# ADDENDUM NUMBER 2

LAKE HARTWELL WTP OGS IMPROVEMENTS
FOR
ANDERSON REGIONAL JOINT WATER SYSTEM
GMC PROJECT NO. CGRE230068

1. **Revisions to the Project Manual**

1.1. The following revisions are hereby added as Addendum No. 2 to the referenced Project Manual and Plans and shall be considered when preparing bids. All documents listed below are included with this Addendum.

- Update sheets X-801 and X-802: Demo required revised to reflect work performed by the Owner
- Update sheets D-801 and D-802: Calibration column and pressure relief piping added for chemical dosing pumps
- Update sheets I-002 and I-811: Calibration column and pressure relief piping added for chemical dosing pumps
- Update specification 46 33 44: Language modified to reflect a field mounted dosing pump assembly.

2. **Questions**

2.1. What are the limits of high-performance coating?

**Answer:** *Correction to Addendum 1* – Coating should cover the room floor and extend 4-feet up the interior walls to the limit indicated on sheet D-802 of the bid set.

2.2. How much coating is on this project?

**Answer:** Approximately 1,077 sq ft

2.3. Skid framework vs. field mounted chemical metering pumps?

**Answer:** Chemical metering pumps shall be field mounted

2.4. Calibration column and pressure relief valves on chemical metering pumps?

**Answer:** Refer to updated plan sheets for addition of calibration column

2.5. Article 4.2 of the Qualifications Statement requires the EMR, TRFR and MH history of the last 3 years of any proposed subcontractors that will have a value of 10% of more of the contract price. Can this requirement be provided after the bid if it is applicable to the final bid?

**Answer:** Yes, this can be provided after the bid, but must be submitted prior to award.

## 2. Acknowledgement

2.1 Receipt of Addendum No. 2 shall be acknowledged in two ways:

2.1.1 Note on Bid Form of the Project Manual – Bidder acknowledges receipt of "Addendum No. 2" and date of "September 25, 2024".

**AND**

2.1.3 EMAIL Goodwyn Mills Cawood, LLC immediately at becca.pick@gmcnetwork.com

## 3. Attachments

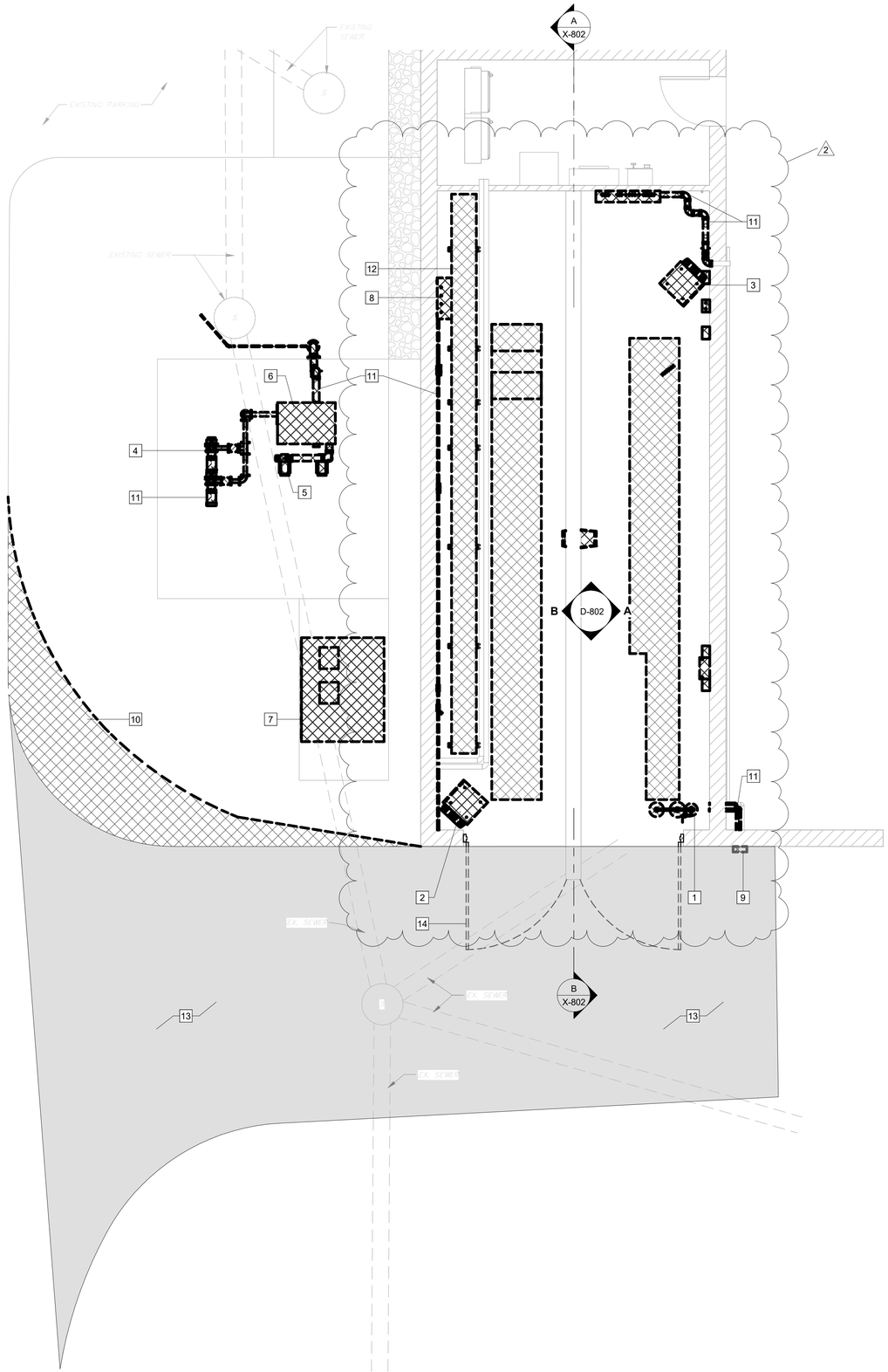
3.1 Sheets X-801, X-802, D-801, D-802, I-002, I-811

3.2 Specification 46 33 44

## 4. Conclusion

4.1 This is the end of Addendum Number 2, dated Friday, September 25, 2024.

**Hannah Ribelin, EIT**




**KEY NOTES:** #

1. REMOVE: EMERGENCY SHOWER AND EYEWASH STATION
2. REMOVE: UNIT HEATER
3. REMOVE: IN-LINE CEILING EXHAUST FAN
4. REMOVE: OXIDANT TRANSFER PUMPS
5. REMOVE: DILUTION BLOWERS
6. REMOVE: STANDPIPE
7. REMOVE: CHILLER CONDENSERS
8. REMOVE: CONTROL PANEL
9. REMOVE: RACEWAY
10. REMOVE: PAVEMENT
11. REMOVE: PIPING AND PIPING ACCESSORIES
12. REMOVE AND SALVAGE: DUCT WORK
13. REMOVE AND REINSTALL: PAVEMENT
14. REMOVE AND REPLACE: DOORS

