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ADDENDUM NO. 3
TO THE REQUEST FOR PROPOSAL
DOCUMENTS FOR PROJECT NO. SDWRP-02-24

CITY OF SANDY

MEMBRANE EQUIPMENT FOR UPGRADED WATER TREATMENT PLANT

This addendum, issued on the **5th day of March 2024,** affects the request for proposal documents for the **Membrane Equipment for Upgraded Water Treatment Plant Project No. SDWRP-02-24** and shall be deemed an integral part of the above referenced documents.

CLARIFICATIONS

Question #1:

Anticipated coagulant dose in the feed water. This information is required in establishing MF flux design.

Response: #1

Anticipated coagulate dose maybe 1-3 mg/l (as product) during most periods. The dose may be 3-9 mg/l during stormy weather with high runoff and elevated TSS, which would coincide with low water demand.

Question #2:

The specification has quoted for Drawing I-001 to Drawing I-006. These drawings have not been attached in the specifications. These is drawings are referenced in the specifications and are required in the interpretation of specification context.

Response #2

The Conceptual Design Report is now included, which contains Process flow Diagrams to be used as reference.

Question #3

After reviewing SECTION 01 33 17 and SECTION 11 30 00 of the specification, Buyer would like to clarify that the PE signed seismic calculations and anchor bolt calculations can be provided for the containerized systems itself, and external tanks. The seismic calculations are not possible for internal equipment, mechanical and electrical components of the containerized system and the interconnecting piping between the containerized systems. Seismic calculations on the internal equipment of the containerized system may require serious work on the containerized equipment and is not Aria Filtra's standard offering. Please allow for the seismic calculations of the complete containerized systems and external tanks only.

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Response: #3

Seismic calculations will be required for the container itself and external tanks. Components bolted to the inside of the container do not require seismic calculations.

Question #4:

Procurement Agreement, Article 10.01A	Request a clarification, as Section 00 70 00 General Procurement Conditions to EJCD Procurement General Conditions, P-200 (2000 Edition), which begin on page 71 of the RFP package, is not listed as a Contract Document.

Response #4: Article 10.01A has been updated and now includes General Conditions for Procurement Contracts.

Question #5:

Procurement Agreement, Article 10.01E	Request a clarification, as Section 00 70 00 General Procurement, which begin on page 71 of the RFP package, is not listed in the order of precedence.

Response #5: Article 10.01E has been updated in includes General Conditions for Procurement Contracts.

Question #6:

EJCDC P-700, Supplementary Conditions, Article 8.01.C.1	Revise to: After all of the Goods have been incorporated into the Project, tested in accordance with such testing requirements as are specified, and are functioning as intended ~~for a period of 11 months during the correction period~~, Buyer or Engineer will make a final inspection. Comment: the Correction Period, per Article 8.3, extends one year from the Notice of Substantial Completion.

Response #6: Comment accepted.

Question #7:

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EJCDC P-700, General Conditions, Article 8.01.C.2	Request a clarification, as "final inspection" is not a defined term, but "Substantial Completion" is a defined term. Does acceptance happen at Substantial Completion? Thank you.

Response #7: Acceptance happens following substantial completion, acceptance testing and final inspection per 8.01.C.2.

Question #8:

EJCDC P-700, Supplementary Conditions, Article 8.02.C.4	Delete, as it is unclear as to what is at serious risk of loss or damage.

Response #8: It is in the buyer's best interest to maintain this statement. Not accepted

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Question #9:

MEMBRANE PROCUREMENT 2002006267 – SANDY PROGRAM MANAGEMENT ARTICLE 6 – CONTRACT PRICE 6.01.D PAGE 00 52 00 - 8	We take exception and should be deleted. We cannot provide a 20-year guaranteed membrane replacement price because of the supply chain uncertainty and price instability that we have all experienced the recent years even if tied to CPI adjustment. The UNA module is the highest performing module on the market and the module configuration has been copied by over 4 manufacturers. Today the market has replacement module options, and this competitive option will manage the Pall UNA module future price. Please remove this price requirement in the bid form as well. This is not applicable.

Response #9: Comment accepted

Question #10

With reference to section 2.07.A (page 22/276): A "Notice to Commence Fabrication" may be issued at any time for a period of 365 days after the Effective Date of the Agreement. However, Article 6.01.C (page 46/276), indicates that "*The Contract Price for membrane units and ancillary equipment shall remain valid for 180 days after the effective date of the agreement. If the "Notice to Commence Fabrication" is issued after 180 days from the effective date of the agreement (up to a maximum of 3 years), the*

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Contract Price will be adjusted through Change Order". Please confirm the timeline for issuing the notice to commence fabrication.

Response #10

"Notice to Commence Fabrication" will be issued once shop drawings and submittals have been approved. This can vary depending on timely submission of documents, quality of submittals, and sellers responsiveness to clarifications. We expect "Notice to Commence Fabrication" would happen between 120 and 200 days of the effective date of the Agreement.

Question #11

With reference to Section 2.11 (page 23/276): please provide the applicable tax rate for this project.

Response #11

Oregon sales tax is 0.0%. Seller to confirm all other taxes and fees.

Question #12

With reference to Section 01 01 00, paragraph 1.1A.2.d. and section 11 30 00, paragraph 2.01B.2:

The document describes that the intent of the coagulation is to comply with regulatory requirements for DBP. However, the feed water quality show TOC levels lower than 1 ppm and no analysis has been provided on DBP generation from the TOC. Please provide details on the level of DBP generated on raw water from chlorine contact. It is not possible to provide any warranty on treated water quality regarding DBP with the available information.

Response #12

Buyer is not asking for a warranty based on DBP formation.

Question #13

With reference to Section 11 30 20 EXHIBIT A, paragraph 2.02.A.6: The effluent color requirement has been specified to be <1 Pcu, but the influent color information was not provided. Please provide the influent color information for our analysis.

Response #13

No color data is available.

City of Sandy – Alder Creek Water Treatment Plant Upgrade

Conceptual Design Report - Final

Reference: 2002006267

Prepared for:
City of Sandy
Jenny Coker, PE – Public Works Director

Prepared by:
Adam Odell, PE

Reviewed by:
Dick Talley, PE, PMP – Project Manager
Bryan Black, PE

Submitted:

December 6, 2023

LIST OF FIGURES

LIST OF TABLES

ATTACHMENTS

AACE	Association for the Advancement of Cost Engineering
ADD	Average Day Demand
ACH	Aluminum Chlorohydrate
AWWA	American Water Works Association
CT	Chlorine Contact Time
DI	Ductile Iron
ft	Feet, Foot
fps	Feet per Second
FWP	Finished Water Pipeline
gpm	Gallons per Minute
HGL	Hydraulic Grade Line
HMI	Human Machine Interface
hp	Horse Power
LPMF	Low Pressure Membrane Filtration
MDD	Maximum Day Demand
MFWTP	Membrane Filtration Water Treatment Plant
MG	Million Gallons
mgd	Million Gallons per Day
OHA	Oregon Health Authority
OPCC	Opinion of Probable Construction Costs
PLC	Programmable Logic Controller
Psi	Pounds per Square inch
PS	Pump Station
RWPS	Raw Water Pump Station
SCADA	Supervisory Control and Data Acquisition
SDWRP	Sandy Drinking Water Reinvestment Program
SF	Square Feet
SRF	State Revolving Fund
VFD	Variable Frequency Drive
WSE	Water Surface Elevation
WSMP	Water System Master Plan
WTP	Water Treatment Plant

1.0 INTRODUCTION AND BACKGROUND

The City of Sandy (City) is embarking on a Program to upgrade and improve reliability of its potable water supply and distribution systems. Following completion of the Water System Master Plan Update (Plan) (Consor, 2022), Oregon Health Authority (OHA) approved the Plan, and the City Council adopted the Plan in November 2022. The City selected Stantec to be the Program Manager in the Spring of 2023 for implementation of the Sandy Drinking Water Reinvestment Program (SDWRP).

Upon review of the Plan and in further consultation with the City, it was jointly determined by the City and Stantec that stabilizing the Alder Creek Water Treatment Plant production reliability was critically important as an immediate need.

In parallel, the City and Stantec also determined to proceed forward to secure a reliable connection to the filtered water supply of the proposed Portland Water Bureau Bull Run Filtration Facility. By stabilizing and achieving near term reliability of these two (2) sources, the City would secure their supply for the near-term future (Year 2040) expected treated water demand. The efforts to achieve these two (2) near-term objectives began in the Summer of 2023 and are proceeding forward.

The second step will be for Stantec to continue to evaluate the future of the City's water supply given its additional potential sources in Brownell Springs and the Salmon River as well as determining the critical investments that are needed to the storage and distribution systems. The results and recommended actions following this secondary analysis will be documented in an Amendment to the Plan which will delve deeper into future upgrades and determine the roadmap for the City moving forward.

In summary, after review of the potential supply options for the next 20+ years, the City selected the following for near-term implementation:

- Build a pump station and pipeline to supply water from the Portland Water Bureau's new Filtration Facility (to be completed in 2027), and
- Upgrade and modernize the existing Alder Creek WTP and related facilities.

This report addresses the improvements to be made for the Alder Creek supply, which has historically been the City's primary source. In 2013, the City built the Hudson Road Pump Station to deliver unfiltered/free-chlorinated Bull Run water (purchased from PWB) to the City's Revenue Reservoir. Bull Run water is then blended with City water (predominantly from the Alder Creek WTP) in the reservoir and delivered to City customers. Blending is required due to the high free-chlorine residual, low pH, and high disinfection by-product (DBP) concentrations from the Bull Run supply.

The existing infrastructure for the Alder Creek supply was built 50+ years ago, including the raw water pipeline from the Alder Creek intake and the water treatment plant (WTP) building. The raw water pump station was constructed in the early 1990s. Inside the WTP building are three (3) Trident package plant units (circa 1995) (2-stage filtration) which provide a nameplate total-installed capacity of approximately 3.0 mgd which is greater than the City's water right of 2.4 mgd

from Alder Creek. The filtered/chlorinated water is then pumped to Terra Fern Reservoir and from there, the water is delivered approximately 8 miles to the City via a single 12-inch transmission pipeline which was constructed over 50 years ago. **Figure 1** below shows the City's main Alder Creek Water Treatment Plan (WTP) and related infrastructure, which is located ~8 miles east from Sandy along Highway 26.

Figure 1 – Alder Creek Water Infrastructure

Over the past two (2) decades, the Alder Creek WTP capacity and reliability has decreased significantly due to mechanical and controls problems with the old Trident filter units and the related mechanical pumping/piping systems. Of the three (3) installed filters, only one (1) is currently in operation and can produce two (2) mgd when Alder Creek turbidites are low (< 3 NTU). If turbidities increase above three (3) NTU, the filter cannot perform reliably. These challenges were a major reason for the City to build the Hudson Road PS. Recently, the City and its contract operator (Veolia) have begun an attempt for restarting the smaller Trident units to increase reliability and capacity, including replacement of media and control upgrades. These improvements could be completed by the end of 2023 and may bring the installed capacity to > 2.5 mgd, partly dependent on how much raw water can be pumped to the WTP and the capacity of the single finished water pump. The City is currently investigating and documenting the flows in Alder Creek as gaging records are not available.

Figure 2 and **Figure 3** show the Alder Creek WTP building and the adjacent backwash storage pond, respectively.

Figure 2 – Alder Creek WTP Building

Figure 3 – Backwash Storage Pond

1.1 ALDER CREEK WTP OPERATIONS

The Alder Creek WTP operates in a “constant speed” mode, meaning that treated water is produced at a constant flowrate and operations staff do not adjust production up or down to match demand daily. Production may be adjusted seasonally/low demand periods, or when turbidity in the creek is higher than normal. In general, when the Terra Fern Reservoir’s water surface elevation (WSE) is low, a signal is initiated to start the WTP, once the reservoir is full, the WTP turns off. Pump speeds and chemical dosing are pre-set and manually adjusted. The filters are backwashed as determined by operations staff, which is typically once per day. The dirty backwash water is routed to the settling pond, and clarified backwash water is returned to Alder Creek.

1.1.1 Alder Creek Intake

No improvements are currently planned at the Alder Creek intake structure. Alder Creek flow monitoring data is currently being gathered and will be provided at a later date.

1.1.2 Raw Water Pump Station

The existing Raw Water Pump Station (RWPS) is accessed from the Alder Creek WTP along an unimproved dirt road. The RWPS is a pre-fabricated cylindrical steel structure which is partially buried. Access down into the pump station requires removing a steel cover plate and climbing down a ladder to an underground space. The RWPS contains:

- Two (1 duty + 1 standby) 1,500 gpm pumps, each 25 hp.
- Variable Frequency Drives (VFDs) and other miscellaneous electrical gear.
- A single sump pump
- Vents and supply fans

The RWPS is in poor condition and has occasionally flooded, which has nearly submerged the VFD cabinets. Pinholes in piping and the pump casing were observed (with water leaking out) and the space is extremely damp which has resulted in severe corrosion. **Figure 4** shows the exterior of the RWPS, and **Figure 5** shows the inside of the RWPS looking down from the access hatch.

Figure 4 – Alder Creek Raw Water Pump Station

Figure 5 – Looking Down Into the Alder Creek Raw Water Pump Station

1.1.3 Filtration Building and Package Filter Units

Raw water from the RWPS, located between the intake and the WTP, is pumped directly to the filters. The raw water is metered with a single-path ultrasonic meter and then dosed with a small amount of coagulant just outside the building in a buried vault. It is unknown currently if additional chemical feed points (such as soda ash) exist in the feed piping system. Raw water is fed into the filter units, sodium hypochlorite is added for disinfection post filtration and then water is pumped to Terra Fern Reservoir. Post-filter chlorine contact time to meet the disinfection requirements is met in the pipeline between the WTP and Terra Fern Reservoir.

The building contains two (2) 350 gpm steel Trident package filters (model #'s TR-210A) installed in 1995, and one (1) 1400 gpm steel Trident package filter (TR-840A) installed in 2000.

Observations of the WTP system includes:

- There is only one (1) operating finished water pump.
- Neither of the 350 gpm filters are currently operational. Only the single 1,400 gpm filter is currently available for use.
- Corrosion of tanks and piping inside the building is pervasive.
- The current Instrumentation and Control system is old and unreliable.
- As stated above, the goal is to make all three (3) filter units operational by the end of 2023 however this has not yet been achieved.

Figure 6 and **Figure 7** are from inside the WTP:

Figure 6 – Filter #2, Currently Inoperable

Figure 7 – Filter #3 and Single Finished Water Pump

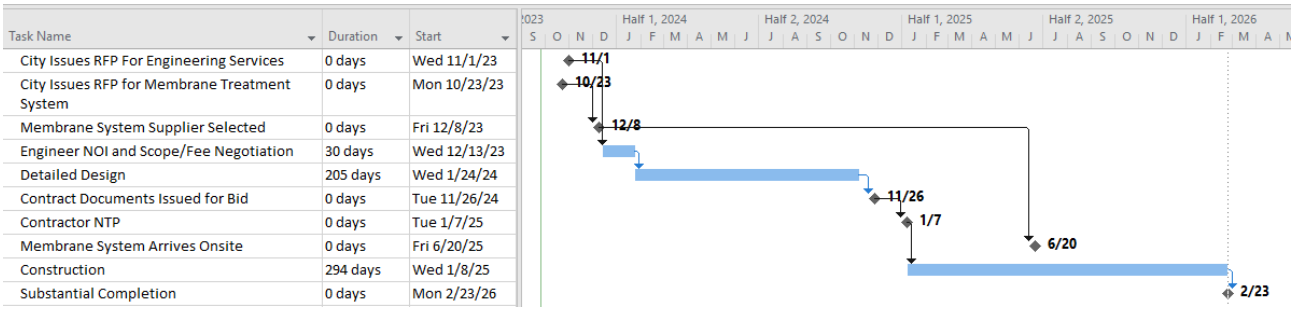
1.2 PROJECT GOALS

The primary goals and objectives of the Alder Creek WTP Upgrade Project include:

- Rehabilitate the existing raw water pump station.
- Develop a firm/reliable capacity of at least 1.8 mgd with a service life of at least 20 years.
- Continue using the existing WTP building for Electrical and Instrumentation needs which are defined in the SCADA Master Plan document (Stantec, 2023). The building should also be used for administration/storage purposes, and the City would like to maintain upkeep of the general structure for a yet-to-be-determined use.
- Complete construction and commissioning prior to mid-2027 which is when the new PWB Bull Run Filtration Facility is planned to become operational.

- Keep the existing Alder Creek WTP operational during construction, to be able to treat and supply up to 1.0 mgd.

