**ADDENDUM NO. 2**

**City of Harrisburg, Oregon**
**Contract Documents and Construction Specifications**
**North and South Treatment Plant**


All bidders are hereby notified of the following modification to the contract documents, construction specifications and construction plans. This modification is to become a part of said contract documents, construction specifications and construction plans.

Each proposal shall include specific acknowledgment of receipt of this Addendum in the space provided below. Failure to acknowledge may result in the proposal being rejected as not responsive.

Contractor _____

By _____

Date _____

This Addendum shall supersede all previously issued specifications and drawings wherein it contradicts same. All other conditions remain unchanged. The following changes, modifications, corrections, clarifications, and/or additions as set forth herein shall apply to the above documents and shall be made a part thereof and shall be subject to all of the requirements thereof as though originally specified and/or shown.

| Item No. | Reference | Description of Change |
|---|---|---|
| | | |
| 1. | Volume 2 | Section 26 05 00 updated, added paragraph 1.3 E 1 “Exception: Fees from the electrical utility company will be paid by the owner.”, see attached. |
| 2. | Volume 2 | Section 09 97 13.24 Steel Water Storage Tank Painting updated to meet NSF600 for application of coating after January 1 2023, see attached. |
| **Drawings** | | |
| 3. | Volume 3 – Sheet G001 | Sheet index updated to match sheet names for I601N and I601S, see attached. |
| 4. | Volume 3 – Sheets R001, R101N, R101S | Drawings updated to reflect drain and expansion changes per questions 13 and 15 below, see attached. |
| 5. | Volume 3 - Sheet C105N | Update drain size to 8” to match reservoir sheets. |
| 6. | Volume 3 – Instrumentation Sheets I100S, I200N, I300, I400 | Locations of instruments and sheet notes updated, see attached. |
| 7. | Volume 3 – Instrumentation Sheets I501N, I503N, I501S, I503S | Note per question 9 response below that the backwash flow meters are pre-purchased and that only one insertion style flow meter, per site, needs to be supplied by the contractor.<br><br>Note per question 24 response below that permanganate and phosphoric acid pumps should be tank-mounted and not skid mounted. |

**Bidders’ Questions**

**1. Will liquidated damages apply to equipment manufacture delays out of the contractors control such as the MCC?**
The City is willing to extend the contract time if an equipment delivery issue arises that is out of the Contractor's control. Contractor shall submit documentation (such as records of order date and communications with the supplier) regarding the delivery issue.

**2. Will there be a utility connection allowance for the unknown electrical connection fee?**
The City will pay the utility connection fee.

**3. Is the City still considering welded steel tanks for the N and S finished water reservoirs? Or would they be open to a concrete tank alternative?**
Welded steel tanks only.

**4. The sheet index for both the North and South drawing sets mentions that Drawings A601N and A601S are Door, Hardware, and Room Finish Schedules. There are no room finish schedules on either drawing.**
The sheet index has been updated to reflect that there is no room finish schedule in drawings A601N and A601S.

**5. Specification 09 90 00 - Painting (Pages 5 and 6) has 5 different floor coating systems. Which systems are to be used?**
Treatment Room, Pump Room, and Electrical Room shall be System 3 Epoxy Sealed Skid Resistant. Chemical Room Shall be System 6.

**6. Drawing A401N and A401S, Restroom Note D mentions resinous flooring. There are 3 different resinous flooring systems in the painting spec. Which system is to be used?**
Restroom shall use system 3 Epoxy Sealed Skid Resistant floor coating.

**7. Specification 09 90 00 , 2.4 B 1 (page 5 of spec), calls out painting of interior concrete walls, ceiling, precast panels. Is this system to be used on the interior CMU walls in the Treatment, Pump, Electrical and Chemical rooms? Or are the walls to remain unpainted?**
Interior walls shall be painted with System 1.

**8. Estimated timeline on when the field coating and lining are anticipated to take place? Starting Jan 1 2023, NSF will be implementing new NSF600 drinking water extraction limitations. Current spec will not meet that standard NSF600 as it's written if the work will be performed post 1-1-2023.**
Project coatings are not expected to be applied until 2023. Specifications have been updated to reflect this, see attached.

**9. The P&ID drawings for both North and South WTP show a Magnetic Flow Meter (I501N & I501S) and an Insertion flow meter (I502N & I502S). But the Site Instrumentation locations (I100N & I200S) only shows one (1) FIT unit. Can you please advise what is to be provided and how many?**
Backwash flow meters for both the North and South WTPs are provided by the owner as part of the prefabricated filter package. Backwash flow meters shall be installed by the contractor. Two insertion style flow meters (one at the North WTP and one at the South WTP) shall be supplied and installed by the contractor per spec section 41 71 20.

**10. Spec section 40 61 00-12, A., 2., j. states "Laptop shown on the network diagram was prepurchase by the City and is not part of this contract." The Network diagram (I300) Note A. says "ALL EQUIPMENT SHOWN ON THIS DRAWING IS NEW AND SHALL BE SUPPLIED, INSTALLED, CONFIGURED, AND COMMISSIONED BY THE CONTRACTOR. SCADA AND PLC PROGRAMMING SHALL BE BY OTHERS". Who is to provide the Laptop?**
City has pre-purchased the laptop and will provide this.

**11. There are check valves on the discharge of the new turbine pumps on the north and south WTP's, but I don't see any specification for check valves. Please advise the type of check valve desired or point out where I missed the spec.**
Provide restrained dismantling joint (ROMAC DJ400; or approved equal) at pump base.

*Check Valve for Booster Pump 1 and Booster Pump 2 shall be:*

a. Flanged end, cast-iron body, bronze mounted swing type, solid bronze or cast-iron disc, bronze seat ring, rated 125-pound SWG, 200-pound WOG.
b. Manufactures and Products:
    1. Stockham G-931; List 37, Clearway check Valve.
    2. Crane Co.; Cat No. 373

*Check Valves for Fire Pumps Shall Be:*

a. Cast-Iron Swing Check Valves 2 1/2 Inches and Larger for Fire Protection Service:
    1. Swing check valves of sizes 2 1/2 through 12 inches for fire protection service shall be UL listed, FM approved, rated for at least 175 psi nonshock, cold water.
    2. Ends shall be flanged, Class 125, ASME B16.1. Materials of construction shall be as follows:

| **Description** | **Material** | **Standards** |
|---|---|---|
| Body and cap | Cast iron | ASTM A126, Class B |
| Disc | Bronze or cast iron | ASTM B62; ASTM B584, Alloy C83600; or ASTM A126, Class B |
| Disc bushing, disc ring, and seat ring | Bronze | ASTM B62, or ASTM B584 (Alloy C83600) |
| Hinge pin | Brass | ASTM B16 or ASTM B21 |

Valves shall be Stockham G-939, Walworth Figure 8883 F, Nibco F-908, or equal.

**12. Drawing M202S in item 7 of the schedule calls for a 1" combo air vac, type 1203. I don't know what the type 1203 refers to, and I can't locate a written specification for these air valves. There is a detail 1 on drawing M502, but this is for an air release valve, not a combination air/vac valve. Please advise where the specification can be found for these combination air valves as well as the appropriate detail to use.**
Disregard reference to Type 1203 valve.

Combination air/vacuum valves for pumping station shall be:

a. 1/2-inch through 3-inch NPT inlets and outlets, 4-inch and larger ASME B16.1 Class 125 flanged inlet with plain outlet and protective hood
b. Rated 150 psi working pressure, cast-iron or ductile iron body and cover, stainless steel float and trim, build and tested to AWWA C512.
c. Manufacturers and Products:
    1. APCO Valve and Primer Corp.; Series 140 of 150.
    2. Val-matic Valve; Series 100.

Degas Relief Valve:
Degas separators shall include degas relief valve as recommended by the manufacture.

**13. Drawings R101N and R101S both show the 24 inch Flex-Tend expansion joints on the outlet lines to have 8 inches of expansion. This appears to conflict with spec section 33 11 10 par. 2.6.A.5.d where joints larger than 12" are listed as having 16" of expansion. Which is correct?**
The specs are correct, and drawings have been updated to match spec section 33 with 16" of expansion, see attached.

**14. Can you clarify the size of the drain for the north reservoir? Drawing C105N under key note 212 lists it as 6", while drawing R101N in details 1 and 2 both list a size of 8".**
The drains for both north and south shall be 8" per Windsor's tank design drawings.

**15. Drawing R101N in detail 2 shows a 90 elbow down to the drain basin, then a gate valve, then a short stub of pipe apparently welded to the tank shell. Detail 2 however has no 90 elbow down into the basin but does show some sort of fitting at the reservoir shell, then the line extends into the reservoir and includes a 90 elbow up and perhaps vertical piping from the elbow. Please clarify the arrangement desired for the drain lines.**
R101S has been revised to show elbow on drain; overflow pipe and drain lines should match, see attached.

**16. On drawing C105N under water lines notes, it states that all water line joints should be restrained. The south reservoir has a similar note. But in the utility construction notes such as 214 on C105N, it gives a minimum distance from a fitting that joints are to be restrained implying that joints outside of this range can be unrestrained. Please clarify.**
The water line notes state "all water line joints to be restrained as required." The requirements (length from fittings) is stated in construction notes.

**17. Spec section 33 05 00 in par. 2.11.A apparently requires domestic made cast iron valves boxes, yet spec section 33 12 16 in par. 2.5.B does not contain a domestic requirement. Please clarify which valve boxes, if any, on this project are required to be of domestic manufacture.**
There is no domestic-made requirement for this project.

**18. Spec section 33 11 10 in par. 2.2.D.2 calls for cement mortar lining on fittings to be double thickness, yet spec section 33 05 00 in both par. 2.8.C.4 and 2.9.E does not contain the double thickness requirement. Please clarify where and when double cement mortar lining is required for DI fittings on this project.**
Double thickness is not required.

**19. Spec section 46 20 00 - Misc. Chemical Feed Equipment: In the chemical feed section it is calling for CPVC vented ball valves, but no mention of CPVC anywhere else. Can PVC be used instead of CPVC?**
PVC is fine for this application.

**20. How will price escalation be handled?**
Reference Oregon Standard Specifications for Construction Section 00195 – Payment.

**21. Why was the project not awarded the first time?**
The project was not awarded the first time because the bids came in above the City's budget and they did not have the financing lined up to pay for it. A new cost estimate was prepared for the project and the City decided to rebid it.

**22. Drawings R101N and R101S for both tanks show full perimeter rooftop guardrails around the tanks, while specification 43 41 14 (page 6) paragraph 2.4 E. 5. calls for "Guardrail: Provide around the roof hatch and ladder area in accordance with UBC." Do the tanks require full perimeter guardrail around the roofs?**
Guardrail will only be required around the roof hatch and ladder as described in the specifications.

**23. Drawing R101N "DRAIN DETAIL" shows a tank shell nozzle with invert elevation common to the bottom of the tank. This is not an acceptable nozzle configuration in accordance with the AWWA D100 design standard, and a flush bottom connection in accordance with API 650 should be installed, but as far as I can tell, there is really no definitive reference to this requirement.**
The drains for both north and south shall be as shown on the plans. The successful bidder can request a revised layout with their submittal for Engineer review.

**24. Drawing I503N shows the Permanganate and the Acid pumps skid mounted. Drawing M203N shows them mounted to the tank. Please clarify.**
Please refer to spec section 46 20 00. Pumps for permanganate and phosphoric acid shall be tank mounted to save space, pumps for sodium hypochlorite shall remain skid mounted. Per paragraph 2.4 D, if pumps cannot be tank mounted alternate mounting may be proposed for the Engineer to approve.

**25. Can we have a copy of the Mandatory Pre-Bid Meeting sign in sheet?**
Yes, see attached.

**No further questions will be answered from this point until after Bid Closing. Please bid the project as you interpret it.**

# SECTION 26 05 00 - GENERAL ELECTRICAL REQUIREMENTS

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

The Harrisburg Water Improvements project includes electrical work at existing North and South Facilities. Work includes replacement of electrical systems, new added electrical equipment as well as a new well 9 at the North facility. The following Electrical, Instrumentation and Controls scope of work includes (but is not limited to) the following:

A. General Electric Utility Information and coordination

1. The Electric Utility servicing both City of Harrisburg locations is:

    a. Pacific Corp
    b. Builder Support phone number is: 800-469-3981
    c. North Site Meter reference number: 77 293 629 (WO# 6969111)
    d. South Site Meter reference number: 74 264 282 (WO# 6969110)

2. Refer to Pacific Corp "Electric Service Requirements Manual" for electric utility requirements for all utility transformer to meter and client incoming service entrance. Located on Pacific Corp website at: https://www.pacificpower.net/working-with-us/builders-contractors/electric-service-requirements.html.

3. The Contractor shall provide permitting and submittals to utility and will coordinate with the utility for any required outages during construction. Any utility forms needing City's representative signature and information shall be coordinated with the City Project Manager/Engineer.

4. Utility required outages during construction shall be coordinated with City operations personnel in order to maintain water distribution system supply and pressure.

B. Hardware System Integrator (HSI) and Software System Integrator (SSI):

1. The Hardware System Integrator (HSI) under this contract shall install, configure and test the base set of SCADA/PLC software and configure all network equipment including the cellular systems. The communications systems shall be configured and tested to confirm communication between two devices at all locations on the network. Upon completion and verification of the testing documents by the Owner's Construction Representative, the HSI shall notify the Owner/Engineer/SSI that the system is ready for Process Control Software Download.

