

## SECTION 40 95 01

### WASTEWATER PUMP STATION SCADA COMMUNICATIONS AND REMOTE TELEMETRY UNIT (RTU)

#### PART 1 GENERAL

##### 1.1 DESCRIPTION

- A. Section Includes:
  - 1. Contractor requirements for electrical and instrumentation/control work to contract and coordinate with an CFPUA approved vendor, as an authorized agent, to install and program Supervisory Control and Data Acquisition (SCADA) Remote Terminal Units (RTU's) as described within this Specification and the Drawings.
- B. Vendor, as an authorized agent, shall provide a Statement of Work to be approved by the CFPUA to include the programming and installation of the equipment. Statement of Work shall include:
  - 1. Programming and installation of the equipment to include communications and programming of the HMI software, to provide a fully operational system in accordance with the drawings and specifications.
  - 2. Based on the Statement of Work, CFPUA will procure for the vendor certain equipment including the RTU, antenna, and related equipment.
- C. Contractor shall provide an interface terminal cabinet for circuitry connections to the SCADA RTU. Such circuitry will originate at the pump station control panel and other panels and devices to monitor the pump station status as indicated within this Specification and the Drawings.
- D. Vendor shall provide conduits, conductors, and cables between the interface terminal cabinet and the SCADA RTU in coordination with Contractor. Conductor and cable terminations in the SCADA RTU shall be made by Vendor.
- E. Contractor shall provide 120V to the SCADA RTU as indicated in the project drawings.
- F. Contractor shall provide a conduit for the SCADA RTU antenna cable as indicated in the project drawings. The antenna mast, mast grounding, and cable will be provided and installed by the Vendor, as an authorized agent.
- G. The vendor, as an authorized agent, shall install, program, and configure the RTU to interface with CFPUA's existing SCADA system and provide programming to interface with the RTU at the central SCADA system.

##### 1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures
- B. Statement of Work by the vendor.

## PART 2 PRODUCTS

### 2.1 CFPUA RTU AND SCADA PRODUCTS SECURITY PROTOCOLS

- A. CFPUA's RTU and SCADA system product information is secure by policy and detailed information may be released via an approved vendor request associated with a specific capital or development project.

### 2.2 FUNCTIONALITY

- A. Equipment control panels shall operate independently of the SCADA/telemetry system in the event of failure of the remote communications link.
- B. The RTU shall provide local automatic monitoring from float switches, bubbler systems, transducers, ultrasonic level sensor inputs, and dry contacts. Inputs shall be provided for both digital inputs and analog (4-20ma DC) transducers. Simultaneous monitoring of analog and digital level sensing devices shall be supported. Battery backup power shall be provided so that monitoring is maintained during primary utility power failures. Specific functions may vary based upon the pump station type and configuration as noted within the contract documents. The inputs indicated in this specification apply for a typical duplex, submersible pump station.
- C. Fail-safe inputs shall be provided indicating intrusion into the RTU enclosure and building (if applicable). Upon loss of this signal, or a series of devices providing this signal, the RTU shall report an alarm to the Central HMIs.
- D. Basic Digital Dry Contact Inputs follow:
  - Pump 1 Run Status
  - Pump 1 Overtemp Alarm
  - Pump 1 Overload Alarm
  - Pump 1 H-O-A Out of Auto Position Status
  - Pump 2 Run Status
  - Pump 2 Overtemp Alarm
  - Pump 2 Overload Alarm
  - Pump 2 H-O-A Out of Auto Position Status
  - High Level Alarm
  - High/High Level Alarm
  - Power Problem
  - Generator Alarm
  - Generator Run Status
  - Automatic Transfer Switch Not in "Normal Position" Status
  - RTU Intrusion
  - Generator Fault / Shutdown
  - Building Intrusion (if applicable)
- E. Basic Analog Inputs follow:
  - Wet Level
  - Flow Rate
  - Pump 1 Operating Speed (if VFD powered)

Pump 2 Operating Speed (if VFD powered)

- F. If the lift station has generator power backup, four inputs shall be configured:
  - 1. Generator Run Status
  - 2. Generator Pre-Alarm / Alarm Condition
  - 3. Generator Fault / Shutdown Condition
  - 4. Pump Station Operating on Generator / ATS out of Normal Position
- G. Contractor shall provide interface circuitry between equipment control panels and RTU panel.
  - 1. A terminal cabinet with terminal strips shall be installed for circuitry connections.
    - a. If a terminal cabinet is installed, extend circuitry to the RTU to a Contractor provided terminal strip in the RTU enclosure.
    - b. If a terminal cabinet is not installed, circuitry shall be terminated on a Contractor provided terminal strip in the RTU enclosure.
  - 2. Digital inputs shall be delivered by 14-gauge conductors in conduits.
  - 3. 4-20ma analog inputs shall be delivered by shielded, 2-wire, 18-gauge cables in aluminum conduits. Provide analog scaling and engineering units to Mobile Communications America, Inc. for proper calibration of analog signals.

### PART 3 EXECUTION

#### 3.1 INSTALLATION OF RTU INTERFACE COMPONENTS

- A. A North Carolina-Certified Electrical Contractor shall perform installation in accordance with the current edition of the NFPA, NEC, UL and local electrical codes.
  - 1. The Contractor shall be responsible to run a 20 Amp, 120V AC circuit to the RTU and ensure all enclosures, ground busses, antenna masts, surge arrestors are grounded and bonded to the existing service main ground.
  - 2. All hardware and brackets shall be 316 stainless steel.
  - 3. All interface wiring shall be tagged with heat shrink pre-printed wire labels. Hand written labels are not acceptable.
  - 4. Contractor shall coordinate with Vendor, as an authorized agent and demonstrate to the CFPUA representative that all features and functions of the RTU perform.

#### 3.2 STARTUP AND ACCEPTANCE

- A. CFPUA has established specific procedures for integration and acceptance of a RTU into CFPUA's SCADA system. This procedure shall be followed. Before acceptance, a complete documented checkout of the RTU, Central HMIs interface and RF communications shall be completed and witnessed by CFPUA and the system supplier.

END OF SECTION