Loxahatchee River District

Water Reclamation | Environmental Education | River Restoration

2500 Jupiter Park Drive, Jupiter, Florida 33458
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D. Albrey Arrington, Ph.D., Executive Director

MEMORANDUM

TO: Governing Board
FROM: D. Albrey Arrington, Executive Director
DATE: June 7, 2016
SUBJECT: Consent Agenda

All items listed below are considered routine and will be enacted by one motion. There will be no separate discussion of these items unless requested by a Board member or citizen, in which event, the item will be removed and considered under the regular agenda.

This month's consent agenda consists of the following items:

A. Dewatering Controls Rehab – to award purchase order
B. A/C Replacement – to award contract
C. Credit Card and Online Payment Fees –to reauthorize purchase order
D. Procurement Policy
E. Hyland Terrace Pump Purchases – to approve purchase
F. Change Orders to Current Contracts – to approve modifications

Should you have any questions in regard to these items, I would be pleased to discuss them further with you.

The following motion is provided for Board consideration:

"THAT THE GOVERNING BOARD approve the Consent Agenda of June 16, 2016 as presented."

Signed,

D. Albrey Arrington
Executive Director

L:/Board/Consent

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D. Albrey Arrington, Ph.D., Executive Director

Memorandum

Date: June 10, 2016

To: Albrey Arrington, Ph.D.

From: Tom Vaughn, Director of Operations

Subject: Rehabilitation – Dewatering Ashbrook Process Control System

Rehabilitation of Dewatering controls is a necessary component of the Dewatering building refurbishment. The Dewatering control rehabilitation project will include the design, build, and installation of all control equipment necessary to complete the project.

In October, 2014, the District solicited Invitation to Bid (ITB) #14-004-PCS for Wastewater Process Control Systems Maintenance and Modification. The contract for labor was awarded to Process Controls Consultants, Inc. and is for an initial 2 year period (through 12-1-2016) with an option for 3 additional 1 year renewal periods. The Bid Specifications section of ITB #14-004-PCS required additional projects for process controls be offered first to the winning bidder with such projects performed at the same hourly rates proposed in their response to IBT #14-004-PCS.

In accordance with ITB #14-004-PCS, District staff presented the Dewatering Control Rehabilitation project to Process Control Consultants, Inc. for consideration. Process Control Consultant, Inc. has confirmed they have the time, skills, and ability to complete the Dewatering Control Rehabilitation project, and they are willing to complete it at the hourly rate specified in ITB #14-004-PCS, and for the number of hours specified in their proposal dated June 9, 2016 (i.e., 1,248 hours @ $85/hour = $106,000).

We, therefore, recommend managing the Dewatering control rehabilitation project as a stand-alone Purchas Order to Process Controls Consultants, Inc. under the auspices of ITB #14-004-PCS.

Suggested Motion:

> **"THAT THE DISTRICT GOVERNING BOARD authorize the Executive Director to execute a Purchase Order to Process Control Consultants, Inc. in an amount not to exceed 1,248 hours or $106,000 for the design, build, and installation of the Dewatering Control Rehabilitation project, in accordance with ITB 14-004-PCS and the Process Control Consultants, Inc. proposal dated June 9, 2016."**

Process Control Consultants, Inc.
P.O. Box 1174
Loxahatchee, Florida 33470
Tel: (561) 791-1511
Cell: (561) 568-1229
E-mail: proccon@comcast.net

PROPOSAL

Quotation # QU16-08

June 9, 2016

Loxahatchee River Environmental
Control District

Subject: Dewatering Control System Refurbishment

This proposal itemizes the labor hours and cost for the control system design of the Dewatering Control System Refurbishment project.

This project will be executed in two phases. Phase 1 will be design. Phase 2 will be construction and implementation.

Process Control Consultants, Inc. will design, build, and install all control equipment detailed in this proposal.

Floor mounting of enclosures and sensors, and the removal and replacement of cable and conduit runs will be accomplished by LRECD personnel.

Project Development Meetings:

At given intervals, following the project time line chart, meetings will be held to coordinate PCC and LRECD activities. These meetings will help ensure smooth progress and minimal process upset during system upgrade.

The time line projected progress will be discussed at each meeting, with task modifications scheduled when necessary.

Obsolete equipment removal and new equipment installation and modification will be monitored to stay on target with time line projections.

