2019 LIFT STATION ELIMINATION NEAR PORTSA
SAWS Solicitation Number: CO-00592
Job No.: 19-2501

ADDENDUM 1
September 19, 2022

To Bidder of Record:

This addendum, applicable to work referenced above, is an amendment to the bid proposal, plans and specifications and as such will be a part of and included in the Contract Documents. Acknowledge receipt of this addendum by entering the Addendum number and issue date on the space provided in submitted copies of the bid proposal.

RESPONSES TO QUESTIONS

1. **Question:** Is the "List of Bid Items" referring to the "Bid Proposal Line Items"?
   Response:
   Yes, that is correct.

2. **Question:** I could not find the "Company Information Packet" in the solicitation, will this be provided at a later date to the Low Bidder?
   Response:
   This is not a document or form provided by SAWS. The Company Information Packet is created by the apparent low bidder and typically includes history of the company, core business information, company structure, etc.

3. **Question:** Considering the current volatile material availability market conditions, how detailed does the "Detailed Baseline Schedule" need to be and will the low bidder be expected to complete the project based on the dates provided in the schedule provided within 24 hours of low bid?
   Response:
   The Detailed Baseline Schedule shall be submitted within one (1) business day of the bid opening as per Supplemental Conditions, amended section 24. The Detailed Baseline Schedule shall include the major work items of the project to be completed within the said Schedule and the allotted contract time. The Bidder shall ensure that the project work completion is prioritized as per Special Conditions section "SC4 Project Requirements". SAWS has project deadlines that need to be adhered to and the Contractor awarded the contract shall diligently pursue the project completion within the allotted contract time to achieve the project completion goals.

4. **Question:** Is it possible for this project Bid Date to be rescheduled to 10/4/22?
   Response:
   See Changes to the Specifications section, item 1 within this addendum.

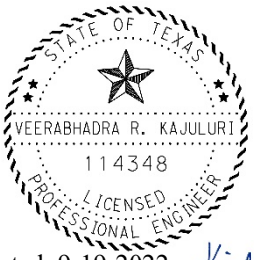
CHANGES TO THE SPECIFICATIONS

1. Invitation to Bidders is deleted in its entirety and replaced with the revised Invitation to Bidders attached herein modifying the bid opening date.
2. Electronic Bid Opening Instructions is deleted in its entirety and replaced with the revised Electronic Bid Opening Instructions attached herein.
3. Special Conditions: The following statement is added at the end of the paragraph to Section SC2. Reports.
   a. The limited asbestos and lead-based paint survey report for the building at LS 305 is posted on the SAWS website for informational purposes. Bidders are encouraged to review the reports at https://apps.saws.org/business_center/contractsol/Drill.cfm?id=4139&View=Yes.
4. Specification Section 16901 Instrumentation and Controls is deleted in its entirety and replaced with the revised specification attached herein.

END OF ADDENDUM

This Addendum, including these two (2) pages, is twenty one (21) pages with attachments in its entirety.

Attachments:
Invitation to Bidders
Electronic Bid Opening Instructions
Specification Section - 16901 Instrumentation and Controls



Dated: 9-19-2022

Veerabhadra R. Kajuluri
WESTON SOLUTIONS, INC.
Texas Registered Engineering Firm F-3123
70 N.E. Loop 410, Suite 200
San Antonio, Texas 78216
210-308-4300 • Fax 210-308-4329

INVITATION TO BIDDERS

Solicitation No. CO-00592

Sealed bids are requested by the San Antonio Water System for the construction of approximately 2,363 LF of 12-inch sanitary sewer by Open Cut, 384 LF of 2-inch PVC force main, demolition of nine (9) lift stations and the construction of one (1) new lift station, including associated manhole improvements, bypass pumping, and traffic control for the 2019 Lift Station Elimination Near PortSA, SAWS Job No. 19-2501.

To view additional project information, as well as obtain the plans and specifications for this project, visit our website located at www.saws.org and click on the Business Center. Then select Bidder, Consultant, and Vendor Registration, which is located on the left-hand side of the screen. Select the Register Now button and proceed with registration.

For difficulties downloading plans and specifications, contact the Contracting Department at 210-233-3341.