GMC
117 Welborn Street
Greenville, SC 29601
T 864.527.0460

SOUTH CAROLINA GOODWYN, MILLS & CAWOOD LLC. No. 6481 CERTIFICATE OF AUTHORIZATION

1" 0" .5" 1"

ISSUE | DATE

| | |
|---|---|
| 100% Submittal | 07.15.2024 |
| Bid Set | 08.02.2024 |
| Addendum 1 | 09.06.2024 |
| Addendum 2 | 09.20.2024 |
| Conformed Set | |
| Project Manager: | AH |
| Engineer: | TR |
| Designer: | HR |
| Drawn By: | LS |

LAKE HARTWELL WTP
OGS IMPROVEMENTS
ANDERSON REGIONAL JOINT WATER SYSTEM
ANDERSON, SC

CGRE230068

**GENERATION BUILDING - PLAN**

X-801

8 X-801 **PLAN**
SCALE: 1/4" = 1'-0"

BIM 360://Lake Hartwell WTP Raw Water Pumps and OGS Improvements/OGS building.rvt B.U_kevin.downing@gmcnetwork.com.rvt
9/19/2024 11:21:48 AM

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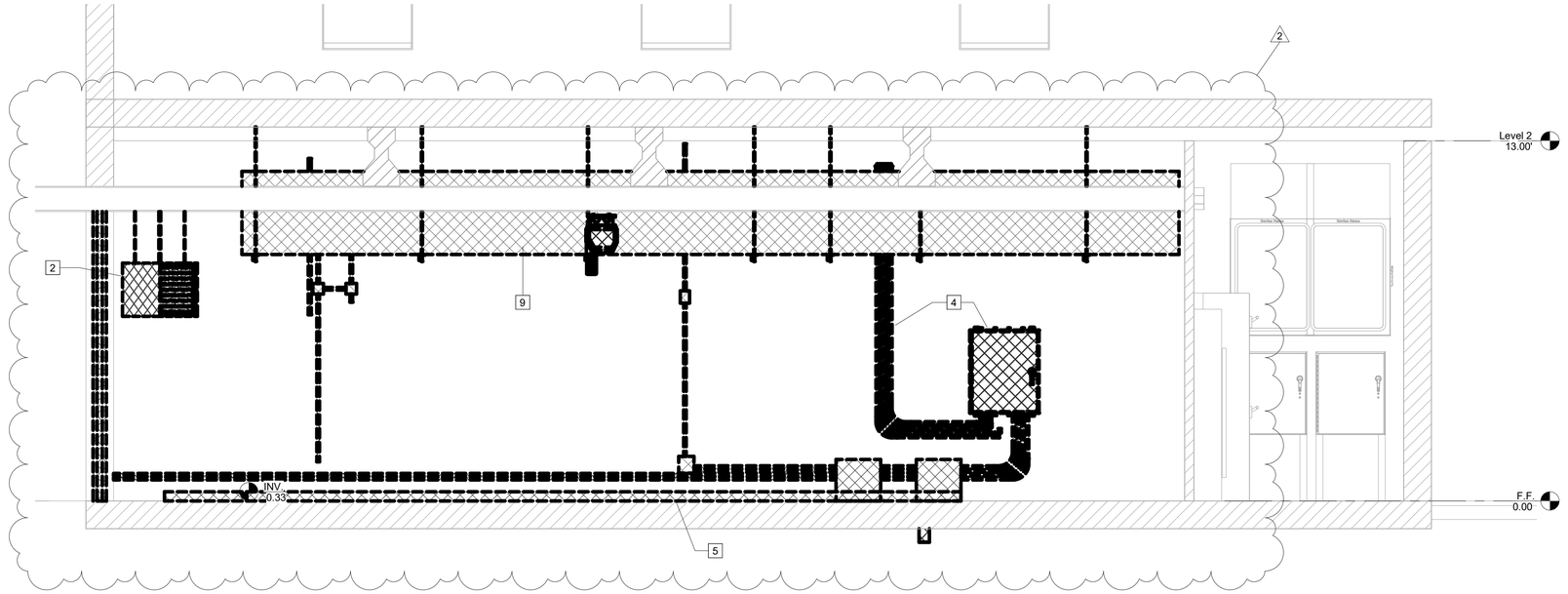
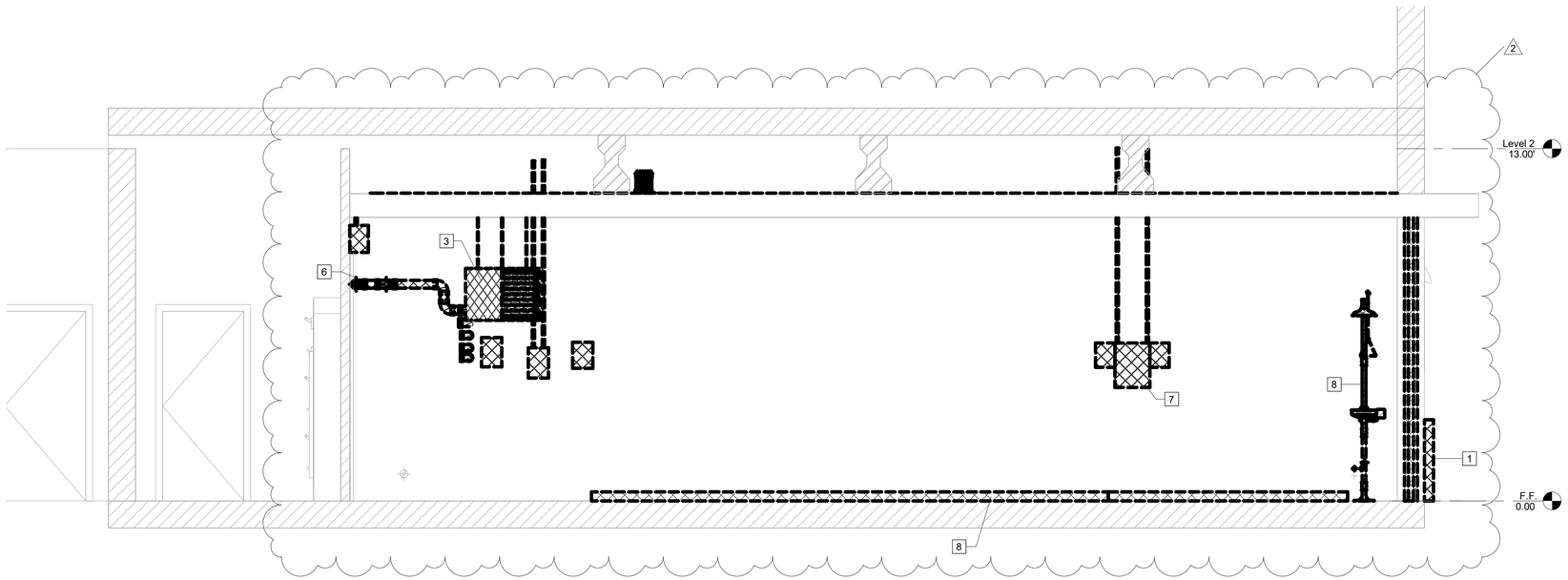



