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ADDENDUM NO. 3
TO THE CONTRACT DOCUMENTS FOR
ALDER CREEK WATER TREATMENT PLANT UPGRADES PROJECT

CITY OF SANDY

This addendum, issued on the **19th day of December 2025,** affects the request for proposal documents for the **Alder Creek Water Treatment Plant Upgrades Project** and shall be deemed an integral part of the above referenced documents.

All bidders shall acknowledge receipt of this addendum under Article 5 of Section C-410, Bid Form.

All changes, corrections, deletions and/or additions to the initial bidding documents enumerated herein shall be included in the Bidder's Proposal. In case of any conflict between the drawings, specifications, and this Addendum, this Addendum shall govern.

ITEM A – BIDDER QUESTIONS AND CLARIFICATIONS

- Refer to attached Clarification Log (Attachment 1)

ITEM B – REVISED SECTIONS

SECTION 01 25 13 - PRODUCT SUBSTITUTION PROCEDURE *(ATTACHMENT 2)*

- Replace Subsection 1.1.C with the following:

  C. Substitution or Alternative Product Options: Product substitutions may be evaluated after issuance of the notice to proceed. Any assumptions regarding the possibility of post-Bod approvals of "or-equals" or substitution requests are made at Bidder's sole risk.

SECTION 33 01 12 - INSPECTION AND TESTING OF WATER UTILITIES *(ATTACHMENT 3)*

- Replace Subsection 1.1.A with the following:

  A. The Contractor shall test all potable water pipelines, storage tanks, utility water, pressure sewer pipe and appurtenant piping, fittings, valves, and meters.

- Replace Subsection 3.1.A with the following:

  A. Water for testing pipelines and storage tanks will be furnished by the Owner; however, the Contractor shall convey the water from the Owner-designated source to the points of use.

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- Replace Subsection 3.1.B with the following:

  B. All pressure pipelines and storage tanks shall be pressure tested; those for potable water shall be disinfected. All chlorinating and testing operations shall be performed in the presence of the Engineer.

SECTION 40 63 43 - PLC-BASED CONTROL SYSTEM HARDWARE *(ATTACHMENT 4)*

- Replace Subsection 2.6.A with the following:

  A. The PLC panels as indicated on the Drawings shall be provided with a panel mounted industrial Operator Interface Terminal.

     1. Screen shall be 12” minimum.

     2. Manufacturer:

        a. Advantech TPC

        b. Or equal, as approved by Engineer.

SECTION 40 63 43 A - IO SCHEDULE *(ATTACHMENT 5)*

- Replace Entire Table with Attachment 4.

SECTION 40 70 00 - INSTRUMENTATION AND CONTROLS, GENERAL *(ATTACHMENT 6)*

- Replace Subsection 1.1.A.4.e with the following:

  e. SI shall be responsible for:

  1) PLC control panel(s) design.

     a) Per Section 40 67 00 – Control Panels and design requirements.

  2) HMI software and configuration.

  3) PLC software and programming.

  4) Assist Electrical Contractor in performing loop tests.

  5) Control system startup, documentation, and training.

- Replace Subsection 1.5.E.1 with the following:

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1. PLC Tag Maps

   a. SI shall submit PLC tag maps at the following milestones in preparation for and coordination with Client's SCADA Integrator.

   1) 85%

   2) 95%

SECTION 40 70 00.02 - INSTRUMENTATION AND CONTROLS, SYSTEM DESCRIPTION *(ATTACHMENT 7)*

- Replace Subsection 1.1.A with the following:

A. Owner-Preferred System Integrator (SI):

   1. Industrial Systems, Vancouver, Washington

   2. The Automation Group (TAG), Eugene, Oregon

   3. Taurus Power and Controls, Tualatin, Oregon

   4. Portland Engineering, Portland, Oregon

   Note: Stantec will serve as Owner's SCADA integrator under separate contract from the project construction. Stantec will be responsible for programming and development of SCADA systems.

- Replace Subsection 1.1.B.1.b with the following:

   b. Upgrades.

   1) The Owner's SCADA platform shall be changed to Ignition. SI to coordinate with the Owner's SCADA Integrator regarding integration of control system information to SCADA. The Owner shall be responsible for providing Ignition software licensing, servers, and thin clients.

      a) SI shall provide PLC tag map to the Owner's SCADA Integrator. The City's SCADA Integrator is responsible for integrating PLC data points into SCADA platform.

      b) SI shall provide network terminations to vendor packaged systems as shown in Design Documentation. The SI shall be responsible for PLC integration of vendor packaged systems as required by 40 61 96 Control Strategies for a complete and operational system. The Owner's SCADA Integrator shall be

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responsible for SCADA integration of vendor packaged systems.

2) The new plant primary control panel and PLC shall be programmed and commissioned by the SI. HMI shall be programmed to accomplish all items required for successful operation of the plant as outlined in 40 61 96 Control Strategies, including local controls, adjustment of setpoints, and enabling/disabling of alarms.

3) The new raw water pump station local control panel and PLC shall be programmed and commissioned by the SI. HMI shall be programmed to accomplish all items required for successful operation of the raw water pump station as outlined in 40 61 96 Control Strategies, including local controls, adjustment of setpoints, and enabling/disabling of alarms.

4) The new remote control panel for the membrane filtration units shall be programmed and commissioned by the SI in coordination with the membrane manufacturer.

5) A new SandyNET fiber optic network shall be commissioned and utilized for communications between plants with the new PLC.

6) New construction by SI to be completed in accordance with all project design documentation (Drawings and Specifications).

SECTION 43 05 01 - GENERAL EQUIPMENT PROVISIONS *(ATTACHMENT 8)*

- Add Subsection 3.3.C immediately after Subsection 3.3.B.4:

C. Training time, Inspection, Startup, and Field adjustment time shall be as recommended by the equipment manufacturer.

1. Unless specified by the individual equipment sections, manufacturer field time shall be as recommended by the manufacturer, with a minimum time of eight (8) hours at the job site.

SECTION C-520 – NON-TRANSPORTATION RELATED PUBLIC IMPROVEMENT CONTRACT AGREEMENT *(ATTACHMENT 9)*

- Remove and replace Article 9.02 as follows:

9.02 In resolving inconsistencies or ambiguities between two or more components of the Contract Documents, the highest precedence shall be given to the Agreement and the order of precedence shall decrease in the following manner:

1. Change Orders or Amendments (if any)
2. Agreement

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3. Addenda
4. Supplementary Conditions
5. General Conditions
6. Exhibits to the Agreement
7. Performance Bond
8. Payment Bond.
9. Certificates of Insurance
10. Specifications
11. Drawings

ITEM C – REVISED DRAWINGS

DRAWINGS (Attachment 10.1 – 10.4)

- Replace Sheet **EI-504-A** with the Attached Sheet, **EI-504-A**.
- Replace Sheet **EI-504-B** with the Attached Sheet, **EI-504-B**.
- Replace Sheet **EI-701-D** with the Attached Sheet, **EI-701-D**.
- Replace Sheet **EI-700** with the Attached Sheet, **EI-700**.

		Question/Comment from Bidder (if applicable)		Response or Clarification Issued
ID	Reference [Section] | [Part] or [Drawing #]	Specification Statement of Concern	Question/Comment	Response/Clarification/Modification
A3.1	33 16 10, 33 16 23, & C-410		Please confirm that Section 33 16 23 (welded steel tank) is the base bid tank for the MF feed service, and that Deductive Alternate A replaces this tank with the bolted steel tank in Section 33 16 10 for the same service and capacity.	Yes, Deductive Alternate A replaces the same tank with a bolted steel tank for the same service and capacity
A3.2	33 16 10, 33 16 23		Are nozzles, access, level instrumentation, mixing (if any), and piping arrangements identical between the welded steel base tank and the bolted steel alternate, or are any changes in appurtenances or configuration intended?	Beyond changing the Tank material from welded steel to the bolted steel alternative, no additional changes in appurtenances or configuration are intended
A3.3	33 16 10, 33 16 23, 33 16 00, 43 41 43		For all tank hydrostatic tests (welded steel, bolted steel, buried FRP, chemical poly tanks), please confirm: (a)Source of test water, (b)Whether Owner supplies water for all required tank tests (c)Whether the Contractor is responsible for test-water disposal in all cases.	See specfication 33 01 12. Owner will provide the water; Contractor resonsible for conveying water to testing location; Contractor responsible for disposal
A3.4	33 16 00		Please provide the expected chemical constituents, pH range, and temperature range for the FRP neutralized chemical waste tank service (CIP waste), so that laminate design and resin selection can be aligned with the actual exposure.	Per 01 64 00 1.1.C, Once awarded, Contractor shall coordinate with Owner furnished Membrane supplier on CIP characteristics. For Bidding purposes, expected chemical constituents are sodium hypochlorite (up to 100 mg/L), Citric Acid (up to 1,400 mg/L), Sodium Bisulfite (up to 1,000 mg/L), sodium hydroxide (900 mg/L). Inlet temperatures are anticipated to be between 5 and 25 degrees C. Specific Gravity is anticipated to be 1 to 1.1. The water is anticipated to be neutralized, with pH rangning from 6.5 to 8.5.
A3.5	01 64 00		Please confirm that the Contractor is responsible for all supports, housekeeping pads, shims/grout, anchor bolts, and minor accessories required to install Owner-furnished membrane and electrical equipment, and for all associated mechanical, electrical, and I&C connections, unless specifically noted as furnished and installed by others.	Yes, See specifcation 01 64 00, the Contractor is responsible for all these items unless specified in the plans or specifications
A3.6	01 64 00, Appendix A & C		For Owner-furnished membrane and electrical equipment, how many onsite vendor/technical representative visits should the Contractor assume, and are additional trips (e.g., due to schedule changes or rework) at Contractor or Owner cost?	Please review Appendix A and C. Per 01 64 00 1.1.C. Onsite vendor/technical representative visits vary according to procurement package and project phase. Additional trips caused from defective product or services will not be paid by the Owner.
A3.7	43 05 01, 43 20 00, 43 25 00, 43 41 43, 46 30 00, 46 33 40, 46 33 44		Several sections require factory startup, onsite inspection, and operator training for pumps, chemical feed skids, poly tanks, and mixers. Please confirm: (a)The minimum number of site visits assumed for each equipment package, and (b)Whether the Contractor should carry all vendor travel and per diem for these services in the bid.	Unless otherwise specified, refer to manufacters' recommendation for length of visit for inspection/start up and training. At a minimum, one full day is required. Contractor is responsible for all costs associated with these services.
A3.8	Testing & retesting		If initial performance or acceptance testing does not meet specified criteria, is the expectation that all retesting costs (labor, vendor reps, water, power) are at Contractor cost, or will the responsible equipment supplier be expected to participate in retest costs?	See specfication 01 75 00 - Equipment Testing and Startup Procedures.

		Question/Comment from Bidder (if applicable)		Response or Clarification Issued
ID	Reference [Section] | [Part] or [Drawing #]	Specification Statement of Concern	Question/Comment	Response/Clarification/Modification
A3.9	40 05 93		Section 40 05 93 sets common requirements for all low-voltage AC motors (NEMA MG-1, IEEE 112, UL 1004, Motor Data forms, etc.). Please confirm that these requirements apply to all equipment-supplied motors, including motors supplied inside OEM packages, unless specifically noted otherwise in that equipment section.	Specification 40 05 93 specifically pertains to all low-voltage AC squirrel cage induction motors.
A3.10	26 05 73, 40 05 93		For the Div 26 power system study and coordination/arc-flash analysis, should the Contractor assume responsibility for collecting all detailed motor and protective device data from vendors and reconciling it with the electrical engineer, or will the Engineer take the lead on data gathering and modeling?	As indicated in the Specfication 26 05 73, Contractor is responsible for the study which includes collecting necessary data and utilizing the services of a Registered Professional Engineer.
A3.11	C-111		Some bid documents reference 2025 and others 2026 for bid and opening dates. Please confirm the correct calendar year for the bid, award, and Notice to Proceed.	The typo on bid closing date was addressed in Addendum #2. Please refer to Addendum #2 for the schedule events and updated Section C-111.
A3.12	C-520 | 4.02		Please confirm that the $500/day Substantial and $500/day Final Completion liquidated damages apply to the overall project completion dates only, and that there are no separate milestone-based liquidated damages for individual facilities.	Correct, the liquidated damages noted in Article 4.02 of C-520 apply to the overal project completion dates. There are no separate milestone-based liquidated damages for individual facilities.
A3.13	C-410 Attachment E		For DBE good-faith effort documentation, will electronic solicitation logs, email copies, and screenshots of advertisements be acceptable as supporting documentation, or is there a prescribed format the Owner prefers?	The documentation formats proposed are suitable.
A3.14	C-520 | 9.02 & C-800 | SC-3.01		Please confirm that the project follows the EJCDC standard order of precedence (Agreement → Addenda → General Conditions → Supplementary Conditions → Specs → Drawings), as modified in C-800, and identify any Owner-specific variations to that order.	The order of precedence shall be as follows: Change Orders or Ammendments → Agreement → Addenda → Supplementary Conditions → General Conditions → Specs → Drawings. Section C-520 Article 9.02 has been revised and attached to reflect this order.
A3.15	01 25 13		What is the latest date the Engineer will accept “or equal” substitution requests for major equipment (tanks, pumps, chemical feed systems, major process equipment) for consideration during bidding, versus after award?	See addendum #1. Product substitutions may be evaluated after issuance of the notice to proceed. Any assumptions regarding the possibility of post-Bod approvals of "or-equals" or substitution requests are made at Bidder's sole risk.
A3.16	C-100, C-110		Are as-built drawings available for the existing facility? Specifically, looking to understand sizes and depths of structures and yard pipe that are to be demolished.	Record drawings shall be uploaded to the City's Bid/RFP web page for use by Bidders.
A3.17	-		Will CAD files be made available?	Refer to Addendum #1 clarification A1.3.
A3.18	08 62 00	2.1.B and 2.2 .A reference specification Section 088000 for skylight glazing however it is not included in the documents.	086200 identifies the glass thickness and unit makeup but does not include information about the performance coatings. A glazing specification identifying performance coatings is required in order to provide a responsive quotation. We suggest a Vitro Solarban 70 and Guardian SNX 62-27 would be appropriate coatings on the #2 surface of the unit; if the glass is desired to be translucent then a white diffused interlayer would need to be specified in the laminated glass. We are glad to work with Stantec to determine an appropriate glass makeup. Confirm: 088000 will be provided to clarify the skylight glass coatings and laminated glass interlayer color.	These unit skylights are over equipment cover, not occupied space. No issue taken with the choice of Vitro Solarban 70 or Guardian SNX 62-27 products. 2.1.A indicates that the Factory-Assembled Skylight includes the glazing; Section 08 80 00 not included. Section 08 62 00 will be revised to remove reference to 08 80 00 for the conformed set that is provided to the successful bidder.

		Question/Comment from Bidder (if applicable)		Response or Clarification Issued
ID	Reference [Section] | [Part] or [Drawing #]	Specification Statement of Concern	Question/Comment	Response/Clarification/Modification
A3.19	08 62 00	2.3.1. and 2.3.2 ALUMINUM FINISHES are in conflict.	2.3.1 references a Class I - Clear Anodic Finish: AAMA 611. Per 2.3.1.a Specified Color: Clear Anodized. Per 2.3.2 High Performance Organic Finish, Three-Coat: Fluoropolymer finish complying with AAMA 2605 containing not less than 70 percent PVDF resin. 2.3.2.C Metal Trim Finish states to "Match roofing material color". The roofing material per spec Section 074113 -2.7.A specifies a three-coat fluoropolymer finish. Confirm: The DeaMor skylight aluminum framing and aluminum flashings will be a three-coat fluoropolymer to match the roofing color.	The Basis of Design product has two options for finish - clear anodic and bronze. Design team chose Clear Anodic. Please ignore high performance (2.3.2) - that is intended for curb base flashing.
A3.20	08 62 00	2.1.J calls for .060" thick flashings which add cost and are not necessary for these skylights.	The requirement for flashing thickness is to remain flat – no oil canning or "fish mouthing" -when spanning required distances and to provide a consistent profile when installed. 0.060" thick material is required for large flashings with extensive spans and requires special forming equipment, notching and backers in order to provide a flat finish plane. The skylight flashings for this project have a short span and would be less expensive and more easily formed watertight in the field with the appropriate 0.040" thick aluminum. Confirm: 2.1.J will be revised to read: Manufacturer's standard aluminum components as required to remain flat, not less than 0.040 inch thick.	0.040 inch thick is an acceptable thickness.
A3.21	08 62 00 | 07 72 00	Details 3 & 5/A512 Skylight @ Roof 1 – Skylight Curb is shown like a premanufactured curb but is not specified in 077200 or 086200.	The skylight curb details show a curb similar to the roof hatches but are not specified. We suggest a suitable premanufactured curb would be manufactured by Roof Products Inc (RPI), 14ga galvanized curb, and a standard color prepainted liner as recommended by manufacturer for the size, with a wood top plate, , minimum 31/2" wide with rigid insulation. Roof Curbs National Manufacturer | Roof Products, Inc. | © 2018 Confirm: The pre-manufactured skylight curb height and material requirements will be clarified.	The is acceptable assuming performance is equal to details 3/A-512-D and 5/A-512-D and related product specifications.
A3.22	08 62 00	Details 3 & 5/A512 Skylight @ Roof 1 – Skylight Curb is not dimensioned, as shown it scales at 2" which is too narrow for the shed skylight system attachment.	The shed skylights require a minimum curb width of 3 ½" for proper attachment. Confirm: The pre-manufactured curb detail will be revised to a minimum width of 3 ½ inches.	The is acceptable assuming performance is equal to details 3/A-512-D and 5/A-512-D and related product specifications.

		Question/Comment from Bidder (if applicable)		Response or Clarification Issued
ID	Reference [Section] | [Part] or [Drawing #]	Specification Statement of Concern	Question/Comment	Response/Clarification/Modification
A3.23	08 62 00	Detail 3/ A512 Skylight at Roof 1 Side – Pre-Manufactured curb interior liner is noted to "match the skylight finish" which is not available.	Detail 3/A512 states "Metal fascia color to match the skylight finish". The interior metal curb liner for the pre-manufactured curbs is only available in a mill or standard white painted finish. We suggest that a cost-effective option to achieve an interior metal liner color to match the skylight finish would be to specify the standard white painted finish on the liner and field-apply the desired finish color over the white painted metal liner; this will provide better adhesion than a mill finish liner for the final paint color. Confirm: The finish color for the interior metal liner of the pre-manufactured skylight curb will be a standard white paint or mill finish.	Standard white paint finish is acceptable.
A3.24	07 41 13 & 07 42 13		[Would you] be able to entertain a substitution request for the Standing Seam Metal Roof & Formed Metal Wall Panels on this project.	Product substitution for the Standing Seam Metal Roof & Formed Metal Wall Panels may be evaluated after issuance of the notice to proceed. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

SECTION 01 25 13 - PRODUCT SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This document describes the requirements for submission of product information and procedures for consideration of substitutions by Owner, including products proposed to be used by Contractor under "or equal" or "acceptable alternate" provisions.

B. Where equipment, materials or process have been specifically named, it is the intention of the Engineer to use these items. If a Contractor desires to have an alternate considered, they are to provide the following information. It will be the responsibility of the Contractor to convince the Engineer that the alternate materials are equal and will perform the intended function at or above that of the specified equipment. The burden of proof is on the Contractor to convince the Engineer that the product is equal for the purpose of a particular function.

Add. 3

C. Substitution or Alternative Product Options: Product substitutions may be evaluated after issuance of the notice to proceed. Any assumptions regarding the possibility of post-Bod approvals of "or-equals" or substitution requests are made at Bidder's sole risk.

1.2 DEFINITIONS

A. The word “Products,” as used herein, is defined to include purchased items form incorporation into the work, regardless of whether specifically purchased for the project or taken from Contractor’s stock of previously purchased products. The word “Materials,” is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of work. The word “Equipment” is defined as products with operation parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in the Contract Documents, including “specialties”, “system”, “structure”, “finishes”, “accessories”, “furnishings”, “special construction”, and similar items, which are self-explanatory and have recognized meanings in the construction industry.

B. Neither “Products” nor “Materials” nor “Equipment” includes machinery and equipment used for preparation, fabrication, conveying and erection of the Goods.

1.3 CONTRACTOR’S OPTIONS

A. For products specified only by reference standards, select any product meeting standards, by any manufacturer.

B. For products specified by naming several products or manufacturers, select any product and manufacturer named.

C. For products specified by naming one or more products, but indicating the option of selecting equivalent products by stating "or equal" or "acceptable alternate" after specified product, Contractor must submit request, as required for substitution, for any product not specifically named.

1. “Or-Equal” Items: if in the Engineer’s sole judgment an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related work will be required, it may be considered by the Engineer as an “or-equal” item, in which case review and approval of the proposed item may in the Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purpose of the paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. It is at least equal in quality, durability, appearance, strength and design characteristics.

b. It will reliably perform at least equally well the function imposed by the design concept of the complete project as a functioning whole;

c. There is no increase in cost to the Owner, and

d. It will conform to the detailed requirements of the item named in the Contract Documents.

D. For products specified by name, brand, model, etc., the Contractor shall provide information as required below for the Engineer to review and determine under their sole discretion that the product is acceptable.

1.4 SUBSTITUTIONS

A. If in the Engineer’s sole judgment an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item, it will be considered a proposed substitute item and subject to the review process.

B. The procedure for review by the Engineer will include the following:

1. Contractor shall submit sufficient information as provided below to allow the Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and therefore an acceptable substitute. Requests for review of proposed substitute items of materials or equipment will not be accepted by the Engineer from anyone other than the Contractor. Include the following minimum information in the application:

a. The Contractor shall certify that the proposed substitution will perform adequately the functions and achieve the results called for by the general design and be similar and of equal substance to that indicated and be suited to the same use as the specified.

b. For products:

1) Product identification, including manufacturer's name and address.