The purpose of this Conceptual Design Report is to provide adequate background information, as well as establish a Basis of Design (BOD), to allow the City to issue an RFP to select the Engineer of Record (EOR) to complete the detailed design for the selected improvements and upgrades. This report identifies the City's preferred treatment alternative for the Alder Creek WTP project which includes a high-level concept design for the preferred alternative. A basic project overall project schedule is shown below in **Figure 8**.



Task Name	Duration	Start
City Issues RFP For Engineering Services	0 days	Wed 11/1/23
City Issues RFP for Membrane Treatment System	0 days	Mon 10/23/23
Membrane System Supplier Selected	0 days	Fri 12/8/23
Engineer NOI and Scope/Fee Negotiation	30 days	Wed 12/13/23
Detailed Design	205 days	Wed 1/24/24
Contract Documents Issued for Bid	0 days	Tue 11/26/24
Contractor NTP	0 days	Tue 1/7/25
Membrane System Arrives Onsite	0 days	Fri 6/20/25
Construction	294 days	Wed 1/8/25
Substantial Completion	0 days	Mon 2/23/26

Figure 8 – Overall Project Schedule

2.0 Recent WTP Production & Water Quality (2020-2022)

Minimal raw water quality exists for the Alder Creek source. Only water production rates, raw water turbidity, and raw water pH are currently tracked. **Table 1** provides the average monthly water production rate in million gallons per day (mgd) for the last four (4) years.

Table 1 – Monthly Average Water Production Rate (mgd)

	Year				
	2019	2020	2021	2022	2023
Jan 1 - 15	/	0.346	0.385	0.553	0.537
Jan 16 - 31	/	0.336	0.327	0.490	0.546
Feb 1 - 15	/	0.360	0.274	0.421	0.529
Feb 16 - 28	/	0.394	0.313	0.484	0.507
Mar 1 - 15	0.295	0.392	0.346	0.450	0.514
Mar 16 - 31	0.160	0.364	0.357	0.482	0.447
Apr 1 - 15	0.221	0.361	0.378	0.427	0.446
Apr 16 - 30	0.192	0.324	0.457	0.302	0.462
May 1 - 15	0.494	0.376	0.623	0.215	0.488
May 16 - 31	0.372	0.400	0.631	0.308	0.748
Jun 1 - 15	0.648	0.469	0.730	0.345	0.748
Jun 16 - 30	0.587	0.567	1.170	0.453	0.776
Jul 1 - 15	0.594	0.678	1.039	0.563	0.897
Jul 16 31	0.880	0.925	1.192	0.926	1.045
Aug 1 - 15	0.975	1.039	0.837	0.873	
Aug 16 - 31	0.932	0.871	0.975	1.022	
Sep 1 - 15	0.730	0.774	0.947	0.970	
Sep 16 - 30	0.430	0.577	0.701	0.738	
Oct 1 - 15	0.377	0.467	0.588	0.574	
Oct 16 - 31	0.244	0.387	0.490	0.620	
Nov 1 - 15	0.235	0.441	0.395	0.583	
Nov 16 - 30	0.230	0.333	0.444	0.694	
Dec 1 - 15	0.341	0.393	0.361	0.683	
Dec 16 - 31	0.361	0.348	0.379	0.573	

The Alder Creek WTP has delivered an annual average supply of 0.5 mgd over the past three (3) years, with a range of about 0.35 to 1.2 mgd depending on seasonal demands.

Raw water quality data is presented in **Figure 9** and **Figure 10** and provides insight into how the quality changes on a seasonal basis. The Alder Creek supply is generally considered to be a low turbidity/low color supply typical of many Pacific Northwest (PNW) surface water supplies west of the Cascades, but can change quickly during periods of heavy rain and run-off. The plant currently operates un-attended during most of each day, with brief daily visits by the City's Contract Operator (Veolia). Due to remoteness and aging equipment, the City has limited/no ability to monitor plant operations remotely. During challenging water quality conditions (turbidity and/or color), the plant production rate is decreased accordingly, as system demands are usually low during these events. The City will also be completing an upgrade/replacement of its SCADA system, and the upgraded WTP is planned to have the ability to be monitored and controlled remotely.

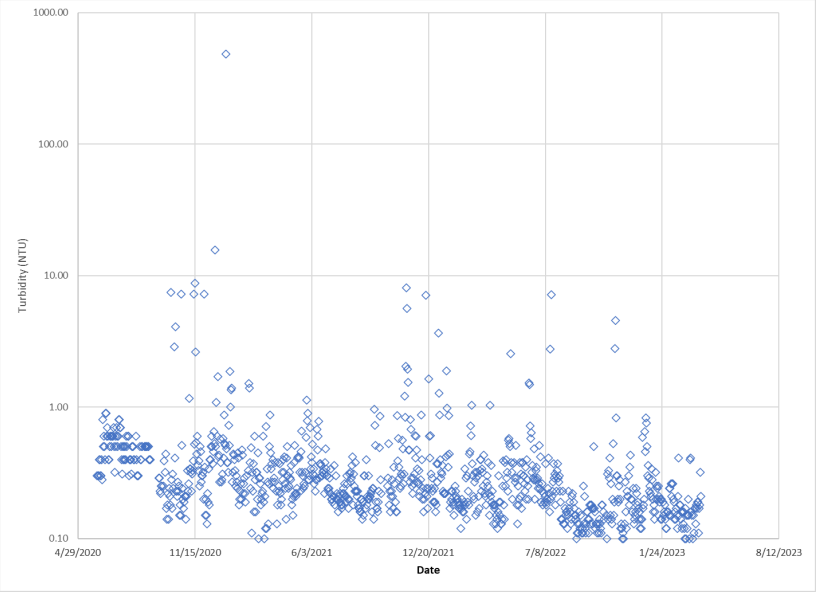


Figure 9 – Average Daily Turbidity

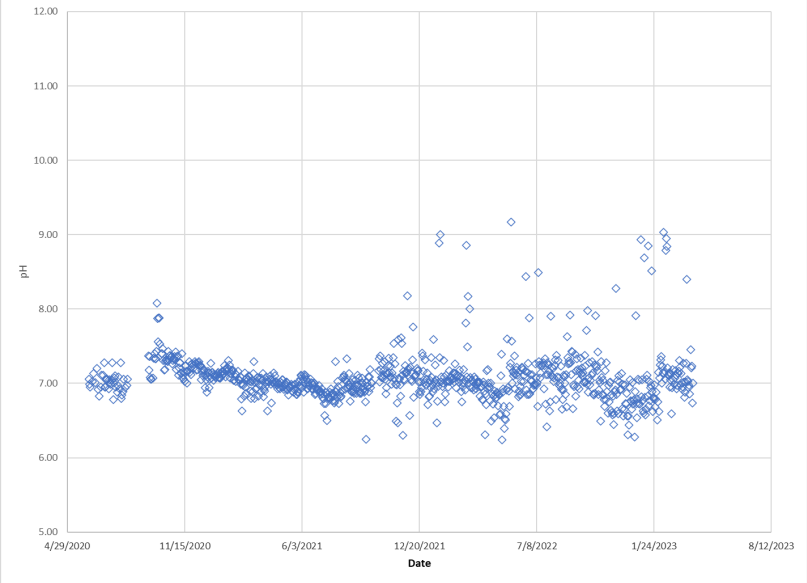


Figure 10 – Average Daily pH

As shown in **Figure 9** the average turbidity in the raw water is 0.91 NTU while the median was found to be 0.25 NTU. 96% of the turbidity measurements taken are lower than 1 NTU and 99.9% of the values under 100 NTU. The average pH is 7.02 with a standard deviation of 0.66. Temperature data was not available for this analysis.

The Design Engineer should determine if caustic soda can be used to raise the final pH for corrosion control purposes since the chemical is already available for membrane cleaning, or, if an additional chemical, such as soda ash, should be used to raise the pH and provide some minor alkalinity addition. A memorandum summarizing the corrosion control strategy should be prepared for Oregon Health Authority's (OHA) review. The current cost estimate has assumed Caustic Soda can be used for corrosion control purposes.

3.0 PREFERRED ALDER CREEK WTP REPLACEMENT ALTERNATIVE

The City and Stantec have reviewed numerous options for providing the City with an overall reliable water supply, including reviewing options for rehabilitating the Alder Creek WTP. The following summary is the City's preferred alternative which meets the City's affordability, schedule, and operations and maintenance goals and needs. A conceptual site layout and process flow diagrams are provided in **Attachment A** and **Attachment B** respectively**.**

3.1 Raw Water Pump Station and Membrane Feed Tank

The raw water pump station should be provided with the following:

- New raw water feed pumps, equivalent in duty/size to the existing
- Greater accessibility to the raw water pumps by removing the lid and adding an alternative lid / roof structure.
- New Variable Frequency Drives (VFDs) and electrical infrastructure, which should be located outdoors above the pump station in a vandal/weather proof enclosure
- New instrumentation and controls systems so that the pump station can be controlled remotely by the new treatment system(s). Pump station instrumentation and controls upgrades are limited to local control. Future actions will be taken by the City to integrate the local control into their planned overall improvements to the Water Supervisory Control and Data Acquisition (SCADA) upgrades by others.
- New sump pumps and exhaust fans
- Replace exposed piping which may be corroded

Coagulant, likely Aluminum Chlorohydrate (ACH), will be added just upstream of a new static mixer and raw water will be discharged to a storage tank, referred to as the MF (Microfiltration) Feed Tank. The purpose of the storage tank is twofold; provide at least six (6) minutes of contact time prior to filtration and provide a hydraulic break for ease of pump controls. The tank should be at least 8,500 gallons and will be located adjacent to the membrane filtration units at the plant site. The ACH tank and MF Feed Tank are shown on the Civil Site Plan in **Attachment A**.

3.2 Membrane Filtration Unit

For WTP capacities < 5 mgd, it is common for surface water supplies to implement a pre-engineered treatment system (package plant) from a cost perspective. Given the unreliability of the current Alder Creek WTP, the City has opted to pre-purchase a pre-packaged (containerized) Low Pressure Membrane Filtration (LPMF) system to quickly advance the design and construction schedule. The selected Design Engineer will be provided with the selected and purchased LPMF system submittal and will be required to design all ancillary facilities required to supply raw water, treat, disinfect, and pump the final finished water to Terra Fern Reservoir.

This LPMF containerized system will incorporate most of the systems needed for a complete water treatment plant. They are full factory tested and shipped ready to the chosen location. An example of a containerized system is shown in **Figure 11**

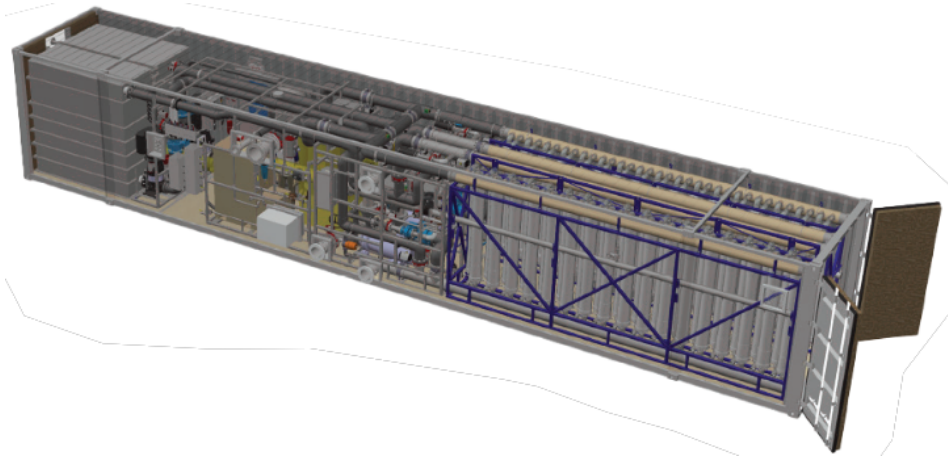


Figure 11 – Containerized LPMF System: Courtesy H2O Innovation

To achieve the desired firm capacity of 1.8 mgd it is anticipated that the City will procure two or more independent containerized membrane systems, each capable of 1.8 mgd in a 1+1 configuration. A Master Control Panel (MCP) may also be purchased to coordinate the operation of the multiple units.

3.2.1 Backwash Waste

Currently, backwash waste from the Trident package filters is routed to the onsite pond. Solids are settled (no coagulant addition to the backwash waste), and the clarified water overflows to Alder Creek. Existing clarified backwash recycle pumps are located in a manhole adjacent to the pond, but are not used and it is unclear if they are currently operable. The City desires to continue with this method of backwash waste management (i.e., no recycle of clarified backwash waste will be required).

3.2.2 Chemical Cleaning Systems

Two tanks are used for cleaning of the membranes; a Clean-In-Place (CIP) tank located within the LPMF container, and a Neutralization tank located outdoors. Chemicals are mixed and batched in the CIP tank and then pumped through the membrane unit. Once the clean is complete, the chemical mixture is sent to the Neutralization tank so that the CIP waste can be pH neutralized and dechlorinated for disposal. The pH-neutralized waste, typically referred to as CIP cleaning waste, will be sent to an underground HDPE tank (CIP Waste Tank) and stored for eventual discharge either to the existing on-site septic tank, or it may be periodically removed and hauled away by a septage hauler. Final location of the CIP Waste Tank will be determined by the Design Engineer.

Chemicals used for cleaning include sodium hydroxide and sodium hypochlorite stored in bulk, and movable totes (~270 gallons) of citric acid and calcium thiosulfate. Chemicals will be provided by the City, but the chemical pumping systems will be provided by, and controlled by the membrane system. It should be noted however that the CIP system can vary by manufacturer.

3.3 Bulk Chemical Storage

Bulk chemical storage will include the following chemicals:

- ACH ; used for coagulation of raw water prior to filtration.
- Sodium Hypochlorite (12.5%); used for both cleaning of the membranes during the CIP process, and for final disinfection of treated water.
- Sodium Hydroxide (25%); used for both cleaning of the membranes during the CIP process, and for pH adjustment of treated water.

Bulk chemical tanks should be at least 3,000 gallons each and will be located adjacent to the membrane system and freeze protected as required. Feed pumps for coagulant addition, disinfection, and pH adjustment will be designed and specified by the design engineer. As stated above, pumps used for the CIP process are typically provided by the membrane system supplier. A secondary containment concept is provided in Appendix A.

3.4 Disinfection and Finished Water Pumping

As shown on Figure 1, there are City of Sandy customers within the immediate vicinity of the Alder Creek WTP. The nearest customer is approximately 600-ft from the finished water pump station. Based on conversations with the City staff, the pipeline that feeds these customers was artificially upsized to achieve the necessary Chlorine Contact Time (CT).

In addition to the City of Sandy's customers, the adjacent Alder Creek Barlow Water District is a wholesale customer who is also served with a direct connection at the WTP site. Again, based on conversations with City Staff, the Alder Creek Barlow Water District has their own tank for water storage as well as meeting the CT requirement.

The remainder of the City's customer base has CT met by using a combination of the finished water pipeline from the Alder Creek WTP and Terra Fern reservoir.

Although previous calculations (by others) have determined that the chlorine contact time is met for all of the City's customers, constructing a small, finished water break tank/clearwell would provide the following benefits:

- Improve overall system control
- Pumping finished water to Terra Fern reservoir is required anyway, and a clearwell is necessary to hold some volume of stored water.
- A buried or partially buried tank allows the membrane feed pumps to be a "standard size" for a containerized treatment plant. Currently, only ~5 psi of headloss is allowed downstream of the membranes without upsizing to a larger membrane feed pump, which could be challenging to fit inside of the container
- Meet CT for the nearby residents without relying to previous work and reduce the City's risk.

Stantec used the following as a preliminary evaluation for estimating a finished water break tank size. Note that the maximum summer water production rate was used, and is more conservative than using colder water temperatures (winter) and lower flow rates.

The removal/inactivation requirements for a Bin 1 supply (lowest microbial risk) per OHA and Environmental Protection Agency (EPA) include:

- 3-log Giardia
- 4-log virus
- 2-log Cryptosporidium

The MF system will likely be granted 2.5-log removal credit for Giardia, 2-log removal credit for Cryptosporidium and no credit for virus removal. Therefore, the minimum disinfection requirements include:

- 0.5-log Giardia
- 4.0-log virus

When using free chlorine as the primary disinfectant, Giardia inactivation requirements are typically the controlling factor to achieve disinfection compliance since viruses are more-easily inactivated by free chlorine. Per EPA's Surface Water Treatment Guidance Manual developed with the original SWTR in the early 1990s, the minimum CT values when using free chlorine for primary disinfection, for filtered water with a temperature of 5.0°C, pH 7.5 and with a 1.0 mg/L residual, are:

- Giardia = 30 mg/L-min

Assuming a baffling factor of 0.3 and a water production rate of 1,400 gpm (2.016 mgd) the calculated minimum reservoir size should be ~140,000 gallons.

