Loxahatchee River District Lift Station Remote Telemetry Panels

Addendum Number 1

March 24, 2022

The following clarifications and modifications are hereby made to the bidding documents for the above referenced project.

Acknowledge receipt of the addendum by inserting its number on Page 17 of the bid. Failure to do so may subject the bidder to disqualification.

<u>General</u>

Item 1-1 Pre-Bid Meeting Minutes and Sign-In Sheet are attached to this addendum.

Specifications

Item 1-2 Amend Specification Section 1200 – Measurement and Payment, Item 3.01.A Pay Item No. 1 – Furnish and Install Cellular Telemetry to read as follows:

The Contract Lump Sum for this item shall constitute full compensation for mobilization, demobilization, general conditions, insurances, shop drawings, permits, temporary facilities, and bonding in accordance with the contract documents necessary to furnish, install, and test new cellular telemetry at all lift stations as shown on the construction drawings. This item also includes any required maintenance of traffic, as-builts reports and final record documents, pre-construction video at each of the lift station sites, coordination with Verizon and AT&T, acceptance testing including cellular signal strength testing, furnishing and installing a new wet well level transducer, programming and configurating the new cellular RTUs, providing spare parts including a minimum of ten (10) spare RTUs, restoration of all lift station sites to existing condition or better, and all other incidentals necessary to completely furnish and install the cellular RTU and all electrical components as shown on the contract drawings. This item additionally includes all SCADA programming and modifications to the existing WWTP SCADA system necessary to monitor the lift station's I/O points via the new cellular RTU system. The first payment shall not include mobilization / demobilization if the CONTRACTOR has not started work at the project site. Payment for this item shall be by per (EA) lift station site.

- Item 1-3 Insert Specification Section 120 Cast In Place Concrete into the Contract Documents.
- Item 1-4Amend Specification Section 1600, Electrical General Requirements, Item1.12.A.6 to read as follows:

Coordinate with Owner's SCADA tech. Contractor shall create new VT SCADA screens for each lift station and program at the WWTP plant VT SCADA the I/O addresses corresponding to Remote discrete points from lift station being monitored by new RTU. Contractor ultimately responsible to make RTU signals of I/O indicated on drawings available at WWTP SCADA system.

Item 1-5 Amend Specification Section 16900, Control Panels, Item 1.1 to include the following:

H. The I&C Contractor shall be responsible to provide all programming and modifications at the existing WWTP SCADA system to create the lift station screen respective to each lift station. SCADA screen shall reflect status and alarm points of I/O being monitored as called out on drawings and specifications. The Contractor may coordinate with the Owner's SCADA tech, but ultimately the I&C Contractor is responsible to provide the programming and configuration of the existing VT SCADA at the WWTP to reflect each lift station's I/O points being monitored through the proposed Cellular RTU system.

Item 1-6 Amend Specification Section 16900, Control Panels, Item 1.2.D.6 to read as follows:

Float system shall be used as primary level control. Level sensor is for the **proposed 10 segment level probe for wet well** level status.

- Item 1-7 Amend Specification Section 16900, Control Panels, Item 2.7.B to read as follows:
 - Provide a Xylem Multitrode 10 segment conductance probe "candy stick." Blue Ribbon Bird Cage Level sensor with a Wastewater diaphragm seal.
 - 2. Provide a barrier 10 segment relay and required wiring. a PVC stilling well, minimum diameter shall be 6" with drilled holes

Item 1-8 Amend Specification Section 16912, RTU Cell Base System, Item 1.1.D to read as follows:

In order to establish sole source responsibility; the instrumentation and Control (I&C) system vendor shall be responsible for hardware equipment and all systems tied to the proposed cell based RTU control panel. The RTU/Pump Controller programming shall be provided by the I&C Contractor. The Contractor shall conduct a cellular signal strength test between AT&T and Verizon Wireless cellular systems at each lift station to have a cellular based RTU system added. Based on the results of such a test – the Contractor shall choose the stronger signal SIM card and configure the new RTU for the cellular carrier with the strongest signal. In the event both signals are similar- Verizon SIM card shall be chosen.

Item 1-9 Amend Specification Section 16912, RTU Cell Base System, Item 1.1.E to read as follows:

The LRD existing SCADA system shall be programmed and configured by **the I&C Contractor LRD programming staff**, but with the help and assistance of the LRD SCADA technician I&C Contractor for each lift station/cellular based radio.

Item 1-10 Amend Specification Section 16912, RTU Cell Base System, Item 1.2.B to include the following:

13. Xylem Multitrode 10 segment level conductance probe to be installed in the wet well as per the construction drawings. Include a barrier 10 segment relay as indicated on the drawings.

Item 1-11 Insert Specification Section 16960 - SCADA System into the Contract Documents.

<u>Drawings</u>

Item 1-12 Replace Sheets G-2, C-3, E-1, E-2, E-3, E-5, E-6, and E-8 with the attached.

Questions from Bidders

Q1: The bid drawings show a level sensor mounting in a stilling well and the stilling to be mounted a secured to the inside of the lift station wall. This seems to overly complicate the project for several reasons. Therefore, I want to confirm the following.