Equipment and Parts Procurement:

All equipment and parts called for in the project manual will be secured. A detailed parts list will be submitted for order.

All enclosures will be fabricated and all electronics mounted and wired before delivery to the job site.

Equipment such as drives, valve operators, sensors, electronic interface units, and appurtenances, will be shipped directly to the job site.

All equipment and control system hardware will be purchased by LRECD directly.

Phase 1:

The following tasks will be developed, and supporting documentation and drawings supplied:

System Planning: 60 Hours

Development of time line schedules for all tasks. This will include equipment procurement and installation. Enclosure design and shipping. Design and layout of cable and conduit runs. Modifications to existing enclosures and equipment. Removal of obsolete equipment including enclosures, drives, valves, wiring and conduit.

Develop a work plan with LRECD personnel in advance, where joint efforts will be required.

Develop process down time schedules, if and when necessary, to allow smooth installation, startup and tuning tasks.

Develop a Project Manual detailing all mechanical, electrical and instrumentation modifications and additions. The Project Manual will augment the project drawings in task description, requirements and control strategy.

Enclosures: 80 Hours

Develop CAD drawings for the new mezzanine control cabinets and the control room cabinet extension, for submittal to the vendor for fabrication. The drawings will include all "equipment cutouts" for switches, buttons, meters, etc. These will be precut by the vendor.

Develop cabinet panel layouts, including hardware, wiring and all appurtenances.

Design a new enclosure for the equipment termination box on the exterior wall of the dewatering building, beside the conveyor system. This cabinet originally housed the lime screw drive system. All of the existing conduit will be replaced. Obsolete signal cable will be removed and new cable and conduit installed.

Develop new drawings of existing cabinets, including removal of obsolete equipment and wiring, addition of new equipment and modification of cable and conduit feeds.

Cabinet drawings will include removal and replacement of VFD's, and any changes to existing MCC panels.

Belt Press Sensors: 40 Hours

Design equipment modifications and control strategy, to support new belt tension control, belt speed control and belt alignment control.

Design mounting fabrication and electrical interface for new Infrared moisture sensors.

Develop CAD drawings and Manual entries for all modifications and additions.

E-Stop System: 30 Hours

Design the complete refurbishment of the E-Stop system. A new E-Stop switch type will be chosen to replace the existing units. The new switches will supply an alarm signal to the SCADA graphics, via PAC, to indicate which section of the E-Stop circuit is tripped.

Develop control strategy to support the new system. A SCADA graphics E-Stop entry will be included In the design.

Wire Layouts: 80 Hours

New cable and conduit runs will be designed for the interface of the new belt press control enclosures and control room cabinet extension.

Cable and conduit replacements or modifications will be designed for polymer and sludge pump to control cabinet interface.

Cable and conduit runs will be designed for the new E-Stop system, to support SCADA graphics display.

System Control Strategy: 170 Hours

Control strategy, which will be part of the Project Manual, will be designed for all process sections that are being upgraded from "Manual Only Control", to automated control. Control strategy will also be developed for modifications to existing control systems.

New process control systems will include polymer injection, sludge flow and belt speed, tension and alignment.

All control strategies will be developed prior to program design, and detailed in the Project Manual, to facilitate a solid understanding of project operation during construction.

Preliminary Drawings: 160 Hours

A complete set of preliminary CAD project drawings will be developed prior to actual work. These drawings will detail the following:

- Existing cable, conduit, enclosures and equipment that will be removed.
- Existing equipment with all necessary modifications.
- All new cable, conduit, enclosures and equipment layouts.
- PAC I/O drawings for all existing modules that will be modified.
- PAC I/O drawings for all new discrete and analog modules.
- Mechanical drawings showing equipment modifications and additions to the control room.
- Mechanical drawings showing all cable and conduit removals, replacements and additions In the process building.
- Mechanical drawings showing enclosure removal, enclosure replacement and cable and conduit feeds to the mezzanine.
- Control strategy drawings showing signal interface of process instruments, drives, control functions and indicators, from applicable devices to PLC I/O chassis modules.

Phase 2

The following tasks will be performed, following the project manual and associated drawing set developed in phase 1 of this project:

Cable & Conduit: 110 Hours

Obsolete cable and conduit will be removed, as per project manual. This will include the following:

Cable and conduit installed along the perimeter of the building connecting the existing mezzanine enclosures to the control room.

