

## SECTION 17201

### LEVEL MEASUREMENT: SWITCHES

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section includes:
  - 1. Tuning fork level switch
  - 2. Ball float level switch.
  - 3. Displacement float level switch.
  
- B. Related sections:
  - 1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
  - 2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
  - 3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents.
    - a. Section 01330 - Submittal Procedures.
    - b. Section 17050 – Basic Measurement and Control Instrumentation Material and Methods.
  
- C. Provide all instruments identified in the Contract Documents.

##### 1.02 REFERENCES

- A. As specified in Section 17050.

##### 1.03 DEFINITIONS

- A. As specified in Section 17050.

##### 1.04 SUBMITTALS

- A. Furnish submittals as specified in Sections 01330 and 17050.
  
- B. Provide complete documentation covering the traceability of all calibration instruments.

##### 1.05 QUALITY ASSURANCE

- A. As specified in Section 17050.

- B. Examine the complete set of Contract Documents and verify that the instruments are compatible with the installed conditions including:
  - 1. Process conditions: Fluids, pressures, temperatures, flows, materials etc.
  - 2. Physical conditions:
    - a. Installation and mounting requirements.
    - b. Location within the process.
    - c. Accessories: Verify that all required accessories are provided and are compatible with the process conditions and physical installation.
- C. Notify the Engineer if any installation condition does not meet the instrument manufacturer's recommendations or specifications.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. As specified in Section 17050.

#### **1.07 PROJECT OR SITE CONDITIONS**

- A. Project environmental conditions as specified in Section 17050.
  - 1. Provide instruments suitable for the installed site conditions including, but not limited to, material compatibility, site altitude, site seismic conditions, humidity, and process and ambient temperatures.

#### **1.08 WARRANTY**

- A. As specified in Section 17050.

#### **1.09 MAINTENANCE**

- A. Furnish all parts, materials, fluids, etc. necessary for operation, maintenance, and calibration purposes throughout the warranty period. Deliver all of these supplies before project substantial completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. One of the following or equal:
  - 1. Tuning Fork Level Switch
    - a. E&H, Liquiphant
    - b. Rosemount, 2100 Series
    - c. Vega, 63 Series
  - 2. Ball float level switch:
    - a. Anchor Scientific Incorporated Roto-Float (CWS Preferred)
    - b. Siemens Water Technologies Corp 9G-EF.
    - c. ITT Flygt Model ENM-10.
  - 3. Displacement float level switch:
    - a. Gems Sensors and Controls Series LS-3.
    - b. B/W Unifloat.

## 2.02 MANUFACTURED UNITS

- A. Tuning Fork Level Switch
  - 1. General: Tuning fork level switches comprised of a control relay, mechanically rigid fork, and transmitter housing.
  - 2. Switch: The control relay senses the liquid level by frequency attenuation at the probe fork when immersed.
    - a. Power Supply:
      - 1) 120 VAC
      - 2) Power Consumption: 10 VA maximum.
    - b. Outputs:
      - 1) Relay outputs:
        - a) 1 Form C contact
        - b) 5 amperes at 24VDC and 120VAC.
        - c) Programmable for NO or NC on liquid presence.
    - c. Electrical connection: One 1/2-inch NPT conduit entry.
    - d. Enclosure: NEMA 4X.
    - e. Approvals: Unclassified, unless located in a classified area.
- B. Ball float level switch:
  - 1. General:
    - a. Free hanging, encapsulated body with a switch to determine position of float.
  - 2. Element:
    - a. Mechanical switch encapsulated in waterproof floating polypropylene ball of nominal diameter, supported by flexible PVC cable and jacket or heavy neoprene.
    - b. The length of the PVC cable shall be, at a minimum, equal to sump depth plus 5 feet.
    - c. Float: Provide Type 316 stainless steel, minimum 3 inches in diameter. The float shall provide a minimum of 2 pounds of buoyancy in solutions with specific gravity of 1 and shall have an operating temperature rating of -30 degrees Fahrenheit to +150 degrees Fahrenheit.
    - d. Lead wires: Mounted in flexible waterproof PVC cable from switch to junction box terminals without splices.
  - 3. Switch:
    - a. Single pole double throw contacts rated 10 amps resistive at 120 VAC.
    - b. Provide the number of floats per level system as indicated on the Drawings.
    - c. Suspend ball float and adjust for level setpoint as required.
  - 4. Components:
    - a. Float cable length shall meet design length plus an additional 10 feet to provide excess when installed in a wetwell or sump.
    - b. Floats shall include Type 316 stainless steel clamp and brackets and 1/4 inch cable to allow testing of the float without entering the basin or wet well.
    - c. Provide all Type 316 stainless steel strain relief at both ends of the float cable.
    - d. Float anchors:
      - 1) Float anchors are not installed at CWS.

- 2) Float shall be suspended from above and includes a built-in weight.
- C. Displacement float level switch:
1. General: Float with a permanent magnet encircles a stationary stem. A hermetically sealed magnetically operated latching reed switch(es) mounted in the stem:
    - a. Mercury switches are not acceptable.
  2. Lead wires: Mounted in flexible waterproof PVC cable from switch to junction box terminals without splices.
  3. Switch:
    - a. Single pole single throw (SPST).
  4. The number of floats per level system shall be as indicated on the Drawings.

### **2.03 ACCESSORIES**

- A. Provide sunshades for outdoor installation.

### **2.04 SOURCE QUALITY CONTROL**

- A. As specified in Section 17050.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine the installation location for the instrument and verify that the instrument will work properly when installed.
  1. Notify the Engineer promptly if any installation condition does not meet the instrument manufacturer's recommendations or specifications.

### **3.02 INSTALLATION**

- A. As specified in Section 17050.

### **3.03 FIELD QUALITY CONTROL**

- A. As specified in Section 17050.

### **3.04 ADJUSTING**

- A. As specified in Section 17050.

### **3.05 CLEANING**

- A. As specified in Section 17050.

### **3.06 DEMONSTRATION AND TRAINING**

- A. As specified in Section 17050.

### **3.07 PROTECTION**

- A. As specified in Section 17050.

### **3.08 SCHEDULES**

- A. Provide populated instrument schedule as detailed herein. The provided information does not necessarily include all required instruments. Provide all instruments identified in the Contract Documents:
  - 1. Instruments may be as indicated on the Drawings, as specified in the Specifications or both.

**END OF SECTION**

<b>A/E:</b>  <b>CONTRACTOR:</b>  <b>Project:</b> <b>Customer:</b> <b>Plant:</b> <b>Location:</b> <b>BOM No.:</b> <b>File:</b>	<b>LEVEL SWITCHES</b>				<b>Spec. No.</b>	<b>Rev.</b>	
	<b>No</b>	<b>By</b>	<b>Date</b>	<b>Revision</b>	17201		
					<b>Contract</b>	<b>Date</b>	
					<b>Req.</b>	<b>P.O.</b>	
					<b>By</b>	<b>Chk</b>	<b>App</b>

<b>G E N E R A L</b>	<b>1</b>	<b>Type</b>	Conductance:	Capacitance:	Tuning Fork:	Ball Float	Displacement
	<b>2</b>	<b>Setting</b>	Field Set:	Factory Set:			
	<b>3</b>	<b>Dead Band</b>	Fixed:	Adj:	Other:		
	<b>4</b>	<b>Material</b>					
	<b>5</b>	<b>Dimensions</b>	Field Set				
	<b>6</b>	<b>Mounting</b>	Flange:	Threaded:	Other: Suspended		
	<b>7</b>	<b>Operating Pressure /Temperature</b>					
	<b>8</b>	<b>Connection</b>	MFR STD:	Other:			
	<b>9</b>	<b>Manufacturer</b>					
	<b>10</b>	<b>Other</b>					
	<b>11</b>	<b>Other</b>					
<b>S W I T C H</b>	<b>12</b>	<b>Type</b>	Mechanical:	Reed:	Other:		
	<b>13</b>	<b>Quantity</b>	Single:	Dual:	Other:		
	<b>14</b>	<b>Form</b>	SPST:	SPDT:	DPDT:	Other:	
	<b>15</b>	<b>Rating:</b>	<b>Amps</b>	<b>Volts</b>	<b>Hertz</b>		
	<b>16</b>	<b>Load</b>		Inductive:	Non-Inductive:		
	<b>17</b>	<b>Other</b>					
	<b>18</b>	<b>Other</b>					

Rev.	Tag Number	Model No.	Setpoint	P&ID	Service	Notes

**Notes:** Refer to Section 17201 for additional level switch requirements.

## SECTION 17206

### LEVEL MEASUREMENT: ULTRASONIC

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Section includes:
  - 1. Ultrasonic level instruments.
  
- B. Related sections:
  - 1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
  - 2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
  - 3. The following sections are related to the Work described in this Section. This list of related sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents.
    - a. Section 01330 - Submittal Procedures.
    - b. Section 17050 - Basic Measurement and Control Instrumentation Material and Methods.
  
- C. Provide all instruments identified in the Contract Documents.

##### 1.02 REFERENCES

- A. As specified in Section 17050.

##### 1.03 DEFINITIONS

- A. As specified in Section 17050.
  
- B. Specific definitions:
  - 1. FDT: Field Device Tool.
  - 2. DTM: Device Type Manager.

##### 1.04 SUBMITTALS

- A. Furnish submittals as specified in Sections 01330 and 17050.
  
- B. Provide complete documentation covering the traceability of all calibration instruments.

##### 1.05 QUALITY ASSURANCE

- A. As specified in Section 17050.

- B. Examine the complete set of Contact Documents and verify that the instruments are compatible with the installed conditions including:
  - 1. Process conditions: Fluids, pressures, temperatures, flows, materials, etc.
  - 2. Physical conditions:
    - a. Installation and mounting requirements.
    - b. Location within the process.
    - c. Accessories: Verify that all required accessories are provided and are compatible with the process conditions and physical installation.
- C. Notify the Engineer if any installation condition does not meet the instrument manufacturer's recommendations or specifications.
- D. Provide instruments manufactured at facilities certified to the quality standards of ISO 9001.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. As specified in Section 17050.

#### **1.07 PROJECT OR SITE CONDITIONS**

- A. Project environmental conditions as specified in Section 17050.
  - 1. Provide instruments suitable for the installed site conditions including, but not limited to, material compatibility, site altitude, site seismic conditions, humidity, and process and ambient temperatures.

#### **1.08 WARRANTY**

- A. As specified in Section 17050.

#### **1.09 MAINTENANCE**

- A. Furnish all parts, materials, fluids, etc. necessary for operation, maintenance, and calibration purposes throughout the warranty period. Deliver all of these supplies before project substantial completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. One of the following or equal:
  - 1. Ultrasonic Level sensor with 4-wire remote transmitter:
    - a. Siemens: Echomax Series sensor with HydroRanger 200 Series Transmitter.
    - b. Ametek Drexelbrook: USonic-R Series.
    - c. Endress+Hauser: Prosonic S FDU Series Sensor with FMU Series Transmitter.

#### **2.02 MANUFACTURED UNITS**

- A. Ultrasonic level measurement with 4-wire remote transmitter:



1. General:
  - a. Continuous non-contact level measurement device with remote transmitter using ultrasonic echo sensing. The transducer generates an ultrasonic pulse in the range of 12 to 50 kHz and measures the time required for the pulse to travel to the process surface and return. The distance is calculated from the send and receive times. Each 4-wire level transmitter system includes, but is not limited to:
    - 1) Ultrasonic Transducer.
    - 2) Signal cable.
    - 3) Transmitter.
2. Performance requirements:
  - a. Accuracy:
    - 1) 0.25 percent of range.
  - b. Repeatability:
    - 1) 0.1 percent of range.
3. Ultrasonic transducer:
  - a. Encapsulated in chemical and corrosion-resistant material as indicated on the Instrument Data Sheet or Instrument index.
  - b. Class I, Division 1 for transducer only.
  - c. Operating temperature range: -5 to 122 degrees Fahrenheit (-20 to 50 degrees Celsius).
  - d. Operating relative humidity range: 5 to 95 percent.
  - e. Functions:
    - 1) Temperature compensation.
  - f. Mounting: As indicated in the Contract Documents.
4. Transmitter:
  - a. Level indicating transmitter:
    - 1) Indicator: Liquid crystal display with approximately 0.50-inch display scaled to read in engineering units.
    - 2) Sensitivity: Able to ignore momentary level spikes or momentary loss of echo and indicate loss of echo condition on indicating transmitter unit.
    - 3) Ability to allow for signal profiles and echo mapping:
      - a) Provide manufacturers software for re-mapping the signal.
  - b. Functions:
    - 1) Level measurement.
    - 2) Tank volume.
    - 3) Flow measurement.
  - c. Power supply:
    - 1) 120 VAC.
    - 2) Power consumption: 36 VA maximum.
  - d. Outputs:
    - 1) Isolated 4 to 20 milliamperes DC with HART communication protocol.
    - 2) Relay outputs:
      - a) 3 Form A or Form C contacts.
      - b) Rated 5 amps at 250 VAC.
      - c) Programmable.
    - 3) Enclosure: NEMA Type 4X.
    - 4) Mounting: As indicated in the Contract Documents.
    - 5) Operating temperature range from -5 to 122 degrees Fahrenheit (-20 to 50 degrees Celsius), relative humidity of 10 to 100 percent.

## **2.03 ACCESSORIES**

- A. Mounting brackets: As indicated on the Drawings.
- B. Provide sunshades for outdoor installations.
- C. Provide handheld programmers for all transmitters.

## **2.04 SOURCE QUALITY CONTROL**

- A. As specified in Section 17050.
- B. Factory calibrate each instrument with a minimum 3-point calibration or according to Manufacturer's standard at a facility that is traceable to the NIST.
  - 1. Submit calibration data sheets to the Engineer at least 30 days before shipment of the instruments to the project site.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine the installation location for the instrument and verify that the instrument will work properly when installed.
  - 1. Notify the Engineer promptly if any installation condition does not meet the instrument manufacturer's recommendations or specifications.

### **3.02 INSTALLATION**

- A. As specified in Section 17050.
- B. Coordinate the installation with all trades to ensure that the mechanical system has all necessary appurtenances including weld-o-lets, valves, etc. for proper installation of instruments.

### **3.03 FIELD QUALITY CONTROL**

- A. As specified in Section 17050.

### **3.04 ADJUSTING**

- A. As specified in Section 17050.

### **3.05 CLEANING**

- A. As specified in Section 17050.

### **3.06 DEMONSTRATION AND TRAINING**

- A. As specified in Section 17050.

### **3.07 PROTECTION**

- A. As specified in Section 17050.

### **3.08 SCHEDULES**

- A. Populate and submit schedules as provided herein. The provided information does not necessarily include all required instruments. Provide all instruments identified in the Contract Documents:
  - 1. Instruments may be as indicated on the Drawings, specified in the Specifications, or both.

