

AGENDA

**ENGINEERING COMMITTEE MEETING
LEUCADIA WASTEWATER DISTRICT**
Wednesday, March 4, 2015 – 2:00 p.m.
1960 La Costa Avenue, Carlsbad, CA 92009

- 1. Call to Order**
- 2. Roll Call**
- 3. Public Comment**
- 4. New Business**
 - A. Authorize the General Manager to execute an Agreement with Infrastructure Engineering Corporation (IEC) for engineering design services for the Leucadia (L1) Force Main West Section Replacement Project in an amount not to exceed \$69,375. (Pages 2 – 9)
 - B. Authorize the General Manager to execute a sole source Agreement with Sloan Electromechanical Service & Sales for the purchase and installation of replacement Variable Frequency Drives (VFD) for the Leucadia and Batiquitos Pump Stations in an amount not to exceed \$200,021.24. (Pages 10 – 15)
- 5. Information Items**
 - A. B1/B2 Force Mains Replacement Project update. (verbal)
 - B. Leucadia Pump Station Generator Replacement update. (verbal)
- 6. Director's Comments**
- 7. General Manager's Comments**
- 8. Adjournment**

MEMORANDUM

DATE: February 26, 2015
TO: Engineering Committee
FROM: Paul J. Bushee, General Manager *on behalf of PSB*
SUBJECT: Leucadia (L1) Force Main West Section Replacement Project Engineering Design Services

RECOMMENDATION:

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

1. Authorize the General Manager to execute an Agreement with Infrastructure Engineering Corporation (IEC) for engineering design services for the Leucadia (L1) Force Main West Section Replacement Project in an amount not to exceed \$69,375.
2. Discuss and take other action as appropriate.

DISCUSSION:

The design phase of the Leucadia (L1) West Section Force Main Replacement Project was included as a goal in the Fiscal Year (FY) 2015 Tactics & Action Plan.

In July 2013 Infrastructure Engineering Corporation (IEC) completed the Leucadia (L1) Force Main Internal Corrosion Evaluation Project Report. Based on the condition of the sample taken from the L1 section west of Interstate 5, IEC recommended that the District discontinue use of L1 until the District conducted further condition assessments of the force main. In October 2013, IEC recommended using SeeSnake, developed by PICA Corporation (PICA), to conduct the non-destructive assessment of L1. Subsequently, PICA submitted a cost proposal of \$663,325. The cost proposal was significantly higher than the original estimate and the budget appropriation amount of \$378,000.

Due to the significant cost difference, staff recommended and the Board agreed that the District should not perform the assessment at that time. Staff did not believe that there was high value in assessing the pipe at a cost of over \$660,000. Instead, staff thought the \$660,000 would be better spent replacing the western section of L1 and staff is confident that L1 can then be relied on for use during an emergency.

To accomplish the replacement of the west section of L1, staff allocated funds for the design phase of the project in the FY 2015 Budget and requested that IEC provide a proposal for project design. IEC has submitted a proposal, attached. The Scope of Services includes:

- Task 1 – Project Management and Administration
- Task 2 – Data Collection and Utility Coordination
- Task 3 – Design Survey and Topography
- Task 4 – Prepare Plans, Specifications and Estimate
- Task 5 – Permitting Assistance

The proposed cost for these design services is \$69,375. Staff has reviewed and discussed the scope of work and proposed fee with IEC. Staff believes the proposal is fair and reasonable. Therefore, it is recommended that the Board authorize the General Manager to execute a design agreement with IEC for the L1 West Section Replacement Project.

Staff will request an appropriation in the FY 2016 Budget for the construction phase of the project.

FISCAL IMPACT:

The FY 2015 budget contains sufficient funds to cover the design services under this Agreement.

PJB:rym

Attachment



February 23, 2015

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

RE: Proposal for Engineering Services for the design of the L1 Sewer Force Main Repair

Dear Mr. Morishita:

Infrastructure Engineering Corporation (IEC) is pleased to provide the Leucadia Wastewater District with this proposal for Engineering Services for the Design of the L1 Sewer Force Main Repair. The proposed scope of services and fee is based on conversations with the District and involvement in previous projects within the L1/L2 Force Main System leading to a thorough understanding of the project site and the force main system including the L1 Force Main Destructive Testing and Non-Destructive Testing Evaluation, the L1/L2 and B1/B2 Force Main Corrosion Rehabilitation Project and the Saxony Pump Station Rehabilitation Project. IEC has experience in facilitating right-of-way permits within the City of Encinitas both for Leucadia Wastewater District and other local agencies.

