

## **SECTION XXXX SUPEROXYGENATION SYSTEM**

### **PART 1 GENERAL**

SuperOxygenation System includes the Downflow Bubble Contactor, PLC driven Process Control Panel and Oxygen Flow Control Panel. Equipment in the specification will be purchased by OWNER and supplied to CONTRACTOR for installation.

### **PART 2 SUBMITTALS**

- 2.1 The SUPPLIER shall furnish drawings of the Downflow Bubble Contactor, Process Control Panel and Oxygen flow control panels for approval of overall dimensions and intake and outlet flange sizes and locations prior to manufacture.
- 2.2 Operation and Maintenance (O&M) Manuals will be provided prior to SuperOxygenation System startup.

### **PART 3 EQUIPMENT DESIGN**

- 3.1 The SuperOxygenation System design is based upon technical information provided by OWNER. This technical information is provided at the end of this section.

### **PART 4 EQUIPMENT**

- 4.1 The Downflow Bubble Contactor shall nominally be XX feet tall and XX feet in diameter. It shall be fabricated of 304 stainless steel and shall be ASME pressure rated. The inlet and outlet liquid connections shall be X inches in diameter ANSI flanges. The oxygen gas connection shall be X inch female NPT threaded connection.
  - 4.2 The Process Control Panel shall include a NEMA rated enclosure, Programmable Logic Controller, Panel View Screen, Side Stream Flow Meter, Alarm Capability, Data Logging/Trending, Pressure Sensor, and a Temperature Sensor.
  - 4.3 The Oxygen Flow Control Panel shall include a Stainless Steel Panel, Oxygen Mass Flow Meter, Rotometer, two Solenoid Valves, two Check Valves, two Isolation Valves and stainless steel tubing. The inlet oxygen connection shall be XX inch female NPT threaded connection.
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## PART 5 OPERATION

- 5.1 The SuperOxygenation system operates by redirecting a side-stream flow of wastewater and pumps it through the Downflow Bubble Contactor. The PLC Control Panel monitors the force main flow rate and determines the oxygen flow. Gaseous oxygen is fed into the Downflow Bubble Contactor by the Oxygen Flow Control Panel. Enough oxygen is dissolved into the force main to sustain aerobic conditions.
- 5.2 The Downflow Bubble Contactor provides a large oxygen/wastewater interface generated by an intense bubble swarm to achieve oxygen dissolution such that the gaseous oxygen is completely dissolved into the wastewater before being discharged.
- 5.3 The PLC shall monitor the force main wastewater flow. Based on this flow, the PLC shall calculate an instantaneous Hydraulic Retention Time (HRT) of the wastewater within the force main. The HRT shall equate to an oxygen uptake rate of the force main. The PLC shall be capable of adjusting the oxygen feed rate into the Downflow Bubble Contactor by means of the Oxygen Mass Flow Meter to match the oxygen uptake rate.
- 5.4 The PLC shall also monitor side-stream pump operation, side stream water flow rate, oxygen flow rate, water pressure and water temperature. These parameters shall be checked against design inputs to ensure optimal system performance and provide for system shutdown and/or alarm notification if operation is out of tolerance.

## PART 6 WARRANTY

- 6.1 SUPPLIER will provide an equipment warranty for the SuperOxygenation System. The equipment warranty will be for a period of one (1) year from the date of initial operation of the SuperOxygenation System and shall be limited to the repair or replacement of the SuperOxygenation System.

## PART 7 SUPPLIER

- 7.1 All Equipment under this specification shall be provided by ECO Oxygen Technologies, LLC, Indianapolis, IN
    - A. Contractor is required by OWNER to execute and abide by SUPPLIER'S Terms and Conditions of Purchase Agreement
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provided at the end of this section.

- B. OWNER will enter into a separate Process Technology License Agreement directly with SUPPLIER as referenced in paragraph 12 of the Terms and Conditions of Purchase Agreement.

END OF SECTION

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