- **1.** Does the installation detail apply to active and existing lift stations or new stations only?
- 2. Do the bid documents intend for the contractor to provide bypass pumping, station cleaning, and wet well entry permitting as a part of the contract for the installation of the level sensors?
- **3.** What method of anchoring is to be used on the lift station wall for the stilling well that is acceptable?
- 4. Would the EOR accept alternative methods or technologies that do not require entry in to the existing wet well (such as Radar Level)?
- A1: The stilling well and pressure level transducer has been replaced with a Multitrode 10 segment candy stick level sensor that will be mounted to the existing float hangers. These level sensors will be installed at all lift stations as a part of this project.

Bypass pumping of the lift station when installing the Multitrode level sensors should not be required for most lift stations. However, if there is a station with such conditions that do not allow for installation of the level sensor without bypassing the lift station, the Contractor shall submit to the District a proposed bypass pumping plan for approval a minimum of 48 hours in advance of bypass operations. No bypassing shall be done without District approval.

Additionally, if it is required for a lift station to be shut down for any reason with or without bypassing, the Contractor shall submit a request for approval to the District no less than 48 hours in advance of the proposed work. The duration of the shutdown is at the sole discretion of the District who retains the right to resume pumping operations at any time if they deem it necessary.

- Q2: On Drawing E-8 please clarify the following regarding the use of an eightfoot length of explosion proof flex.:
 - 8-ft is not a standard length for explosion proof flex. Flex is factory assembled; length is not adjustable.
 - The factory cable that will be in the flex is low voltage and low amperage, not at risk for arcing.
- A2: Flex liquidtight conduit is not to be explosion proof rated and can be cut to size as required. The cable in the flex is a low voltage cable.

Q3: How many stations have RTUs that are currently mounted on radio towers? Will the existing towers need to be removed?

A3: None of the lift stations in this project have existing telemetry or telemetry towers.

Q4: We would like to request an extension to the bid due date of at least two (2) weeks.

A4: The District is not currently considering an extension to the bid.

Q5: What is the material of construction of the wet wells?

A5: The vast majority of the existing lift station wet wells should be constructed out of unlined and uncoated concrete. If there is an instance of a lift station wet well with a different material or includes a coating or liner, the Contractor shall coordinate with the Owner and Engineer to develop a work change directive to address that individual station. Work that falls outside of the typical installation such as a lift station with a different material of construction or coating/liner will be addressed using the additional allowance line item to the extent possible.

END OF ADDENDUM 1

Prebid Meeting Minutes

Client:	Loxahatchee River District
Project:	Lift Station Remote Telemetry Panels
Date:	March 22, 2022
Time:	2:00 PM
Engineer:	Holtz Consulting Engineers, Inc.

- 1. Introduction and Sign-In:
- Bids Due April 5, 2022 at 2:00 PM via DemandStar
 Bids Opened April 5, 2022 at 2:00 PM at the Loxahatchee River District, 2500 Jupiter Park
 Drive, Jupiter, FL 33458
 Original bid bonds need to be submitted to the District within 48 hours after opening of the bids.
- 3. Questions asked at today's pre-bid meeting will be recorded and will be responded to in writing in an addendum unless the questions can be answered directly by way of reference to specific specification section or plan sheet. An addendum will be issued with the prebid meeting minutes and addressing some changes to the level sensor and SCADA and cellular test requirements.
- 4. Award will be made to the lowest responsive and responsible bidder submitted within budget.
- 5. Summary of work:
 - A. Installation of 115 cellular remote telemetry unit (RTU) panels at 115 lift station project sites. Contractor will be responsible to configure all remote cellular radios to establish a cellular communication network between all lift station RTUs and the plant SCADA system and shall coordinate with the District's IT Manager/SCADA administrators to establish communications. The Contractor will also be responsible to coordinate with Verizon and AT&T (Verizon is the District's preferred cellular provider) to issue to new SIM cards with private IP addresses specified by the District. These IP addresses will be private and secure. A new SIM card will need to be activated, provisioned, and installed for each new radio. Provide and install all electrical equipment, Uni-Strut and hardware as required onto existing equipment rack or provide new rack as required. Provide conduit control wires, grounding, RTU enclosure, wet well sensor raceway, and mounting hardware as required. This project will also include furnishing and installing wet well level sensors as shown on the drawings.
 - B. In upcoming addendum, note the following requirements:

The I&C Contractor shall be responsible to provide all programming and modifications at the existing WWTP SCADA system to create the lift station screen respective to each lift station. SCADA screen shall reflect status and alarm points of I/O being monitored as called out on drawings and specifications. The Contractor may coordinate with the Owner's SCADA tech, but ultimately the I&C Contractor is responsible to provide the programming and configuration of the existing VT SCADA at the WWTP to reflect each lift station's I/O points being monitored through the proposed Cellular RTU system.

In order to establish sole source responsibility; the instrumentation and Control (I&C) system vendor shall be responsible for hardware equipment and all systems tied to the proposed cell based RTU control panel. The RTU/Pump Controller programming shall be provided by the I&C Contractor. The Contractor shall conduct a cellular signal strength test between AT&T and Verizon Wireless cellular systems at each lift station to have a cellular based RTU system added. Based on the results of such a test – the Contractor shall choose the stronger signal SIM card and configure the new RTU for the cellular carrier with the strongest signal. In the event both signals are similar- Verizon SIM card shall be chosen.