PROJECT UNDERSTANDING AND APPROACH

L1 Sewer Force Main History

The L1 and L2 force mains are existing 24" sewer force mains that convey raw sewage from the Leucadia Pump Station approximately 14,000 feet along La Costa Avenue to the Batiquitos Gravity Sewer. L1 was installed in 1979 and is composed of 24" ductile iron pipe with a poly-liner at the high points and cement mortar lined elsewhere. L2 was installed in phases, beginning in 1996 and ending in 2003 and is composed of PVC pipe with ductile iron fittings, a steel overcrossing at I5 and HDPE installed by horizontal directional drilling under El Camino Real.

A study prepared by Dexter Wilson Engineering Inc. titled Leucadia Wastewater District Force Main Inspection Study for L1, L2, B2, and B3 dated July 28, 2009 recommended installation of two manholes and access points on the existing L1 force main for the purposes of inspection and maintenance. These manholes would allow for destructive testing of the L1 force main along with future access for CCTV inspections. However, due to the associated cost for installation and maintenance of the sewer manholes, and the limited nature of data received regarding corrosion from CCTV, the District elected to proceed with destructive testing only. The destructive testing evaluated the existing condition of the L1 sewer force main and expected lifespan as it relates to crown corrosion.

Results from the L1 force main destructive testing showed that the exterior of the polyethylene wrap surrounding the L1 force main was in good condition. The exterior of the pipe itself along with the interior, however, showed missing or poorly adhered liner on the interior with significant corrosion both inside and on the exterior surface of the pipe. Several through wall perforations



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were found. CCTV inspection up and downstream showed further evidence of disbonded or missing liner and corresponding corrosion product.

The District has elected to proceed with replacement of the L1 sewer force main west of I5. This includes approximately 2,540 feet of the L1 sewer force main from the abandoned L2 Phase I/III interconnection which is located just to the west of I5 to the existing NCTD railroad bridge, and then west from the railroad bridge to the discharge manhole at Coast Highway.

The railroad bridge crossing was replaced in 1998 and will remain in place. It is expected that the replacement will connect to the 1998 replacement outside of NCTD right-of-way and an encroachment permit from NCTD will not be required.

Caltrans Encroachment Permit

The eastern L1 force main connection point is just outside of the western edge of Caltrans right-of-way. As such, construction within Caltrans right-of-way will not take place, but traffic control will have to be staged within Caltrans right-of-way and this will require the District to obtain a Caltrans encroachment permit. From initial conversations with Caltrans regarding the FY15 Leucadia Scenic Lining Project the permit application requirements are expected to include the following:

- Caltrans encroachment permit application.
- Letter from LWD authorizing IEC to act on their behalf in submitting the permit.
- Permit application fees (provided by the District).
- CEQA documentation (provided by the District).
- Final signed plans for construction.
- Traffic control plans for work adjacent to Caltrans right-of-way.
- Water Pollution Control Drawings.

IEC has included Rick Crafts Engineering to prepare traffic control plans and assist in coordinating with Caltrans in order for the District to obtain the Caltrans encroachment permit.

City of Encinitas Right-of-way Permit

From recent design work completed within the City of Encinitas, IEC understands that there are a number of requirements that the City requires before issuing a right-of-way permit. IEC recommends that the initial permitting process be started during the design phase and pursued concurrently with the Caltrans encroachment permit process in order to minimize risk of potential change orders resulting from City requests during issuance of the final right-of-way permit to the Contractor. IEC's understanding of typical City requests during permitting and our proposed approach to addressing these issues in the Contract Documents are outlined below:

- Traffic control plans are required for major intersections. IEC has included Rick Crafts Engineering on our team to complete traffic control plans for the I5 interchange and the Coast Highway/La Costa Avenue intersections.
- Survey Monuments. The City has previously requested a record of survey for every survey monument within project corridors. Our previous successful approach to this request is to indicate to the City that a requirement for record of survey seems excessive but survey monuments within 15 feet of the project alignment were specifically called out to be protected in place.



