

SECTION 16780**S.C.A.D.A. SYSTEM R.T.U. INSTALLATION****PART 1 - GENERAL**

1.01 SCOPE OF WORK

- A. All conditions of the existing contract shall apply.
- B. The Contractor shall coordinate all work with the local Electrical Supervisor for the area. The Contractor shall review the installation with the area Electrical Supervisor before starting the work. The installation shall be completed and inspected by the local supervisor or his representative.
- C. The Contractor shall be responsible for location of all utilities.

1.02 REFERENCE STANDARDS

- A. All work shall be in accordance with the Florida Building Code and the National Electrical Code.

PART 2 - PRODUCTS

2.01 MIAMI-DADE WATER AND SEWER DEPARTMENT SUPPLIED MATERIALS

- A. R.T.U. in a NEMA 4X enclosure. Note that batteries are to be furnished and installed inside the 4X enclosure by the contractor.
- B. Radio
- C. Antenna with mounting cap and cable
- D. Force main pressure transmitter assembly consisting of a 1-inch diameter threaded nipple, manifold with test port and pressure gage with isolation diaphragm and the pressure transmitter unit.
- E. Low level pressure switch
- F. Wet well level transformer (for the RTU)
- G. Current transformer
- H. Amp transmitter
- I. "Station Flooding"(drywell) and "High Level"(wetwell) float switches; Mini Float,

model SM N.O.

- J. "Low Level"(wetwell) float switch; Mini Float, model SM N.C.
- K. "Intrusion Alarm" , Square D 9007 Series A, Type C54D, Type C54RC, Type C54A2, Microswitch #MC7711-BZ-2R-A2 or equal as required for that type of installation.

2.02 CONTRACTOR SUPPLIED MATERIALS

- A. Unless otherwise specifically called out elsewhere herein, all other labor, materials and equipment required for SCADA System R. T. U. Installation will be provided by the Contractor whether or not said items are specifically called out in the Contract Documents.
- B. Individual wires shall be 600 volt, 75° C insulation, 14 guage stranded copper. Ends shall be terminated with compressiron lugs. Wires shall be color coded according to Miami-Dade Water and Sewer Department supplied drawings and identified by wire marking labels. Any circuits designated as "spare" shall each have individual ends securely taped and marked "spare".
- C. Shielded multi-conductor transducer wire shall be Belden twisted #16 stranded copper with shield, 600 volt rated. The shield shall be terminated at the R. T. U. end only. Shield shall be cut back to insulation and taped at other end. Shielded wire shall be run in a raceway with no other power circuits.
- D. The antenna ground rod shall be copper weld 3/4", 10 feet long and driven by the Contractor.
- E. Tapping saddle assembly for pressure transmitter consisting of: solid brass, single strap (silicon bronze), tapping saddle with Buna-N-gasket, Ford Style 101B with 1-inch tap; brass corporation stop with 1-inch inlet, outlet and valve AWWA/CC taper thread inlet by flare copper outlet, Ford FB600-4; brass adapter for flare copper connection (replaces flare nut) 1-inch female copper thread x 1-inch female iron pipe thread, Ford part no. C01-44. All items specified as brass shall be ASTM B-62, UNS C83600 allow and shall conform with NSF 61.

PART 3 - EXECUTION

3.01 ANALOG INPUTS

- A. Three transducers are involved at each site with standard or microprocessor control (current, wetwell pressure level, and force main pressure). The pressure transmitters will be installed by MD-WASD forces in coordination with, and as a part of, the Contractor's permitted work. The Contractor shall mount the current transformer on the leg of the power cable from which the control power is derived and connect shielded wiring to all three transducers. The current

transformer shall be installed to indicate power used whether on normal or generator power where applicable. The current transducer shall be installed in existing cabinets as close as possible to the current transformer.

- B. At sites identified by MD-WASD only two types of transducers, (force main pressure and current), will be used. Shielded wire from the level logic control device to the R. T. U. shall be installed for level indication. Termination of the shielded cable to the control unit shall be performed by MD-WASD forces.
- C. Other analog inputs may include flow recorders, suction pressure, discharge pressure, vibration or R. P. M. input. The MD-WASD shall supply devices and the Contractor will supply and install circuits. These circuits will be installed by the Contractor, but terminated by MD-WASD forces.