A **non-mandatory** pre-bid meeting will be held at **3:00 PM (CDT)** on **September 6, 2022** via WebEx.

https://saws.webex.com
Audio Connection: (210) 233-2090
Meeting number (access code): 2493 100 3710
Meeting password: LSPortSA

For questions regarding this solicitation, technical questions or additional information, please contact Janie M. Powell, Contract Administrator, in writing via email to: Janie.Powell@saws.org or by fax to (210) 233-5351 until **4:00 PM (CDT)** on **September 12, 2022**. Answers to the questions will be posted to the web site by **5:00 PM (CDT)** on **September 19, 2022** as a separate document or included as part of an addendum. Please be advised that Bidders are prohibited from communicating with any other SAWS staff, the Consultant, the Developer, or City of San Antonio officials regarding this IFB up until the contract is awarded as outlined in the Instructions to Bidders.

Due to the COVID-19 emergency and to protect the health of the public, SAWS is implementing new procedures for the submission of bids. Bids will be received either Electronically or through Sealed bids, until **10:00 AM (CDT), September 30, 2022**. **Electronic** bids will be received via the secure SAWS FTP site. **Sealed** bids will be received by Contract Administration, 2800 U.S. Hwy 281 North, Tower II, Customer Center Building, **via a drop box located on the left wall when walking through the first set of double glass doors of the main Tower II entry on the north side of the building**, San Antonio, Texas 78212. See the Electronic Bid Opening Instructions attachment for additional information regarding an electronic bid submittal. **Electronic** bids shall be accompanied by a bid bond in an amount not less than five percent of the total bid price. (Or, if providing SAWS with a cashier's check or certified check in an amount not less than five percent of the total bid price, SAWS will request this within 24 hours from the apparent low bidder. **Sealed** bids must be accompanied by a cashier's check, certified check, or bid bond in an amount not less than five percent of the total bid price**.** Bids will then be publicly opened and read aloud by Contract Administration via WebEx.

https://saws.webex.com
Audio Connection: (210) 233-2090
Meeting number: 2498 905 0176

Meeting password: LSPortSA

If Bidders intend to submit bids electronically, Bidders will need to submit a request by **September 29, 2022 10:00 AM CDT** to receive access to the File Transfer Protocol (FTP) site via email to **Janie.Powell@saws.org**. Bidder's email requesting access to the FTP site shall provide the legal name of Bidder's company and the intended recipient's email address and phone number. No requests for FTP site access will be accepted after **September 29, 2022 10:00 AM (CDT)**.

2019 LIFT STATION ELIMINATION NEAR PORTSA
Solicitation Number: CO-00592

ELECTRONIC BID OPENING INSTRUCTIONS
SEPTEMBER 30, 2022 10:00 AM (CDT)

FTP BID PROPOSAL UPLOAD

In order to receive electronic bids for this project, SAWS will utilize a SAWS secured File Transfer Protocol (FTP) site. Only Bidders bidding as Prime Contractors will need to submit their request prior to **September 30, 2022 10:00 AM (CDT)** to receive access to the FTP site via email to **Janie.Powell@saws.org**. Bidder's email shall provide the legal name of the Bidder's company and the intended recipient's email address and phone number. No requests for FTP site access will be accepted after **September 29, 2022 10:00 AM (CDT).** Once a Bidder is approved for access, an email with a hyperlink to the FTP site and a unique password for the Bidder will be provided to the Bidder's email recipient.

Once access is received, Bidders may upload the required documents per the Bid Proposal checklist any time before **September 30, 2022 10:00 AM (CDT)**. Please ensure to allow sufficient time should Bidder's experience technical difficulties in uploading the required documents. No changes to the Bid nor bid price can be made once the Bid has been received by SAWS.

Bidders shall comply with the following:

1) Limit files to one (1) pdf file that includes all requested documents, per the Bid Packet Checklist. ONLY ONE SUBMITTAL WILL BE ACCEPTED PER REQUEST. Do not upload any zip files.
2) Ensure that the itemized List of Bid Items is (are) the first page(s) of your file.
3) Bidders may protect the document from editing by adding a password. However, the document must be accessible for viewing by SAWS without requiring a password.
4) File shall be named: CO-00592_ **Lift Station Elimination Near PortSA_FIRM NAME**
5) DO NOT SHARE ACCESS AND/OR PASSWORD WITH OTHER PARTIES OUTSIDE YOUR COMPANY.
6) ENSURE THE BID IS RECEIVED BY SAWS NO LATER THAN THE DUE DATE AND TIME. BIDS RECEIVED BY SAWS AFTER THE BID OPENING DEADLINE WILL NOT BE ACCEPTED.

