SECTION 463341 - LIQUID CHEMICAL FEED SYSTEM COORDINATION AND INTEGRATION

Note that this section has only been edited for NYSOGS standardization and has not been technically edited. The designer shall make all technical edits specific to the project for this section.

This Section includes descriptions and integration of control schemes for integration of liquid chemical feed systems as specified in other Sections.

Information included in this Section is based on typical integration requirements for a liquid chemical feed system in a water or wastewater treatment facility. Modify this Section based on selected equipment and Project requirements.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Special submittals and data sheets.

Control panels.

[**Polymer blending and feed equipment.**]

Installation requirements.

* + - * 1. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 033000 - Cast-in-Place Concrete: Equipment bases and supports.

Sections 404213 - Process Piping Insulation: Insulation requirements for piping and appurtenances.

Section 404223 - Process Equipment Insulation: Insulation requirements for equipment and devices.

Section 463333 - Polymer Blending and Feed Equipment: Integration requirements.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

* + - * 1. Instrument Society of America:

ISA 5.1 - Instrumentation Symbols and Identification.

ISA 20 - Specification Forms for Process Measurement and Control Instruments Primary Elements and Control Valves.

* + - 1. COORDINATION
         1. Integrate instrumentation and control devices provided under other Sections.
         2. Resolve signal, power, or functional incompatibilities among interfacing devices.
      2. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
        2. Manufacturer’s installation instructions shall be provided along with product data.
        3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
        4. Product Data: Submit manufacturer's information with each instrument data sheet.
        5. Shop Drawings:

Symbology and Nomenclature: Comply with ISA 5.1.

Indicate interfaces between instruments, motor starters, control valves, variable-speed drives, flow meters, chemical feeders[**, and**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Data Sheets:

Comply with ISA 20.

Submit following:

Manufacturer's model number or designation.

Tag number as indicated on [**Shop**] Drawings.

Component system or loop.

Installation location.

Input and output characteristics.

Scale, range, units[**, and**] [**multiplier**].

Requirements for [**electric**] [**air**] <**\_\_\_\_\_\_\_\_**> supply.

Materials of component parts in contact with process chemicals.

Special requirements or features.

* + - * 1. Manufacturer Instructions: Submit [**detailed instructions on installation requirements, including storage and handling procedures**] <**\_\_\_\_\_\_\_\_**>.
        2. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
        3. Manufacturer Reports: Certify that [**equipment has been installed according to manufacturer instructions**] <**\_\_\_\_\_\_\_\_**>.
        4. Qualifications Statements:

Coordinate following Subparagraphs with requirements specified in QUALIFICATIONS Article.

Submit qualifications for system integrator.

Submit system integrator's approval of installer.

* + - 1. CLOSEOUT SUBMITTALS
         1. Project Record Documents: Complete loop and schematic diagrams including field and panel wiring, piping and tubing runs, routing, mounting details, and point-to-point diagrams with cable, wire, tube, and termination numbers.
      2. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

* + - * 1. Instruments Using Common Measurement Principle:

Furnish by single manufacturer.

Furnish same type, model, or class.

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Perform Work according to <**\_\_\_\_\_\_\_\_**> standards.
        2. System Integrator: Company specializing in integrating products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
        3. Installer: Company specializing in performing Work of this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience [**and approved by system integrator**].
      1. DELIVERY, STORAGE, AND HANDLING
         1. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
         2. Store materials according to manufacturer instructions.
         3. Protection:

Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

Provide additional protection according to manufacturer instructions.

* + - 1. AMBIENT CONDITIONS
         1. Panels and Enclosures: Suitable for operation in locations as indicated on Drawings.
         2. Temperature Range: [**32**] <**\_\_\_\_\_\_\_\_**> degrees F to [**104**] <**\_\_\_\_\_\_\_\_**> degrees F
         3. Maximum Thermal Shock: 1 degree F per minute.
         4. Relative Humidity: [**20**] <**\_\_\_\_\_\_\_\_**> to [**90**] <**\_\_\_\_\_\_\_\_**> percent, noncondensing.
         5. Furnish heating, cooling, and dehumidifying devices to maintain instrumentation within [**20**] <**\_\_\_\_\_\_\_\_**> percent of rated operating ranges.
         6. Instrumentation in Hazardous Areas: Suitable for use in particular hazardous or classified location.
      2. EXISTING CONDITIONS
         1. Field Measurements:

Verify field measurements prior to fabrication.

Indicate field measurements on Shop Drawings.

* + - 1. WARRANTY

This Article extends warranty period beyond one year. Extended warranties may increase construction costs and Director’s Representative enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**two**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for liquid feed equipment control systems.

1. PRODUCTS
   * + 1. PERFORMANCE AND DESIGN CRITERIA
          1. Corrosion Resistance: Furnish materials resistant to corrosive attacks from process chemicals being handled.
          2. Analog Signals:

Vary in direct linear proportion to measured variable.

Transient DC Voltage:

Not exceeding 300 V over 1 ms.

No dc component over 300 V.