2) Manufacturer's literature:

a) Product description

b) Performance and test data

c) Reference standards

c. Name and address of similar projects on which product was used and date of installation.

d. All variations of the proposed substitute item for the specified shall be identified in the application and available engineering, sales, maintenance, repair and replacement service shall be indicated.

e. The application shall state the extent, if any, to which the use of the proposed substitute will prejudice Contractor's achievement of delivery on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provision of any other direct contract with Owner for work on the project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the substitute in connection with the work is subject to payment of any license fee or royalty.

f. The application shall also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other sellers affected by any resulting change, all of which will be considered by the Engineer in evaluating the proposed substitute item.

C. In making request for substitution, Contractor shall:

1. Investigate proposed product or method and determine that it is equal or superior in all respects to that specified.

2. Provide the same guarantee for substitution as for product or method specified.

3. Coordinate installation of accepted substitution into work, making such changes as may be required for work to be complete in all respects.

4. Waive all claims for additional costs related to substitution which consequently become apparent.

5. Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6. If the Substitute product requires Engineer Redesign, Contractor shall pay associated costs to revise Construction Drawings.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION 01 25 13

SECTION 33 01 12 - INSPECTION AND TESTING OF WATER UTILITIES

PART 1 - GENERAL

1.1 WORK INCLUDED

Add. 3

A. The Contractor shall test all potable water pipelines, storage tanks, utility water, pressure sewer pipe and appurtenant piping, fittings, valves, and meters.

B. The Contractor shall be responsible for obtaining permits for discharging excess testing and disinfection water and dechlorination of such water if required to satisfy permit limits.

1.2 SUBMITTALS

A. The Contractor shall furnish the following information:

1. A testing plan and schedule, including method for conveyance, control, disposal, de-chlorination, and disinfection shall be submitted in writing for approval.

2. Name of certified bacteriological testing laboratory for potable water testing.

3. Provide to the Project Engineer a record of test duration calculations for each segment tested.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All test equipment, chemicals for chlorination, temporary valves, bulkheads, and other water control equipment, and choice of disinfectant shall be as determined by the Contractor.

B. Chlorine for disinfection may be in one of the following forms:

1. Sodium hypochlorite liquid containing approximately 5 to 15% available chlorine, per ANSI/AWWA B 300.

2. Calcium hypochlorite, granular or in 5g tablets containing approximately 65% available chlorine by weight, per ANSI/AWWA B 301.

3. Liquid chlorine: Only with written authorization of Engineer, in accordance with the requirements of ANSI/AWWA B301 - Liquid Chlorine and only by trained personnel using appropriate safety practices.

C. Dechlorinate water prior to discharge in accordance with AWWA C655, Field Dechlorination. Dechlorination agents may be sodium bisulfite, calcium bisulfite, sodium sulfite, or sodium thiosulfate.

PART 3 - EXECUTION

Add. 3

3.1 GENERAL

A. Water for testing pipelines and storage tanks will be furnished by the Owner; however, the Contractor shall convey the water from the Owner-designated source to the points of use.

B. All pressure pipelines and storage tanks shall be pressure tested; those for potable water shall be disinfected. All chlorinating and testing operations shall be performed in the presence of the Engineer.

C. Disposal of flushing water and water containing chlorine shall be by methods acceptable to the Oregon Department of Environmental Quality.

D. Disinfection operations shall be scheduled as late as possible during the Contract Time to maximize the degree of sterility of the facilities at the time the Work is accepted by the Owner. Bacteriological testing shall be performed by a certified testing laboratory and paid by the Contractor.

3.2 HYDROSTATIC TESTING OF PIPELINES

A. Reference Drawings for required test pressures and leakage allowances.

B. Prior to hydrostatic testing, pipelines shall be flushed or blown out as appropriate. Flushing pipe velocity shall be 2.5 ft/second minimum.

C. The Contractor shall test pipelines either in sections or as a unit. No section of the pipeline shall be tested until the trench has been properly backfilled and all field-placed concrete or mortar has attained an age of 7 days, or until adequately cured. The test shall be made by closing valves when available or by placing temporary bulkheads in the pipe and filling the line slowly with water. The Contractor shall be responsible for ascertaining that all test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to or movement of the adjacent pipe. Unharnessed sleeve-type couplings, expansion joints, or other sliding joints shall be restrained or suitably anchored prior to the test to avoid movement and damage to piping and equipment. Remove or protect any pipeline-mounted devices that may be damaged by the test pressure. The Contractor shall provide sufficient temporary tapping's in the pipelines to allow for all entrapped air to exit. After completion of the tests, such taps shall be permanently plugged. Open all air relief valves during filling.

D. The pipeline shall be filled at a rate which will not cause any surges or exceed the rate at which the air can be released through the release valves at a reasonable velocity. All the air within the pipeline shall be allowed to escape. The differential pressure across the orifices in the air release valves shall not be allowed to exceed 5 psi at any time during filling.

E. Verify that, in a minimum two-hour test, the pipe does not leak in excess of the allowable leakage as defined by the following formula in which L is the allowable leakage in gallons per hour. Leakage is only allowed for buried piping.

$$L = \frac{ND(P)^{1/2}}{7{,}400}$$

Where L = Allowable Leakage (gallons/hours)

N = Number of Joints in Tested Line - including fittings (number)

D = Nominal Pipe Diameter (inches)

P = Tested Pressure (psi, gauge)

F. For pipe working pressures less than or equal to 100 psi, sustain a test pressure of 150 psi. For pipe working pressures greater than 100 psi, sustain a test pressure at least 1.5 times the working pressure or as determined by the Engineer. See Drawings for planned testing pressures of various pipelines.

G. Pressure test pipe per ASTM F 2164-02 Field Leaking Testing of Polyethylene (PE) Pressure Piping Systems using Hydrostatic Pressure.

3.3 DISINFECTING PIPELINES – TABLET OR GRANULE METHOD

A. Solution Strength: 25 mg/L minimum.

B. Use: Only if the pipes and appurtenances are kept clean and dry during construction. Do not use on solvent welded plastic or screwed joint steel pipe.

C. Placement When Using Granules: During construction, place calcium hypochlorite granules at the upstream end of the first section of pipe, at the upstream end of the first pipe of each branch main, and at approximately 500-foot intervals in all new pipes as they are laid, as per AWWA C651.

D. Granular Quantity:

Ounces of Hypochlorite Granules at 500-foot Intervals	
Pipe Diameter (inches)	Granules Amount (ounces)
4	1.7
6	3.8
8	6.7
10	10.5
12	15.1
14 and larger	D^2 x 15.1

E. Placement When Using Tablets: During construction, place 5g calcium hypochlorite tablets in each section of pipe as noted in Table 2, and also place one tablet in each hydrant, hydrant branch and other appurtenances. Attach tablets to the inside of the pipe using an adhesive such as Permatex No. 2 or approved substitution. Assure no adhesive is on the tablet except on the broad side attached to the surface of the pipe. Attach all the tablets at the inside top of the main, with approximately equal numbers of tablets at each end of a given pipe length. If the tablets are attached before the pipe section is placed in the trench, mark their position on the section so it can be readily determined that the pipe is installed with the tablets at the top.

Number of Tablets [1]	
Pipe Diameter (inches)	No. of 5g Tablets [2]
4	1
6	1
8	2
10	3
12	4
16	6
18	7
20	9
24	13

[1] Adjust for pipe length other than 18 feet.

[2] Based on 3.25g available chlorine per tablet.

F. Filling Procedure: When granule or tablet installation has been completed, fill the main with clean water at a velocity not exceeding 1 fps. Take precautions to assure that air pockets are eliminated. Leave this water in the pipe for at least 24 hours. If the water temperature is less than 41°F, leave the water in the pipe for at least 48 hours. Position valve so that the chlorine solution in the main being treated will not flow into water mains in active service.

3.4 DISINFECTING PIPELINES – CONTINUOUS FEED METHOD

A. Solution Strength: Dose at 25 mg/L for 4 hours

B. Residual: 10 mg/L at 24 hours.

C. Dosing Methods:

1. Liquid Chlorine: Solution feed vacuum-operated chlorinator in combination with a booster pump. Direct feed is not allowed.

2. Hypochlorite Solution: Chemical feed pump designed for feeding chlorine solutions.

3. Calcium Hypochlorite Granules: Refer to previous section.

D. Filling Procedure: Use approved source to flow clean water at a constant, measured rate into the newly laid water main. Fill at a point not more than 10 feet downstream from the beginning of the new main. Measure concentration at regular intervals to ensure a 25 mg/L dose. Position valves so that the chlorine solution in the main being treated does not flow into water mains in active service. Do not stop chlorine application until the entire main is filled with chlorinated water. Retain the chlorinated water in the main for at least 4 hours, operating all valves and hydrants in the section treated. At the end of the 24-hour period, verify the treated water in all portions of the main has a residual of 10 mg/L free chlorine.

3.5 DISINFECTING PIPELINES – SLUG METHOD

A. Solution Strength: 100 mg/L.

B. Dosing Methods: Per Engineer's direction

C. Filling Procedure: Use approved source to flow clean water at a constant, measured rate into the newly laid water main. Fill at a point not more than 10 feet downstream from the beginning of the new main. Measure concentration at regular intervals to ensure 100 mg/L dose. Apply the chlorine continuously and for the time required to develop a solid column or "slug" of chlorinated water that will, expose all interior surfaces to a 100 mg/L for at least 3 hours. Measure the chlorine residual in the slug as it moves through the main. If at any time it drops below 50 mg/L, stop flow and relocate chlorination equipment at the head of the slug, and as flow is resumed, add chlorine to restore the free chlorine in the slug to not less than 100 mg/L. As the chlorinated water flows past fittings and valves, operate valves and hydrants to disinfect appurtenances and pipe branches.

3.6 DISINFECTING PIPELINES – FINAL FLUSHING

A. After the retention period, flush the chlorinated water from the main until chlorine measurements show that the concentration in the water leaving the main is no higher than that in the system, or is acceptable for domestic use.

B. Dispose of flushing water to a location approved by the Engineer.

3.7 DISINFECTING PIPELINES – BACTERIOLOGICAL TESTS

A. After final flushing and before the water main is placed in service, test samples collected from the main(s) for coliform bacteria. Take 2 samples from each location at least 24 hours apart.

B. If the initial disinfection fails to produce approved bacteriological samples, reflush and resample the main. If check samples show bacterial contamination, re-chlorinate the main until approved results are obtained.

3.8 DISINFECTING PIPELINES – SWABBING

A. If connections are not disinfected along with the newly installed main, swab or spray the interior of all pipe and fittings used in making the connections with a 1% hypochlorite solution before installation.

END OF SECTION 33 01 12

SECTION 40 63 43 – PLC-BASED CONTROL SYSTEM HARDWARE

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Contractor, through the use of the System Integrator (SI) as defined in Section 40 70 00.02, shall provide a PLC-based control system (PLCS) complete and operable, in accordance with the Contract Documents.

1.2 SUBMITTALS

A. Submittals shall be in accordance with the applicable requirements of Section 40 70 00 – Instrumentation and Control, General and Section 01 33 00 – Submittal Procedures.

B. Shop Drawings: The PLC hardware submittal shall be included with the control panel submittals per Section 40 67 00 – Control Panels. PLC hardware submittals shall include but are not limited to the following:

1. Data sheets shall be included for each PLCS component together with a technical product brochure or bulletin. These data sheets shall show the component name as used within the Contract Documents, the manufacturer's model number or other identifying product designation, the project tag number, the project system of which it is a part, the input and output characteristics, the requirements for electric power, the ambient operating condition requirements, and details on materials of construction.

2. Complete and detailed bills of materials: A bill of material list, including quantity, description, manufacturer, and part number, shall be submitted for each component of the PLC system. Bills of material shall include all items within an enclosure.

3. Proposed version of PLC firmware.

C. UPS and battery load calculations to show that the backup capacity and time meet the specified requirements. Operation and Maintenance Manuals: The following items shall also be included in with the SCADA Operations and Maintenance Manuals:

1. All PLC control panel drawings.

2. All control panel and PLC submittal information.

3. A digital copy containing a pdf of documented PLC program and copy of the downloadable source code.

1.3 QUALITY ASSURANCE

A. Special warranty requirements shall be in accordance with the applicable requirements of Section 40 70 00 – Instrumentation and Control, General.

B. Equipment, software, and materials which do not achieve design requirements after installation shall be replaced or modified by the Contractor to attain compliance. The cost for doing so shall be the Contractor's responsibility. Following replacement or modification, the Contractor shall retest the system and perform any additional procedures needed to place the complete PLC in satisfactory operation and attain design compliance approval from the Engineer.

C. The Contractor warrants the materials and workmanship used for the PLCS equipment and materials and further guarantees the materials and workmanship used for any equipment and materials produced and furnished hereunder as a part of the Work to be as required and agreed upon, free from injurious defects, and in all respects satisfactory for the service required.

D. The Contractor warrants/guarantees the satisfactory performance of the equipment and materials under operating conditions for a period of two years after the date of final acceptance. In the event that tests and inspections disclose latent defects or failure to meet the specified requirements, the Contractor upon notification by the Owner shall proceed at once to correct or repair any such defects or non-conformance or to furnish, at the delivery point named in the Contract Documents, such new equipment or parts as may be necessary for conformity to the requirements, and shall receive no additional compensation therefore. In case of any required repairs or other corrective or remedial Work covered under warranty, the warranties on all such corrections, repairs, new equipment, or parts shall be extended for an additional 24 months from the date of final acceptance or 12 months from the date of completion of any such corrections, repairs, new equipment, or parts, whichever date is later. If the Owner performs repair, the Contractor shall reimburse the Owner for all costs incurred in the removal of the defective material and installation of the replacement.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials and all equipment furnished under this Contract shall be new, free from defects, of first quality, and produced by manufacturers regularly engaged in the manufacture of these products.

B. Hardware Commonality: Where there is more than one item of similar equipment being furnished all such similar equipment shall be the product of a singular manufacturer.

C. All PLCs, I/O modules, power supplies and other accessories required to form a complete system shall be provided. Parts may be required to complete the system that are not shown on the drawings but are the responsibility of the Contractor to furnish in order to provide a complete, operable system.

D. All materials shall be UL listed.

2.2 PLC ENCLOSURES

A. Each PLC and its corresponding I/O modules, power supply module(s), communication interface device(s), and peripheral equipment shall be mounted inside suitable enclosures. All I/O wiring from the field to the I/O modules shall be terminated on terminal blocks in the enclosure.

B. PLC enclosures shall be provided in accordance with Section 40 67 00 - Control Panels.

2.3 PROGRAMMABLE LOGIC CONTROLLER (PLC)

A. PLCs shall be provided for locations listed in Section 40 70 00 – Instrumentation and Control, General.

B. Each PLC shall be of solid-state design. All CPU operating logic shall be contained on plug-in modules for quick replacement. Chassis wired logic is not acceptable. The controller shall be capable of operating in a hostile industrial environment and designed to provide high reliability specifically in this process application. The internal wiring of the controller is to be fixed, with the logic functions it must perform in a given application to be programmed into its memory. The controller shall be supplied with the CPU, input/output scanner, inputs, outputs, memory, power supply, and all power and interface cables necessary to function as a complete and operable PLC system. Each PLC shall be furnished with multiple onboard communication ports to support all communication functions as outlined by Drawings and other Contract Documents.

C. Central Processors (CPU): Each CPU shall contain all the relays, timers, counters, number storage registers, shift registers, sequencer, arithmetic capability, and comparators necessary to perform the indicated control functions. It shall be capable of interfacing sufficient discrete inputs, analog inputs, discrete outputs, and analog outputs to meet requirements plus excess capacity as described above. Specifically, the PLCs shall have the following features and capabilities:

1. The CPU within the system shall perform internal diagnostic checking and give visual indication to the user by illuminating a "green" indicator when no fault is detected and a "red" indicator when a fault is detected.

2. Non-volatile memory shall store the operating system information to protect against loss in the case of power loss or system shutdown. Only at the time of a hardware change shall this configuration status be altered or reentered.

3. PLC firmware shall be the most currently available from the manufacturer at the time of hardware procurement.

D. Program Creation and Storage (Memory): Memory capacity shall be configurable to allow for the most efficient match to the intended application. It shall be possible to upgrade to a processor with a larger memory size simply by saving a program, replacing the processor, and downloading the program to the new system without having to make any program changes.

1. The operator shall be able to backup volatile memory, including data and program logic onto removable media, at their option.

2. Each unit shall be supplied with sufficient memory to implement the indicated control functions plus a reserve capacity. This reserve capacity shall be totally free from any system use. The memory shall be programmed in a multi-mode configuration with multiple series or parallel contacts, counters, timers, and arithmetic functions.

E. PLC Input/Output (I/O) Modules: All I/O housings and modules shall be suitable for hostile industrial environments as described above. All I/O modules shall be isolated and conform to IEEE Surge Withstand Standards and NEMA Noise Immunity Standards.

1. Modules shall be removable without having to disconnect wiring from the module's terminals by means of a swing-arm or plug-in wiring connector.

2. Each PLC I/O location shall contain the I/O modules required to provide all of the I/O points contained in the I/O Lists.

3. 20% spare I/O capacity shall be provided.

F. Manufacturer, without exception:

1. PLCs and associated hardware shall be as shown in panel layout design. Typical PLC hardware is shown as follows. Additional hardware to be provided as needed per project requirements.

a. For panels LCP-A100, PCP-B100, RCP-D100:

1) Controller: PACSYSTEMS RX3i Controller IC695CPE310

a) Coordinate final PLC selection with Owner.

2) Discrete Input: IC694MDL645

3) Discrete Output: IC694MDL740

4) Analog Input: IC695ALG112

5) Analog Output: IC695ALG708

6) Ethernet: FL SWITCH 2314-2SFP

b. For panel RCP-B110 for interface with vendor controls equipment

1) Controller: Allen Bradley 5069-AENTR

a) Ethernet/IP remote I/O adapter

2) Discrete Input: 5069-IB16

3) Discrete Output: 5069-OB16

4) Analog Input: 5069-IF8

5) Analog Output: 5069-OF8

2.4 POWER SUPPLY

A. Provide and install power supply to power each PLC per requirements listed in Section 40 67 00 – Control Panels and as shown in panel layout design/BOM.

2.5 UNINTERRUPTIBLE POWER SUPPLY (UPS)

A. Provide and install UPSs to power each PLC per requirements listed in Section 40 67 00 – Control Panels and as shown in panel layout design/BOM.

Add. 3

2.6 OPERATOR INTERFACE TERMINAL (OIT)

A. The PLC panels as indicated on the Drawings shall be provided with a panel mounted industrial Operator Interface Terminal.

1. Screen shall be 12” minimum.

2. Manufacturer:

a. Advantech TPC

b. Or equal, as approved by Engineer.

2.7 SOFTWARE

A. The SI shall provide one copy of PLC programming software licensed in the name of the Owner. Programming software shall be installed on the SCADA Server.

B. Manufacturer, without exception:

1. PAC Machine Edition Professional Development Suite.

2.8 REDUNDANCY

A. PLC redundancy not required.

2.9 SPARE PARTS

A. Spare parts shall be provided in original manufacturer packaging with unbroken seals.

B. Provide the following spare parts:

1. Quantity one (1) spare PLC Power supply.
2. Quantity one (1) spare PLC Processor.
3. Quantity one (1) spare PLC Ethernet Bridge Module.
4. Quantity one (1) spare PLC I/O module for each type required in each PLC.
5. Provide all other manufacturer recommended PLC system spare parts.

PART 3 - EXECUTION

3.1 STORAGE AND HANDLING

A. All equipment and materials delivered to the Site shall be stored in a location which shall not interfere with the operations of the Owner's personnel or interfere with construction. Storage and handling shall be performed in a manner which shall afford maximum protection to the equipment and materials. It is the Contractor's responsibility to assure proper handling and on-site storage.

3.2 INSTALLATION

A. The Contractor shall utilize personnel to accomplish, or supervise the physical installation of all elements, components, accessories, or assemblies which it provides. The Contractor shall employ installers who are skilled and experienced in the installation and connection of all elements, components, accessories, and assemblies it provides.

3.3 CALIBRATION, TESTING, AND COMMISSIONING

A. Provide calibration, testing, and commissioning as specified in Section 40 79 23 – Testing, Calibration, and Commissioning.