- Concrete. The City requires all concrete work to be specifically called out on the plans and performed in accordance with City details.
- Color of abovegrade facilities. There is an existing air valve on the alignment that will be replaced in place. IEC recommends the District replace the air valve with a new valve in a sealed manhole for odor control purposes, but if it remains aboveground we will coordinate with the City in selecting a specifying a color for the aboveground enclosure.
- Trees. The City has requested in the past that no excavation take place within the dripline of existing trees. We will recommend replacing the pipe within existing alignment due to a congested utility corridor, however, relocation of appurtenances out of the dripline of trees may be considered.
- Paving. IEC will coordinate with the City regarding paving requirements and has included scope to prepare cross sections to convey paving requirements.
- Shoring Design. On a previous project the City requested shoring plans be submitted in conjunction with the design drawings. IEC recommends the development of shoring be left to the Contractor's means and methods but recommends including in the specifications a requirement be added that the Contractor must submit approved shoring design to the City at least two weeks in advance of construction.
- Coastal Development Permit. Although this project is within the Coastal Development Zone, it is a repair project that does not increase capacity or cause undue environmental impacts and is expected to be exempt from CDP permitting. IEC has included scope to prepe a short memorandum documenting the project's exemption from CDP requirements as part of the City permitting assistance.

Project Execution

From working on previous projects with the District, IEC understands the District values input from District staff and other consultants during the design process of major projects. IEC is committed to working as part of the District's team and has prepared this scope and fee with this in mind.

Because the alignment is expected to keep to the existing alignment, no geotechnical borings are expected to be required. It is anticipated the District considers this project exempt from CEQA, CDP, and obtainment of an NDPES construction storm water permit. Geotechnical, traffic control, potholing, and CEQA or CDP permitting assistance is not included in the proposed scope of services.

SCOPE OF SERVICES

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

Task 1 – Project Management and Administration

In order to expedite the project, we anticipate one kickoff meeting, and two final design meetings will be required during the project. Additional coordination can be addressed via telephone conferences or emails. IEC will provide schedule updates at each project milestone and at any point where the schedule milestones change.



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Task 2 – Data Collection and Utility Coordination

IEC will complete a USA DigAlert Design request and contact and request record drawings from utility companies that have utilities in the vicinity. A follow-up request for review will be performed at the 90% and 100% submittals for review of location of facilities and that new facilities are shown on the plans.

Task 3 – Design Survey and Topography

We will conduct a field design survey of the project area in order to develop a base map for subsequent design. The base mapping will be prepared in AutoCAD format at 40 scale. Additional planimetric survey will be performed 500-feet in either direction of the proposed alignment to provide adequate information from which to complete required traffic control plans.

Task 4 – Prepare Plans, Specifications and Estimate (PS&E)

IEC will prepare plans, technical specifications, and a cost estimate (P,S,&E) for the work. The scope and fee for contract document preparation assumes the force main will be replaced in the existing alignment and does not include time to significantly reroute the force main through the La Costa Avenue congested utility corridor. The plans are expected to contain the following:

- Title sheet w/ General Notes, Legend, Abbreviations (3)
- Plan and Profile (3)
- Civil Details (1)
- WPCD (3)
- Traffic Control Drawings (3)

We anticipate making two review submittals to the District at the 90% and 100% completion levels and then preparation of the final bid-ready set of documents. Specifications and contract documents will be prepared based on the District's standard front end contract documents.

Task 5 – Permitting Assistance

IEC anticipates one coordination meeting with Caltrans prior to application submittal. IEC will prepare and submit the encroachment permit application package to Caltrans to consist of the following in conjunction with the 100% submittal to the District:

- Caltrans encroachment permit application.
- Letter from LWD authorizing IEC to act on their behalf in submitting the permit.
- Permit application fees (provided by the District).
- CEQA documentation (provided by the District).
- Final signed plans for construction.
- Traffic control plans for work within Caltrans right-of-way.
- Water Pollution Control Drawings.

Final encroachment permit requirements will be incorporated into the final contract documents.

IEC anticipates one coordination meeting with the City of Encinitas, and two submittals to the City. IEC will meet with the City prior to the 90% design development and incorporate City comments into the 90% plans. The 90% contract documents will be submitted concurrently to the City and the District. IEC will submit 100% contract documents to the City for final review.



