

AGENDA

**ENGINEERING COMMITTEE MEETING
LEUCADIA WASTEWATER DISTRICT
Tuesday, May 1, 2018 – 8:30 a.m.
1960 La Costa Avenue, Carlsbad, CA 92009**

- 1. Call to Order**
- 2. Roll Call**
- 3. Public Comment**
- 4. New Business**
 - A. Receive and file the Leucadia Pump Station Rehabilitation Preliminary Design Report completed by Infrastructure Engineering Corporation. (Pages 2 - 4)
 - B. Authorize the General Manager to execute Amendment No. 4 to Task Order No. 29 to the Engineering Design Services Agreement with Infrastructure Engineering Corporation (IEC) for engineering design services for the Leucadia Pump Station Rehabilitation Project in an amount not to exceed \$180,200. (Pages 5 - 10)
- 5. Information Items**
 - A. Update of the Poinsettia Train Station Parallel Gravity Pipeline Project. (verbal)
 - B. Evaluation to Rebuild or Replace the Large Mobile Emergency Bypass Pump. (verbal)
- 6. Directors' Comments**
- 7. General Manager's Comments**
- 8. Adjournment**

MEMORANDUM

DATE: April 26, 2018
TO: Engineering Committee
FROM: Paul J. Bushee, General Manager 
SUBJECT: **Leucadia Pump Station Rehabilitation Project Preliminary Design Report Completion**

RECOMMENDATION:

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

1. Receive and file the Leucadia Pump Station Rehabilitation Preliminary Design Report completed by Infrastructure Engineering Corporation.
2. Discuss and take other action as appropriate.

BACKGROUND:**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 was to combine both recommended projects into a single rehabilitation project for FY 2017. As a result, in September 2016 the Board authorized the execution of Task Order 29 enabling IEC to commence design of the project.

As project design progressed, staff discovered extremely high levels of hydrogen sulfide (H₂S) 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 H₂S level. However, no significant H₂S reduction resulted from the field tests. At that time it was determined that an evaluation and redesign of the mechanical system was required to reduce the H₂S levels. As a result, the project 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. Subsequently, in October 2017 the Board authorized the execution of the Amendment No. 3 to Task Order 29 to complete the Preliminary Design Report (PDR) for the LPS Rehabilitation Project.

DISCUSSION:

During the initial phase of design a Preliminary Design Report (PDR) is completed to establish the scope and parameters of the project. The PDR establishes the framework for the project to focus the design effort and make it more efficient. IEC has completed the PDR which includes the following project recommendations:

- Install five new pumps, three of which have 150 horsepower (HP) motors and two with 25 HP motors.

- Install dry pit submersible pumps. Dry pit pumps can run while submerged but also run in air, thereby improving the survivability of the pump station in a flooding emergency.
- Reuse the two Mitsubishi VFDs and install three new Mitsubishi VFDs during the construction.
- Utilize a pumping control strategy that uses variable speed pumps to maintain a constant level in the wet well. Augment the control strategy with timers during certain periods of the day for longer pump run periods and reduced pump starts.
- Reposition check valves to the horizontal position from their current vertical position. Use swing arm style check valves instead of flapper style valves for improved operation of the pump station.
- Replace the 24" discharge header which was installed as part of the 1971 construction.
- Inspect and repair the wet well liner during construction when the pump station is in full bypass.

The executive summary is attached for your review. A copy of the PDR is available upon request.

It should be noted that pump station bypassing will be necessary to construct the project which includes replacing the pumps and associated valves and piping. Other work that is to be performed during bypassing is wet well lining inspection and rehabilitation as necessary.

Staff recommends that the Board receive and file the Leucadia Pump Station Rehabilitation Preliminary Design Report completed by IEC. Staff intends to execute a task order amendment with IEC for continued engineering services as the project transitions into the design/bidding phase of the project.

rym:PJB

Attachment

EXECUTIVE SUMMARY

The Leucadia Pump Station Rehabilitation Project began in 2016 as a group of relatively minor upgrades and repairs based on findings of the 2014 pump station condition assessment. The scope has since expanded to address ongoing operational and maintenance issues such as excessive pump starts and lack of availability for outdated pump parts. The proposed project now includes the replacement of all pumps and associated piping, valves, fittings and appurtenances. Additionally, three variable frequency drives (VFD) will be replaced and programming adjustments to the Programmable Logic Controller (PLC), Operator Interface terminal (OIT) and Supervisory Control and Data Acquisition (SCADA) will be made. The upgrades and improvements identified in the original project will be completed. This Preliminary Design Report (PDR) provides a full hydraulic analysis, recommendations for pump replacement and configuration, a process control description, electrical and structural improvement recommendations, an engineer's opinion of probable cost, and an implementation schedule.