If the Bidder is in need of help, they may contact the SAWS Contract Administrator, **Janie Powell**, at **210-233-2443** or view troubleshooting tips at http://www.Serv-U.com/sharefiles

WEBEX BID OPENING MEETING

The WebEx meeting details are below if you would like to view the public opening of the bids.

When it's time, start or join the WebEx meeting from https://saws.webex.com

Access Information
Meeting Number: 2498 905 0176
Meeting Password: LSPortSA
Audio Connection: (210)-233-2090

If you have any questions or concerns, please feel free to contact me.

Thank you,

Janie M. Powell
Contract Administrator
2800 U.S. Highway 281 North, Ste. 171 | San Antonio, TX 78212
Office | 210-233-2443
Email | **Janie.Powell@saws.org**

SECTION 16901

INSTRUMENTATION AND CONTROLS

PART 1- GENERAL

1.1 SCOPE

A. Furnish and install all instruments, control devices, and associated equipment as described herein and in the Drawings, or as required, to provide a complete and functional-instrumentation and control system, including all hardware, software, materials, labor, and consumables.

B. Ancillary equipment required for proper system installation and operation, including interconnecting cables, relays, signal converters/isolators, terminal blocks, fuses, din rail, connectors, installation and mounting hardware shall be furnished and installed whether specified or not.

C. All system components shall be assembled, installed, configured, calibrated, tested, and commissioned as described in the Contract Documents and in full compliance with-the directions and recommendations of the equipment manufacturer and the ENGINEER.

D. Where practical, similar instruments, control devices, hardware, and other system components shall be of a single, reputable, well-established manufacturer as specified herein or as otherwise approved by the ENGINEER.

E. Substitution of equipment and system functions will not be accepted unless explicitly approved by the ENGINEER.

1.2 RELATED WORK

A. Related sections that apply to this section include but are not necessarily limited to the following:

1. Section 16010 “Electrical General Provisions”
2. Section 16902 “Control Panels”
3. Section 16951 “Testing Instrumentation and Controls”
4. Section 16060 “Acceptance Testing and Calibration”

1.3 REFERENCED STANDARDS

A. The following standards apply to this section:

1. Instrument Society of America (ISA)
    a. ISA S5.1 Instrument Symbols
    b. ISA S5.4 Loop Diagrams
2. NFPA 70 National Electric Code (NEC)
3. National Electrical Manufactures Association (NEMA)

a. NEMA 250 Enclosures for Electrical Equipment

4. ICS 6 Enclosures for Industrial Controls and Systems

5. Underwriters Laboratories (UL)

6. San Antonio Water System

B. Where reference is made to any of the above standards, the revision in effect at the time of bid opening shall apply.

1.4 SUBMITTALS

A. Submit to the ENGINEER, in accordance with Section 16010, copies of all materials required to establish compliance with this Section. At a minimum, submittals shall include the following:

1. Manufacturers' data sheets providing:

a. Manufacturer and model number

b. Physical description

c. Specifications

d. Certification of compliance with referenced standards

2. Installation Instructions

a. Site planning requirements

b. Mounting and orientation diagrams

c. Signal and power wiring diagrams

3. Check-out and Testing

a. Wiring/Loop check procedure and check list

b. Functional test procedures and check list

c. OWNER acceptance documentation

4. Start-up Instructions

a. Set-up and configuration procedures

b. Special service recommendations

c. Instrument scales in engineering units

5. Maintenance Instructions

a. Field calibration procedures

b. Calibration equipment requirements

c. Factory calibration certificate as applicable

6. Warranty information

a. Two year minimum warranty

b. Installation and field support

1.5 QUALITY ASSURANCE

A. The complete instrumentation and control system shall be furnished and installed by a single, qualified supplier who is regularly engaged in the design and implementation of similar systems for the water/wastewater industry.