**END OF SECTION**

<b>A/E:</b>  <b>Contractor:</b>  <b>Project:</b> Caustic System Replacement Project  <b>Customer:</b> Rock Creek Plant  <b>Plant:</b> Rock Creek WWTP  <b>Location:</b> Hillsboro, OR  <b>BOM No.:</b>  <b>File:</b>		<b>ULTRASONIC LEVEL INSTRUMENTS</b>							
						<b>Spec. No.</b>		<b>Rev.</b>	
						17206			
						<b>Contract</b>		<b>Date</b>	
						<b>Req.</b>		<b>P.O.</b>	
						<b>By</b>		<b>Chk</b>	
<b>G</b>	1	<b>Instrument Tag Number</b>							
	<b>E</b>	2	<b>Service</b>						
		3	<b>P&amp;ID</b>						
		4	<b>Other</b>						
<b>P</b>	5	<b>Type</b>	Ultrasonic	Ultrasonic	Ultrasonic				
	6	<b>Housing Material</b>							
	<b>R</b>	7	<b>Measurement Range</b>						
		8	<b>Op. Temp. Range</b>						
	<b>O</b>	9	<b>Manufacturer</b>						
		10	<b>Model</b>						
11		<b>Model Number</b>							
<b>C</b>	12	<b>Style</b>	Mfg. Std	Mfg. Std	Mfg. Std				
	13	<b>Length</b>							
	14	<b>Other</b>							
	15	<b>Other</b>							
<b>T</b>	16	<b>Other</b>							
	17	<b>Type</b>							
	18	<b>Operating Mode</b>							
	19	<b>Enclosure</b>							
	20	<b>Mounting</b>							
	21	<b>Temperature Range</b>							
	22	<b>Voltage Requirements</b>							
	23	<b>Power</b>							
	24	<b>Accuracy</b>							
	25	<b>Display</b>							
	26	<b>Output</b>							
	27	<b>Calibration</b>							
	28	<b>Status Relay</b>							
	29	<b>Manufacturer</b>							
	30	<b>Model No.</b>							
	31	<b>Elect. Entry</b>							
	32	<b>Other</b>							
<b>O</b>	33								
	34								
	35								
	36								
<b>Notes:</b>									

**SECTION 17901**  
**INSTRUMENT LIST**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. The Instrument list is not a take-off list. Refer to Drawings and Specifications for additional information. Where any discrepancies between this list and the P&ID drawings arise, the P&ID shall govern.
- B. Abbreviations used in the Instrument Index are defined on the Drawings.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

**3.1 INSTRUMENT LIST**

- A. Instrument list attached to this section as Supplement 1.
- B. Columns include the following
  1. Tag: tag number is a unique number that identifies the instrumentation on the drawings.
  2. Description: Describes the instrument or device.
  3. Size: Indicates the size of instrument to apply for flow meters and some others. This field does not apply to all instruments.
  4. Output Type: for instrumentation that is monitored by the PLC or other devices the signal will be either 4-20ma analog signal or dry contact for discrete signals. None indicates that the instrument is not interface to a PLC or other monitoring device.
  5. Calibration: Instrumentation calibration is provided in engineering units. For analog signals, gauges, and rotometers a range will be provided. For discrete instruments a contact open or close above or below a value will be given. The Contractor shall coordinate Owner during construction on all calibration ranges indicated TBD in the schedule.
  6. Power Type: "4-Wire" indicates the analog instrument will be provided with a power source. "2-Wire" indicates the instrument will be loop powered from the PLC. "120VAC" indicates the signal will be 120 volt ac discrete signal. "None" indicates the instrument is mechanically indicated.
  7. P&ID Drawing: Indicates which P&ID the instrument is shown.
  8. Specification: Provides a reference to the instrumentation specification requirements.
  9. Installation Details: Provides a reference to all applicable installation details.

**END OF SECTION**

**INSTRUMENT LIST**

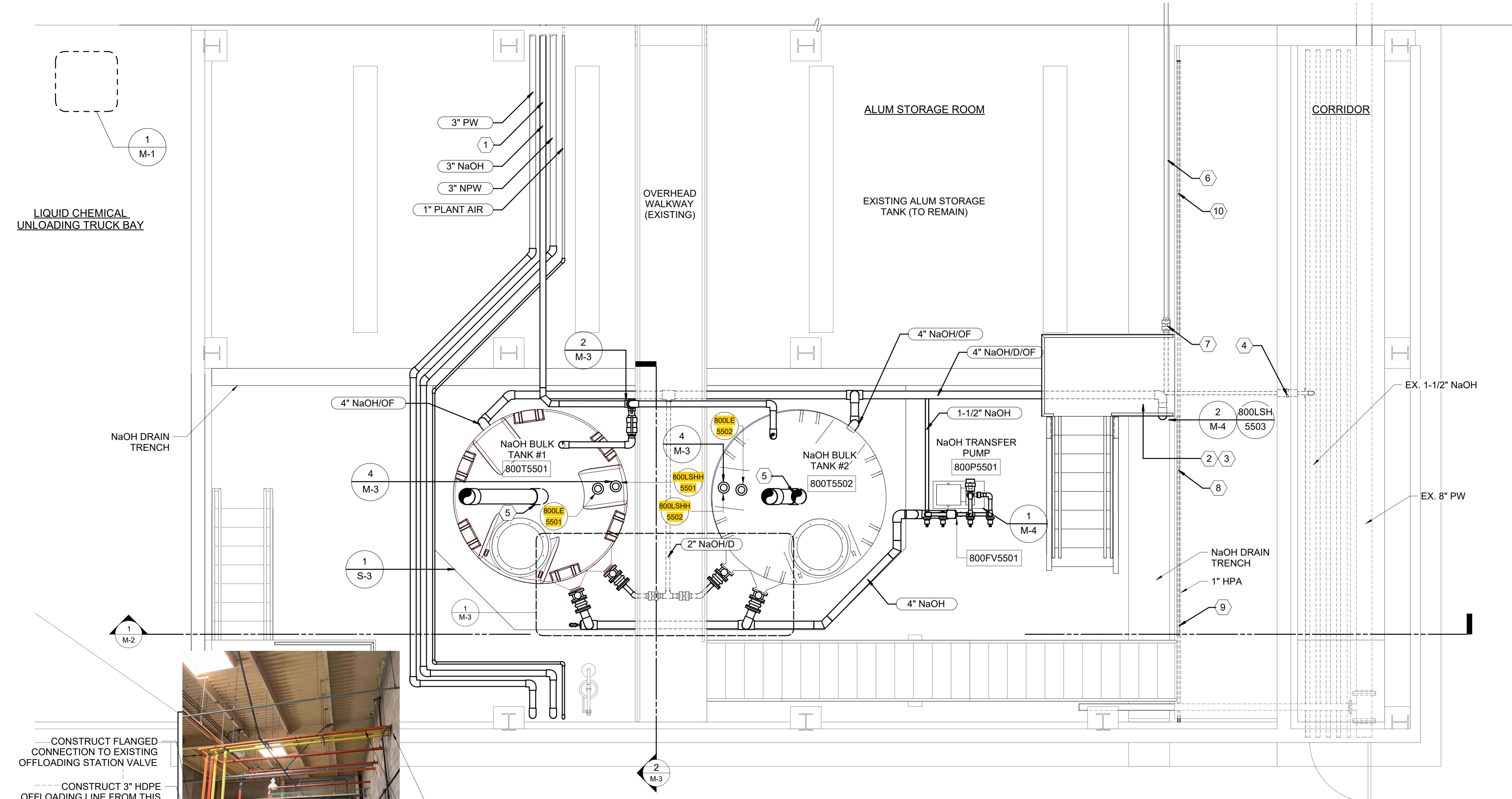
LOOP DESCRIPTION	TAG / ACCESSORY	INSTRUMENT DESCRIPTION	P&ID	NOTES	DETAIL
CAUSTIC BULK STORAGE TANK NO. 1 LEVEL	800LE5501 800LIT5501	Level Element and Transmitter, Ultrasonic	I-2	Min. Range: 0 - 20 ft Process Fluid: NaOH Connection: See Drawings	
CAUSTIC BULK STORAGE TANK NO. 2 LEVEL	800LE5502 800LIT5502	Level Element and Transmitter, Ultrasonic	I-2	Min. Range: 0 - 20 ft Process Fluid: NaOH Connection: See Drawings	
CAUSTIC BULK STORAGE TANK NO. 1 HIGH HIGH LEVEL	800LSHH5501	Level Switch, Tuning Fork	I-2	Setpoint: Top of tank straight shell Process Fluid: NaOH Connection: See Drawings	
CAUSTIC BULK STORAGE TANK NO. 2 HIGH HIGH LEVEL	800LSHH5502	Level Switch, Tuning Fork	I-2	Setpoint: Top of tank straight shell Process Fluid: NaOH Connection: See Drawings	
CAUSTIC CONTAINMENT SUMP LEVEL	800LSH5501	Level Switch, Float	I-2	Setpoint: Type: Gems Mount: See Detail	

**GENERAL NOTES**

1. CONTRACTOR TO PROVIDE PIPE SUPPORTS AND HANGERS PER SPECIFICATION 15060.
2. THE MATERIALS AND ELASTOMERS USED SHALL BE COMPATIBLE WITH CHEMICALS BEING CONVEYED.
3. CONTRACTOR SHALL SUBMIT DETAILED LAYOUT OF CHEMICAL PIPING FOR ENGINEER'S REVIEW PRIOR TO INSTALLATION.
4. CONTRACTOR TO FIELD VERIFY LOCATION OF OVERHEAD WALKWAY AND CONFIRM THAT TANK PLACEMENT WILL PROVIDE 3-INCH GAP BETWEEN EACH TANK AND NEAREST POINT OF WALKWAY. SUBMIT REVISED LAYOUT TO ENGINEER FOR REVIEW PRIOR TO CONCRETE PLACEMENT.

**# SHEET KEYNOTES**

1. CONSTRUCT APPROXIMATELY 110 FEET OF 3" HDPE NaOH OFFLOADING LINE FROM EXISTING OFFLOADING STATION TO TANKS. REUSE EXISTING WALL PENETRATION FOR CONSTRUCTION OF PIPE FROM ALUM STORAGE ROOM INTO LIQUID CHEMICAL UNLOADING TRUCK BAY. REFER TO PHOTO DETAIL 1 FOR POINT OF TERMINATION OF NEW PIPING AT EXISTING OFFLOADING STATION.
2. 4" PVC NaOH/D/O/F ROUTED INTO TRENCH WITH DOWNTURNED 90 DEG. ELBOW AND PIPE EXTENSION BELOW GRATING SURFACE.
3. 1-1/2" PVC NaOH/BYP LINE ROUTED INTO TRENCH WITH DOWNTURNED 90 DEG. ELBOW AND PIPE EXTENSION BELOW GRATING SURFACE.
4. CORE DRILL THROUGH WALL. TIE-INTO EXISTING 1-1/2" NaOH LINE. SEE DETAIL 2 ON M-9.
5. CONSTRUCT 8" PVC VENT TO EXISTING VENT PENETRATIONS IN ROOF ABOVE.
6. CONSTRUCT 2" PVC DRAIN IN TRENCH FROM NaOH DRAIN TRENCH TO EXISTING CHEMICAL SUMP ON NORTH SIDE OF THE ROOM. INSTALL 90 DEG. BEND DOWN INTO EXISTING CHEMICAL SUMP SIMILAR TO OTHER DRAINS. REFER TO STRUCTURAL SHEETS FOR CONTAINMENT WALL PENETRATION.
7. CONSTRUCT LOCKABLE BALL VALVE.
8. CONSTRUCT 1/2" COPPER HPA SERVICE TO VALVE 800FV5501. ROUTE PIPE ALONG CONTAINMENT WALL AND TANK PAD.
9. CONSTRUCT 1" COPPER HPA ALONG EDGE OF ELEVATED WALKWAY. ROUTE UNDERNEATH STAIRS AND ABOVE NEW CONTAINMENT WALL. CONNECT TO EXISTING HPA LINE AT NORTH AND SOUTH ENDS OF TRENCH.
10. CONSTRUCT 1/2" COPPER HPA SERVICE TO CONTROL VALVE AT ALUM TANK (TYP OF 2). CONNECT TO 1" COPPER HPA CONSTRUCTED ALONG EDGE OF WALKWAY.



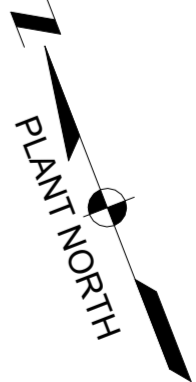
**1 GROUND LEVEL PLAN**  
3/8" = 1'-0"



**2 CHEMICAL OFFLOADING LINE REPLACEMENT PHOTO DETAIL**  
NO SCALE

CONSTRUCT FLANGED CONNECTION TO EXISTING OFFLOADING STATION VALVE  
CONSTRUCT 3" HDPE OFFLOADING LINE FROM THIS POINT TO NEW CHEMICAL TANKS IN ADJACENT ALUM STORAGE ROOM ALONG SIMILAR ALIGNMENT TO EXISTING NaOH OFFLOADING LINE

EXISTING WALL PENETRATION TO BE REUSED  
EXISTING NaOH OFFLOADING LINE TO BE DEMOLISHED AND REPLACED



A:\caddocs\0001-004-ROCK\_CREEK\0001-004-100-M-1.rvt 3/13/2024 8:55:12 AM

DRN: DG	ORIG DATE: MARCH 2024
DSN: MS	DWG #: M-1
CHK: AM	CAD FILE #: M-1.DWG
APPD:	SCALE: AS INDICATED

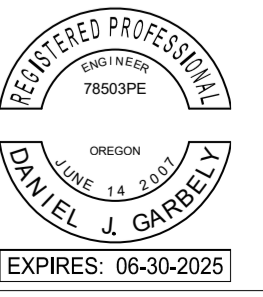
THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.				
REV #	DATE	DRN	APPD	DESCRIPTION