The PDR completed by IEC recommends that the District move forward with the rehabilitation of the Leucadia Pump Station. Specific recommendations include:

- Install five new pumping units, three of which have 150 horsepower (HP) motors and the other two have 25 HP motors. This configuration will cover the peak wet weather flows as well as low nighttime flows.
- Install dry pit submersible pumps. Dry pit pumps can run while submerged but also run in air. The pump and motor are closely coupled, so the entire unit is pulled when maintenance is required.
- Reuse the two Mitsubishi VFDs recently installed by Sloan Electrical and use Sloan to install the three new VFDs during the construction.
- Utilize a process control strategy that uses variable speed pumps to maintain a constant level in the wet well. Augment the control strategy with timers during certain periods of the day, which should result in longer pump runs and fewer pump starts.
- Reposition the check valve to the horizontal position from its current vertical position. Install swing arm style check valves instead of flapper style valves for better operation of the check valve during pumping.
- Replace the 24" discharge header which was installed as part of the 1971 construction. The cast iron and ductile iron header will be replaced with a lined and coated ductile iron pipe.
- Test and repair the wet well liner during construction when the pump station is in full bypass.

MEMORANDUM

DATE: April 26, 2018
 TO: Engineering Committee
 FROM: Paul J. Bushee, General Manager 
 SUBJECT: Leucadia Pump Station Rehabilitation Project – Design Services

RECOMMENDATION:

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

1. Authorize the General Manager to execute Amendment No. 4 to Task Order No. 29 to the Engineering Design Services Agreement with Infrastructure Engineering Corporation (IEC) for engineering design services for the Leucadia Pump Station Rehabilitation Project in an amount not to exceed \$180,200.
2. Discuss and take other action as appropriate.

DISCUSSION:**Tactical Goal: Infrastructure and Technology / Leucadia Pump Station Rehabilitation**

Previously, the Board of Directors received and filed the Leucadia Pump Station Preliminary Design Report (PDR) completed by Infrastructure Engineering Corporation (IEC). The PDR recommended the following major project components:

- Install five new pumps, three of which have 150 horsepower (HP) motors and two with 25 HP motors.
- Install dry pit submersible pumps. Dry pit pumps can run while submerged but also run in air, thereby improving the survivability of the pump station in a flooding emergency.
- Reuse the two Mitsubishi VFDs and install three new Mitsubishi VFDs during the construction.
- Utilize a pumping control strategy that uses variable speed pumps to maintain a constant level in the wet well. Augment the control strategy with timers during certain periods of the day for longer pump run periods and reduced pump starts.
- Reposition check valves to the horizontal position from their current vertical position. Use swing arm style check valves instead of flapper style valves for improved operation of the pump station.
- Replace the 24" discharge header which was installed as part of the 1971 construction.
- Inspect and repair the wet well liner during construction when the pump station is in full bypass.

Additionally, the PDR estimated the construction cost for the project, without contingency, to be \$2,454,000.

The next phase of the project is the final design phase. IEC has submitted a proposal, attached, to complete the design of the project. The Scope of Work includes:

Task 1 – Project Management and Administration

IEC will attend three review meetings: a kick off meeting and one after each of the design submittals. IEC will develop a comment log for District comments on both the specifications and

the plans with a column for IEC's response to each comment. Additional coordination, project status reports and schedule updates will be addressed via e-mail and telephone.

Task 2 – Final Design

The design of the project will conform to the PDR. IEC will:

- Prepare two design submittals at 75% and 100% levels of design
- Prepare the bid package that will consist of D-sized sheets, Construction Specifications Institute (CSI) format specifications and an engineer's opinion of probable construction cost
- The plan set will consist of 53 plan sheets

IEC's proposed fee for design services is \$180,200 which includes services to support project design, such as electrical engineering subconsultant design services. This fee is 7.3% of the estimated construction cost. Staff believes the proposal is fair and reasonable. Therefore, staff recommends that the Board authorize the General Manager to execute Amendment No. 4 to Task Order 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 commence the design services to be provided under this task order.

rym:PJB

Attachment



April 23, 2018

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

RE: Proposal for Engineering Services for Final 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 4) for engineering services to prepare the Final Design 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. A third amendment was added to prepare a Preliminary Design Report (PDR) that includes replacement of pumps and piping in the station as well as the minor improvements from the original scope. The services requested under this fourth amendment supplement, and do not overlap with, services authorized.