- C. Restoration of all areas affected by construction activities to existing conditions or better.
- 6. It is suggested that all contractors planning to submit Bids on this Project attend this meeting or listen to the complete recording of the prebid conference and sign a certification attesting that they have listened to and understood the contents of the meeting as recorded. The recordings will be available for listening upon request from the District's Purchasing Department at purchasing@lrec.org.
- 7. Bids are to be submitted as an Electronic Bid via Demandstar. To submit a response for this bid electronically, please follow the instructions on Demandstar. Electronic responses are the only method allowed for bidders to respond to this solicitation.
- 8. All Addenda must be acknowledged.
- 9. A single electronic Bid shall be submitted for all portions of the Work.
- 10. Bid requirements:
 - 1. Instructions to Bidders Article 1
 - 2. Proposal Article 2
 - Bid form
 - Article 2a- Questionnaire
 - List of subcontractors. If work is to be self-performed, please indicate so.
 - Sworn Statement on Public Entity Crimes



- Condensed Financial Statement
- 3. Bid Security Article 3 Original Bid Bonds Shall be Submitted to District within 48 hours of bid opening.
- 12. Item #2 on bid form for additional allowance shall be \$50,000 as indicated on bid form.
- 13. Provide public construction bonds in the full amount of the contract price.
- 14. Adhere to all requirements included within Loxahatchee River District Standards.
- 15. Project Schedule:
 - A. Contract time is 595 calendar days to reach substantial completion and 65 calendar days from substantial to reach final completion. Substantial completion is considered the point at which all tasks necessary to start-up and successfully operate the equipment have been completed.
 - B. Liquidated damages are \$100 per day for failure to meet the substantial completion and \$75 per day for failure to meet final completion milestones.
- 16. Any questions or clarifications must be submitted in writing to HCE by close of business Tuesday, March 29, 2022 by 5 p.m. for inclusion in addendum. Matt.Paymer@holtzconsulting.com
- 17. The Engineering Construction Cost Estimate is approximately \$2,050,000
- 18. Instructions to Bidders Item 2: Bid Security required in the amount of 10% of bid. Scanned copy to be included in bid on the Bid Due date. Original must be submitted within 48 hours of Bid Due date or the Bid will be deemed non-responsive. Original Bid Bond due not later than March 17, 2022 at 2:30 pm. Submit Bid Bonds to:

Kris Dean, P.E., Deputy Executive Director/Director of Engineering Services Loxahatchee River Environmental Control District 2500 Jupiter Park Drive Jupiter, FL 33458

19. Notice To Proceed (Instructions to Bidders, paragraph 24) will be issued on a date mutually agreed to w/in 90 days of Notice of Award. Notice of Award is scheduled to be issued April 25, 2022.

- 20. Instructions to Bidders Item 25: Health, Safety and Environmental Performance. Bid submittal includes:
 - a. OSHA Form 300A for past 3 years
 - b. Experience Modification Rating
 - c. Written HSE program w/ training records.
- 21. Contractor Evaluation Report (Instructions To Bidders, paragraph 26)
 - a. Recorded for every project
 - b. Previous experience on District projects will be used in contractor evaluations for award of this an future projects.
- 22. Insurance (Special Conditions, paragraph 9.08)
- 23. Holiday Schedule:
 - a. New Year's: 1/1/2022
 - b. Martin Luther King, Jr.: 1/17/2022
 - c. Memorial Day: 5/30/2022
 - d. Juneteenth: 6/19/2022
 - e. Independence Day: 7/4/2022
 - f. Labor Day: 9/5/2022
 - g. Veteran's Day: 11/11/2022
 - h. Thanksgiving: 11/24-25/2022
 - i. Christmas Eve: 12/23/2022
 - j. Christmas Day: 12/26/2022

Sign In Sheet Prebid Meeting Lift Station Remote Telemetry Panels

March 22, 2022 – 2:00 pm

Name	Company			
Kris Dean	LRD			
Sharyn Allen	LRD			
Matt Paymer	HCE			
Christine Miranda	HCE			
Jose Reyes	C&W Engineering			
Eric Johnson	Xylem			
Manuel Montero	Xylem			
Dan Edison	Telemetry & Process Controls			
Eric Sullivan	General Control Systems			
Jimena Ibarra	General Control Systems			
John Stock	CC Control Corporation			
Kara Rachlin	Schweitzer Engineering Laboratories			
Milton Weaver	Revere Control Systems			
Mark Thielke	CEC Controls – Wood Group			

SECTION 120

CAST IN PLACE CONCRETE

120.01 <u>Materials</u>

120.01.1 <u>Concrete</u>

Ready-mixed concrete shall be used. It shall comply with the Standard Specifications for Ready-Mixed Concrete, ASTM Designation C94 for the strengths specified herein. Alternate No.2, under Paragraph 4 - Quality of Concrete ASTM C94 shall govern for the design of the concrete mixture.

120.01.2 <u>Cement</u>

Type I cement shall be used in concrete for general purposes. Type II cement shall be used for sewer manholes, wet wells, and all other applications where the concrete may be exposed to a wastewater atmosphere.

120.02 <u>Concrete</u>

120.02.1 <u>Mix</u>

Concrete shall be composed of Portland cement, coarse aggregate, fine aggregate and water. The concrete mix shall be designed to produce the quality specified, proportioned and mixed in accordance with the requirements set forth herein and shall in all cases meet the following requirements:

<u>Class</u>	Location	28 Day Compressive <u>Strength</u>
A.	Specifically Required on Plans	4,000 psi
B.	General Structural Concrete	3,000 psi
C.	Non-structural Applications	2,500 psi

120.02.2 <u>Slump</u>

The concrete, when placed, shall show slumps within the following limits when tested in accordance with the Method of Test for Slump of Portland Cement Concrete, ASTM Standard Specification C-143.