  
 2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

PROJ NAME: **ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134**

SHEET TITLE: **MECHANICAL MECHANICAL PLAN**

SHEET: 12 OF: 50	DRW #:
PLOT DATE: 3/13/2024	M-1
PLC #: N/A	
CWS PROJ #: 7134	



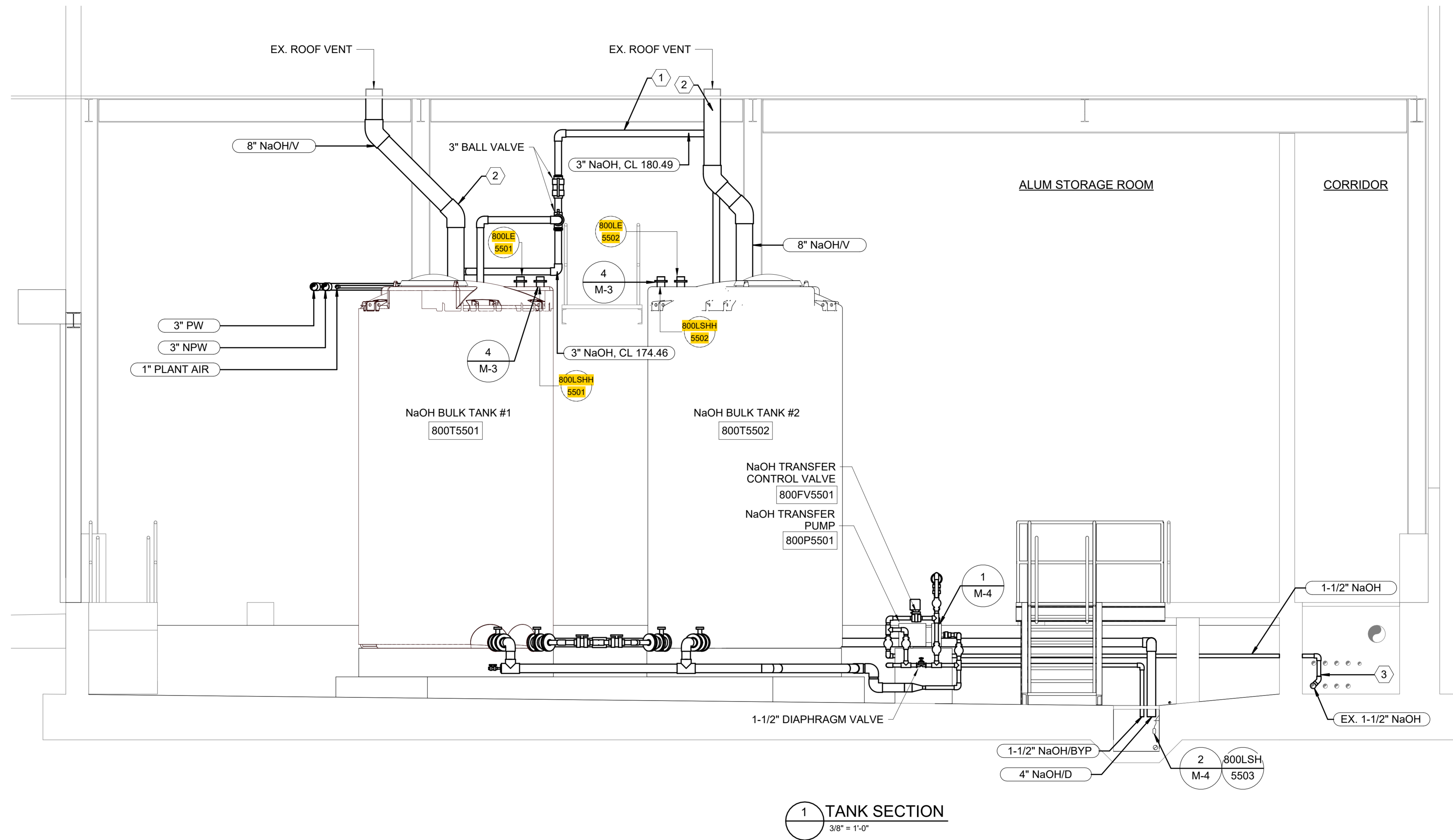


**GENERAL NOTES**

1. CONTRACTOR TO PROVIDE PIPE SUPPORTS AND HANGERS PER SPECIFICATION 15060.
2. THE MATERIALS AND ELASTOMERS USED SHALL BE COMPATIBLE WITH THE CHEMICALS BEING CONVEYED.
3. CONTRACTORS SHALL SUBMIT DETAILED LAYOUT OF CHEMICAL PIPING FOR ENGINEER'S REVIEW PRIOR TO INSTALLATION.

**# SHEET KEYNOTES**

1. INSTALL PIPE WITH A 1/8" PER FOOT SLOPE DOWN FROM EAST TO WEST. ENSURE NO JOINTS OCCUR OVER THE ELEVATED WALKWAY.
2. CONSTRUCT 8" PVC VENT TO EXISTING VENT PENETRATION IN ROOF. ROUTE VENT PIPE AROUND EXISTING STRUCTURAL COMPONENTS IN A MANNER WHICH MAINTAINS PIPE ORIENTATION AS CLOSE TO VERTICAL AS POSSIBLE.
3. CUT IN AND WELD 1-1/2" HDPE TEE FOR CONNECTION TO NEW NaOH LINE.



**1 TANK SECTION**  
3/8" = 1'-0"

DRN: DG	ORIG DATE: MARCH 2024
DSN: MS	DWG #: M-2
CHK: AM	CAD FILE #: M-2.DWG
APPD:	SCALE: 3/8" = 1'-0"

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION

Clean Water Services  
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

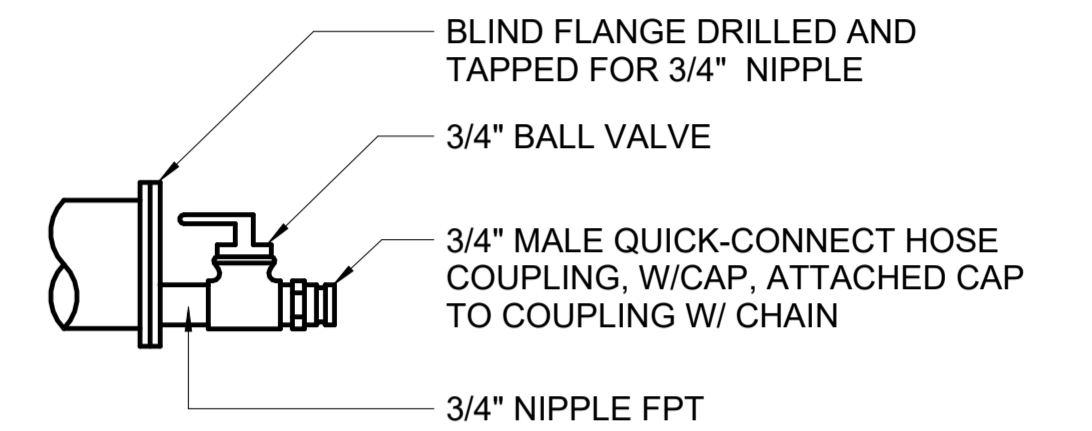
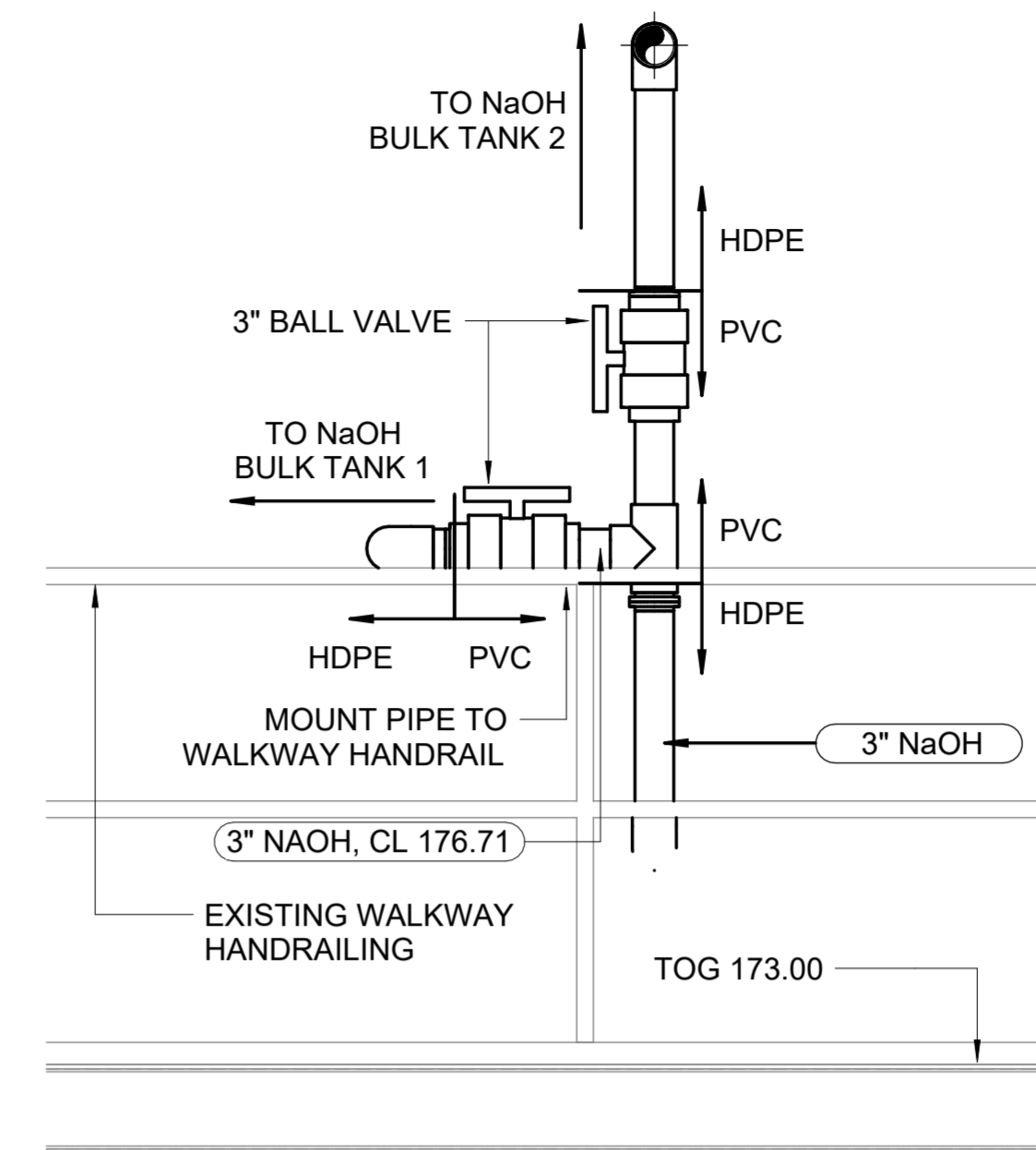
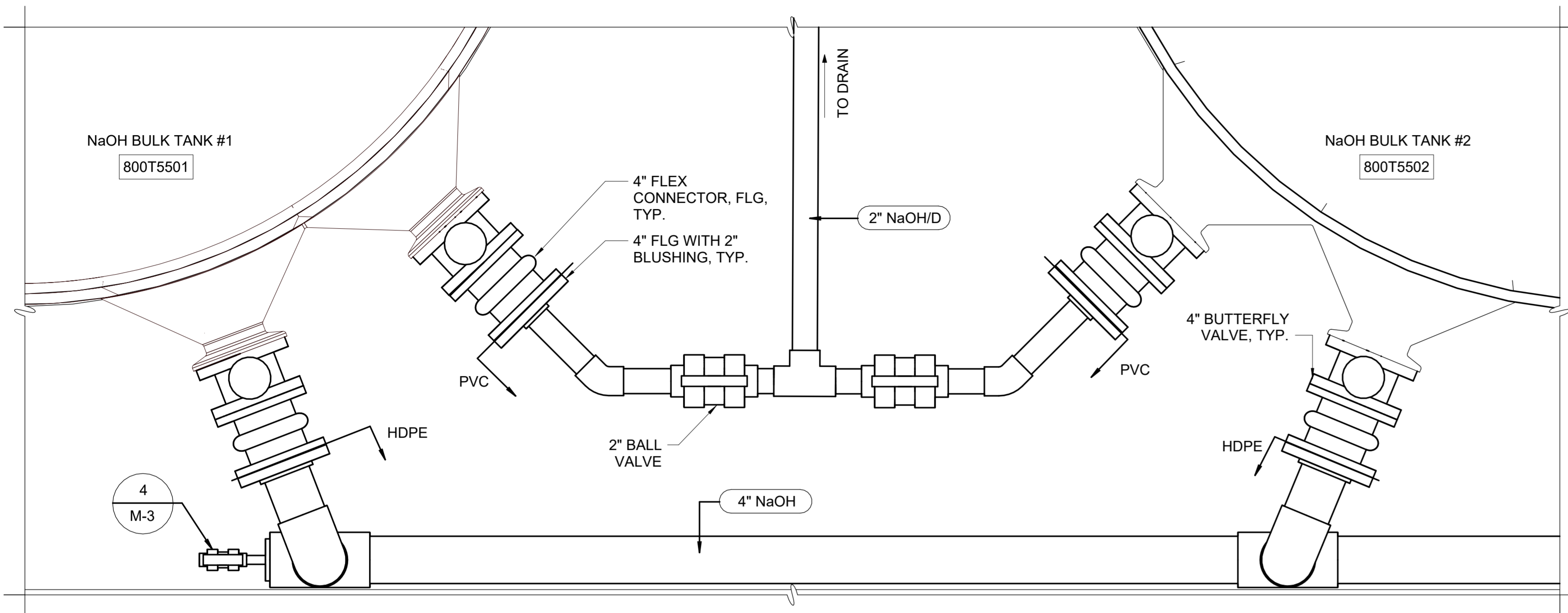
PROJ NAME: **ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134**