2. The Software System Integrator (SSI) (under a separate contract) shall design, configure and commission the SCADA and PLC process control software. After notifications from the HSI that the network systems are tested and operational, the SSI shall download the process control programs to the HSI configured systems and verify systems are communicating across the preconfigured networks.

C. The Telemetry and SCADA work for both facilities:

1. The Telemetry systems shall consist of Cellular Modems based on the FirstNet cellular network utilizing Cradle Point modems. The system will be setup as a first responder type network for resilience and dependability. The Contractor shall install, setup, configure, commission and test the cellular network. The system will be Ethernet based and provide the backbone for the SCADA communication systems.

2. The SCADA system shall be native compatible Rockwell Ethernet/IP communications with the Rockwell PLC systems. The contractor shall provide a network and component system capable of supporting the pre-purchased Rockwell FactoryTalk and Logix5000 software and based on the drawing SCADA Systems architecture.

3. PC equipment will be provided under this contract. The systems will be configured and installed utilizing NIST SP 800-82, Rev. 2, Guide to Industrial Control Systems as a Cyber Security resource.

4. Contractor to purchase all computer equipment as identified on the network diagram.

D. Work at North Facility:

1. Addition of a new North Reservoir with electrical, control/signal, lightning protection and grounding.

2. Addition of a new building to house the pressure filter, chemical systems, electrical infrastructure, booster pumps and fire pump. The building will also include five bathrooms for the neighboring Fair Grounds for various activities.

3. Addition of Well 9 building and all equipment to make a functional operating well. The well will supply water to a new reservoir located near the existing Well 8 facility.

4. Well 8 incoming electrical will be decommissioned and a new power feed from the new MCC will be installed. The well 8 ATS shall be replaced with a disconnect switch and all associated hardware will be modified to accommodate the new power feed. Refer to electrical drawings.

5. The existing well 8 utility meter and the utility wiring will remain intact for possible future metered connection to the fairgrounds area. A conduit will be installed to the new manhole (with a pull string) as shown on the drawings and only conduit will be installed for future use.

6. The electrical will require the following:

    a. A new utility electrical service and secondary conductor conduit/wire from the utility pole to the meter box at the new building to meet the new loads. NOTE" Currently the transformer is mounted on the pole which may change to a pad mounted transformer should the utility require it during construction.

    b. A new utility meter box, incoming equipment, backup generator, ATS, MTS (with portable generator connection) and MCC as shown on the drawings.

    c. New Power, Instrumentation and Control wiring for all equipment as identified in these specifications and the drawings.

    d. New Power, Instrumentation and Control conduit and wiring to/from the new Well 9.

    e. Set the Well 8 VFD to constant speed as it is no longer feeding directly into the distribution system. The contractor shall examine the pump curve of the existing pump and estimate the proper speed for pumping to operate at its most efficient point.

    f. Modification of the electrical control scheme for Well 8 to meet the new wiring and control schematic requirements as shown on the drawings. Refer to the FVNR electrical schematics in the drawings and adjust to interface with the existing VFD (to be operated at constant speed).

    g. A Process Automated Control (PAC) system including a PLC, instrumentation and control functions required by these specifications and the drawings.

    h. Facility and area lighting.

    i. Proper grounding per the NEC, IEEE Green Book, these specifications and drawings.

E. Work at South Facility:

1. Addition of a new South Reservoir with electrical, control/signal and grounding.

2. Addition of a new building to house the pressure filter, chemical systems, electrical infrastructure, booster pumps and fire pump.

3. The electrical will require the following:

    a. Replace the existing utility electrical service and feeder conduit/wire to the existing MCC building with new service feeder conductors from the existing transformer.

    b. Install a new Allen Bradley MCC. Utilize the existing feeder boxes, conduit and wire from Wells 4, 6 & 7 and reconnect to new MCC.

    c. A new utility meter box for larger service, incoming equipment, backup generator, ATS, MTS (with portable generator connection) and MCC as shown on the drawings.

    d. Rewire existing circuits from existing distribution panel to the new distribution panel.

    e. Rewire existing Maintenance Building wiring to new MCC.

    f. A power sub feeder to the new Filter and Pump Station building MCC from the new MCC in the existing building.

    g. Power, Instrumentation and Control wiring for all equipment as identified in these specifications and the drawings. Note the conduits to the new instruments on the existing reservoir and the new reservoir.

    h. Modification of the electrical control scheme for Wells 4, 6, and 7 to meet the new wiring and control schematic requirements as shown on the drawings. Refer to the FVNR electrical schematics in the drawings.

    i. A Process Automated Control (PAC) system including a PLC, instrumentation and control functions required by these specifications and the drawings.

    j. Facility and area lighting per drawings.

    k. Proper grounding per the NEC, IEEE Green Book, these specification and drawings.

F. Work in General:

1. Provide all required labor, project equipment and materials, tools, construction equipment, safety equipment, transportation, and test equipment, and satisfactorily complete all electrical work shown on the Drawings, included in these Specifications, or required for a complete and fully operating facility. In addition, provide wiring for the equipment that will be provided under other Divisions of these Specifications.

2. Provide all conduit for the Instrumentation and Controls specified in Division 40. Provide all Instrumentation and Control wire that is specified in Division 26.

3. Auxiliary Devices: Provide conduit and wire for power and control for all auxiliary devices such as solenoid valves, pressure switches, and instruments that are included as part of a manufacturer's packaged system (i.e., all systems specified in divisions covering packaged systems). Contractor shall be responsible for conduit and wire to these auxiliary devices even if not specifically shown on the Drawings or specified herein. Coordinate with contractor providing pressure filters, chemical systems and any other package equipment supplied for the project.

4. Coordination with local utility to clarify boundaries for connection purposes.

G. Work Specified in Other Divisions:

1. Division 40: Providing instruments and other electrical equipment specified in Division 40.

H. Work to be done by Others outside this contract and coordinated by the contractor under this contract:

1. Provide and connect Utility Power Company meters and main incoming wire as coordinated with the local utility. Refer to utility's boundaries of responsibility.

2. Coordinate with the SSI (Software System Integrator) regarding scheduling for SCADA and PLC I/O testing, startup, installation, functional testing and startup/commissioning.

3. Provide telephone company instruments, relays, terminals, and cables. (if required by field modifications).

I. Safety:

1. Conduct operations in accordance with NFPA 70E, Standard for Electrical Safety Requirements for Employee Workspaces.

1.2 SUBMITTALS

A. Shop Drawings:

1. General: Submit Product Review or Product information shop drawings for materials and equipment as required under the General Conditions (Volume 1).

2. For Product Review submittals, submit a single, complete submittal package for all items specified in a particular Specification section. Submittal packages shall be

organized by equipment type. Include separators and tabs or other means of identifying each Specification paragraph (e.g., 2.01, 2.02, etc.) of the submittal.

3. For substituted (or equal) equipment in submittals, provide product data sheets and warranty information for first named and the substituted equipment. Identify any differences between the first named and the substitution. Provide technical benefits of the substitution over the first named.

B. As-Built Shop Drawings: Revise manufacturer's shop drawings to show any construction changes. Prior to final acceptance, deliver one complete set to the Engineer for favorable review. After such review, provide copies of all CAD produced drawings on magnetic media satisfactory to the Engineer in AutoCAD DWG format.

C. Manuals:

1. Furnish manuals for equipment where Manuals are specified in the equipment Specifications. Submit manuals in accordance with the requirements of the General Conditions (Volume 1).

2. In each manual, include equipment descriptions, record shop drawings, operation and maintenance instructions, parts ordering data and ratings for the equipment furnished for this project.

D. Spare Parts:

1. For each piece of equipment, submit a list of recommended spare parts (Preferably in MS Excel format). Include part numbers and the name, address, and telephone number of the supplier.

1.3 QUALITY ASSURANCE

A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the following applicable codes and publications.

1. National Electrical Code (NEC), applicable edition

2. State of Oregon Electrical Code

3. National Electrical Safety Code (NESC), recent edition

4. Occupational Safety and Health Act (OSHA) standards

5. Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems, International Electrical Testing Association (NETA), recent edition.

6. Practices identified in the NECA 1-2006 Good Workmanship in Electrical Construction publication shall be adhered to.

B. Variances: In instances where two or more codes are at variance, the most restrictive requirements shall apply.

C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA). The revisions of these standards in effect on the date of issuance of the Contract Documents shall apply.

D. Underwriters Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Safety labeling and listing by other organizations, such as ETL Testing Laboratories, may be substituted for UL labeling and listing if acceptable to the authority having code enforcement jurisdiction. Should the authority having code enforcement require UL certification after the equipment is installed, the UL field certification costs shall be the contractor's responsibility at no expense to the Owner or Engineer. Provide service entrance labels for all equipment required by the NEC to have such labels.

E. Contractor's Expense: Obtain and pay for all required bonds, insurance, licenses, permits and inspections, and pay all taxes, and fees that will be required for the electrical construction work.

1. Exception: Fees from the electrical utility company will be paid by the owner.

F. Series short circuit ratings for protective devices are not allowed.

1.4 DRAWINGS

A. The Electrical Drawings are diagrammatic; exact locations of electrical products shall be verified in the field with the Owner's Construction Representative except where special details are used to illustrate the method of installation of a particular piece or type of equipment or material, the requirements or descriptions in this Specification shall take precedence in the event of conflict.

1. Locations of equipment, inserts, anchors, motors, panels, pull boxes, manholes, conduits, stub-ups, fittings, lighting fixtures, power and convenience outlets, exterior lighting units and ground wells are approximate unless dimensioned; verify locations with the Engineer prior to installation.

2. Field verify scaled dimensions on Drawings.

3. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for the installations.

4. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the Engineer for favorable review.

5. Resolution of conflicting interpretations of the Contract Documents shall conform to the General Conditions (Volume 1).

B. As-Built Drawings:

1. Maintain a complete full-size and accurate red-lined Record Set of Drawings for the electrical construction work. This set shall remain in the main construction facility, not used in the field and shall be updated on a weekly basis. The Owner or Engineer shall have access to these drawings at any time during construction.

2. Record all work that is installed differently than shown on the Drawings. Identify with cloud lines, initials and date the change was incorporated into the drawing set.

3. During construction, markups on all field sets of drawings shall be transferred to the clean set of full-size Drawings (item #1 above) with red ink. Mark the Drawings "AS-CONSTRUCTED DRAWINGS" and submit them to the Engineer when the electrical work is completed.

4. Locate all underground conduits by accurate field-measured dimensions from walls and corners, etc., of surrounding structures. Identify these conduits on the Record Set of Drawings prior to pouring concrete. Have the redlines verified by the Owner's Construction Representative prior to pouring concrete.

1.5 FACTORY TESTS

A. Submit reports of factory tests and adjustments performed by equipment manufacturers to the Engineer prior to field testing and adjustment of the equipment. These reports shall identify the equipment and show dates, results of tests, measured values and final adjustment settings. Provide factory tests and adjustments for equipment where factory tests are specified in the equipment Specifications.

1.6 INSPECTIONS

A. The Engineer/Owner or Owner representative may inspect the fabricated equipment at the factory before shipment to job site. Provide the Engineer with sufficient prior notice (minimum of 14 calendar days) so that an inspection can be arranged at the factory.

B. Inspection of the equipment at the factory by the Engineer/Owner or Owner's Construction Representative will be made after the manufacturer has performed satisfactory checks, adjustments, tests and operations.

C. Favorable review of the equipment at the factory only allows the manufacturer to ship the equipment to the project site. The Contractor shall be responsible for the proper installation and satisfactory startup operation of the equipment to the satisfaction of the manufacturer and the Engineer.

1.7 COORDINATION

A. Coordinate the electrical work with the other trades, code authorities, utilities, and the Owner.

B. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods. Schedule and carry out shutdowns so as to cause the least disruption to operation of the plant and privately owned facilities. Temporary lighting and power are to be provided by the contractor to facilitate construction work by all trades while facility electrical is not available.

C. When two trades join together in an area, make certain that no electrical work is omitted.

1.8 JOB CONDITIONS

A. Operations:

1. Keep all power shutdown periods to a minimum.

2. Carry out shutdowns only after the schedule has been favorably reviewed by the Engineer.

B. Construction Power:

1. Make all arrangements for the required construction power.

2. When required, provide all equipment, materials and wiring in accordance with the applicable codes and regulations.

3. Upon completion of the project, remove all temporary construction power equipment, material and wiring from the site as the property of the Contractor.

C. Storage:

1. Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.9 ELECTRICAL AND TELEPHONE SERVICES

A. Provide all the equipment and materials not provided by the utility companies for permanent electrical and telephone services at the locations shown on the Drawings and described hereinafter. All work shall meet the requirements of the serving utility companies.

B. Coordinate all work with the serving utilities, obtain the required inspections, and notify the respective utility when service is required.

1.10 DAMAGED PRODUCTS

A. Notify the Engineer in writing in the event that any equipment or material is damaged.

B. Obtain prior favorable review by the Engineer before making repairs to damaged products.

1.11 OPTIONAL EQUIPMENT

A. For optional or substituted equipment, refer to Division 1, General Conditions.

1.12 LOCATIONS

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located, as defined in Paragraph B. herein.

B. Definitions of Types of Locations:

1. Dry Locations: All those indoor areas which do not fall within the definitions below for Wet, Damp, Hazardous, or Corrosive Locations and which are not otherwise designated on the Drawings.

2. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

3. Damp Locations: All spaces wholly or partially underground or having a wall or ceiling forming part of a channel or tank, unless otherwise designated on the Drawings.

