC for engineering design services for the Leucadia Pump Station Rehabilitation Project.

FISCAL IMPACT:

Staff appropriated funds in the FY18 Budget for this project. The budget contains sufficient funds to cover the design services to be provided under this agreement.

rym:PJB

Attachment

September 28, 2017

Mr. Robin Morishita
Leucadia Wastewater District
1960 La Costa Avenue
Carlsbad, California 92009

RE: Proposal for Engineering Services for Preliminary Design of Leucadia Pump Station Rehabilitation Project

Dear Mr. Morishita:

It has been our pleasure to assist the District with the Leucadia Pump Station (LPS) Rehabilitation Study Project. This letter requests an amendment (Amendment 3) for engineering services to prepare a Preliminary Design Report (PDR) for the LPS Rehabilitation Project. The services requested under this amendment supplement, and do not overlap with, services authorized under the original task order. The original task order authorized IEC to prepare design documents for a limited rehabilitation project at the LPS based on minor improvements identified in the 2014 Pump Station Assessment Report. An amendment to the contract was made in order to have the 24-inch cast iron discharge header pipe inspected. A second amendment was added to evaluate the relocation of the existing check valve from a vertical position to a horizontal position. IEC will include the findings of the previous work into the PDR to be prepared under this new amendment to the contract.

PROJECT UNDERSTANDING AND APPROACH

The current task is to prepare a PDR that includes replacement of pumps and piping in the station. This new direction of the project comes from discussions with District staff and the District Engineer. The pump size, configuration and layout will be determined as part of the PDR effort. The goals of replacing the pumps at the station include:

- Ensure pumping capability for pumping the full range of flow rates based on the discussion during the September 13, 2017 meeting with the District staff and District Engineer
- Provide for pump station redundancy
- Optimize pump efficiency
- Consider continuous flow, by using a variable speed drive for the pump, through the L1/L2 forcemain as a priority when selecting pumps

Pump capacities, configurations and layouts for three flow scenarios, developed by the District Engineer, will be looked at during the preliminary design. A scope of work for preparation of the PDR for the LPS Rehabilitation Project follows:

SCOPE OF WORK

Task 1 – Project Management and Administration

We anticipate a project kick-off meeting, two progress meetings and a PDR review meeting. IEC will prepare agendas and minutes for each meeting. Additional coordination, project status reports and schedule updates will be addressed via e-mail and telephone.

Deliverables: Meeting agendas and minutes
Task 2 – Preliminary Design Report (PDR)
The following activities will take place during the preliminary design:

Wet Well Inspection – RF Yeager will conduct an inspection and test the T-lock from the exterior of the wet well, observing the upper portion of the wet well, to ascertain its conditions. The wet well level will be lowered to a minimum during the testing. A letter report with observations, findings and recommendations will be prepared.

Preparation of Base Drawings
IEC will make a site visit to the pump station to measure the Leucadia Pump Station pump room footprint, existing piping connections to exterior piping, existing piping headers, HVAC equipment and crane reach. We will update the existing LPS CADD base files to reflect existing conditions.

Pump Size and Configuration Evaluation - IEC will analyze three flow scenarios:

- Peak Wet Weather Flow (PWWF) = 11.5 MGD – Consider using three pumps operating and two force main in operation
- Daily Peak Flow (PDF) = 6.2 MGD – Consider one pump operating at full speed and pump operating at reduced speed running at this flow; Maintain a velocity of 3.0 fps in L1/L2 force main.
- Low Flow = 1.1MGD – Consider that pumps may operate continuously or in stop/start mode.

IEC will evaluate up to three pump configurations/pump selections to achieve the above desired flow conditions. Included in the pump selection/configuration evaluations will be the evaluation of the suitability of a dry-pit submersible pump and pump efficiencies for the above flow applications.

Electrical Preliminary Design – Moraes Pham & Associates (MPA) will make a site visit and meet with field staff to evaluate the existing electrical gear and VFDs with respect to the proposed new pump sizes and configuration. MPA will review whether the new VFDs at the station can be reused based on the new size of the pumps. A single line drawing and one plan drawing showing power distribution based on the pump layout will be prepared for the PDR. A discussion of the electrical design recommendations will be included in the PDR. An opinion of probable construction cost for the concrete repairs will be included in the PDR.

Structural Preliminary Design – Kelsey Structural will visit the pump station site interior and exterior and meet with field services staff during a structural assessment of the exterior of the pump station, which will include the top slab of the emergency storage tank and surge tank and odor scrubber areas. The force main valve vault will also be inspected. A discussion of the electrical design recommendations will be included in the PDR. Structural sections will be prepared for the PDR report with recommendations for repairs and upgrades. In addition preliminary details, if required, for floor slab repairs will be prepared where written descriptions are inadequate. An opinion of probable construction cost for the concrete repairs will be included in the PDR.

