1. GENERAL

1.1 General Requirements

.1 Design, supply, and installation of a PLC-based control system for the UV Light Disinfection facility that will control and monitor the system in accordance with the requirements defined by the Contract Documents.

.2 PLCs and I/O sub-systems shall be housed in a central marshalling panel to be located adjacent to treatment area.

.3 Design, supply, and installation of a PLC communication network complete with all necessary interface devices, and network hardware.

.4 Cooperation with the Systems Integrator and City staff to interface and test the new PLC system together with the City's existing PLC and SCADA systems.

.5 Start-up and commissioning of the complete control system and associated field devices and wiring.

2. PRODUCTS

2.1 PLCs

.1 General

.1 All new PLC equipment to be based on the Modicon TSX Quantum family as applicable (no substitutions allowed).

.2 All processors are to be sized to provide sufficient capacity to handle the logic and data requirements plus an additional 50% spare CPU memory.

.3 Communication protocol for the new PLC network to be Modbus Plus.

.4 Digital Inputs shall meet or exceed the following criteria:

.1 120 VAC input signals

.2 Individually isolated

.3 Status indicator light for each input

.4 Terminal strip

.5 Digital Outputs shall meet or exceed the following criteria:

.1 Normally open contacts

.2 Individually isolated

.3 120 VAC, 4 A rating

.4 Status indicator light for each output

.5 Terminal strip

.6 Analog Inputs shall meet or exceed the following criteria:

.1 4 to 20 mA DC isolated

.2 12-bit analog-to-digital converter

.3 Accuracy of 0.5% of input range or better

.4 Input impedance of 250 ohms or less

.5 Terminal strip

.7 Analog Outputs shall meet or exceed the following criteria:

.1 4 to 20 mA DC isolated

.2 12-bit analog-to-digital converter

.3 Accuracy of 0.5% of out range or better

.4 Load driving capability of 500 ohms or more

.5 Terminal strip

.8 Modbus Plus will be used to interface to all UV System Control and Power Panels and to the City's existing PLC and SCADA systems.

.9 Provide at least 20% spare I/O of each type in each panel assembly.

.10 Provide all necessary racks, power supplies, cables, communication cards, and accessories.

.11 Provide spares of all PLC system components (minimum of one of each exact type) supplied including: power supply, processor, communication modules, and input/output modules.

.12 Provide 10% spare slot capacity for each PLC panel assembly.

.13 Provide 25% spare power supply capacity for each PLC panel assembly.

.14 Each new PLC panel assembly is to include a true on-line uninterruptible power supply (UPS) system suitably suited to maintain the panel load for at least sixty minutes and;

incoming power transient surge suppression equal to Sola Hevi-Duty STV100K series. Connect the surge suppressor dry contacts to a PLC input and configure as an alarm on the control system at each panel.

.2 UV Master PLC

.1 Modicon TSX Quantum main processor and hot standby CPU.

.2 Modbus Plus communication interface built into each processor.

.3 Network Option Module to facilitate connection of a second Modbus Plus Network to interface with the UV system.

.4 I/O modules as defined on the I/O lists.

.5 Uninterruptable Power Supply (UPS).

.6 New panel assembly to be located in the lower south Mezzanine area of the Deacon Booster Pumping Station. Refer to the drawings for the exact location.

2.2 System Integration Requirements

.1 Cooperate and coordinate activities with other contractors, City staff, and consultants to facilitate installation, testing, validation, and commissioning of the UV Light Disinfection System.

.2 Supply, install, test and commission the UV Master PLC Control Panel as specified in this Division and as shown on the Drawings.

.3 Extend the existing Modbus Plus Network and assist the Systems Integrator to establish communication between the UV Master PLC, Station Master PLC and each of the Pump PLCs. Test data exchange with each PLC as defined in this Division and the process description.

.4 Supply and install a Modbus Plus Network between the UV Master PLC and each of the six UV System Control and Power Panels supplied under separate contract. Assist the Systems Integrator to establish communication using the peer cop utility and test data exchange between the noted PLCs.

.5 All equipment testing and commissioning responsibilities must be carried out while at the same time maintaining the Booster Pumping Station monitoring and control operation. Any equipment outage requirements are to be kept to a minimum and are to be scheduled with the Contract Administrator prior to implementation. Control system shutdowns can not be accommodated during high demand season from May to September.

3. EXECUTION

3.1 Performance – General

.1 Refer to Section 17010, Part 3

3.2 Installation

.1 Provide hardware in accordance with the foregoing requirements in sufficient quantity to satisfy the performance requirements defined in this and other Divisions of the Specification.

.2 Provide all necessary documentation to define the control system including details for all hardware.

.3 Commission and start up the system as defined herein.

.4 Provide all documentation and training as defined herein.

.5 Maintain existing plant operation during entire construction period. Refer to the requirements of Division 1.

END OF SECTION