Min. Max.

Type of Conc	rete	Slump	<u>Slump</u>
Mass Concret	e	1 Inch	3 Inches
Reinforced Co	oncrete:		
Thin vertical s	sections and thin		
thickness		3 Inches	6 Inches
Heavy vertica	l sections more		
than 7 inches	in thickness	3 Inches	5 Inches
Structural Sla	bs	1 Inch	4 Inches
120.02.3	Air Entraining		

Air entrained concrete shall conform with the following requirements:

	Maximum Aggregate Size(Inches):):
	<u>3/8</u> :	<u>1-2</u> :	<u>3/4</u> :	<u>1:</u>	1-1/2:	
Average total air content,						
percent (Plus or minus 1%):	5	5	4	4	3	

120.03 Placing Concrete

Concrete shall be placed within 1 hour of the load ticket time stamp and before the initial set has occurred.

The concrete shall be compacted and worked in an approved manner into all corners and angles of the forms and around reinforcement and embedded fixtures in such a manner to prevent segregation of the coarse aggregate.

All concrete shall be placed with an aid of mechanical vibrating equipment supplemented by hand forking or spading. Vibration shall be transmitted directly to the concrete and not through the forms. The duration of vibration at any location in the forms shall be held to a minimum necessary to produce thorough compaction. The concrete shall be placed by suitable equipment as nearly as possible to its final location and without any segregation of the aggregate. Any free vertical drop shall not exceed 4-1/2 feet.

Expansion joints shall be placed as indicated on the plans. Joint material shall be installed as indicated and as approved by the Design Engineer. Construction joints shall be made only at locations indicated on the plans or approved by the Design Engineer, and in such manner as not to impair the strength, water-tightness or appearance of the structure.

120.04 <u>Finishing</u>

All top surfaces which are not covered by forms and which are not to be covered by additional concrete or backfill, shall be carried slightly above grade and struck off by board finish. All edges shall be provided with a 3/4 inch chamfer. All exposed surfaces which show board marks, joint marks or other irregularities after the forms are removed shall, at the discretion of the Design Engineer, be rubbed with carborundum brick, filled or otherwise dressed to produce a smooth true surface.

No special concrete or cement mortar topping course shall be used for slab finish unless shown on the drawings. The slab shall be brought to a true and even finish by power or hand floating. Unless otherwise specified, the surface shall be steel troweled to a smooth finish. Troweling shall be the minimum to obtain a smooth, dense surface and shall not be done until the mortar has hardened sufficiently to prevent excess fine material from being worked to the surface.

120.05 <u>Curing</u>

All concrete shall be kept wet by covering with water and approved water saturated covering, or other approved method which will keep all surfaces continuously wet for a period of seven (7) days, unless otherwise specified by the Design Engineer. All concrete shall be adequately protected from injurious action by the sun. Fresh concrete shall be protected from heavy rains, flowing water and mechanical injury. All concrete shall be kept damp for at least seven (7) days by covering with an approved saturated covering, by a system of perforated pipes of mechanical sprinklers, or by any other approved method which will keep all surfaces continuously damp.

Where wood forms are left in place during curing, they shall be kept wet at all times to prevent opening at the joints and drying out of the concrete. Water for curing shall be clean and entirely free from any elements which might cause staining or discoloration of the concrete.

120.06 <u>Forms</u>

Forms shall be of wood, metal, or other approved material shall be built true to line and grade, mortar tight, adequately braced and supported, and sufficiently rigid to prevent displacement or sagging.

Forms, except those lined with absorptive form lining, shall be coated with a non-staining mineral oil applied shortly before placing the concrete. In lieu of oiling, forms for unexposed surfaces may be thoroughly wetted immediately before placing the concrete.

Forms ties shall be of a design such that when forms are removed no metal shall be within 1 inch of the finished surface. Holes remaining from withdrawn tie rods or bolts shall be filled solid with cement mortar.

Under normal conditions, the minimum waiting period after placing concrete for stripping forms shall be as follows:

Wł	nere Used	<u>Time</u>		
1.	Bottom forms of girders and beams, floor slabs, and other concrete.	5 Days		
2.	Walls, piers, columns, sides of beams, and other vertical surfaces.	24-48 hours		

The use of this schedule shall not operate to relieve the Contractor or the Design Engineer of responsibility for the safety of the structure.

120.07 <u>Embedded Items</u>

In addition to steel reinforcement, pipes, and other metal objects, as shown on the plans or ordered to be built into, or set in, or attached to the concrete, all necessary precautions shall be taken to prevent these objects being displaced, broken, or deformed. Before concrete is placed, care shall be taken to determine that any embedded or wood parts are firmly and securely fastened in place as indicated. They shall be thoroughly cleaned and free of paint or other coating, rust, scale, oil, or any foreign matter. The concrete shall be packed tightly around the pipes and other metal work to prevent leakage and to secure perfect adhesion. Drains shall be adequately protected from intrusion of concrete.

Concrete placing operations shall not begin until the reinforcing steel, utilities, anchor bolts, etc., to be embedded in concrete have been inspected and approved by the Design Engineer.

