

SECTION 33 00 40 - REMOTE TANK LEVEL MONITORING SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Remote Telemetry Units (RTU).
- B. Tank Level Monitoring System.

1.2 INTENT

- A. Basic function of the Tank level Monitoring RTU shall be to monitor liquid level via pressure of the water storage tank. The Storage Building RTU shall communicate with the altitude valve RTU via the Tank and Well Monitoring Control Package.
- B. In addition to the analog level data, the Monitoring RTU, at the elevated storage tank, shall be designed to accept a discrete input from a security panel within the Storage Building. Door switches shall be used for detection of entry into the storage building.
- C. Storage tank liquid level shall be monitored by a pressure transducer, and the associated controller functions. The Tank level sensor shall be separately mounted and its 4-20 mA output wired via appropriate cable to the Storage Building RTU panel.
- D. The level shall be monitored through a pressure transducer specified herein.
- E. A pressure gauge with drain and bleed valve shall be provided.
- F. RTU monitoring should be compatible with existing County monitoring website.
- G. Manufacturers shall be Mission, Omni site, or equal.

1.3 QUALITY ASSURANCE

- A. The unit shall be built in strict accordance with the latest published standards of NEMA, IEEE and ANSI. In addition, wherever possible, components utilized in construction shall be Underwriters Laboratory listed. Equipment is to be completely factory assembled, wired and tested prior to shipment.
- B. For purposes of system responsibility, all of the equipment listed herein shall be furnished by a single supplier with experience in comparable system requirements and shall be of the latest and most modern design. The supplier shall be responsible for the correct operation of the equipment as specified after installation.

1.4 SUBMITTALS

- A. Submit Shop Drawings and product data in accordance with the general sections of the specifications.
- B. Submit manufacturer's latest description literature including operational description, dimensions, installation methods, size, weight, material types, input/output capability, and wiring diagrams.
- C. Submit Operation and Maintenance data in accordance with general sections of the specifications.

#### 1.5 SPARE PARTS

- A. Provide spare parts as recommended by the manufacturer and including the following:
  - 1. CMX-21 Card
  - 2. One Pressure Element of similar scale
- B. Package spare parts in boxes that are clearly labeled with part name and manufacturer's part/stock number.

#### 1.6 WARRANTY

- A. System manufacturer shall guarantee that the materials and/or workmanship of the equipment be free from defects for a period of one (1) year from date of substantial completion, providing the equipment has been operated and maintained in accordance with the system manufacturer's recommendations.
- B. System manufacturer shall replace or repair any part or parts found defective during this warranty period due to failures caused by reasons other than misuse, ordinary wear and tear, or unforeseen causes or conditions.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. Equipment shall be provided in wall mounted, Underwriter's Laboratory rated, NEMA Type 12 enclosure. The enclosure shall be fabricated from a minimum of 14-gauge, cold rolled steel and painted the manufacturer's standard color. Hinges shall be 11-gauge, full length, and piano type. Lift-off hinges or other low-quality designs are specifically not acceptable. Enclosure shall include a back plate for mounting internal components.
- B. Controls shall operate from a source of 120 volts, 1 phase, 3 wire, 60 Hz. All controls shall be protected from lightning or other transient voltages by a power arrestor. A properly sized control power circuit breaker shall be provided. The breaker shall supply power to all controls within the enclosure.

- C. All required DC power supplies, including those for instrumentation loops shall be provided. Units shall provide sufficient voltage regulation and ripple control to assure powered components can operate within their required tolerances.
- D. A battery backed, bumpless power source to run remote units for a period of one (4) hours in the event of a failure of the normal AC source shall be included. The battery shall be of the gel cell type and sized to provide DC power for the specified power fail period. The battery shall be kept fully charged using a regulated float voltage charging system that has the ability to charge the battery even if fully discharged.
- E. The monitoring unit shall have an operational temperature range of -20°C to 60°C (-4°F to 140°F), and a storage temperature range of -40°C to 80°C (-4°F to 176°F), under relative humidity conditions of 10 to 95% non-condensing.
- F. All wiring shall be in complete conformity with the National Electric Code, state, local and NEMA electrical standards. All incoming and outgoing wires shall be connected to numbered terminal blocks and all wiring neatly tied and fastened to the chassis as required.
- G. The panels provided under this section shall be constructed in compliance with Underwriter's Laboratories, Inc., category 508A standards – Enclosed Industrial Control Panels listing and following-up. The control panels shall bear the Underwriter's Laboratories serialized label for "Enclosed Industrial Control Panel".