4. Hazardous Locations: All areas in which fire or explosion hazards may exist, normally or accidentally, due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or filings. These areas are shown on the Drawings, together with the Class and Division designations as defined in the NEC, determining the enclosure types and wiring methods required.

5. Corrosive Locations: Areas where chemical is stored or processed including chlorine or sulfur dioxide gas under pressure.

## PART 2 PRODUCTS

### 2.1 STANDARD OF QUALITY

A. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are favorably reviewed by the Engineer prior to installation.

B. It is the intent of these Specifications and Drawings to secure high quality in all materials and equipment in order to facilitate operation and maintenance of the facility. All equipment and materials shall be new and the products of reputable suppliers having adequate experience in the manufacture of these particular items. For uniformity, only one manufacturer will be accepted for each type of product. All equipment shall be designed for the service intended and shall be of rugged construction, of ample strength for all stresses, which may occur during fabrication, transportation, erection, and continuous or intermittent operation. All equipment shall be adequately stayed, braced and anchored and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details.

C. All components and devices installed shall be standard items of industrial grade, unless otherwise noted, and shall be of sturdy and durable construction suitable for long, trouble-free service. Light-duty, fragile and competitive grade devices of doubtful durability shall not be used.

### 2.2 NAMEPLATES

A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings and the model designation.

B. Identify each piece of equipment and related controls with a rigid laminated engraved phenolic nameplate. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel screws or, where favorably reviewed by the Engineer, with epoxy cement. Where no inscription is indicated on the Drawings, furnish nameplates with an appropriate inscription furnished by the Engineer upon prior request by the Contractor.

C. Each control device, including pushbuttons, control switches, and indicating lights, shall have an integral legend plate or nameplate indicating the device function. These shall be inscribed as indicated on the Drawings or as favorably reviewed by the Engineer.

2.3 FASTENERS

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel. Provide stainless steel fasteners in Corrosive Locations. When fastening to existing walls, floors, and the like, provide capsule anchors, not expansion shields. Size capsule anchors to meet load requirements. Minimum size capsule anchor bolt is 3/8 inch.

2.4 PAINTING

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish, which has been damaged or is otherwise unsatisfactory, to the satisfaction of the Engineer.

B. Wiring System: Paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed. Paint finishes shall include proper surface preparation, prime coat and a final finish coat, and shall conform to Section 09 90 00.

2.5 ENCLOSURES

A. Unless otherwise noted, provide enclosures as follows:

1. Dry Locations: NEMA Type 12
2. Wet Locations: NEMA Type 3R or 4X based on water dynamics
3. Damp Locations: NEMA Type 12 gasketed or better
4. Hazardous Locations (gases): NEMA Type 7
5. Hazardous Locations (dusts): NEMA Type 9
6. Corrosive Locations: NEMA Type 4X
7. See additional requirements below in Paragraph 3.08, Metal Panels

PART 3 EXECUTION

3.1 REQUIREMENTS

A. All electrical installations shall conform to the codes and standards outlined in this Section.

3.2 WORKMANSHIP

A. Assign a qualified representative who shall supervise the electrical construction work from beginning to completion and final acceptance.

B. Perform all labor using qualified craftsmen, who have had experience on similar projects. Provide first-class workmanship for all installations.

C. Ensure that all equipment and materials fit properly in their installations.

D. Perform any required work to correct improperly fit installations at no additional expense to the Owner.

E. Follow practices identified in NECA 1-2006 Good Workmanship in Electrical Construction.

3.3 EXCAVATION AND BACKFILL

A. Provide the excavations for electrical equipment foundations and trenches for conduits as shown on the Drawings.

B. Exercise caution during all excavation work and avoid damage to existing underground pipes. Exercise extreme caution when working near existing electrical conduits and facilities. Field verify the location of all electrical facilities before proceeding with any nearby work.

C. Refer to Division 31 23 00, Excavation and Fill, of these Specifications for all excavation and backfilling work.

3.4 CONCRETE

A. Where shown on the Drawings or specified, provide the required concrete installations for conduit encasement and equipment foundations.

B. Refer to Division 03 00 00, Concrete, of these Specifications for all concrete work.

3.5 CONDUCTOR IDENTIFICATION

A. Identify all wires and cables in conformance with the requirements of Sections 26 05 53. This requirement applies to all equipment provided under this contract, regardless of Division, as well as to all conductors provided or worked on during this contract.

3.6 INSTALLING EQUIPMENT

A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

B. Install all floor-mounted equipment on 4-inch-high reinforced concrete pads. The Contractor, suppliers, and fabricators shall take this requirement into consideration when designing, fabricating, and installing panels, motor control centers, and other enclosures so that height above the floor of the operating handles of electrical devices meets the requirements of these Specifications and applicable codes.

C. Seismic Anchoring: Refer to Manufacturer’s documentation for anchorage design.

## 3.7 CUTTING, DRILLING, AND WELDING

A. Provide any cutting, drilling, and welding that is required for the electrical construction work.

B. Structural members shall not be cut or drilled, except when favorably reviewed by the Engineer. Use a core drill wherever it is necessary to drill through concrete or masonry.

C. Provide the required welding for equipment supports. Conduits and fittings shall not be welded to structural steel.

D. Perform patch work with the same materials as the surrounding area and finish to match, as specified in Division 03 of these specifications.

## 3.8 METAL PANELS

A. Mount all metal panels which are mounted on or abutting concrete walls in damp locations or any outside walls 1/4 inch from the wall and paint the back sides of the panels with a high build epoxy primer. Film thickness shall be 10 mils minimum.

## 3.9 PROTECTIVE DEVICE COORDINATION

A. Provide the services of a recognized independent testing laboratory or coordination analysis consultant for the proper system coordination of the protective devices furnished on this project. Submit the name and the qualifications of the laboratory or consultant for review by the Engineer; qualifications must include professional registration of proposed personnel as electrical engineers.

B. Short Circuit Calculations: Provide short circuit calculations for the electrical system shown on the drawings. The calculations shall include symmetrical fault currents and ground fault currents. Obtain required utility data to perform calculations in addition to any information not indicated on the Drawings but required to perform these calculations.

C. The protective device on the line side closest to the fault or abnormal conditions shall isolate the problem portion of the system and minimize damage in that portion. The rest of the system shall be maintained in normal service. The coordination shall be in conformance with the recommendations of latest IEEE Standard 242.

D. Submit the analysis that shall include impedance and short circuit calculations, list of any assumptions made in the analysis, the recommended settings of the protective devices, and the system time/current characteristic curves. The submittal shall be made so as to allow time for review and resubmittal, if necessary, before the implementation of final settings and adjustments by the testing laboratory.

3.10 HARMONIC ANALYSIS: NONE REQUIRED

3.11 FIELD TESTS

A. Perform power wiring tests in accordance with applicable procedures as described in NETA Acceptance Testing Specifications.

B. Give sufficient notice to the Engineer prior to any test to permit witnessing the test.

C. Provide the services of a recognized independent testing laboratory and pay all costs of performing the inspections and tests as specified herein.

D. The testing laboratory shall provide all materials, equipment, labor and technical supervision to perform such tests and inspections. It is the intent of these tests to ensure that all electrical equipment is operational within industry and manufacturer's tolerances and is installed in accordance with the Contract Documents and manufacturer's instructions. The tests and inspections shall determine the suitability for energization.

E. The testing laboratory shall meet federal OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907. Membership in the International Electrical Testing Association (NETA) constitutes proof of meeting such criteria. The testing laboratory shall submit proof of these qualifications to the Engineer for review. Testing laboratory shall be Electrical Testing and Controls, Electro-Test, Power Systems, or equal.

F. The testing laboratory shall have a calibration program, which maintains all applicable test instrumentation within, rated accuracy. The accuracy shall be traceable to the National Bureau of Standards in an unbroken chain. Instruments shall be calibrated in accordance with the following frequency schedule:

1. Field instruments: 6 months maximum
2. Laboratory instruments: 12 months
3. Leased specialty equipment: 12 months

G. Where testing pursuant to NETA requirements is required in these specifications, submit a test report which includes the following:

1. Name of project, name of person performing test, and date of test

2. Description of equipment tested

3. Description of test

4. List of test equipment used and calibration date

5. Test results

6. Conclusions and recommendations

7. Appendix, including appropriate test forms:

   a. The test report shall be bound, and its contents certified.

   b. Submit the completed report directly to the Engineer no later than thirty (30) days after completion of the test unless directed otherwise.

   c. Number of reports to be submitted for review shall be the same as the number required for shop drawing submittals.

H. Safety practices shall include, but are not limited to, the following requirements:

1. Occupational Safety and Health Act (OSHA).

2. Accident Prevention Manual for Industrial Operations, Seventh Edition, National Safety Council, Chapter 4.

3. Applicable state and local safety operating procedures.

I. All field tests shall be performed with apparatus de-energized except where otherwise specifically required by the latest Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems published by NETA. The testing laboratory shall have a designated safety representative who shall be present on the project and supervise operations with respect to safety. Circuits operating in excess of 600 volts between conductors shall have conductors shorted to ground by a hot-line grounded device approved for the purpose. In all cases, work shall not proceed until the safety representative has determined that it is safe to do so. The testing laboratory shall have available sufficient protective barriers and warning signs to conduct specified test safely.

J. Electrical equipment and materials furnished and installed by the Contractor, and the testing equipment listed below shall be tested in accordance with the "Inspection and Test Procedures" and "System Function Tests" of the latest Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems published by NETA. Tests shall not include any tests listed as optional in the aforementioned NETA Specifications unless specifically noted in respective equipment specifications for this project.

K. Retesting will be required for all unsatisfactory tests after the equipment or system has been repaired. Retest all related equipment and systems if required by the Engineer. Repair and retest equipment and systems, which have been satisfactorily tested but later, fail, until satisfactory performance is obtained.

L. Putting Equipment and Cables into Service: Submittal and favorable review of the specified factory and field tests shall occur before the Contractor is permitted to place the respective equipment or cable into service.

M. Miscellaneous Tests:

1. Insulation Resistance, Continuity, Rotation: Perform routine insulation resistance, continuity and rotation tests for all distribution and utilization equipment including all motors 1/2 horsepower and larger prior and in addition to tests performed by the testing laboratory specified herein. Supply a suitable and stable source of test power to the test laboratory at each test site. The testing laboratory shall specify requirements. Notify the testing laboratory when equipment becomes available for acceptance tests. Work shall be coordinated to expedite project scheduling. All testing shall be performed in the presence of the Engineer. The testing laboratory shall be responsible for implementing all final settings and adjustments on protective devices and tap changes. Any system material or workmanship that is found defective on the basis of acceptance tests shall be reported directly to the Engineer. The testing laboratory shall maintain a written record of all tests and upon completion of project, assemble and certify a final test report.

2. Motor Current: Measure and record current in each phase for each new motor. Include measurement of the motor terminal voltages and motor currents when the motor is being operated at normal operating loads. For motors that are part of adjustable frequency drive systems, use true-RMS-reading instruments in making the measurements.

3. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed, adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions, and demonstrate satisfactory interfacing with the data acquisition and alarm systems (including SCADA at the WWTP).

## 3.12 EQUIPMENT PROTECTION

A. Exercise care at all times after installation of equipment, motor control centers, etc., to keep out foreign matter, dust, dirt, debris, or moisture. Use protective sheet metal covers, canvas, heat lamps, etc., as needed to ensure equipment protection.

## 3.13 CLEANING EQUIPMENT

A. Thoroughly clean all soiled surfaces of installed equipment and materials.

B. Clean out and vacuum all construction debris from the bottom of all equipment.

C. Provide and touch-up to original condition any factory painting that has been marred or scratched during shipment or installation, using paint furnished by the equipment manufacturer.

3.14 CLEANUP

A. Upon completion of the electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the Engineer.

END OF SECTION

# SECTION 09 97 13.24 - STEEL WATER STORAGE TANK PAINTING

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:

1. High-performance coatings and special preparation of tank surfaces.

2. Painting and Coating: Preparing, priming, painting, and staining of surfaces.

B. Related Requirements:

1. Section 09 90 00 - Painting and Coating: Preparing, priming, painting, and staining of surfaces.

### 1.2 REFERENCE STANDARDS

A. Federal Specification Unit:

1. FS A-A-3054 - Paint, Heat Resisting (204 Degrees C).

B. Master Painters Institute:

1. MPI - Approved Products List.

2. MPI - Architectural Painting Manual.

C. Military Standardization Documents:

1. MIL C-22750D - Coatings: Epoxy Polyamide.

D. SSPC: The Society for Protective Coatings:

1. SSPC - Painting Manual, Volume 2: Systems and Specifications.

2. SSPC-Paint 16 - Coal Tar Epoxy-Polyamide Black (or Dark Red).

3. SSPC-SP 2 - Hand Tool Cleaning.

4. SSPC-SP 3 - Power Tool Cleaning.

5. SSPC-SP 5 - White Metal Blast Cleaning.

6. SSPC-SP 6 - Commercial Blast Cleaning.

7. SSPC-SP 7 - Brush-Off Blast Cleaning.

8. SSPC-SP 10 - Near-White Metal Blast Cleaning.

9. SSPC-SP 11 - Power Tool Cleaning to Bare Metal.

E. Paint shall be certified in accordance with ANSI/NSF/CAN Std. 61 and the extraction requirements of NSF/ANSI/CAN 600 and is qualified for use on interior potable water tanks.