120.08 <u>Reinforcing Steel</u>

Reinforcing bars and mesh shall be sizes and shapes as indicated on the drawings. Bars shall be deformed bars of intermediate grade, new billet steel conforming with ASTM Designation A-615, Grade 60. Wire mesh shall conform with ASTM Designation A-I85.

120.09 <u>Water Stops</u>

Water stops shall be molded PVC, hollow center bulb, multiple ribbed as manufactured by W.R. Meadows, Inc., Electrovert, Inc. or Serviced Products Corporation, or approved equal.

120.10 <u>Testing Services</u>

Testing shall be performed by an independent commercial testing laboratory approved by the District. The Design Engineer shall furnish the District with copies of compression and slump test reports for every thirty (30) cubic yards or portion thereof of concrete placed. It shall be the responsibility of the Design Engineer to produce concrete of the strength, durability, workability and finish specified, furnish representative material for specimens in quantities required by the testing laboratory, and cooperate and assist in taking samples of materials for testing. The District reserves the right to take and test additional concrete samples.

END OF SECTION 120

SECTION 16960

SCADA SYSTEM

PART 1 GENERAL

1.01 INTRODUCTION

- A. Provide expanded development of the Owner's existing Trihedral VT SCADA software. Contractor shall use his own development key. Provide all software drivers as may be required.
- B. SCADA and operator interface system software and integration shall be provided.

1.02 SCOPE

- A. Provide programming, configuration, labor, and all documentation for a complete operating system. The Owner shall be the licensed Owner of all software and developed files.
- B. The computer system shall exchange data from the remote lift stations via Cellular Radio Telemetry provide dynamic screen displays, reports, alarm handling and alarm logging and all human machine interface to the I&C system.
- C. Other software and programming functions shall be provided as may be required.
- D. Existing VT SCADA licenses shall be reused, including development and run time licenses.
- E. Provide runtime licenses as required to provide HMI graphics interface for each duplex lift station screen at the existing WWTP SCADA system
- F. Contractor shall use his own development key.

1.04 MANUFACTURER

A. In order to establish system responsibility, the software programming shall be provided as part of Lift station Telemetry improvements. The Contractor programming the Owner's SCADA system shall be the same Contractor providing the Cellular based radio telemetry system in Section 16900 and 16912.

1.05 SUBMITALS

A. Submittals for approval shall be provided for any and all materials. No materials shall be used without approval from the Engineer.

B. Refer to the General Requirements for documentation of Shop Drawings and O&M Manuals.

PART 2 PRODUCTS

2.01 SCADA SOFTWARE

- A. All I/O associated with the new remote RTU systems shall be represented in the SCADA system as well as derived tags. System development shall be consistent with the existing conventions.
- B. Provide programming and configuration of the SCADA software and its drivers as may be required for a fully functional system. Provide, install and configure any and all drivers to work with new systems over the secured cellular based internet communications.
- C. The Duplex lift station screens shall be similar in nature as the existing DFS SCADA screens currently being monitored. Coordinate with LRD personnel for the graphical representation of the I/O points on the lift station screen.
- D. Alarm Processing
 - 1. Alarm conditions shall automatically be brought to the operator's attention audibly and visually on the PC. The video terminal shall have reserved section for alarm display and/or a dedicated screen for displaying alarms. The capabilities of the specified software shall be utilized, including color changes, audible and visual annunciations, alarm logging to disk with time and date stamp, alarm acknowledgement written to disk with time and date stamp, alarm report generation upon operator demand shall be provided. Audible and flashing visual annunciation shall remain until acknowledgement by the operator. Non-flashing visual alarm shall remain until alarm clears. Alarms shall be provided with automatic reset.
 - 2. An alarm screen shall be provided to simulate and mimic the operation of the annunciator.
 - 3. Provide alarm log with time, date and tag.
- E. Dynamic Screen Displays
 - 1. Color dynamic screen displays shall be provided. All PLC I/O as well as derived values and alarms shall be utilized and displayed on one or more screens. System developer shall use good judgment in developing logically oriented screens depicting the process. Dynamic bar graphs with text shall be used to represent analog values such as tank levels, alarm

levels shall represent graphically and with text. Diagrams shall be developed to represent tanks, piping, valves and the like. Consistent conventions shall be used regarding normally open/close states, alarm/normal states, running/non-running states for all equipment with I/O associated with it.

- 2. Provide man machine interface via touch screen. Operator shall have the ability to control and display well and other equipment and instrument status and levels all equipment scheduled via the PLC. Control shall minimally include start/stop indicated pumps in the automatic mode. Operator shall have the ability to place equipment in an "OUT OF SERVICE" mode which shall affect the PLC program appropriately. Control shall be provided to open/close all valves.
- 3. Operator shall have the status of all setpoints and the ability to modify those setpoints, timers and the like.
- 4. Color print outs of proposed screens shall be submitted for review and approval.
- 5. The computer SCADA screens shall depict the process as indicated by the Drawings. The following minimum screens together with all the other requirements as specified in the PLC strategies shall be provided as a minimum:
 - a. Lift station pump(s) operation status ON/OFF, and fail status
 - b. Wetwell level (from level sensor)
 - c. RTU and LSCP panel Intrusion status
 - d. Status of OFF, LEAD, LAG, HWL floats
 - e. HOA in AUTO status
- 6. Screens shall depict all elements including selector switch positions, valve positions, motor run status, floats, levels, intrusion, and the like.
- 7. Status on/off, faults, and alarm screen colors coordinate with Owner.
- F. Detailed report generations shall be provided showing useful information for water applications. Report on demand as well as scheduled reports shall be provided. Coordinate with Owner and provide reports per Owner's requirements.
- G. Submit reports for approval.