END OF SECTION 40 63 43

DEVICE	TAG	I/O TAGNAME	PANEL	CONTROLLER	OUTPUT TYPE	P&ID	DESCRIPTION	ANALOG SIGNAL TYPE	DISCRETE SIGNAL TYPE	MIN. ANALOG / DISCRETE 'OFF' VALUE	MAX. ANALOG / DISCRETE 'ON' VALUE	DEVICE POWER REQUIREMENTS	NOTES
YS-A100	YA	_A100_YS_YA	LCP-A100	PLC-A100	DI	EI-701-A	RAW WATER STATION HATCH INTRUSION ALARM		24 VDC	NORMAL	ALARM	N/A	
PIT-A101	PI	_A101_PIT_PI	LCP-A100	PLC-A100	AI	EI-701-A	RAW WATER INLET PRESSURE	4-20mA		0 PSI	100 PSI	LOOP	
VFD-A110	YC	_A110_VFD_YC	LCP-A100	PLC-A100	DO	EI-701-A	RAW WATER PUMP 1 RUN COMMAND	ETHERNET		OFF	RUN	EXTERNAL	
VFD-A110	YI	_A110_VFD_YI	LCP-A100	PLC-A100	DI	EI-701-A	RAW WATER PUMP 1 RUNNING			OFF	RUNNING		
VFD-A110	YI.LR	_A110_VFD_YI_LR	LCP-A100	PLC-A100	DI	EI-701-A	RAW WATER PUMP 1 LOCAL/REMOTE			LOCAL	REMOTE		
VFD-A110	YA	_A110_VFD_YA	LCP-A100	PLC-A100	DI	EI-701-A	RAW WATER PUMP 1 FAULT			NO FAULT	FAULT		
VFD-A110	SC	_A110_VFD_SC	LCP-A100	PLC-A100	AO	EI-701-A	RAW WATER PUMP 1 SPEED COMMAND			0 HZ	60 HZ		
VFD-A110	SI	_A110_VFD_SI	LCP-A100	PLC-A100	AI	EI-701-A	RAW WATER PUMP 1 SPEED FEEDBACK			0 HZ	60 HZ		
VFD-A120	YC	_A120_VFD_YC	LCP-A100	PLC-A100	DO	EI-701-A	RAW WATER PUMP 2 RUN COMMAND	ETHERNET		OFF	RUN	EXTERNAL	
VFD-A120	YI	_A120_VFD_YI	LCP-A100	PLC-A100	DI	EI-701-A	RAW WATER PUMP 2 RUNNING			OFF	RUNNING		
VFD-A120	YI.LR	_A120_VFD_YI_LR	LCP-A100	PLC-A100	DI	EI-701-A	RAW WATER PUMP 2 LOCAL/REMOTE			LOCAL	REMOTE		
VFD-A120	YA	_A120_VFD_YA	LCP-A100	PLC-A100	DI	EI-701-A	RAW WATER PUMP 2 FAULT			NO FAULT	FAULT		
VFD-A120	SC	_A120_VFD_SC	LCP-A100	PLC-A100	AO	EI-701-A	RAW WATER PUMP 2 SPEED COMMAND			0 HZ	60 HZ		
VFD-A120	SI	_A120_VFD_SI	LCP-A100	PLC-A100	AI	EI-701-A	RAW WATER PUMP 2 SPEED FEEDBACK			0 HZ	60 HZ		
PIT-A102	PI	_A102_PIT_PI	LCP-A100	PLC-A100	AI	EI-701-A	RAW WATER OUTLET PRESSURE	4-20mA		0 PSI	150 PSI	LOOP	
LSH-A100	LAH	_A100_LSH_LAH	LCP-A100	PLC-A100	DI	EI-701-A	SUMP LEVEL HIGH		24 VDC	NO ALARM	ALARM	N/A	
LSL-83767	LAL	_83767_LSL_LAL	RCP-B110	RIO-B110	DI	EI-701-B	CITRIC ACID LOW LEVEL ALARM		24 VDC	---	LOW LEVEL	N/A	
SV-83721A	ZCO	_83721A_SV_ZCO	RCP-B110	RIO-B110	DO	EI-701-B	CITRIC ACID PUMP RUN COMMAND / VALVE OPEN		24 VDC	OFF	VALVE OPEN / RUN	24 VDC	
SV-83721B	ZCO	_83721B_SV_ZCO	RCP-B110	RIO-B110	DO	EI-701-B	CITRIC ACID PUMP RUN COMMAND / VALVE OPEN		24 VDC	OFF	VALVE OPEN / RUN	24 VDC	
P-84100A	YC	_84100A_P_YC	RCP-B110	RIO-B110	DO	EI-701-B	SODIUM BISULFITE PUMP 1 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
P-84100A	YA	_84100A_P_YA	RCP-B110	RIO-B110	DI	EI-701-B	SODIUM BISULFITE PUMP 1 FAULT		24 VDC	NO FAULT	FAULT		
P-84100A	SC	_84100A_P_SC	RCP-B110	RIO-B110	AO	EI-701-B	SODIUM BISULFITE PUMP 1 SPEED COMMAND	4-20mA		BY VENDOR	BY VENDOR		
P-84100B	YC	_84100B_P_YC	RCP-B110	RIO-B110	DO	EI-701-B	SODIUM BISULFITE PUMP 2 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
P-84100B	YA	_84100B_P_YA	RCP-B110	RIO-B110	DI	EI-701-B	SODIUM BISULFITE PUMP 2 FAULT		24 VDC	NO FAULT	FAULT		
P-84100B	SC	_84100B_P_SC	RCP-B110	RIO-B110	AO	EI-701-B	SODIUM BISULFITE PUMP 2 SPEED COMMAND	4-20mA		BY VENDOR	BY VENDOR		
SV-B100	ZCO	_B100_SV_ZCO	PCP-B100	PLC-B100	DO	EI-701-B	AIR TANK DRAIN		24 VDC	CLOSED	OPEN	120 VAC	POWERED THROUGH RELAY CONTACT
P-84200A	YC	_84200A_P_YC	RCP-B110	RIO-B110	DO	EI-702-B	SODIUM HYDROXIDE PUMP 1 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
P-84200A	YA	_84200A_P_YA	RCP-B110	RIO-B110	DI	EI-702-B	SODIUM HYDROXIDE PUMP 1 FAULT		24 VDC	NO FAULT	FAULT		
P-84200A	SC	_84200A_P_SC	RCP-B110	RIO-B110	AO	EI-702-B	SODIUM HYDROXIDE PUMP 1 SPEED COMMAND	4-20mA		BY VENDOR	BY VENDOR		
P-84200B	YC	_84200B_P_YC	RCP-B110	RIO-B110	DO	EI-702-B	SODIUM HYDROXIDE PUMP 2 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
P-84200B	YA	_84200B_P_YA	RCP-B110	RIO-B110	DI	EI-702-B	SODIUM HYDROXIDE PUMP 2 FAULT		24 VDC	NO FAULT	FAULT		
P-84200B	SC	_84200B_P_SC	RCP-B110	RIO-B110	AO	EI-702-B	SODIUM HYDROXIDE PUMP 2 SPEED COMMAND	4-20mA		BY VENDOR	BY VENDOR		
LSL-83067A	LAL	_83067A_LSL_LAL	RCP-B110	RIO-B110	DI	EI-703-B	NaOCl TANK 1 LOW LEVEL		24 VDC	---	LOW LEVEL	N/A	
LSL-83067B	LAL	_83067B_LSL_LAL	RCP-B110	RIO-B110	DI	EI-703-B	NaOCl TANK 2 LOW LEVEL		24 VDC	---	LOW LEVEL	N/A	
LT-B110	LI	_B110_LT_LI	PCP-B100	PLC-B100	AI	EI-703-B	NaOCl TANK 1 LEVEL	4-20mA		0 FT	12 FT	LOOP	
LT-B120	LI	_B120_LT_LI	PCP-B100	PLC-B100	AI	EI-703-B	NaOCl TANK 2 LEVEL	4-20mA		0 FT	12 FT	LOOP	
PMP-B130	YC	_B130_PMP_YC	PCP-B100	PLC-B100	DO	EI-703-B	SODIUM HYPOCHLORITE PUMP 1 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
PMP-B130	SC	_B130_PMP_SC	PCP-B100	PLC-B100	AO	EI-703-B	SODIUM HYPOCHLORITE PUMP 1 SPEED COMMAND	4-20mA		0 L/H	20 L/H		
PMP-B130	SI	_B130_PMP_SI	PCP-B100	PLC-B100	AI	EI-703-B	SODIUM HYPOCHLORITE PUMP 1 SPEED FEEDBACK	4-20mA		0 L/H	20 L/H		
PMP-B130	YA	_B130_PMP_YA	PCP-B100	PLC-B100	DI	EI-703-B	SODIUM HYPOCHLORITE PUMP 1 FAULT		24 VDC	NO FAULT	FAULT		
PMP-B140	YC	_B140_PMP_YC	PCP-B100	PLC-B100	DO	EI-703-B	SODIUM HYPOCHLORITE PUMP 2 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
PMP-B140	SC	_B140_PMP_SC	PCP-B100	PLC-B100	AO	EI-703-B	SODIUM HYPOCHLORITE PUMP 2 SPEED COMMAND	4-20mA		0 L/H	20 L/H		
PMP-B140	SI	_B140_PMP_SI	PCP-B100	PLC-B100	AI	EI-703-B	SODIUM HYPOCHLORITE PUMP 2 SPEED FEEDBACK	4-20mA		0 L/H	20 L/H		
PMP-B140	YA	_B140_PMP_YA	PCP-B100	PLC-B100	DI	EI-703-B	SODIUM HYPOCHLORITE PUMP 2 FAULT		24 VDC	NO FAULT	FAULT		
SV-83121A	ZCO	_83121A_SV_ZCO	RCP-B110	RIO-B110	DO	EI-703-B	SODIUM HYPOCHLORITE PUMP 3 PUMP RUN COMMAND		24 VDC	OFF	VALVE OPEN / RUN	24 VDC	
SV-83121B	ZCO	_83121B_SV_ZCO	RCP-B110	RIO-B110	DO	EI-703-B	SODIUM HYPOCHLORITE PUMP 4 PUMP RUN COMMAND		24 VDC	OFF	VALVE OPEN / RUN	24 VDC	
LT-B210	LI	_B210_LT_LI	PCP-B100	PLC-B100	AI	EI-704-B	ACH TANK 1 LEVEL	4-20mA		0 FT	6 FT	LOOP	
LSL-B210	LAL	_B210_LSL_LAL	PCP-B100	PLC-B100	DI	EI-704-B	ACH TANK 1 LOW LEVEL		24 VDC	---	LOW LEVEL	N/A	
LT-B220	LI	_B220_LT_LI	PCP-B100	PLC-B100	AI	EI-704-B	ACH TANK 2 LEVEL	4-20mA		0 FT	6 FT	LOOP	
LSL-B220	LAL	_B220_LSL_LAL	PCP-B100	PLC-B100	DI	EI-704-B	ACH TANK 2 LOW LEVEL		24 VDC	---	LOW LEVEL	N/A	

DEVICE	TAG	I/O TAGNAME	PANEL	CONTROLLER	OUTPUT TYPE	P&ID	DESCRIPTION	ANALOG SIGNAL TYPE	DISCRETE SIGNAL TYPE	MIN. ANALOG / DISCRETE 'OFF' VALUE	MAX. ANALOG / DISCRETE 'ON' VALUE	DEVICE POWER REQUIREMENTS	NOTES
LH-B101	YA	_B101_LH_YA	PCP-B100	PLC-B100	DO	EI-704-B	CHEMICAL TANK HIGH LEVEL ALARM		24 VDC	NORMAL	TANK HIGH LEVEL	120 VAC	TO HORN AND LIGHT THROUGH RELAY CONTACT
PMP-B230	YC	_B230_PMP_YC	PCP-B100	PLC-B100	DO	EI-704-B	ACH PUMP 1 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
PMP-B230	SC	_B230_PMP_SC	PCP-B100	PLC-B100	AO	EI-704-B	ACH PUMP 1 SPEED COMMAND	4-20mA		0 L/H	10 L/H		
PMP-B230	SI	_B230_PMP_SI	PCP-B100	PLC-B100	AI	EI-704-B	ACH PUMP 1 SPEED FEEDBACK	4-20mA		0 L/H	10 L/H		
PMP-B230	YA	_B230_PMP_YA	PCP-B100	PLC-B100	DI	EI-704-B	ACH PUMP 1 FAULT		24 VDC	NO FAULT	FAULT		
PMP-B240	YC	_B240_PMP_YC	PCP-B100	PLC-B100	DO	EI-704-B	ACH PUMP 2 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
PMP-B240	SC	_B240_PMP_SC	PCP-B100	PLC-B100	AO	EI-704-B	ACH PUMP 2 SPEED COMMAND	4-20mA		0 L/H	10 L/H		
PMP-B240	SI	_B240_PMP_SI	PCP-B100	PLC-B100	AI	EI-704-B	ACH PUMP 2 SPEED FEEDBACK	4-20mA		0 L/H	10 L/H		
PMP-B240	YA	_B240_PMP_YA	PCP-B100	PLC-B100	DI	EI-704-B	ACH PUMP 2 FAULT		24 VDC	NO FAULT	FAULT		
PMP-B250	YC	_B250_PMP_YC	PCP-B100	PLC-B100	DO	EI-704-B	ACH PUMP 3 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
PMP-B250	SC	_B250_PMP_SC	PCP-B100	PLC-B100	AO	EI-704-B	ACH PUMP 3 SPEED COMMAND	4-20mA		0 L/H	10 L/H		
PMP-B250	SI	_B250_PMP_SI	PCP-B100	PLC-B100	AI	EI-704-B	ACH PUMP 3 SPEED FEEDBACK	4-20mA		0 L/H	10 L/H		
PMP-B250	YA	_B250_PMP_YA	PCP-B100	PLC-B100	DI	EI-704-B	ACH PUMP 3 FAULT		24 VDC	NO FAULT	FAULT		
FSH-B100	FAH	_B100_FSH_FAH	PCP-B100	PLC-B100	DI	EI-705-B	EMERGENCY SHOWER/EYEWASH ALARM		24 VDC	---	ALARM	120 VAC	TO HORN AND LIGHT THROUGH RELAY CONTACT
LT-B310	LI	_B310_LT_LI	PCP-B100	PLC-B100	AI	EI-705-B	SODA ASH TANK LEVEL	4-20mA		0 FT	4 FT	LOOP	
LSL-B310	LAL	_B310_LSL_LAL	PCP-B100	PLC-B100	DI	EI-705-B	SODA ASH TANK LOW LEVEL ALARM		24 VDC	---	LOW LEVEL	N/A	
FVS-B310	YI	_B310_FVS_YI	PCP-B100	PLC-B100	DI	EI-705-B	SODA ASH MIXER RUNNING		24 VDC	OFF	RUNNING	EXTERNAL	
FVS-B310	YA	_B310_FVS_YA	PCP-B100	PLC-B100	DI	EI-705-B	SODA ASH MIXER FAULT		24 VDC	NO FAULT	FAULT		
PMP-B330	YC	_B330_PMP_YC	PCP-B100	PLC-B100	DO	EI-705-B	SODA ASH PUMP 1 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
PMP-B330	SC	_B330_PMP_SC	PCP-B100	PLC-B100	AO	EI-705-B	SODA ASH PUMP 1 SPEED COMMAND	4-20mA		0 L/H	10 L/H		
PMP-B330	SI	_B330_PMP_SI	PCP-B100	PLC-B100	AI	EI-705-B	SODA ASH PUMP 1 SPEED FEEDBACK	4-20mA		0 L/H	10 L/H		
PMP-B330	YA	_B330_PMP_YA	PCP-B100	PLC-B100	DI	EI-705-B	SODA ASH PUMP 1 FAULT		24 VDC	NO FAULT	FAULT		
PMP-B340	YC	_B340_PMP_YC	PCP-B100	PLC-B100	DO	EI-705-B	SODA ASH PUMP 2 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
PMP-B340	SC	_B340_PMP_SC	PCP-B100	PLC-B100	AO	EI-705-B	SODA ASH PUMP 2 SPEED COMMAND	4-20mA		0 L/H	10 L/H		
PMP-B340	SI	_B340_PMP_SI	PCP-B100	PLC-B100	AI	EI-705-B	SODA ASH PUMP 2 SPEED FEEDBACK	4-20mA		0 L/H	10 L/H		
PMP-B340	YA		PCP-B100	PLC-B100	DI	EI-705-B	SODA ASH PUMP 2 FAULT		24 VDC	NO FAULT	FAULT		
PMP-B350	YC	_B350_PMP_YC	PCP-B100	PLC-B100	DO	EI-705-B	SODA ASH PUMP 3 RUN COMMAND		24 VDC	OFF	RUN	EXTERNAL	
PMP-B350	SC	_B350_PMP_SC	PCP-B100	PLC-B100	AO	EI-705-B	SODA ASH PUMP 3 SPEED COMMAND	4-20mA		0 L/H	10 L/H		
PMP-B350	SI	_B350_PMP_SI	PCP-B100	PLC-B100	AI	EI-705-B	SODA ASH PUMP 3 SPEED FEEDBACK	4-20mA		0 L/H	10 L/H		
PMP-B350	YA	_B350_PMP_YA	PCP-B100	PLC-B100	DI	EI-705-B	SODA ASH PUMP 3 FAULT		24 VDC	NO FAULT	FAULT		
UPS-B100	YI	_B100_UPS_YI	PCP-B100	PLC-B100	DI	EI-705-B	UPS READY		24 VDC	NOT READY	READY	120 VAC	
UPS-B100	YA.BAT	_B100_UPS_YA_BAT	PCP-B100	PLC-B100	DI	EI-705-B	UPS BATTERY MODE		24 VDC	NORMAL MODE	BATTERY MODE		
UPS-B100	YA	_B100_UPS_YA	PCP-B100	PLC-B100	DI	EI-705-B	UPS FAULT		24 VDC	NO FAULT	FAULT		
AIT-B810	AI	_B810_AIT_AI	PCP-B100	PLC-B100	AI	EI-706-B	RAW WATER TURBIDITY	4-20mA		0 NTU	700 NTU	120 VAC	
AIT-B811	AI	_B811_AIT_AI	PCP-B100	PLC-B100	AI	EI-706-B	RAW WATER PH	4-20mA		4 pH	9 pH	120 VAC	
AIT-B811	TI	_B811_AIT_TI	PCP-B100	PLC-B100	AI	EI-706-B	RAW WATER TEMPERATURE	4-20mA		32 °F	120 °F		
AIT-B820	AI	_B820_AIT_AI	PCP-B100	PLC-B100	AI	EI-706-B	FINISHED WATER TURBIDITY	4-20mA		0 NTU	700 NTU	120 VAC	
AIT-B821	AI	_B821_AIT_AI	PCP-B100	PLC-B100	AI	EI-706-B	FINISHED WATER PH	4-20mA		4 pH	9 pH	120 VAC	
AIT-B821	TI	_B821_AIT_TI	PCP-B100	PLC-B100	AI	EI-706-B	FINISHED WATER TEMPERATURE	4-20mA		32 °F	120 °F		
AIT-B821	AI	_B821_AIT_AI	PCP-B100	PLC-B100	AI	EI-706-B	FINISHED WATER CHLORINE	4-20mA		0 PPM	15 PPM		
ACP-B100	YA	_B100_ACP_YA	PCP-B100	PLC-B100	DI	EI-706-B	INTRUSION DETECTION ALARM		24 VDC	NORMAL	ALARM	24 VDC	
MS-B901	MAH	_B901_MS_MAH	PCP-B100	PLC-B100	DI	EI-707-B	SHC LEAK DETECTED TO STATIC MIXER	MODBUS		---	LEAK DETECTED	EXTERNAL	
MS-B902	MAH	_B902_MS_MAH	PCP-B100	PLC-B100	DI	EI-707-B	SHC LEAK DETECTED TO TRAILER #1			---	LEAK DETECTED	EXTERNAL	
MS-B903	MAH	_B903_MS_MAH	PCP-B100	PLC-B100	DI	EI-707-B	SHC LEAK DETECTED TO TRAILER #2			---	LEAK DETECTED	EXTERNAL	
FIT-C101	FI	_C101_FIT_FI	RCP-D100	RIO-D100	AI	EI-701-C	INLET WATER FLOW	4-20mA		0 GAL/MIN	2000 GAL/MIN	120 VAC	
FIT-C101	FQI	_C101_FIT_FQI	RCP-D100	RIO-D100	DI	EI-701-C	INLET WATER TOTAL FLOW		24 VDC	0 GAL	1000 GAL		
LIT-C104	LI	_C104_LIT_LI	RCP-D100	RIO-D100	AI	EI-701-C	MF TANK LEVEL	4-20mA		0 FT	16 FT	LOOP	
LSL-C105	LAL	_C105_LSL_LAL	RCP-D100	RIO-D100	DI	EI-701-C	MF TANK LEVEL LOW		24 VDC	---	LOW LEVEL	N/A	
FIT-D101	FI	_D101_FIT_FI	RCP-D100	RIO-D100	AI	EI-701-D	BACKWASH WASTE FLOW	4-20mA		0 GAL/MIN	500 GAL/MIN	120 VAC	