B. Instruments, control devices, hardware, and other system components shall be new and of standard models, distributed and serviced by reputable, well-established manufacturers as approved by the ENGINEER. Custom or one-of-a-kind components will not be accepted.

C. Upon completion of installation and checkout, the instrumentation and control system shall function as described herein and on the Drawings and will be tested and documented to the satisfaction of the ENGINEER.

1.6 MAINTENANCE

A. Supplier shall furnish all special tools, equipment, and software required for normal adjustment, calibration, and maintenance of all instrumentation and controls equipment.

B. Supplier shall furnish all documentation and special training required for the normal adjustment, calibration, and maintenance of all instrumentation and controls equipment.

C. Supplier shall furnish the following spare parts:

1. One power supply for each ten units or fraction thereof furnished

2. One surge suppressor for each ten units or fraction thereof furnished

3. Ten spare fuses of each type and size furnished

4. Ten lamps of type and size furnished

5. One relay for each twenty or fraction thereof of each type furnished

1.7 DELIVERY, STORAGE, AND HANDLING

A. Product delivery, storage and handling shall comply with Section 16010.

B. Equipment and materials shall be shipped to the jobsite in appropriate packing and/or crating so as to prevent damage during shipment.

C. Equipment and materials shall be delivered to the site in a timely manner to ensure uninterrupted progress of the work.

D. Only new equipment and materials, meeting the specifications, shall be accepted at the jobsite.

E. Upon delivery to the jobsite, all equipment and materials shall be immediately inspected, and any damaged equipment or materials shall be rejected.

F. All equipment and materials shall be handled with care. All process connections on instrumentation shall be sealed to prevent contamination by foreign material or moisture.

G. Equipment and materials shall be stored so as to permit easy access for identification and inspection.

H. All equipment and materials that are stored on site shall be adequately protected from damage.

I. Off-site equipment and material storage shall be climate-controlled.

J. All equipment and materials shall be covered to prevent damage. All equipment and materials susceptible to damage from sunlight, rain, hail, sleet, snow, wind, and other elements shall be adequately protected so as to prevent such damage.

PART 2- PRODUCTS

2.1 LIFT STATION MEASURING SYSTEM

A. General:

1. The wetwell level measuring system shall consist of sensor installed in the wetwell and a transmitter installed in the control panel.

2. Sensor shall be of the solid-state head-pressure sensing type, suitable for continuous submergence and operation and shall be installed in accordance with manufacturer's instructions.

3. The transducer assembly shall be connected with the sensor and placed in successful operation. It shall be provided with input power and output signal transient protection, associated control elements as specified herein and in accordance with manufacturer's instructions.

4. Provide an intrinsically safe barrier between the upper and lower assemblies. The barrier shall render the level sensing system suitable for use in Class 1, Division 1 Groups A, B, C and D, Class 2, Division 1, Groups E, F and G, and Class 3, Division 1 hazardous locations.

5. The transducer shall be a 4-20 mAdc, 2-wire, 15 to 30 VDC loop-powered type with its output signal directly proportional to the measured level excursion over a factory-calibrated range.

6. The use of the manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and typical configuration desired.

7. The transducer shall be connected to the sensor by a cable furnished with the sensor.

B. Construction:

1. The transducer housing shall be fabricated of type 316 stainless steel with a barrier diaphragm.

2. The transducer shall be temperature compensated.

3. The transducer element shall incorporate high over-pressure protection and be designed to withstand intermittent overpressures two times the full-scale range being sensed. Sensing principles employing LVDTs, resistive or pneumatic elements shall not be acceptable.

4. The internal pressure of the lower transducer assembly shall be relieved to atmospheric pressure though a heavy-duty urethane jacketed hose/cable assembly and a slack PVC bellows assembly. The sealed breather system shall compensate for variations in barometric pressure and expansion and contraction of air due to temperature changes and altitude as well as prevent fouling from moisture and other corrosive elements.