1.3 PREINSTALLATION MEETINGS

A. Convene a meeting a minimum one week prior to commencing Work of this Section. Meeting shall be attended by Contractor, Owner's representative, Engineer, Coating Applicators, and Manufacturer's representative.

B. Topics to be discussed at meeting shall include:

1. A review of Contract Documents shall be made and deviations or differences shall be resolved.

2. Review items such as environmental conditions, surface conditions, surface preparation, application procedures, and protection following application.

3. Establish which areas on-site will be available for use as storage areas and working area.

C. Inspection Services:

1. The Contractor shall designate a person to fulfill the requirements of the Inspector as described in the FIELD QUALITY CONTROL section. The COATING MANUFACTURER REPRESENTATIVE (Section 3.9) can fulfill these responsibilities.

1.4 SUBMITTALS

A. Section 01 30 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Submit product information related to surface preparation materials that meet specification requirements shown in Part 2, Products.

C. Product Data:

1. Submit manufacturer information indicating coating materials, performance ratings and application information.

2. Include MPI - Approved Products Lists with proposed products highlighted.

D. Samples: Submit two color samples, illustrating available colors for selection.

1. Manufacturer's Certificate: Certify that products meet or exceed specified requirements. Materials Resources Certificates:

a. Certify source for regional materials and distance from Project Site.

2. Indoor Air Quality Certificates:

a. Certify VOC content for each interior paint and coating.

E. Manufacturer Instructions: Submit special procedures, perimeter conditions requiring special attention and any other instructions or procedures.

F. Qualifications Statements:

1. Submit qualifications for manufacturer and applicator.

2. Submit manufacturer's approval of applicator.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 30 – Contract Closeout: Requirements for submittals.

B. Section 01 70 20 - Operation and Maintenance Data: Submit maintenance and cleaning requirements for coatings, repair and patching techniques and touch up recommendations.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Section 01 70 30 - Contract Closeout: Requirements for maintenance materials.

B. Extra Stock Materials:

1. Furnish 1 gal. of each color of each type of coating specified, for Owner's maintenance use.

2. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

1.7 QUALITY ASSURANCE

A. MPI Standards:

1. Comply with indicated MPI standards.

2. Products: Listed in MPI - Approved Products List.

B. Maintain 1 copy of each standard affecting Work of this Section on Site.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum ten years' documented experience.

B. Applicator: Company specializing in performing Work of this Section with minimum five years' documented experience and approved by manufacturer. Submit listing of not less than 3 of applicator's most recent applications representing similar scope and complexity to Project requirements. List shall include information as follows:

1. Project name and address

2. Name and phone number of OWNER

3. Name and phone number of CONTRACTOR

4. Name and phone number of ENGINEER

5. Date of completion

1.9 DELIVERY, STORAGE, AND HANDLING

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

B. Container Labeling: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Inspection:

1. Accept materials on Site in manufacturer's sealed and labeled containers.

2. Inspect for damage and to verify acceptability.

D. Store materials in ventilated area and otherwise according to manufacturer instructions.

E. Protection:

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

2. Provide additional protection according to manufacturer instructions.

1.10 AMBIENT CONDITIONS

A. Section 01 50 00 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Minimum Conditions: Install in accordance with manufacturers recommendations.

C. Subsequent Conditions: Maintain above temperature range, 24 hours before, during, and 72 hours after installation of coating.

D. Provide lighting level of necessary to complete the project.

E. Restrict traffic from area where coating is being applied or is curing.

1.11 WARRANTY

A. Section 01 70 40 – Warranties and Bonds: Requirements for warranties.

B. Include coverage for bond to substrate, degradation of chemical resistance and delamination.

PART 2 PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

A. Minimum Performance:

1. This specification lists specific products manufactured by Tnemec Company, Inc. of Kansas City, Missouri. Materials specified herein are cited as a minimum standard of quality that will be acceptable.

2. Materials specified herein shall not preclude consideration of equivalent materials. Equivalent materials shall be submitted to Engineer for consideration and shall be made at least fourteen (14) days prior to the bid date.

a. Requests for substitution shall include evidence of satisfactory past performance on water tanks.

b. Substitutions will not be considered that change number of coats or do not meet specified total dry film thickness.

c. Request for substitution shall include all performance testing for the proposed coatings for comparison to specified products listed.

d. Paints for interior wet applications must be listed by NSF International as certified for potable water contact in accordance with ANSI/NSF Std. 61, Section 5, Protective (Barrier) Materials

2.2 COMPONENTS

A. Coatings:

1. Description:

a. Complete multicoat systems formulated and recommended by manufacturer for intended applications and in indicated thicknesses.

b. Specified number of coats does not include primer or filler coat.

2. Lead content: None.

3. Chromium Content as Zinc Chromate or Strontium Chromate: None.

4. Maximum VOC Content: As required by applicable regulations.

5. Colors: As selected from manufacturer's standard colors.

6. Primer: As recommended by painting system manufacturer.

B. Exterior Treatment – Zinc/Epoxy/Polyurethane

1. Surface Preparation: SSPC-SP6 Commercial Blast Cleaning The removal of all grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter by compressed air nozzle blasting, centrifugal wheels or other specified method. Discoloration caused by certain stains shall be limited to no more than 5 percent of each unit area. Unit area is approximately 9 in2.

2. Prime Coat: Apply one full coat of Tnemec Series 94-H20 Hydro-Zinc. This coating shall be applied at a dry film thickness of 4 to 6 mils per coat.

3. Intermediate Coat: Apply one full coat of Tnemec Series 27 Typoxy. This coating shall be applied at a dry film thickness of 2.5 – 3.5 mils per coat.

4. Finish Coat: Apply one full coat of Tnemec Series 1095-Endurashield. This coating shall be applied at a dry film thickness of 2.0 – 3.0 mils per coat. Color shall be selected by the Owner.

C. Interior Treatment– Zinc/Epoxy/Epoxy

1. Surface Preparation: SSPC-SP10/NACE 2 Near-White Metal Blast Cleaning The removal of all grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter by compressed air nozzle blasting, centrifugal wheels or other specified method. Discoloration caused by certain stains shall be limited to no more than 5 percent of each unit area. Unit area is approximately 9 in2.

2. Prime Coat: Apply one full coat of Tnemec Series 94-H20 Hydro-Zinc. This coating shall be applied at a dry film thickness of 2.5 to 3.5 mils per coat.

3. Intermediate Coat: Apply one full coat of Tnemec Series 21 Epoxoline. This coating shall be applied at a dry film thickness of 6.0-8.0 mils per coat. Color shall be white or off white.

4. Finish Coat: A stripe coat of Tnemec N140 at 3.0-4.0 mils. Apply one full coat of Tnemec Series 21 Pota-Pox. This coating shall be applied at a dry film thickness of 6.0 – 8.0 mils per coat. Color shall be selected by the Owner.

## 2.3 SURFACE PREPARATION MATERIALS

A. Abrasives

1. Abrasives used in blast cleaning operations shall be clean, well graded, non- metallic, and free of contaminants which would interfere with adhesion of the coatings to the substrate material.

2. Selection of abrasive size and type shall be based upon the type, grade, and surface condition of the steel to be cleaned and on the finished surface to be produced for the subsequent paint system.

3. Blast cleaning abrasives shall meet or exceed the following minimum criteria:

| Description | Criteria |
|---|---|
| Shape | Angular |
| Hardness (Mohr Scale) | 8 |
| Specific Gravity | 3.3 |
| Bulk Density (1lbs/cu. ft.) | 110 |
| Free Silica (% by wt.) | 0 |

4. Blast cleaning abrasive particle size shall be that which will produce a 2.0-mil (.002-inch) anchor profile on the substrate metal or in accordance with recommendations of the manufacturers of the specified coating system to be applied, subject to approval by the ENGINEER.

5. Blast cleaning abrasive manufacturer: Blast cleaning abrasives shall be Kleen Blast Abrasive as manufactured by Kleen Blast, Green Diamond Abrasive as manufactured by Green Diamond Sand Products or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 30 - Contract Closeout: Requirements for application examination.

B. Substrates:

1. Verify that substrate surfaces are ready to receive Work of this Section as indicated by coating manufacturer.

2. Obtain and follow manufacturer instructions for examination and testing of substrates.

3.2 PREPARATION

A. Section 01 70 30 - Contract Closeout: Requirements for application preparation.

B. Provide a minimum of two days' notice to Owner in advance of spray painting to notify public and private property owners.

C. Contractor will be responsible and pay for all damage to public and private property which is a result of falling particles of metal, paint, or other materials which may fall during painting operations.

D. Clean surfaces of loose foreign matter.

E. Remove substances that would bleed through finished coatings; if removal is not possible, seal surface with shellac.

F. Remove finish hardware, fixture covers, and accessories and store.

G. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent.

H. Ferrous Metal:

1. Solvent clean.

2. Remove loose rust, loose mill scale, and other foreign substances.

3. Hand Tools: Comply with SSPC-SP 2.

4. Power Tools: Comply with SSPC-SP 3.

5. Blasting: Comply with SSPC-SP 10.

3.3 APPLICATION

A. Comply with MPI - Architectural Painting Manual.

B. Apply primer to each surface, unless specifically not required by coating manufacturer.

C. Apply coatings to specified thicknesses.

D. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish.

E. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.4 FIELD QUALITY CONTROL

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

3.5 CLEANING

A. Collect waste material that may constitute fire hazard, place in closed metal containers, and remove daily from Site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.6 PROTECTION

A. Section 01 70 30 - Contract Closeout: Requirements for protecting finished Work.

B. Protect adjacent surfaces and materials not receiving coating from overspray.

C. Mask when necessary to provide adequate protection and repair damage.

3.7 BRUSH COATS AND NON-SKID SURFACING

A. Specifications pertaining to brush coats and non-skid surfacing are as follows:

1. Brush Coats:

a. All welds, laps, edges, inside angles, and irregular surfaces shall receive a brush coat of the specified product prior to application of each complete coat.

b. Paint may be applied as a spray stripe coat and back brushed by hand.

c. Coatings shall be brushed in multiple directions to ensure penetration and coverage, as directed by the ENGINEER.

2. Non-Skid Surfaces:

a. Applied after the full prime coat has cured.

b. Where shown on the Drawings or specified elsewhere in this Section, a non-skid surface shall be applied to a portion of the reservoir roof surface.

3. Application:

a. Broadcast over a wet coat of the finish topcoat specified herein.

b. Following curing of coating/sand mixture, non-skid surface area shall be top coated with the same finish coating.

4. Locations:

a. On a 3-foot wide strip extending from the roof access hatch to the vent at the center of tank roof.

b. On a 3-foot wide strip around the roof vent at the tank center.

c. On a 3-foot wide strip around the roof's access hatch.

3.8 ATMOSPHERIC CONDITIONS

A. No coatings shall be applied under the following limitations:

1. Temperature: If temperatures are anticipated to be as noted below within eight hours after application of the coating.

2. Epoxy Coatings: Surface to be coated is below 55 degrees Fahrenheit (F). Exceptions may be approved by ENGINEER with concurrence from manufacturer if material is "low temperature" type.

3. Inorganic Zinc or Urethane Finishes: Surface to be coated is below 40 degrees F.

4. When the temperature is less than 5 degrees F above the dew point.

a. The dew point shall be measured by use of an instrument such as a sling psychrometer in conjunction with U.S. Department of Commerce Weather Bureau Psychometric Tables or other instrument acceptable to the ENGINEER.

5. When the temperature of the surface to be coated is above 125 degrees F for all coating types.

B. Surfaces: When the surfaces to be coated are wet or damp or there is the presence of rain, snow, fog, or mist coatings shall not be applied.

C. If any of the above adverse conditions are present, the coating or paint application shall be postponed until conditions are favorable. The day's coating or paint application shall be completed in time to permit the film.

3.9 COATING MANUFACTURER'S REPRESENTATIVE PARTICIPATION-COATING INSPECTOR

A. Painting/Coating Manufacturer's Representative:

1. Services of the paint/coating manufacturer's representative shall be provided at no additional expense to the OWNER.

2. Reporting from the paint manufacturer's representative shall not preclude the ENGINEER from making independent assessments of the quality of Work. The ENGINEER will make the final decision as to the acceptability of the paint/coating systems.

3. Responsibilities:

a. Make periodic site visits throughout the course of the surface preparation and the painting/coating application.

b. Schedule all site visits with the ENGINEER.

c. Minimum Site Visits:

1) Inspect typical shop and field steel preparation prior to primer applications.

2) Inspect finished primer applications prior to application of intermediate coats.

3) Inspect each intermediate coat prior to application of subsequent finish coats.

4) Inspect final coats and report to the ENGINEER the representative's assessment of the paint system's suitability and acceptability for the intended service.

d. Prepare and submit written reports directly to the ENGINEER immediately following each site visit.

1) Reports shall identify the representative's observations relative to the quality of the surface preparation and painting/coating work.

2) Reports shall address any conditions observed which have the potential to adversely impact the finished painting/coating system's integrity and performance.

3) Any such findings shall be immediately remedied by the CONTRACTOR.

3.10 COLLECTION, MONITORING AND DISPOSAL OF REGULATED WASTES

A. Unless otherwise indicated on the Plans or in the Specifications, all abrasive blasting material and byproducts, paints, solvents and containers, and any other discarded materials or equipment shall remain the property of the CONTRACTOR and shall be disposed of in a manner compliant with applicable Federal, State, and local laws and regulations governing disposal of all wastes generated by the CONTRACTOR in the prosecution of this work.

