Technical Specification 034.01

SCADA CONTROL SYSTEMS FOR SEWER PUMP STATIONS

1.0 General

a) It is the intent of this specification for the utility contractor to furnish and install a pump station SCADA / RTU system complete in every respect. The utility contractor shall furnish all labor, supervision, materials, tools, equipment and services necessary for the complete installation of the instrumentation and control system as detailed in this technical specification and as shown on the Brunswick County pump stations Standard Details.

b) Refer to the following County Standard Detail drawings and Technical Specifications as applicable:

1) SCADA Antenna Detail for Brunswick County

2) Pump Station Details for Pump Stations 50 HP and Smaller

3) Pump Station Details for Pump Stations Larger than 50 HP

4) Pump Station Electrical Details 1 – 50 HP Duplex Control Panel

5) Pump Station SCADA / RTU Details 1 – 50HP

6) RTU / Control Panel – Pumps Larger than 50 HP utilizing Soft Starts

7) RTU / Control Panel – Pumps Larger than 50 HP utilizing VFDs

8) Technical Specification 023.01: *Wastewater Pump Stations with Submersible* P*umps*

2.0 Submittals

a) Submittals shall comply with the requirements of all relevant Brunswick County Standard Details and Technical Specifications as referenced herein.

b) The utility contractor shall submit for review all shop drawings, certified prints, literature, and manufacturer's data sheets for SCADA / RTU equipment. Submittals shall go to the Engineer for review and approval.

c) All furnished SCADA and pump controls shall be 100% compatible with the existing Brunswick County Public Utilities system. This shall include, but is not limited to, all SCADA radios, PLCs, VFDs, enclosures, soft starters, NEMA contactors, network switches, and user interface touch screens. Materials specified in County Technical Specifications and Standard Details provide full system compatibility, adequate parts availability, wiring and communications compatibility, meet current dimensional requirements, and require minimum additional staff training and software.

d) The results of a radio signal strength path analysis shall be submitted in a detailed report documenting the actual radio field test procedures and results along with the confirmation of the minimum required antenna height.

NOTE: Brunswick County will not accept pump station facilities if the radio signal strength is not (-) 80 dBa or less. The radio signal path analysis must be submitted for County review and approval prior to final plan approval.

e) Contact Brunswick County Public Utilities for current radio model for SCADA / RTU panel and for assistance with the signal path analysis study.

3.0 Products

a) Refer to County Technical Specifications and Standard Details for required equipment and materials.

4.0 Rohn SCADA Antenna

a) The Rohn 65G antenna and foundation is the standard antenna for all Brunswick County pump stations.

b) Refer to the *SCADA Antenna Detail for Brunswick County* Standard Detail.

c) The Engineer and utility contractor shall review and be familiar with the *SCADA Antenna Detail for Brunswick County* Standard Detail.

d) The tower portion for a Brunswick County Pump Station shall be installed in its entirety, turnkey, per the Standard Details, by the utility contractor. A complete unit includes the concrete foundation, base unit, antenna sections to required height, ten (10) foot antenna mast, directional antenna, conduits, coaxial cable, coaxial connections, grounding system, coaxial grounding kit, strain reliefs, weatherproof fitting as required for all conduits, cable ties, and all other materials and labor necessary for a complete, turnkey, seamless, and fully functional system.

e) Antenna tower height shall be a minimum forty (40) feet in height.

f) Antenna towers greater than sixty (60) feet in height require down guys and a larger pump station site footprint – contact Brunswick County Public Utilities for guidance.

g) Rohn antenna foundation design basis parameters are:

1) presumptive soil type is clay soil
2) dry soil conditions with water table below foundation depth
3) frost depth less than or equal to 3.5 feet
4) soils are non-corrosive
5) soils are non-expansive

h) The Engineer shall investigate the pump station site and existing soil conditions to determine whether any modifications are required to the standard Rohn foundation design:

1) If modifications are required, a geotechnical soil report and revised foundation design, sealed by a licensed Engineer in the State of North Carolina, shall be submitted to Brunswick County for review and approval.

2) Upon approval of the geotechnical report by Brunswick County the Engineer shall submit revised antenna plans sheets for review and approval. Tower designs shall meet the approved national standard ANSI / EIA – 222 –F and ANSI / TIA – 222-G, Structure Class I, Exposures B & C, Topographic Category I.

i) The antenna tower shall be rated for (110) mph wind speed with a three (3) second wind gust per Rohn technical literature.

5.0 Pump Station Control Systems

a) Pump Stations 1 – 50 HP

1) Primary control method shall be four (4) float switches in the wet well.

2) Refer to *Pump Station Electrical Details 1 – 50 HP Duplex Control Panel*, *Pump Station SCADA / RTU Details 1 – 50 HP*, and Technical Specification 023.01: *Wastewater Pump Stations with Submersible Pumps.*

b) Pump Stations > 50 HP

1) Primary control method shall be the Dwyer submersible transducer for pump stations greater than 50 HP using soft starts and VFDs. Refer to County standard detail for the Dwyer transducer.

2) Dwyer submersible transducer specifications are:

a) Dwyer PBLT2 submersible level transmitter 0 – 10 psi
b) Power: 13 – 30 VDC
c) Output: 4 – 20 mA, 2-wire
d) Accuracy: (+)(-) 0.25% of full scale
e) Transmitter wetted materials: 316 SS, 316L SS, Buna-N
f) Cable wetted materials: polyurethane
g) Cable lengths shall be long enough to reach any junction box, RTU panel, or electrical building without splicing
h) Diaphragm seal: large diameter, 316 SS, non-clogging
i) Ventilation tube in cable assembly with maintenance free filter
j) ½ inch, NPT (M) conduit connection

3) Backup level control system shall utilize four (4) float switches.

4) Refer to *RTU / Control Panel – Pumps Larger than 50 HP utilizing Soft Starts*, RTU */Control Panel – Pumps Larger than 50 HP utilizing VFDs*, and Technical Specification 023.01: *Wastewater Pump Stations with Submersible Pumps.*

6.0 SCADA system start-up and checkout

a) The entire control system shall be furnished by a single supplier who shall furnish the services of a competent technical representative for a minimum of one (1) day to insure that the equipment is installed correctly, to adjust the equipment, and to instruct operating personnel in the proper operation, maintenance, and care of the equipment. This start-up checkout and testing must be scheduled a minimum of (48) hours in advance with Brunswick County Public Utilities. If the checkout and startup fails for any reason the technical representative shall schedule additional on-site time as necessary in order to achieve a successful startup of the system to the satisfaction of Brunswick County Public Utilities.

7.0 Warranty Period

a) The utility contractor shall provide a one year warranty for all SCADA / RTU equipment stating that it is free from defects in materials and workmanship. Any equipments failures during the one year warranty period due to materials and / or workmanship shall be remedied by the utility contractor to the satisfaction of Brunswick County Public Utilities.

b) The warranty period shall commence at either the date of Final Acceptance for a County CIP project, or the date of recordation of the Deed of Dedication for a developer installed project.