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SCHEDULE

The proposed schedule is as follows:

- March 11, 2015 – NTP
- March 11 – April 8 – 4 weeks – Survey
- April 8 – May 6 – 4 weeks – 90% Design
- April 22 – Meet with City of Encinitas prior to 90% design
- May 6 – May 20 – 2 weeks – District Review of 90% Design
- May 20 – Meet with City of Encinitas to discuss 90% review comments
- May 21 – Meet with LWD to discuss 90% review comments
- May 21 – June 11 – 3 weeks - 100% Design
- June 11 – September 11 – Caltrans Encroachment Permit Obtainment
- September 11 – September 25 – Final Design
- September 28 – October 22 – October - Bid
- October 22 – October 27 – Bid Review
- November 4 – Engineering Committee Meeting
- November 11 – Board Meeting
- November 11 – February 11, 2016 – 3 months - Construction

FEE

The proposed level of effort and fee is indicated on the attached table. 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) 413-2400 should you have any questions or need further information.

Sincerely,

Robert S. Weber, P.E.
Senior Project Manager

cc: Jamie Fagnant, P.E., IEC

**FEE ESTIMATE
LEUCADIA WASTEWATER DISTRICT
L1 Force Main Repair**

Task/ Subtask	Task/Subtask Description	Senior Project Manager	Designer/ Project Engineer	CADD Designer III/Engineer III	CADD Designer II/ Engineer II	Project Surveyor	Subtask Labor-Hours	Subtask Labor Cost	Direct Cost	Subcontract	Total Cost
		\$180.00	\$130.00	\$115.00	\$110.00	\$130.00					
TASK 1	Project Management and Administration										\$6,260
	Kickoff Meeting	3	4				7	\$1,060	\$60	\$0	\$1,120
	Final Design Meetings (2)	6	8				14	\$2,120	\$120	\$0	\$2,240
	Additional coordination/phone conferences	6	8				14	\$2,120	\$0	\$0	\$2,120
	Schedule Updates		6				6	\$780	\$0	\$0	\$780
TASK 2	Data Collection and Utility Coordination										\$3,250
	DigAlert Design request		1		4		5	\$570	\$50	\$0	\$620
	follow up with utility agencies		2		6		8	\$920	\$0	\$0	\$920
	conflict checks, 90%, 100%, final		3		12		15	\$1,710	\$0	\$0	\$1,710
TASK 3	Design Survey and Topography										\$15,145
	Design Survey and Topography				16	66	82	\$10,340	\$1,550	\$3,255	\$15,145
TASK 4	Plans, Specifications and Cost Estimate										\$32,290
	90% Submittal	4	20	48			72	\$8,840	\$0	\$5,250	\$14,090
	100% Submittal	4	20	28			52	\$6,540	\$0	\$1,050	\$7,590
	Final Submittal	4	8	16			28	\$3,600	\$0	\$1,050	\$4,650
	WPCD		12		40		52	\$5,960	\$0	\$0	\$5,960
TASK 5	Permitting Assistance										\$12,430
	Caltrans Encroachment Permit	2	10	20			32	\$3,960	\$60	\$3,150	\$7,170
	City of Encinitas Right-of-way Permit	2	16	24			42	\$5,200	\$60	\$0	\$5,260
		31	118	136	78	66	429				
		\$5,580	\$15,340	\$15,640	\$8,580	\$8,580		\$53,720	\$1,900	\$13,755	\$69,375

TOTAL NOT-TO-EXCEED FEE: \$69,375

MEMORANDUM

DATE: February 26, 2015
TO: Engineering Committee
FROM: Paul J. Bushee, General Manager *crb/mbj for PJB*
SUBJECT: **Agreement to Procure and Install Variable Frequency Drives for the Leucadia and Batiquitos Pump Stations**

RECOMMENDATION:

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

1. Authorize the General Manager to execute a sole source Agreement with Sloan Electromechanical Service & Sales for the purchase and installation of replacement Variable Frequency Drives (VFD) for the Leucadia and Batiquitos Pump Stations in an amount not to exceed \$200,021.24.
2. Discuss and take other action as appropriate.

DISCUSSION:

The purchase and installation of replacement Variable Frequency Drives at the Leucadia Pump Station was included as a goal in the Fiscal Year (FY) 2015 Tactics & Action Plan.

In April 2014, Infrastructure Engineering Corporation (IEC) completed the District's pump stations assessment and recommended that two Variable Frequency Drives (VFDs) at the Leucadia Pump Station be replaced in FY15 due to operational issues. The VFD is a critical electrical component which controls the speed and output flow of a pump. The four VFDs at the Leucadia Pump Station (LPS) were installed in April 2006. The District's Asset Management Plan estimates the useful life of pump station electrical components at 10 years.