DEVICE	TAG	I/O TAGNAME	PANEL	CONTROLLER	OUTPUT TYPE	P&ID	DESCRIPTION	ANALOG SIGNAL TYPE	DISCRETE SIGNAL TYPE	MIN. ANALOG / DISCRETE 'OFF' VALUE	MAX. ANALOG / DISCRETE 'ON' VALUE	DEVICE POWER REQUIREMENTS	NOTES
FIT-D101	FQI	_D101_FIT_FQI	RCP-D100	RIO-D100	DI	EI-701-D	BACKWASH WASTE FLOW TOTAL		24 VDC	0 GAL	100 GAL	120 VAC	
ME-D110	YI.1	_D110_ME_YI_1	RCP-D100	RIO-D100	DI	EI-701-D	TRAIN #1 RUNNING	ETHERNET		NOT RUNNING	RUNNING	N/A	
ME-D110	YI.2	_D110_ME_YI_2	RCP-D100	RIO-D100	DI	EI-701-D	TRAIN #2 RUNNING	ETHERNET		NOT RUNNING	RUNNING		Add. 3
ME-D110	YI.AM	_D110_ME_YI_AM	RCP-D100	RIO-D100	DI	EI-701-D	HAND/AUTO	ETHERNET		HAND	AUTO		
ME-D110	YA	_D110_ME_YA	RCP-D100	RIO-D100	DI	EI-701-D	FAULT	ETHERNET		---	FAULT		
XV-D110	ZCO	_D110_XV_ZCO	RCP-D100	RIO-D100	DO	EI-701-D	LPMF 1 CIP CYCLE VALVE COMMAND OPEN		24 VDC	---	OPEN	EXTERNAL	
XV-D110	ZCC	_D110_XV_ZCC	RCP-D100	RIO-D100	DO	EI-701-D	LPMF 1 CIP CYCLE VALVE COMMAND CLOSE		24 VDC	---	CLOSE		
XV-D110	ZIO	_D110_XV_ZIO	RCP-D100	RIO-D100	DI	EI-701-D	LPMF 1 CIP CYCLE VALVE OPENED		24 VDC	---	OPENED		
XV-D110	ZIC	_D110_XV_ZIC	RCP-D100	RIO-D100	DI	EI-701-D	LPMF 1 CIP CYCLE VALVE CLOSED		24 VDC	---	CLOSED		
XV-D120	ZCO	_D120_XV_ZCO	RCP-D100	RIO-D100	DO	EI-701-D	LPMF 1 BACKWASH CYCLE VALVE COMMAND OPEN		24 VDC	---	OPEN	EXTERNAL	
XV-D120	ZCC	_D120_XV_ZCC	RCP-D100	RIO-D100	DO	EI-701-D	LPMF 1 BACKWASH CYCLE VALVE COMMAND CLOSE		24 VDC	---	CLOSE		
XV-D120	ZIO	_D120_XV_ZIO	RCP-D100	RIO-D100	DI	EI-701-D	LPMF 1 BACKWASH CYCLE VALVE OPENED		24 VDC	---	OPENED		
XV-D120	ZIC	_D120_XV_ZIC	RCP-D100	RIO-D100	DI	EI-701-D	LPMF 1 BACKWASH CYCLE VALVE CLOSED		24 VDC	---	CLOSED		
ME-D210	YI.1	_D210_ME_YI_1	RCP-D100	RIO-D100	DI	EI-701-D	TRAIN #1 RUNNING	ETHERNET		NOT RUNNING	RUNNING	N/A	
ME-D210	YI.2	_D210_ME_YI_2	RCP-D100	RIO-D100	DI	EI-701-D	TRAIN #2 RUNNING	ETHERNET		NOT RUNNING	RUNNING		Add. 3
ME-D210	YI.AM	_D210_ME_YI_AM	RCP-D100	RIO-D100	DI	EI-701-D	HAND/AUTO	ETHERNET		HAND	AUTO		
ME-D210	YA	_D210_ME_YA	RCP-D100	RIO-D100	DI	EI-701-D	FAULT	ETHERNET		---	FAULT		
XV-D210	ZCO	_D210_XV_ZCO	RCP-D100	RIO-D100	DO	EI-701-D	LPMF 2 CIP CYCLE VALVE COMMAND OPEN		24 VDC	---	OPEN	EXTERNAL	
XV-D210	ZCC	_D210_XV_ZCC	RCP-D100	RIO-D100	DO	EI-701-D	LPMF 2 CIP CYCLE VALVE COMMAND CLOSE		24 VDC	---	CLOSE		
XV-D210	ZIO	_D210_XV_ZIO	RCP-D100	RIO-D100	DI	EI-701-D	LPMF 2 CIP CYCLE VALVE OPENED		24 VDC	---	OPENED		
XV-D210	ZIC	_D210_XV_ZIC	RCP-D100	RIO-D100	DI	EI-701-D	LPMF 2 CIP CYCLE VALVE CLOSED		24 VDC	---	CLOSED		
XV-D220	ZCO	_D220_XV_ZCO	RCP-D100	RIO-D100	DO	EI-701-D	LPMF 2 BACKWASH CYCLE VALVE COMMAND OPEN		24 VDC	---	OPEN	EXTERNAL	
XV-D220	ZCC	_D220_XV_ZCC	RCP-D100	RIO-D100	DO	EI-701-D	LPMF 2 BACKWASH CYCLE VALVE COMMAND CLOSE		24 VDC	---	CLOSE		
XV-D220	ZIO	_D220_XV_ZIO	RCP-D100	RIO-D100	DI	EI-701-D	LPMF 2 BACKWASH CYCLE VALVE OPENED		24 VDC	---	OPENED		
XV-D220	ZIC	_D220_XV_ZIC	RCP-D100	RIO-D100	DI	EI-701-D	LPMF 2 BACKWASH CYCLE VALVE CLOSED		24 VDC	---	CLOSED		
ATS-D100	YI	_D100_ATS_YI	RCP-D100	RIO-D100	DI	EI-701-D	ATS UTILITY POWER		24 VDC	---	UTILITY POWER		
ATS-D100	YA.EP	_D100_ATS_YA_EP	RCP-D100	RIO-D100	DI	EI-701-D	ATS EMERGENCY POWER		24 VDC	---	EMERGENCY POWER	EXTERNAL	
ATS-D100	YA	_D100_ATS_YA	RCP-D100	RIO-D100	DI	EI-701-D	ATS FAULT		24 VDC	NO FAULT	FAULT		
GEN-D100	YI.LR	_D100_GEN_YI_LR	RCP-D100	RIO-D100	DI	EI-701-D	GENERATOR LOCAL/REMOTE		24 VDC	LOCAL	REMOTE		
GEN-D100	YI	_D100_GEN_YI	RCP-D100	RIO-D100	DI	EI-701-D	GENERATOR RUNNING		24 VDC	OFF	RUNNING	EXTERNAL	
GEN-D100	YA	_D100_GEN_YA	RCP-D100	RIO-D100	DI	EI-701-D	GENERATOR FAULT		24 VDC	NO FAULT	FAULT		
GEN-D100	II	_D100_GEN_II	RCP-D100	RIO-D100	AI	EI-701-D	GENERATOR CURRENT	4-20mA		0 A	1500 A		
VFD-E110	YC	_E110_VFD_YC	RCP-D100	RIO-D100	DO	EI-701-E	FINISHED WATER PUMP 1 RUN COMMAND			OFF	RUN		
VFD-E110	YI	_E110_VFD_YI	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 1 RUNNING			OFF	RUNNING		
VFD-E110	YI.LR	_E110_VFD_YI_LR	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 1 LOCAL/REMOTE			LOCAL	REMOTE		
VFD-E110	YA	_E110_VFD_YA	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 1 FAULT	ETHERNET		NO FAULT	FAULT	EXTERNAL	
VFD-E110	SC	_E110_VFD_SC	RCP-D100	RIO-D100	AO	EI-701-E	FINISHED WATER PUMP 1 SPEED COMMAND			0 HZ	60 HZ		
VFD-E110	SI	_E110_VFD_SI	RCP-D100	RIO-D100	AI	EI-701-E	FINISHED WATER PUMP 1 SPEED FEEDBACK			0 HZ	60 HZ		
VFD-E110	TAH	_E110_VFD_TAH	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 1 HIGH MOTOR TEMP			NORMAL	HIGH TEMP		
VFD-E120	YC	_E120_VFD_YC	RCP-D100	RIO-D100	DO	EI-701-E	FINISHED WATER PUMP 2 RUN COMMAND			OFF	RUN		
VFD-E120	YI	_E120_VFD_YI	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 2 RUNNING			OFF	RUNNING		
VFD-E120	YI.LR	_E120_VFD_YI_LR	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 2 LOCAL/REMOTE			LOCAL	REMOTE		
VFD-E120	YA	_E120_VFD_YA	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 2 FAULT	ETHERNET		NO FAULT	FAULT	EXTERNAL	
VFD-E120	SC	_E120_VFD_SC	RCP-D100	RIO-D100	AO	EI-701-E	FINISHED WATER PUMP 2 SPEED COMMAND			0 HZ	60 HZ		
VFD-E120	SI	_E120_VFD_SI	RCP-D100	RIO-D100	AI	EI-701-E	FINISHED WATER PUMP 2 SPEED FEEDBACK			0 HZ	60 HZ		
VFD-E120	TAH	_E120_VFD_TAH	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 2 HIGH MOTOR TEMP			NORMAL	HIGH TEMP		
VFD-E130	YC	_E130_VFD_YC	RCP-D100	RIO-D100	DO	EI-701-E	FINISHED WATER PUMP 3 RUN COMMAND			OFF	RUN		
VFD-E130	YI	_E130_VFD_YI	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 3 RUNNING			OFF	RUNNING		
VFD-E130	YI.LR	_E130_VFD_YI_LR	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 3 LOCAL/REMOTE			LOCAL	REMOTE		
VFD-E130	YA	_E130_VFD_YA	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 3 FAULT	ETHERNET		NO FAULT	FAULT	EXTERNAL	
VFD-E130	SC	_E130_VFD_SC	RCP-D100	RIO-D100	AO	EI-701-E	FINISHED WATER PUMP 3 SPEED COMMAND			0 HZ	60 HZ		
VFD-E130	SI	_E130_VFD_SI	RCP-D100	RIO-D100	AI	EI-701-E	FINISHED WATER PUMP 3 SPEED FEEDBACK			0 HZ	60 HZ		
VFD-E130	TAH	_E130_VFD_TAH	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP 3 HIGH MOTOR TEMP			NORMAL	HIGH TEMP		

DEVICE	TAG	I/O TAGNAME	PANEL	CONTROLLER	OUTPUT TYPE	P&ID	DESCRIPTION	ANALOG SIGNAL TYPE	DISCRETE SIGNAL TYPE	MIN. ANALOG / DISCRETE 'OFF' VALUE	MAX. ANALOG / DISCRETE 'ON' VALUE	DEVICE POWER REQUIREMENTS	NOTES
LSH-E104	LAH	_E104_LSH_LAH	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP STATION HIGH LEVEL		24 VDC	---	HIGH LEVEL	N/A	
LSL-E104	LAL	_E104_LSL_LAL	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER PUMP STATION LOW LEVEL		24 VDC	---	LOW LEVEL	N/A	
LT-E105	LI	_E105_LT_LI	RCP-D100	RIO-D100	AI	EI-701-E	FINISHED WATER PUMP STATION LEVEL	4-20mA		0 FT	15 FT	LOOP	
PIT-E100	PI	_E100_PIT_PI	RCP-D100	RIO-D100	AI	EI-701-E	FINISHED WATER OUTLET PRESSURE	4-20mA		0 PSI	150 PSI	LOOP	
FIT-E101	FI	_E101_FIT_FI	RCP-D100	RIO-D100	AI	EI-701-E	FINISHED WATER FLOW	4-20mA		0 GAL/MIN	4000 GAL/MIN	120 VAC	
FIT-E101	FQI	_E101_FIT_FQI	RCP-D100	RIO-D100	DI	EI-701-E	FINISHED WATER FLOW TOTAL		24 VDC	0 GAL	1000 GAL		
LSL-G101	LAL	_G101_LSL_LAL	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP STATION LOW LEVEL		24 VDC	---	LOW LEVEL	N/A	
LSH-G101	LAH	_G101_LSH_LAH	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP STATION HIGH LEVEL		24 VDC	---	HIGH LEVEL	N/A	
LT-G103	LI	_G103_LT_LI	RCP-D100	RIO-D100	AI	EI-701-F	BACKWASH RECYCLE PUMP STATION LEVEL	4-20mA		0 FT	10 FT	LOOP	
VFD-G110	SC	_G110_VFD_SC	RCP-D100	RIO-D100	AO	EI-701-F	BACKWASH RECYCLE PUMP 1 SPEED COMMAND	ETHERNET		0 HZ	60 HZ	EXTERNAL	
VFD-G110	SI	_G110_VFD_SI	RCP-D100	RIO-D100	AI	EI-701-F	BACKWASH RECYCLE PUMP 1 SPEED FEEDBACK			0 HZ	60 HZ		
VFD-G110	YC	_G110_VFD_YC	RCP-D100	RIO-D100	DO	EI-701-F	BACKWASH RECYCLE PUMP 1 RUN COMMAND			OFF	RUN		
VFD-G110	YI	_G110_VFD_YI	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 1 RUNNING			OFF	RUNNING		
VFD-G110	YA	_G110_VFD_YA	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 1 FAULT			NO FAULT	FAULT		
VFD-G110	YI.LR	_G110_VFD_YI_LR	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 1 LOCAL/REMOTE			LOCAL	REMOTE		
VFD-G110	MAH	_G110_VFD_MAH	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 1 MOISTURE DETECTED			---	MOISTURE		
VFD-G110	TAH	_G110_VFD_TAH	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 1 HIGH TEMPERATURE			---	HIGH TEMP		
VFD-G120	SC	_G120_VFD_SC	RCP-D100	RIO-D100	AO	EI-701-F	BACKWASH RECYCLE PUMP 2 SPEED COMMAND	ETHERNET		0 HZ	60 HZ	EXTERNAL	
VFD-G120	SI	_G120_VFD_SI	RCP-D100	RIO-D100	AI	EI-701-F	BACKWASH RECYCLE PUMP 2 SPEED FEEDBACK			0 HZ	60 HZ		
VFD-G120	YC	_G120_VFD_YC	RCP-D100	RIO-D100	DO	EI-701-F	BACKWASH RECYCLE PUMP 2 RUN COMMAND			OFF	RUN		
VFD-G120	YI	_G120_VFD_YI	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 2 RUNNING			OFF	RUNNING		
VFD-G120	YA	_G120_VFD_YA	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 2 FAULT			NO FAULT	FAULT		
VFD-G120	YI.LR	_G120_VFD_YI_LR	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 2 LOCAL/REMOTE			LOCAL	REMOTE		
VFD-G120	MAH	_G120_VFD_MAH	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 2 MOISTURE DETECTED			---	MOISTURE		
VFD-G120	TAH	_G120_VFD_TAH	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 2 HIGH TEMPERATURE			---	HIGH TEMP		
AIT-G105	AI	_G105_AIT_AI	RCP-D100	RIO-D100	AI	EI-701-F	BACKWASH RECYCLE PUMP STATION OUTLET TURBIDITY	4-20mA		0 NTU	700 NTU	120 VAC	
VFD-G120	TAH	_G120_VFD_TAH	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP 2 HIGH TEMPERATURE			---	HIGH TEMP		
AIT-G105	AI	_G105_AIT_AI	RCP-D100	RIO-D100	AI	EI-701-F	BACKWASH RECYCLE PUMP STATION OUTLET TURBIDITY	4-20mA		0 NTU	700 NTU	120 VAC	
FIT-G104	FI	_G104_FIT_FI	RCP-D100	RIO-D100	AI	EI-701-F	BACKWASH RECYCLE PUMP STATION OUTLET FLOW	4-20mA		0 GAL/MIN	200 GAL/MIN	120 VAC	
FIT-G104	FQI	_G104_FIT_FQI	RCP-D100	RIO-D100	DI	EI-701-F	BACKWASH RECYCLE PUMP STATION OUTLET FLOW TOTAL		24 VDC	0 GAL	100 GAL		
LT-H100	LI	_H100_LT_LI	RCP-D100	RIO-D100	AI	EI-701-H	CIP WASTE TANK LEVEL	4-20mA		0 FT	8 FT	LOOP	
LSHH-H101	LAHH	_H101_LSHH_LAHH	RCP-D100	RIO-D100	DI	EI-701-H	CIP TANK HIGH HIGH LEVEL		24 VDC	---	OVERFLOW	N/A	
LSH-H101	LAH	_H101_LSH_LAH	RCP-D100	RIO-D100	DI	EI-701-H	CIP TANK HIGH LEVEL		24 VDC	---	HIGH	N/A	
LSL-H101	LAL	_H101_LSL_LAL	RCP-D100	RIO-D100	DI	EI-701-H	CIP TANK LOW LEVEL		24 VDC	---	LOW	N/A	
LSLL-H101	LALL	_H101_LSLL_LALL	RCP-D100	RIO-D100	DI	EI-701-H	CIP TANK LOW LOW LEVEL		24 VDC	---	LOW LOW	N/A	
FVS-H110	YC	_H110_FVS_YC	RCP-D100	RIO-D100	DO	EI-701-H	CIP WASTE TANK PUMP 1 RUN COMMAND	ETHERNET		OFF	RUN	EXTERNAL	
FVS-H110	YI	_H110_FVS_YI	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 1 RUNNING			OFF	RUNNING		
FVS-H110	YI.LR	_H110_FVS_YI_LR	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 1 LOCAL/REMOTE			LOCAL	REMOTE		
FVS-H110	YA	_H110_FVS_YA	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 1 FAULT			NO FAULT	FAULT		
FVS-H110	MAH	_H110_FVS_MAH	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 1 MOISTURE DETECTED			---	MOISTURE		
FVS-H110	TAH	_H110_FVS_TAH	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 1 HIGH MOTOR TEMP			---	HIGH TEMP		
FVS-H120	YC	_H120_FVS_YC	RCP-D100	RIO-D100	DO	EI-701-H	CIP WASTE TANK PUMP 2 RUN COMMAND	ETHERNET		OFF	RUN	EXTERNAL	
FVS-H120	YI	_H120_FVS_YI	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 2 RUNNING			OFF	RUNNING		
FVS-H120	YI.LR	_H120_FVS_YI_LR	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 2 LOCAL/REMOTE			LOCAL	REMOTE		
FVS-H120	YA	_H120_FVS_YA	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 2 FAULT			NO FAULT	FAULT		
FVS-H120	MAH	_H120_FVS_MAH	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 2 MOISTURE DETECTED			---	MOISTURE		
FVS-H120	TAH	_H120_FVS_TAH	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE TANK PUMP 2 HIGH MOTOR TEMP			---	HIGH TEMP		
FIT-H102	FI	_H102_FIT_FI	RCP-D100	RIO-D100	AI	EI-701-H	CIP WASTE OUTLET FLOW RATE	4-20mA		0 GPM	100 GPM	120 VAC	
FIT-H102	FQI	_H102_FIT_FQI	RCP-D100	RIO-D100	DI	EI-701-H	CIP WASTE OUTLET FLOW TOTAL		24 VDC	0 GAL	5 GAL		
FIT-T101	FI	_T101_FIT_FI	PN-803	PLC	AI	N/A	TERRA FERN FLOW RATE	4-20mA		0 GAL	4000 GAL		CONNECT TO EXISTING CONTROL PANEL AT TERRA FERN
FIT-T101	FQI	_T101_FIT_FQI	PN-803	PLC	DI	N/A	TERRA FERN FLOW TOTAL		24 VDC	0 GAL	5 GAL		CONNECT TO EXISTING CONTROL PANEL AT TERRA FERN

SECTION 40 70 00 – INSTRUMENTATION AND CONTROL, GENERAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. General requirements applicable to all Process Control and Instrumentation Work.
2. General requirements for process control and instrumentation submittals.
3. See Section 40 70 00.02 – Instrumentation and Control, System Description for a list of Prequalified System Integrator (SI) and a complete description of the system.
4. As specified in this section, the Contractor shall provide the following services including, but not limited to:
    a. PLC panels and panel submittals
    b. Instrumentation required for the successful completion of the project that is not explicitly provided by others. Refer to Sections 40 67 00 A and 40 70 00 A for description of equipment which is provided by the Contractor.
    c. Termination of all control wiring of instrumentation in the field and in control panels.
    d. Loop testing and documentation of all instrumentation loops.
    e. SI shall be responsible for:
        1) PLC control panel(s) design.
            a) Per Section 40 67 00 – Control Panels and design requirements.
        2) HMI software and configuration.
        3) PLC software and programming.
        4) Assist Electrical Contractor in performing loop tests.
        5) Control system startup, documentation, and training.

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5. It is the intent of these Specifications that the entire instrumentation and control system be complete and operable. Provide all necessary material and labor for the complete system from source of power to final utilization equipment, including all connections, testing, calibration of all equipment furnished by others, as well as equipment furnished by the Contractor.

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.

a. Items involving electrical, control, and instrumentation construction may be indicated on the Drawings or specified in the Specifications that do not apply specifically to electrical, control, and instrumentation systems.

3. It is the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents.

C. Interfaces to equipment, instruments, and other components:

1. The Drawings, Specifications, and overall design are based on preliminary information furnished by various equipment manufacturers, which identify a minimum scope of supply from the manufacturers. This information pertains to, but is not limited to, instruments, control devices, electrical equipment, packaged mechanical systems, and control equipment provided with mechanical systems.

2. Provide all material and labor needed to install the actual equipment furnished, include all costs to add any additional instruments, wiring, control system inputs/outputs, controls, interlocks, electrical hardware etc., which may be necessary to make a complete, functional installation based on the actual equipment furnished:

a. Make all changes necessary to meet the manufacturer's wiring requirements.

3. Submit all such changes and additions to the Engineer for acceptance as specified in Section 00 72 13 – General Conditions.

4. Review the complete set of Drawings and Specifications in order to ensure that all items related to the instrumentation and control systems are completely accounted for. Include any items indicated on the Drawings or in Specifications from another discipline in the scope of Work:

a. If a conflict between Drawings and Specifications is discovered, refer conflict to the Engineer as soon as possible for resolution.

D. All instrumentation, and control equipment and systems for the entire project to comply with the requirements specified in the Instrumentation and Control Specifications, whether referenced in the individual Equipment Specifications or not:

1. The requirements of the Instrumentation and Control Specifications apply to all Instrumentation and Control Work specified in other Specifications, including HVAC controls, packaged mechanical systems, LCPs, VCPs, etc.

2. Inform all vendors supplying instrumentation, control systems, panels, and/or equipment of the requirements of the Instrumentation and Control Specifications.

3. The Owner is not responsible for any additional costs due to the failure of the Contractor to notify all subcontractors and suppliers of the Instrumentation and Control Specifications' requirements.

E. Contract Documents:

1. General:

a. The Drawings and Specifications are complementary and are to be used together in order to fully describe the Work.

2. Specifications:

a. Section 00 72 13 – General Conditions and Section 00 73 00 – Supplementary Conditions of the Contract Documents govern the Work.

b. These requirements are in addition to all General Requirements.