SHEET TITLE: **MECHANICAL MECHANICAL SECTIONS**

SHEET: 13 OF 51	DWG #:
PLOT DATE: 3/13/2024	<b>M-2</b>
PLC #: N/A	
CWS PROJ #: 7134	

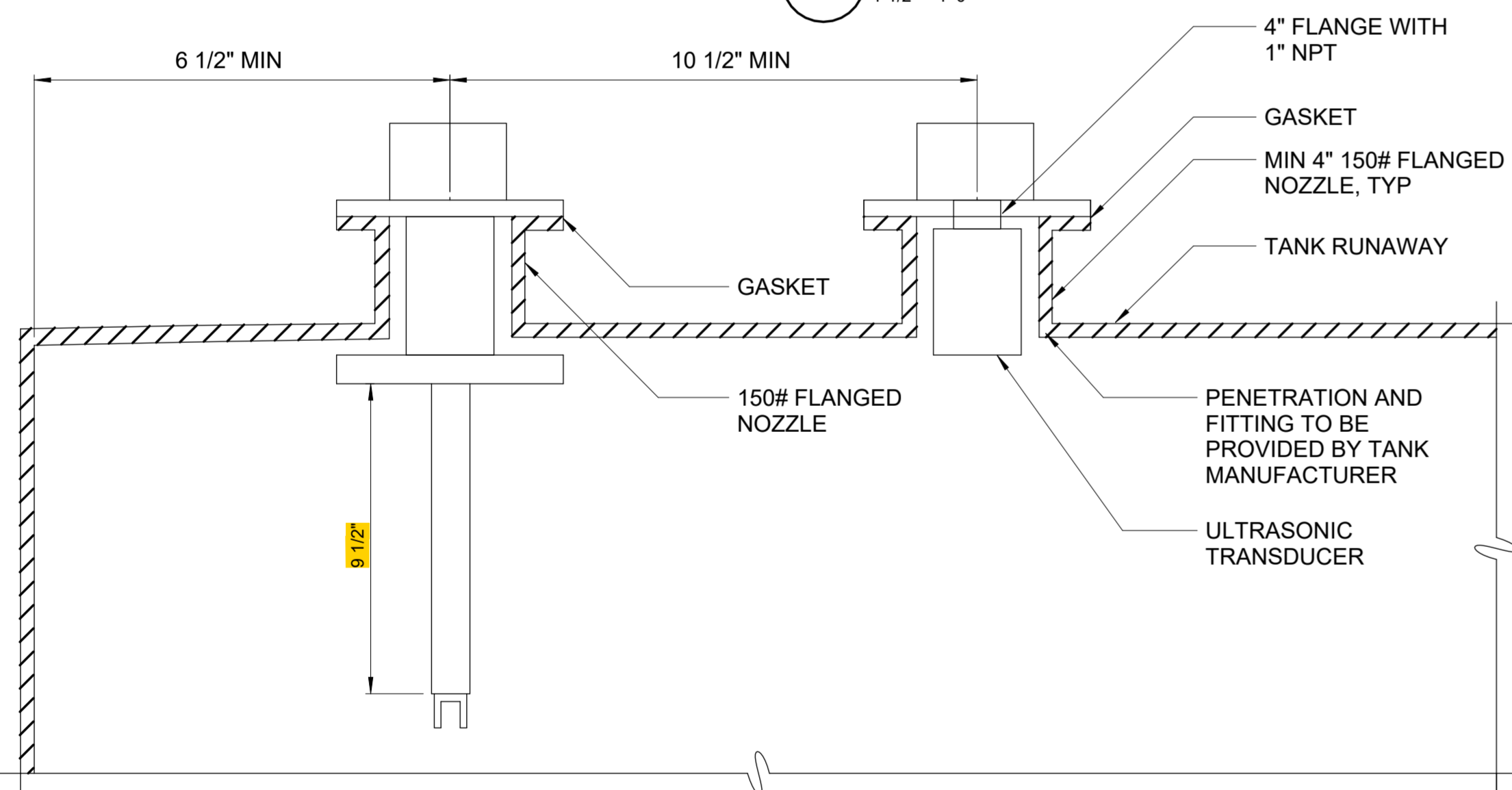


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NOTE:  
ALL 3/4" PIPING, FITTINGS, BALL VALVE AND QUICK CONNECT SHALL BE 316 SST

**1 TANK OUTLET PIPING ENLARGED PLAN**  
1-1/2" = 1'-0"



NOTE:  
1. COORDINATE TANK PENETRATION SIZE AND MOUNTING FLANGE WITH TANK MANUFACTURER TO ALLOW FOR INSTALLATION OF TUNING FORK LEVEL SWITCH AND ULTRASONIC TRANSDUCER.

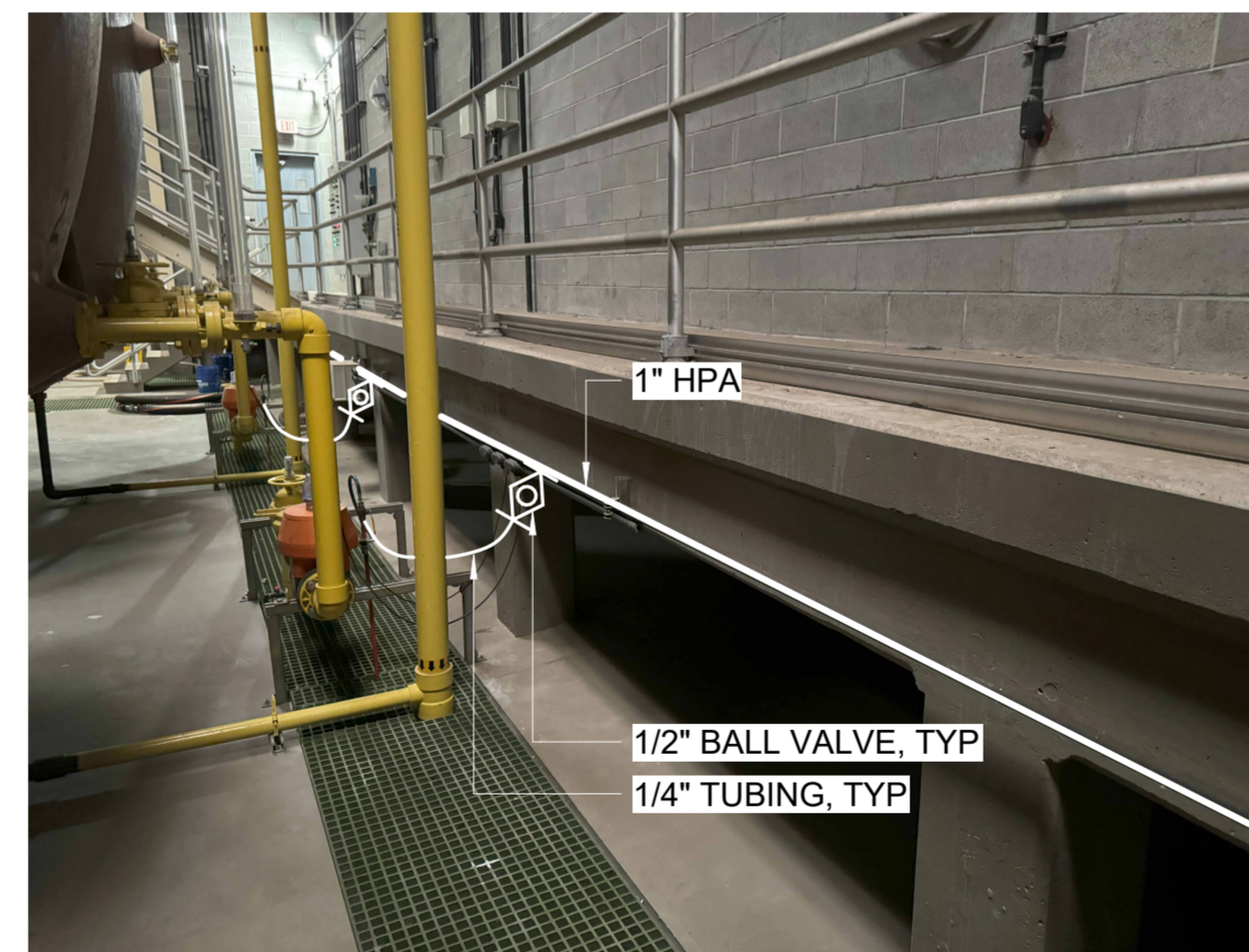
- 2. ENDRESS AND HAUSER FTL62-CAA4BAHPQ2DQAAAFJ TUNING FORK LEVEL SWITCH OR APPROVED EQUAL.
- 3. ENDRESS AND HAUSER FDU91 ULTRASONIC TRANSDUCER OR APPROVED EQUAL.

**4 LEVEL SWITCH AND ULTRASONIC LEVEL MOUNTING DETAIL**  
NO SCALE

**2 NaOH FILL LINE VALVE ASSEMBLY DETAIL**  
3/4" = 1'-0"

NOTE:  
1. HDPE TO PVC CONNECTIONS SHALL BE FLANGED.

**3 FLUSHING CONNECTION**  
NO SCALE



**5 AIR LINE CONSTRUCTION ROUTING**  
NO SCALE



NOTE:  
SEE DETAIL 1 ON D-3 FOR AREA OF DEMOLITION.

**6 AIR LINE CONSTRUCTION CONNECTION**  
NO SCALE

A:\p\c\Drawings\0001-004-ROCK\_CREEK\0001-004-100-M-1.rvt 3/13/2024 8:55:14 AM

DRN: DG	ORIG DATE: MARCH 2024
DSN: MS	DWG #: M-3
CHK: AM	CAD FILE #: M-3.DWG
APPD:	SCALE: AS INDICATED

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION



PROJ NAME:  
**ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134**

SHEET TITLE:  
**MECHANICAL MECHANICAL DETAILS**

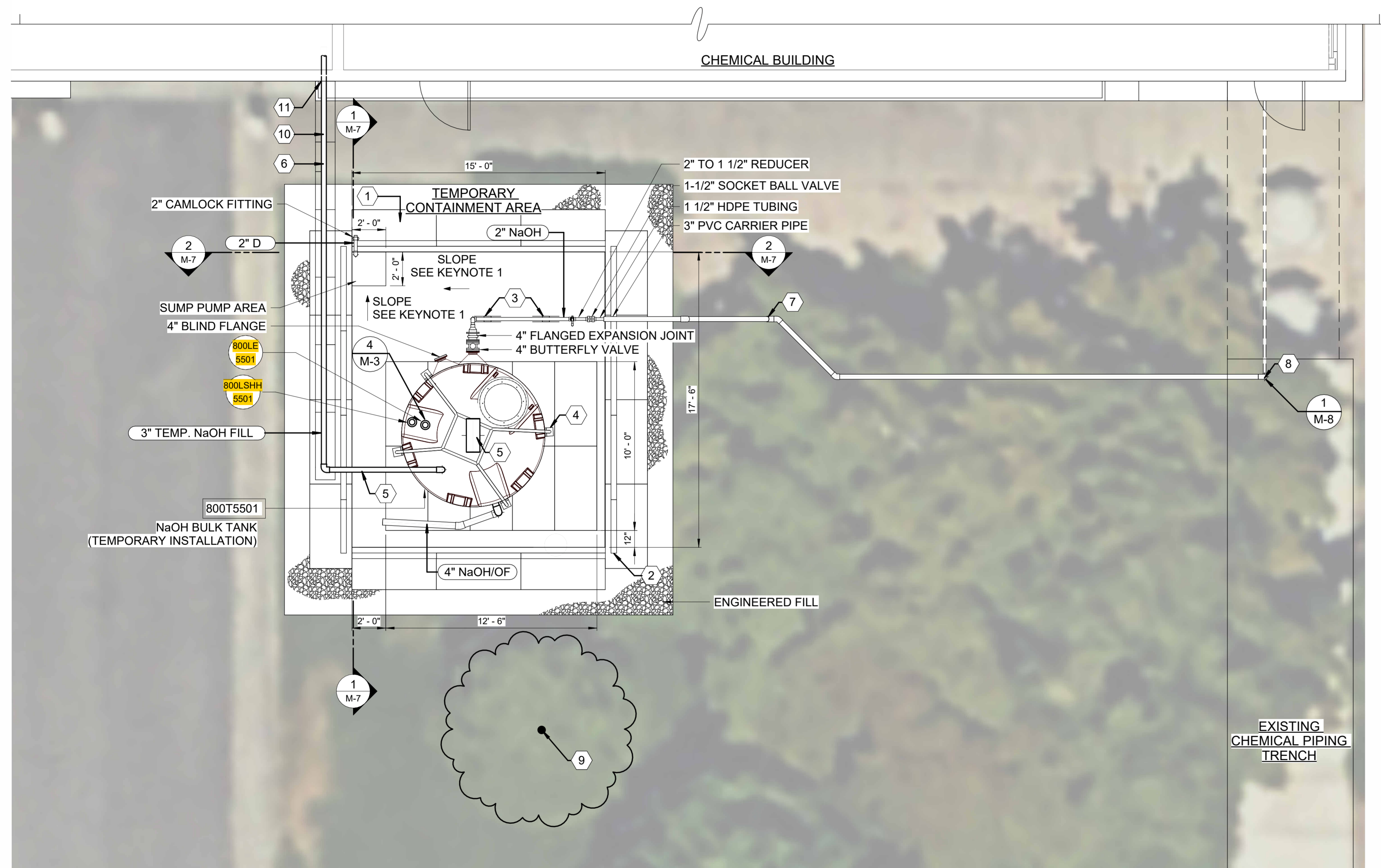
SHEET: 14 OF: 50  
PLOT DATE: 3/13/2024  
PLC #: N/A  
CWS PROJ #: 7134

DWG #:

M-3



BREAK LINE, SEE DWG M-6



1 TEMPORARY NaOH SYSTEM PLAN  
1/4" = 1'-0"

GENERAL NOTES

1. TEMPORARY NaOH SYSTEM TO BE CONSTRUCTED AND TESTED PRIOR TO DEMOLITION OF THE NaOH SYSTEM INSIDE THE CHEMICAL BUILDING.
2. TEMPORARY NaOH SYSTEM MUST REMAIN IN OPERATION UNTIL NaOH BULK TANK #2 (800T5502), NaOH TRANSFER PUMP (800P5501) AND ALL ACCOMPANYING PIPES, VALVES, INSTRUMENTS, AND OTHER APPARATUSES HAVE BEEN INSTALLED AND TESTED INSIDE THE CHEMICAL BUILDING SO AS TO CREATE A RELIABLY OPERATING SYSTEM WHICH IS ABLE TO RECEIVE NaOH DELIVERY AT THE LIQUID CHEMICAL OFFLOADING STATION, STORE CHEMICAL IN NaOH BULK TANK #2, AND PUMP CHEMICAL INTO THE FACILITY'S NaOH DISTRIBUTION SYSTEM.
3. FOLLOWING SUCCESSFUL TESTING OF NaOH BULK TANK # 2 SYSTEM, TEMPORARY NaOH SYSTEM WILL BE DECOMMISSIONED. TANK TO BE RELOCATED INSIDE CHEMICAL BUILDING AND INSTALLED AS NaOH BULK TANK #1. INSTRUMENTS AND VALVES TO BE REUSED FOR PERMANENT INSTALLATION INSIDE THE BUILDING OR SALVAGED AND PROVIDED TO THE DISTRICT IF NOT REQUIRED FOR PERMANENT INSTALLATION. TEMPORARY PIPING TO BE REMOVED AND TEMPORARY PIPING WALL PENETRATIONS TO BE FILLED WITH NON-SHRINK GROUT.
4. FOLLOWING REMOVAL OF ALL EQUIPMENT, CONTRACTOR TO REMOVE AND DISPOSE OF ECO BLOCKS, EPDM LINER, AND OTHER COMPONENTS OF TEMPORARY CONTAINMENT AREA OFFSITE.
5. FOLLOWING DEMOLITION OF TEMPORARY CONTAINMENT AREA, CONTRACTOR TO REMOVE ALL ENGINEERED FILL AND ROCK, PLACE APPROVED TOP SOIL IN AREA TO GRADE WHERE ENGINEERED FILL WAS REMOVED, AND MARK ENDS OF IRRIGATION PIPE(S) WITH 2X4. THE DISTRICT WILL REPAIR THE IRRIGATION SYSTEM AND RESTORE THE GRASS AREA AFTER CONSTRUCTION.