C. Functional Requirements:

1. Performance

2. Outputs: 4-20 Ma

3. Loop Power: Isolated 24 VDC at 20 mA regulated

4. Output Loop Resistance: 600 Ohms maximum

D. Tools, Spare Parts, and Accessories:

1. Any additional spare parts recommended by the manufacturer shall be provided.

E. Manufacturer:

1. Transducer shall be Mercoid Dwyer Model PBLTX. Intrinsically safe barrier shall be Mercoid Dwyer Model # MTL7706/7787 with psi range as required by depth of wetwell, or approved equal. Indicate pressure rating for each submersible level transducer. Transducers rated at less than the wet well total depth shall be prohibited.

2. Transmitter shall be Siemens Hydro Ranger 200 (Model 7ML1034-3AA11) having the following features:

   a. Analog Output: isolated 4-20mADC proportional to level, minimum 75052. total burden; 0.1% programmed range resolution

   b. Relay contact outputs: Four control relays, form A, N.O., rated 5A @ 250VAC non-inductive; two alarm relays, form C, N.O./N.C., rated 5A @ 250VAC non-inductive.

   c. Control Functions: Pump down and lead pump alternate

   d. Display: Integral, back-lit LCD display to indicate level and relay settings in engineering units

   e. Enclosure: Suitable for panel mount.

   f. Power: 120VAC, 60Hz

   g. Programming: Hand-held.

2.2 LEVEL SWITCHES

A. Type: Sealed, eccentric tilting float type, mercury-free float switch.

B. Performance

1. Weighted float to hang vertically when not immersed and tilt when immersed.

C. Features:

1. One SPDT switch rated 5A @ 120VAC.
2. Hermetically sealed polypropylene or PTFE body as appropriate for wastewater application.
3. Heavy duty, three conductor, PVC jacketed cable with watertight seal to switch body.

D. Acceptable Manufacturers:

1. Flygt ENM-10.
2. ENGINEER approved equal.

2.3 DISCHARGE PRESSURE INDICATING TRANSMITTER

A. Electronic gauge pressure indicating transmitter.

B. Performance:

1. Accuracy: 0.1% calibrated span.
2. Stability: 0.1% Upper range limit.
3. Temperature: -40 to 85C (-40 to 185F).
4. Maximum operating pressure: 150 psi minimum.

C. Features:

1. All stainless steel construction.
2. 4-20 mAdc analog output directly proportional to the measured pressure, 500 Ohm total burden with 24 Vdc loop power.
3. HART protocol module for integration into the PLC.
4. 2-wire, 24 Vdc loop powered.
5. Integral LCD display indicating pressure in psi.
6. Stainless steel mounting bracket and bolts.

D. Acceptable Manufacturers:

1. Rosemont 2088GS22A1B4E5M5.

2. ENGINEER approved equal.

2.4 DISCHARGE PRESSURE GAUGE

A. Mechanical pressure gauge with 4 ½" dial, stainless steel rotary geared Teflon movement, hermetically sealed aluminum solid front housing. Furnish with brass fittings, stopcock and a pressure snubber. PSI range for the pressure gauge shall be as noted on the construction drawings.

B. Pressure gauge shall be Ashcroft 1379 Duragauge, or ENGINEER approved equal.

2.5 PANELS

A. Refer to Section 16902 for panel specifications.

2.6 24VDC POWER SUPPLIES

A. Type: Industrial grade 24VDC Switching Power Supply

B. Performance

1. Input: 120VAC +/- 10%, 60Hz
2. Output: 1 X 24VDC, <50mVpp ripple
3. Output current rating 125% of connected load
4. Output protected against open circuit, short circuit and overload with auto-recovery
5. Class I (IEC 536) transient/surge protection meeting IP20 (IEC 529)
6. Operating temperature: 14-140°F without de-rating. Meets UL 508