## 2.2 TERMINAL UNITS

- A. The Remote Terminal shall be integral to the Tank Level Monitoring unit and specifically designed for water and wastewater applications. The use of generic products to provide these functions is unacceptable to either the Engineer or the Owner.
  - 1. Unit provided shall be as hereinafter described.
- B. Units shall accept the following types of signals:
  - 1. Digital Inputs shall be via dry contact closures. The inputs to the RTU shall be voltage free dry contacts, of the SPDT type.
  - 2. Digital Outputs shall be 12 volt DC, driven via the RTU's outputs.
- C. The minimum configuration shall consist of a controller, with integral Tank Level Display, power supply, integrally mounted AC power supply to drive the RTU, signal Isolators and interposing relays.
  - 1. The RTU at the Tank Level Controller, situated at the remote tank shall provide for 8 digital inputs, 3 digital outputs and 2 analog inputs.
  - 2. The RTU at the control valve shall be located at the vault and shall match RTU at the tank.
- D. Expansion I/O requirements shall be accomplished by modules, which easily plug into an expansion bus. Provision shall be made for the following:
  - 1. Tank Site Storage Building (RTU) and Tank Level Control System
    - a. Discrete Outputs – High and Low Level; Building Intrusion
    - b. Discrete Inputs – *High and Low Level Alarms; Building Intrusion*
    - c. Analog Inputs – *Tank Level*

2.3 LEVEL MONITORING

- A. Pressure transducer shall be Siemens Water Technologies Model A300, Rosemont, or equal.
- B. Pressure gauge shall be Ashcroft, WIKA, or equal, reading in both PSI and Feet scaled 0-50 feet of water.
- C. Provide adjustable pressure snubber at transducer, Ashcroft, USA Blue Book, or equal, material to match fittings.
- D. Pressure transducer shall be calibrated to match the tank float at mid-point of scale.

2.4 INTRUSION SENSOR

- A. Provide intrusion sensor on door of storage system wired to RTU. Sensor control shall have manual override delay to avoid false signals to RTU.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide labor, materials, tools, equipment, supplies and auxiliary devices, including brackets and mounting hardware, to install the system.
- B. Install the system in accordance with the manufacturer's instructions and the approved Shop Drawings.
- C. Provide electrical disconnects and fuses or circuit breakers as required.
- D. Install the system and auxiliary devices to aid in future maintenance.

3.2 MANUFACTURER'S FIELD SERVICES

- A. Provide the services of a qualified manufacturer's representative for installation assistance, programming, demonstration, certification, start-up, and instructions.
- B. Programming:
  - 1. Provide the services of a manufacturer's field representative to program the system.
  - 2. Storage Tank System Operation:
    - a. The RTU receives a pressure signal from the Tank Pressure Transmitter (4-20mA). The signal setpoints must be transmitted to the altitude valve's controller RTU.
- C. Installation Assistance, Calibration, Certification, Start-Up:
  - 1. Provide the services of a manufacturer's representative for a minimum of two (2) eight-hour workdays, excluding travel time.

2. Submit a report from manufacturer's representative certifying that the equipment has been installed properly and is operating properly. Submit this report and certification to Engineer within 30 days after successful start-up of equipment.
  3. An on-site tech shall provide a final system calibration when the entire water system is complete, properly functioning, and accepted by the Owner.
- D. Demonstration and Instructions:
1. Provide demonstration and instructions for Owner's operating personnel as required.

END OF SECTION 33 00 40