The existing Terra Fern reservoir is 250,000 gallons, and the volume of water in the transmission pipeline from Alder Creek to Terra Fern reservoir is ~45,000 gallons.

During summer, it's known that the water level drops in Terra Fern reservoir, and the full volume cannot be assumed. Therefore, assuming a 30% full reservoir, and using the volume inside the pipeline as credit, a modest 20,000 gallon tank can be used.

It should also be noted that the geotechnical boring found softer than anticipated soils at this location which can be mitigated (without ground improvements) by over-excavating at least the top 10-ft of material and burying or partially burying the tank. Attachment 'A' currently shows a rectangular, mostly buried, cast-in-place tank, 20-ft x 15-ft with vertical turbine style pumps on top.

3.5 Site Civil Design and Infrastructure

3.5.1 General Site Layout

The LPMF containerized system, CIP and neutralization system, and bulk chemical storage will be located on a single slab on grade, but not within an enclosed building. A canopy, meant to protect

the infrastructure from rain and snow will be provided. Pipe and tanks subjected to freezing temperatures should be heat traced and insulated. Bulk chemicals can be located behind a chemical containment curb, and should a leak occur, fluid can be routed to the underground HDPE tank, normally used to hold neutralized CIP waste. As shown on the Civil Site Plan (**Attachment A**), the slab and canopy will be located in an area currently containing an existing drainfield (septic tank/pump are adjacent to the existing building). The drain field will be relocated as shown to make space for the new treatment infrastructure.

Stantec will provide the design consultant a survey of the WTP site, the RWPS, and a Geotechnical Data Report based on a single boring conducted September 1, 2023 under the anticipated Finished Water Storage Tank.

3.5.2 Yard Piping

The current design concept has a new raw water pipeline intercepting the existing raw water pipe downstream of the existing meter vault, just before a separate vault containing check valves and a gate valve at the plant site. The new raw water pipe will then be routed through a static mixer vault and discharge into the MF Feed tank. Pumping through the membrane system is typically done by pumps located within the membrane container unit. For containerized membrane treatment systems, filtered water is usually sent to a small, on-board, filtrate tank which can then be pumped into the Finished Water Storage Reservoir. As shown on the civil site plan (**Attachment A**), the current water distribution main splits; a small diameter pipeline (unknown size) feeds local homes along Whisky Creek Rd, and a 2” diameter pipeline feeds the Alder Creek Barlow Water District, which is about another mile east along Highway 26.

3.6 SCADA and Electrical Systems

- The Design Engineer will engage the Owner’s SCADA system integrator (Stantec) for the implementation of the new SCADA system for the Alder Creek WTP upgrades. The programming and deployment of the SCADA system for the Alder Creek WTP will be performed by Stantec but assistance in commissioning of the new SCADA system onsite will be supported by the Contractor and Design Engineer who will be responsible for all site PLC and HMI programming or updates. Procurement of the SCADA equipment will be by the Design Engineer and shall follow the guidelines based on the hardware and software requirements laid out in the City of Sandy SCADA Master Plan (2023).

- Plant instrumentation and controls upgrades are limited to local control. Future actions will be taken by the City to integrate the local control into their planned overall improvements to the Water Supervisory Control and Data Acquisition (SCADA) upgrades by others.

Incoming power is a 600-amp service provided by PGE with a manual transfer switch connected to the standby generator as shown in **Attachment C**. New power requirements are expected to need a new 1500 kva pad mounted transformer and 480 volt stepdown transformers and a new diesel standby generator. As the current market is seeing very long lead times on electrical transformers and equipment, the Design Engineer will be expected to prepare pre-procurement documents to expedite delivery to ensure the project meets the overall schedule.

3.7 Demolition

Following full and complete commissioning of the new LPMF system, the existing WTP infrastructure including the filters, piping, chemicals, and pumps should be removed and disposed. The building should be cleaned and prepared for the next phase of work.

ATTACHMENT A

Stantec

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CITY OF SANDY

SANDY PROGRAM OWNERS REP

SANDY, OREGON

Project No.: 2002006267

File Name: ALDER CREEK SITE PLAN

Scale: NO SCALE

AL	AO		YYYY.MM.DD
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Title
ALDER CREEK WTP SITE PLAN

Revision:

Drawing No.
C-00X

ORIGINAL SHEET - ANSI D

ATTACHMENT B

VALVES

- 3 WAY MULTI-PORT VALVE
- 4 WAY MULTI-PORT VALVE
- AIR VACUUM, AIR RELEASE, OR COMBINATION AIR VACUUM AND AIR RELEASE ASSEMBLY
- ANGLE VALVE
- BACK-PRESSURE VALVE
- BACKFLOW PREVENTER VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- CONE VALVE
- DIAPHRAGM VALVE
- FLAP VALVE
- GATE VALVE
- GLOBE VALVE
- HOSE BIBB VALVE
- NEEDLE VALVE
- PINCH VALVE
- PLUG VALVE
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- SLEEVE VALVE
- TELESCOPING VALVE
- FLOAT VALVE

VALVE AND GATE ACTUATORS

- DIAPHRAGM ACTUATOR
- S — E/H = ELECTROHYDRAULIC, P = PNEUMATIC, S = SOLENOID
- M — MOTOR ACTUATOR
- PISTON ACTUATOR
- WEIGHT BALANCED ACTUATOR

GATES

- SLIDE GATE
- STOP GATE OR SHEAR GATE

PUMPS & COMPRESSORS

- SLUDGE DIAPHRAGM PUMP
- HORIZONTAL CENTRIFUGAL PUMP
- GENERIC PUMP
- CHEMICAL METERING PUMP
- DRUM PUMP
- ROTARY GEAR PUMP
- SPLIT-CASE PUMP
- HOSE / PERISTALTIC PUMP
- PLUNGER / PISTON PUMP
- PROGRESSIVE CAVITY PUMP
- ROTARY LOBE PUMP
- SUBMERSIBLE SUMP PUMP
- SUBMERSIBLE TURBINE PUMP
- VERTICAL TURBINE PUMP
- VERTICAL CENTRIFUGAL PUMP
- AIR ACTUATED DIAPHRAGM PUMP
- VERTICAL SUMP PUMP
- RECIPROCATING COMPRESSOR
- ROTARY SCREW COMPRESSOR

PIPING ACCESSORIES

- ANNULAR SEAL
- ATMOSPHERIC VENT
- BLIND FLANGE
- CAP - BREATHER
- CAP - SCREW / THREADED
- CAP - WELDED
- CAP - QUICK DISCONNECT
- CHLORINE INJECTOR OR CHEMICAL EDUCTOR
- DIAPHRAGM SEAL
- DRAIN
- EXPANSION CHAMBER WITH RUPTURE DISK
- EDUCTOR
- FLANGED
- OR — FLEXIBLE CONNECTION - BELLOWS TYPE
- F/A — FLAME ARRESTOR
- FCO / FCO — FLOOR CLEANOUT
- F — FILTER
- HUB DRAIN
- INLINE MIXER
- PIPE MATERIAL CHANGE
- PULSATION DAMPENER
- REDUCER - CONCENTRIC
- REDUCER - ECCENTRIC
- REMOVABLE SPOOL PIECE
- UNION
- RUPTURE DISK
- STRAINER - BASKET TYPE
- STRAINER - DUPLEX BASKET TYPE
- STRAINER - WYE TYPE
- SLOPE
- T — TRAP
- WCO OR WCO — WALL CLEANOUT
- TP — TIE-IN POINT

BLOWERS

- AERATOR
- BLOWER
- POSITIVE DISPLACEMENT BLOWER
- SINGLE STAGE CENTRIFUGAL BLOWER

MISCELLANEOUS

- BRIDGE CRANE
- CALIBRATION COLUMN
- CONTAINER SCALE
- CARTRIDGE FILTER
- DEMISTOR
- FIRE HYDRANT
- GAS BOTTLE
- HEAT EXCHANGER - PLATE TYPE
- HEAT EXCHANGER - STRAIGHT TYPE
- HEAT EXCHANGER - U TUBE
- HEATER
- HORN
- PANEL-MOUNTED HORN
- BEACON
- MISCELLANEOUS EQUIPMENT
- MIXER
- M — MOTOR SYMBOL
- HORIZONTAL PRESSURE VESSEL
- VERTICAL PRESSURE VESSEL
- RADIO ANTENNA
- REFRIGERATOR DRYER
- SAMPLE COOLER
- AUTO-BACKWASHING STRAINER
- TANK WITH CONE SHAPED ROOF
- TANK WITH DOME ROOF
- TANK WITH FLOATING COVER
- TANK, VESSEL, OR BIN
- TEMPERING TANK
- TOTE TANK
- WATER LEVEL
- GENERATOR

REV 010119

ACH - ALUMINIUM CHLOROHYDRATE
BWW - BACKWASH WASTE
CIP - CLEAN IN PLACE
CT - CHLORINE CONTACT
DI - DUCTILE IRON
DR - DRAIN
FT - FILTERED WATER
MCP - MASTER CONTROL PANEL
MF - MEMBRANE FILTRATION
NC - NORMALLY CLOSED
PW - POTABLE WATER
PE - POLYETHYLENE
PV - GENERIC FOR POLYVINYL CHLORIDE
PVC - POLYVINYL CHLORIDE
SDH - SODIUM HYDROXIDE
SCH - SODIUM HYPOCHLORITE

MF/UF SCOPE OF SUPPLY OF BOUNDARY

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SANDY PROGRAM OWNERS REP
SANDY, OREGON

Project No.: 2002006267
File Name: GI-001
Scale: NTS

XX	XX	XX	YYYY.MM.DD
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Title
SYMBOLS AND NOMENCLATURE - 01

Revision: XXX
Drawing No.
GI-001

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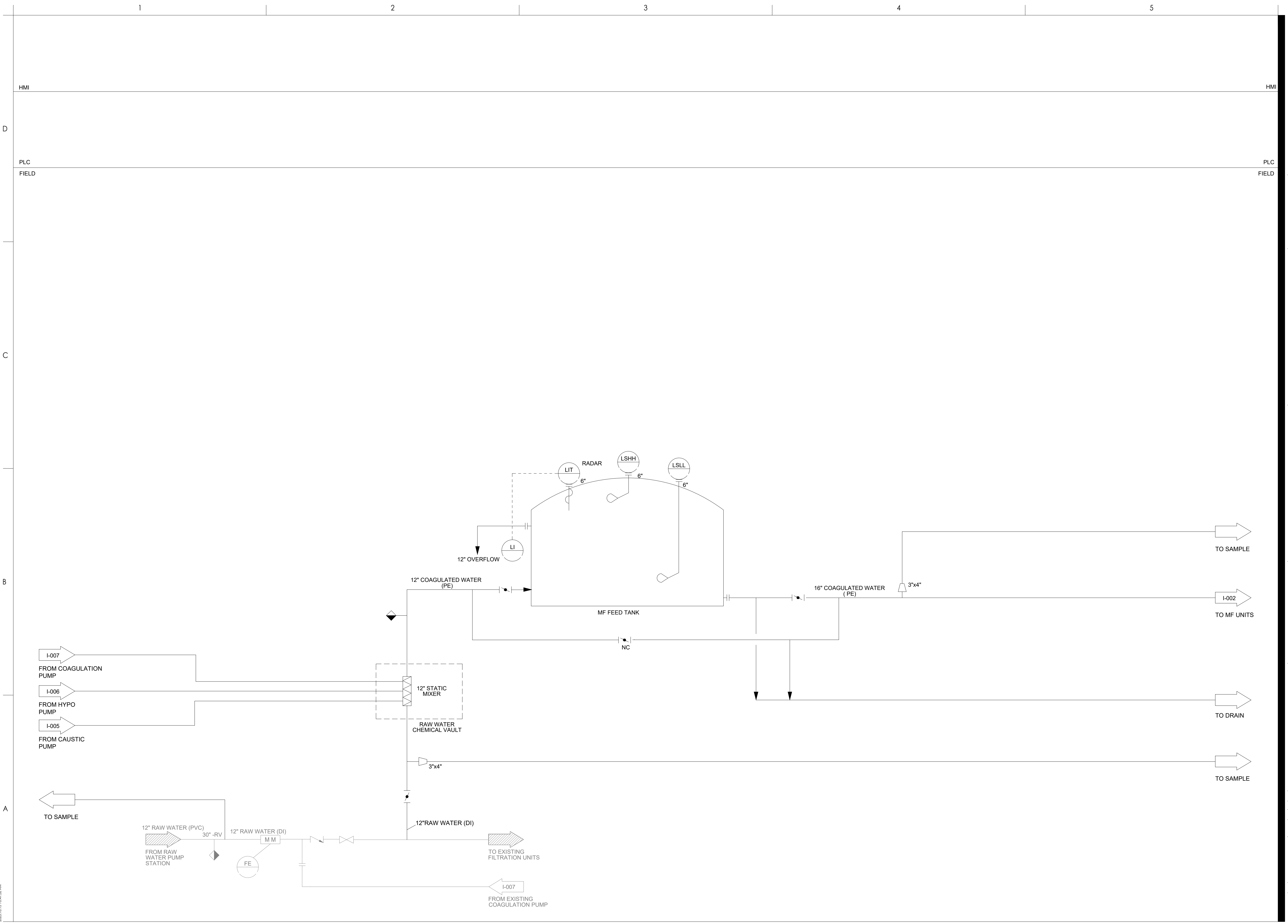
ORIGINAL SHEET - ANSI D



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SANDY, OREGON

Project No.: 2002006267

File Name: I-001

Scale: NTS

XX	XX	XX	YYYY.MM.DD
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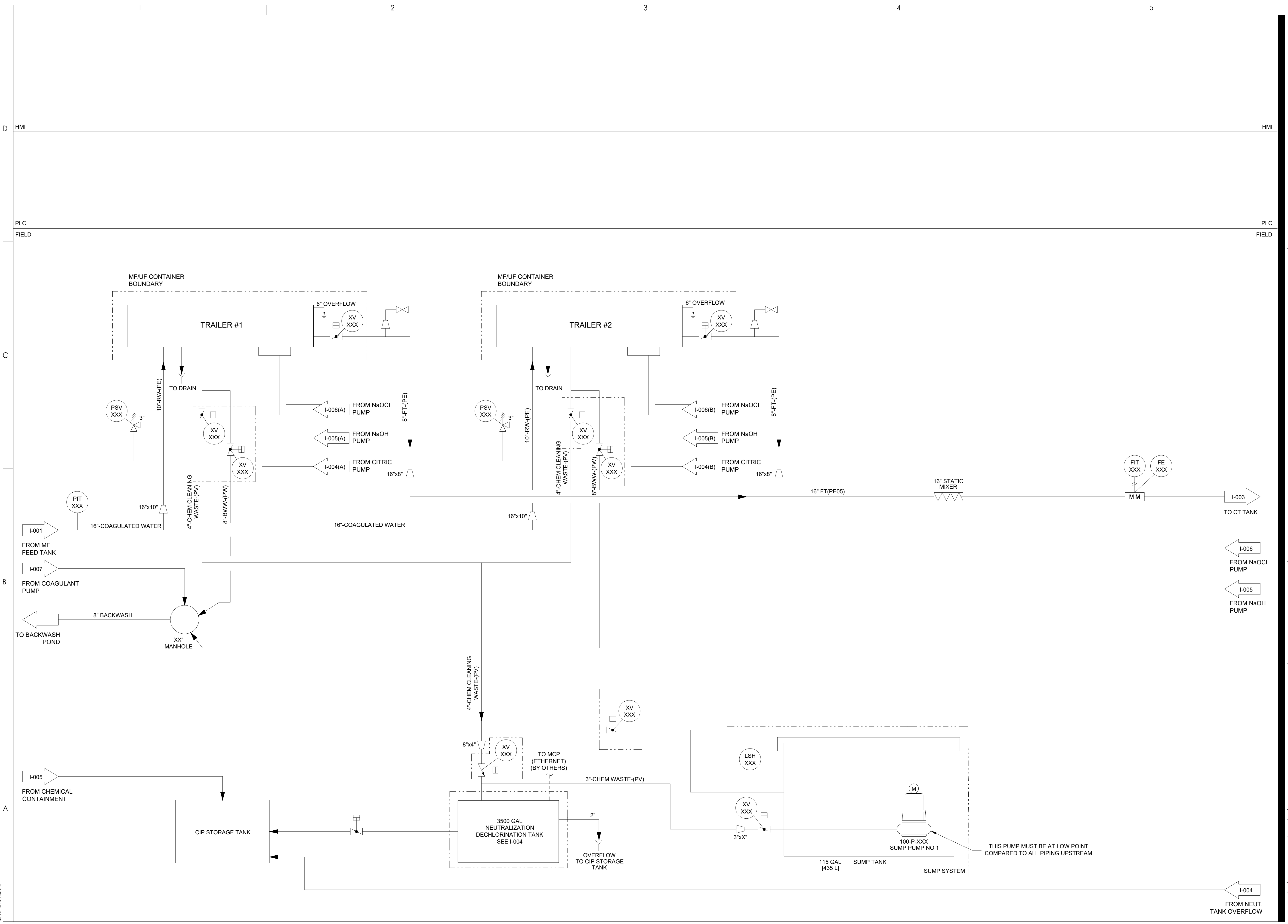
Title
MF FEED TANK P&ID