3.11 PAINTING REQUIREMENTS

A. Paint top surfaces of all purlins, rafters, beams and all other roof structural members prior to the roof plate installation.

B. Paint lower side of roof plates prior to installation.

C. Caulk all unwelded roof plate and structural member laps, prior to painting.

D. Caulking material; polyurethane sealant; PRC Permapad RC-270, Vulkem 921, or equal - Apply in accordance with the manufacturer's instructions.

E. Paint the underside of floor plates prior to laying down on the base material.

F. At columns, paint the top side of floor plates and the underside of column base plates prior to column erection.

3.12 PAINTING

A. Perform interior and exterior cleaning, preparation, and painting in accordance with AWWA D102 and Section 09 90 00.

B. Provide a first anniversary inspection of the tank painting, including testing and any required repair work, at no additional cost to the Owner.

END OF SECTION

# INDEX OF DRAWINGS



| NO. | DATE | BY | REVISION |
|---|---|---|---|
| 1 | 04/22/22 | LHO | ADDENDUM NO. 2 |

NOTICE

0 ½ 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DSN DESIGNED

CAD DRAWN

CHK CHECKED

REGISTERED PROFESSIONAL ENGINEER 65286PE OREGON MAY 18, 1982 LEE H. ODELL

MARCH 2022

murraysmith

Branch ENGINEERING INC. Since 1977
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CITY OF HARRISBURG Established 1866

**WTP DESIGN NORTH & SOUTH**

**SHEET INDEX**

PROJECT NO.: 20-0028.300 | SCALE: AS SHOWN | DATE: MARCH 2022

SHEET G001

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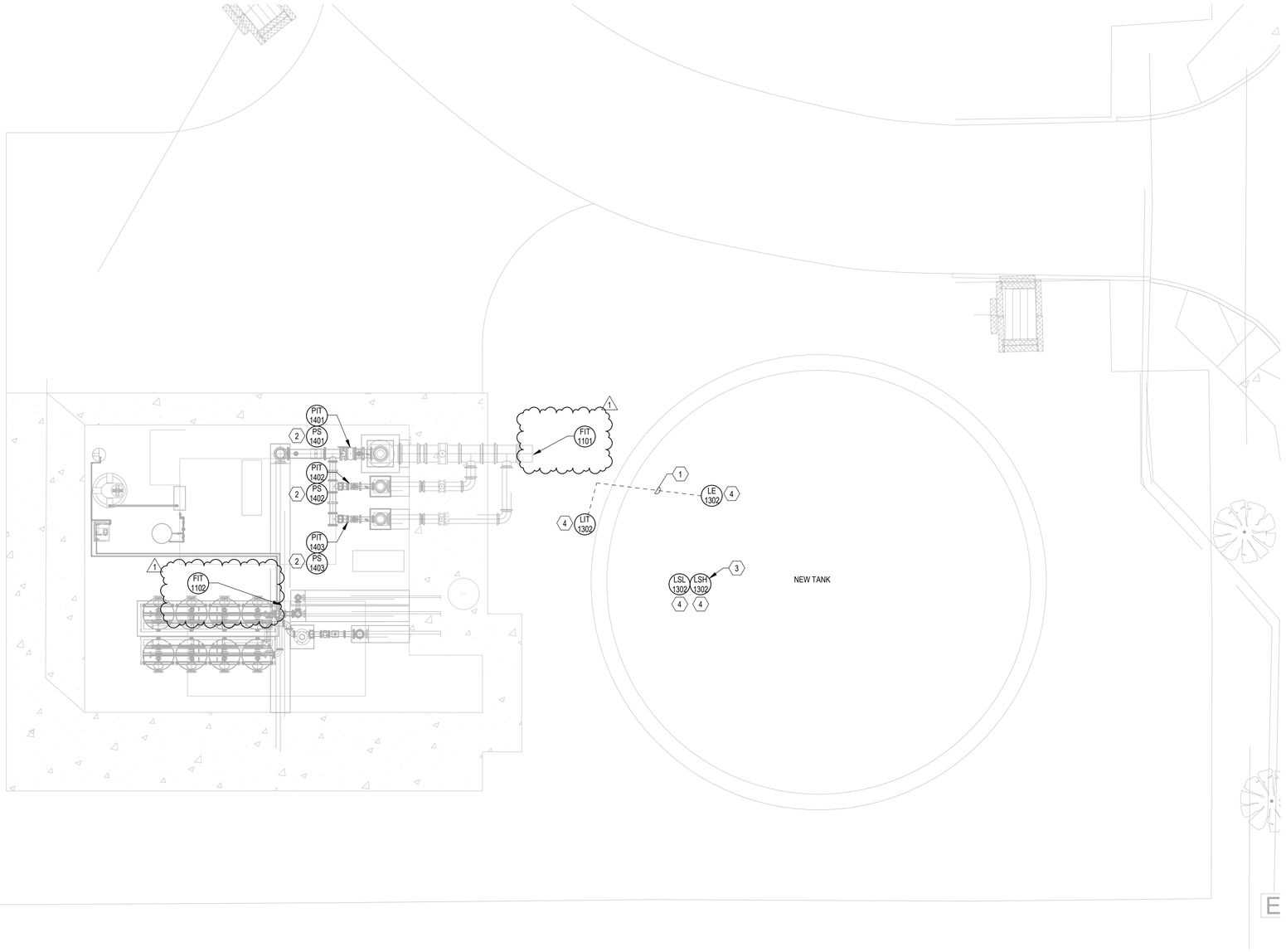
## GENERAL SHEET NOTES

A. REFER TO SPECIFICATIONS AND INSTRUMENTATION LISTED FOR ADDITIONAL EQUIPMENT INFORMATION.
B. SEE I/O SPECIFICATION FOR A COMPLETE LIST OF PLC I/O, CORRECT I/O COUNT, AND LOOP NUMBERS. (1)

## KEYNOTES

1 ORDER MANUFACTURER CABLE WITH CORRECT LENGTH OF CABLE TO REACH FROM THE LEVEL ELEMENT (LE) TO THE LEVEL INDICATING TRANSMITTER (FIT).
2 PRESSURE SWITCH (PS) SHALL BE MOUNTED BETWEEN THE CHECK VALVE AND THE PUMP. PRESSURE INDICATING TRANSMITTER (PIT) SHALL BE MOUNTED BETWEEN THE CHECK VALVE AND THE ISOLATION GATE. THE PIT SHALL BE ADJUSTED TO AVERAGE THE PRESSURE SAMPLES TO REDUCE INDICATIONS OF HIGH PRESSURE SPIKES DURING PUMP START AND STOP.
3 REFER TO DETAIL 2/I410. DO NOT PENETRATE THE WALL OF THE TANK. THE "FLOAT TREE" SHOULD BE MOUNTED INSIDE THE ACCESS HATCH AT THE TOP OF THE TANK UTILIZING THE SAME CONCEPTS AS DETAIL 2/I410.
4 DUPLICATE INSTRUMENTATION ON EXISTING TANK.




1 SOUTH SITE PLAN - INSTRUMENTATION
SCALE: 1/8" = 1'-0"

N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| NO. | DATE | BY | REVISION |
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| 1 | 04/22/22 | | ADDENDUM 2 |

0 1/2 1
NOTICE
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REGISTERED PROFESSIONAL ENGINEER 90778PE OREGON JUNE 30, 2017 THAYER J. HENDRICKSON
Expires: 6/30/2023

murraysmith

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Springfield, OR 97477
p: 541.746.0637
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CITY OF HARRISBURG Established 1866

**WTP DESIGN NORTH & SOUTH**
*TAX MAP: 15S04W04 TAX LOT: 600*
*TAX MAP: 15S04W09 TAX LOT: 700*

# SOUTH SITE PLAN - INSTRUMENTATION LOCATIONS

PROJECT NO.: 20064 | SCALE: AS SHOWN | DATE: MARCH 2022

SHEET
I100S

## GENERAL SHEET NOTES

A. CONTRACTORS RESPONSIBLE FOR GATHERING CORRECT DISTANCES FOR BIDDING PURPOSES.
B. REFER TO SPECIFICATIONS AND INSTRUMENTATION LIST FOR ADDITIONAL EQUIPMENT INFORMATION.
C. SEE I/O SPECIFICATION FOR A COMPLETE LIST OF PLC I/O, CORRECT I/O COUNT, AND LOOP NUMBERS. (1)

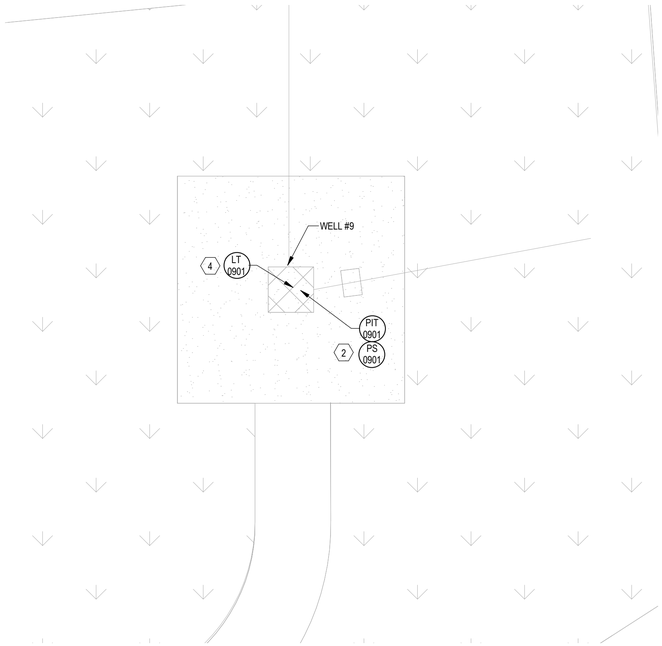
## KEYNOTES

1 ORDER MANUFACTURER CABLE WITH CORRECT LENGTH OF CABLE TO REACH FROM THE LEVEL ELEMENT (LE) TO THE LEVEL INDICATING TRANSMITTER (FIT).

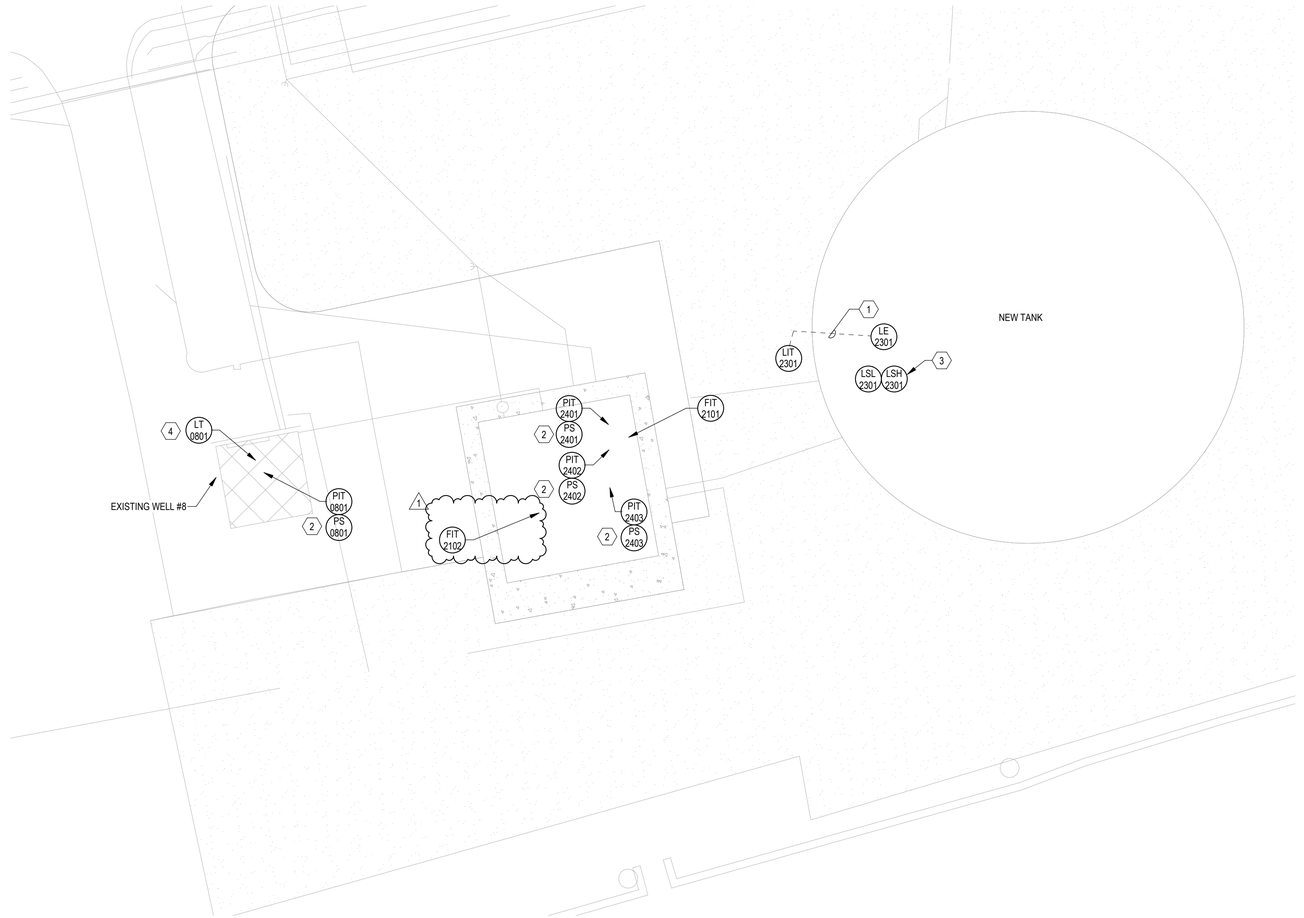
2 PRESSURE SWITCH (PS) SHALL BE MOUNTED BETWEEN THE CHECK VALVE AND THE PUMP. PRESSURE INDICATING TRANSMITTER (PIT) SHALL BE MOUNTED BETWEEN THE CHECK VALVE AND THE ISOLATION GATE. THE PIT SHALL BE ADJUSTED TO AVERAGE THE PRESSURE SAMPLES TO REDUCE INDICATIONS OF HIGH PRESSURE SPIKES DURING PUMP START AND STOP.