A X-802 **SECTION**

SCALE: 3/8" = 1'-0"

**KEY NOTES:** #

1. REMOVE: RACEWAY
2. REMOVE: UNIT HEATER
3. REMOVE: IN-LINE CEILING EXHAUST FAN
4. REMOVE: ELECTRICAL CONDUIT AND CONTROL PANEL
5. REMOVE: CONCRETE EQUIPMENT PAD AND REPAIR FLOOR
6. REMOVE: MIOX INTAKE PIPING
7. REMOVE: HYPO DILUTION PUMP PANEL AND DISCONNECT
8. REMOVE: ADAM EMERGENCY SHOWER AND EYEWASH STATION
9. REMOVE AND SALVAGE: DUCT WORK




B X-802 **SECTION**

SCALE: 3/8" = 1'-0"

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**GENERATION**
**BUILDING - SECTIONS**

# X-802

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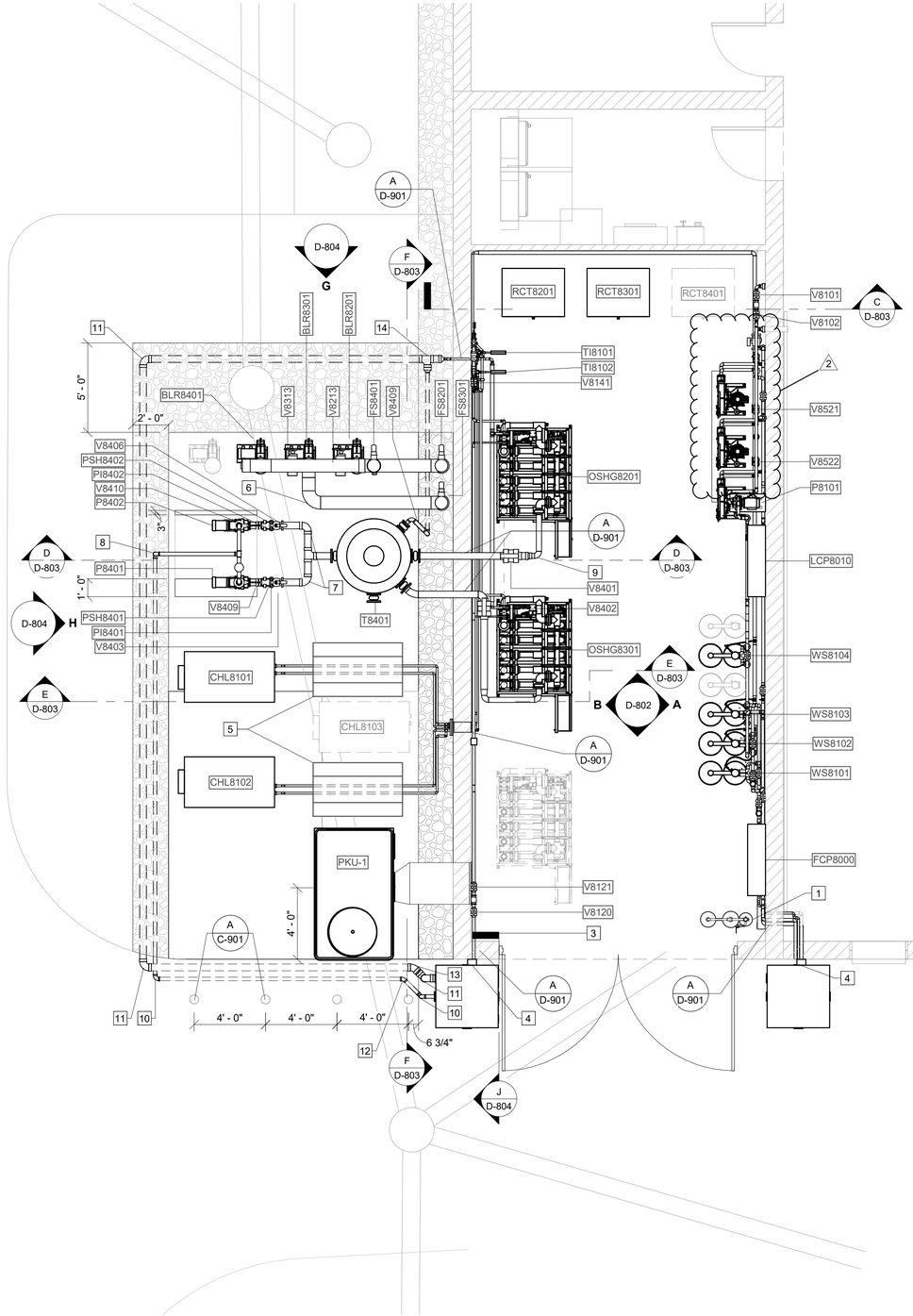