3.02 ANALOG OUTPUTS

- A. At sites determined by MD-WASD shielded wire and conduit shall be installed for analog outputs such as VFD speed control, valve control, or other positioning devices. Circuits shall be installed by the Contractor, but terminated by MD-WASD.

3.03 DISCRETE INPUTS

- A. Feedback signal circuits are "Pump On", "Station Flooding" (drywell), "High Level" (wetwell), "Low Level" (wetwell), "Generator Run", "Intrusion Alarm" and "Common Alarm". Except where noted, the Contractor shall provide all materials and devices to complete these two wire circuits. The power will be from the R. T. U. and all devices shall be normally open in the safe or off condition.
 - 1. "Pump On" shall be provided by a Contractor furnished and installed auxiliary contact on each pump motor starter. (Note: two speed pumps require two per pump.) No other devices shall be used to indicate "Pump On".
 - 2. "Station Flooding" (drywell), "High Level" (wetwell), and "Low Level"(wetwell), shall be supplied by MD-WASD and installed by the Contractor. In pump stations with pneumatic controls (bubbler system) MD-WASD will provide a pneumatic pressure switch for "Low Level"(wetwell) to be installed by the Contractor.
 - 3. "Intrusion Alarm" will be supplied by MD-WASD and installed by the Contractor.

3.04 DISCRETE OUTPUTS

- A. Active control circuits to start each pump, (or each speed), stop pump, and reset alarms shall be installed and connected.

1. The normally closed stop relay in the R. T. U. shall be connected in series to the existing stop control circuit.
2. The normally open start relay shall be connected in parallel to the existing auto start control circuit. **No existing safety or process orderly shutdown circuits shall be bypassed or defeated for either the start or stop control circuit.**
3. The "Common Alarm" circuit shall be from a normally open R.T.U. relay in parallel with the existing reset switch.

3.05 R. T. U.

- B. There shall be no holes or entrance of any type into the top of the R.T.U. enclosure.
- C. The R. T. U. shall not be mounted below grade or inside the drywell. If existing structure does not provide mounting for the R.T.U. a separate MD-WASD approved stanchion shall be constructed and installed by the Contractor. The R.T.U. stanchions shall be installed in accordance with current MD-WASD approved S. C. A. D. A., R. T. U. installation drawings. Equivalent parts shall require approval by the S.C.A.D.A. Section representative.
- D. All abraded galvanized hardware shall be cleaned and then recoated with two coats of cold galvanized compound.

3.06 CONDUITS

- A. Rigid galvanized conduit shall be used in all exterior below grade installations. It shall be coated with two coats of Bitumastic No. 50 or equal. Rigid galvanized conduit shall extend completely through all concrete penetrations at which point it may be converted to PVC conduit in the interior of the drywell. Rigid aluminum conduit may be used in installations above grade where exposed.
- B. All concrete penetrations shall be sealed with epoxy grout compound. All conduits shall have minimum 1/4" spacing where installed on concrete surfaces.
- C. All conduits below grade and/or extending from the wetwell shall have seal off fittings installed before entry into the R. T. U. enclosure. All conduits shall be sealed with duct seal compound during the construction phase to limit the exposure of electronic circuitry to corrosive atmosphere.

3.07 MISCELLANEOUS

- A. A separate circuit shall be provided for and installed by the Contractor from the existing lighting/control panel, to provide 120 VAC power to the R. T. U. This circuit shall be routed through an available phase monitor relay normally open contact. This circuit will be switched on by the SCADA Section at start-up.

- B. For wetwell/drywell pump stations with the pump controller in the drywell a MD-WASD supplied enclosure and terminal strips shall be installed for circuits entering and exiting the drywell.
- C. Additional work such as sidewalk or street cutting may be required. This work must be authorized by the Project Manager and validated by a detailed, itemized invoice showing exact labor and material used.
- D. An as-built drawing, (schematic and point-to-point) of the final installation and approved by the SCADA representative shall be provided by the Contractor for the installation before final payment is made.
- E. A Certificate of Completion and original approved permits shall be supplied to the Department before final payment is made.
- F. Install SCADA tapping saddle at location shown on Plans, pressure test, perform 1-inch tap, in coordination with MD-WASD forces, connect remainder of pressure transmitting system, and test.

END OF SECTION