3 REFER TO DETAIL 2/I410. DO NOT PENETRATE THE WALL OF THE TANK. THE "FLOAT TREE" SHOULD BE MOUNTED INSIDE THE ACCESS HATCH AT THE TOP OF THE TANK UTILIZING THE SAME CONCEPTS AS DETAIL 2/I410.

4 WELL WATER LEVEL TRANSMITTER (LT) SHALL BE SUBMERSIBLE. ORDER LT WITH PROPER LENGTH OF CABLE TO DROP TO 5 FEET ABOVE WELL PUMP HOUSING. LT CABLE MUST BE KEVLAR LINED TO PROVIDE CABLE SUPPORT FOR THE WEIGHT OF THE DEVICE. SEE INSTRUMENTATION SPECS FOR MORE.




2 NORTH SITE PLAN - INSTRUMENTATION WELL #9
SCALE: 1" = 20'-0"




1 NORTH SITE PLAN - INSTRUMENTATION MAIN WTP
SCALE: 1" = 20'-0"

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| 1 | 04/22/22 | | ADDENDUM 2 |

0 1/2 1
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DRAWN
CHECKED

REGISTERED PROFESSIONAL ENGINEER
90778PE
OREGON
JUNE 30, 2017
THAYER J. HENDRICKSON
Expires: 6/30/2023

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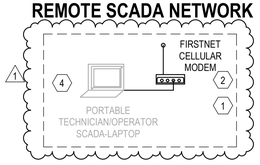
**WTP DESIGN**
**NORTH & SOUTH**
*TAX MAP: 15S04W04 TAX LOT: 600*
*TAX MAP: 15S04W09 TAX LOT: 700*

# NORTH SITE PLAN - INSTRUMENTATION LOCATIONS

PROJECT NO.: 20064
SCALE: AS SHOWN
DATE: MARCH 2022

SHEET
I200N

## REMOTE SCADA NETWORK




3 SCADA NETWORK - REMOTE
NOT TO SCALE

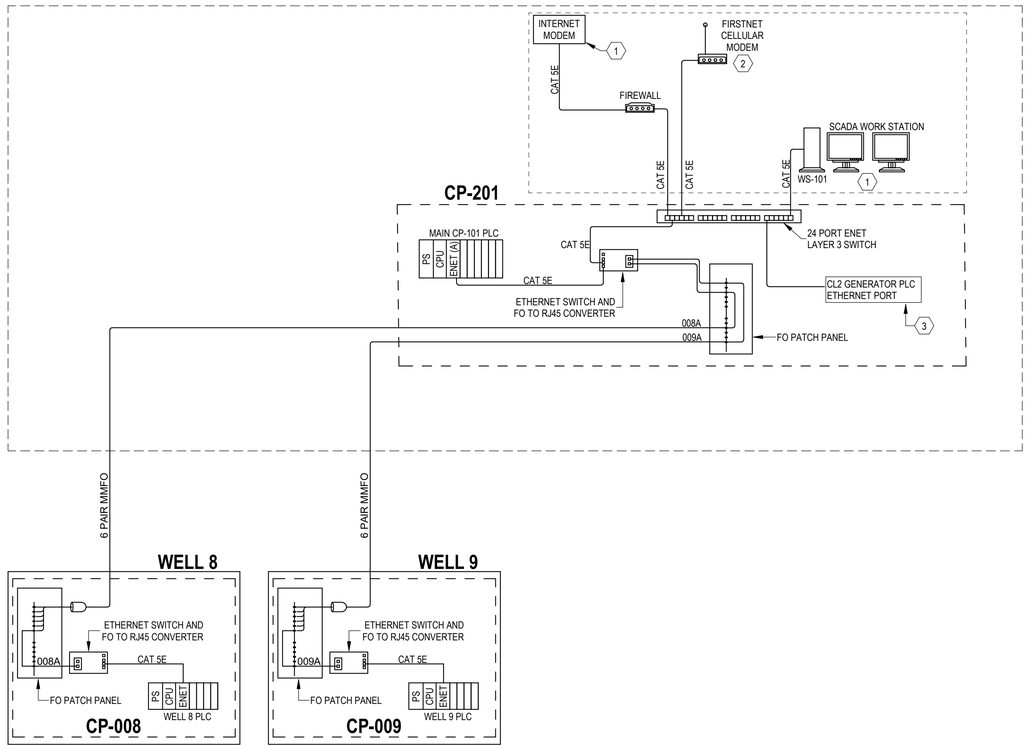
### GENERAL SHEET NOTES

A. ALL EQUIPMENT SHOWN ON THIS DRAWING IS NEW AND SHALL BE SUPPLIED, INSTALLED, CONFIGURED, AND COMMISSIONED BY THE CONTRACTOR. SCADA AND PLC PROGRAMMING SHALL BE BY OTHERS.
B. IP ADDRESSES WERE INTENTIONALLY LEFT OFF THIS DRAWINGS FOR CYBER SECURITY REQUIREMENTS. IP ADDRESSES WILL BE DISCUSSED BUT SHALL NOT BE DOCUMENTED ON A PUBLICLY ACCESSIBLE DISCOVERABLE DOCUMENT. IP ADDRESSES SHALL BE PROVIDED BY THE CITY'S DESIGNATED NETWORK CONSULTANT OR THE ENGINEER VERBALLY AT THE REQUIRED TIME OF COMMISSIONING. IP ADDRESSES SHALL NOT BE OPENLY VISIBLE ON THE FRONT OF ANY EQUIPMENT. IP ADDRESSES CAN BE CONCEALED ON THE EQUIPMENT BEHIND A SECURE COVER ACCESSIBLE BY CITY'S TECHNICAL PERSONNEL.
C. CONTRACTOR TO VERIFY ALL COMMUNICATIONS CONFIGURATION AND CONNECTIVITY FROM POINT TO POINT, INCLUDING BUT NOT LIMITED TO THE FIRSTNET CELLULAR SYSTEMS.
D. SEE I/0 SPECIFICATION FOR A COMPLETE LIST OF PLC I/0, CORRECT I/O COUNT, AND LOOP NUMBERS.

### KEYNOTES

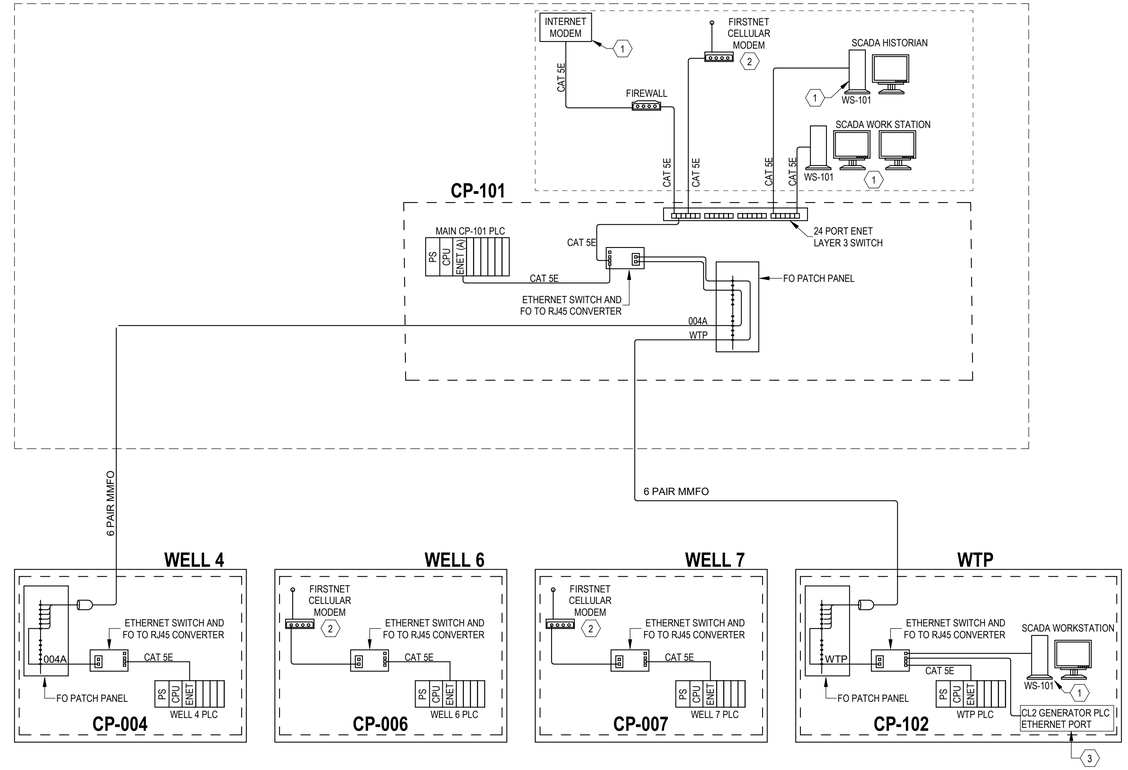
1 CONTRACTOR FURNISHED AND CONFIGURED EQUIPMENT.PROCESS CONTROL PROGRAMMING BY OTHERS.
2 FIRSTNET SYSTEMS TO BE CONFIGURED AND TESTED FOR CONNECTIVITY. ACCOUNT ESTABLISHED BY CITY - ACCOUNT INFORMATION TO BE PROVIDED TO CONTRACTOR FOR CONFIGURATION OF MODEMS.
3 IN ADDITION TO THE PLC I/O FROM THE CL2 GENERATOR TO THE SCADA PLC, THE CONTRACTOR SHALL INSTALL AN ETHERNET CABLE FROM THE LOCAL SWITCH TO THE CL2 GENERATOR PLC ETHERNET PORT.
4 NOT IN CONTRACT - PREPURCHASED BY OWNER.

## NORTH SITE WTP




1 SCADA NETWORK - NORTH SITE
NOT TO SCALE

## SOUTH SITE WTP




2 SCADA NETWORK - SOUTH SITE
NOT TO SCALE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OREGON
JUNE 30, 2017
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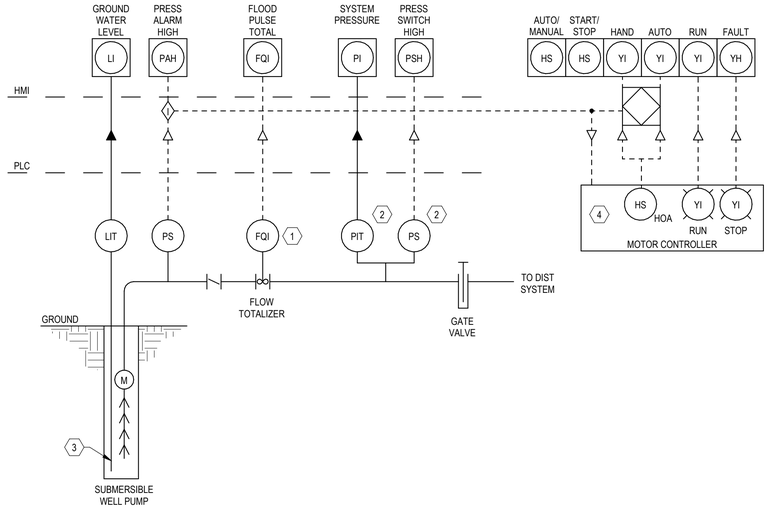
**WTP DESIGN NORTH & SOUTH**
*TAX MAP: 15S04W04 TAX LOT: 600*
*TAX MAP: 15S04W09 TAX LOT: 700*

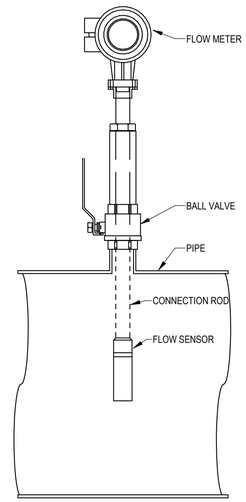
# SCADA NETWORK DIAGRAM (OVERALL NETWORK FOR BOTH N&S SYSTEMS)

PROJECT NO.: 20064 | SCALE: AS SHOWN | DATE: MARCH 2022

SHEET
I300




1 WELL INSTRUMENTATION, TYPICAL BASED ON WELL #8
NOT TO SCALE




2 INSERTION FLOW METER
NOT TO SCALE

**GENERAL SHEET NOTES**

A. SEE I/0 SPECIFICATION FOR A COMPLETE LIST OF PLC I/0, CORRECT I/O COUNT, AND LOOP NUMBERS.

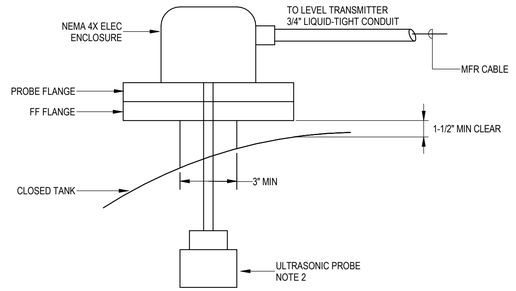
**KEYNOTES**

1 FQI SHALL BE A DIGITAL PULSE DEVICE TO INDICATE TO THE SCADA SYSTEM A QUANTITY OF WATER HAS PASSED THROUGH THE FLOW METER. SEE EXISTING UNITS ON EXISTING WELLS.