- H. All the I/O indicated on the drawings shall be included in the SCADA system.
- I. Data Logging
 - 1. Provide data logging of wetwell levels
 - 2. Up to two more parameters selected by LRD staff

PART 3 EXECUTION

- 3.01 LICENSING
 - A. The Owner shall be the named license holder for all software provided.

3.02 PROGRAMMING

- A. Contractor shall program the SCADA software.
- B. Contractor shall coordinate the programming with the pump controllers/cellular based RTU radios at each lift station.
- C. Alarms shall be directed to the printer, screen and hard disk.

3.03 START UP, TESTING MODIFICATIONS

- A. All I/O interface shall be confirmed by testing.
- B. Provide a typewritten sequence of checkout. Provide a spreadsheet including each point or tag and provide sign off field as follows:
 - 1. Tag name
 - 2. CP checkout
 - 3. Electrician checkout
 - 4. Owner/Engineer checkout
- C. Provide an additional 4 manhours of programming time for modifications and changes in the field. This time shall be in addition to start up and testing.
- 3.04 SEQUENCE OF OPERATION
 - A. Provide written narrative of complete system operation.
 - B. Provide any start up description.

- C. Provide any shut down description.
- D. Provide trouble shooting instructions.

3.05 SCADA/PLC TRAINING

- A. After startup and demonstration, provide Owner training sessions.
 - 1. Provide a 1-hour session per lift station to show LRD staff remote status points being monitored and received by SCADA.

END OF SECTION





Zones 3 and 4 **Overall Site Map**



Zones 8, 9 and 13 Overall Site Map

162 nd PLN

161st St N

152nd Rd N





Overall Site Map

OLTZ CONSULTING ENGINEERS, INC.	CHRISTINE J. MIRANDA, PE	
270 SOUTH CENTRAL BLVD., SUITE 207 JUPITER, FLORIDA 33458 PH. (561) 575-2005		G-2
Cert. No. 26960	License No: 60906	







LIFT STATION 049 (ZONE 2) SECTION 23, TOWNSHIP 40S, RANGE 42E LATITUDE 26.9804, LONGITUDE -80.1113



GENERAL ELECTRICAL NOTES

1. <u>SCHEMATIC NATURE</u> 10. CONDUIT PLAN VIEWS ARE SCHEMATIC IN NATURE AND MEANT TO SHOW THE SCHEMATIC ARRANGEMENT OF EQUIPMENT AND CONDUIT. 2. <u>APPROVED SHOP DRAWINGS</u> USE APPROVED SHOP DRAWINGS FOR LAY OUT OF EQUIPMENT. THE 11. JUNCTION BOXES CONTRACT DOCUMENTS WILL VARY FROM THE SHOP DRAWINGS. INFORM THE ENGINEER IMMEDIATELY IF THERE ARE LAY OUT ISSUES OR INADEQUATE SPACE FOR EQUIPMENT OR CLEARANCES. LAND CONDUITS IN OPENINGS OF 12. <u>CONDUCTORS</u> ENCLOSURES PER THE APPROVED SHOP DRAWINGS, DO NOT USE THE CONTRACT DRAWINGS. 3. <u>CLEARANCES</u> IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MEET N.E.C. CLEARANCES ABOUT EQUIPMENT. THE SAME APPLIES TO RACEWAY SUPPORTS. 13. <u>GROUNDING</u> 4. <u>ROUTING</u> CONDUIT ROUTING IS SCHEMATIC IN NATURE. CONDUIT ROUTING IS SHOWN FOR CLARITY ON THE CONTRACT DRAWINGS. ROUTE CONDUITS AS MAY BE REQUIRED. 14. FUTURES FACILITIES 5. FIELD VERIFICATIONS FOR SUCH FACILITIES. FIELD VERIFY ALL EXISTING CONDITIONS. MAKE MINOR ADJUSTMENTS AS NEEDED. INFORM OWNER/ENGINEER OF INCONSISTENCIES IMMEDIATELY IF 15. <u>RESPONSIBILITIES</u> PROBLEMS OR CONFLICTS EXIST. 6. <u>COMPLETE AND FUNCTIONAL SYSTEMS</u> PROVIDE ALL LABOR AND MATERIAL FOR A COMPLETE AND FUNCTIONAL SYSTEM. DEMONSTRATE SYSTEM OPERATION TO THE OWNER/ENGINEER. 16. <u>HOME RUNS</u> 7. <u>LABELING</u> THE CONTRACTOR SHALL PROVIDE LAMCOID PRINTED LABELS FOR ALL EQUIPMENT AND TYPED PANELBOARD SCHEDULES AS REQUIRED. 17. <u>SEPARATION</u> 8. CONTRACTOR MINIMUM REQUIREMENTS PROVIDE AND INSTALL A COMPLETE ELECTRICAL SYSTEM AS INDICATED ON RACEWAYS. THE DRAWINGS. ITEMS NOT SHOWN BUT OBVIOUSLY NECESSARY FOR A COMPLETE SYSTEM SHALL BE INCLUDED. 18. <u>RESTORATION</u> THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS, INSPECTIONS AND APPROVALS. COORDINATE WITH OWNER TO ACTIVATE NEW CELL BASED RTU AND SCADA 19. <u>WARRANTY</u> SYSTEM AS REQUIRED. ALL WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE, NFPA, AND THE LOCAL BUILDING CODES. ALL COMPONENTS SHALL BE U.L. APPROVED. 20. <u>LRD REQUIREMENTS</u> CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL CONCEALED FACILITIES BEFORE ANY WORK BEGINS. 9. SCOPE OF WORK A. PROVIDE NEW 120V POWER FROM EXISTING LSCP TO RTU. B. PROVIDE CONTROL AND SIGNAL WIRES, AND CONDUIT. C. WHERE NEEDED PROVIDE NEW EQUIP RACK FOR RTU. D. PROVIDE AND INSTALL AND CONFIGURE/PROGRAM LEVEL INSTRUMENT. E. PROVIDE & INSTALL NEW POWER & CONTROLS RACEWAYS, ELECTRICAL EQUIPMENT, GROUNDING, AND CONFIGURE RTU AND FIELD INSTRUMENTS. F. STARTUP AND TESTING OF PUMPS, AND ALL ELECTRICAL EQUIPMENT. G. TRAINING AND O&M MANUALS. CONDUITS/WIRING BETWEEN LSCP AND RTU EXIST. LSCP PROPOSED RTU CP DISCRETE SIGNALS, 33#14,1-1/4"C 120V POWER, 3#14,3/4"C-