Revision: XX

Drawing No.
I-001



1
2
3
4
5
D
C
B
A
HMI
PLC
FIELD
MF/UF CONTAINER BOUNDARY
TRAILER #1
TRAILER #2
6" OVERFLOW
XV XXX
PSV XXX
3"
TO DRAIN
10"-RW-(PE)
8"-FT-(PE)
I-006(A)
FROM NaOCl PUMP
I-005(A)
FROM NaOH PUMP
I-004(A)
FROM CITRIC PUMP
I-006(B)
I-005(B)
I-004(B)
16"x8"
16"x10"
4"-CHEM CLEANING WASTE-(PV)
8"-BWW-(PW)
PIT XXX
I-001
FROM MF FEED TANK
16"-COAGULATED WATER
16" FT(PE05)
16" STATIC MIXER
FIT XXX
FE XXX
M M
I-003
TO CT TANK
I-006
FROM NaOCl PUMP
I-005
FROM NaOH PUMP
I-007
FROM COAGULANT PUMP
8" BACKWASH
TO BACKWASH POND
XX" MANHOLE
I-005
FROM CHEMICAL CONTAINMENT
CIP STORAGE TANK
8"x4"
TO MCP (ETHERNET) (BY OTHERS)
3"-CHEM WASTE-(PV)
3500 GAL NEUTRALIZATION DECHLORINATION TANK SEE I-004
2"
OVERFLOW TO CIP STORAGE TANK
LSH XXX
3"xX"
M
100-P-XXX SUMP PUMP NO 1
115 GAL [435 L]
SUMP TANK
SUMP SYSTEM
THIS PUMP MUST BE AT LOW POINT COMPARED TO ALL PIPING UPSTREAM
I-004
FROM NEUT. TANK OVERFLOW

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SANDY, OREGON

Project No.: 2002006267
File Name: I-002
Scale: NTS

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Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
SUMP TANK P&ID

Revision: XX
Drawing No.
I-002

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Project No.: 2002006267

File Name: I-003

Scale: NTS

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Title
BOOSTER PUMPS P&ID

Revision: XX

Drawing No.
I-003

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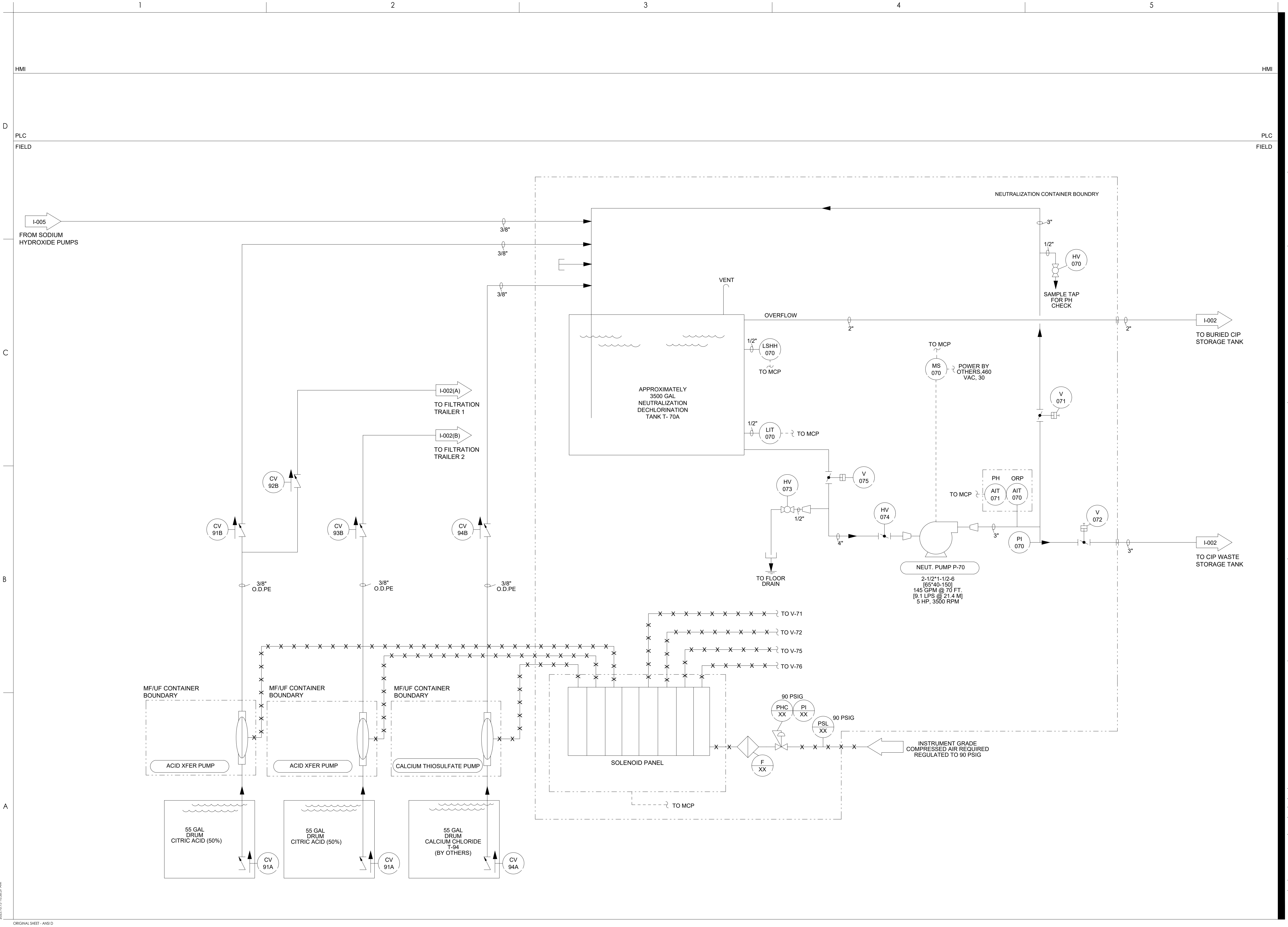

1
2
3
4
5
D
C
B
A
HMI
HMI
PLC
PLC
FIELD
FIELD
NEUTRALIZATION CONTAINER BOUNDRY
I-005
FROM SODIUM HYDROXIDE PUMPS
3/8"
3/8"
3/8"
3"
1/2"
HV 070
SAMPLE TAP FOR PH CHECK
VENT
OVERFLOW
2"
2"
I-002
TO BURIED CIP STORAGE TANK
1/2"
LSHH 070
TO MCP
TO MCP
MS 070
POWER BY OTHERS,460 VAC, 30
APPROXIMATELY 3500 GAL NEUTRALIZATION DECHLORINATION TANK T- 70A
1/2"
LIT 070
TO MCP
V 071
I-002(A)
TO FILTRATION TRAILER 1
I-002(B)
TO FILTRATION TRAILER 2
V 075
HV 073
1/2"
TO FLOOR DRAIN
HV 074
4"
PH
ORP
TO MCP
AIT 071
AIT 070
3"
PI 070
V 072
3"
I-002
TO CIP WASTE STORAGE TANK
NEUT. PUMP P-70
2-1/2"1-1/2-6
[65*40-150]
145 GPM @ 70 FT.
[9.1 LPS @ 21.4 M]
5 HP, 3500 RPM
CV 92B
CV 91B
CV 93B
CV 94B
3/8" O.D.PE
3/8" O.D.PE
3/8" O.D.PE
TO V-71
TO V-72
TO V-75
TO V-76
MF/UF CONTAINER BOUNDARY
MF/UF CONTAINER BOUNDARY
MF/UF CONTAINER BOUNDARY
ACID XFER PUMP
ACID XFER PUMP
CALCIUM THIOSULFATE PUMP
SOLENOID PANEL
90 PSIG
PHC XX
PI XX
PSL XX
90 PSIG
F XX
INSTRUMENT GRADE COMPRESSED AIR REQUIRED REGULATED TO 90 PSIG
TO MCP
55 GAL DRUM CITRIC ACID (50%)
55 GAL DRUM CITRIC ACID (50%)
55 GAL DRUM CALCIUM CHLORIDE T-94 (BY OTHERS)
CV 91A
CV 91A
CV 94A
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SANDY PROGRAM
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SANDY, OREGON

Project No.: 2002006267

File Name: I-004

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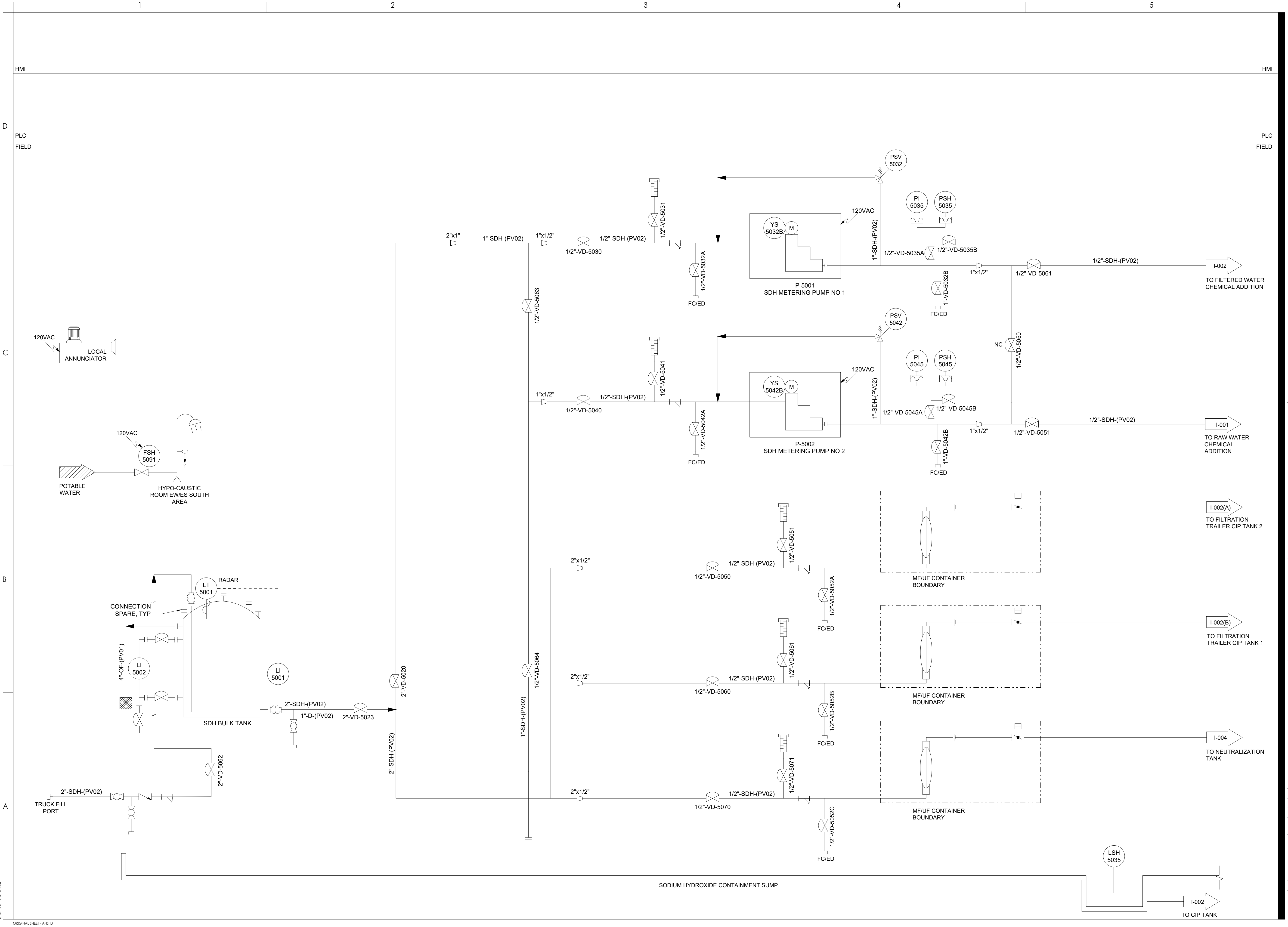
Title
NEUTRALIZATION P&ID

Revision: XXX

Drawing No.
I-004



HMI
PLC
FIELD
120VAC
LOCAL ANNUNCIATOR
FSH 5091
POTABLE WATER
HYPO-CAUSTIC ROOM EW/ES SOUTH AREA
2"x1"
1"-SDH-(PV02)
1"x1/2"
1/2"-VD-5030
1/2"-SDH-(PV02)
1/2"-VD-5031
1/2"-VD-5032A
FC/ED
YS 5032B
M
P-5001
SDH METERING PUMP NO 1
PSV 5032
PI 5035
PSH 5035
1"-SDH-(PV02)
1/2"-VD-5035A
1/2"-VD-5035B
1"-VD-5032B
1"x1/2"
1/2"-VD-5061
I-002
TO FILTERED WATER CHEMICAL ADDITION
1/2"-VD-5063
NC
1/2"-VD-5050
1/2"-VD-5040
1/2"-VD-5041
1/2"-VD-5042A
YS 5042B
P-5002
SDH METERING PUMP NO 2
PSV 5042
PI 5045
PSH 5045
1/2"-VD-5045A
1/2"-VD-5045B
1"-VD-5042B
1/2"-VD-5051
I-001
TO RAW WATER CHEMICAL ADDITION
2"x1/2"
1/2"-VD-5050
1/2"-VD-5051
1/2"-VD-5052A
MF/UF CONTAINER BOUNDARY
I-002(A)
TO FILTRATION TRAILER CIP TANK 2
LT 5001
RADAR
CONNECTION SPARE, TYP
4"-OF-(PV01)
LI 5002
LI 5001
SDH BULK TANK
2"-SDH-(PV02)
1"-D-(PV02)
2"-VD-5023
2"-VD-5020
1/2"-VD-5064
1/2"-VD-5060
1/2"-VD-5061
1/2"-VD-5052B
I-002(B)
TO FILTRATION TRAILER CIP TANK 1
2"-VD-5062
TRUCK FILL PORT
1/2"-VD-5070
1/2"-VD-5071
1/2"-VD-5052C
I-004
TO NEUTRALIZATION TANK
LSH 5035
SODIUM HYDROXIDE CONTAINMENT SUMP
I-002
TO CIP TANK
ORIGINAL SHEET - ANSI D