2 PRESSURE SWITCH (PS) CAN BE INTEGRAL TO THE PRESSURE INDICATOR TRANSMITTER (PIT). PS MUST BE ADJUSTABLE VIA THE HUMAN INTERFACE MODULE (HIM) ON THE FRONT OF THE PIT.

3 WELL WATER LEVEL TRANSMITTER (LT) SHALL BE SUBMERSIBLE. ORDER LT WITH PROPER LENGTH OF CABLE TO DROP TO 5 FEET ABOVE WELL PUMP HOUSING. LT CABLE MUST BE KEVLAR LINED TO PROVIDE CABLE SUPPORT FOR THE WEIGHT OF THE DEVICE. SEE INSTRUMENTATION SPECS FOR MORE.

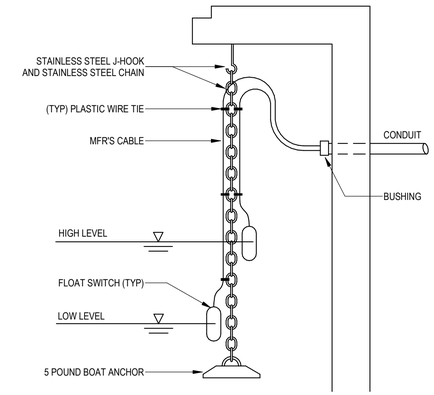
4 MOTOR CONTROL FUNCTIONS SHALL BE VIA THE ALLEN BRADLEY E300 OVERLOAD DEVICE. REFER TO THE ELECTRICAL SCHEMATICS FOR PROPER CONFIGURATION.




NOTES:

1. COORDINATE TANK FLANGE THROAT SIZE WITH PROBE DIAMETER.
2. LOCATE PER SENSOR MFR'S REQUIREMENTS TO AVOID INTERFERENCE.
3. USE PVC, SCH 80 FLANGE IN CORRISIVE LOCATIONS.

3 ULTRASONIC LEVEL SENSOR DETAIL
NOT TO SCALE




REFER TO DRAWINGS FOR FS QUANTITY, INITIAL ELEVATION AND FUNCTION

4 WETWELL FLOAT SWITCH DETAIL
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**WTP DESIGN NORTH & SOUTH**
*TAX MAP: 15S04W04 TAX LOT: 600*
*TAX MAP: 15S04W09 TAX LOT: 700*

# INSTRUMENTATION DETAILS

PROJECT NO.: 20064
SCALE: AS SHOWN
DATE: MARCH 2022

SHEET
I400

# CITY OF HARRISBURG

## WATER RESERVOIRS

## North #1 & South #2

| ITEM | PURPOSE / COMMENT |
|---|---|
| INLET PIPE | PROVIDE DUCKBILL VALVE SYSTEM AND MIXING/WATER AGE (CFD) ANALYSIS. |
| OUTLET PIPE | MIN 6" ABOVE FLOOR, SILT STOP |
| RESERVOIR DRAIN | FLUSH WITH BOTTOM TO ALLOW COMPLETE DRAINING. |
| | INCLUDE A REMOVABLE SILT STOP. |
| RESERVOIR OVERFLOW / AIR GAP / BASIN | INCLUDE DUCKBILL CHECK VALVE. CONTRACTOR TO SIZE OVERFLOW BASED ON MAX FLOW. BASIN MUST BE ABLE TO CONVEY FLOW |
| RESERVOIR VENTS | SIZE BASED ON MAX FLOW RATE OF 9,000 GPM |
| ACCESS HATCHES | (1) 39" SQUARE TOP ACCESS HATCH & MIN (2) 36" MANHOLES WITH HINGED BOLTED COVERS (OPPOSITE SIDES OF TANK) |
| EXTERNAL FIXED LADDER | SAF-T-CLIMB & SECURITY DOOR |
| INTERNAL LADDER | HANDRAIL TO ASTM STANDARD A53-B. PROVIDE DAVIT CRANE CAPABLE OF SUPPORTING 350 LBS |
| LEVEL CONTROL | PRIMARY CONTROL IS ULTRASONIC LEVEL SENSOR MOUNTED TO ROOF OF TANK. |
| | SECONDARY CONTROL FLOAT TREE. |
| INTRUSION ALARM | TOP HATCH. |
| ISOLATION VALVES | SEE CIVIL SHEETS. |
| SAMPLE LINES & BOX | MOUNT BOX TO TANK AND CAP LINES FOR FUTURE CONNECTION. |
| ROOF/SHELL CONDUIT SUPPORTS | INTEGRAL. |
| RESERVOIR WATER QUALITY | THE INLET AND OUTLET WILL BE POSITIONED TO PROVIDE MIXING AND CIRCULATION. |
| | CONTRACTOR TO PROVIDE DUCKBILL MIXING SYSTEM AND HYDRO DYNAMIC MIXING (CFD) ANALYSIS. |
| | CYCLING OF THE RESERVOIR SHOULD BE UTILIZED TO ADDRESS THERMAL STRATIFICATION AND RESIDENCE TIME. |
| PROTECTIVE COATINGS | ALL COATINGS MUST BE ANSI/NSF STANDARD 61 CERTIFICATION. |
| SEAL WELDS | ROOF PLATE LAPS, RAFTER TO UNDERSIDE OF ROOF, ROOF TO SHELL. |
| ACHORAGE | BY CONTRACTOR (IF REQUIRED) |
| DESIGN CODES AND STANDARDS | AWWA D100-11 (SECTION 14) |
| | 2015 IBC |
| | PROJECT SPECIFICATIONS |
| GENERAL NOTES | PIPE COATING AND LINING SHALL BE PER PROJECT SPECIFICATIONS. |
| | PIPE FLANGES SHALL BE PER AWWA C207, CLASS - D |
| | FLANGE BOLT HOLE TO STRADDLE FLANGE VERTICAL CENTERLINE, UNLESS OTHERWISE SPECIFIED. |
| | HANDRAIL TO ASTM STANDARD A53-B |
| MATERIALS | STRUCTURAL SHAPES TO ASTM STANDARD A36 AND A992 |
| | PIPING TO ASTM STANDARD A53-B |
| | HANDRAIL TO ASTM STANDARD A53-B |
| DESIGN CRITERIA | DESIGN PRESSURE - ATMOSPHERE |
| | DESIGN TEMPERATURE - AMBIENT |
| | ROOF LIVE LOAD - 15.00 PSF |
| | ROOF SNOW LOAD - 30.00 PSF |
| | DESIGN WIND VELOCITY |
| | - ULTIMATE - 130 MPH |
| | - EXPOSURE - 15F |
| | - WIND IMPORTANCE FACTOR - 1.25 |
| TANK PERIOD (NORTH) | NORTH TANK (Ø110'-0") |
| | IMPULSIVE PERIOD = ___ SECONDS (TBD BY TANK SUPPLIER) |
| | CONVECTIVE PERIOD (OF SLOSHING WATER) = ___ SECONDS (TBD BY TANK SUPPLIER) |
| | SLOSHING WAVE HEIGHT (BY TANK SUPPLIER) |
| | SEISMIC USE GROUP III (RISK CATEGORY IV) = ___ FT (TBD BY TANK SUPPLIER) |
| TANK PERIOD (SOUTH) | SOUTH TANK (Ø57'-0" ") |
| | IMPULSIVE PERIOD = ___ SECONDS (TBD BY TANK SUPPLIER) |
| | CONVECTIVE PERIOD (OF SLOSHING WATER) = ___ SECONDS (TBD BY TANK SUPPLIER) |
| | SLOSHING WAVE HEIGHT (BY TANK SUPPLIER) |
| | SEISMIC USE GROUP III (RISK CATEGORY IV) = ___ FT (TBD BY TANK SUPPLIER) |
| SEISMIC | CONTENTS SPECIFIC GRAVITY: 1.00 WATER |
| | ROOF TYPES AND SLOPE: |
| | - CONICAL ROOF WITH CENTER SUPPORT STRUCTURE OPEN |
| | - ROOF WITH 1" IN 12" SLOPE |
| | CONCRETE STRENGTH - 4,500 PSI |
| | ALLOWABLE SOIL BEARING PRESSURE - 2,500 PSF (+1/3 INCREASE IN SEISMIC OR WIND) - VERIFY WITH GEOTECHNICAL REPORT |

**Tank Dimensions (North)**

| Tank Dimensions and Elevation Summary Table | | | |
|---|---|---|---|
| Diameter | 110 | ft | |
| Top of Shell Elevation | | ft | TBD by Tank Supplier |
| Shell Height | | ft | TBD by Tank Supplier |
| Overflow Elevation | 329.50 | ft | |
| Overflow Height | 22 | ft | |
| Max Operating Level (MOL) | 329.00 | ft | |
| Freeboard | 0.5 | ft | 6" below overflow. |
| Top of Reservoir Slab Elevation | 307.50 | ft | |

| Reservoir Storage Volumes – North | | | |
|---|---|---|---|
| Top Capacity Level (TCL) | 1,563,073 | gal | At lip of overflow |
| Max Operating Level (MOL) | 1,527,549 | gal | 6" below overflow. |

**Tank Dimensions (South)**

| Tank Dimensions and Elevation Summary Table | | | |
|---|---|---|---|
| Diameter | 57 | ft | |
| Top of Shell Elevation | | ft | TBD by Tank Supplier |
| Shell Height | | ft | TBD by Tank Supplier |
| Overflow Elevation | 340.50 | ft | |
| Overflow Height | 24 | ft | |
| Max Operating Level (MOL) | 340.00 | ft | |
| Freeboard | 0.5 | ft | 6" below overflow. |
| Top of Reservoir Slab Elevation | 316.50 | ft | |

| Reservoir Storage Volumes – South | | | |
|---|---|---|---|
| Top Capacity Level (TCL) | 457,859 | gal | At lip of overflow |
| Max Operating Level (MOL) | 448,321 | gal | 6" below overflow. |

**RESERVOIR SHEET INDEX**




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REGISTERED PROFESSIONAL ENGINEER
13922
OREGON
March 16, 1984
CHARLES T McDONALD
Expires: 12/31/2022

murraysmith

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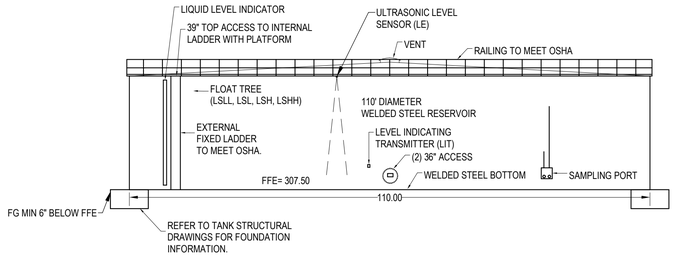
**WTP DESIGN NORTH & SOUTH**

*TAX MAP: 15S04W04 TAX LOT: 600*
*TAX MAP: 15S04W09 TAX LOT: 700*

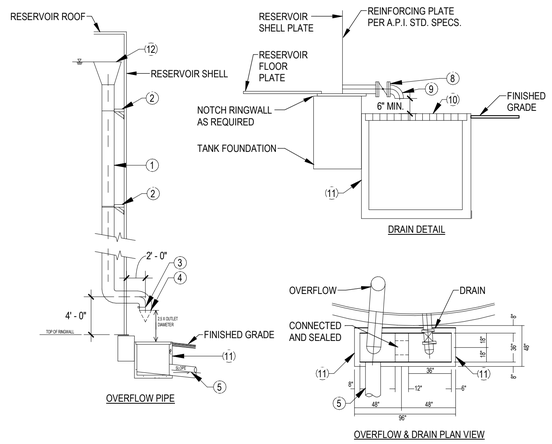
**RESERVOIR GENERAL INFORMATION**

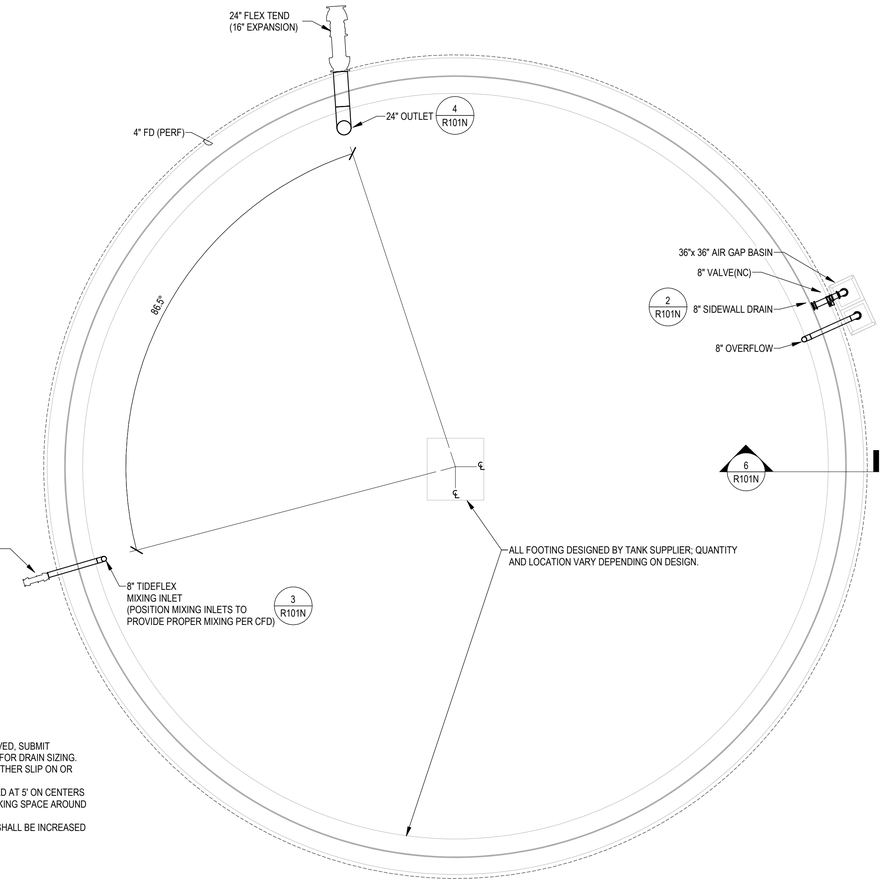
PROJECT NO.: 20064 | SCALE: AS SHOWN | DATE: MARCH 2022