- PROVIDE DUCT SEAL AT ALL CONDUIT PENETRATIONS, TYPICAL FOR CONDUIT LEGEND BOTH PANELS 6 TSP, 1#14, 1-1/2"C EP SEALOFE _____LEVEL 11#14,3/4"C)/1 \sim EXIST. WETWELL - PROVIDE NEW WETWELL PENETRATION PER LRD STANDARDS CONDUIT INSTALLATION NOTES THE ABOVE IS A DIAGRAMMATIC REPRESENTATION OF THE WIRES AND CONDUITS BETWEEN THE EXISTING LIFT STATION CONTROL PANEL AND THE PROPOSED CELLULAR RTU CONTROL PANEL. 2. DEPENDING ON FIELD CONDITIONS THE CONTRACTOR MAY PENETRATE THE LSCP THROUGH THE SIDE (NEVER THROUGH THE TOP), BUT FIRST THE CONTRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL THE EQUIPMENT LAYOUT/LOCATION AND CONDUIT LAYOUT BETWEEN THE PANELS AND THE WETWELL (THIS IS TO BE SUBMITTED AT EVERY INSTALLATION LOCATION) Date: 03/16/2022 LOXAHATCHEE RIVER DISTRICT Scale: AS NOTED LIFT STATION Design By:<u>JLR</u> Drawn By: <u>AOD</u> REMOTE TELEMETRY PANELS 03/16/22 MAG ADDENDUMN NO.1 Check By<u>: MAG</u> DATE BY REVISIONS

CONDUIT SIZES AS SHOWN ON THE DRAWINGS ARE MINIMUM. THE CONTRACTOR MAY INCREASE AS REQUIRED FOR EASE OF PULLING. ALL UNDERGROUND CONDUITS SHALL BE INSTALLED 24" BELOW FINAL GRADE.

PROVIDE ADDITIONAL BOXES AS MAY BE REQUIRED.

PROVIDE THHN/THWN COPPER U.L. LISTED. CONDUCTORS SHALL BE COPPER STRANDED, 600V RATED, TYPE THWN WITH 75°C RISE. GROUNDING CONDUCTORS SHALL BE TINNED COPPER, 600V RATED, #6 AWG MINIMUM GAUGE. MULTICONDUCTOR CABLES SHALL BE STRANDED #14 AWG THWN INSULATED WITH PVC JACKET. 4-20mA SIGNAL CABLES SHALL BE BELDEN 2C#16 AWG, STRANDED, 600V RATED, TYPE 8719 OR EQUAL.

PROVIDE GROUND SYSTEM AS INDICATED ON THE DRAWINGS AND AS REQUIRED BY THE NATIONAL ELECTRIC CODE.

WHERE FUTURE FACILITIES ARE INDICATED. CONDUIT ROUTING SHALL ACCOUNT

BIDDERS, SUPPLIERS, EQUIPMENT VENDORS, GENERAL CONTRACTOR, SUB CONTRACTORS AND OTHER SIMILAR ENTITIES ARE REQUIRED TO READ ALL THE CONTRACT DOCUMENTS INCLUDING DRAWINGS AND SPECIFICATIONS.

CONTRACTOR SHALL COORDINATE HOME RUNS BETWEEN PLAN VIEWS. WHERE ANY CONDUIT IS SHOWN IN ANY PLAN VIEW IT SHALL BE INSTALLED THE ENTIRE LENGTH AS MAY BE REQUIRED.

MAINTAIN MIN. 12" SEPARATION BETWEEN 4-20MADC SIGNAL AND OTHER

CONTRACTOR SHALL RESTORE TO ORIGINAL CONDITION ALL FACILITIES HE DISTURBS. CONTRACTOR SHALL PROVIDE CLEANUP, AND PROPER DISPOSAL, AND PAY ALL FEES FOR ALL DEMOLISHED MATERIALS AND THE LIKE.

CONTRACTOR SHALL WARRANT LABOR AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE OWNER'S ACCEPTANCE OF THE COMPLETED PROJECT.