# SHEET KEYNOTES

1. EPDM LINER WITH MINIMUM 45 MIL THICKNESS SHALL BE PLACED IN CONTAINMENT AREA. SPLICES SHALL BE DOUBLE SEAM WITH 3" WIDE DOUBLE-SIDED TAPE OR AS RECOMMENDED BY MANUFACTURER. LINER SHALL BE FASTENED TO CONCRETE ECO BLOCKS WITH 2X4 HEM FIR PRESSURE TREATED BATTENS WITH 1/4" STAINLESS STEEL WEDGE ANCHORS AT 24 INCHES ON CENTER AND MINIMUM EMBEDMENT OF 4 INCHES INTO CONCRETE ECO BLOCK. BEFORE ANCHORING EPDM LINER TO ECO BLOCKS, CONTRACTOR SHALL PLACE EXTRA FILL UNDER LINER AND SLOPE GRADE TOWARDS LOWER SUMP PUMP AREA. SLOPE SHALL BE AT A MINIMUM 1/4" PER FT.
2. CONCRETE ECO BLOCKS SHALL BE FLAT TOP BLOCKS WITH RECESSED LIFTING HOOKS WITH SMOOTH SURFACE. CONTRACTOR SHALL COORDINATE INSTALLATION PROCEDURE WITH MANUFACTURER TO ENSURE NO PUNCTURING OF EPDM LINER. SPACING BETWEEN ECO BLOCKS SUPPORTING TANK SHALL BE NO MORE THAN 1/4" TO ENSURE FULL TANK SUPPORT. 1/4" EPDM MAT SHALL BE PLACED BETWEEN ECO BLOCKS SUPPORTING TANK AND EPDM LINER TO PREVENT DAMAGE TO EPDM LINER DURING INSTALLATION. ECO BLOCKS MUST BE LEVEL.
3. TEMPORARY, SELF SUPPORTING PIPE SUPPORTS SHALL BE AS SHOWN ON PLAN VIEW. PIPE SUPPORTS PROVIDED SHALL BE V-HEAD SELF SUPPORTING PIPE STAND WITH HEIGHT ADJUSTABLE HEAD AND SET SCREW OR APPROVED EQUAL. STAND SHALL BE MADE OF CHEMICAL RESISTING MATERIALS. STANDS SHALL BE PLACED ON 1/4" EPDM LINER FROM POTENTIAL TEARING. STANDS REQUIRING ANCHORS WILL NOT BE PERMITTED. CONTRACTOR SHALL SUBMIT PIPE SUPPORT PLAN WITH SELECTED PIPE SUPPORTS TO ENGINEER FOR APPROVAL. PIPE SUPPORTS SHALL BE PLACED ON 1/4" EPDM MAT. TO PROTECT EPDM LINER FROM POTENTIAL TEARING. PIPING SUPPORTS SHALL BE SPACED AT NO MORE THAN 5'-0".
4. TANK SHALL BE ANCHORED TO CONCRETE ECO BLOCKS AS SHOWN ON PLAN WITH RESTRAINT CABLES AND CLIPS PROVIDED BY TANK MANUFACTURER AND INSTALLED AT MANUFACTURER RECOMMENDED LOCATIONS. A DISTANCE OF 4" MUST BE MAINTAINED BETWEEN EDGE OF CONCRETE ECO BLOCK AND EDGE OF RESTRAINT CLIP. CONTRACTOR SHALL SUBMIT RESTRAINT AND ANCHORAGE DETAILS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF OREGON.

# SHEET KEYNOTES

5. CONSTRUCT 8' PVC VENT TOPPED WITH 8" PVC TEE. COVER OPEN ENDS OF TEE WITH BUG SCREEN AND CLAMP SECURELY IN PLACE
6. CONSTRUCT TEMPORARY 3" NaOH FILL LINE, APPROXIMATELY 75 FEET.
7. CONSTRUCT 1-1/2" HDPE NaOH CONNECTION FROM PUMP TO EXISTING NaOH DISTRIBUTION LINE IN COVERED PIPE TRENCH TO EAST. LINE TO BE CONSTRUCTED FROM APPROXIMATELY 145 FEET OF HDPE TUBING. FOR SECTION OF THE LINE BETWEEN THE TEMPORARY CONTAINMENT AREA AND THE CHEMICAL PIPING TRENCH, CONSTRUCT 1-1/2" HDPE LINE INSIDE 3" PVC CARRIER PIPE TO PROVIDE PROTECTION. CONSTRUCT WITH LONG SWEEPS TO PREVENT CRIMPING OF HDPE TUBING. TERMINATE ENDS OF CARRIER PIPE INSIDE CHEMICAL PIPING TRENCH AND TEMPORARY CONTAINMENT AREA.
8. CONTRACTOR TO ROUTE TEMPORARY NaOH TUBING THROUGH EXISTING CHEMICAL PIPE TRENCH TO CONNECTION POINT SHOWN ON M-6. CONTRACTOR SHALL TEMPORARILY SUPPORT TUBING ON EXISTING PIPE RACK IN TRENCH.
9. CONTRACTOR TO PROTECT EXISTING TREE DURING CONSTRUCTION.
10. CONTRACTOR TO PROVIDE AND INSTALL UNISTRUT PIPE SUPPORT SYSTEM FOR CAUSTIC FILL PIPING, ELECTRICAL, AND INSTRUMENTATION CONDUIT FROM BUILDING TO TANK. PIPING SUPPORT SHALL MAINTAIN CONSTANT HEIGHT TO MATCH ELEVATION OF TANK INLET WITH CAUSTIC FILL PIPING AND CONDUITS SHALL BE SUPPORTED AT NO MORE THAN 5'-0" SPACINGS. UNISTRUT SUPPORTS SHALL BE ANCHORED TO BUILDING AND CONTAINMENT AREA ECO BLOCKS PER MANUFACTURERS RECOMMENDATIONS TO RESIST VERTICAL AND LATERAL LOADS AND MOVEMENTS. UPON REMOVAL OF TEMPORARY SYSTEM, UNISTRUT ANCHORS SHALL BE CUT AT THE BUILDING AND BUILDING WALL REPAIRED PER SPECIFICATION SECTION 03732. UNISTRUT SYSTEM AND REMOVAL PLAN SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.
11. CORE DRILL THROUGH EXISTING WALL, SEE DETAIL 2 ON M-8.

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DRN: DG	ORIG DATE: MARCH 2024
DSN: MS	DWG #: M-5
CHK: AM	CAD FILE #: M-5.DWG
APPD:	SCALE: 1/4" = 1'-0"

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION

Clean Water Services  
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

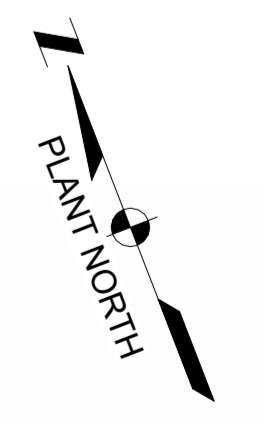
PROJ NAME:  
**ROCK CREEK  
 SODIUM HYDROXIDE TANK  
 REPLACEMENT PROJECT  
 NO.7134**