3. Contract Drawings:

a. The Instrumentation and Control Drawings show in a diagrammatic manner, the desired locations, and arrangements of the components of the Instrumentation Work. Follow the Drawings as closely as possible, use professional judgment and coordinate with the other trades to secure the best possible installation. Use the entire Drawing set for construction purposes.

b. Locations of equipment, control devices, instruments, boxes, panels, etc. are approximate only. Exercise professional judgment in executing the Work to ensure the best possible installation:

1) The equipment locations and dimensions indicated on the Drawings and elevations are approximate. Use the shop drawings to determine the proper layout, foundation, and pad requirements, etc. for final installation. Coordinate with all subcontractors to ensure that all instrumentation and control equipment is compatible with other equipment and space requirements. Make changes required to accommodate differences in equipment dimensions.

2) The Contractor has the freedom to select any of the named manufacturers as identified in the individual Specifications; however, the Engineer has designed the spatial equipment layout based upon a single manufacturer and has not confirmed that every named manufacturer's equipment fits in the allotted space. It is the Contractor's responsibility to ensure that the equipment being furnished fits within the defined space.

c. Installation details:

1) The Contract Drawings include installation details showing means and methods for installing instrumentation and control equipment. For cases where typical details are not provided or compatible with an installed location, develop installation details that are necessary for completing the Work, and submit these details for review by the Engineer.

d. Schematic diagrams:

1) Schematic diagrams show control function only. Incorporate other necessary functions for proper operation and protection of the system.

2) Add interposing relays, where required, to provide all necessary contacts for the control system or where needed to function as interposing relays for control voltage coordination, equipment coordination, or control system voltage drop considerations.

3) Mount all devices shown on motor controller schematic diagrams in the controller compartment enclosure, unless otherwise noted or indicated.

4) Control schematics are to be used as a guide in conjunction with the descriptive operating sequences in the Specifications. Combine all information and furnish a coordinated and fully functional control system.

F. Alternates/Alternatives:

1. Substitute item provisions as specified in Section 01 25 13 – Product Substitution Procedures.

G. Changes and change orders:

1. As specified in P-700 – Standard General Conditions.

1.2 REFERENCES

A. See Section 40 70 00.01 – Instrumentation and Control, References and Definitions

1.3 DEFINITIONS

A. See Section 40 70 00.01 – Instrumentation and Control, References and Definitions

1.4 SYSTEM DESCRIPTION

A. See Section 40 70 00.02 – Instrumentation and Control, System Description

1.5 SUBMITTALS

A. Furnish submittals as specified in Section 01 33 00 – Submittal Procedures and this Section.

1. Furnish the submittals required by each section in the Electrical Specifications.

2. Adhere to the wiring numbering scheme as specified in cable and conduit schedules provided in the project design and per identification requirements as outlined in Section 26 05 00 – Electrical, General.

a. Uniquely number each wire.

b. Wire numbers must appear on all Equipment Drawings.

3. Use equipment and instrument tags, as indicated on the Drawings, for all submittals.

B. Submittal organization as specified in Section 01 33 00 – Submittal Procedures and this Section

C. Submittal requirements as specified in Section 01 33 00 – Submittal Procedures and this Section:

1. Furnish submittals including:

a. Project Shop Drawing submittals.

b. The Process Control and SCADA Software Submittal, including control system software, programming, and screens.

c. Testing, Calibration and Start-up procedures.

d. O&M Manual as specified in Section 01 78 23 – Operation and Maintenance Data.

e. Training Submittals.

f. Record Documents.

g. Testing Documents

D. Submittal preparation as specified in Section 01 33 00 – Submittal Procedures and this Section:

Add. 3

E. Specific submittal requirements:

1. PLC Tag Maps

a. SI shall submit PLC tag maps at the following milestones in preparation for and coordination with Client's SCADA Integrator.

1) 85%

2) 95%

2. Control panel hardware submittal in one (1) package

a. Project Shop Drawing submittals.

1) Control panel hardware submittal in 1 package with complete and detailed bills of materials:

a) Including quantity, description, manufacturer, and part number for each assembly or component for each control panel.

b) Include all items within an enclosure.

2) Furnish sufficient information to evaluate the suitability of the proposed material or equipment for the intended use, and for compliance with these Specifications.

3) Use equipment and instrument tags as depicted on the P&IDs for all submittals.

4) Adhere to wiring identification scheme outlined in Section 40 67 00 – Control Panels.

5) Wire numbers must appear on all equipment drawings.

b. Requirements for physical separation between control system components and 120 VAC, 480 VAC, and medium voltage power cables.

c. UPS and battery load calculations to show that the backup capacity and time meet the specified requirements.

d. Provide a data sheet for each control system component together with a technical product brochure or bulletin.

3. O&M Manual

a. Spare parts list:

b. Control and SCADA System Software Record Documents:

1) Include electronic copies of all software and applications.

2) Navigation tree and screen shots of all SCADA screens with basic narrative.

3) Navigation tree and screen shots of all OIT screens with basic narrative

c. Instrument data sheets and cut sheets:

d. Training Submittals.

e. Record Documents.

4. Training submittals:

a. Develop and submit for review a general training plan. Include complete descriptions of all planned training classes, a preliminary training schedule, a list of all proposed instructors along with resumes, examples of proposed training manuals, and a description of any special training tools to be used (simulators, self-paced modules, personal computer-based training, etc.).

b. The Engineer will review the general training plan. Special emphasis will be placed on review of the qualifications of the proposed instructors and the timing of the individual courses to maximize their effectiveness. If, in the opinion of the Engineer, the proposed instructors are not sufficiently qualified to conduct the specified training courses, or lack experience, where required, on the specific configuration of the system, provide more qualified instructors.

5. Record documents:

   a. Furnish as specified in Section 01 77 00 – Closeout Procedures.

   b. Provide record documents of all Instrumentation Drawings.

   c. Shop drawings:

   d. Review and corrections:

      1) Correct any record documents or other documents found to be incomplete, not accurate, of poor quality, or containing errors.

   e. Control Panel Drawings

   f. Control System Diagram:

      1) Submit a complete set of control system diagrams including the following information:

         a) All PLCs, workstations, printers, communication devices, and communication links:

         2) All cables required for communication requirements.

6. Testing, Calibration, and Start-up Submittal:

   a. General testing submittal requirements are specified in this Section and other Sections.

   b. Test Procedure Submittals:

      1) Submit the proposed procedures to be followed during tests of the PCIS and its components in two parts:

         a) Preliminary Submittal: Outline of the specific proposed tests and examples of proposed forms and checklists.

         b) Detailed Submittal: After successful review of the Preliminary Submittal, submit the proposed detailed test procedures, forms, and checklists. Include a statement of test objectives with the test procedures.

   c. Provide certified and witnessed test and calibration checklists for any of the following tests:

      1) Calibration, adjustment, and test details for all components and systems.

      2) Factory Acceptance Tests (FAT).

      3) Site Acceptance Test (SAT)

      4) Operational Readiness Test (ORT).

   d. Test reports:

      1) As specified in Section 01 33 00 – Submittal Procedures.

1.2 QUALITY ASSURANCE

A. Manufacture instruments at facilities certified to the quality standards of ISO 9001.

B. Furnish all equipment listed by and bearing the label of UL or of an independent testing laboratory acceptable to the Engineer and the Authority Having Jurisdiction.

C. The panel provider must have their own operating UL listed panel fabrication facility. All panels must be fabricated at this facility and meet all UL 508/508A requirements.

D. System Integration:

1. The Contractor, through the use of a pre-qualified SI as defined in Section 40 70 00.02 – Instrumentation and Control, System Description, is responsible for the implementation of the PCIS and the integration of the PCIS with other required instrumentation and control devices.

2. The Contractor assumes full responsibility, working with the SI where applicable, to perform all Work to select, furnish, install, test, calibrate, and place into operation all instrumentation, controls, telemetry equipment, control panels, and SCADA system including application software, for a complete, integrated and functional PCIS system.

3. Due to the complexities associated with the interfacing of numerous control system devices, it is the intent of these Specifications that the SI be responsible for the integration of the PCIS with existing devices and devices provided under the Contract Documents with the objective of providing a completely integrated control system.

E. Hazardous Location Rating of Equipment: Equipment manufacturer shall reference the hazardous-area classification drawing in the Contract Documents and provide equipment in compliance with the defined NFPA 70 classification requirements. It will be the manufacturer's sole responsibility to submit equipment in compliance with the Contract Documents and National Electric Code requirements.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store all equipment and materials delivered to the job site in a location that will not interfere with the construction or the Owner’s operations.

B. Shipping precautions:

1. After completion of shop assembly, successful FAT, pack all equipment, cabinets, panels, and consoles in protective crates and enclose in heavy-duty polyethylene envelopes or secured sheeting to provide complete protection from damage, dust, and moisture.

2. Place dehumidifiers when required, inside the polyethylene coverings.

3. Skid-mount the equipment for final transport.

4. Provide lifting rings for moving without removing protective covering.

5. Display boxed weight on shipping tags together with instructions for unloading, transporting, storing, and handling at the job site.

C. Tagging:

1. Tag each component and/or instrument to identify its location, instrument tag number, and function in the system.

2. Firmly attach a permanent tag indelibly machine marked with the instrument tag number, as given in the tabulation, on each piece of equipment constituting the PCIS.

3. Tag instruments immediately upon receipt in the field.

4. Prominently display identification on the outside of the package.

5. Utilize the tag and loop number identifications shown on the P&IDs.

D. Delivery and inspection:

1. Deliver products in undamaged condition, in manufacturer's original container or packaging with identifying labels intact and legible. Include date of manufacture on label.

1.4 PROJECT OR SITE CONDITIONS

A. Site conditions:

1. Provide a PCIS, including all equipment, raceways and any other components required for a complete installation that meets the environmental conditions for the Site as specified in the General Requirements and below.

1.5 SEQUENCING

A. General:

1. As specified in Sections 01 31 19 – Project Meetings and 01 35 13 – Special Project Procedures.

2. Testing requirements are specified in Section 01 75 00 – Equipment Testing and Startup, as well as other sections.

3. General scheduling requirements are specified in Section 01 32 16 – Construction Progress Schedule.

4. Other scheduling activities to be determined between the Owner, Contractor, Engineer, and SI.

B. Training:

1. As specified in this Section.

2. Complete all training as agreed upon with the Owner, Contractor, Engineer, and SI.

3. Within 10 days after the completion of training, submit the following:

a. A list of all Owner personnel that attended the session.

b. A copy of the training materials utilized during the lesson with all notes, diagrams, and comments.

C. Site Acceptance Test (SAT) or Pre-commissioning test:

1. Commence after acceptance of all training, wire test, calibration tests, and loop validation tests, and all inspections have demonstrated that the PCIS complies with all Contract requirements.

2. The Programmer will assist with SAT testing for PLCs programmed by the Programmer.

3. The Programmer shall not be required to be on site, nor shall the Programmer be required to supply application software, until the loop validation tests are complete for a PLC and all prerequisites for the pre-commissioning test are completed.

4. Complete SAT test before the ORT.

D. Operational Readiness Test (ORT)

1. Complete all with the Owner, Contractor, Engineer and SI.

2. Confirmation by the Owner, Contractor, and Engineer that the PCIS functions correctly and as designed.

E. Substantial completion testing: The following conditions be fulfilled before the PCIS is considered complete:

1. All submittals have been completed and approved.

2. The Owner training has been performed.

3. All required spare parts, expendable supplies, and test equipment have been delivered to the Owner.

4. The PCIS has been calibrated, loop tested and pre-commissioned.

5. The ORT has been successfully completed.

6. All debris associated with installation of instrumentation has been removed.

7. All probes, elements, sample lines, transmitters, tubing, and enclosures have been cleaned and are in like-new condition.

1.6 WARRANTY

A. Warrant the PCIS as specified in Section 00 72 00 – Standard General Conditions of the Construction Contract:

1. Provide additional warranty as specified in the individual Instrumentation and Control Specifications.

1.7 SYSTEM START-UP

A. Replace or modify equipment, software, and materials that do not achieve design requirements after installation in order to attain compliance with the design requirements:

1. Following replacement or modification, retest the system and perform additional testing to place the complete system in satisfactory operation and obtain compliance acceptance from the Engineer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide similar items from a single manufacturer throughout the PCIS portion of the Project.

B. Allowable manufacturers are specified in individual instrument and equipment specifications in other sections of the Instrumentation and Control Specifications.

2.2 MATERIALS

A. Furnish all materials under this Contract that are new, free from defects, and standard products produced by manufacturers regularly engaged in the production of these devices and that bear all approvals and labels as required by the Specifications.

B. Provide materials complying with the applicable industrial standard as specified in the Contract Documents.

2.3 SOURCE QUALITY CONTROL

A. Provide all equipment that is new, free from defects, and standard products produced by manufacturers regularly engaged in the production of these products that bear all approvals and labels as required by the Specifications.

B. Arrange with all manufacturers of the equipment and fabricators of panels and cabinets, to allow the Owner and Engineer to inspect and witness the testing of the equipment at the site of fabrication:

1. Equipment includes cabinets, special control systems, flow measuring devices, and other pertinent systems and devices.

C. Factory testing is specified in Division 26 and other sections of the Electrical, and the Instrumentation and Control Specifications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The SI is encouraged to attend a pre-bid conference and examine the premises completely before bidding. It is the SI's responsibility to be fully familiar with the existing conditions and local requirements and regulations.

B. Review the existing Site conditions and examine all shop drawings for the various items of equipment in order to determine exact routing and final terminations for all wiring and cables.

C. Provide a complete instrumentation and control system:

1. Install all extra conduits, cables, and interfaces as may be necessary to provide a complete and operating electrical, and process control and instrumentation system.

3.2 FIELD QUALITY CONTROL

A. Inspection:

1. Allow for inspection of PCIS installation.

2. Provide any assistance necessary to support inspection activities.

3. Engineer inspections may include, but are not limited to, the following:

a. Inspect equipment and materials for physical damage.

b. Inspect installation for compliance with Drawings and Specifications.

c. Inspect installation for obstructions and adequate clearances around equipment.

d. Inspect equipment installation for proper leveling, alignment, anchorage, and assembly.

e. Inspect equipment nameplate data to verify compliance with design requirements.

f. Inspect cable terminations.

g. Inspect/witness instrument calibrations/verifications.

4. Inspection activities conducted during construction do not satisfy inspection requirements specified in Division 26.

B. Instrument Installation Inspection:

1. Provide any assistance necessary to support inspection activities.

2. Inspections may include, but are not limited to, the following:

a. Inspect equipment and materials for physical damage.

b. Inspect the installed arrangement, lay lengths, orientation, piping obstructions etc. that could affect the instruments accuracy or repeatability.

c. Inspect installation for compliance with Drawings and Specifications.

d. Inspect installation for obstructions and adequate clearances around equipment.

e. Inspect equipment installation for proper leveling, alignment, anchorage, and assembly.

f. Inspect equipment nameplate data to verify compliance with design requirements.

g. Inspect cable terminations.

h. Inspect/witness instrument calibrations/verifications.

3. Inspection activities conducted during construction do not satisfy inspection requirements specified in Division 26.

C. Field testing is specified in Division 26 and Section 01 75 16.

D. Installation supervision:

1. Ensure that the entire PCIS is installed in a proper and satisfactory manner. At a minimum, the Contractor, with assistance of the SI where applicable, shall provide the following services:

a. Installation resources:

1) Coordinate with the Contractor regarding installation requirements of the Contract Documents.

b. Provide technical assistance to installation personnel by telephone:

1) Furnish installation personnel with at least one copy of the approved submittals, including all installation details.

c. Periodic inspections during the construction period.

d. A complete check of the completed installation to ensure that it is in conformance with the requirements of the equipment manufacturer and the Contract Documents.

e. Field-verify accuracy and calibration of all instruments.

3.3 CLEANING

A. As specified in Section 01 77 00 – Project Closeout.

3.4 PROTECTION

A. Protect all Work from damage or degradation until date of Substantial Completion.

END OF SECTION 40 70 00

SECTION 40 70 00.02 – INSTRUMENTATION AND CONTROL, SYSTEM DESCRIPTION

Add. 3

1.1 SYSTEM DESCRIPTION

A. Owner-Preferred System Integrator (SI):

1. Industrial Systems, Vancouver, Washington
2. The Automation Group (TAG), Eugene, Oregon
3. Taurus Power and Controls, Tualatin, Oregon
4. Portland Engineering, Portland, Oregon

Note: Stantec will serve as Owner's SCADA integrator under separate contract from the project construction. Stantec will be responsible for programming and development of SCADA systems.

B. SI Scope of Work to include the following:

1. SCADA Hardware/Software Upgrades:

a. Existing System.

1) Sandy Alder Creek operates on GE Cimplicity (version 2021) for the SCADA software. Existing SCADA network utilizes copper leased line for communication between the water treatment plant and wastewater treatment plant. The primary control panel utilizes a GE Fanuc Series 90-30 for the plant PLC. Alarm callouts are managed through Win911.

2) The raw water pump station currently uses a GE Fanuc VersaMAX. Communications between the raw water pump station and the main water treatment plant are over a dedicated copper line.

Add. 3

b. Upgrades.

1) a) The Owner's SCADA platform shall be changed to Ignition. SI to coordinate with the Owner's SCADA Integrator regarding integration of control system information to SCADA. The Owner shall be responsible for providing Ignition software licensing, servers, and thin clients.

SI shall provide PLC tag map to the Owner's SCADA Integrator. The City's SCADA Integrator is responsible for integrating PLC data points into SCADA platform.

Add. 3

b) SI shall provide network terminations to vendor packaged systems as shown in Design Documentation. The SI shall be responsible for PLC integration of vendor packaged systems as required by 40 61 96 Control Strategies for a complete and operational system. The Owner's SCADA Integrator shall be responsible for SCADA integration of vendor packaged systems.

2) The new plant primary control panel and PLC shall be programmed and commissioned by the SI. HMI shall be programmed to accomplish all items required for successful operation of the plant as outlined in 40 61 96 Control Strategies, including local controls, adjustment of setpoints, and enabling/disabling of alarms.

3) The new raw water pump station local control panel and PLC shall be programmed and commissioned by the SI. HMI shall be programmed to accomplish all items required for successful operation of the raw water pump station as outlined in 40 61 96 Control Strategies, including local controls, adjustment of setpoints, and enabling/disabling of alarms.

4) The new remote control panel for the membrane filtration units shall be programmed and commissioned by the SI in coordination with the membrane manufacturer.

5) A new SandyNET fiber optic network shall be commissioned and utilized for communications between plants with the new PLC.

6) New construction by SI to be completed in accordance with all project design documentation (Drawings and Specifications).

2. Instrumentation. Contractor to provide and install control system instrumentation as described in the drawings and specifications. Refer to 40 70 00 A – Device List for complete list of instrumentation

3. Control Panels. Contractor to provide control panels as described in the drawings and specifications. Refer to 40 67 00 – Control Panels

4. Contractor to provide conduit and cable for associated instrumentation and control as described in the drawings and specifications. Refer to cable schedules in drawings

5. Programming/Startup/Commissioning/Training. Provide complete system installation, programming, commissioning, and training as described in these drawings and specifications and as necessary to provide a complete and functional instrumentation and control system.

C. Control system installation and startup constraints:

1. Every effort shall be made to minimize downtime and maintain SCADA access to existing PLC hardware during construction and startup.

2. All PCIS and network outages shall be scheduled and pre-approved by the Engineer. The Contractor shall submit a PCIS and network cutover plan to the Engineer for approval.

3. The new SCADA server shall be fully and completely tested as specified prior to installation, cutover, and commissioning. The existing SCADA server shall remain in service through the duration of construction until the new SCADA server is prepared and ready to be put online.

4. The new fiber network shall be fully installed, terminated, tested per specifications, and approved by the Engineer prior to cutover from the existing network. This includes all patch panels, network switches, cables, fiber jumpers, and patch cords.

D. General requirements:

1. The Work includes everything necessary for and incidental to executing and completing the Instrumentation and Control System Work indicated on the Drawings and specified in the Specifications and reasonably inferable there from including but not limited to:

a. Preparing hardware submittals for field instrumentation.

b. Design, develop, and draft control panel designs and all other drawing submittals specified in the Instrumentation and Control Specifications.

c. Prepare the test plan, the training plan, and the spare parts submittals.

d. Provide all SCADA system hardware and software as indicated in documentation.

e. Fabricate panels.

f. Perform factory tests on panels.

g. Perform bench calibration and verify calibration after installation.

h. Oversee and certify installation of the PCIS.

i. Oversee, document, and certify loop testing.

j. Oversee, document, and certify system pre-commissioning.

k. Conduct the performance tests.

l. Prepare operation and maintenance manuals.

m. Conduct training classes.

n. Integrate the PCIS with instrumentation and control devices provided under other sections.

o. Prepare Record Drawings.

1) Develop all Record Drawings associated with instruments and equipment provided under the scope of this contract.

2) Contract Documents and all Owner furnished and any existing equipment the system is interfacing.

p. Resolve signal, power, or functional incompatibilities between the PCIS and interfacing devices.

q. Perform all required corrective and preventative maintenance.

2. Coordinate all aspects of the Work between Contractor and all subcontractors before bidding to ensure that all costs associated with a complete installation are included. The Owner is not responsible for any change orders due to lack of coordination of the Work between the Contractor, the SI, the other subcontractors or suppliers.

3. Furnish detailed, complete, and thorough operations and maintenance documentation, including but not limited to operations manuals, maintenance manuals, as-built wiring drawings, training manuals, as-built software documentation, and all other documentation required to operate, modify, and maintain all parts of the PCIS.

4. Portions of this Project involve installation in existing facilities and interfaces to existing circuits, power systems, controls, and equipment. Perform and document detailed field investigations of existing conditions (circuits, power systems, controls, equipment, etc) before performing any Work.

5. Defective Work:

   a. As specified in Division 00 and 01 of Specifications.