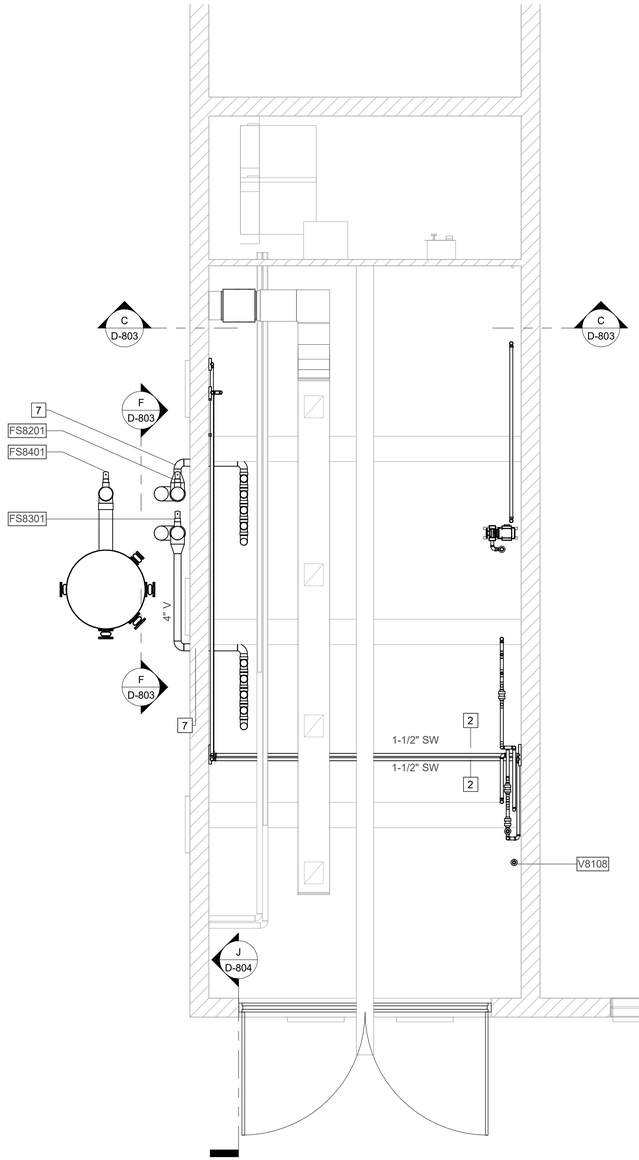


**8A** D-801 **LOWER PLAN**
SCALE: 1/4" = 1'-0"

**8B** D-801 **UPPER PLAN**
SCALE: 1/4" = 1'-0"

## GENERAL NOTES:

1. ALL PIPING TO BE SCH 80 PVC W/ PVC SOCLET AND PVC CEMENT
2. INSTALL HYDROGEN DETECTOR AND TRANSMITTER PROVIDED BY OSHG SKID MANUFACTURER ACCORDING TO MANUFACTURER INSTRUCTIONS
3. SECURE OSHG SKID AND RECTIFIER TO FLOOR WITH SST MECHANICAL ANCHORS

## KEY NOTES: [#]

1. EMERGENCY SHOWER AND EYEWASH STATION
2. 1-1/2" SOFTENED WATER FEED TO OSHG SYSTEM
3. 1/2" BRINE FEED SYSTEM TO OSHG SYSTEM
4. METAL RACEWAY
5. 36" X 60" ANTI-SLIP PIPE COVER
6. 8" 90° FL BEND
7. 4" 90° FL BEND
8. 2" 90° FL BEND
9. 3" 90° FL BEND
10. 2" 90° MJ BEND
11. 4" 90° MJ BEND
12. 2" 45° MJ BEND
13. 4" 45° MJ BEND
14. 4" X 2" TEE FOR GRAVITY DRAIN LINE, INVERT = 780' (CONTRACTOR TO FIELD VERIFY DEPTH OF EXISTING SEWER)

GMC
117 Welborn Street
Greenville, SC 29601
T 864.527.0460

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ANDERSON REGIONAL JOINT WATER SYSTEM
ANDERSON, SC

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GENERATION BUILDING - PLANS

D-801

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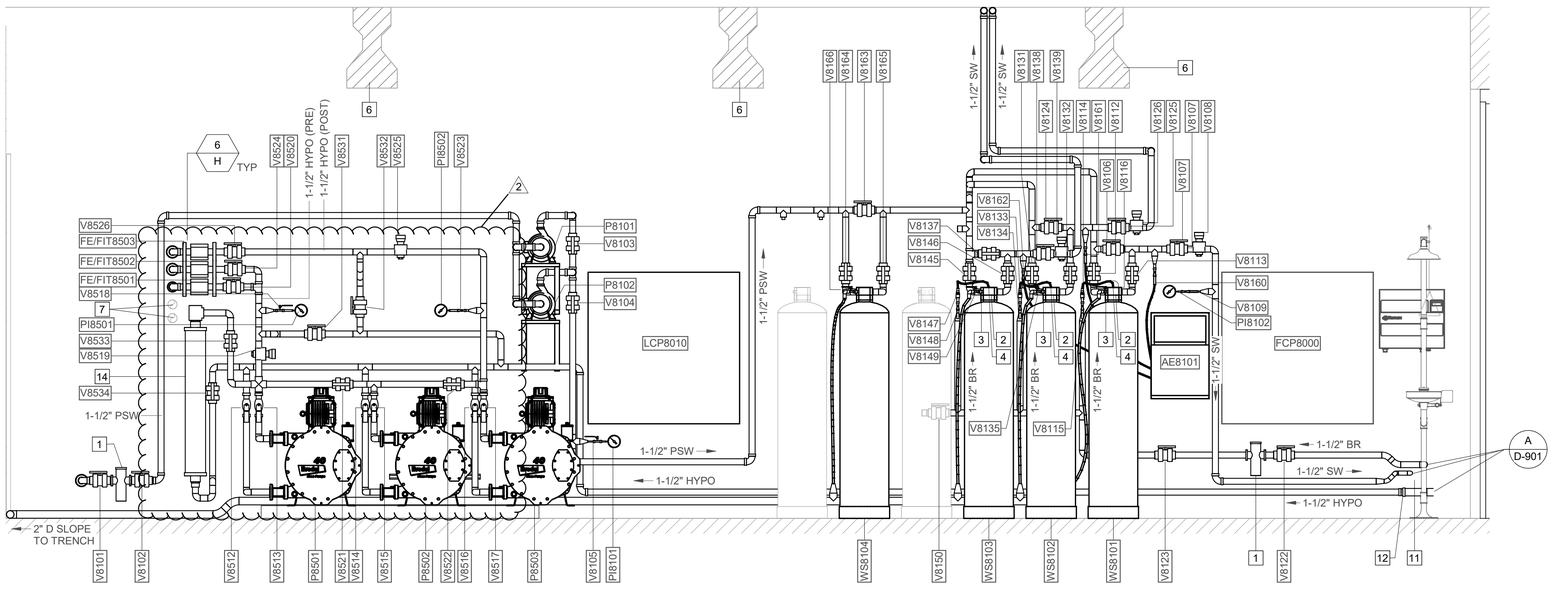
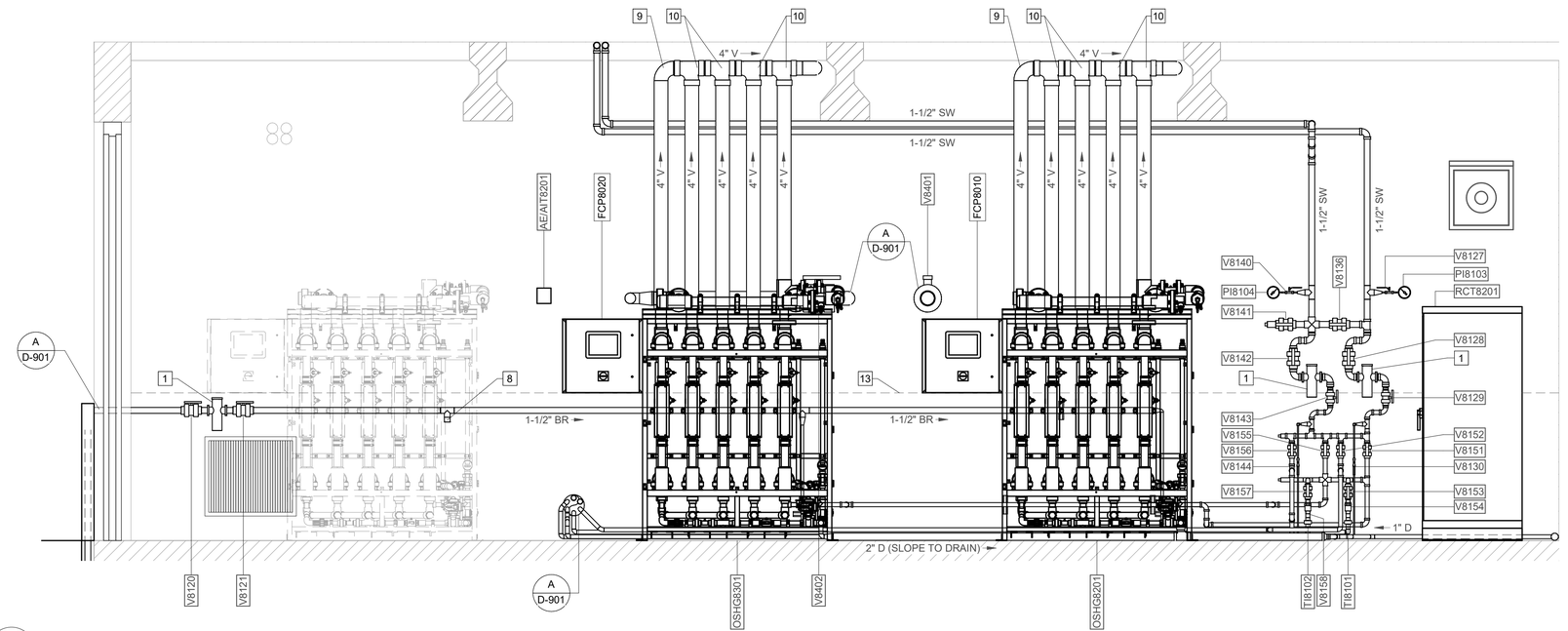