Cable and conduit supporting the existing sludge pump VFD's.

Cable and conduit feeds to the existing cabinet on the exterior wall of the building to support the old lime feed drive system.

Other cable and conduit that will be replaced for automation equipment interface.

Sensors: 80 Hours

New sensors will be installed as per project manual.

The Presses will include the following sensors:

- Belt tension
- Belt alignment
- Belt speed (sensor exists, any modifications for control compatibility will be done).
- IR moisture sensors

Sensor replacements that may be required for control system interface support. This will include sludge control, polymer control and belt press control.

Enclosures: 150 Hours

All enclosures will be fully fabricated, all equipment mounted and completely wired, before installation.

The two existing mezzanine enclosures will be removed and replaced with new enclosures as per project manual, supporting the two existing presses. A third mezzanine enclosure will be installed to support a future third press.

A new junction box will be installed on the mezzanine, and all cable and conduit supporting the new control enclosures, will be fed through this box. The control room to mezzanine conduit will be terminated in the junction box, and short conduit runs will be installed from the box to each of the three press control enclosures. All cable runs will be continuous, from the control room, through the junction box, to the control enclosures.

A new enclosure will replace the existing enclosure that supported the obsolete lime feed drive system. The new enclosure will be a feed through box for signal cables that are current and necessary.

A new enclosure extension will be added to the existing control cabinet that houses to Allen-Bradley remote I/O chassis'. The current system has all pre wired terminals in the cabinet. These will be moved to the extension enclosure that will be mounted on the side of the existing control cabinet. The extension will allow the necessary I/O module additions without causing a crammed installation.

Drives: 24 Hours

The existing sludge pump drives will be removed. They will be replaced with new drives. The existing drives are controlled by the plant PAC through DeviceNet protocol. The new drives will be direct wire to the applicable discrete and analog modules in the control room PAC remote I/O chassis.

Modification will be made to the existing polymer drives and/or actuators, to support PAC control.

E-Stop System: 20 Hours

The entire E-Stop pull line system will be rewired. Each switch will be replaced with a switch that supplies a status signal to the PAC I/O chassis. This will allow the display of the particular switch triggered, on the plant SCADA graphics screen.

Control System Hardware: 30 Hours

New discrete and analog modules will be installed in the existing Allen-Bradley remote I/O chassis, to support additional sensor and interface hardware.

All applicable configuration files for these modules will be completed and all necessary calibrations preformed.

The modules will be terminated with pre wired cables. All cable terminal blocks and connectors will be installed in the control cabinet extension, along with the existing terminal blocks being relocated from the main control cabinet.

I/O points that are obsolete (i.e. lime system support) will be used to support some of the new I/O requirements, minimizing the number of new modules required.

Software Development: 114 Hours

The plant PAC processor has a separate subroutine for the Dewatering system. The program data base also has a dedicated dewatering section along with internal tags. The existing subroutine and database will be modified to include tags for the new sensors, drives, operator interface (switches, push buttons, discrete and analog entries, etc.), and control parameters. All tag development that is relevant to the plant SCADA system will be shared with LRECD "IT" personnel for graphics display.

The existing program will be reprogrammed where necessary. New algorithms will be added, and modifications to existing algorithms will be programmed to support the new control system. The new control applications will include the following:

- Belt Press Tension.
- Belt Press Speed.
- All current belt permissives (i.e. alignment, various temperatures, cake height, various pressures, etc.) will be included.
- Sludge Flow Control.
- Polymer Flow Control.

Polymer flow will be regulated to maintain a preset cake moisture content, using the infrared moisture sensors.

All control target, limit and time delay set points will be changeable though the SCADA graphics displays.

All existing data base entries, program algorithms, trending and totalization routines that are obsolete, will be purged.

System Startup

All systems will be tested and verified to perform as designed.

Documentation: 100 Hours

A final set of project drawings will be supplied. These will be the "As Builds", and will depict any and all modifications and additions made to the preliminary drawings during construction.

A complete set of Operating Procedures will be supplied. These procedures will be in a folder, with individual process section tabs.

All operator interactions will be explained:

- Start/Stop operations.
- Activation sequencing.
- Control System operation (PID, Etc.)
- Control set point entries.
- Equipment status indications, and corrections if required.