C. Features

1. Din-rail mounted.
2. Finger-safe terminals.
3. LED indicator light to indicate presence/health of 24VDC output.

D. Acceptable Manufacturers

1. IDEC model PS5R-SC24.
2. ENGINEER approved equal

2.7 CONTROL RELAYS

A. Type: General purpose, electromechanical control relays

B. Performance

1. Coil: 120VAC, 60Hz unless otherwise indicated on the Drawings.

2. Contacts: 240VAC, 10A resistive.

3. Operating temperature: -40 to 131 °F

C. Features

1. Sealed construction for protection against moisture and contaminants

2. Silver cadmium oxide contact material

3. Din-rail mountable socket base

4. LED indicating light to indicate presence of coil voltage

D. Acceptable manufacturers

1. IDEC RH2B-UL-12O w/ SH2B-05 socket.

2. ENGINEER approved equal

2.8 TIMING RELAYS

A. Type: Solid state, microprocessor-controlled, electromechanical timing relay

B. Performance

1. Coil voltage: 120VAC, 60Hz unless otherwise indicated on the drawings

2. Contacts: 240VAC, 10A resistive

3. Operating temperature: -4 to 131 °F

C. Features

1. Sealed construction for protection against moisture and contaminants

2. Silver cadmium oxide contact material

3. Tubular, eight or eleven-pin plug-in terminal configuration with din-rail mountable socket base

4. Timing function as indicated on the Drawings

5. Field programmable timing ranges from 0.1 seconds to 600 hours

6. Dial or rotary switches for selection of timing range and time delay

7. LED pilot light(s) to indicate when relay is timing and when relay is timed out

D. Acceptable Manufacturers

1. Square D Type JCK

2. Eaton/Cutler Hammer TR Series

3. ENGINEER approved equal

2.9 PUSHBUTTONS, SELECTOR SWITCHES, AND INDICATING LIGHTS

A. Type: 30.5mm pushbuttons, selector switches, and indicating lights

B. Performance

1. NEMA 4/13, oil-tight, dust-tight, water-tight
2. Silver alloy contacts rated 240VAC, 10A resistive
3. 120VAC, transformer type LED indicating lights with push-to-test feature.
4. Operating temperature: 1 to 150°F

C. Features

1. Heavy duty, zinc die cast operator construction
2. Finger proof terminals on contact blocks and indicator light modules
3. Pushbutton operators to be flush head type with momentary action unless indicated otherwise on the Drawings
4. Stop pushbutton operators to be red; all other pushbutton operators to be black unless indicated otherwise on the Drawings
5. Selector switches to be maintained action unless indicated otherwise on the Drawings
6. Pushbuttons and selector switches to have one spare normally open and one spare normally closed contact beyond the number required by the Drawings
7. Indicator light lamps to be removable from the front of the unit
8. Indicator light lens color as indicated on the Drawings

D. Acceptable manufacturers

1. Square D Type 9001 K
2. Eaton/Cutler Hammer 10250T
3. ENGINEER approved equal

2.10 TERMINAL BLOCKS

A. Type: Feed-through, fused, and grounding terminal blocks

B. Performance

1. Rated voltage: 600V
2. Rated surge voltage: 8kV

3. Maximum current: 41 A

C. Features

1. Din rail mountable
2. Width: 6.2mm
3. Number of levels: 1
4. Number of connections: 2
5. Connection type: screw terminal
6. Wire size: 26-10AWG 7. Color
    a. Feed-through terminal blocks: Grey
    b. Fused terminal blocks: Grey or black
    c. Ground terminal blocks: Green/yellow
7. Fused terminal blocks to have LED blown fuse indicator
8. End barriers, end clamps, jumpers, labels and all other terminal block accessories to be of the same manufacturer as terminal blocks

D. Acceptable Manufacturers

1. Phoenix Contact
2. ENGINEER approved equal

2.11 RECEPTACLES

A. Furnish and install receptacles as shown on the Drawings.

B. Receptacles installed in the service rack to provide 120 volt power outlets for plugging general maintenance equipment shall be GFCI and shall be as specified in Section 16140 - Wiring Devices.

C. Each receptacle installed within the SCADA panel for plugging the UPS and the air conditioning unit shall be dedicated non-GFCI, single receptacle type, one for each device.

D. Furnish and install a cast aluminum box for each receptacle.

E. For each exterior receptacle, furnish and install a stainless steel, waterproof cover.

F. For each receptacle installed inside an enclosure, furnish and install a white or ivory nylon cover.

2.12 PROGRAMMABLE LOGIC CONTROLLER (PLC)

A. General

The PLC shall be a complete system that includes, but is not limited to, the following:

1. Processor
2. PLC modules, chassis and power supply
3. Connection buses
4. All connection cables

B. Features:

1. RS232 communications port dedicated for communications with and compatible with the SCADA IP/Ethernet communication type radio system specified in Section 16904 – Scada Radio System and the SAWS SCADA system.
2. RS232 communications port dedicated for programming; the communications port dedicated for communications with the SCADA system shall not be used for programming the PLC.
3. Battery backup of program memory or flash memory.