A D-801 **ELEVATION**

SCALE: 1/2" = 1'-0"




B D-801 **ELEVATION**

SCALE: 1/2" = 1'-0"

**KEY NOTES:** #

1. 50 MICRON FILTER
2. CONNECT 1-1/2" SCH. 80 PVC PIPING TO BRASS ADAPTERS ON WATER SOFTNER USING PRO-PRESS MACHINE OR SWEAT AND 1-1/2" FEMALE PRESS; ALTERNATIVELY MAY USE 1-1/2" SCH. 80 MALE ADAPTER WITH 2-PART EPOXY; REMOVE #4 DISC FROM WATER SOFTENER AND INSTALL #1 DISC FOR PROPER OPERATION
3. 5/8" OD PE TUBING FOR WATER SOFTENER DRAIN; CONNECT TO 1/2"; CONNECT TO 1/2" SCH. 40 OR SCH. 80 PVC PIPING
4. 3/8" OD PE TUBING FOR BRINE FEED CONNECTED VIA BARB AND SST PIPE CLAMP TO 1-1/2" FEED PIPING DOWNSTREAM OF EXISTING ISOLATION AND CHECK VALVES; CONNECT TO WATER SOFTENER
5. CLEAR SCH. 80 PVC PIPING
6. BEAM LOCATION IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE EXACT LOCATION & AVOID ANY CONFLICTS.
7. CAP EXISTING HOLES FOR FUTURE USE
8. CAP PIPE FOR FUTURE USE
9. 4" 90° FL BEND
10. 4" TEE
11. CONTRACTOR TO COORDINATE WITH ENGINEER PRIOR TO WORK ON EXISTING AND PROPOSED PIPING IN THIS AREA
12. 2" X 1-1/2" REDUCER
13. LIMIT OF HIGH-PERFORMANCE COATING
14. CALIBRATION COLUMN

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Greenville, SC 29601
T 864.527.0460

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**GENERATION BUILDING - ELEVATIONS**

D-802

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## GENERAL EQUIPMENT

| | |
|---|---|
| CENTRIFUGAL PUMP | HEAT EXCHANGER |
| POSITIVE DISPLACEMENT PUMP | PERISTALTIC PUMP |
| VERTICAL TURBINE PUMP | STATIC MIXER |
| HORIZONTAL SPLIT-CASE PUMP | MIXER |
| ROTARY SCREW COMPRESSOR | SILENCER |
| PROGRESSIVE CAVITY PUMP | DRAIN |
| GRINDER | VENT |
| DIAPHRAGM PUMP | FLEXIBLE HOSE OR JOINT |
| EDUCTOR | DIAPHRAGM OR LOAD CELL |
| CENTRIFUGAL FAN / BLOWER | UNION |
| BLOWER (POSITIVE DISPLACEMENT) | ANNULAR SEAL RING |
| SPRAY NOZZLE | SINGLE ARCH EXPANSION JOINT |
| FILTER/STRAINER | SLIDE GATE |
| HEATER | HIGH-SPEED TURBO BLOWER |
| CALIBRATION COLUMN | |

## VALVES

- GATE
- GLOBE
- CHECK
- DIAPHRAGM
- BALL
- FLOAT
- DUCKBILL CHECK
- NEEDLE
- BUTTERFLY
- SAFETY RELIEF
- PRESSURE REGULATING
- PLUG
- 3-WAY
- AIR RELEASE
- MUD OR FOOT
- PINCH
- KNIFE GATE

## INSTRUMENTS

- FLOWMETER - MAG
- FLOWMETER - PROPELLER
- FLOWMETER - VENTURI
- FLOWMETER - THERMAL MASS
- ROTAMETER
- PARSHALL FLUME
- LEVEL ELEMENT (ULTRASONIC)
- FLOAT SWITCH
- VIBRATING FORK LEVEL SWITCH