SCOPE OF SERVICES

IEC recommends that the District move forward with final design of the rehabilitation of the Leucadia Pump Station. The final design should include replacement and reconfiguration of the five existing pumps, replacement of all mechanical piping, valves and appurtenances, new electrical and controls equipment including two variable frequency drives (VFDs). The existing generator is sufficiently sized and will not be replaced. Structural improvements will be made to the dry pit floor slab and exterior concrete areas around the pump station. The project will also include miscellaneous improvements such as a new building air supply fan, odor control fan and building roof access hatch.

The following detailed scope of services describes the specific tasks and deliverables that will be performed.

Task 1 – Project Management and Administration

IEC will attend three review meetings: one after each of the design submittals. We will develop a comment log for District comments on both the specifications and the plans with a column for IEC response to be filled out. Additional coordination, project status reports and schedule updates will be addressed via e-mail and telephone.



Task 2 – Final Design

IEC will prepare two design submittals at 75% and 100% levels of design. IEC will prepare one bid package that will consist of D-sized sheets, Construction Specifications Institute (CSI) format specifications and an engineer’s opinion of probable construction cost. The design set will consist of 53 proposed drawings as listed in the Proposed Drawing List:
Proposed Drawing List

- | | |
|---------------------------------------|---|
| G-1 General Notes | M-10 Mechanical Details 3 |
| G-2 Abbreviations & Symbols | S-1 General Notes |
| G-3 Pump Curves | S-2 General Notes & Special Inspection Tables |
| G-4 Site Plan – Existing | S-3 Typical Details |
| G-5 Site Plan | S-4 Upper Level Plan |
| G-6 Site Plan Enlarged | S-5 Upper Level Plan |
| G-7 Paving and Grading Plan | S-6 Enlarged Topping Slab Plan |
| G-8 Yard Piping Plan | S-7 Section |
| G-9 Schematic Bypass Pumping Plan | S-8 Structural Details |
| G-10 - Civil Details 1 | S-9 Structural Details |
| G-11 - Civil Details 2 | E-1 Standard Symbols and Abbreviations |
| D-1 Demolition Plan - Exterior | E-2 Partial Single Line Diagram/Elevations |
| D-2 Demolition Plan - Exterior | E-3 Upper Level Electrical Plan |
| D-3 Demolition Plan - Interior | E-4 Lower Level Electrical Plan |
| D-4 Demolition Section – Interior | E5-Upper Level Lighting Plan |
| D-5 Demolition Photos 1 | E-6 Lower Level Lighting Plan |
| D-6 Demolition Photos 2 | E7-Overflow Basin Area Electrical Plan |
| D-7 Demolition Photos 3 | E-8 Control Diagram |
| D-8 Demolition Photos 4 | E-9 Control Diagram |
| M-1 Mechanical Plan – Exterior | E10- Schedules |
| M-2 Mechanical Sections – Exterior | E11 – Details |
| M-3 Mechanical Plan Upper Level | I-1 P & ID Symbols and Abbreviations |
| M-4 Mechanical Sections Upper Level | I-2 P & ID 1 |
| M-5 Mechanical Plan – Lower Level | I-3 P & ID 2 |
| M-6 Mechanical Sections – Lower Level | I-4 P & ID 3 |
| M-7 Mechanical Sections – Lower Level | |
| M-8 Mechanical Details 1 | |
| M-9 Mechanical Details 2 | |

Deliverables: 75% and 100% Design Submittals with plans, specifications and Engineer’s Opinion of Probable Construction Cost. The design submittals will be delivered as pdf files to the District. IEC will coordinate with the District and their reprographics vendor to deliver the pdf files for bidding.



Mr. Robin Morishita
Leucadia Wastewater District
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SCHEDULE

It is anticipated IEC will commence with the final design work immediately upon notice to proceed. The final design submittal will be completed within six months. 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. The proposed level of effort and fee is indicated on the attached table. We estimate the cost of the additional work to be \$180,200. This would bring the total requested project budget to \$317,945. 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, PE
Project Manager

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