In the past the District has experienced problems with the Eaton VFDs installed at both LPS and Batiquitos Pump Station (BPS). In September 2008, to alleviate chronic problems with one of the four Eaton VFDs at BPS, staff decided to replace it with a Mitsubishi VFD. Additionally, field support from Eaton has been marginal at best. As a result, staff took this opportunity to research other manufacturers to improve reliability and field support and to standardize the pump station VFDs. Rockwell Automation (Rockwell), representative for Allen Bradley, and Sloan Electromechanical (Sloan), representative for Mitsubishi, were asked to present their VFD products to an evaluation team. The team included Joe Moraes (Moraes/Pham & Associates), Rockwell Swanson (Rockwell Construction Services) and staff members. As a result of the evaluation, the team selected Sloan and the Mitsubishi VFD for the following reasons:

- District is very satisfied with the Mitsubishi VFD at BPS, it has been reliable and has operated trouble free since installation
- Sloan will retrofit the Mitsubishi VFDs into the current Eaton enclosure, Rockwell will replace the entire enclosure and VFD at a higher cost
- District has experienced responsive and professional field support from Sloan

- Sloan will retrofit the Mitsubishi VFDs into the current Eaton enclosure, Rockwell will replace the entire enclosure and VFD at a higher cost
- District has experienced responsive and professional field support from Sloan

Joe Moraes' recommendation letter supporting this selection is attached for review.

Subsequently, Sloan was asked to provide a proposal to replace the VFDs, attached. Based on Joe Moraes' recommendation, the VFDs will include bypass capability and soft starters. The proposed price for each VFD at Leucadia is \$30,489.04 and at Batiquitos is \$46,347.72. The price includes sales tax, freight and installation.

To replace the two LPS VFDs it was anticipated that each VFD and its enclosure would be replaced as a unit. This would require engineering design, construction services for installation and associated soft costs. As a result, staff budgeted \$256,000 in the FY 2015 budget to replace the two LPS VFDs. Sloan proposes to retrofit the Mitsubishi VFDs into the current enclosures, as they accomplished in September 2008 at BPS. This approach reduces material costs, minimizes design and requires no construction. Based on Sloan's quote, the District will be able to replace two VFDs at Leucadia (\$60,978.08) and three VFDs at Batiquitos (\$139,043.16) for a total of \$200,021.24. It should be noted that the three VFDs to be replaced at BPS were installed between July 2004 and June 2005.

Under Section 11.1, Sole Source Procurement, of the District's Procurement Policy, sole source procurement is allowed in cases where goods and services are obtainable from only one vendor due to unique circumstances. Sloan is the only southern California representative for the Mitsubishi VFD and successfully performed the retrofit of the VFD at BPS in the past.

Therefore, staff recommends that the Board authorize the execution of a sole source Agreement with Sloan for the purchase and installation of replacement VFDs for the Leucadia and Batiquitos Pump Stations.

FISCAL IMPACT:

The appropriation in the FY 2015 Budget is sufficient to cover the procurement and installation of the VFDs at both pump stations.

Attachments

rym:PJB

MPA MORAES/PHAM & ASSOCIATES

2131 Palomar Airport Road • Suite 120 • Carlsbad • CA 92011 • Fax (760) 431-7179 • Tel. (760) 431-7177

February 17, 2015

Robin Morishita
Technical Services Manager
Leucadia Wastewater District
1960 La Costa Avenue
Carlsbad, CA 92009

RE: Variable Frequency Drive (VFD) Standardization

Robin

After attending presentations by Rockwell Automation (Allen Bradley) and Sloan Electric (Mitsubishi) it is my opinion that Mitsubishi VFD's may be the best choice for VFD product standardization with regard to retrofit projects where utilization of existing enclosures and controls are desired.

Both VFD products are excellent and there are some advantages and disadvantages between product selection that are based solely on service and scope of support.

Rockwell has a very large installed base for their equipment and they have the depth of personnel and technical expertise to service the District for VFD's, PLC's and other integration products that are designed for compatibility between each other. Although Rockwell provides system integration they have not provided conventional turnkey installation of their VFD products in my past experience with them. Retrofitting Allen Bradley VFD's into existing enclosures could involve multiple Rockwell people if they, in fact, offer that service. Retrofitting Rockwell VFD's into Batiquitos and Leucadia pump stations will likely require more District engineering effort to provide a bid package for the installation compared to Sloan Electric.