## GENERAL FITTINGS

- REDUCER
- FLANGE/BOLTED
- END CAP
- RESTRICTING ORIFICE
- COUPLER CONNECTION

## ACTUATORS

- MOTOR OPERATOR
- SOLENOID
- PNEUMATIC ACTUATOR

## LINE LEGEND

- PRIMARY PROCESS LINE
- SECONDARY PROCESS LINE
- EXISTING
- ELECTRICAL SIGNAL
- ES 120/1 — ELECTRIC SUPPLY VOLTAGE/PHASE
- INSULATED
- HEAT TRACED
- ETHERNET
- PA — PLANT AIR SUPPLY
- IA — INSTRUMENT AIR SUPPLY
- NPW — NON-POTABLE WATER SUPPLY
- PRW — REUSE WATER SUPPLY
- BY VENDOR

GMC
117 Welborn Street
Greenville, SC 29601
T 864.527.0460

SOUTH CAROLINA PROFESSIONAL ENGINEER
NOLLY ZIBOLSKI
GOODWYN MILLS CAWOOD, LLC
No. 9451
CERTIFICATE OF AUTHORIZATION

1" 0" .5" 1"

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# P&ID LEGENDS

I-002

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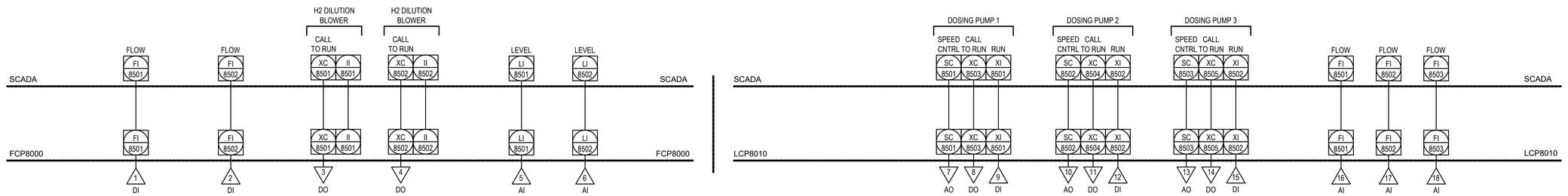


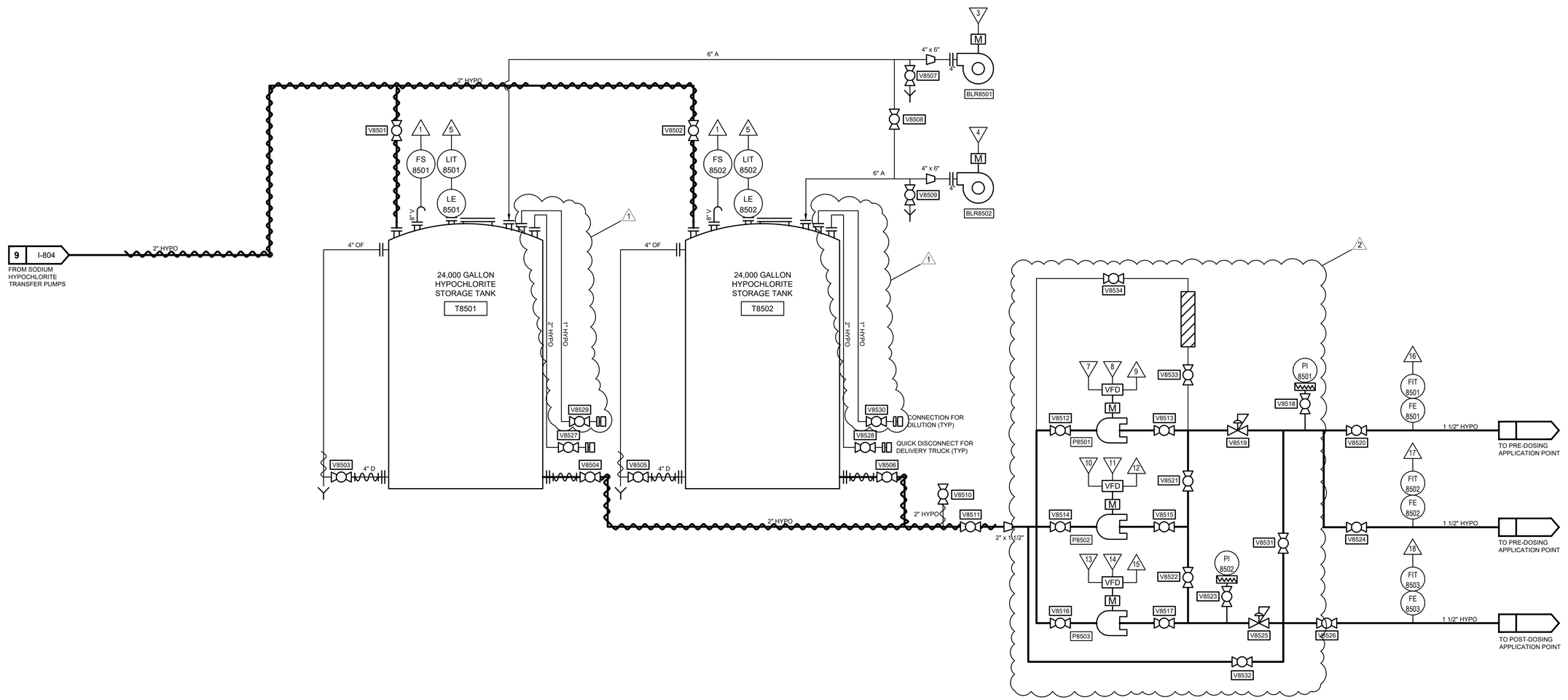


**T8501**
HYPO STORAGE TANK NO. 1
SPEC: 43 41 45
CAPACITY: 24,000 GAL

**T8502**
HYPO STORAGE TANK NO. 2
SPEC: 43 41 45
CAPACITY: 24,000 GAL

**P8501**
DOSING PUMP NO. 1
SPEC: 46 33 41
CAPACITY: 0.0005 - 17.6 GPM
MAX BACK PRESSURE: 30 PSI

**P8502**
DOSING PUMP NO. 2
SPEC: 46 33 41
CAPACITY: 0.0005 - 17.6 GPM
MAX BACK PRESSURE: 30 PSI

**P8503**
DOSING PUMP NO. 3
SPEC: 46 33 41
CAPACITY: 0.0005 - 17.6 GPM
MAX BACK PRESSURE: 30 PSI

**BLR8501**
HYDROGEN DILUTION BLOWER NO. 4
SPEC: 46 33 13
CAPACITY: 609 CFM

**BLR8502**
HYDROGEN DILUTION BLOWER NO. 5
SPEC: 46 33 13
CAPACITY: 609 CFM

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117 Welborn Street
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T 864.527.0460

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No. 6451

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# P&ID - HYPOCHLORITE STORAGE TANKS & DOSING PUMPS

# I-811

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# SECTION 46 33 44 - PERISTALTIC METERING PUMPS

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section Includes:

1. Peristaltic metering pumps and accessories.
2. Valves and Appurtenances.
3. Fabricated enclosure.

B. Related Requirements:

1. Division 26 – Electrical.
2. Division 27 – Communication.
3. Division 40 – Process Interconnections.
4. Section 43 41 45 – Fiberglass Reinforced Plastic Tanks.