E. Operating facility:

1. Portions of existing facility must remain fully functional throughout the entire construction period. In consideration of this requirement, comply with the following guidelines:

   a. All outages must be of minimal duration and fully coordinated and agreed to by the Owner. Adjust the construction to meet the requirements of the Owner.

   b. As weather and facility demand conditions dictate, re-adjust the construction schedule to meet the demands placed upon Owner by its users.

2. The Contractor is responsible for the integrity and measurement accuracy of all loops. However, any defect found in existing equipment is the responsibility of the Owner.

3. The standards of documentation, instrument tagging, cable and conductor termination, terminal identification and labeling that apply to the new installation apply equally to the existing installation affected by this work.

END OF SECTION 40 70 00.02

SECTION 43 05 01 - EQUIPMENT GENERAL PROVISIONS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The provisions of this Section apply to all sections of Divisions 41 to 46 unless specifically revised therein.

B. Furnish each piece of equipment complete with its base, drives, shafting, couplings, controls, guards, and other appurtenances which are specified or are required for proper and safe operation.

C. Furnish any special tools or equipment required for proper operation, maintenance, testing, or adjusting.

1.2 REFERENCE STANDARDS

A. Codes: All codes, as referenced herein, are specified in Section 01 42 19 – Reference Standards.

B. Equipment shall be in accordance with the following standards, as applicable and as indicated in each equipment specification:

1.	AFBMA	Anti-Friction Bearing Manufacturers Association, Inc.
2.	ASTM	American Society for Testing and Materials
3.	ANSI	American National Standards Institute
4.	ASME	American Society of Mechanical Engineers
5.	AWWA	American Water Works Association
6.	ASHREA	American Society of Heating, Refrigerating, and Air Conditioning Engineers
7.	AWS	American Welding Society
8.	NFPA	National Fire Protection Association
9.	NEMA	National Electrical Manufacturers Association
10.	OSHA	General Industry Safety Orders

C. The following standards are referenced in this and other Divisions 41 to 43 and Division 46:

1.	ANSI B16.1	Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800

2.	ANSI B16.5	Pipe Flanges and Flanged Fittings, Steel, Nickel Alloy and other Special Alloys
3.	ANSI B46.1	Surface Texture
4.	ANSI S12.6	Method for the Measurement of the Real-Ear Attenuation of Hearing Protectors
5.	ASME B1.20.1	General Purpose Pipe Threads (Inch)
6.	ASME B31.1	Power Piping
7.	AWWA C206	Field Welding of Steel Water Pipe
8.	AWWA C207	Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144-inches (100 mm through 3,600 mm)
9.	AWWA D100	Welded Steel Tanks for Water Storage
10.	ASTM A48	Gray Iron Castings
11.	ASTM A108	Steel Bars, Carbon, Cold-Finished, Standard Quality
12.	ASME B17.1	Keys and Keyseats
13.	ASME B106.1M	Design of Transmission Shafting

1.3 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00 – Submittal Procedures and the specific equipment specifications sections.

B. Shop Drawings: Furnish complete drawings and technical information for equipment, piping, valves, and electrical and controls. Where indicated or required by the Engineer, Shop Drawings shall include clear, concise calculations showing equipment anchorage forces and the capacities of the anchorage elements proposed by the Contractor.

C. Spare Parts List: The Contractor shall obtain from the manufacturer and submit at the same time as Shop Drawings a list of suggested spare parts for each piece of equipment. Contractor shall also furnish the name, address, and telephone number of the nearest distributor for each piece of equipment.

D. Operation and Maintenance Manual: Provide technical operation and maintenance manuals in accordance with Section 01 78 23 – Operation and Maintenance Data.

1.4 ADAPTATION OF EQUIPMENT

A. The Contractor shall furnish equipment readily adaptable for installation and operation. Equipment furnished shall be compatible with all other equipment furnished under the Contract.

B. The Contractor shall assume full responsibility for all modifications of mechanical and electrical controls, equipment, wiring, piping, as required to accomplish function intended by the Contract Documents.

1.5 QUALITY ASSURANCE

A. Guarantees: Unless otherwise accepted herein, guarantee all equipment and its installation. Guarantees shall cover the following: (1) Faulty or inadequate design; (2) Improper assembly or erection; (3) Leakage, breakage, or other failure; and (4) Defective workmanship or materials.

B. Inspection, Start-up, and Field Adjustment: The Contractor shall demonstrate that all equipment meets the specified performance requirements. Contractor shall provide the services of an experienced, competent, and authorized service representative of the manufacturer of each item of major equipment who shall visit the site of Work to perform the following tasks:

1. Assist the Contractor in the installation of the equipment.

2. To inspect, check, adjust if necessary and approve the equipment installation.

3. To start-up and field-test the equipment for proper operation, efficiency, and capacity.

4. To perform necessary field adjustments during the test period until the equipment installation and operation are satisfactory to the Engineer.

5. To instruct the Owner's personnel in the operation and maintenance of the equipment. Instruction shall include step-by-step troubleshooting procedures with all necessary test equipment.

C. Quality and Tolerances: Tolerances and clearances shall be as shown on the Shop Drawings and shall be closely adhered to.

D. Machine Finish: The type of finish shall be the most suitable for the application and shall be shown in micro-inches in accordance with ANSI B46.1

E. Manufacturer's Experience: Equipment manufacturer shall have a record of at least 5 years of successful, trouble free operation in similar applications and size equal or larger than the equipment in this contract.

1.6 SCHEDULE OF PAYMENTS

A. The schedule of payments, less retainage, for the supplying of Goods and Services associated with equipment provided shall be according to the following Table. Cost of labor associated with the installation of the equipment shall be paid as a separate line item. No payments shall be made beyond 80% until the Operations and Maintenance Manuals have been reviewed and accepted by Owner.

Task Completion	Amount
Engineer's Approval of Submittals	10% of Equipment Cost in Schedule of Values
Delivery of all Goods	60% of Equipment Cost in Schedule of Values
Manufacturer's Installation Certification and Startup Testing	10% of Equipment Cost in Schedule of Values
Engineer's Approval of O&M Manual	5% of Equipment Cost in Schedule of Values
Completion of All Training	5% of Equipment Cost in Schedule of Values
Substantial Completion	10% of Equipment Cost in Schedule of Values

PART 2 - PRODUCTS

2.1 GENERAL

A. Protection of Equipment: Equipment shall be boxed, crated, or otherwise protected from damages and moisture during shipment, handling, and storage. Equipment shall be protected from exposure to corrosive fumes and shall be kept thoroughly dry at all times. Pumps, motors, drives, electrical equipment, and other equipment having anti-friction or sleeve bearings shall be stored in weather tight storage facilities prior to installation. For extended storage period, plastic equipment wrappers shall be avoided to prevent accumulation of condensate in gears and bearings. In addition, motor space heaters shall be energized, and shafts shall be rotated. Equipment delivered to the Site with rust or corroded parts shall be rejected. If equipment develops defects during storage, it shall be disassembled, cleaned, and recoated to restore it to original condition.

B. Identification Equipment Items: At the time of shipping, each item of equipment shall have a legible identifying mark corresponding to the equipment number in the Contract Documents for the particular item.

C. Protective Coating: Equipment shall be painted or coated in accordance with Section 09 90 00 – Painting and Coating, unless otherwise indicated. Non-ferrous metal and corrosive-resisting steel surfaces shall be coated with grease or lubricating oil. Coated surfaces shall be protected from abrasion or other damage during handling, testing, storing, assembly, and shipping.

D. Controls: Equipment and system controls shall be in accordance with Division 26 and Division 40.

E. All flanges on equipment and appurtenances provided under this Section shall conform to ANSI B16.1, Class 125; or B16.5, Class 150, unless otherwise shown. All pipe threads shall be in accordance with ANSI/ASME B1.20.1, and with requirements of Section 40 05 00– Piping, General.

F. Nameplates: Equipment nameplates of stainless steel shall be engraved or stamped and fastened to the equipment in an accessible location with No. 4 or larger oval head stainless steel screws or drive pins. Nameplates shall contain the manufacturer's name, model, serial number, size, characteristics, and appropriate date describing the machine performance ratings.

G. Tools: The Contractor shall furnish one complete set of special wrenches and other special tools necessary for the assembly, adjustment, and dismantling of the equipment. Tools shall be of best quality hardened steel forging with bright finish. Wrench heads shall have work faces dressed to fit nuts. Tools shall be suitable for professional work and manufactured by Snap On, Crescent, Stanley, or equal. The set of tools shall be neatly mounted in a labeled toolbox of suitable design provided with a hinged cover.

H. Lubricants: The Contractor shall install lubricants for all equipment during storage and prior to initial testing of the equipment. After successful initial testing, final testing, and satisfactory completion of startup testing as specified in Section 01 75 00 – Equipment Testing and Startup Procedures, the Contractor shall conduct one complete lubricant change on all equipment. In addition, the Contractor shall be responsible for the proper disposal of all used lubricants. The Owner will then be responsible for subsequent lubricant changes.

I. Hazardous Location Rating of Equipment: Equipment manufacturer shall reference the hazardous-area classification drawing in the Contract Documents and provide equipment in compliance with the defined NEC- classification requirements. It will be the manufacturer's sole responsibility to submit equipment in compliance with the Contract Documents, NFPA 820, and NEC requirements.

2.2 EQUIPMENT SUPPORTS

A. All pipe connections to equipment shall be supported, anchored, and guided to avoid stresses and load on equipment flanges and equipment. Supports and hangers shall be in accordance with the requirements of Section 43 05 50 - Equipment Mounting.

2.3 NOISE REQUIREMENTS

A. Noise Level: When in operation, no single piece of equipment shall exceed the OSHA noise level requirement of 105 dBA for one-hour exposure per day.

B. High Noise Level Location: The Contractor shall provide two personal hearing protection stations at the Blower Room.

C. Personal Hearing Protection: In each hearing protection station, the Contractor shall furnish three pairs of high attenuation hearing protectors in the original unopened packaging. The ear protectors shall be capable of meeting the requirements of ANSI S12.6 and shall produce a noise level reduction of 25 dBA at a frequency of 500 Hz. The hearing protectors shall have fluid filled ear cushions and an adjustable, padded headband. The protectors shall be stored in a weatherproof, labeled, steel cabinet, provided at an approved location near the noise producing equipment.

2.4 VIBRATION LIMITATIONS

A. Vibration frequencies shall span the range from 5.0 to 5,000 Hz. Where specified, measurements shall be obtained while the installed equipment is operating within the specified speed range.

B. Centrifugal Machines with Sleeve Bearings: Unless otherwise specified, centrifugal machines with sleeve bearing shafts shall not exhibit unfiltered RMS readings for vibration displacement in excess of the following:

Shaft speed range range, rpm	Displacement peak to peak, mils
Up to 900	3.5
901-1800	3.0
1801-3000	2.5
3001-4500	2.0
Above 4500	1.6

Displacement measurements shall be taken radially on the shaft at two points at each bearing. Measuring points shall be 90 degrees apart.

C. Centrifugal Machines with Antifriction Bearings: Unless otherwise specified, centrifugal machines with antifriction bearing shafts shall not exhibit unfiltered RMS readings for vibration velocity in excess of 0.12 inch per second. Velocity measurements shall be taken on one point of each bearing housing.

D. Positive Displacement Machines: Unless otherwise specified, positive displacement machines of the rotary, reciprocating and controlled volume types shall operate without any lateral or torsional vibration characteristics that may accelerate wear of the equipment. The Contractor shall provide manufacturer's certification that the manufacturer has inspected the machine under operating conditions and found it to comply with the manufacturer’s requirements.

E. Vibration Isolators: Air compressors, blowers, engines, inline fans shall be provided with restrained spring-type vibration isolators or pads per manufacturer's written recommendations. Vibration isolations shall be provided with seismic restraint.

2.5 CRITICAL SPEED REQUIREMENTS

A. Unless otherwise specified, rotating mechanical equipment shall not exhibit critical speeds within the specified range of operating speeds and impeller blade pass frequencies. Critical speeds for equipment with rigid rotor systems shall be at least 20 percent greater than maximum operating speed and maximum impeller blade pass frequency, whichever is greater. Critical speeds for equipment with flexible shaft-rotor systems shall be at least 15 percent below minimum operating speed and 20 percent above maximum operating speed and blade pass frequency.

2.6 DRIVE TRAINS AND SERVICE FACTORS

A. Drive Trains and Service Factors: Service factors shall be applied in the selection or design of mechanical power transmission components. All components of drive train assemblies between the prime mover and the driven equipment shall be designed and rated to deliver the maximum peak or starting torque, speed, and horsepower. All of the applicable service

factors shall be considered, such as mechanical (type of prime mover), load class, start frequency, ventilation, ambient temperature, and fan factors. Drive train components include couplings, shafts, gears, and gear drives, drive chains, sprockets, and V-belt drives. Unless otherwise indicated, the following load classification shall apply in determining service factors:

Type of Equipment	Service Factor	Load Classification
Centrifugal Fans	1.0	Uniform
Pumps		
Centrifugal or Rotary	1.0	Uniform
Reciprocating	1.8	Moderate Shock
Cranes or Hoists	1.25	Moderate Shock

B. Mechanical Service Factors

	Mechanical Service Factors
Uniform	1.25
Moderate Shock	1.50
Heavy Shock	2.0

C. For thermal rating adjustments such as start frequency, ambient temperature, and hourly duty cycle factor, ventilation factor, and fan factor, refer to gear manufacturer sizing information.

D. For service factors of electric motor, see Section 40 05 93 – Common Motor Requirements for process Equipment

Where load classifications are not indicated, service factors based on AGMA 514.02 shall be used for standard load classification and for flexible couplings.

2.7 SHAFTING

A. Shafting shall be continuous between bearings and shall be sized to transmit the power required. Keyways shall be accurately cut in line. Shafting shall not be turned down at the ends to accommodate bearings or sprockets whose bore is less than the diameter of the shaft. Shafts shall rotate in the end bearings and shall be turned and polished, straight, and true.

B. Design Criteria: All shafts shall be designed to carry the steady state and transient loads suitable for unlimited number of load applications, in accordance with ASME B 106.1 M - Design of Transmission Shafting. Where shafts are subjected to fatigue stresses, such as frequent start and stop cycles, the mean stress shall be determined by using the modified Goodman Diagram. The maximum torsional stress shall not exceed the endurance limit of the shaft after application of the factor of safety of 2 in the endurance limit and the stress

concentration factor of the fillets in the shaft and keyway. Stress concentration factor shall be in accordance with ASME Standard B17.1 - Keys and KeySeats.

C. Materials: Shafting materials shall be appropriate for the type of service and torque transmitted. Environmental elements such as corrosive gases, moisture, and fluids shall be taken into consideration. Materials shall be as indicated unless furnished as part of an equipment assembly.

1. Low carbon cold-rolled steel shafting shall conform to ASTM A 108, Grade 1018.

2. Medium carbon cold-rolled shafting shall conform to ASTM A 108, Grade 1045.

3. Other grades of carbon steel alloys shall be suitable for service and load.

4. Corrosion-resistant shafting shall be stainless steel or Monel, whichever is most suitable for the intended service.

D. Differential Settlement: Where differential settlement between the driver and the driven equipment may occur, a shaft of sufficient length with sets of universal type couplings shall be provided.

2.8 BEARINGS

A. Bearings shall conform to the standards of the Anti-Friction Bearing Manufacturers Association, Inc. (AFBMA).

B. To assure satisfactory bearing application, fitting practice, mounting, lubrication, sealing, static rating, housing strength, and lubrication shall be considered in bearing selection.

C. All re-lubricatable type bearings shall be equipped with a hydraulic grease fitting in an accessible location and shall have sufficient grease capacity in the bearing chamber.

D. All lubricated-for-life bearings shall be factory-lubricated with the manufacturer's recommended grease to insure maximum bearing life and best performance.

E. Anti-Friction Type Bearing Life: Except where otherwise indicated, bearings shall have a minimum 10 life expectancy of 10 years or 20,000 hours, whichever occurs first. Where so indicated, bearings shall have a minimum rated L-10 life expectancy corresponding to the type of service, as follows:

Type of service	Design Life, years	L-10 Design Life, hours
	(Whichever comes first)	
8-hour shift	10	20,000
16-hour shift	10	40,000
Continuous	10	60,000

F. Bearing housings shall be of cast iron or steel and bearing mounting arrangement shall be as indicated or as recommended in the published standards of the manufacturer. Split-type housings may be used to facilitate installation, inspection, and disassembly.

G. Sleeve Type Bearings: Sleeve-type bearings shall have a steel, cast iron or ductile iron housing and Babbitt or bronze liner. Bearing housing shall be bolted and doweled to the lower casing half. These housings shall be provided with cast iron caps bolted in place and the bearing end caps shall be bored to receive the bearing shells. Sleeve bearings shall be designed on the basis of the maximum allowable load permitted by the bearing manufacturer. If the sleeve bearing is connected to an equipment shaft with a coupling, the coupling transmitted thrust will be assumed to be the maximum motor or equipment thrust. Lubricant, lubrication system, and cooling system shall be as recommended by the bearing manufacturer.

H. Plate Thrust Bearings: Thrust bearings shall be the Kingsbury Type, designed and manufactured to maintain the shaft in the fixed axial position without undue heating or the necessity of adjustment or attention. Bearings shall be oil lubricated to suit the manufacturer's standard method of lubrication for the specific bearing. If bearing cooling is required, manufacturer shall provide necessary piping, filters, and valves.

2.9 ELECTRIC MOTORS

A. All motors shall comply with requirements listed in Section 40 05 93 – Common Motor Requirements for Process Equipment. All variable frequency drive (VFD) controlled motors shall comply with NEMA MG-1 Design “B” requirements.

2.10 SPARE PARTS

A. Spare parts, where specified, shall be provided in clearly labeled boxes. Labels shall display “City of Sandy" a major piece of equipment to which the part belongs, the part name, and the manufacturer's part number.

PART 3 - EXECUTION

3.1 PROTECTION

A. Box, crate, or otherwise completely enclose and protect all equipment during shipment, handling, and off-site storage. Responsibility for storage on the job site will be assigned to the installing Contractor.

B. Protect equipment from exposure to elements and keep all items thoroughly dry at all times. Protect against impact, abrasion, discoloration, and other damage. Protect electrical equipment, controls, and insulation against moisture, freezing, or water damage.

3.2 INSTALLATION

A. Equipment shall be installed in accordance with the manufacturers written recommendations. The Contractor shall select or recommend the size and type of coupling required to suit each specific application; installation shall be per equipment manufacturer's

printed recommendations. All insulating connections shall be installed in accordance with the manufacturer's printed instructions.

B. Alignment: Equipment shall be field tested to verify proper alignment.

3.3 SERVICES OF MANUFACTURER

A. Inspection, Startup, and Field Adjustment: Where required by individual sections, an authorized, experienced, and competent service representative of the manufacturer shall visit the Site for the number of days indicated in those sections to witness or perform the following and to certify in writing that the equipment and controls have been properly installed, aligned, lubricated, adjusted, and readied for operation.

1. Installation of equipment

2. Inspection, checking, and adjusting the equipment and approving its installation

3. Startup and field testing for proper operation, efficiency, and capacity

4. Performing field adjustments during the test period to ensure that the equipment installation and operation comply with requirements

B. Instruction of the Owner's Personnel: Where required by the individual equipment sections, an authorized training representative of the manufacturer shall visit the Site for the number of days indicated in those sections to instruct the Owner's personnel in the operation and maintenance of the equipment, including step-by-step troubleshooting with necessary test equipment. Instruction shall be specific to the models of equipment provided.

1. The representative shall have at least two years' experience in training. A resume of the representative shall be submitted.

2. Training shall be scheduled three weeks in advance of the scheduled session.

3. Proposed training material and a detailed outline of each lesson shall be submitted for review. Review comments from the Engineer shall be incorporated into the material.

4. The training materials shall remain with the trainees after the session. The Contractor shall videotape the training for later use by the Owner's personnel.

Add. 3

C. Training time, Inspection, Startup, and Field adjustment time shall be as recommended by the equipment manufacturer.

1. Unless specified by the individual equipment sections, manufacturer field time shall be as recommended by the manufacturer, with a minimum time of eight (8) hours at the job site.

3.4 PACKAGED EQUIPMENT

A. When any system is furnished as pre-packaged equipment, the Contractor shall coordinate all necessary space and structural requirements, clearances, utility connections, signals, and outputs with subcontractors to avoid later change orders.

B. If the packaged system has any additional features (as safety interlocks, etc.) other than required by the Contract Documents, the Contractor shall coordinate such features with the Engineer and provide all material and labor necessary for a complete installation as required by the manufacturer.

3.5 FIELD TESTS

A. Where indicated by the individual equipment sections, equipment shall be field tested after installation to demonstrate satisfactory operation without excessive noise, vibration, or no overheating of bearings or motor.

B. The following field testing shall be conducted:

1. Start, check, and operate the equipment over its entire operating range. Vibration level shall be within the amplitude limits as indicated or as recommended by the reference applicable Standards.

2. Obtain, record, and provide to Engineer concurrent readings of motor voltage, amperage, capacity, vibration, and bearing temperatures for each piece of major equipment.

C. The Engineer shall witness field testing. The Contractor shall notify the Engineer of the test schedule seven days in advance.

D. In the event that any equipment fails to meet the test requirements, the equipment shall be modified and resettled until it satisfies the requirement.

END OF SECTION 43 05 01

SECTION C-520 – NON-TRANSPORTATION RELATED PUBLIC IMPROVEMENT CONTRACT AGREEMENT

THIS CONTRACT is made as of the _____ day of _____, 2026 by and between

"Owner":

City of Sandy, Oregon
AJ Thorne, Public Works Director
39250 Pioneer Blvd, Sandy, OR 97055
Phone: (801) 568-2999
ajthorne@ci.sandy.or.us
Tax ID: 93-6002250

and **"Contractor":**

Name: _____
Adress: _____[]
_____
Phone: _____
Email: _____
Tax ID: _____

for **"Project": Alder Creek Water Treatment Plant Upgrades**.