Sloan Electric has provided Mitsubishi VFD retrofits at Batiquitos Pump Station with great success. The Mitsubishi product has reportedly been running without problems. The nature of the retrofit was to replace the Eaton VFD's, in place, with existing Eaton enclosures and controls remaining. Sloan is an installing contractor as well as the Mitsubishi VFD supply vendor for San Diego County.

Sloan Electric is a small local contractor/supplier that has a good track record with the District. Their personnel depth does not match Rockwell. However their responsiveness and control of product delivery is heavily weighted in my option.

It is my recommendation that Mitsubishi be considered by the District as the standard product moving forward.

In addition I recommend that any new bypass ability be soft starters with internal shorting contactors. The full voltage bypass contactors for Leucadia pump station should be replaced with soft starters.

Sincerely,

A handwritten signature in red ink, appearing to read "Joe Moraes", with a stylized flourish extending to the right.

Joe Moraes, P.E.
President

Leucadia Wastewater District
1960 La Costa Avenue
Carlsbad, CA 92009
Attention: Jeff Stecker

February 16, 2015

Subject: Variable Frequency Drive (VFD) Replacements (Rev. 1)
Batiquitos and Leucadia Pump Stations

Jeff,

This letter is our proposal for the following scope of services to replace VFDs with Mitsubishi VFDs at Batiquitos and Leucadia Pump Stations.

Batiquitos Pump Station

Please note that we replaced the No. 4 pump VFD in September, 2008.

Includes:

1. Remove existing VFD and document control wiring.
2. Install new VFD, rated at 361 amps with 110% overload rating for 1 minute. Motor full load rating is 321 amps.
3. Install new DC Link reactor.
4. Install new VFD keypad on enclosure door.
5. Commission VFD and train operator.
6. Drawing and 1 year warranty.

Please note the existing line reactor on each pump will be re-used.

Cost **\$ 26,502.72 (each)**

Sales tax and ground freight are included and work is quoted on a straight-time basis.

Pumps 1 and 3 are the locations for this work to be performed.

Lead time: 2-3 weeks for materials plus 1 week for installation per pump.

Batiquitos Optional Equipment including Bypass and a Soft Start

Includes:

1. 3-contactor bypass equipment (using 300HP, 450 amp rated contactors) scheme consisting of :
2. LINE contactor
3. VFD isolation contactor mechanically and electrically interlocked with BYPASS contactor with overload
4. Schneider Altistart 22 Soft Start
5. Credit for using a 325 amp VFD instead of the 361 amp VFD as the space used by the smaller VFD is required for adding this equipment,
6. Remote Keypad and communications cable
7. Power and control wiring
8. Selector switch and logic

Bypass and SS \$ 19,845.00 (each)

Total cost **\$ 46,347.72 (each)**

Sales tax and ground freight are included and work is quoted on a straight-time basis.

Lead time: 2-3 weeks for materials plus 1 week for installation per pump.

All materials and services quoted herein do not adhere to any specific construction or project specifications unless specifically stated and agreed to within the quote.

ALL QUOTES ARE VALID FOR 30 DAYS



Leucadia Pump Station

Includes:

1. Remove existing VFD and document control wiring.
2. Install new VFD, rated at 260 amps with 110% overload rating for 1 minute. Motor full load rating is 231 amps.
3. Install new DC link reactor.
4. Install new 3% impedance input line reactor.
5. Install new VFD keypad on enclosure door.
6. Commission VFD and train operator.
7. Drawing and 1 year warranty.

Cost **\$ 22,889.04 (each)**

Sales tax and ground freight are included and work is quoted on a straight-time basis.

Lead time: 2-3 weeks for materials plus 1 week for installation per pump

Leucadia Optional Equipment including Soft Start Bypass

Add to existing bypass system when performed with the VFD replacement:

1. Schneider Altistart 22 Soft Start
2. Remote Keypad and communications cable

SS adder \$ 7,600.00 (each)

Total cost **\$ 30,489.04 (each)**

Sales tax and ground freight are included and work is quoted on a straight-time basis.

Lead time: 2-3 weeks for materials plus 1 week for installation per pump.

Sincerely,

Jerry Gray

All materials and services quoted herein do not adhere to any specific construction or project specifications unless specifically stated and agreed to within the quote.

ALL QUOTES ARE VALID FOR 30 DAYS