### 1.2 REFERENCE STANDARDS

A. U.S. General Services Administration:

1. ZZ-R-765 - Commercial Item Description: Rubber, Silicone.

B. Instrument Society of America (ISA):

1. ISA 5.1 - Instrumentation Symbols and Identification.
2. ISA 20 - Specification Forms for Process Measurement and Control Instruments Primary Elements and Control Valves.

C. National Electric Code (NEC)

D. Occupational Safety and Health Administration (OSHA)

### 1.3 COORDINATION

A. Section 01 31 00 – Project Management and Coordination: Requirements for coordination.

B. Section 01 32 16 – Construction Progress Schedule: Requirements for scheduling.

C. Coordinate Work of this Section with Engineer/Owner. Schedule Work of this Section after finishing concrete work for housekeeping pad and prior to connecting piping work.

D. Integrate instrumentation and control devices provided under other Sections.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data:

1. Submit pump performance characteristics.
2. Submit electrical characteristics and connection requirements.
3. Submit manufacturer model number, dimensions, service sizes, and finishes.

C. Shop Drawings:

1. Symbology and Nomenclature: Comply with ISA 5.1.
2. Submit detailed and certified dimensional Shop Drawings for materials and equipment, including wiring and control diagrams, performance charts and curves, installation and anchoring requirements, fasteners, and other details.
3. Indicate interfaces between instruments, motor starters, control valves, variable-speed drives and flow meters.

D. Data Sheets:

1. Comply with ISA 20.
2. Submit following:

a. Manufacturer's model number or designation.
b. Component system or loop.
c. Installation location.
d. Input and output characteristics.
e. Scale, range and units.
f. Requirements for electric and plant water requirements.
g. Materials of component parts in contact with process chemicals.
h. Special requirements or features.

E. Manufacturer's Instructions:

1. Submit detailed instructions on installation requirements, including storage and handling procedures, anchoring, and layout.
2. Submit application, selection, and hookup configuration with pipe and accessory elevations.
3. Submit hanging and support requirements and recommendations.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

G. Manufacturer Reports: Indicate that equipment has been installed according to manufacturer's instructions.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for closeout procedures.

B. 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. Record actual locations and final orientation of equipment and accessories.

C. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.

## 1.6 SPARE PARTS

A. Each chemical metering pump shall be provided with the following as applicable:

1. Two replacement hoses.
2. Two hose lubricant refills.

## 1.7 QUALITY ASSURANCE

A. Ensure that materials of construction on pump liquid end are compatible with chemicals listed in the chemical feed schedule at the end of this specification.

B. Pumps shall be supplied and labeled by the original manufacturer. Relabeled products shall not be acceptable.

## 1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 – Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept pumps on-site in manufacturer's original packaging and inspect for damage.

C. Store materials according to manufacturer instructions.

D. Protection:

1. Store products in areas protected from weather, moisture, or possible damage.
2. Do not store products directly on ground.
3. Handle products to prevent damage to interior or exterior surfaces.

## 1.9 WARRANTY

A. Section 01 70 00 – Execution and Closeout Requirements: Requirements for warranties.

B. The Manufacturer and Contractor shall furnish a warranty extending twelve (12) months after substantial completion date on the wet end.

C. The Manufacturer shall furnish a warranty extending twenty-four (24) months after substantial completion date on the mechanical drive.

PART 2 - PRODUCTS

2.1 PERISTALTIC-TYPE METERING PUMPS

A. Manufacturers:

1. The equipment, peristaltic metering pumps, shall be manufactured by:

a. Watson-Marlow Bredel Pumps; Wilmington, MA.
b. Or Approved Equal.

2. Changes to the arrangement indicated in the specifications and in the plan, set shall be at the expense of the installing contractor. No change orders will be issued to the contractor for modifications to the laying length, footprint, concrete layout, electrical, mechanical, etc.

B. Description: Self-priming peristaltic metering pump and accessories.

C. Capacity:

1. See schedule.
2. Discharge Pressure: See schedule.
3. Process Fluid Viscosity: See schedule.

D. Materials:

1. As recommended by manufacturer for dosing chemical.

E. Construction:

1. The chemical feed pump shall be of the horizontal, positive displacement, peristaltic hose pump type capable of operating in either direction without flow variation.

a. Pump shall be capable of being rotated in 90-degree increments for four (4) different port-mounting configurations.

b. Hose shall be manufactured of three-layer elastomer with an extruded inner wetted layer compatible with the process fluid, four layers of nylon reinforcement and a Natural Rubber outer layer. Hose outside diameter shall be machined to maintain a wall thickness within $\pm$ 0.25 mm tolerance. The hose external surface shall have a surface roughness of Ra 8$\pm$ 4m. Hoses must have a smooth extruded internal surface and have tolerance controlled through machining. Hoses must have a minimum static burst pressure rating of 800 psi and be replaceable without cover or pump removal.

c. Pump housing shall be cast iron (ASTM A48 Class 40) and shall be supplied with an internal bearing hub to support the rotor on its own bearings. Provide a threaded drain plug at the lowest point of the pumping chamber to allow complete drainage of lubricant. Pump rotor shall be Cast Iron rotor ASTM A48 Class 25 with adjustable, shimmable shoes constructed of epoxy or extruded aluminum as

recommended by the manufacturer. Shims shall be constructed of 316 Stainless Steel with a shim thickness of 0.5mm. The specified manufacturing tolerance of the hose, when compressed, shall not exceed the occlusion setting of one shim.

d. Supply pump with flanged 316SS inlet and outlet to ANSI/ASA 150# standards with wetted inserts compatible with the process fluid as indicated in the Process Pump Schedule. Flange supports shall be 316SS and of one piece construction and shall secure to the pump housing via two or four bolts to maintain a compression seal between the pump housing and hose.

e. Pump cover shall be constructed of ASTM A245 Class 36 Cast Iron. Equip cover with a viewing window constructed of PMMA to allow clear visual confirmation of direction of rotation. Window shall be marked with a minimum lubricant registration mark for proper indication of lubricant level when pump is stationary. For pumps with adjustable shoes, the window shall be large enough to replace pressing shoes and allow shim adjustment without removing pump cover. Pump covers shall be bolted along the perimeter to the pump housing and shall seal via a captive quadring seal.

f. Each pump shall be provided with high lubricant leak detection system. Leak detection systems shall not trigger when exposed to water.

g. Provide premium efficient, TEFC or TENV, squirrel-cage induction motors, NEMA C face, conforming to the latest applicable requirements of NEMA, IEEE, ANSI, and NEC standards. Motors are to be designed for continuous duty for 3-phase, 230/460VAC operation, NEMA Design B with torque and starting currents in accordance with NEMA MG1-1993-12.35 and 12.38. Ratings to be based on a 40 degree C ambient 3,300 feet altitude or lower operation with a maximum temperature rise of 80 degree by resistance C at 1.0 service factor (and 90 degree C rise 1.15 service factor).