Electrical Signals in Outside Control Panels: 4 to 20 mA dc.

Signals within Enclosures: [**4 to 20 mA dc**] [**1 to 5 V dc**].

Isolate signals from ground.

* + - * 1. Pneumatic Signals: 3 to 15 psig with 3 psig equal to zero percent and 15 psig equal to 100 percent.
      1. CONTROL PANELS
         1. Control Wiring:

Material: Copper.

Minimum Size: No. 16 AWG

Tagging:

Tag control wiring at both ends with legible permanent-coded wire-marking sleeve.

Mark with white PVC tubing sleeves with machine-printed black marking.

Mark according to wire numbers as indicated on control wiring diagrams and terminal strip numbers.

* + - * 1. Power Supplies:

Operation:

115 V, plus or minus 10 percent.

60 Hz, plus or minus 2 Hz.

Furnish power supplies for two-wire transmitters, loops for monitoring discrete inputs, and outputs.

Design: Minimum 130 percent of maximum simultaneous current draw.

Furnish power ON-OFF switch or air circuit breaker for each item requiring electrical power.

Mount power supplies in enclosures in field panel.

Modify following Article and include Articles for other liquid chemical feed equipment based on Project requirements.

* + - 1. POLYMER BLENDING AND FEED EQUIPMENT
         1. As specified in Section 463333 - Polymer Blending and Feed Equipment.
         2. Control System: [**Microprocessor**] [**PLC**].
         3. Selector Switch: LOCAL - OFF - REMOTE.
         4. Indicator Light: RUN.
         5. Alarm: LOW WATER FLOW.
         6. Communications Interface: <**\_\_\_\_\_\_\_\_**>.
         7. Pump:

[**Manual**] [**or**] [**automatic**].

Pacing Signal: 4 to 20 mA dc.

1. EXECUTION
   * + 1. INSTALLATION
          1. According to manufacturer instructions.
          2. Tagging:

Tag each component to identify its location, tag number as indicated on Drawings, and system function.

Provide [**stainless-steel**] <**\_\_\_\_\_\_\_\_**> tag permanently marked with tag number as indicated on Drawings.

* + - * 1. Equipment Bases and Supports:

Material: Concrete, as [**specified in Section 033000 - Cast-in-Place Concrete**] [**indicated on Drawings**].

Minimum Thickness: 3-1/2 inches

Length and Width: [**Extending 6 inches beyond supported equipment**] [**As indicated on Drawings**].

Anchor Bolts and Accessories: Use templates furnished with equipment.

Supports:

Material: [**Steel members**] [**Formed steel channel**] [**Steel pipe and fittings**] <**\_\_\_\_\_\_\_\_**>.

Brace and fasten with flanges bolted to equipment structure.

Provide rigid anchors for pipes after vibration isolation components are installed.

* + - * 1. Install insulation as indicated on [**Shop**] Drawings and as specified in Sections 404213 - Process Piping Insulation and 404223 - Process Equipment Insulation.
        2. Furnish installation certificate from device manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.
      1. FIELD QUALITY CONTROL
         1. Calibration:

Calibrate each instrument at 20, 40, 60, 80, and 100 percent of its span using test instruments to simulate inputs.

Field-calibrate instruments that were not bench-calibrated.

Tags: Attach calibration and testing tag to each device, signed and dated by device manufacturer's representative after calibration has been completed.

* + - * 1. After installation, inspect and test for proper operation.
        2. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than <**\_\_\_\_\_\_\_\_**> [**days**] [**hours**] on Site for installation, inspection, startup, field testing, and instructing Director’s Representative in operation and maintenance of equipment.
        3. Equipment Acceptance:

Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.

Make final adjustments to equipment under direction of manufacturer's representative.

* + - 1. DEMONSTRATION
         1. Demonstrate system startup, shutdown, routine maintenance, alarm condition responses, and emergency repair procedures to Director’s Representative.
      2. ATTACHMENTS

When relying on separate schedules, tables, illustrations, or forms to specify product requirements, include list of each attachment. Include identical list of attachments in Project Manual table of contents.

Insert attachments following END OF SECTION. Consider following example of control system functional description.

* + - * 1. Functional Description:

Metering Pump MP-7:

Metering Pump MP-7 shall be energized when treated water flow range is within (operator-adjustable) set point.

Liquid polymer control panel (LPCP) shall receive a 4-to-20-mA dc signal from process water flow meter FIT-100.

When Selector Switch SS-100 is in AUTO position, Metering Pump MP-7 shall be energized and de-energized based on process water flow range. Pumps shall be de-energized upon LOW PROCESS WATER FLOW signal.

When Selector Switch SS-100 is in HAND position, Metering Pump MP-7 will operate manually, and speed control shall be controlled by local potentiometer.

When Selector Switch SS-100 is in OFF position, Metering Pump MP-7 will not operate.

If Metering Pump MP-7 fails under a GENERAL PUMP FAILURE ALARM, a signal shall be sent to the AutoDialer.

END OF SECTION 463341