Owner and Contractor agree as follows:

CONTRACT

ARTICLE 1 – WORK

1.01 Contractor will complete all Work as specified or indicated in the Contract Documents or reasonably inferable as necessary to produce the results intended by the Contract Documents. The Work is described as follows: The Project includes furnishing all labor, materials, and equipment necessary for the installation of raw water pump station upgrades, slab on grade canopy structure, chemical storage and containment, disinfection system, finished water pump station with buried clearwell, site grading, erosion control, civil sitework and yard piping, stormwater improvements and associated electrical and instrumentation improvements.

Note: The Owner will prepurchase a generator, automatic transfer switch, switchgear, the containerized membrane treatment system and select support equipment for the membrane system. The Owner will assign the associated purchase order(s) to the Contractor and the Contractor shall assume ownership of the purchase order.

ARTICLE 2 – RESERVED

ARTICLE 3 – ENGINEER AND CONSTRUCTION MANAGER

3.01 City's has retained Keller Associates as the "Engineer".

3.02 City's has retained Stantec as the "Construction Manager" to act as Owner's Representative.

ARTICLE 4 – CONTRACT TIMES

4.01 Time is of the essence and time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

Notwithstanding anything contained in the General Conditions, Contractor will begin the Work upon execution of this Contract. Unless Owner otherwise agrees in writing and in conformance with the General Conditions, Contractor will achieve Substantial Completion on or before **July 1st, 2027** and achieve Final Completion on or before **September 1st 2027**. A Notice to Proceed is required in order to begin Work under this Contract.

4.02 The parties recognize and agree that City shall suffer financial and other incalculable losses if the Work is not completed within the times specified in Section 4.01, plus any authorized extensions thereof. The parties also recognize the delays, expense and difficulties involved in proving the precise, actual loss suffered by City if the Work is not completed on time. Accordingly, instead of requiring any such proof, the parties have negotiated and ultimately agree that as liquidated damages for delay, but not as a penalty, Contractor will pay City, or City may withhold from any sums due Contractor, $500.00 for each day that expires after the time specified in 4.01 for Substantial Completion until the Work is deemed substantially complete. After Substantial Completion, if Contractor neglects, refuses or fails to complete the remaining Work within the Contract Time or any extensions thereof permitted by City, Contractor will pay City, or City may withhold from any sums due Contractor, $500.00 for each day that expires after the time specified in 4.01 for Final Completion until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner will pay Contractor for completion and acceptance of the Work in accordance with the Contract Documents an amount not-to-exceed _____ (the "Contract Price"). All specific cash allowances are included in this price and have been computed in accordance with the General Conditions.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 The parties shall proceed with payment in accordance with the General Conditions. Owner will pay Contractor the Contract Price within thirty (30) days of receiving the invoice from Contractor.

ARTICLE 7 – INTEREST

7.01 All moneys not paid when due will bear interest at the rate specified in ORS 279C.570.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Solicitation Documents or other Owner-furnished documents, if any.

B. Contractor has visited the Site and become familiar with and is satisfied as to its general condition.

C. Contractor is familiar with and is satisfied as to all federal, state, and local laws and regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities), if any, that have been identified in the Contract Documents; and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Supplementary Conditions.

E. Contractor has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and underground facilities) at or contiguous to the Site that may affect cost, progress or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures or construction to be employed by Contractor, including any specific means, methods, techniques, sequences and procedures of construction expressly required by the Contract Documents, and safety precautions and programs incident thereto.

F. Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. Contractor is aware of the general nature of other work, if any, to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

I. Contractor has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and their written resolution, if any, is acceptable to Contractor.

J. The Contract Documents are sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 Contents

A. The Contract Documents consist of all of the following:
   a. This Agreement
   b. Exhibit A-1 – Acceptance of Assignment (Membrane Equipment Procurement – Alder Creek Water Treatment Plant Upgrade Project)
   c. Exhibit A-2 – Acceptance of Assignment (Alder Creek Water Treatment Plant Upgrades – Electrical Pre-Procurement)
   d. Completed Bid Form
   e. Bonds:
      i. Performance bond (together with the power of attorney).
      ii. Payment bond (together with power of attorney)
   f. Volume 1 – Specifications & Appendices as listed in the table of contents of the Project manual inclusive of the General Conditions and Supplemental Conditions.
   g. Volume 2 – Drawings as listed in the sheet index
   h. Addenda (Number ___ to ___ inclusive)
   i. The following which may be delivered or issued on or after the effective date of the Agreement
      i. Notice of Substantial Completion
      ii. Notice of Final Completion
      iii. Written Amendments(s)
      iv. Change Order(s)
      v. Field Order(s)
      vi. Engineer's Written Interpretation(s)

9.02 In resolving inconsistencies or ambiguities between two or more components of the Contract Documents, the highest precedence shall be given to the Agreement and the order of precedence shall decrease in the following manner:

1. Change Orders or Amendments (if any) Add. 3
2. Agreement
3. Addenda
4. Supplementary Conditions
5. General Conditions Add. 3
6. Exhibits to the Agreement
7. Performance Bond
8. Payment Bond.
9. Certificates of Insurance
10. Specifications
11. Drawings

ARTICLE 10 - MISCELLANEOUS

10.01 Capitalized terms used in this Contract have the meanings stated in the General Conditions and the Supplementary Conditions, if any.

10.02 No assignment except those listed in SC-18.08, delegation, novation or any other transfer by either party of any rights or obligations under or interests in the Contract will be binding on the other without the written consent of the party sought to be bound. Specifically, but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law) and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

10.03 Each party binds itself, its directors, partners, successors, and assigns to the other party, its directors, partners, successors and assigns in respect to all covenants, agreements and obligations contained in the Contract.

10.04 Any provision or part of the Contract held to be void or unenforceable under any law or regulation will be deemed stricken. All remaining provisions will continue to be valid and binding upon Owner and Contractor, who agree that the Contract will be reformed to replace the stricken provision or part with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 This Contract is the final written expression of all the terms of the Contract and is the complete and exclusive statement of those terms. Any and all representations, promises, warranties, or statements by Contractor or Contractor's agents that differ in any way from the terms of this written agreement shall be given no force and effect. This Contract will not be construed against its drafter.

ARTICLE 11– SAFE DRINKING WATER FINANCING REQUIREMENTS

11.01 Termination for Cause and for Convenience & Breach of Contract (language to be included in all construction contracts and subcontracts in excess of $10,000:)

"Contractor shall address termination for cause and for convenience, including the manner by which it will be effected and the basis for settlement. In addition, contractor shall address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate."

11.02 Equal Employment Opportunity:

"Contractor shall comply with Executive Order 11246 of September 24, 1965, entitled ''Equal Employment Opportunity,'' as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR chapter 60)."

11.03 Procurement of Recovered Materials:

"Contractor must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, including procurement of recovered materials in a manner designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247."

11.04 Whistleblower:

"Contractor receiving SDWRLF funds shall under or through this contract to, post notice of the rights and remedies provided to whistleblowers under No Fear Act Pub. L. 107-174. 29 CFR § 1614.703 (d)."

11.05 Source of Funds:

"Work under this contract is funded by the federal Safe Drinking Water Revolving Loan Fund through Business Oregon and a partnership of Local and/or Private Funds. "

11.06 Suspension and Debarment:

"Contractor certifies that it is not debarred or suspended or is otherwise excluded from or ineligible for participation in federal assistance programs under Executive Order 12549, ''Debarment and Suspension", and shall not contract or permit any subcontract at any level with any party similarly excluded or ineligible. A list of excluded parties is available in the System for Award Management (SAM) at www.sam.gov http://www.epls.gov/, under "search records"."

11.07 Copeland "Anti-Kickback" Act:

"Contractor shall comply with the Copeland "Anti-Kickback" Act (18 U.S.C. 847) as supplemented in Department of Labor regulations (29 CFR part 3)."

11.08 Intellectual Property:

"Contractor hereby grants to the U.S. E.P.A. a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for federal government purposes, any intellectual property developed under this contract. Contractor shall secure from third parties the same license in the name of the U.S. E.P.A. regarding any intellectual property developed by third parties as subcontractors under this contract, or developed under contract with the Contractor specifically to fulfill Contractor's obligations related to this contract."

11.09 Inspections; Information:

"Contractor shall permit, and cause its subcontractors to allow [insert name of water system Owner], the State of Oregon, the federal government and any party designated by them to:

- Examine, visit and inspect, at any and all reasonable times, the property, if any, constituting the Project.
- Inspect and make copies of any accounts, books and records, including, without limitation, its records regarding receipts, disbursement, contracts, and any other matters relating to the Project, and to its financial standing, and shall supply such reports and information as reasonably requested.
- Interview any officer or employee of the Contractor, or its subcontractors, regarding the Project.
- Contractor shall retain all records related to the Project for three years after final payments are made and any pending matters are closed.

11.10 Disadvantaged Business Enterprises:

Recipient will implement the good faith efforts for solicitation and contracting with Disadvantaged Business Enterprises ("DBE") described in Appendix B of the Safe Drinking Water Handbook. This applies to all solicitation and contracting for construction, equipment, supplies, engineering or other services that constitute the Project financed by this Contract. Recipient will maintain documentation in a Project file on Disadvantaged Business Enterprises. Recipient will maintain documentation in a Project file and submit required forms, as described in Appendix B of the Safe Drinking Water Handbook. Recipient will ensure that all prime contractors and subcontractors implement the good faith efforts for solicitation and contracting, and comply with all DBE procurement forms, statements, and reporting requirements. Recipient will ensure that each procurement contract (prime plus all subcontractor contracts) includes the following term and condition:

"The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40 CFR part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract or other legally available remedies."

Recipient will ensure that all prime contractors and subcontractors implement the good faith efforts for solicitation and contracting, and comply with all DBE procurement forms, statements, and reporting requirements.

See DBE Six Good Faith Efforts and Form

11.11 Prohibition on Certain Telecommunication and Video Surveillance Services or Equipment:

"As required by 2 CFR 200.216, federal grant or loan recipients and subrecipients are prohibited from obligating or expending loan or grant funds to procure or obtain; extend or renew a contract to procure or obtain; or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use covered telecommunications equipment, video surveillance services or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115-232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

Prohibitions extend to the use of Federal funds by recipients and subrecipients to enter into a contract with an entity that "uses any equipment, system, or service that uses covered telecommunications equipment or services" as a substantial or essential component of any system, or as critical technology as part of any system. Certain equipment, systems, or services, including equipment, systems, or services produced or provided by entities subject to the prohibition are recorded in the System for Award Management exclusion list."

11.12 American Iron Steel

The Contractor acknowledges to and for the benefit of the [insert name of water system Owner] ("Purchaser") and the State of Oregon (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Drinking Water State Revolving Fund that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any

further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the

Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

11.13 Federal Labor Standards

NOTE: Oregon Bureau of Labor and Industries (BOLI) prevailing wage requirements apply to public entities for projects over $50,000 and private entities for projects that utilize more than $750,000 of public funds.

Prevailing Wage Requirements.

"Construction projects assisted in whole or in part with the Safe Drinking Water Revolving Loan Fund Program (SDWRLF) must be carried out in compliance with Federal Davis Bacon and Related Acts and the Oregon Bureau of Labor and Industries (BOLI) requirements. Contractor shall pay each worker employed in the performance of this contract not less than the higher of the wage rate for the type of work being performed as set forth in either the Oregon Prevailing Wage "Prevailing Wage Rate for Public Works Contracts in Oregon" (if applicable) or the applicable federal Davis-Bacon Wage Decision. Contractor shall download a U.S. Department of Labor Employee Fair Compensation Notice and post it at the work site along with a list of locally prevailing wage rates. Contractor shall prepare and submit weekly Certified Payroll Reports on forms to be supplied by Business Oregon. Contractor shall permit access to construction site in order to conduct on-site interviews with workers during working hours."

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work

actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Sub recipients may obtain wage determinations from the U.S. Department of Labor's web site, www.dol.gov.

(ii)(A) The sub recipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the sub recipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the sub recipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the sub recipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the

benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The sub recipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the sub recipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the sub recipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an

individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the sub recipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sub recipient(s).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.
(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State

Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may by appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and sub recipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

11.14 Federal Labor Standards

Contract Provision for Contracts in Excess of $100,000.

(a) Contract Work Hours and Safety Standards Act. The sub recipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible

therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The sub recipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through

(4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Sub recipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Sub recipient shall insert in any such contract a clause providing hat the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

5. Compliance Verification

(a) The sub recipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The sub recipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.

(b) The sub recipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. Sub recipients must conduct more frequent interviews if the initial interviews or other information indicated that there is a risk that the contractor or subcontractor is not complying with DB.

Sub recipients shall immediately conduct interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence."

(c) The sub recipient shall periodically conduct spot checks of a representative sample of weekly

payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The sub recipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the sub recipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Sub recipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the sub recipient shall verify evidence of fringe benefit plans and payments there under by contractors and subcontractors who claim credit for fringe benefit contributions.

(d) The sub recipient shall periodically review contractors and subcontractor's use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

(e) Sub recipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at http://www.dol.gov/whd/america2.htm.

11.15 Environmental and Natural Resource Laws (include the following language in all construction contracts and subcontracts in excess of $100,000:)

"Contractor shall comply with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h)), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR part 15).

11.16 Prohibition on the Use of Federal Funds for Lobbying (Certification Regarding Lobbying form follows, for any contracts in excess of $100,000).

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, Owner has caused this Contract to be executed by its duly authorized undersigned agents and Contractor has executed this Contract effective as of the date last signed below.

EFFECTIVE DATE OF CONTRACT: _____/____/_____ (month/day/year)

SIGNED:

OWNER	**Contractor**
By: _____	**By: _____**
Name: _____	**Name: _____**
Title: _____	**Title: _____**
Date: _____	**Date: _____**

ADDENDUM 3
ATTACHMENT 10.1

SCADA

RCP-D100
RIO-D100

FIELD

BACKWASH WASTE FLOW — FI D101
BACKWASH WASTE TOTAL FLOW — FQI D101
TRAIN #1 RUNNING — YI.1 D110
TRAIN #2 RUNNING — YI.2 D110
FAULT — YA D110
HAND/AUTO — YI.AM D110
LPMF 1 CIP CYCLE VALVE COMMAND OPEN — ZCO D110
LPMF 1 CIP CYCLE VALVE COMMAND CLOSE — ZCC D110
LPMF 1 CIP CYCLE VALVE OPENED — ZIO D110
LPMF 1 CIP CYCLE VALVE CLOSED — ZIC D110
LPMF 1 BACKWASH CYCLE VALVE COMMAND OPEN — ZCO D120
LPMF 1 BACKWASH CYCLE VALVE COMMAND CLOSE — ZCC D120
LPMF 1 BACKWASH CYCLE VALVE OPENED — ZIO D120
LPMF 1 BACKWASH CYCLE VALVE CLOSED — ZIC D120
TRAIN #1 RUNNING — YI.1 D210
TRAIN #2 RUNNING — YI.2 D210
FAULT — YA D210
HAND/AUTO — YI.AM D210
LPMF 2 CIP CYCLE VALVE COMMAND OPEN — ZCO D210
LPMF 2 CIP CYCLE VALVE COMMAND CLOSE — ZCC D210
LPMF 2 CIP CYCLE VALVE OPENED — ZIO D210
LPMF 2 CIP CYCLE VALVE CLOSED — ZIC D210
LPMF 2 BACKWASH CYCLE VALVE COMMAND OPEN — ZCO D220
LPMF 2 BACKWASH CYCLE VALVE COMMAND CLOSE — ZCC D220
LPMF 2 BACKWASH CYCLE VALVE OPENED — ZIO D220
LPMF 2 BACKWASH CYCLE VALVE CLOSED — ZIC D220
ATS UTILITY POWER — YI D100
ATS EMERGENCY POWER — YA.EP D100
ATS FAULT — YA D100
GENERATOR LOCAL/REMOTE — YI.LR D100
GENERATOR RUNNING — YI D100
GENERATOR FAULT — YA D100
GENERATOR CURRENT — II D100

WATER FROM SYSTEM

4" FW (6.C) UG AG
2" CRW (6.C)
12x8
8" CRW (6.C)
AVRV-D111
BFV-D110
PRV-D110
BFV-D111
AVRV-D110
2" FW (43.C)
2" DR (6.B)
ME-D110
RE: APPENDIX A
4" CIP (PRESSURIZED) (8.C)
10" FW (6.C)
AVRV-D216
AVRV-D215
AG UG
FROM CHEMICAL STORAGE
2" SPARE (19.D) — 16 EI-702-B
2" SHC (19.D) — 17 EI-707-B SHC
2" SH (19.D) — 13 EI-707-B SH
2" C ACID (19.D) — 09 EI-707-B CITRIC ACID
2" SBS (19.D) — 11 EI-707-B SODIUM BISULFITE
XV D110
120VAC
XV D120
2" CIP DR (8.B)
480VAC
AVRV-D112
BFV-D112
4" CIP DR (8.B)
4" CIP OF (8.B)
4" BKP OF (8.B)
BFV-D113
4" BKP DR (8.B)
AVRV-D113
AVRV-D114
8" BWW (6.C)
12" BWW (6.C)
4" DR (8.B)
12" CRW (6.C)
12"x8"
FROM MF FEED TANK
EI-701-C 02
FIT D101
FE D101
M
VAULT
ACH FROM CHEMICAL VAULTS
EI-707-B 20
0.75" w/ 2" CARRIER ACH (19.D)
TO BACKWASH RECYCLE PONDS
24 EI-701-F
12" BWW (6.C)
MANHOLE
FROM MF FEED TANK DRAIN
EI-701-C 23
10" OF (6.C)
FROM SODIUM HYPOCHLORITE SKID
EI-703-B 41
0.75" w/ 2" CARRIER SHC (19.D)

ME-D210
RE: APPENDIX A
AVRV-D211
AVRV-D212
AVRV-D213
AVRV-D214
BFV-D210
PRV-D210
BFV-D211
AVRV-D210
480VAC
AVRV-D216
AVRV-D215
AG UG
FROM CHEMICAL STORAGE
2" SPARE (19.D) — 47 EI-702-B
2" SHC (19.D) — 18 EI-707-B SHC
2" SH (19.D) — 14 EI-707-B SH
2" C ACID (19.D) — 10 EI-707-B CITRIC ACID
2" SBS (19.D) — 12 EI-707-B SODIUM BISULFITE
XV D210
XV D220
120VAC
4" CIP (PRESSURIZED) (8.C)
12"x10"
12" FW (6.C)
MIX-D100
STATIC MIXER VAULT (OUT)
EI-701-E 03 TO CLEARWELL
ATS-D100
GEN-D100
COMP AIR TO CHEM SKIDS
1.5" CA (18.F)
EI-701-B 26
EI-707-B 22 SODA ASH
EI-707-B 16 SHC
EI-707-B 15 SHC SPARE
0.75" w/ 2" CARRIER SHC (19.D)
EI-701-H 25 TO CIP WASTE TANK
EI-701-H 28 TO CIP WASTE TANK
EI-701-H 29 TO CIP WASTE TANK
EI-701-H 30 TO CIP WASTE TANK
6" DR (8.B)
6"x4"

KELLER ASSOCIATES
4800 SW Griffith Drive, Suite 128
Beaverton, OR 97005
(971) 405-6331

REGISTERED PROFESSIONAL ENGINEER
97265PE
Digitally Signed: 2025.12.18 09:20:07 PST
OREGON
MAY 11, 2012
BRADLEY M. CULVER
EXPIRES: 12-31-2025

NO.	REVISIONS	DATE
1	ADDENDUM #3	2025-12-17

SANDY

ALDER CREEK WATER TREATMENT PLANT UPGRADES

LPMF SYSTEM - P&ID

DRAWN: ELK | CHECK: JAT

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 224100-000 | PAGE

SHEET NO. EI-701-D

J:\224100-000 SANDY ALDER CREEK WTP UPGRADES\C_DESN_CAD\3_DESIGN\D_PLANS-1\09_INSTR\D_STRUCTURE\EI-701-D.DWG LAST SAVED: 12/18/2025 12:36 PM PRINTED: 12/18/2025 2:06 PM

ADDENDUM 3
ATTACHMENT 10.2

GENERAL SHEET NOTES

1. BILL OF MATERIALS REFLECTS INTENDED COMPONENTS AS DERIVED FROM OWNER RECOMMENDED PREFERRED SCADA EQUIPMENT. CONTRACTOR TO COORDINATE WITH OWNER FOR APPROVAL OF "OR EQUAL" EQUIPMENT SUBSTITUTIONS PRIOR TO SUBMITTING CONTROL PANEL SHOP DRAWING & SCHEMATIC SUBMITTALS.
2. ITEM QUANTITIES ARE RELATIVE TO INTENDED DESIGN. CONTRACTOR TO DETERMINE FINAL BOM ITEM QUANTITIES AND/OR ANY ADDITIONAL ITEMS TO BE INCLUDED IN SUBMITTALS.