F. Operation:

1. Electrical Characteristics: As specified in Division 26 – Electrical and following:

   a. 2 hp.
   b. Voltage: 230/460 VAC, three phase, 60 Hz.

2. Motors: As specified in Section 40 05 93 - Common Motor Requirements for Process Equipment.
3. Disconnect Switch: Factory mounted at equipment.

G. Controls:

1. Panel shall be equipped with a three-position hand/off/auto switch. When in the Hand position, pump speed shall be regulated via panel mounted speed potentiometer and shall be started or stopped via the panel mounted local start/stop pushbuttons. When in the Off position, the pump shall be off. When in the Auto position, the panel will require a closed contact remote start signal and will pace pump speed based on a remote 4-20mA input signal. When in Auto, pump will not

stop until remote start contact is disengaged or the Emergency Stop has been engaged. Provide output status contact to indicate to a remote source when the pump is running in the Auto mode.

2. When running, the Pump Running light shall be illuminated and running time shall be logged on the ETM. Provide output status contact to indicate to a remote source that the pump is running and an output 4-20mA signal to indicate pump speed. When stopped, the Pump Stopped light shall be illuminated.

3. Provide Pump Failure detection which shall stop the pump in the event of a hose failure, overpressure, or drive failure. When such an event occurs, the Pump Failure light shall be illuminated simultaneously with the corresponding Fault light. Provide output status contact to indicate to a remote source when the pump has stopped due to failure. Alarm horn shall engage in the event of a failure and shall be equipped with a silence pushbutton. Provide a reset pushbutton to restore the pump to functional mode once failure has been corrected.

4. Hose failure shall be detected by a Normally Closed float switch mounted on the pump.

5. High discharge pressure shall be detected by a Normally Closed pressure switch located within the discharge line of the pump.

6. Drive failure shall be detected via current limit and software fault detection of the VFD

7. Provide local forward/reverse switch to locally change pump direction.

2.2 ACCESSORIES

A. Hose:

1. Material: As indicated on schedule.

2. Pressure Rating: As indicated on schedule.

B. Feed System:

a. Feed system design shall be such that the wetted end of the pump is orientated at the open end of the framework for easy access. Systems designed with the wet end of the pump facing the back wall shall not be acceptable.

C. Calibration Column:

a. One calibration column shall be supplied with each metering pump. The calibration column shall be constructed of clear PVC. Graduations shall be in milliliters and it shall be sized for a minimum 30 second drawdown when the metering pump is operating at 100% capacity.

2. Pressure Relief Valve:

   a. Two pressure relief valves shall be installed in the common discharge piping. Pressure relief valves shall be of the 2-port design and shall be equipped with socket, flanged or compression connections. Pressure relief valves shall be field adjustable from 10 to 150 psig without the need for special tools.

3. Discharge Pressure Gauge with Diaphragm Seal:

   a. One discharge pressure gauge and diaphragm seal assembly shall be supplied with each system discharge. The 2.5" pressure gauge shall be rated 0-100 psig, have a white face with black lettering and be of phenolic construction. Discharge Gauge shall be assembled to a Diaphragm Seal with a Viton Diaphragm and 1/2-inch NPT PVC process connection.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Install power and control and wiring as specified in Division 26 – Electrical.

B. Flush hosing with clean water.

### 3.2 START-UP AND PERFORMANCE WARRANTY TESTS

A. Make equipment adjustments required to place system in proper operating condition.

B. Test each feed system for proper operation in the presence of the Owner. All testing costs are the Contractors.

C. Furnish all testing equipment, special instruments and devices required for performance testing.

D. Modify and/or replace defective equipment until it meets specified requirements. Re-test system to verify satisfactory operation.

E. Demonstrate the accuracy of each metering pump using job supplied calibration column.

### 3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 – Quality Requirements: Requirements for inspecting and testing.

B. Section 01 70 00 – Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

C. Pre-operational Check: Before operating system or components, vent air from system to ensure water in pump.

D. Startup and Performance Testing:

1. Test metering pump flow rate by measuring time to fill or by draining calibration column with potable water.
2. Operate each chemical feed system on clear water for continuous period of four hours.
3. Hydrostatically test system piping for leaks at the pumps listed pressure rating.
4. Tags: Attach calibration and testing tag to each device, signed and dated by device manufacturer's representative after calibration has been completed.

E. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than two (2) 8-hour days on-Site for installation, inspection, field testing, and instructing Owner's personnel in maintenance of equipment.

F. Equipment Acceptance:

1. Adjust, repair, modify, or replace components failing to perform as specified, and rerun tests.
2. Make final adjustments to equipment under direction of manufacturer's representative.

G. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

## 3.4 DEMONSTRATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for demonstration and training.

B. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

C. Demonstrate system control functions and alarms.

## 3.5 ATTACHMENTS

A. Chemical Feed Pump Schedule:

1. Sodium Hypochlorite Pumps: P8501, P8502, P8503

a. Location: Chemical Building.
b. Pump Type: Peristaltic.
c. Dosing Chemical: Sodium hypochlorite.

1) Physical state: Clear to slightly greenish-yellow liquid.
2) Concentration by weight: 0.8 %.
3) Specific gravity: 1.02 @ 60 degrees F.
4) Viscosity: 1.0 cPs
5) Minimum temperature: 55 degrees F.
6) Maximum temperature: 95 degrees F.

d. Flow Capacity: 15.38 GPM.

e. Discharge Pressure: < 5 psig.
f. Motor Size: 2 HP, direct drive.
g. Field-mounted triplex assembly.
h. 1 1/2" pipe connection.
i. Viton seals or approved equal.
j. Pressure relief valves (2).
k. Pressure gauges with guards (2).
l. Calibration columns (2).

END OF SECTION 46 33 44