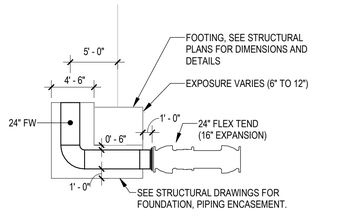
SHEET
R001



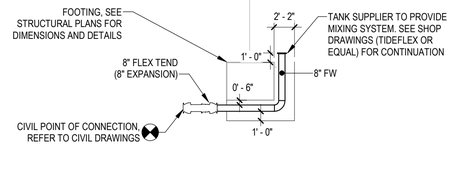

5 NORTH RESERVOIR SECTION
SCALE: 1/16" = 1'-0"




4 OUTLET NORTH
SCALE: 1/8" = 1'-0"




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

## MATERIAL LIST

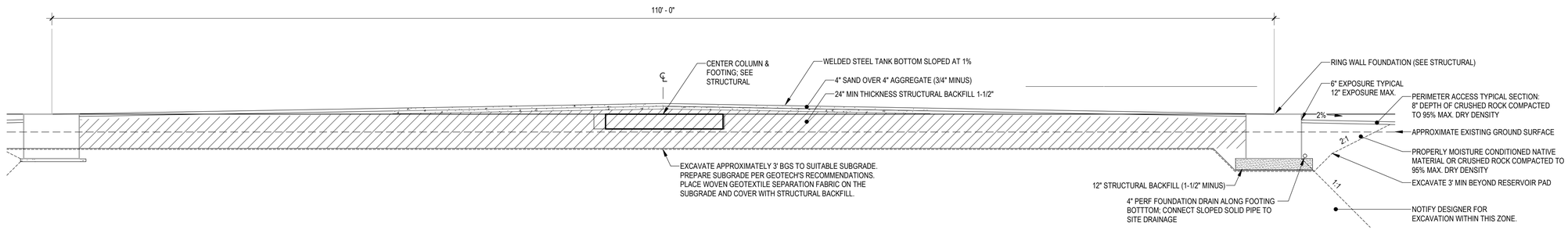
1. STD. WT. STL. PIPE, EPOZY LINDED AND OUTSIDE COATED WITH RESERVOIR, SIZED FOR MAXIMUM FLOW
2. BRACKET, COATED WITH RESERVOIR
3. FLAPPER STYLE FLOW SWITCH CONNECTED TO THE SCADA SYSTEM
4. DUCKBILL VALVE
5. 12" MIN. PVC STORM DRAIN, SLOPE TO SITE DRAINAGE SYSTEM
6. NOT USED
7. NOT USED
8. 8" GATE VALVE
9. 8" 90° BEND STD. WT. STL. PIPE, P.E.X. FLG, EPOXY LINED AND OUTSIDE COATED WITH RESERVOIR
10. STEEL GRATE
11. 36" x 36" MIN. CONCRETE DRAIN BOX. SLOPE FLOOR TO DRAIN
12. CONE OVERFLOW WEIR. EPOXY LINED AND OUTSIDE COATED WITH RESERVOIR. SIZED FOR MAXIMUM FLOW

2 TYPICAL DRAIN AND OVERFLOW DETAIL
NOT TO SCALE

## NOTES

1. PIPING SIZES TO BE APPROVED, SUBMIT HYDRAULIC CALCULATIONS FOR DRAIN SIZING.
2. ALL FLANGES TO BE 150#. EITHER SLIP ON OR WELD NECK AS REQUIRED.
3. GUARD POSTS TO BE PLACED AT 5' ON CENTERS MAX. WITH ADEQUATE WORKING SPACE AROUND PIPING
4. SIZE ON CONCRETE DRAIN SHALL BE INCREASED AS REQUIRED.

1 NORTH WATER RESERVOIR UNDERGROUND PIPING
SCALE: 3/32" = 1'-0"




6 SUBGRADE - FOUNDATION PREPARATION NORTH
SCALE: 3/16" = 1'-0"

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13922
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CHARLES T MCDONALD
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Springfield, OR 97477
p: 541.746.0637
www.BranchEngineering.com

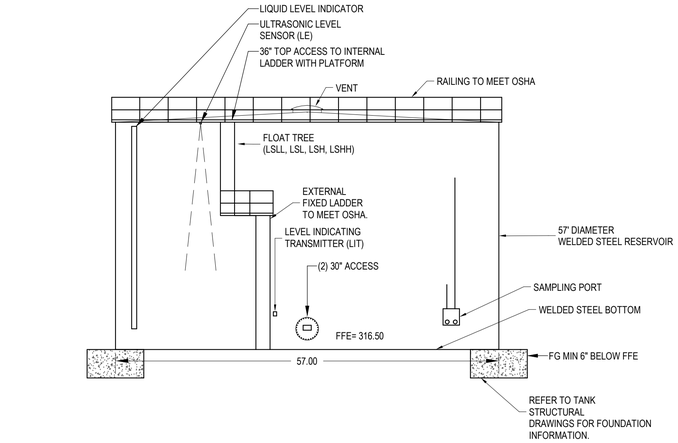
CITY OF HARRISBURG Established 1866

**WTP DESIGN**
**NORTH & SOUTH**
*TAX MAP: 15S04W04 TAX LOT: 600*
*TAX MAP: 15S04W09 TAX LOT: 700*

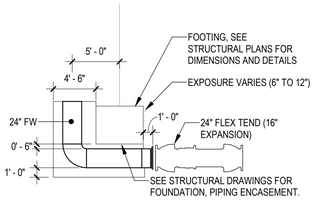
# NORTH RESERVOIR

PROJECT NO.: 20064
SCALE: AS SHOWN
DATE: MARCH 2022

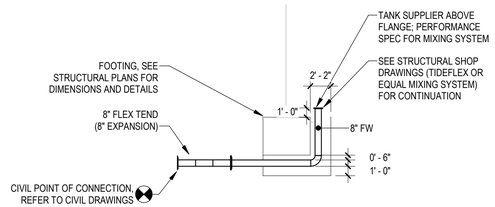
SHEET
R101N



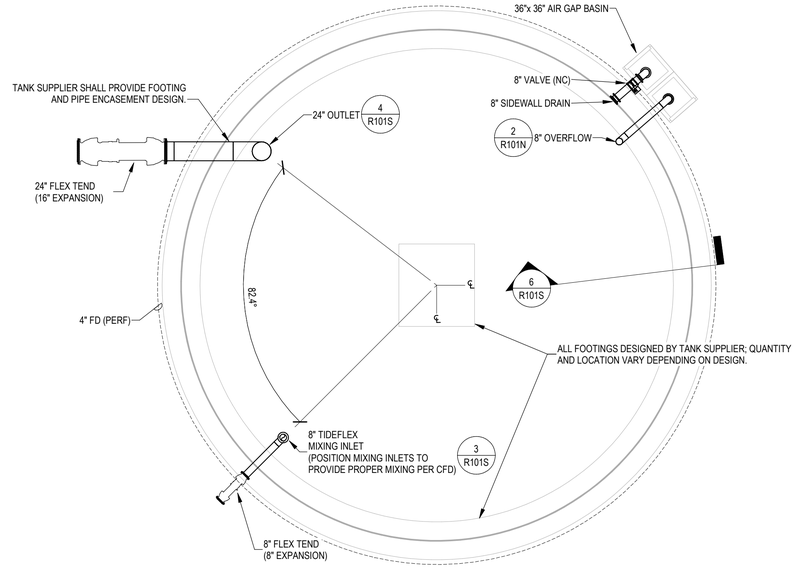

5 SOUTH RESERVOIR SECTION
SCALE: 3/32" = 1'-0"




4 OUTLET SOUTH
SCALE: 1/8" = 1'-0"

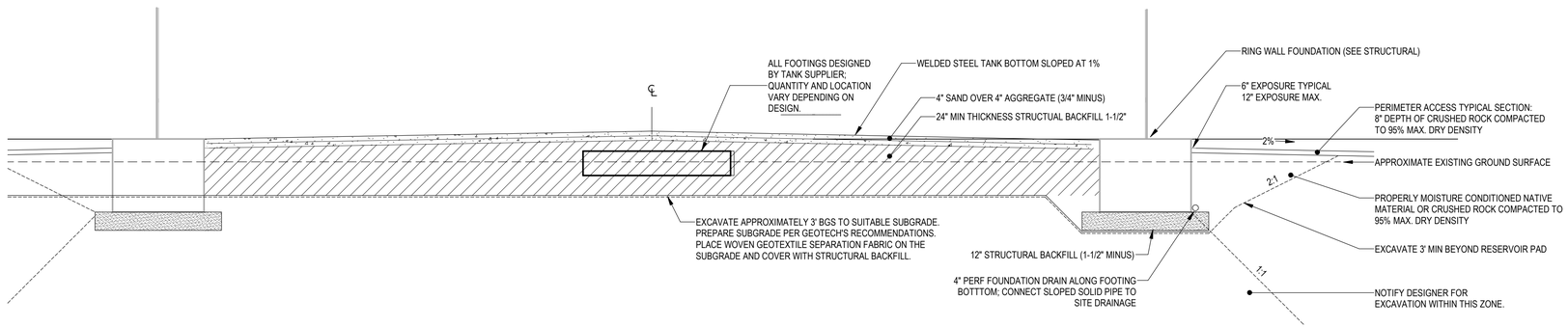



3 INLET SOUTH
SCALE: 1/8" = 1'-0"




1 SOUTH WATER RESERVOIR -PLUMBING
SCALE: 1/8" = 1'-0"

N




6 SUBGRADE - FOUNDATION PREPARATION SOUTH
SCALE: 1/4" = 1'-0"

Windsor Engineers
Vancouver, WA |
Duluth + Minneapolis, MN
www.windsorengineers.com


| NO. | DATE | BY | REVISION |
|---|---|---|---|
| 1 | 4/18/2022 | TMS | REVISION PER ADDENDUM 2 |

NOTICE
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE
0 1/2 1

DESIGNED
DRAWN
CHECKED

REGISTERED PROFESSIONAL ENGINEER
13922
OREGON
March 16, 1988
CHARLES T MCDONALD
Expires: 12/31/2022

murraysmith

Branch ENGINEERING INC
Since 1977
310 5th Street
Springfield, OR 97477
p: 541.746.0637
www.BranchEngineering.com

CITY OF HARRISBURG
Established 1866

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**NORTH & SOUTH**
*TAX MAP: 15S04W04 TAX LOT: 600*
*TAX MAP: 15S04W09 TAX LOT: 700*

# SOUTH RESERVOIR

PROJECT NO.: 20064
SCALE: AS SHOWN
DATE: MARCH 2022

SHEET
R101S

## Harrisburg North and South Water Treatment Facility

**April 13, 2022**

## Mandatory Pre-Bid Meeting Sign-In Sheet

| Name | Company |
|---|---|
| 1.Aaron Gress | MurraySmith |
| 2. Damien Gilbert | Branch Engineering |
| 3. Trevor Spires | HP Civil |
| 4. Shawn Long | Twin Rivers Plumbing |
| 5. Jeff Sitz | The Saunders Company |
| 6. Robert Smith | Pumptech LLC |
| 7. Dave Sherman | JWF |
| 8. Glinda Ireland | R&G Excavating, Inc. |
| 9. Stan Orr | Orr, Inc. |
| 10. Spencer Lemmon | Wildish Building Co. |
| 11. David Sampson | R.L. Reimers Co. |
| 12. Beau Solesbee | Pacific Excavation Inc. |
| 13. Brennon Aho | BRX, Inc. |
| 14. Matt Stephens | Benton Electric |
| 15. John Wajtas | Deans Commercial |

Harrisburg North and South Water Treatment Facility

April 13, 2022

Mandatory Pre-Bid Meeting Sign-In Sheet

| | |
|---|---|
| 16. Cory Mathis | Davis Electric Inc. |
| 17. Mark Taisey | Western States |
| 18. Kevin Campbell | Safety Electric Inc. |
| 19. Ian Sloane | R&G Excavating |
| 20. Zachary Tillotson | Hermanson Company LLC |
| 21. Mike Brye | Camp Creek Electric |
| 22. Chuck Scholz | City of Harrisburg |