SHEET TITLE:  
**MECHANICAL  
 TEMPORARY NaOH SYSTEM  
 PLAN**

SHEET: 16 OF 50  
 PLOT DATE: 3/13/2024  
 PLC #: N/A  
 CWS PROJ #: 7134

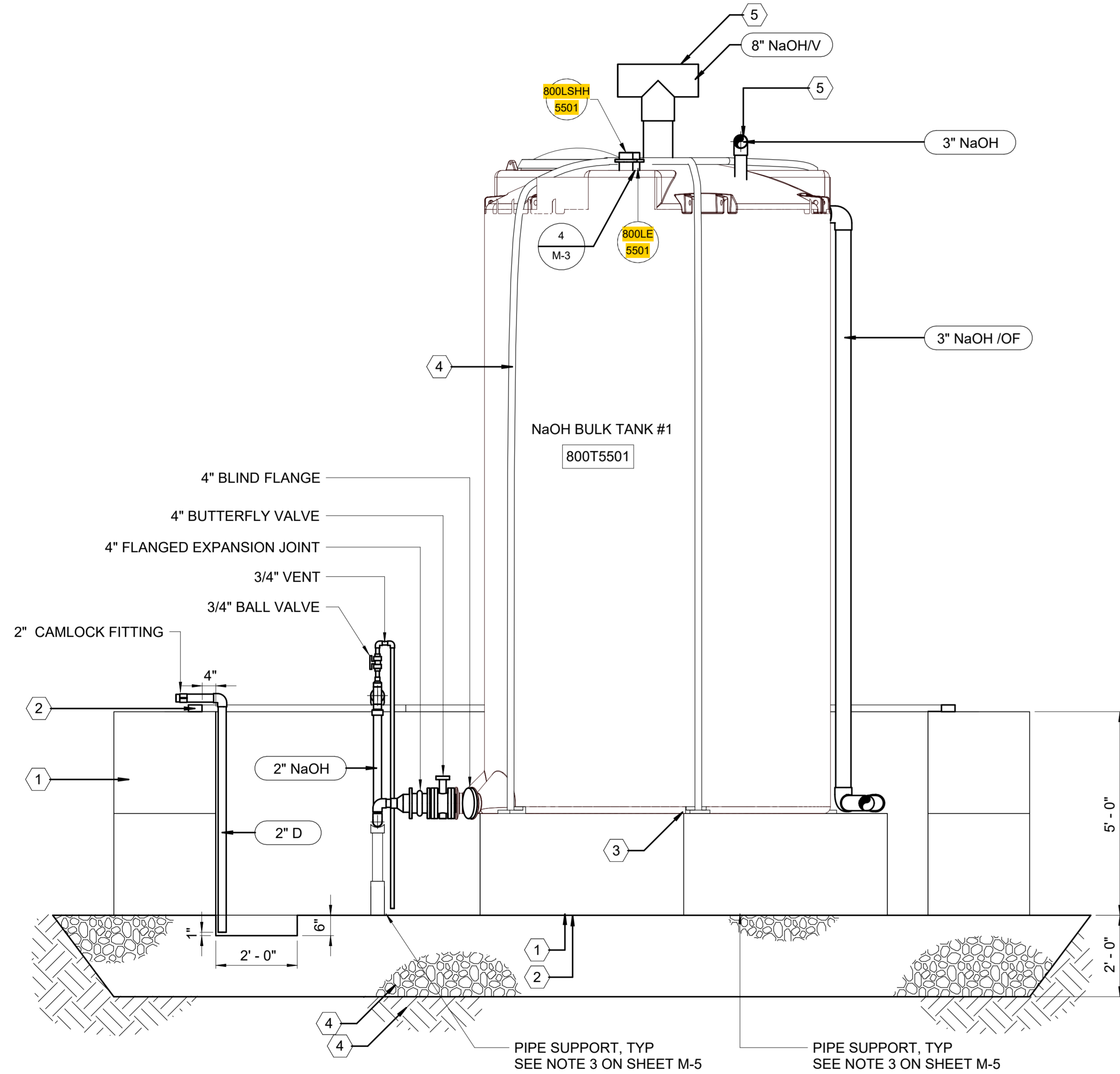
DWG #:  
**M-5**

REGISTERED PROFESSIONAL ENGINEER  
 LICENSE 14393  
 DANIEL J. GARRELY  
 OREGON  
 EXPIRES: 06-30-2025

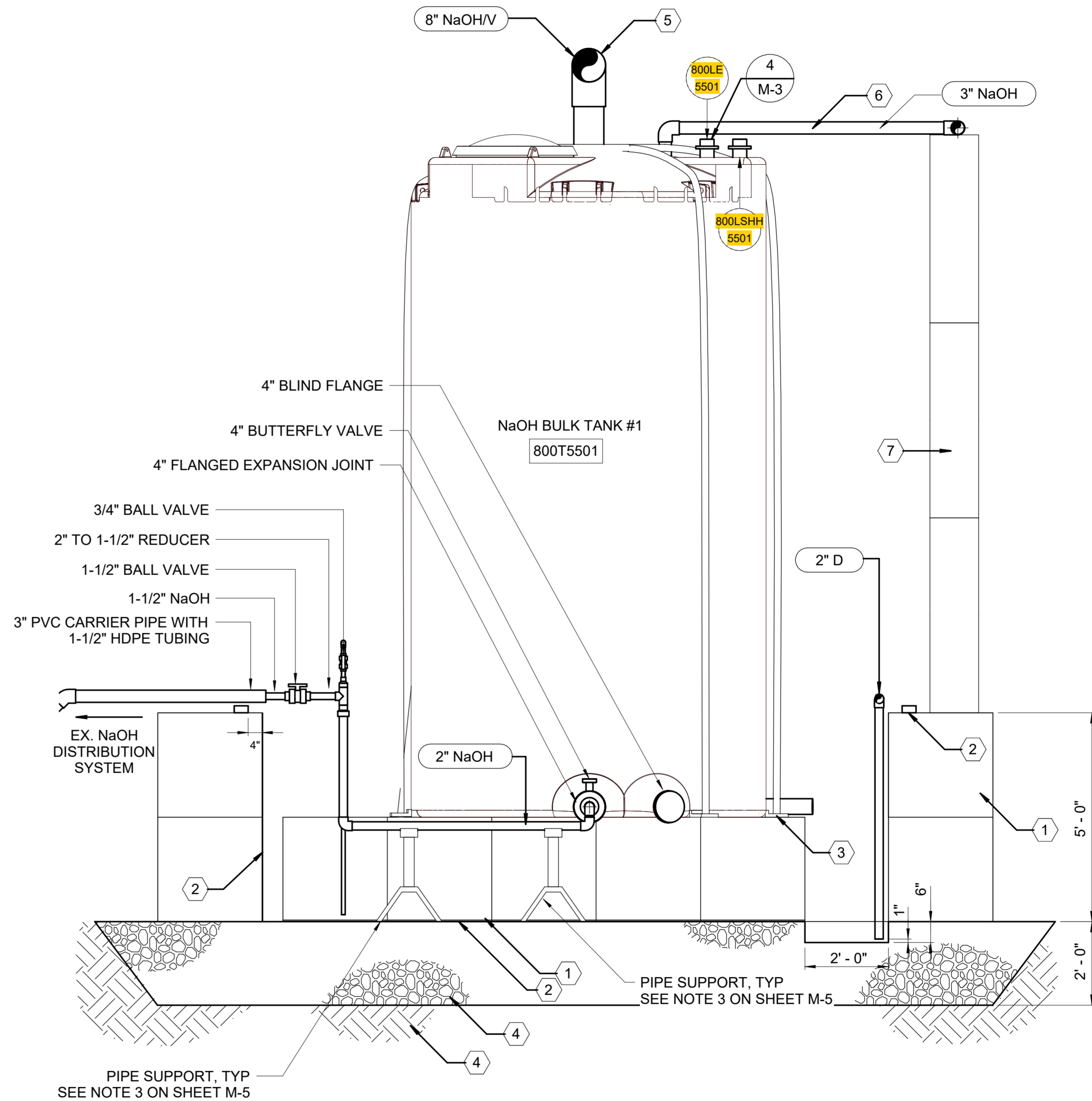


# SHEET KEYNOTES

- ECO BLOCKS SHALL BE FLAT TOP BOCKS WITH RECESSED LIFTING HOOKS WITH SMOOTH SURFACE. CONTRACTOR SHALL COORDINATE INSTALLATION PROCEDURE WITH MANUFACTURER TO ENSURE NO PUNCTURING OF EPDM LINER. SPACING BETWEEN ECO BLOCKS SUPPORTING TANK SHALL BE NO MORE THAN 1/4" TO ENSURE FULL TANK SUPPORT. 1/4" EPDM MAT SHALL BE PLACED BETWEEN ECO BLOCKS SUPPORTING TANK AND EPDM LINER TO PREVENT DAMAGE TO EPDM LINER DURING INSTALLATION. ECO BLOCKS MUST BE LEVEL.
- EPDM LINER WITH MINIMUM 45 MIL THICKNESS SHALL BE PLACED IN CONTAINMENT AREA. SPLICES SHALL BE DOUBLE SEAM WITH 3" WIDE DOUBLE SIDED TAPE OR AS RECOMMENDED BY MANUFACTURER. LINER SHALL BE FASTENED TO CONCRETE ECO BLOCS WITH 2X4 HEM FIR PRESSURE TREATED BATTENS WITH 1/4" STAINLESS STEEL WEDGE ANCHORS AT 24 INCHES ON CENTER AND MINIMUM EMBEDMENT OF 4 INCHES INTO CONCRETE ECO BLOCK.
- TANK SHALL BE ANCHORED TO CONCRETE ECO BLOCKS AS SHOWN ON PLAN WITH RESTRAINT CABLES AND CLIPS PROVIDED BY TANK MANUFACTURER AND INSTALLED AT MANUFACTURER RECOMMENDED LOCATIONS. A DISTANCE OF 4" MUST BE MAINTAINED BETWEEN EDGE OF CONCRETE ECO BLOCK AND EDGE OF RESTRAINT CLIP. CONTRACTOR SHALL SUBMIT RESTRAINT AND ANCHORAGE DETAILS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL OR STRUCTURAL ENGINEER LICENSED IN THE STATE OF OREGON.
- SITE SHALL BE CLEARED AND PREPARED PER SPECIFICATION SECTION 02100. SOIL SHALL BE EXCAVATED A MINIMUM OF 2'-0" TO COMPACTABLE SOIL. SOIL SHALL THEN BE COMPACTED, FILLED AND LEVELED WITH ENGINEERED SELECT FILL PER SPECIFICATION SECTION 02200. CONTRACTOR IS EXCLUSIVELY RESPONSIBLE FOR EXCAVATION SUPPORT SYSTEM AND DESIGN OF THAT SYSTEM FOR CONSTRUCTION. SUPPORT SYSTEMS SHALL BE DESIGNED SUCH THAT VIBRATIONS ARE MINIMIZED.
- CONSTRUCT 8" PVC VENT TOPPED WITH 8" PVC TEE. COVER OPEN ENDS OF TEE WITH BUG SCREEN AND CLAMP SECURELY IN PLACE.
- CONSTRUCT TEMPORARY 3" HDPE NaOH FILL LINE. PROVIDE 2" CAMLOCK FITTING ON END TO ALLOW FOR CONNECTION TO CHEMICAL SUPPLY TRUCKS.
- CONTRACTOR TO PROVIDE AND INSTALL UNISTRUT PIPE SUPPORT SYSTEM FOR HDPE PIPING, ELECTRICAL, AND INSTRUMENTATION CONDUIT FROM BUILDING TO TANK. PIPING SUPPORT SHALL MAINTAIN CONSTANT HEIGHT TO MATCH ELEVATION OF TANK INLET WITH HDPE PIPING AND CONDUITS SHALL BE SUPPORTED AT NO MORE THAN 5' - 0" SPACINGS. UNISTRUT SUPPORTS SHALL BE ANCHORED TO BUILDING AND CONTAINMENT AREA ECO BLOCKS PER MANUFACTURERS RECOMENDATIONS TO RESIST VERTICAL AND LATERAL LOADS AND MOVEMNETS. UPON REMOVAL OF TEMPORARY SYSTEM, UNISTRUT ANCHORS SHALL BE CUT AT THE BUILDING AND BUILDING WALL REPAIRED PER SPECIFICATION SECTION 03732. UNISTRUT SYSTEM AND REMOVAL PLAN SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.



1 SOUTH SECTION  
M-5 1/2" = 1'-0"



2 WEST SECTION  
M-5 1/2" = 1'-0"

DRN: DG	ORIG DATE: MARCH 2024
DSN: MS	DWG #: M-7
CHK: AM	CAD FILE #: M-7.DWG
APPD:	SCALE: 1/2" = 1'-0"

<p>THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.</p>				
REV #	DATE	DRN	APPD	DESCRIPTION

  
 2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

PROJ NAME: **ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134**

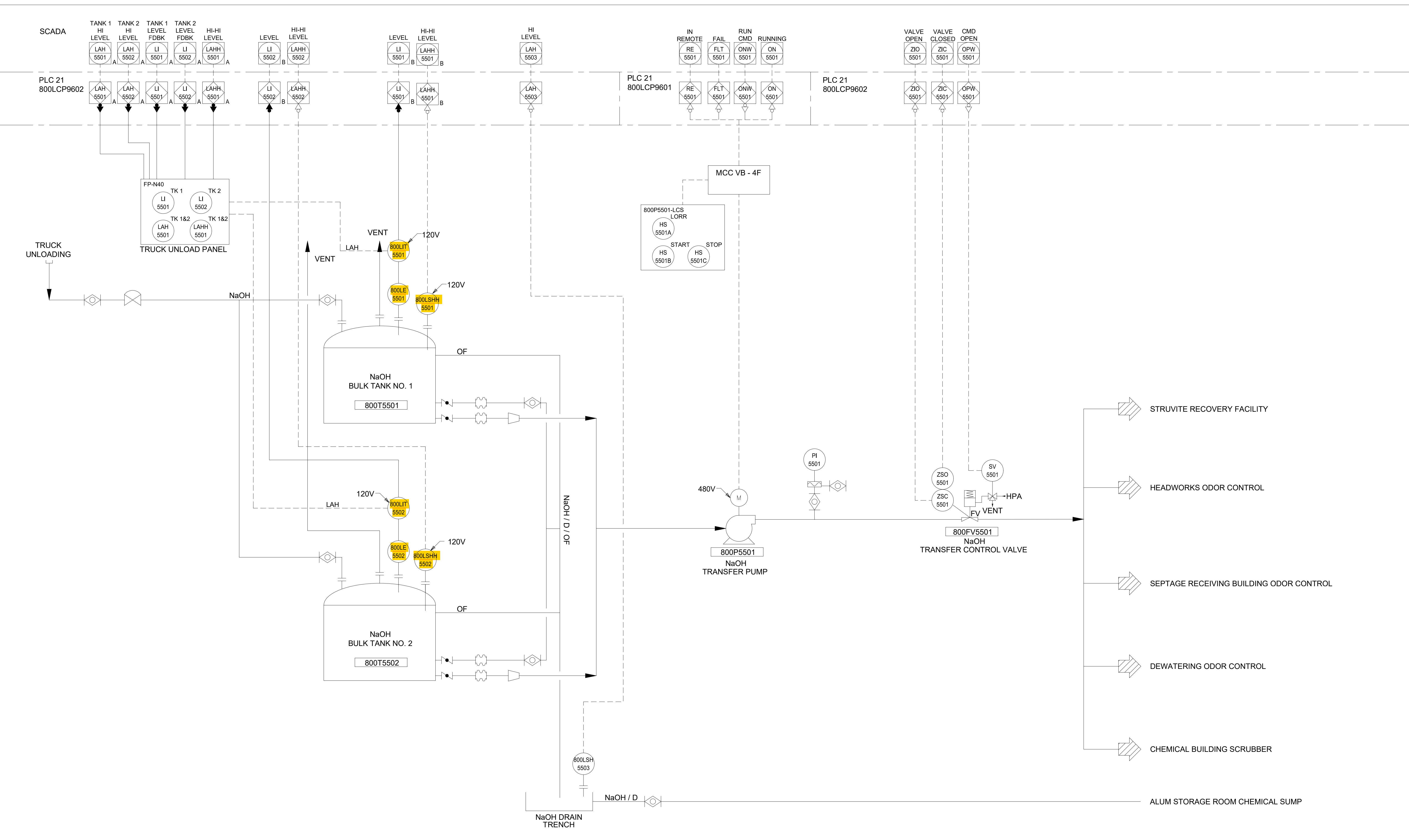
SHEET TITLE: **MECHANICAL TEMPORARY NaOH SYSTEM ELEVATIONS**

SHEET: 18 OF: 50	DWG #:
PLOT DATE: 3/13/2024	M-7
PLC #: N/A	
CWS PROJ #: 7134	

  
 DANIEL J. GARRELY  
 OREGON LICENSE # 14300  
 EXPIRES: 06-30-2025

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DRN: KR	ORIG DATE: MARCH 2024
DSN: KR	DWG #: I-2
CHK: KR	CAD FILE #: I-2.DWG
APPD: LK	SCALE: NO SCALE

<b>THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.</b>				
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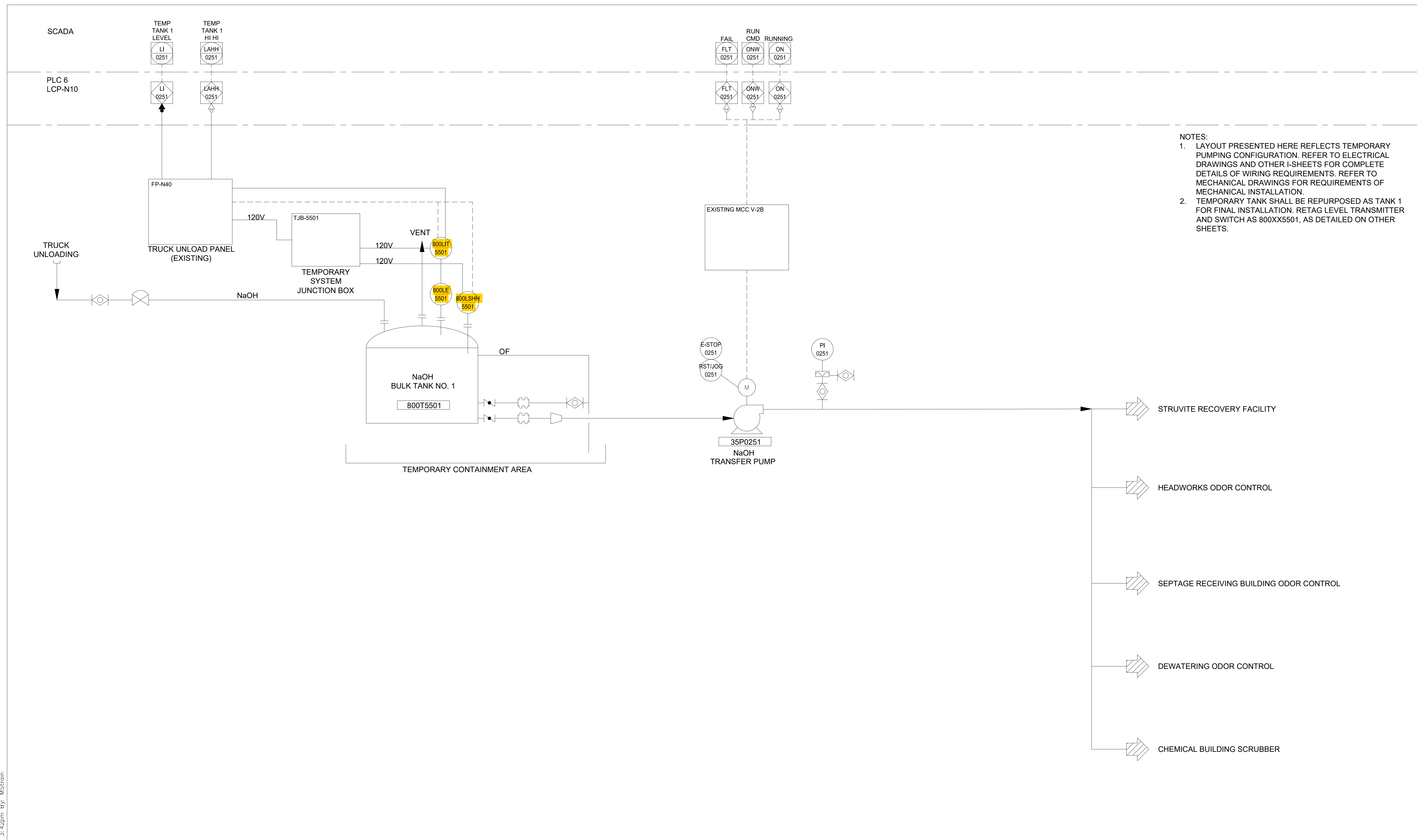
PROJ NAME: **ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134**

SHEET TITLE: **INSTR. AND CONTROL CAUSTIC SYSTEM P&ID**

SHEET: 29 OF: 50
PLOT DATE: 03/13/2024
PLC #: N/A
CWS PROJ #: 7134

DWG #: **1-2**





NOTES:  
 1. LAYOUT PRESENTED HERE REFLECTS TEMPORARY PUMPING CONFIGURATION. REFER TO ELECTRICAL DRAWINGS AND OTHER I-SHEETS FOR COMPLETE DETAILS OF WIRING REQUIREMENTS. REFER TO MECHANICAL DRAWINGS FOR REQUIREMENTS OF MECHANICAL INSTALLATION.  
 2. TEMPORARY TANK SHALL BE REPURPOSED AS TANK 1 FOR FINAL INSTALLATION. RETAG LEVEL TRANSMITTER AND SWITCH AS 800XX5501, AS DETAILED ON OTHER SHEETS.