PROVIDE MATERIALS AND METHODS PER LOXAHATCHEE RIVER DISTRICT REQUIREMENTS. MATCH LRD SCADA AND TELEMETRY STANDARDS.

ELECTRICAL LEGEND

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RACEWAY EXPOSED LIGHTING RACEWAY CONCEALED RACEWAY CONCEALED	oto	LEVEL SWITCH, FLOAT SWITCH	J	JUNCTION BOX PANELBOARD. ELECTRICAL EQUIP. ENCL
RACEWAY TURNED UP/DOWN	22	THERMAL SWITCH		
MOTOR		HEATER	Μ	MOTOR OPERATED VALVE
TRANSFORMER	G	PILOT LIGHT		
FUSE	RTM	RUN TIME METER		RED, MAINTAINED PUSH BUTTON
CIRCUIT BREAKER	\checkmark		\sim	TIMING CONTACT
CAPACITOR	0 0	SELECTOR SWITCH	\frown	
LIGHTNING ARRESTER	0 0		$-\bigcirc$	CONTROL RELAY, MOTOR STARTER, ETC.
SAFETY DISCONNECT SWITCH, HP RATED	~ ~	PUSH BUTTON ON-OFF SWITCH	<u>C01</u>	DENOTES CONDUIT TAG 01
GROUND		NORMALLY OPEN CONTACT	C01 C02	DENOTES SEPARATE CONDUITS WITH SEPARATE WIRE
DUPLEX, 14" AFF	NI.			
METALLIC ETHERNET CAT6e		NURMALLY CLUSED CUNTACT	<u>(A-1</u>)	DENUTES PANELBUARD A, CIRCUIT 3

MATERIAL SCHEDULE

LOCATION	CONDUIT	MISC ENCLOSURE MATERIALS	MISC ENCLOSURE NEMA RATING	FASTENERS, STRUT, THREADED ROD, ETC.	REMARKS
INTERIOR					
EXPOSED	PVC SCHED. 80	316 SS	4X	316 SS	
EXTERIOR					
BELOW GRADE	PVC SCHED. 80	CONCRETE BOXES	N/A	316 SS	
BELOW GRADE	PVC SCHED. 80				TO WETWELL
ABOVE GRADE	ALUM.	316 SS	4X	316 SS	NOT TO WETWELL

GENERAL NOTES

1. THE SCHEDULE SHALL ESTABLISH THE MINIMUM LEVEL OF QUALITY FOR MATERIALS. UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR IN THE SPECIFICATIONS.

2. THE SCHEDULE SHALL NOT APPLY TO POWER TRANSFORMERS, LIGHT FIXTURES AND THE LIKE, THOSE ELEMENTS ARE NOTED OR INDICATED ELSEWHERE.

3. PROVIDE EP SEAL OFFS FOR CONDUIT RUNS TO WET WELL.

ELECTRICAL ABBREVIATIONS

М	COMPRESSOR	LS	LIMIT SWITCH/LIFT STATION	SA	SURGE ARRESTER				
Ρ	CONTROL PANEL	LLA	LOW LEVEL ALARM	SB	SURGE BOX				
РМ	CONSTRUCTION PROJECT MANAGER	LSCP	LIFT STATION CONTROL PANEL	SC	SURGE CAPACITOR				
R	CONTROL RELAY	LRD	LOXAHATCHEE RIVER DISTRICT	SCC	SHIELDED CONTROL CABLE				
SC	DISCONNECT SWITCH	М	MOTOR STARTER	SM	SUB-METER				
ГМ	ELAPSED TIME METER	MCC	MOTOR CONTROL CENTER	SS	SELECTOR SWITCH OR				
	FUSE	MLO	MAIN LUGS ONLY		316 STAINLESS STEEL				
S	FLOAT SWITCH	MP	MAIN PUMP	TB	TERM. BOX				
SA	FIELD SURGE ARRESTOR	OL	OVER LOAD RELAY	TD	TIME DELAY				
EN	GENERATOR	ОН	OVERHEAD	TS	TEST SWITCH				
FI	GROUND FAULT INTERRUPTER	00X	OFF, OFF, ON	WP	WEATHER PROOF				
LA	HIGH LEVEL ALARM	PB	PUSH BUTTON	XFMR	TRANSFORMER				
OA	HAND-OFF-AUTO	PB	PULL BOX	ZSC	POSITION SWITCH CLOSED				
OR	HAND-OFF-REMOTE	PDP	POWER DIST. PANEL	ZSO	POSTION SWITCH OPEN				
WL	HIGH WATER LEVEL	PM	POWER MONITOR						
B	INST. PULL BOX	PSCP	PUMP STATION CONTROL PANEL						
C	JOCKEY PUMP	R,G,A	RED, GREEN, AMBER PILOT LIGHT						
4	LIGHTNING ARRESTER	RTU	REMOTE TERMINAL UNIT						
					Г				
						ন্মি	C&W	enginee	ering



- CONDUIT SIZE -1 #14 WIRE

- 6 TWISTED SHIELDED PAIRS

ELECTRICAL NOTES AND LEGEND

LEGEND

N/A NOT APPLICABLE 316 SS 316 STAINLESS STEEL



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E-3





DXAHATCHEE RIVER DISTRICT	CELL BASED RTU
LIFT STATION	PANEL SCHEMATICS
REMOTE TELEMETRY PANELS	SHEET 3



