

SECTION 16900

GENERAL REQUIREMENTS - INSTRUMENTS AND CONTROLS

PART 1-GENERAL

1.1 Description

A. This Division includes instruments, meters, control devices, and control panels as specified in each Section.

B. Related Work

1. Section 11315 – Submersible Sewage Pumps.
2. Section 16901 - Control Panels (including Sewage Lift Station Pump Control.)
3. Section 16902 – Measuring and Controlling Instruments and Loops
4. Section 16924 – Programmable Logic Controller (PLC) and accessories. (including Supervisory Control and Data Acquisition SCADA RTU.)
5. Section 16950 – Field Testing

1.2 References

1. Instrument Society of America (ISA)

S20 - Specification Forms for Process Measurement and Control Instruments, Primary Elements and Control Valves.

2. Others as specified in applicable Sections.

3. National Fire Protection Association

National Electrical Code, NFPA 70

Standard for Electrical Safety in the Workplace, NFPA 70E

4. National Electrical Safety Code, IEEE C2.

5. Occupational Safety and Health Administration, OSHA.

6. All electrical and control equipment and material shall bear the recognized Underwriters Laboratories, Inc. (UL) seal of approval. It is Vendor's responsibility to obtain local

inspection approval for all non-UL labeled equipment and pay all fees in connection with the same.

1.3 Work Progress Reports and Photographs

- A. Conform to DIVISION 1.

1.4 Submittals

A. Compliance Submittals

1. Submit as specified in Section 1330.
2. Manufacturer with prime responsibility shall assume responsibility for all Compliance Submittals.
3. **Includes, but not limited to, the following:**
 - a. Fabrication drawings, front elevation, wiring, diagrams, and bills of material for control panels.
 - b. Engraving schedule and physical dimensions for nameplates and phenolic overlays.
 - c. Electrical and mechanical connection diagrams for all separately mounted instruments.
 - d. Individual specification or descriptive sheets for instruments, annunciators and similar major system components to conform to ISA S20.
 - e. **Instruction Books**

For all instruments, transducers, and similar major system equipment.

In addition to the requirements as specified in DIVISION 1, submit single-page specification sheets for each instrument which lists the type, model number, function, scale, input, actuation, output and other specific features of that instrument.

1.5 System Responsibility – System Integrator

Systems may utilize equipment of different manufacturers but one System Integrator is to assume overall responsibility for the complete system.

A. Approved System Integrator

1. HSQ Technology, Inc
2. Alliance Service and Control Specialists, Inc.
3. Engineer prior approved equal.

1.6 System Integrator Pre-Qualification

- A.** System Integrator shall be provided by a firm specializing in control panel construction. Request for approval shall be submitted to engineer a minimum of 10 days prior to bid.

PART 2 - MATERIALS - Specified in applicable sections, SECTIONS 16900-16950.

PART 3 - EXECUTION

3.1 Factory Tests

- A.** As a minimum, the manufacturer's standard tests and calibration procedures shall be conducted on all instruments.
- B.** All field devices to be calibrated at factory prior to shipment to site. Applicable test reports to be shipped with field device.

3.2 Lightning and Surge Protection

- A.** Provide lightning and surge protection to all instruments, power supplies, electronic equipment and input and output control and signal lines specified in this Section. This protection shall be in accordance with the applicable standards and shall be suitable to protect the equipment during electrical storms which occur in the area of the project.

3.3 Installation: Specified in applicable Sections, SECTIONS 16900-16950.

3.4 Manufacturer's Field Services

- A.** Provide as specified in Section 1750.
- B.** Provide supervision for a minimum of three working days, with days in excess of this as required during the test and start-up period by the prime responsibility manufacturer.
- C.** Test and start-up supervision shall continue until the system is in proper operating condition as determined by the Engineer.
- D.** Provide manufacturer's supervision during Work to correct deficiencies in equipment manufactured by them and to correct deficiencies in the installation and wiring of equipment. Corrections shall be at no increase in the contract price.
- E.** Also provide supervision for a minimum of three working days to instruct Owner's personnel in proper operation and maintenance of the equipment. Instruction shall take place after equipment start-up is complete.
- F.** Manufacturer's field services required for all instruments, control devices, and other devices furnished as a part of the control panel or instruments and associated control devices separately mounted to assure proper installation, setting, connection, and functioning.

3.5 Field Testing - Instrument and Control Systems

A. General Requirements

- 1.** Conform to requirements as specified in DIVISION 1.
- 2.** Conduct all tests in the presence of Engineer or Owner under the supervision of equipment manufacturer's field engineer.
- 3.** Notify Engineer two weeks prior to the commencement of all tests.
- 4.** Include all tests recommended by the equipment manufacturer unless specifically waived by Engineer.

5. Include all additional tests recommended by Engineer that he deems necessary because of field conditions, to determine that equipment and material and systems meet requirements of Contract Documents.
6. Be responsible for all damage to equipment and material due to improper test procedures or test apparatus handling.

B. Test Reports

1. Submit as specified in DIVISION 1.
2. Maintain a written record in quadruplicate of all tests showing date, personnel making tests, equipment or material tested, tests performed, and results.

3.6 Coordination and Scheduling: Coordinate installation of equipment and materials with construction schedule.

PART 4 MEASUREMENT AND PAYMENT

4.1 Measurement

- A.** No measurement will be made for this item.

4.2 Payment

- A.** Payment will be made at the contract lump sum price bid and shall be considered full payment for providing labor and materials to perform this work.

**** END OF SECTION 16900 ****