File: C:\Users\mstrain\OneDrive\Documents\Hazen and Sawyer\80001-004\_ROCK CREEK\Project Files\01\_Design\Inst\1-3.dwg TAB: I=P&D  
 Plotted: 3/12/24 at 3:42pm by: MStrain

DRN: KR	ORIG DATE: MARCH 2024
DSN: KR	DWG #: I-3
CHK: KR	CAD FILE #: I-3.DWG
APPD: LK	SCALE: NO SCALE

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REV #	DATE	DRN	APPD	DESCRIPTION



PROJ NAME: **ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134**

SHEET TITLE: **INSTR. AND CONTROL TEMPORARY CAUSTIC SYSTEM P&ID**

SHEET: 30 OF: 50
PLOT DATE: 03/13/2024
PLC #: N/A
CWS PROJ #: 7134

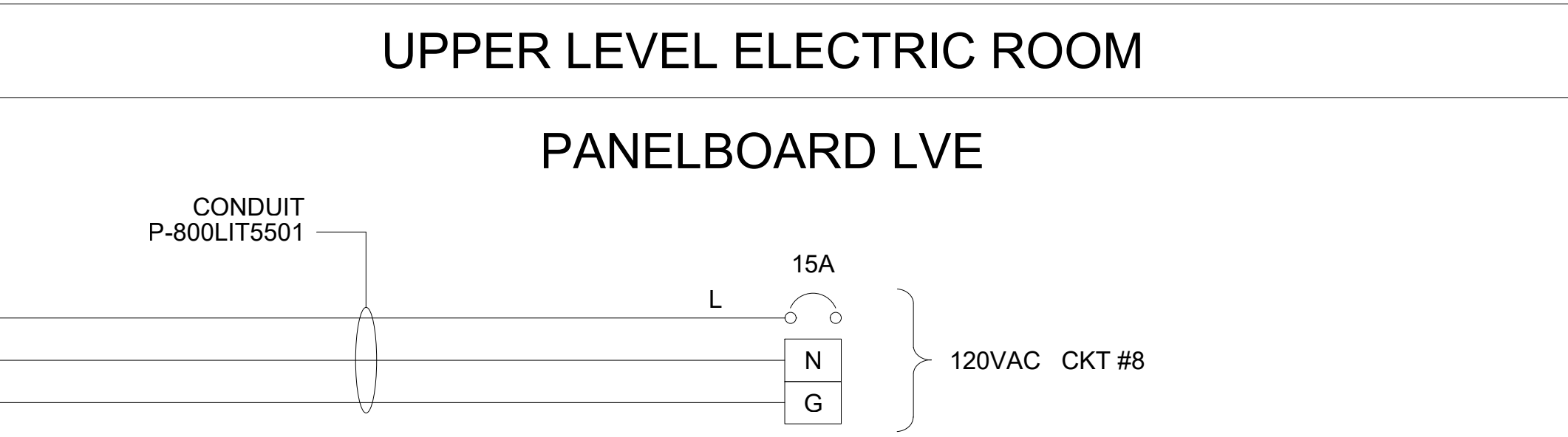
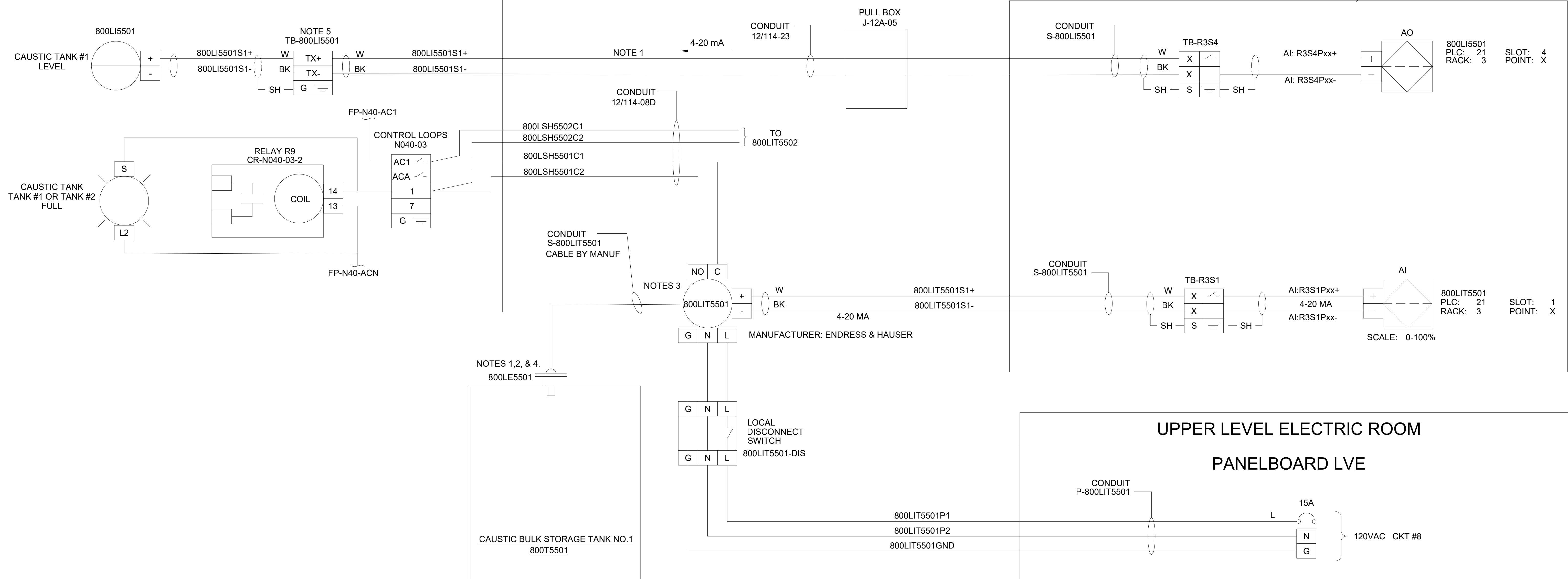
DWG #: **I-3**



ROCK CREEK CHEMICAL BUILDING

TRUCK UNLOADING  
TRUCK UNLOADING PANEL FP-N40

SODIUM HYDROXIDE & ALUM STORAGE ROOM



**ORT1 CHECKOUT COMPLETED**

INTEGRATOR: \_\_\_\_\_

ELECTRICAL: \_\_\_\_\_

OWNER: \_\_\_\_\_

DATE: \_\_\_\_\_

- NOTES:
- FOR 800LE5501 & 800LE5502: CONTRACTOR TO PURCHASE AND INSTALL E&H ULTRASONIC SENSORS, PART NUMBER FDU91-UN6AA.
  - FOR 800LE5502: CONTRACTOR TO PURCHASE AND INSTALL E&H FLANGE ASSEMBLY, PART NUMBER FAX50-XJGF.
  - FOR 800LIT5502: CONTRACTOR TO PURCHASE AND INSTALL E&H TRANSMITTER, PART NUMBER FMU90-N11CA132AA1A.
  - TANK 800T5501 WAS USED FOR TEMPORARY SERVICE AND WAS INSTALLED WITH LEVEL TRANSMITTER, LEVEL SENSOR, AND FLANGE ADAPTER. ORDER NEW LEVEL SENSOR WITH THE LONG CABLE AS SHOWN IN NOTE 1.
  - TERMINALS IN FP-N40: INSTALL THREE TERMINALS AS DESCRIBED IN DRAWING I-11 AND LABEL AS "TB-800LI5502" FOR CAUSTIC TANK NO.2. RELABEL TERMINAL BLOCK TB-N040-03 AS TB-800LI5501 FOR CAUSTIC TANK NO.1.

TAG	LOOP DESCRIPTION	PLC PANEL	PANELBOARD	CIRCUIT#
800LIT5501	CAUSTIC BULK STORAGE TANK NO.1 LEVEL	800LCP9602	LVE	8
800LIT5502	CAUSTIC BULK STORAGE TANK NO.2 LEVEL	800LCP9602	LVE	9

File: C:\Users\mstrain\OneDrive\Documents\Rock Creek\Project Files\01\_Design\Inst\I-4.dwg TAB: I-05  
 Plotted: 3/12/24 at 3:42pm by: MStrain

DRN: KR	ORIG DATE: MARCH 2024
DSN: KR	DWG #: I-4
CHK: KR	CAD FILE #: I-4.DWG
APPD: LK	SCALE: NO SCALE

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION



PROJ NAME: ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134

SHEET TITLE: INSTR. AND CONTROL TYPICAL CAUSTIC TANK LEVEL TRANSMITTER LOOP DRAWING

SHEET: 31 OF: 50	DWG #:
PLOT DATE: 03/13/2024	I-4
PLC #: N/A	
CWS PROJ #: 7134	



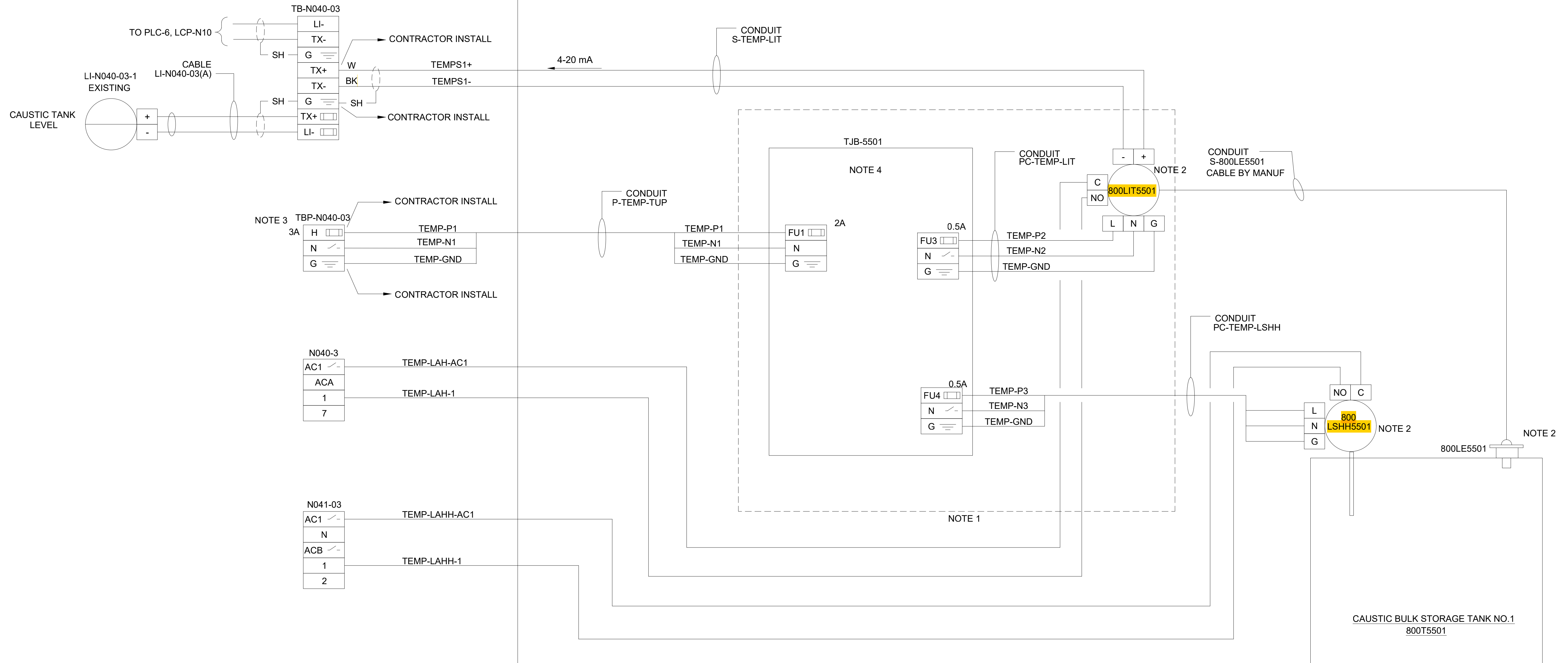




ROCK CREEK WRRF

CHEMICAL BLDG. TRUCK UNLOADING  
TRUCK UNLOADING PANEL FP-N40

TEMPORARY CAUSTIC TANK-OUTSIDE



ORT1 CHECKOUT COMPLETED

INTEGRATOR: \_\_\_\_\_

ELECTRICAL: \_\_\_\_\_

OWNER: \_\_\_\_\_

DATE: \_\_\_\_\_

- NOTES:
1. MOUNT TJB-5501 AND LEVEL TRANSMITTER (800LIT5501) ON SAME STAND, POSITIONED FOR TRUCKER ACCESS.
  2. CONTRACTOR TO PURCHASE AND INSTALL LEVEL TRANSMITTER, LEVEL SENSOR, LEVEL SWITCH, AND FLANGE ADAPTER FOR TEMPORARY INSTALLATION AS FOLLOWS:
    - 2.1. 800LIT5501: E&H P/N FMU90-N11CA132AA1A
    - 2.2. 800LE5501: E&H P/N FDU91-UN2AA
    - 2.3. FLANGE ADAPTER: E&H P/N FAX50-XJGF
    - 2.4. 800LSHH5501: E&H P/N E&H TUNING FORK, PART NUMBER FTL62-CAA4BAHPQ2(DQ)AAAFJ. CONTRACTOR TO VERIFY INSERTION LENGTH, CODE DQ IN PART NUMBER.
  3. WHEN MAKING CONNECTION FOR SIGNAL AND POWER INSIDE PANEL FP-N40, REPLACE FUSE WITH AMPERAGE SHOWN.
  4. BUILD TEMP CAUSTIC TANK TJB AS DETAILED ON DRAWING E-11.