CONTROL PANEL BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOG #	NOTES
01	1	NEMA 4 48" H x 36" W x 12" D ENCLOSURE	SAGINAW	SCE-48EL3612LPPL	
02	1	45" H x 33" W SUBPANEL	SAGINAW	SCE-48P36	
03	1	18" LED LIGHT FIXTURE W/ INTEGRATED DOOR SWITCH	SAGINAW	SCE-LF18NO	
04	2	FILTERED VENT, 8" x 8"	RITTAL	3239200	
05	1	PANEL PC W/ CAPACITIVE TOUCH SCREEN 12" MIN	ADVANTECH	TPC SERIES	OR APPROVED EQUAL 1
06	A/R	DIN RAIL SLOTTED, 15mm D	PHOENIX CONTACT	1201730	FOR REFERENCE, OR EQUAL
07	A/R	DIN RAIL END STOP 9.5mm W	PHOENIX CONTACT	0800886	
08					
09					
10	A/R	TYPE F PANDUIT NARROW SLOT WIRING DUCT (2"x3"), GREY	PANDUIT	F2X3LG6	
11	A/R	PANDUIT WIRING DUCT COVER, GREY	PANDUIT	C2LG6	
12	1	PACSYSTEMS RX3i CONTROLLER, 13MB	EMERSON	IC695CPE310	FOR REFERENCE, OR EQUAL; COORDINATE WITH OWNER FOR PREFERRED CONFIGURATION
13	1	12 CHANNEL ISOLATED VOLTAGE/CURRENT ANALOG INPUT MODULE	EMERSON	IC695ALG112	
14	1	8 CHANNEL CURRENT ANALOG OUTPUT MODULE	EMERSON	IC695ALG708	
15	1	16 POINT DC INPUT MODULE, 24 VDC SIGNALS	EMERSON	IC694MDL645	
16	1	16 POINT DC OUTPUT MODULE, 24 VDC SIGNALS	EMERSON	IC694MDL740	
17	1	POWER SUPPLY, 24VDC, 40W	EMERSON	IC695PSD040	
18	1	12 SLOT UNIVERSAL BACKPLANE	EMERSON	IC695CHS007	
19					
20					
21	1	2000 SERIES MANAGED ETHERNET SWITCH, 14 RJ45 PORTS, 2 SFP PORTS, 10/100/1000 Mbps	PHOENIX CONTACT	1006191	OR APPROVED EQUAL
22	1	FIBER SPLICE BOX, OM2, 16 TERMINAL	PHOENIX CONTACT	1019683	OR APPROVED EQUAL
23	2	OM2 50/125 FIBER OPTIC PATCH CABLE			
24	A/R	PATCH CORD, RJ45 MALE/RJ45 MALE, 3FT, BLUE	QUIKTRON	576-S10-003	FOR REFERENCE, OR EQUAL; FOR PLC NETWORKING
25	A/R	PATCH CORD, RJ45 MALE/RJ45 MALE, 7FT, BLUE	QUIKTRON	576-S10-007	FOR REFERENCE, OR EQUAL; FOR TOUCHSCREEN HMI NETWORKING
26	A/R	CIRCUIT BREAKER 1P 15A	PHOENIX CONTACT	2907571	
27	A/R	CIRCUIT BREAKER 1P 8A	PHOENIX CONTACT	2907565	
28	A/R	CIRCUIT BREAKER 1P 2A	PHOENIX CONTACT	2907559	
29	1	SURGE PROTECTOR	PHOENIX CONTACT	2907918	
30	1	UPS BYPASS SWITCH	ALWAYS-ON	BPS12020-ATS-DCC	
31	1	120V DUPLEX RECEPTACLE 15A W/ LED INDICATOR DIN RAIL MOUNTED	PHOENIX CONTACT	0804177	
32	1	UNINTERRUPTIBLE POWER SUPPLY, 120VAC, 1500VA	EATON	9SX	NOT SHOWN - TO SIT IN BOTTOM OF ENCLOSURE. INCLUDE RELAY-MS EXPANSION CARD
33	A/R	TERMINAL BLOCK, 250V FUSE, AWG 24-10, PUSH-IN TYPE	PHOENIX CONTACT	3211907	
34	A/R	TERMINAL BLOCK, FEED THROUGH, AWG 24-10, PUSH-IN TYPE	PHOENIX CONTACT	3211757	
35	A/R	TERMINAL BLOCK, GROUND, FEED THROUGH, AWG 24-10, PUSH-IN TYPE, GREEN-YELLOW	PHOENIX CONTACT	3211766	
36	A/R	TERMINAL BLOCK PLUG-IN BRIDGE, 20-POSITION (6mm), RED	PHOENIX CONTACT	3030365	FOR REFERENCE, MODIFY # OF POSITIONS OR COLOR AS REQUIRED
37	A/R	TERMINAL BLOCK END COVER, D-ST 4, GREY 2.2mm W	PHOENIX CONTACT	3030420	
38	2	POWER SUPPLY 24VDC/10A - PRO BAS	WEIDMULLER	2838460000	OR APPROVED EQUAL
39	1	REDUNDANCY MODULE - PRO RM	WEIDMULLER	2486090000	OR APPROVED EQUAL
40	A/R	TERMINAL BLOCK, 24V FUSE, AWG 24-10, PUSH-IN TYPE	PHOENIX CONTACT	3211903	
41	A/R	TERMINAL BLOCK, FEED THROUGH, AWG 26-12, PUSH-IN TYPE	PHOENIX CONTACT	3209510	
42	A/R	TERMINAL BLOCK, GROUND, FEED THROUGH, AWG 26-12, PUSH-IN TYPE, GREEN-YELLOW	PHOENIX CONTACT	3209636	
43	A/R	TERMINAL BLOCK PLUG-IN BRIDGE, 20-POSITION (5.2mm), RED	PHOENIX CONTACT	3030226	FOR REFERENCE, MODIFY # OF POSITIONS OR COLOR AS REQUIRED
44	A/R	TERMINAL BLOCK END COVER, D-ST 2.5, GREY 2.2mm W	PHOENIX CONTACT	3030417	
45	A/R	TERMINAL BLOCK 24 VDC COIL SPDT POWER RELAY, PUSH-IN TYPE	PHOENIX CONTACT	2900299	
46	A/R	TERMINAL BLOCK, TRIPLE LEVEL, FEED THROUGH W/ GROUND, AWG 26-12, PUSH-IN TYPE	PHOENIX CONTACT	3210541	
47	A/R	TERMINAL BLOCK, TRIPLE LEVEL, FEED THROUGH W/ GROUND, AWG 26-12, PUSH-IN TYPE, BLUE	PHOENIX CONTACT	3210538	
48	A/R	TERMINAL BLOCK END COVER, D-ST 2.5 TRIPLE LEVEL, GREY 2.2mm W	PHOENIX CONTACT	3211647	
49	A/R	TERMINAL BLOCK, DOUBLE LEVEL, FEED THROUGH, AWG 26-12, PUSH-IN TYPE	PHOENIX CONTACT	3210567	
50	A/R	TERMINAL BLOCK END COVER, D-ST 2.5 DOUBLE LEVEL, GREY 2.2mm W	PHOENIX CONTACT	3211634	
51	A/R	FUSE, 5 X 20 mm, FAST-ACTING	BUSSMANN	GMA-R SERIES	FOR REFERENCE, OR APPROVED EQUAL

KELLER ASSOCIATES
4800 SW Griffith Drive, Suite 128
Beaverton, OR 97005
(971) 405-6331

REGISTERED PROFESSIONAL ENGINEER
97265PE
Digitally Signed: 2025.12.18 15:24:14-0700
OREGON
MAY 11, 2001
BRADLEY M. CULVER
EXPIRES: 12-31-2025

NO.	REVISIONS	DATE
1	ADDENDUM #3	2025-12-17

SANDY

ALDER CREEK WATER TREATMENT PLANT UPGRADES

LCP-A100 - BILL OF MATERIALS

DRAWN:SRLB | CHECK: BMC

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 224100-000 | PAGE

SHEET NO. EI-504-A

ADDENDUM 3
ATTACHMENT 10.3

GENERAL SHEET NOTES

1. BILL OF MATERIALS REFLECTS INTENDED COMPONENTS AS DERIVED FROM OWNER RECOMMENDED PREFERRED SCADA EQUIPMENT. CONTRACTOR TO COORDINATE WITH OWNER FOR APPROVAL OF "OR EQUAL" EQUIPMENT SUBSTITUTIONS PRIOR TO SUBMITTING CONTROL PANEL SHOP DRAWING & SCHEMATIC SUBMITTALS.
2. ITEM QUANTITIES ARE RELATIVE TO INTENDED DESIGN. CONTRACTOR TO DETERMINE FINAL BOM ITEM QUANTITIES AND/OR ANY ADDITIONAL ITEMS TO BE INCLUDED IN SUBMITTALS.

CONTROL PANEL BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	MANUFACTURER	CATALOG #	NOTES
01	1	NEMA 4 60" H x 48" W x 12" D ENCLOSURE	SAGINAW	SCE-60EL4812LPPL	
02	1	56" H x 44" W SUBPANEL	SAGINAW	SCE-60P48	
03	2	18" LED LIGHT FIXTURE W/ INTEGRATED DOOR SWITCH	SAGINAW	SCE-LF18NO	
04	2	FILTERED VENT, 8" x 8"	RITTAL	3239200	
05	1	PANEL PC W/ CAPACITIVE TOUCH SCREEN 12" MIN	ADVANTECH	TPC SERIES	OR APPROVED EQUAL 1
06	A/R	DIN RAIL SLOTTED, 15mm D	PHOENIX CONTACT	1201730	FOR REFERENCE, OR EQUAL
07	A/R	DIN RAIL END STOP 9.5mm W	PHOENIX CONTACT	0800886	
08	A/R	TYPE F PANDUIT NARROW SLOT WIRING DUCT (1.5"x3"), GREY	PANDUIT	F1.5X3LG6	
09	A/R	PANDUIT WIRING DUCT COVER, GREY	PANDUIT	C1.5LG6	
10	A/R	TYPE F PANDUIT NARROW SLOT WIRING DUCT (2"x3"), GREY	PANDUIT	F2X3LG6	
11	A/R	PANDUIT WIRING DUCT COVER, GREY	PANDUIT	C2LG6	
12	1	PACSYSTEMS RX3i CONTROLLER, 13MB	EMERSON	IC695CPE310	FOR REFERENCE, OR EQUAL; COORDINATE WITH OWNER FOR PREFERRED CONFIGURATION
13	3	12 CHANNEL ISOLATED VOLTAGE/CURRENT ANALOG INPUT MODULE	EMERSON	IC695ALG112	
14	2	8 CHANNEL CURRENT ANALOG OUTPUT MODULE	EMERSON	IC695ALG708	
15	2	16 POINT DC INPUT MODULE, 24 VDC SIGNALS	EMERSON	IC694MDL645	
16	1	16 POINT DC OUTPUT MODULE, 24 VDC SIGNALS	EMERSON	IC694MDL740	
17	1	POWER SUPPLY, 24VDC, 40W	EMERSON	IC695PSD040	
18	1	12 SLOT UNIVERSAL BACKPLANE	EMERSON	IC695CHS012	
19					
20					
21	1	2000 SERIES MANAGED ETHERNET SWITCH, 14 RJ45 PORTS, 2 SFP PORTS, 10/100/1000 Mbps	PHOENIX CONTACT	1006191	OR APPROVED EQUAL
22					
24	A/R	PATCH CORD, RJ45 MALE/RJ45 MALE, 3FT, BLUE	QUIKTRON	576-S10-003	FOR REFERENCE, OR EQUAL; FOR PLC NETWORKING
25	A/R	PATCH CORD, RJ45 MALE/RJ45 MALE, 7FT, BLUE	QUIKTRON	576-S10-007	FOR REFERENCE, OR EQUAL; FOR TOUCHSCREEN HMI NETWORKING
26	A/R	CIRCUIT BREAKER 1P 15A	PHOENIX CONTACT	2907571	
27	A/R	CIRCUIT BREAKER 1P 8A	PHOENIX CONTACT	2907565	
28	A/R	CIRCUIT BREAKER 1P 2A	PHOENIX CONTACT	2907559	
29	1	SURGE PROTECTOR	PHOENIX CONTACT	2907918	
30	1	UPS BYPASS SWITCH	ALWAYS-ON	BPS12020-ATS-DCC	
31	1	120V DUPLEX RECEPTACLE 15A W/ LED INDICATOR DIN RAIL MOUNTED	PHOENIX CONTACT	0804177	
32	1	UNINTERRUPTIBLE POWER SUPPLY, 120VAC, 1500VA	EATON	9SX	NOT SHOWN - TO SIT IN BOTTOM OF ENCLOSURE. INCLUDE RELAY-MS EXPANSION CARD
33	A/R	TERMINAL BLOCK, 250V FUSE, AWG 24-10, PUSH-IN TYPE	PHOENIX CONTACT	3211907	
34	A/R	TERMINAL BLOCK, FEED THROUGH, AWG 24-10, PUSH-IN TYPE	PHOENIX CONTACT	3211757	
35	A/R	TERMINAL BLOCK, GROUND, FEED THROUGH, AWG 24-10, PUSH-IN TYPE, GREEN-YELLOW	PHOENIX CONTACT	3211766	
36	A/R	TERMINAL BLOCK PLUG-IN BRIDGE, 20-POSITION (6mm), RED	PHOENIX CONTACT	3030365	FOR REFERENCE, MODIFY # OF POSITIONS OR COLOR AS REQUIRED
37	A/R	TERMINAL BLOCK END COVER, D-ST 4, GREY 2.2mm W	PHOENIX CONTACT	3030420	
38	2	POWER SUPPLY 24VDC/10A - PRO BAS	WEIDMULLER	2838460000	OR APPROVED EQUAL
39	1	REDUNDANCY MODULE - PRO RM	WEIDMULLER	2486090000	OR APPROVED EQUAL
40	A/R	TERMINAL BLOCK, 24V FUSE, AWG 24-10, PUSH-IN TYPE	PHOENIX CONTACT	3211903	
41	A/R	TERMINAL BLOCK, FEED THROUGH, AWG 26-12, PUSH-IN TYPE	PHOENIX CONTACT	3209510	
42	A/R	TERMINAL BLOCK, GROUND, FEED THROUGH, AWG 26-12, PUSH-IN TYPE, GREEN-YELLOW	PHOENIX CONTACT	3209636	
43	A/R	TERMINAL BLOCK PLUG-IN BRIDGE, 20-POSITION (5.2mm), RED	PHOENIX CONTACT	3030226	FOR REFERENCE, MODIFY # OF POSITIONS OR COLOR AS REQUIRED
44	A/R	TERMINAL BLOCK END COVER, D-ST 2.5, GREY 2.2mm W	PHOENIX CONTACT	3030417	
45	A/R	TERMINAL BLOCK 24 VDC COIL SPDT POWER RELAY, PUSH-IN TYPE	PHOENIX CONTACT	2900299	
46	A/R	TERMINAL BLOCK, TRIPLE LEVEL, FEED THROUGH W/ GROUND, AWG 26-12, PUSH-IN TYPE	PHOENIX CONTACT	3210541	
47	A/R	TERMINAL BLOCK, TRIPLE LEVEL, FEED THROUGH W/ GROUND, AWG 26-12, PUSH-IN TYPE, BLUE	PHOENIX CONTACT	3210538	
48	A/R	TERMINAL BLOCK END COVER, D-ST 2.5 TRIPLE LEVEL, GREY 2.2mm W	PHOENIX CONTACT	3211647	
49	A/R	TERMINAL BLOCK, DOUBLE LEVEL, FEED THROUGH, AWG 26-12, PUSH-IN TYPE	PHOENIX CONTACT	3210567	
50	A/R	TERMINAL BLOCK END COVER, D-ST 2.5 DOUBLE LEVEL, GREY 2.2mm W	PHOENIX CONTACT	3211634	
51	A/R	FUSE, 5 X 20 mm, FAST-ACTING	BUSSMANN	GMA-R SERIES	FOR REFERENCE, OR APPROVED EQUAL

KELLER ASSOCIATES
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(971) 405-6331

REGISTERED PROFESSIONAL ENGINEER
97265PE
Digitally Signed: 2025.12.18 10:04:24-07'00'
OREGON
MAY 11, 2001
BRADLEY M. CULVER
EXPIRES: 12-31-2025

NO.	REVISIONS	DATE
1	ADDENDUM #3	2025-12-17

SANDY

ALDER CREEK WATER TREATMENT PLANT UPGRADES

PCP-B100 - BILL OF MATERIALS

DRAWN:SRLB | CHECK: BMC

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 224100-000 | PAGE

SHEET NO. EI-504-B

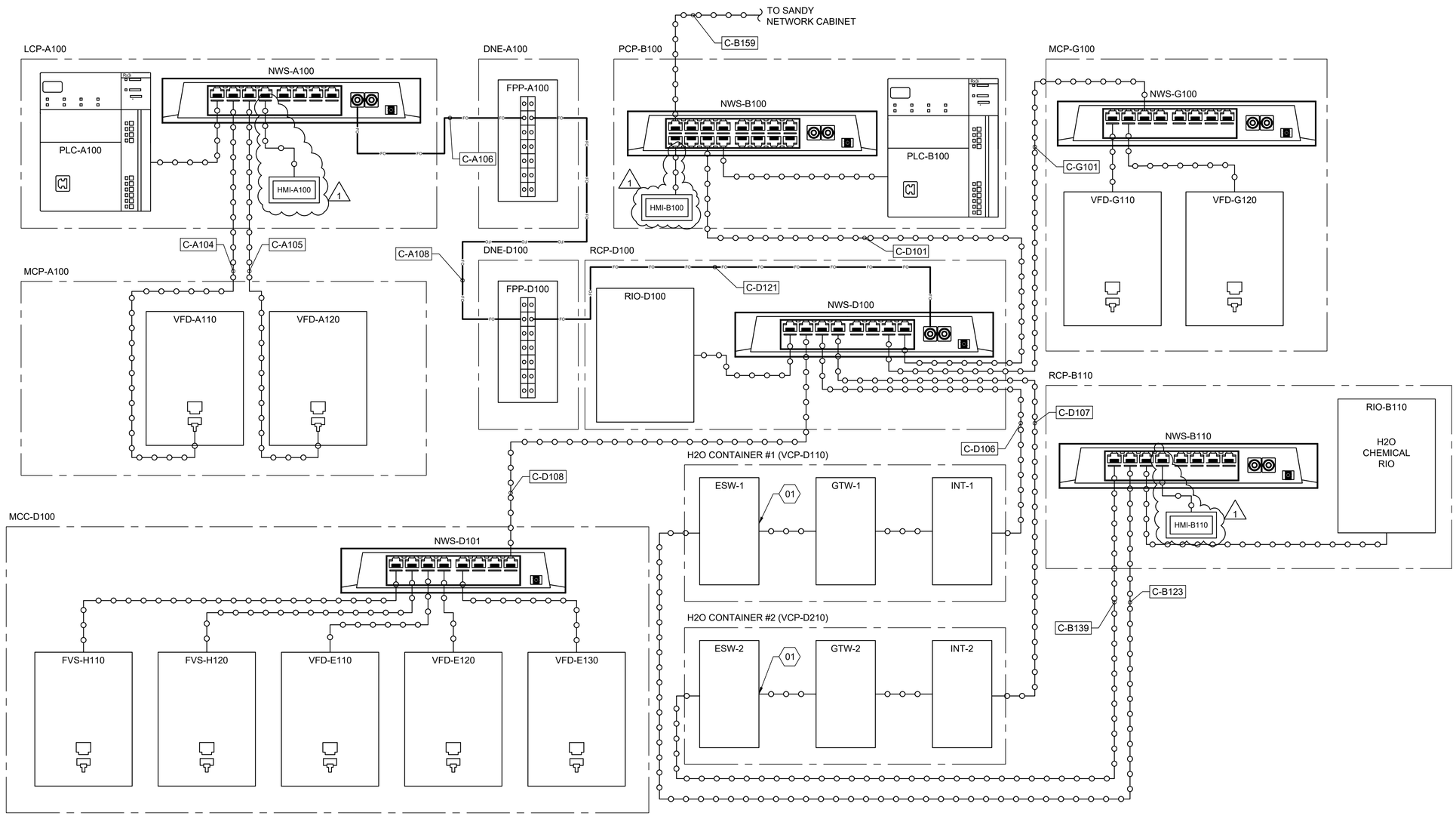
ADDENDUM 3
ATTACHMENT 10.4

GENERAL SHEET NOTES

1. CONTRACTOR TO PROVIDE ALL EQUIPMENT AND ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION.
2. COORDINATE WORK AND ROUGH-IN LOCATIONS WITH RELATED TRADES.
3. CONCEAL ALL RACEWAYS WITHIN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.
4. ROUTE CONDUIT IN COMMON TRENCH WHENEVER POSSIBLE.
5. COORDINATE WITH SCADA INTEGRATOR.
6. RE: EI-601, EI-602 FOR CONDUIT SCHEDULE.

SHEET KEYNOTES

01 RE: APPENDIX A 24U5588-I27-0001 NETWORK DIAGRAM FOR DETAILED VENDOR ETHERNET DIAGRAM.



A1 NETWORK DIAGRAM
N.T.S.

KELLER ASSOCIATES
4800 SW Griffith Drive, Suite 128
Beaverton, OR 97005
(971) 405-6331

REGISTERED PROFESSIONAL ENGINEER
97265PE
Digitally Signed: 2025.12.18 15:24:32-07'00'
OREGON
MAY 11, 2001
BRADLEY M. CULVER
EXPIRES: 12-31-2025

NO.	REVISIONS	DATE
1	ADDENDUM #3	2025-12-17

SANDY

ALDER CREEK WATER TREATMENT PLANT UPGRADES

NETWORK DIAGRAM

DRAWN: EK | CHECK: BC

VERIFY SCALE: Scales based on 22"x34" prints.
1-1/2 Inches

PROJECT NO. 224100-000 | PAGE

SHEET NO. EI-700

J:\224100-000 SANDY ALDER CREEK WTP UPGRADES\C_DESIGN_CAD\3_DESIGN\D_PLANS-1109_INSTR\EI-700.DWG LAST SAVED: 12/18/2025 12:26 PM PRINTED: 12/18/2025 12:27 PM