C. Acceptable Manufacturers

1. Allen Bradley Compact Logix 1769-L33ER consisting of the following:
   a. 1.0 MB user memory.
   b. 1 GB SD Flush memory.
   c. One eight-slot backplane with available space for up to 8 modules in the SCADA panel
   d. One power supply module. Allen Bradley 1769-PA4.
   e. One CPU module. Allen Bradley 1769-L30ER.
   f. CPU battery. Allen Bradley 1769-BA, lithium battery.
   g. 32-point, 24VDC digital input module. Allen Bradley 1769 IQ32. (Quantity as required by the Drawings)
   h. One 8 channel 4-20mADC analog input module. Allen Bradley 1769 IF8.
   i. One cable, CPU to SCADA radio.
   j. Two Programming cables, CPU to PC, plus 8 additional spare programming cables Allen Bradley 1756CP3/A.

D. Communications

1. The PLC shall communicate and transmit data through the processor IP port.

E. Programming:

1. The PLC shall use the latest version of RS LOGIX 5000 Full Edition ENE Configuration software for programming the CPU. Contractor to provide cable needed for communications. (Allen Bradley)

2. CONTRACTOR to coordinate with the OWNER'S representative.

3. The programming of the radios and the top-end will be provided by the OWNER. Programming shall be completed by the OWNER within 30 days of notification.

F. Spare Parts

1. Provide 20% of all installed parts as spares.

2. Spares are required for the processor, power supply, and I/O modules.

G. Coordination

1. CPU programming/delivery shall be coordinated with SAWS inspections.

2.13 TRANSIENT SURGE SUPPRESSORS

A. Performance

1. Minimum continuous operating voltage: 150VAC.

2. Minimum continuous feed-through current capacity: 20A

3. Minimum discharge current: 10kA

4. Meets UL 1449

B. Features

1. Feed-through design; failure of protection elements shall not interrupt power to protected equipment

2. Modular construction allowing replacement of protection elements without disrupting power to protected equipment

3. DIN rail mountable

C. Acceptable Manufacturers

1. Phoenix Contact COMBOTRAB 28 56 70 2

2. ENGINEER approved equal

2.14 ALARM BEACON AND HORN

A. Features

1. Weatherproof construction

2. Flashing red beacon

3. Volume adjustable horn

B. Acceptable Manufacturers

1. Horn- Edwards 876/877 Series
2. Beacon- 114ST series
3. ENGINEER approved equal

2.15 UNINTERRUPTIBLE POWER SUPPLY

A. Performance

1. 4 msec. transfer time on power failure
2. Sized to the connected load with 25% spare capacity
3. Provide continuous operation for 120 minutes at full load
4. Rated power – 1500 VA.
5. Number of power outlets – six NEMA 5-15R.
6. USB compatible.
7. Built-in bypass.
8. Ambient operation temperature range – 32 to 104 degrees F.
9. Ambient operating relative humidity range – 0 to 95% non-condensing.
10. Multi-function LCD status and control console.
11. Audible visible alarm indication.
12. Harmonic distortion – less than 2%.

B. Acceptable Manufacturers

1. APC Smart SRT 1500 MXLA or SRT 1500 RMXLANC with battery failure alarm contact for connection to SCADA RTU.
2. ENGINEER approved equal.

2.16 ELECTRICAL CONNECTIONS AND WIRING

A. Cables-D.C. Systems

1. Single pair cable shall be 16 gauge, stranded copper, twisted and shielded, equal to Belden 8719.
2. All field cables shall be tagged with T&B E-Z code wire markers, series DPWC or equal. All spare pairs in field cables shall be grounded to the instrumentation ground to eliminate the antenna effect from ungrounded spares.
3. Branch cables shall be run to each instrument in conduit. They shall be connected to instruments according to the instrument manufacturer's recommendation.