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File Name: I-005

Scale: NTS

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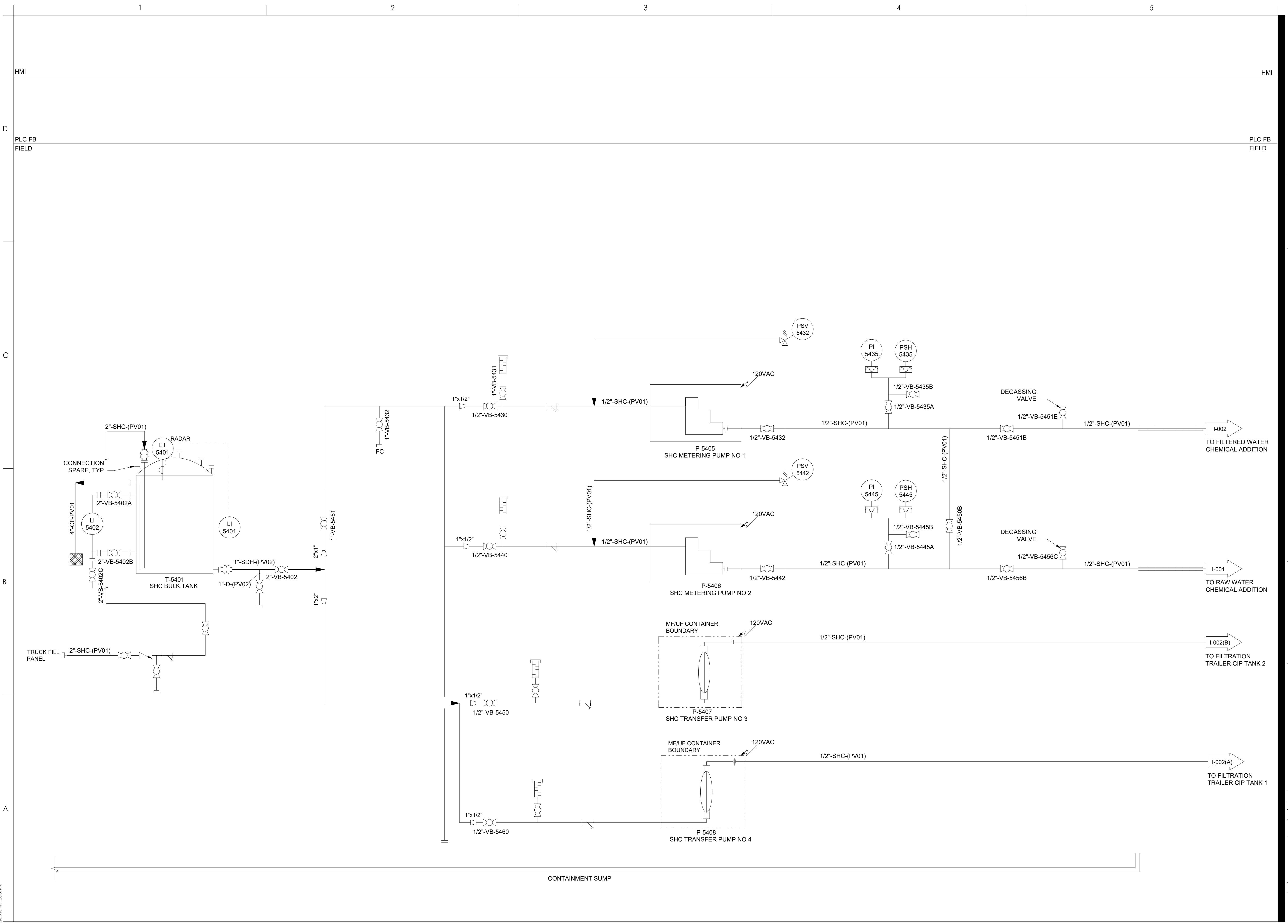
Title
FILTRATION AREA
CHEMICAL FEED - SODIUM HYDROXIDE

Revision: XXX

Drawing No.
I-005



1
2
3
4
5
D
C
B
A
HMI
HMI
PLC-FB
FIELD
PLC-FB
FIELD
2"-SHC-(PV01)
RADAR
LT 5401
CONNECTION SPARE, TYP
2"-VB-5402A
4"-OF-PV01
LI 5402
LI 5401
2"-VB-5402B
2"-VB-5402C
T-5401
SHC BULK TANK
1"-SDH-(PV02)
2"-VB-5402
1"-D-(PV02)
TRUCK FILL PANEL
2"-SHC-(PV01)
2"x1"
1"x2"
1"-VB-5451
1"-VB-5432
FC
1"x1/2"
1"-VB-5431
1/2"-VB-5430
PSV 5432
120VAC
1/2"-SHC-(PV01)
P-5405
SHC METERING PUMP NO 1
1/2"-VB-5432
1/2"-SHC-(PV01)
PI 5435
PSH 5435
1/2"-VB-5435B
1/2"-VB-5435A
DEGASSING VALVE
1/2"-VB-5451E
1/2"-SHC-(PV01)
1/2"-VB-5451B
I-002
TO FILTERED WATER CHEMICAL ADDITION
1/2"-SHC-(PV01)
PSV 5442
1/2"-SHC-(PV01)
1"x1/2"
1/2"-VB-5440
120VAC
1/2"-SHC-(PV01)
P-5406
SHC METERING PUMP NO 2
1/2"-VB-5442
1/2"-SHC-(PV01)
PI 5445
PSH 5445
1/2"-VB-5445B
1/2"-VB-5445A
1/2"-VB-5450B
DEGASSING VALVE
1/2"-VB-5456C
1/2"-SHC-(PV01)
1/2"-VB-5456B
I-001
TO RAW WATER CHEMICAL ADDITION
MF/UF CONTAINER BOUNDARY
120VAC
1/2"-SHC-(PV01)
I-002(B)
TO FILTRATION TRAILER CIP TANK 2
1"x1/2"
1/2"-VB-5450
P-5407
SHC TRANSFER PUMP NO 3
MF/UF CONTAINER BOUNDARY
120VAC
1/2"-SHC-(PV01)
I-002(A)
TO FILTRATION TRAILER CIP TANK 1
1"x1/2"
1/2"-VB-5460
P-5408
SHC TRANSFER PUMP NO 4
CONTAINMENT SUMP

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SANDY, OREGON

Project No.: 2002006267

File Name: I-006

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XX	XX	XX	YYYY.MM.DD
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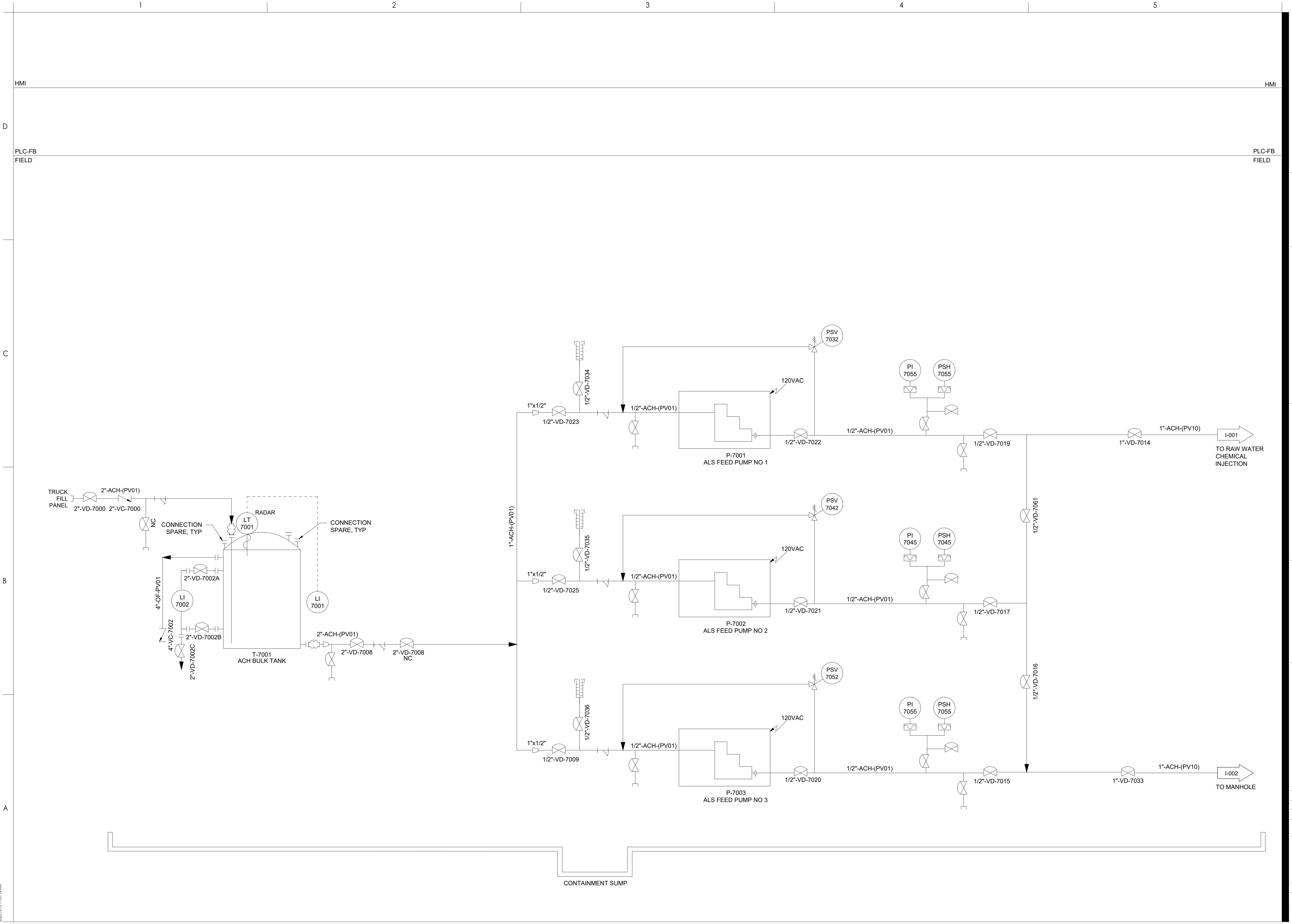
Title
FILTRATION BUILDING
CHEMICAL FEED - SODIUM HYPOCHLORITE

Revision: XXX

Drawing No.
I-006



ORIGINAL SHEET - ANSI D

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Stantec
601 SW 2nd Ave #1400
Portland, Oregon, 97204
Tel: +1.503.226.7377
www.stantec.com

Consultant

Revision | By | Appd | YYYY.MM.DD

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Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

Not for permits, pricing or other official purposes. This document has not been completed or checked and is for general information or comment only.

Client/Project
CITY OF SANDY

SANDY PROGRAM
OWNERS REP

SANDY, OREGON

Project No.: 2002006267
File Name: I-007

Scale: NTS

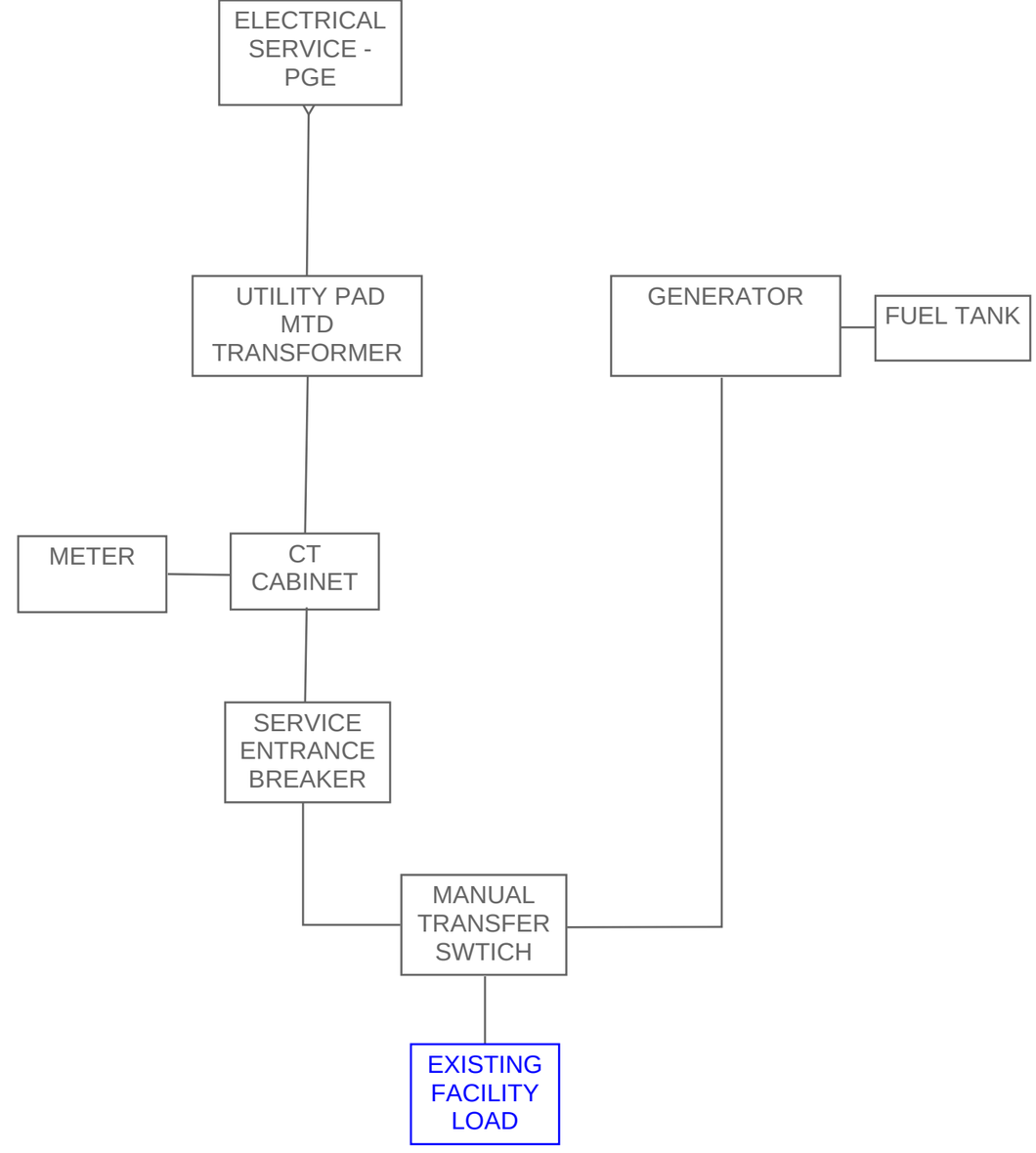
XX	XX	XX	YYYY.MM.DD
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
FILTRATION BUILDING
CHEMICAL FEED - ALUMINUM CHLOROHYDRATE

Revision: XXX

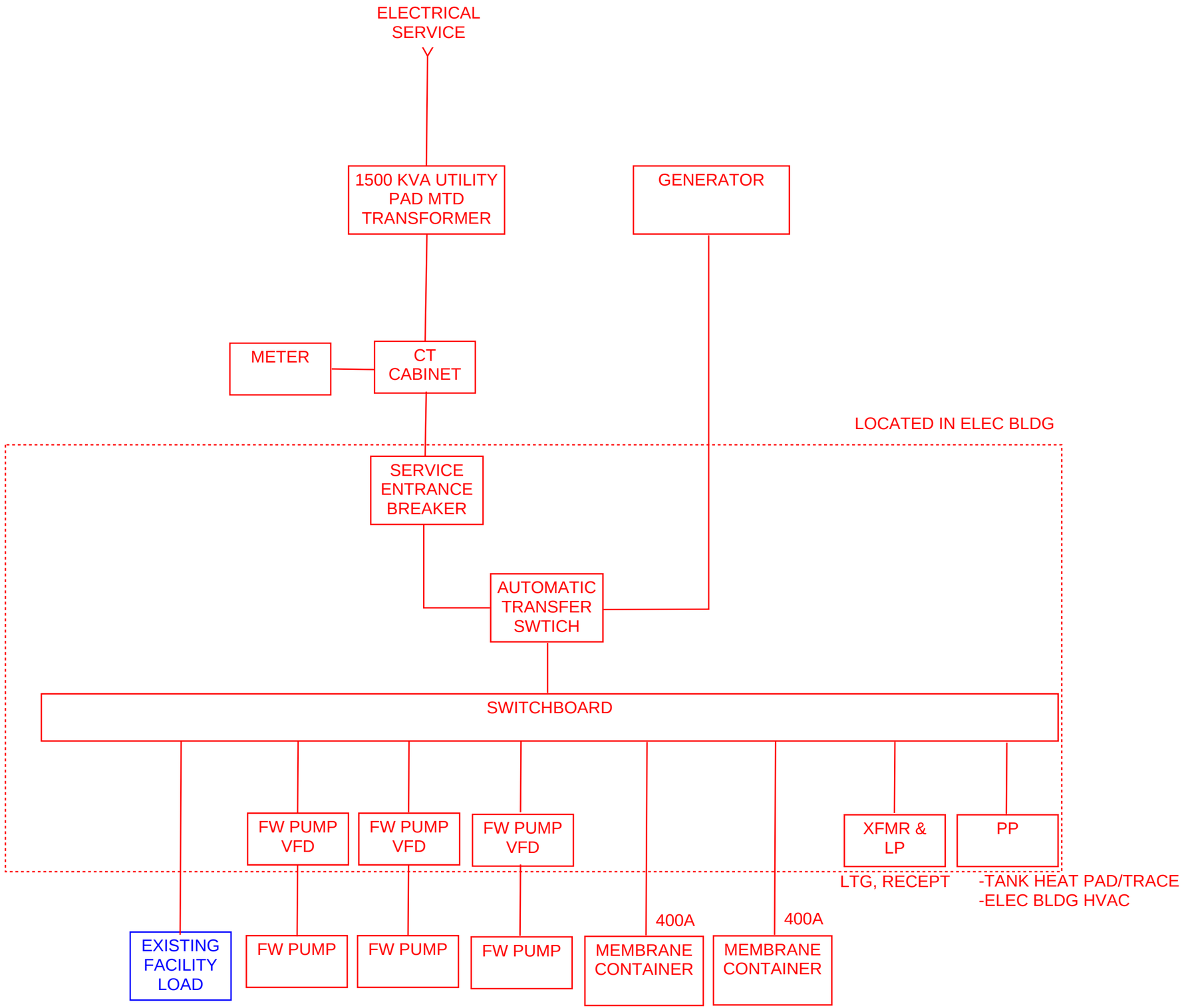
Drawing No.
I-007

ATTACHMENT C



EXISTING FACILITY SIMPLIFIED ONE-LINE

Maintain exiting service until new service is established and facility load can be moved.