File: C:\Users\mstrain\DC\ACCDOes\Hazen and Sawyer\80001-004-ROCK CREEK\Project Files\01\_Design\Inst\1-11.dwg TAB:1-TEMP-01  
Plotted: 3/12/24 at 3:47pm By: MStrain

DRN: KR	ORIG DATE: MARCH 2024
DSN: KR	DWG #: I-11
CHK: KR	CAD FILE #: I-11.DWG
APPD: LK	SCALE: NO SCALE

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION



PROJ NAME: ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134

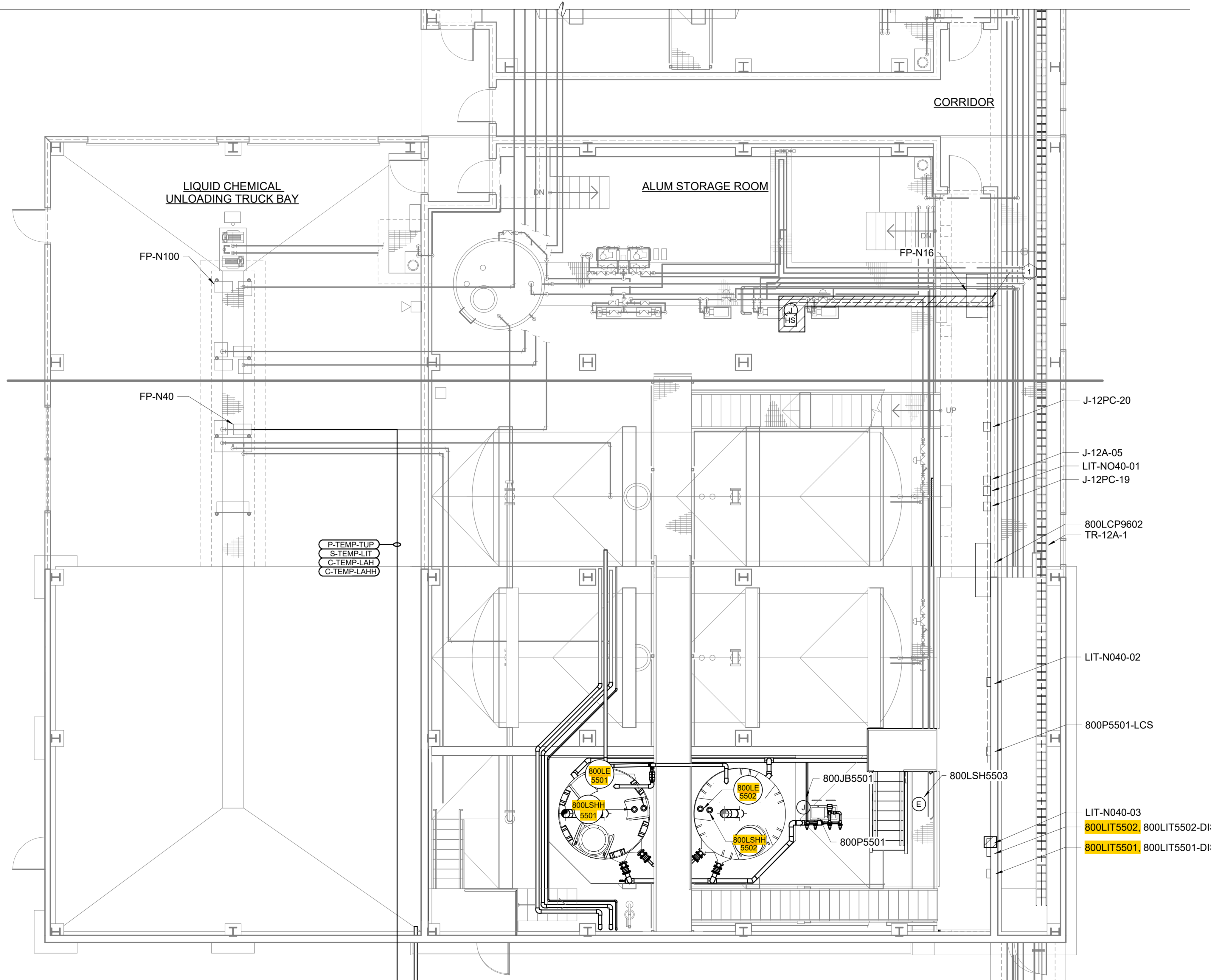
SHEET TITLE: INSTR. AND CONTROL TEMPORARY INSTRUMENTS CAUSTIC TEMP TANK LOOP DRAWING

SHEET: 38 OF 50  
PLOT DATE: 03/13/2024  
PLC #: N/A  
CWS PROJ #: 7134

DWG #: I-11



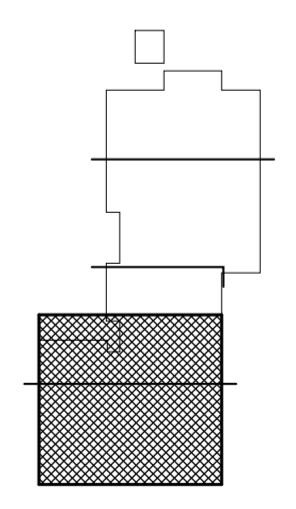
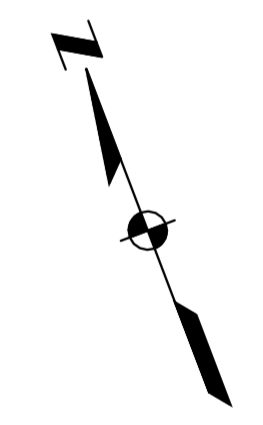
CONTINUED ON SHEET E-4



- GENERAL NOTES**
- LAYOUT SHOWN HERE IS FROM RECORD DRAWINGS. FIELD VERIFY ALL EXISTING CONDITIONS BEFORE COMMENCING WORK
  - CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY. COORDINATE FINAL CONDUIT ROUTING WITH CLIENT AND FIELD CONDITIONS
- # SHEET KEYNOTES**
- INTERCEPT EXISTING POWER AND CONTROL CONDUITS FOR NaOH TRANSFER PUMP UNDER WALKWAY AND REROUTE TO NEW PUMP LOCATION. DEMOLISH EXISTING CONDUCTORS TO SOURCE AND REINSTALL NEW CONDUCTORS.
  - INSTALL NaOH TRANSFER PUMP 800P5501 AND CONTROL VALVE 800FV5501 PER WIRING DIAGRAM ON SHEET E-6

1 ELECTRICAL GROUND FLOOR SOUTH POWER PLAN  
3/16" = 1'-0"

KEY PLAN SOUTH  
NO SCALE



Autodesk Docs://0001-004-ROCK\_CREEK/0001-004-100-E-1.rvt  
 3/13/2024 8:58:44 AM

DRN: WS	ORIG DATE: MARCH 2024
DSN: AB	DWG #: E-5
CHK: AB	CAD FILE #: E-5.DWG
APPD:	SCALE: AS INDICATED

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION

2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

PROJ NAME: **ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134**

SHEET TITLE: **ELECTRICAL GROUND FLOOR SOUTH POWER PLAN**

SHEET: 43 OF 50  
 PLOT DATE: 03/13/2024  
 PLC #: N/A  
 CWS PROJ #: 7134

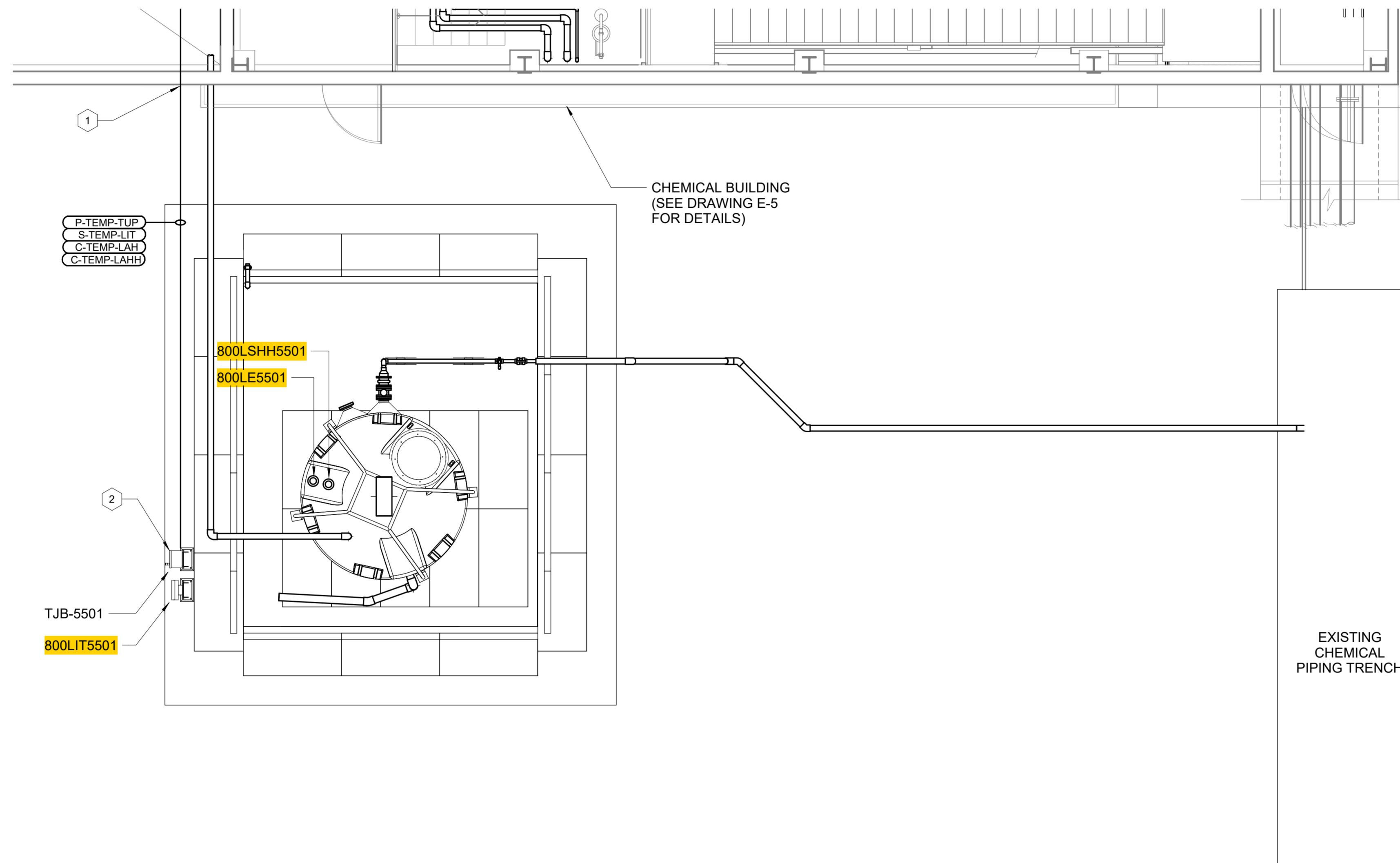
DWG #: **E-5**

GENERAL NOTES

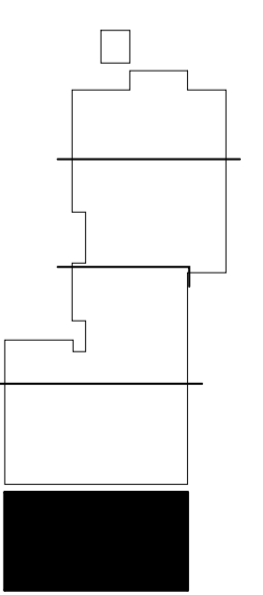
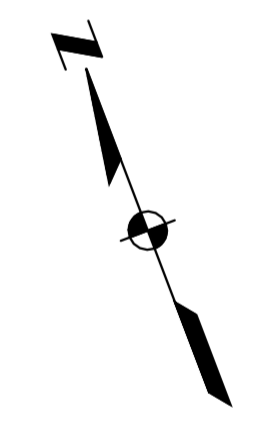
- REFER TO DRAWINGS M-5 AND M-6 FOR COMPLETE DETAILS OF TEMPORARY PUMPING SYSTEM.
- COORDINATE FINAL INSTALLED LOCATION OF ALL EQUIPMENT WITH SUBMITTED AND EXISTING MECHANICAL AND STRUCTURE EQUIPMENT AND STRUCTURES.

# SHEET KEYNOTES

- ROUTE CONDUIT ON TEMPORARY UNISTRUT PIPE SUPPORT SYSTEM AND THROUGH EXISTING PENETRATION ABOVE HEIGHT OF GARAGE DOOR NEAR CEILING OF GROUND FLOOR. SEE NOTE 10 ON M-5.
- MOUNT NEW DISCONNECT SWITCH AND LEVEL TRANSMITTER ON SUPPORT STRUT OR C-FORM ALUMINUM SUPPORT.



1 TEMPORARY NaOH SYSTEM POWER PLAN  
1/4" = 1'-0"



KEY PLAN SOUTH YARD  
NO SCALE

Autodesk Docs://0001-004-ROCK\_CREEK/0001-004-100-E-PT  
 3/12/2024 2:46:45 PM

DRN: WS	ORIG DATE: MARCH 2024
DSN: AB	DWG #: E-6
CHK: AB	CAD FILE #: E-6.DWG
APPD:	SCALE: NO SCALE

		REV #	DATE	DRN	APPD	DESCRIPTION

2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

PROJ NAME: **ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134**

SHEET TITLE: **ELECTRICAL TEMPORARY NaOH SYSTEM POWER PLAN**

SHEET: 44 OF 50  
 PLOT DATE: 03/13/2024  
 PLC #: N/A  
 CWS PROJ #: 7134

DWG #:  
E-6



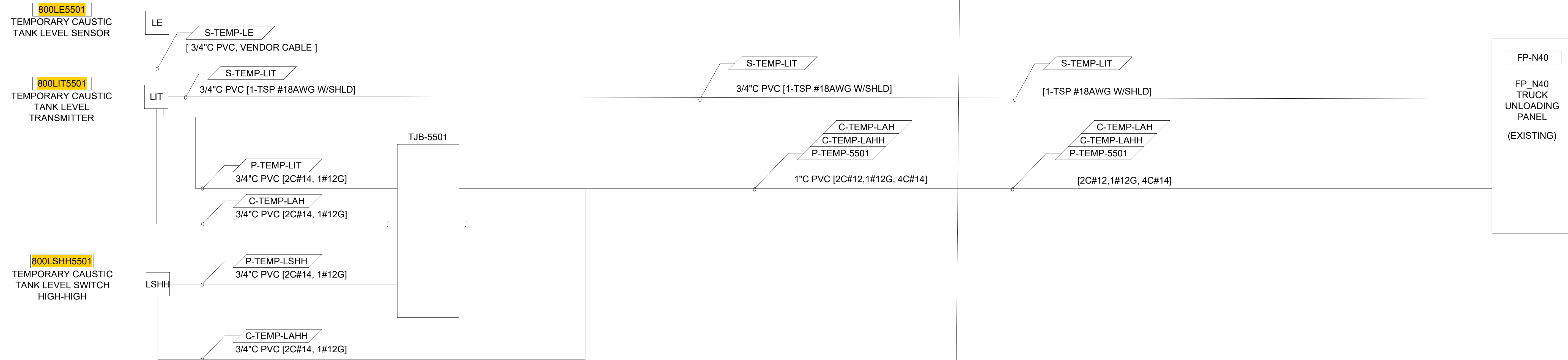


ROCK CREEK WRRF

OUTSIDE-NEAR CHEMICAL BUILDING

CHEMICAL BUILDING

TRUCK UNLOAD BAY



3/12/2024 3:57 PM C:\Users\mstrain\OneDrive\Documents\Hazen and Sawyer\80001-004\_ROCK CREEK\Project Files\01\_Design\Elect\TEMP-01.dwg

DRN: WS	ORIG DATE: MARCH 2024
DSN: AB	DWG #: E-10
CHK: AB	CAD FILE #: E-TEMP-01.DWG
APPD:	SCALE: NO SCALE

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
REV #	DATE
DRN	APPD
DESCRIPTION	



PROJ NAME: ROCK CREEK SODIUM HYDROXIDE TANK REPLACEMENT PROJECT NO.7134

SHEET TITLE: ELECTRICAL CIRCUIT/RACEWAY TEMPORARY CAUSTIC TANK BLOCK DIAGRAM

SHEET: 48 OF: 50
PLOT DATE: 03/13/2024
PLC #: N/A
CWS PROJ #: 7134

DWG #: E-10