4. All instrument signal wiring shall use black insulation as positive (+) and white insulation as negative (-).

2.17 GROUNDING AND SHIELDING.

A. Grounding and shielding shall be a major consideration in the installation of process control electronic instrumentation. Grounding and shielding details shall be designed and incorporated in every instrumentation and electrical engineering work over package.

1. An isolated instrumentation ground (SPG) shall be utilized as the grounding configurations for the electronic instrumentation. The SPG shall be the master reference ground (MRG).

2. Proper bonding procedure shall be followed on every ground connection.

3. A milliamp control loop shall be grounded only at one point, the negative of the power supply.

4. Care must be exercised to avoid multiple commons and multiple grounds when interconnecting different loops with non-isolated instrumentation.

5. Grounded sensors shall have shields grounded on the sensor end only.

6. Ungrounded sensors shall have shields grounded on the receiver end only.

2.18 CELLULAR ROUTER

A. Cellular router shall be equal to Cisco IR809G-LTE-GA-K9 with Cisco ANT-4G-PNL-OUT-N multiband panel outdoor antenna.

B. Two gigabit ethernet interfaces and two serial interfaces.

C. Dual subscriber-identify-module (SIM) and multiple wireless WAS technologies.

D. Download/upload speeds of 100/50 Mbps.

E. 2 GB memory.

F. Outdoor, wall or mast mount antenna, 11.6” high, dual type N female connector, operating temperature range of -22 to 158 degrees F.

PART 3- EXECUTION

3.1 INSTALLATION

A. Furnish and install all instrumentation and controls and associated equipment as shown on the drawings or as otherwise required for a satisfactorily operating system. Comply with manufacturer’s instructions and recommendations.

B. Installation shall be performed by qualified personnel regularly engaged in the installation, checkout,

testing and maintenance of industrial process instrumentation and controls systems.

C. Furnish and install all mounting supports, hardware, process seals, isolation devices and fasteners as required for a complete and functional operation.

D. Furnish and install conduit, raceway, wiring, terminations, wire tags, signal isolators, connectors and miscellaneous hardware as required for connection of all signals, shields, power and grounding per this specification.

E. Install power wiring in separate raceways from signal wiring in order to minimize noise induction in process signals. Provide adequate separation between power and signal conduits in duct banks.

F. Seal all wiring terminations to protect against infiltration of process fluids, moisture, grit, sludge, dust or other contaminants.

G. Install seals on all conduits from wetwell terminal boxes to the SCADA and pump control panels, and from wetwell to junction boxes.

3.2 INSTALLATION CHECKS

A. Secure the services of an experienced, competent, manufacturer-authorized representative to visit the site and inspect, check, adjust and approve the installation of the system. Each representative shall be present during the initial startup and at other times as required to resolve any operational issues that may arise.

B. Provide written documentation certifying that all instrumentation and controls equipment is:

1. Properly installed and wired

2. Accurately configured, calibrated, oriented, and aligned

3. Properly placed in service and functioning as designed

C. No separate payment shall be made for installation checks. Time spent during installation checks does not qualify as O&M training where specified.

3.3 FIELD QUALITY CONTROL

A. Furnish equipment manufacturer services as required by the individual equipment specifications.

B. Inspect wiring and connections for physical damage and proper connection.

C. After inspection and prior to energizing equipment, perform and document comprehensive loop checks to ensure proper wiring and continuity between all system components.

D. Provide legible, "red-lined", as-built documentation for all process connections and wiring immediately upon commissioning instrumentation and controls equipment.

3.4 DEMONSTRATION

A. Provide appropriate support personnel for demonstration of operation of completed instrumentation and control system installation during system testing. Instrumentation and controls testing shall be coordinated with the test schedule for other major equipment.

B. Support personnel shall make any required adjustments and changes to instrumentation and controls equipment mounting, wiring, calibration, setup, or configuration to expedite completion of system testing.

C. Provide report documenting test procedures, results, changes, and adjustments required to complete instrumentation and control system testing and demonstration.

PART 4- MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. The work performed, materials furnished and all labor, tools, equipment and incidentals necessary to complete the work under this item will not be measured or paid for directly, but shall be considered subsidiary to the various bid items of the contract.

END OF SECTION 16901