PROPOSED FACILITY SIMPLIFIED ONE-LINE

Red is new/proposed equipment. Blue is existing.

ATTACHMENT D

OPINION OF PROBABLE CONSTRUCTION COST (OPCC)

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Overview

Project	**Sandy Alder Creek WTP Design Concept**			*Job Number*	2002006267	*Estimate Total*	**$12,122,000**
Location	Sandy, OR			*Task Number*	01.0101.200	*Accuracy Range*	**-20% to +30%**
Overview	Originally the option 3B Approach			*Submittal Date*	14-Jul-23	*Prime Contractor*	GENERAL CONTRACTOR as GC & CM
Contact	Adam Odell	*Avg Flow-MGD*	2.00	*Prepared By*	Jim Ward	*Project Bid & Delivery*	BID/BUILD without Preconstruction
Phone	(503) 220-5409	*Max Flow-MGD*	NA	*Version #*	000	*Construction Duration*	37 weeks

OPCC Model Philosophy & Methodology

*This proprietary model, developed on an Excel platform, is a tool utilized for preparing class 4-5 OPCC estimates, and follows the principles involved with conceptual estimating as well as the general estimating guidelines developed within Stantec. The absence of both mature design deliverables and a comprehensive scope identity typically encountered early in a project design effort has driven the establishment of this model, which continues to provide historically reliable and surprisingly detailed cost estimates. This is accomplished through a "BASIS-OF-ESTIMATE" and "FORCED DETAIL" methodology which builds an initial foundation of the primary "estimatable" scope items. After generating this "go-by" basis of work, the model internally produces baseline costs through application of cost-analyses and parametric functions, manipulation of historical & equipment size/capacity data, and traditional unit-cost methodologies using definable values of quantity, count, dimensions, service, productivity, and/or end-use. These bare costs are then further "conditionalized" & "localized" based upon a combination of both perceived and known conditions involving the site location, site conditions, scope specifics, material selections, and likely risk issues, all of which are selected from dropdowns within the "ASSUMPTIONS" section heading each division of work. The subsequent direct costs are initially established for the three primary installation elements of labor **(MH$)**, construction materials/consumables & construction equipment **(M&CE$)**, and major engineered/procured equipment **(EQ$)**, and are summarized into a work breakdown structure (WBS) for adjustment with select/anticipated burdens & mark-ups for the Subcontractor(s) and Prime Contractor, and final Estimator add-ons for contingency & escalation. All miscellaneous supporting costs for completing the estimate are also included, with this valuation based upon years of observed and proven ratios and percentages.*

Glossary of Potential OPCC Output Sheets

Sheet Name	Purpose/Description
OPCC BASIS-OF-ESTIMATE CHECKLIST	Matrix identifying the primary OPCC scope & project delivery issues, including an indication of initial responsibility and inclusion
OPCC BASIS-OF-ESTIMATE	Clarifications and/or exceptions related specifically to the project scope and perceived issues
OPCC ESTIMATE & MODEL CLARIFICATIONS	Clarifications and/or exceptions related specifically to the OPCC model and related estimating issues
OPCC LABOR RATE STANDARDS	Development of the DIV manhour rates per the indicated source of initial base and fringe trade rates adjusted then for work schedule
OPCC COMMODITY STANDARDS	Construction commodity items listing with costs currently utilized in the OPCC model and based on monthly updates from ENR
WBS ITEM COST OVERVIEW	Report presenting the OPCC WBS items fully allocated with Prime Contractor, Estimator Gross Adjustments, and all other cost burdens
OPCC SUMMARY	Report identifying the specifics on how the cost build-up occurs from Installing Contractor's direct cost to Owner's final cost-of-work
WBS COST DISTRIBUTION & BUILD-UP	Report presenting the detail by both WBS and CSI division on the build-up from Contractor's direct cost to Owner's final cost-of-work
WBS MANHOURS DISTRIBUTION	Report presenting the installing Contractor's estimated final installation manhours by both WBS and CSI division
PRELIMINARY CONSTRUCTION SCHEDULE	Basic bar-chart presentations of the WBS line items, one with projections of cashflow and construction manpower loading
INSTALLATION OVERVIEW	Development of the construction baseline standards, assumptions, and localizing factors, including a roll-up of the DIV worksheets
DIV 1s (01) PRIME CONTRACTOR STAFF	Development of the anticipated Prime Contractor supervisory staff labor, travel/living needs, and camp costs (where applicable)
DIV 1g (01) GENERAL CONDITIONS	Development of the anticipated general conditions needs and tradesmen camp costs (where applicable)
DIV 1p (01) PASS-THRU COSTS	Development of the anticipated pass-through (i.e. unburdened) costs such as rental, operating, and supply/install quotes
DIV 2c (02 & 31-35) COMMON SITEWORK	Development of the "common" (i.e. self-performed) site/civil construction items by type, dimension, & quantity
DIV 2s (02 & 31-35) SPECIALTY SITEWORK	Development of the "specialty" (i.e. subcontracted) site/civil construction items by type, dimension, & quantity
DIV 2w (33) WELL WORK	Development of the subcontracted well construction items by type, dimension, & quantity
DIV 3 (03) CONCRETE	Development of the cast-in-place concrete construction items by type, dimension, & quantity, along with CY, and tons of rebar
DIV 4 (04) MASONRY	Development of the masonry building systems which include built-in allowances for doors, windows, & misc openings
DIV 5 (05) METALS	Development of the miscellaneous metal items by type, dimension, quantity, and tons
DIVS 3 & 5-8 (03 & 05-08) BUILDINGS	Development of steel & specialty building systems which include built-in allowances for doors, windows, & misc openings
DIVS 7-10 (07-10) COATINGS & FINISHES	Development of the field-applied coatings & finishes by type, dimension, & quantity, along with SF
DIV 13f (33) FIELD-ERECTED TANKS	Development of the field-erected metal tanks & components by type, dimension, & quantity, along with tons, SF, and gallons
DIV 13s (33) SHOP-FABRICATED TANKS	Development of the shop-fabricated metal tanks & components by type, dimension, & quantity, along with tons, and gallons
DIVS 11i-15i (21-23) MECHANICAL INSTALLATION	Development of the mechanical installation work by parametrics, dimension, & quantity data
DIV 16i (25-28 & 33) ELECTRICAL INSTALLATION	Development of the electrical installation by parametrics, dimension, & quantity data
DIVS 16e (25-28 & 33) ELECTRICAL EQUIPMENT	Development of the electrical equipment including switchboards, MCC's, transformers, gensets, control panels, & process controls
WBS CONNECTED ELECTRICAL LOADS	Report presenting the WBS-level and connected amperage & KVA loads per the voltage selected, along with forecast of actual load
MISCELLANEOUS CALCULATORS	Collection of quick models for sizing pipe & wire/conduit, along with install data for wire, bus duct, vent duct, PE pipe, & lagoons
EXCAVATION CALCULATOR	Model for calculating specific earthwork quantities from defined structural and trench excavation scope in either US or metric
REBAR CALCULATOR	Model for calculating specific quantities of concrete & rebar from defined structural design data in either US or metric
DIVS 11-16 (40-45) PROCESS EQUIPMENT	Development via a P&ID of the project process & mechanical equipment breakdown with all related items by size/capacity & quantity
BUILDING COST INDEXES	Both historical and future cost indexes used by the Navy for forecasting escalation, and provides guidance for OPCC estimates

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OPCC BASIS-OF-ESTIMATE CHECKLIST

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Version	Date	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	000	14-Jul-23	2002006267

Basis-of-Estimate Items

NOTE: Item numbers in brown font indicate an auto-fill checkmark and/or variable text that adjusts with selection(s) made in other OPCC sheets

#	Work Scope & Estimate Content	*OPCC Status* INCLUDED As OPCC Scope	EXCLUDED But By Others	EXCLUDED Or Not Required
1	*This OPCC version # 000 replaces all previous estimate versions in their entirety for this specific project and/or scope*	✓		
2	*Estimator review of the project site and/or work area, either via a physical walk-through or photographic/video records*			✓
3	*Class 4 Opinion-of-Probable-Operating-Cost (OPOC) estimate with operating & maintenance forecasts*	✓		
4	*April 2023 RS Means Construction Cost Indexes for Portland, OR utilized to baseline material & install cost trends*	✓		
5	*June 2023 ENR Construction Economics data utilized to baseline select commodity costs*	✓		
6	*2023 RSMeans Construction Labor Rates publication for Portland, OR utilized to baseline labor costs*	✓		
7	*20% ESTIMATE contingency for potential issues related to Estimator judgements, take-offs, omissions, etc.*	✓		
8	*10% SCOPE contingency for potential growth related to design changes, Owner preferences, regulatory issues, etc.*	✓		
9	*Construction estimated to start June 2024 with October 2024 mid-point and completion in February 2025*	✓		
10	*1.8% GENERAL escalation to mid-point of construction established per APR's assigned to MH, M&CE, & EQ costs*	✓		
11	*1% SPECIAL escalation as a one-time lump sum escalation adjustment for updating the MH, M&CE, & EQ database costs*	✓		
12	*Taxes, including (but not limted to) sales, gross-receipts, professional, use, and/or Value-Added*			✓
13	*General Conditions allowances in DIV 1 for work reasonably anticipated but not currently quantifiable*	✓		
14	*Allowances in DIVS 2-16 for the work that can be reasonably anticipated but not currently quantifiable*	✓		
15	*Allowance for future inflation*		✓	
16	*Duties, tariffs, and/or import & export fees including any related expenses*			✓
17	*Commissions and/or royalties including any related expenses*			✓
18	*Liquidated damages including any related expenses*			✓
19	*Prime Contractor to be GENERAL CONTRACTOR as GC & CM*	✓		
20	*Prime Contractor solicited, bid, & contracted based upon BID/BUILD without Preconstruction*	✓		
21	*Prime Contractor to pre-plan work sequencing, equipment pre-purchase, and/or early site mobilization as needed*			✓
22	*Prime Contractor to provide staff (re: DIV 1) for the project management & construction oversight needs*	✓		
23	*Prime Contractor to self-perform select construction work and/or equipment procurement scope*	✓		
24	*Prime Contractor to provide Construction Manager (i.e. CM) services*	✓		
25	*Prime Contractor to provide Guaranteed Maximum Pricing (i.e. GMP)*			✓
26	*Prime Contractor to have direct contractual & reporting responsibilities to OWNER or OWNER'S Rep*	✓		
27	*Prime Contractor to provide a safety program including management, training, reporting, & mitigation responsibilities*	✓		
28	*Prime Contractor to provide a QA/QC program including testing, inspecting, reporting, & mitigation responsibilities*	✓		
29	*Oversight of the Prime Contractor by OWNER'S 2nd-party Engineer*		✓	
30	*Oversight of the Prime Contractor by OWNER'S 2nd-party safety and/or QC professional*		✓	
31	*Allowance for non-competitive bid conditions (i.e. < 4 qualified bids)*		✓	
32	*Construction labor primarily at local Prevailing Wage/Davis Bacon rates*	✓		
33	*40-hour work week, based upon an anticipated schedule of (5)-8 hr days Mon-Fri*	✓		
34	*Multiple-shift construction schedule*			✓
35	*Reduction of the construction duration due to an overtime work schedule*			✓
36	*Installation manhour rate adjustments due to anticipated issues with labor pool, location, and/or work conditions*			✓
37	*Installation manpower productivity adjustment due to anticipated issues with labor pool, location, and/or work conditions*			✓
38	*Installation manhour productivity adjustments due to shut-downs, phasing, demolition, and/or PPE requirements*			✓
39	*Remote site rotation allowance for eligible tradesmen, supervision, & Prime Contractor field staff*			✓
40	*Remote travel & camp allowance for eligible tradesmen, supervision, and/or Prime Contractor staff*			✓
41	*Project engineering, design, & permitting services*		✓	
42	*Geotechnical testing, engineering, & design services*		✓	
43	*Engineering support services during construction & start-up*		✓	
44	*Supply & installation per standards typically anticipated for Municipal & Governmental work*	✓		
45	*OCIP (i.e. Owner-controlled-insurance-program) covering all insurance & bond costs at all tiers for this project*			✓

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OPCC BASIS-OF-ESTIMATE CHECKLIST

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Version	Date	Job #
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Basis-of-Estimate Items

NOTE: Item numbers in brown font indicate an auto-fill checkmark and/or variable text that adjusts with selection(s) made in other OPCC sheets

#	Work Scope & Estimate Content	*OPCC Status* INCLUDED As OPCC Scope	EXCLUDED But By Others	EXCLUDED Or Not Required
46	*Property acquisitions, leases, easements, right-of-ways, and related fees, costs, & schedule impacts*			✓
47	*Financing, leasing, legal services, and related fees, costs, & schedule impacts*			✓
48	*Work permits, inspections, and related fees, costs, & schedule impacts*			✓
49	*Water-use permits, inspections, and related fees, costs, & schedule impacts*			✓
50	*Environmental/ecological permits, inspections, and related fees, costs, & schedule impacts*			✓
51	*Cultural/preservation work permits, inspections, and related fees, costs, & schedule impacts*			✓
52	*Discharge permits, inspections, and related fees, costs, & schedule impacts (i.e. NPDES, POTW, SWPPP, etc.)*		✓	
53	*Water/wastewater/air sampling, collection, analysis, and/or pilot treatability studies*			✓
54	*Building and trades-work construction permits, inspections, and related fees & costs*	✓		
55	*Work anticipated within a Brownfield site assessed to be Mostly Clear Above & Below Grade*	✓		
56	*Consideration for both negligible congestion and negligible spread of existing yard and/or systems infrastructure*	✓		
57	*Hazardous materials/work conditions requiring personal protection and equipment*			✓
58	*High-work conditions requiring personal fall protection equipment*			✓
59	*Clean-room work conditions requiring personal protection and equipment*			✓
60	*Underwater work requiring diver(s) with surface support team and equipment*			✓
61	*Weather (i.e. precipitation) and/or temperature considerations during execution of the work*	✓		
62	*Disadvantaged and/or minority business enterprise considerations for select work*	✓		
63	*System/process oversight of operations and maintenance during start-up & training*	✓		
64	*System/process operations and maintenance during functional and/or performance testing*		✓	
65	*System/process operations and maintenance from commissioning & forward*		✓	
66	*Supply and/or procurement of major EQ items within DIVS 11-15*	✓		
67	*Domestic (US) overland shipping of procured items to project site*	✓		
68	*Stretch-wrapping of select EQ (excluding permanent materials) for shipping and/or on-site storage*	✓		
69	*Crating of select EQ (excluding permanent materials) for shipping and/or on-site storage*			✓
70	*Containerization of select EQ (excluding permanent materials) for shipping and/or on-site storage*			✓
71	*Primary excavation issue of Dust Control considered within the construction area(s)*	✓		
72	*Secondary excavation issue of Wet/Sandy Soil considered within the construction area(s)*	✓		
73	*0.06-0.10 (x G) Peak acceleration consideration for construction of buildings & structures*	✓		
74	*Category IV - Essential facility risk consideration for construction of buildings & structures*	✓		
75	*Zone II - 160 MPH wind consideration for construction of buildings & structures*	✓		
76	*Minimum of 1,800 PSF uniform soil-bearing capacity in construction area(s)*		✓	
77	*Minimum of 200 PCI uniform soil modulus of subgrade in construction area(s)*		✓	
78	*Maximum of 0.500 INCH uniform soil settlement potential in construction area(s)*		✓	
79	*Maximum of 0.250 INCH differential soil settlement potential in construction area(s)*		✓	
80	*Slurry walls for select areas, excavation, and/or structures*			✓
81	*Deep foundations for select structures*			✓
82	*Soil pre-loading and/or over-excavation with recompaction (of excavated material) for select areas*			✓
83	*Shoring, lagging, cribbing, and/or trench boxes for select areas, excavations, and/or structures*			✓
84	*Steel sheet piling for select areas, excavations, and/or structures*			✓
85	*Saw-cutting and/or core-drilling within select areas*			✓
86	*Potholing and/or utility locating within select areas*	✓		
87	*Traffic controls within select areas*	✓		
88	*Erosion controls within select areas*	✓		
89	*Dewatering due to excessive surface run-on, aquifers/springs, and/or high water table within select areas*	✓		
90	*Removal/disposal of existing native topsoil, vegetation, trees, and/or fencing within select areas*			✓