Engineer's Opinion of Probable Construction Cost – An Engineer's Opinion of Probable Construction Cost will be prepared for the three pump size and configuration alternatives. The capital cost and energy usage of each of different pumping configuration will be calculated and used for comparison of the alternatives. Cost for other improvements, including structural and electrical improvements identified and recommended during the preliminary design phase, for the project will also be included. The cost opinion will include provisions for mobilization, installation, contractor's overhead and profit, and include a contingency of 30%. Soft costs such as engineering and construction management will not be included. The cost estimates will be incorporated into the PDR.

Draft PDR
IEC will prepare a draft PDR, which will include existing condition drawings and provide pump selections and configuration. The draft PDR will include pump selection and configuration alternatives.

Draft PDR Review Comments

IEC will attend a meeting with the District to discuss the draft PDR. Upon District approval of the proposed pump selection and configuration, a draft final PDR will be prepared.

Draft Final PDR
IEC will prepare a draft final PDR, which will include a proposed mechanical plan showing the approved pump selection and configuration. The report will also document the findings of the wet well observation, the surge analysis and structural or electrical upgrades required for the proposed pump station upgrade.

Draft Final PDR Review Comments
Upon receipt of comments on the draft/final PDR, IEC will incorporate the comments and issue the Final PDR.

Final PDR
IEC will issue a final PDR, which will incorporate the comments of the District on Draft/Final report.

Deliverable: Draft PDR - Pump Selection & Configurations/Draft Final PDR/Final PDR

Task 3 – Instrumentation and Controls Consulting

IEC has included a time and materials allowance for 20 hours for Rockwell Construction Services (RCS) to consult on the current pump control strategy. RCS has an excellent understanding of control strategies used in wastewater pump stations. IEC may consult with RCS during the pump selection/configuration analysis, where a complete understanding of the control strategy can help select and configure pumps with fewer starts per hours.

SCHEDULE

It is anticipated IEC will attend a kick-off meeting with the District within two weeks following the notice to proceed. Following the kick-off meeting, IEC will prepare a draft PDR that will include pump selections and configurations within twelve weeks. Upon District approval of the draft PDR, a final draft PDR will be produced within four weeks. Following a two week review period by the District, IEC will prepare a final PDR upon receipt of District comments within two weeks. Additional drafts or a change in scope from the scope proposed herein will require additional time and budget.

FEE

The proposed level of effort and fee is indicated on the attached table. We estimate the cost of the additional work to be $86,592. This would bring the total requested project budget to $137,745. Billing will be in accordance with our current agreement for as-needed engineering services. We sincerely appreciate the opportunity to provide this proposal and assist the District with this project. Please contact me at (858) 842-4425 should you have any questions or need further information.

Sincerely,

Jane Costello

Jane Costello, PE
Project Manager

cc: Jamie Fagnant, PE, IEC, Rob Weber, PE, IEC

FEE ESTIMATE
LEUCADIA WASTEWATER DISTRICT
Pump Rehabilitation Project - Preliminary Design Report

Task/ Subtask	Task/Subtask Description	*Principal (Rob Weber)*	*Project Manager (Jane Costello)*	*Sr. Project Engineer (Patrick Mulvey)*	*Sr. Project Engineer (Jamie Fagnant)*	*Engineer II/ CAD II Designer (Marie Fawcett)*	*Word Processor (Annette Moore)*	Subtask Labor-Hours	Subtask Labor Cost	Direct Cost	Subcontract	Total Cost
		$200.00	$180.00	$160.00	$160.00	$120.00	$98.00					
TASK 1	**Project Management and Administration**											**$7,230**
	Meetings - One Kick-off/Two Progress/One Review	3	12	6	12			33	$5,640			$5,640
	Project Status Reports/Coordination		8					8	$1,440	$150		$1,590
									$0			$0
TASK 2	**Preliminary Design Report**											**$75,547**
	Wet Well Inspection		4					4	$720	$50	$3,229	$3,999
	Preparation of Base Drawings			24		32		56	$7,680	$150		$7,830
	Pump Size and Configuration Evaluation	4	40	8	16			68	$11,840			$11,840
	Engineer's Opinion of Probable Cost		16	24	16			56	$9,280			$9,280
	Draft Preliminary Design Report	4	24	24	16	40	8	116	$17,104			$17,104
	Electrical Preliminary Design		4					4	$720		$7,875	$8,595
	Structural Preliminary Design		4					4	$720		$7,875	$8,595
	Review Comments		6		2	6		14	$2,120			$2,120
	Draft Final Preliminary Design Report		14		3	6	4	27	$4,112			$4,112
	Review Comments		2		2	2		6	$920			$920
	Final Preliminary Design Report		2		1	2	4	9	$1,152			$1,152
TASK 3	**Instrumentation and Controls Consulting**											**$3,815**
	Pump Operation Control Strategy Review		4					4	$720	$50	$3,045	$3,815
		11	140	86	68	88	16	409				
		$2,200	$25,200	$13,760	$10,880	$10,560	$1,568		$64,168	$400	$22,024	**$86,592**

TOTAL NOT-TO-EXCEED FEE: $86,592