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OPCC BASIS-OF-ESTIMATE CHECKLIST

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#	Work Scope & Estimate Content	*OPCC Status* INCLUDED As OPCC Scope	EXCLUDED But By Others	EXCLUDED Or Not Required
91	*Removal/disposal of existing EQ, piping, electrical, structures, rubble, and/or debris within select areas*			✓
92	*Relocation of existing utilities, ductbank, utilidors, chases/tunnels, pipe, and/or conduit/wiring*			✓
93	*Remediation due to hazardous materials within select areas*			✓
94	*Remediation due to cultural (i.e. historical, archaeological, etc.) content within select areas*			✓
95	*Landscaping, irrigation, seeding, sodding, mulching, plantings, and/or restoration within select areas*	✓		
96	*Temporary fencing system for safety/security/privacy purposes around select site/construction areas*	✓		
97	*Permanent fencing system for safety/security/privacy purposes around select system/project areas*			✓
98	*Asphalt paving, patching, and/or repairing of select road, parking, and miscellaneous areas*			✓
99	*Curb & gutter system for select road, parking, and/or landscaping areas*			✓
100	*Outdoor lighting units for select areas*	✓		
101	*Concrete-filled steel pipe bollards/guardposts for protecting select equipment, area(s), and/or structure(s)*	✓		
102	*Secondary containment for select areas, tanks, and/or structures*	✓		
103	*Secondary containment of select piping systems*	✓		
104	*Emergency diesel generator(s) including automatic transfer switching and on-board fuel system(s)*	✓		
105	*Emergency power sized to maintain full operation of select treatment, building, & support systems*	✓		
106	*Paralleling gear for multiple emergency generators*			✓
107	*Double-walled bulk diesel storage tank system with level indication and transfer pumping*			✓
108	*Sealing, waterproofing, and/or chemical-resistant finish for select field-constructed surfaces*	✓		
109	*Coating and/or galvanizing of select steel building and canopy structural components*	✓		
110	*LEED construction (with certification) of select building structures and/or components*			✓
111	*Usage cost of utilities (i.e. electric, water, natural gas, sewerage, etc.) utilized during construction*		✓	
112	*Assistance in removal, abatement, and/or disposal of existing fluids, sludges, and residuals*		✓	
113	*PPE stations and placarding of project hazards including noise, moving machinery, and chemicals*	✓		
114	*Heat, light, ventilation, entry switches, utility outlets, and/or sump pumps for select vault structures*	✓		
115	*Fire protection systems, materials, equipment, and/or placarding within select areas*	✓		
116	*Grounding and/or lightning protection systems, materials, and/or equipment within select areas*	✓		
117	*Concrete strength (28 day minimum) provided at 4,000 PSI (6½-7½ sacks/CY)*	✓		
118	*Type II (lo heat & sulfate resist) cement utilized in structural concrete*	✓		
119	*A615-Plain Steel (qty in tons) reinforcement bar utilized in structural concete, supplied and installed by rebar Subcontractor*	✓		
120	*Material of construction varies for personnel accessways and is dependent on location and/or exposure*	✓		
121	*Piping and/or wiring supports primarily utilizing Galv Steel Strut*	✓		
122	*Local safety disconnect switches for select motorized equipment*	✓		
123	*Local HOA and/or ON-OFF control stations for select equipment*			✓
124	*Combination eyewash and shower stations (including tempered water system/supply) in select areas*	✓		
125	*ADA (Americans with Disabilities Act) accessibility in select areas*			✓
126	*Valved end-connections and/or by-passes for select in-line instrumentation and control valves*			✓
127	*Solenoid-controlled water stations for select sealwater and/or flushwater systems*	✓		
128	*Stairway access & perimeter handrailing for select building interior elevated spaces*			✓
129	*Ductwork system for select equipment and/or tankage*	✓		
130	*Ductwork system for select areas and/or structures*			✓
131	*Coating of select pipe, fittings, and valves*	✓		
132	*Heat-tracing of select pipe, fittings, & valves*	✓		
133	*Insulation & jacketing of select pipe, fittings, & valves*	✓		
134	*Heat-tracing of select tankage*			✓
135	*Insulation of select tankage*			✓

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OPCC BASIS-OF-ESTIMATE CHECKLIST

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

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Basis-of-Estimate Items

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#	Work Scope & Estimate Content	*OPCC Status* INCLUDED As OPCC Scope	EXCLUDED But By Others	EXCLUDED Or Not Required
136	*Architectural treatments and/or finishes similar for all building structures*			✓
137	*Permanent overhead crane/hoist system(s) that are stand-alone and/or integrated to select structure(s)*			✓
138	*Field-erected bolted metal tank(s) with factory-applied epoxy finish(es)*	✓		
139	*Scope-wide safety management system with communications/PA and health & safety monitoring*			✓
140	*Scope-wide security management system with access controls and intrusion monitoring*	✓		
141	*Scope-wide surveillance management system with video monitoring & archiving*	✓		
142	*Access to the work area considered as Relatively Easy throughout the project execution*	✓		
143	*Patching, repairing, and/or restoring of select existing local infrastructure utilized during work*	✓		
144	*Location for stockpiling, spreading, and/or disposal of surplus soil < 7.5 mile radius from ISBL*	✓		
145	*Location for stockpiling, spreading, and/or disposal of clearing & grubbing waste < 7.5 mile radius from ISBL*	✓		
146	*Location for stockpiling, spreading, or disposal of demolition waste < 7.5 mile radius from ISBL*	✓		
147	*Payment of fee(s) associated with soil and waste stockpiling, spreading, and/or disposal*	✓		
148	*Continuous free & clear access, easement, and/or right-of-way to work area*		✓	
149	*Oversize, overweight, and/or drop-deck trailer accessibility to work area*		✓	
150	*Public and/or main access roads which are suitable and available throughout construction*		✓	
151	*Material and equipment laydown, staging, and/or storage area(s) within 100' of work area*		✓	
152	*Parking area(s) for installation personnel within 100' of work area*		✓	
153	*480 V primary power supply/tie-in location (with sufficient ampacity) within 100' of work area*		✓	
154	*480 V back-up power supply/tie-in location (with sufficient ampacity) within 100' of work area*	✓		
155	*Hydro-test water supply (with sufficient pressure & volume) or tie-in location within 100' of work area*		✓	
156	*Disposal location for hydro-test fluids within 100' of work area*		✓	
157	*Potable water supply (with sufficient pressure & volume) or tie-in location within 100' of work area*		✓	
158	*Utility and/or fire protection water supply (with sufficient pressure & volume) or tie-in location within 100' of work area*		✓	
159	*Sanitary waste piping tie-in location (with sufficient capacity) within 100' of work area*			✓
160	*Compressed and/or instrument air supply (with sufficient pressure & volume) or tie-in location within 100' of work area*	✓		
161	*Steam and/or fossil fuel supply (with sufficient pressure & volume) or tie-in location within 100' of work area*			✓
162	*Influent and/or effluent piping (of sufficient size) or tie-in location within 100' of work area*		✓	
163	*Return and/or recycle piping (of sufficient size) or tie-in location within 100' of work area*		✓	
164	*Treatment chemical supply (of sufficient size & concentration) or tie-in location within 100' of work area*	✓		
165	*Landline and/or high-speed internet service (of sufficient bandwidth) or tie-in location within 100' of work area*		✓	
166	*High-speed wireless internet service availability (with sufficient speed & bandwidth) within 100' of work area*		✓	
167	*Integration of existing power, process, and site (i.e. safety, security, and/or surveillance) controls to new systems*		✓	
168	*Integration of new power controls to existing systems*	✓		
169	*Integration of new process controls to existing systems*	✓		
170	*Integration of new site controls (i.e. safety, security, and/or surveillance) to existing systems*	✓		
171	*Remote monitoring, alarm, & control of new process and/or site management systems*			✓
172	*Local set-aside of select equipment, piping, electrical, metals, and misc. materials subject to demolition*	✓		
173	*Salvaging/recovery of select equipment, piping, electrical, metals, and misc. materials subject to demolition*		✓	
174	*Public art costs, contributions, community outreach, and related impact on construction, cost, and/or schedule*			✓
175	*Owner's engineering, program/project management, and/or oversight costs*			✓
176	*Independent project and/or system commissioning costs and related impact on schedule*			✓

END

Stantec

OPCC BASIS-OF-ESTIMATE

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Date	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	14-Jul-23	000	2002006267

B-O-E Clarifications

NOTE: Item numbers in brown font indicate an auto-fill and/or variable text that adjusts with selection(s) made in other OPCC sheets

1	This opinion of probable construction costs (OPCC) has been assigned a Class 5 (i.e. PLANNING or ORDER-OF-MAGNITUDE) level status per our judgement of the level of project definition, expected accuracy range, and other characteristics per the estimating guidelines developed within Stantec. The estimating methodologies primarily utilized within a class 5 OPCC typically involves capacity factoring, parametrics, simple modeling techniques, judgement, and analogy
2	Per internationally recognized guidelines, the accuracy range limits for this specific OPCC class would be as follows: LOW end = (-)20% to (-)50%, and HIGH end = (+)30% to (+)100%, with a 90% confidence that the actual cost will fall within the bounds of these ranges after application of the appropriate contingencies.
3	Considering the estimate class vs. quality of scope definition, amount of contingency, and perceived OPCC reliability, it is the Estimator's judgement that the MINIMUM class accuracy range limits should apply, specifically -20% to +30%. These percentages should be applied to the estimate total to establish the OPCC accuracy range in USD
4	Stantec's opinions, recommendations and assessments are limited by a) the accuracy and completeness of information upon which it may reasonably rely, b) schedule constraints or scope limitations, c) unknown or variable site or other conditions, d) other factors beyond Stantec's control. Any estimates as to construction costs or quantities are limited by a lack of control over financial and/or market conditions, including the future price of labor, materials, and prospective bidding environments and procedures. Consultant does not warrant or guarantee the accuracy or completeness of its Services to the extent impacted by these limitations and Client should limit its reliance on the Services in like manner.
5	A combination of "ESTIMATE "and "SCOPE" contingencies has been included in this OPCC for covering not only the potential issues related to any Estimator judgements, take-offs, or omissions, but also providing for the potential project growth due to design changes/revisions, undefined regulatory considerations, Owner preferences, and general unknowns that could arise over the duration of the project. Please note however that escalation due to code and/or technology changes has not been considered.
6	Subcontractor(s) mark-ups applied to procured/engineered equipment items is currently established at 5% for Overhead & General Conditions and 7% for Profit. The subsequent 2nd tier mark-ups applied by the Prime Contractor on Subcontractor costs are currently established at 1% for General & Administration and 2% for Profit
7	The following scope definition deliverable(s) provided by Others comprise the primary resource used for preparing this OPCC estimate: a. Stantec Alder Creek Site Plan for OPCC drawing (1 PDF sheet) received via email link 13Jul23 b. Stantec Sandy P&ID's 07.12.23 drawings (8 PDF sheets) received via email link 13Jul23 b. Various scope clarification emails, messaging, and/or discussions up to the submittal date of this OPCC
8	Specific issues related to this OPCC include: a. A Special Escalation factor has been included to bring the available cost estimating database resources up to current anticipated levels b. All excavations and trenching is presumed to be laid-back open cut, and all pavement area work anticipated to require in-kind asphalt patching c. Where necessary, local (within 100 LF) connections are anticipated as available for sanitary waste, potable water, and 480V electric power d. 300 kW genset package includes integral diesel belly tank (single wall) within a CIP concrete containment area e. To maintain volume identified plus 2' freeboard, 182.5k gal finished water storage tank has 37' sidewall f. Finished water pumps are comprised of 2+1 canned vertical turbine pumps mounted outdoors g. It is presumed that existing raw water pump station can be shut-down during the can restoration and pump & controls replacement h. No demolition or rehabilitation allowances are included in this OPCC version i. Containerized membrane packages are anticipated to be pre-piped, pre-wired, and fully assembled and ready for use after external connections & support equipment j. Allowances have been included for: i. 480 VAC power feeder ii. Yard piping iii. New septic and drainfield
9	Although there are uncertainties associated with the current tariff situation, the allowance presently included in the OPCC SUMMARY sheet for SPECIAL escalation is intended to partially absorb any impact of applicable tariffs
10	The Prime Contractor is anticipated to self-perform the following installation scope in this OPCC: a. DIV 1g General Conditions b. DIV 1s Site Staffing for Project Management & Construction Oversight c. DIV 2c Common Sitework d. DIV 3 Concrete e. DIV 5i INSTALL: Miscellaneous Metals f. DIVS 5-8 Buildings & Components
11	Additionally, the Prime Contractor is anticipated to procure the following direct from the Fabricators, Manufacturers and/or Vendors: a. DIVS 11-15s SUPPLY: Process & Mechanical EQ
12	The following Vendor and/or cost information has been provided by Others for use as the capital equipment costs in this OPCC. Where freight, field services, and/or spare parts costs are indicated as included in the cost, an approximation of these costs (if not specifically broken out) will be deducted from the cost prior to utilization in the OPCC and then added back in within the OPCC SUMMARY sheet. a. Containerized membrane treatment systems: **$1,500,000/each**
13	***END***
14	
15	

OPCC ESTIMATE & MODEL CLARIFICATIONS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Date	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	14-Jul-23	000	2002006267

Model Clarifications

1 Although not included in this OPCC estimate, the largest potential impact on the Owner's cost for this project, and as demonstrated in the table below, may be the number of qualified Contractor(s) that are solicited and subsequently responsive to a bid request:

Bids Solicited & Received	1	2 - 3	4 - 5	6 - 7	8 or more
Potential Cost Deviation From This OPCC Scope & Estimate	+25% to +100%	+10% to +25%	0% to +10%	0% to -10%	-10% to -20%

2 This model utilizes the addition of a suffix to select CSI division numbers for differentiating the scope of supply and subsequent worksheets. Specifically, DIV 1 utilizes **(s)** for site staffing, **(g)** for general conditions, and **(p)** for pass-thru scope items; DIVS 5, 15, & 16 use **(s)** for procurement of equipment and/or fabrications and **(i)** for installation of equipment and/or fabrications; DIV 2 applies **(c)** for common sitework, **(s)** for specialty sitework, and **(w)** for well work**;** and DIV 13 utilizes **(f)** for field-erected tanks and **(s)** for shop-fabricated tanks

3 The OPCC LABOR RATE STANDARDS sheet is provided to highlight the methodology behind development of the blended rate which is then applied based on the CSI division. The fringe benefits rate is anticipated to cover those paid by the employer and/or union such as vacation, pension, training, advancement funds, and health & welfare contributions. For any overtime work, the applicable overtime factor (i.e. multiplier) is applied to the MH base rate, while the fringe benefits cost is applied straight-up against each MH worked.

4 Wage rate adjustments and/or overtime work hours may be applied within this OPCC in anticipation of attracting the highest quality tradesmen for this project, and considers that the availability of this talent could otherwise be compromised depending on the current labor market conditions of the area.

5 The percentages applied for the establishing the indirect costs are estimates based upon the Estimator's judgement concerning the scope of work, anticipated work schedule, and risk allocation deemed necessary at the time of this submittal.

6 The absence of engineering costs is intended to represent that all engineering services are excluded, including but not limited to design, permitting, procurement, geotechnical investigations, contractor solicitation, bid, & selection, and support/oversight during construction, start-up, & commissioning.

7 The designation of both the PROJECT DELIVERY method and PRIME CONTRACTOR has a direct bearing on the final OPCC cost, so the designation of these in the OPCC is important. For example, a typical local General Contractor executing the work as PRIME (and possibly CM as well) will require a cost structure that differs significantly from an EPCM as PRIME, most notably regarding the work being self-performed vs. subcontracted, the potential travel/living costs involved, and the tiers of mark-ups/burdens applied.

8 The *"Assumptions"* section at the top of each DIV sheet should be referenced for identifying a portion of the "forced-detail" utilized in the OPCC, including both perceived and known issues such as specific components, materials of construction, site concerns, and working conditions that could impact the cost basis of this OPCC.

9 The *"General Conditions Allowances"* section in DIV 1 sheet, and *"Allowances"* section at bottom of DIVS 2-17 sheets, are all comprised of "potential" cost items initially based on type & quantity of work occurring within each CSI division, with the intention of covering items that could be reasonably anticipated but cannot yet be fully defined and/or quantified.

10 The totals for each of these Allowance sections identified above should be considered as more reliable and representative of an appropriate overall cost, rather than considering each individual line item cost (or absence thereof) that comprise this total, any of which may or may not actually end up being necessary.

11 The manhours developed for each work item reflects the total, whether it be executed by an "individual" or "crew", with the manhour rates depicted thoughout the OPCC having been developed to reflect a blend of the anticipated ratios of trade labor and supervision for each CSI division. These individual blended DIV rates include adjustments for any overtime and/or shift work identified in the INSTALLATION OVERVIEW sheet.

12 The overall composite rates provided in the MODEL LABOR RATE STANDARDS sheet is for informational purposes only and reflects the weighting effect due to the actual divisions and scope of work comprising the project.

13 The OPCC BASIS-OF-ESTIMATE CHECKLIST sheet is provided as a quick reference of those scope, execution, and cost items *INCLUDED* in the OPCC, those *EXCLUDED* from the OPCC but anticipated as necessary and the responsibility of Others, and those *EXCLUDED* from the OPCC because they are not required or believed to be unnecessary.

14 The DIV 1 costs are split up into separate sheets, with the DIV 1s PRIME CONTRACTOR STAFF sheet carried as part of the *"Prime Contractor"* section of the OPCC SUMMARY sheet, while the DIV 1c GENERAL REQUIREMENTS sheet costs are carried as part of the direct cost subtotal line within the *"Cost-of-Work"* section of the OPCC SUMMARY sheet. The third cost sheet is the DIV 1p PASS-THRU ALLOWANCES which typically is carried only in the PRIME CONTRACTOR cost summary sections of the OPCC. This split is due to the anticipation that the general conditions would primarily be executed utilizing trades labor, construction tools/equipment, and consumable materials.

15 The DIV 15 MECHANICAL INSTALLATION sheet and DIV 16 ELECTRICAL INSTALLATION sheet material selection drop-downs (5 each) at the top ASSUMPTIONS section, along with the associated percentage, are intended to represent an overall materials profile and utilization anticipated throughout the project.

16 There may be instances where highly un-symmetrical or complex structures will be dimensionally and/or geometrically "smoothed" to establish more-simplified units that comply with the OPCC input cell templates, all in an attempt to maintain the overall component aspect ratios and overall size. This typically occurs in the DIV sheets utilizing dimensional data inputs.

17 The PRELIMINARY CONSTRUCTION SCHEDULE sheet, if provided, attempts to present all the forecast and WBS totals in a means approximating the anticipated "normal" distribution over the job duration. Typically, the overall construction duration should be considered as more accurate than the individual WBS item durations.

18 The DIVS 3 & 5-8 BUILDINGS/COMPONENTS sheet includes a composite cost of all structural & architectural scope required for the building shell (walls and/or roof). All other building-related construction scope is costed elsewhere, such as sitework & excavation (re: DIV 2), concrete slabs & foundations (re: DIV 3), masonry (re: DIV 4), miscellaneous metals (re: DIV 5), finishes (re: DIVS 9-10), HVAC, fire protection, utilities, & plumbing (re: DIV 15), and HVAC power/controls, fire detection/alarm, utilities, & lighting (re: DIV 16).

19 With exception of those process equipment budget costs provided by Others, all buy-out equipment costs in the DIVS 11-16 PROCESS EQUIPMENT sheets are anticipated to be of US origin and have been derived either through best judgement of the Estimator or extrapolation of similar items from an independent equipment quote/purchase database.

20 Equipment packages identified as "Skid" units are anticipated to be procured as assembled, pre-piped, pre-valved, pre-wired, pre-switched, and pre-painted by the Manufacturer to the fullest extent possible, typically requiring only re-assembly of the required shipping breakdown, touch-up paint, & off-skid piping/wiring homeruns.

21 The DIVS 11-16 PROCESS EQUIPMENT sheets provide equipment line-item breakdowns of the subtotal for the *"Process Equipment Installation Summary"* sections at the top of the DIV 15 MECHANICAL INSTALLATION and DIV 16 ELECTRICAL INSTALLATION sheets. Each field-installed process/mechanical equipment item within the DIVS 11-16 PROCESS EQUIPMENT sheets provides parametric costing for all necessary DIV 15 mechanical work such as off-load, handle, set, anchor, grout, and needed hangars/brackets/supports, pipe, fittings, manual valves, check valves, pressure gauges, and sample ports, and for all necessary DIV 16 electrical equipment such as off-load, handle, set, anchor, grout, and needed hangars/brackets/supports, disconnect/safety switches, raceway, flex-conduit, fittings, wire, terminations, and grounding.

22 In instances where PRECONSTRUCTION time is indicated, this duration for the front-end scope/construction issues, some which are typically outside the installing Contractor(s) responsibility and control. This time may incude, if applicable, final Contractor negotiation(s), Prime and/or Subcontractor pre-construction efforts including early staffing & mobilization, work sequence pre-planning, permit, submittal, & approval cycles, and procurement of specilized/long-lead equipment. If required, coordination for any special demolition, work phasing, and/or shut-downs may also apply.

OPCC ESTIMATE & MODEL CLARIFICATIONS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Date	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	14-Jul-23	000	2002006267

Model Clarifications

Estimate Classification Guidelines Currently Followed:

CLASS 1	Engineering is from 95% to 100% complete, and would comprise virtually all engineering and design documentation of the project including Integrated Project Plans, Project Master Schedules, Escalation Strategy, Work Breakdown Structure, Project Code of Accounts, Contracting Strategy, Block Flow Diagrams, Plot Plans, Process Flow Diagrams, Utility Flow Diagrams, Piping and Instrumentation Diagrams, Heat and Material Balances, Process Equipment Lists, Specifications & Datasheets, General Equipment Arrangement Drawings, Spare Parts Lists, Mechanical Discipline Drawings, Electrical Discipline Drawings, Instrumentation/Control System Discipline Drawings, Civil Drawings, Structural Drawings, Project Execution Plans, and Commissioning Plans. Typical accuracy ranges for Class 1 estimates are from -10% to +15% and sometimes higher depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Class 1 estimates involve the highest degree of deterministic estimating methods, and require a great amount of effort. ***NOTE: Because these estimates are prepared in the greatest detail for an actual upcoming project, they are typically always prepared by an installing Contractor either as a bid response or for an active project change order.***
CLASS 2	Engineering is from 70% to 90% complete, and would comprise at a minimum the following: process flow diagrams, utility flow diagrams, piping and instrumentation diagrams, heat and material balances, final plot plan, final layout drawings, complete engineered process and utility equipment lists, single line diagrams for electrical, electrical equipment and motor schedules, vendor quotations, detailed project execution plans, researching and work force plans, etc. Typical accuracy ranges for Class 2 estimates are from -15% to +20% and sometimes higher depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Class 2 estimates are prepared in great detail, and often involve tens of thousands of unit cost line items. ***NOTE: This class typically reflects the final estimate prepared as an Engineer's Estimate or Opinion-of-Probable-Construction-Cost (i.e. OPCC).***
CLASS 3	Engineering is from 45% to 60% complete, and would comprise at a minimum the following: process flow diagrams, utility flow diagrams, preliminary piping and instrument diagrams, plot plan, developed layout drawings, and essentially complete engineered process and utility equipment lists. Typical accuracy ranges for Class 3 estimates are from -30% to +50% and sometimes higher depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Class 3 estimates are typically prepared using more deterministic estimating methods than stochastic methods. Factoring and other stochastic methods may be used to estimate less-significant areas of the project.
CLASS 4	Engineering is from 25% to 30% complete, and would comprise at a minimum the following: plant capacity, block schematics, indicated layout, process flow diagrams for main process systems, etc. Typical accuracy ranges for Class 4 estimates are from +/- 15 to 50% (sometimes higher), depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Class 4 estimates virtually always use stochastic estimating methods such as equipment factors, Lang factors, Hand factors, Chilton factors, Peters-Timmerhaus factors, Guthrie factors, the Miller method, gross unit costs/ratios, and other parametric and modeling techniques.
CLASS 5	Engineering is from 0% to 25% complete, and would be prepared within a very limited amount of time and with little effort expended - sometimes requiring less than an hour to prepare. Often the proposed plant type, location, and capacity are only known at the time of preparation. Typical accuracy ranges for Class 5 estimates are from -50% to +100% and sometimes higher depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Class 5 estimates virtually always use stochastic estimating methods such as equipment factors, Lang factors, Hand factors, Chilton factors, Peters-Timmerhaus factors, Guthrie factors, the Miller method, gross unit costs/ratios, and other parametric and modeling techniques.

END

Stantec

OPCC LABOR RATE STANDARDS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

NOTE: Fringes are those benefits paid by the employer and/or union such as vacation, pension, training, advancement funds, and health & welfare contributions

Labor Rate Basis & Adjustments

Prevailing Wage/Davis Bacon

Rate Escalation Factor	1.00
Trade Supervision Premium	$2.00
Incidental Overtime Allowance	0.0%
Non-Specific Rate Adjustment	

Closest RSMeans City Rate | *State*: Portland | OR

County of Site Location: Clackamas County

Trades Labor Rate Data Source: 2023 RSMeans Publication: Labor Rates for the Construction Industry

Construction Work Schedule: (5)-8 hr days Mon-Fri

Overtime Factors on Base Rate

	Hrs <= 8	Hrs > 8
M-F	1X Base	1½X Base
Sat	1½X Base	2X Base
Sun	2X Base	3X Base

Manhour Rate Data

Straight-Time Trades Labor

Trade	Base	Fringes	Total	Trade	Base	Fringes	Total	Trade	Base	Fringes	Total
Helpers-5 Trades Avg	$33.60	$16.13	$52.44	*Operator-Oiler*	$44.02	$16.35	$60.37	*Rodman-Reinforcing*	$41.13	$30.72	$71.85
Common Bldg Laborer	$34.98	$16.55	$51.53	*Operator-Mechanic*	$53.81	$16.35	$70.16	*Roofer-Composition*	$38.78	$20.48	$59.26
Asbestos/Insulate Worker	$0.00	$0.00	$79.76	*Glazier*	$44.43	$25.09	$69.52	*Roofer Helper*	$0.00	$0.00	$44.45
Boilermaker	$40.46	$30.59	$71.05	*Lather*	$44.74	$18.91	$63.65	*Sheet Metal Worker*	$45.80	$25.46	$71.26
Bricklayer	$43.00	$24.25	$67.25	*Millwright*	$50.24	$19.21	$69.45	*Sprinkler Installer*	$44.13	$25.84	$69.97
Bricklayer Helper	$36.25	$16.55	$52.80	*Painter-Ordinary*	$30.72	$14.18	$44.90	*Steamfitter/Pipefitter*	$50.68	$35.00	$85.68
Carpenter	$44.97	$19.21	$64.18	*Painter-Structural Steel*	$30.72	$14.18	$44.90	*Stone Mason*	$43.00	$24.25	$67.25
Cement Finisher	$40.81	$21.17	$61.98	*Pile Driver*	$45.74	$19.21	$64.95	*Structural Steel Worker*	$41.13	$30.72	$71.85
Electrician	$53.85	$27.84	$81.69	*Plasterer*	$41.16	$19.23	$60.39	*Welder-Structural Steel*	$41.13	$30.72	$71.85
Operator-Crane/Shovel	$55.97	$16.35	$72.32	*Plasterer Helper*	$36.25	$16.55	$52.80	*Tile Layer*	$37.65	$20.83	$58.48
Operator-Medium	$45.26	$16.35	$61.61	*Plumber*	$50.68	$35.00	$85.68	*Tile Layer Helper*	$28.29	$15.30	$43.59
Operator-Light	$44.02	$16.35	$60.37	*Plumber Helper*	$0.00	$0.00	$68.54	*Truck Driver-Heavy*	$31.10	$16.73	$47.83

(comments)

OPCC Composited & Weighted Labor Rate

OPCC Straight-Time (ST) Labor Base Rate

Base	Fringes	Fringes %	Total
$43.68	$22.39	51.3%	**$66.07**

OPCC Over-Time (OT) Labor Base Rate

Base	Fringes	Fringes %	Total

Impact of Work Schedule on OPCC Composite Labor Rate

Weekly Schedule	*Monday thru Friday*				*Saturday*				*Sunday*				*Composite Rate Impact*		
	Day = 8 Hr		Day > 8 Hr		Day = 8 Hr		Day > 8 Hr		Day = 8 Hr		Day > 8 Hr				
Hours & Workdays	ST MH per Week	ST $ per Week	OT MH per Week	OT $ per Week	OT MH per Week	OT $ per Week	OT MH per Week	OT $ per Week	OT MH per Week	OT $ per Week	OT MH per Week	OT $ per Week	TOTAL MH per Week	TOTAL $ per Week	TOTAL $ per MH Rate
(4)-10 hr days Mon-Fri (w/o OT)	40	$2,643	0	$0	0	$0	0	$0	0	$0	0	$0	40	$2,643	**$66.07**
(5)-8 hr days Mon-Fri	40	$2,643											40	$2,643	**$66.07**
(5)-8 hr days Mon-Fri + Incidental O	40	$2,643	0	$0	0	$0	0	$0	0	$0	0	$0	40	$2,643	**$66.07**
(4)-10 hr days Mon-Fri (with OT)	32	$2,114	8	$703									40	$2,817	**$70.43**
(6)-8 hr days Mon-Sat	40	$2,643	0	$0	8	$703	0	$0	0	$0	0	$0	48	$3,346	**$69.71**
(4)-12 hr days Mon-Fri	32	$2,114	16	$1,406									48	$3,521	**$73.34**
(5)-10 hr days Mon-Fri	40	$2,643	10	$879	0	$0	0	$0	0	$0	0	$0	50	$3,522	**$70.43**
(7)-8 hr days Mon-Sun	40	$2,643			8	$703			8	$878			56	$4,224	**$75.42**
(5)-10 hr days Mon-Fri + 8 hrs Sat	40	$2,643	10	$879	8	$703	0	$0	0	$0	0	$0	58	$4,225	**$72.84**
(5)-12 hr days Mon-Fri	40	$2,643	20	$1,758									60	$4,401	**$73.34**
(6)-10 hr days Mon-Sat	40	$2,643	10	$879	8	$703	2	$219	0	$0	0	$0	60	$4,444	**$74.07**
(5)-12 hr days Mon-Fri + 8 hrs Sat	40	$2,643	20	$1,758	8	$703							68	$5,104	**$75.06**
(6)-10 hr days Mon-Sat + 8 hrs Sun	40	$2,643	10	$879	8	$703	2	$219	8	$878	0	$0	68	$5,322	**$78.27**
(7)-10 hr days Mon-Sun	40	$2,643	10	$879	8	$703	2	$219	8	$878	2	$307	70	$5,629	**$80.42**
(6)-12 hr days Mon-Sat	40	$2,643	20	$1,758	8	$703	4	$439	0	$0	0	$0	72	$5,543	**$76.98**
(6)-12 hr days Mon-Sat + 8 hrs Sun	40	$2,643	20	$1,758	8	$703	4	$439	8	$878			80	$6,421	**$80.26**
(7)-12 hr days Mon-Sun	40	$2,643	20	$1,758	8	$703	4	$439	8	$878	4	$614	84	$7,034	**$83.74**

Stantec

OPCC LABOR RATE STANDARDS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Establishing OPCC Blended Labor Rates for Each DIV

Fully-Burdened Rate includes allowances for payroll deducts & workers compensation insurance, and small tools & safety gear, as well as Subcontractor allowances (where applicable) for overhead & general conditions, profit, insurances, & bonds, and finally for the Prime Contractor's overall project allowances for insurances, general & administrative, profit, & bonds. NOTE: Taxes are excluded in these rates

DIVS 1-2: General Requirements & Sitework

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Operator (crane)	2	$72.32	$72.32	$144.64
Operator (medium)	4	$61.61	$61.61	$246.44
Driver (heavy)	2	$47.83	$47.83	$95.66
Operator (mechanic)	1	$70.16	$70.16	$70.16
Operator (oiler)	1	$60.37	$60.37	$60.37
Pile Driver	1	$64.95	$64.95	$64.95
Helper/Apprentice	2	$52.44	$52.44	$104.87
Laborer	4	$51.53	$51.53	$206.12
Supervision	3	$74.32	$74.32	$222.96
Total Count	**20**		Total Cost	**$1,216**

Blended Base Rate = $60.81

Fully-Burdened Rate = $86.00 $98.34

DIV 3: Concrete

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Carpenter	4	$64.18	$64.18	$256.72
Rodman	4	$71.85	$71.85	$287.40
Cement Finisher	3	$61.98	$61.98	$185.94
Operator (crane)	1	$72.32	$72.32	$72.32
Operator (medium)	1	$61.61	$61.61	$61.61
Helper/Apprentice	2	$52.44	$52.44	$104.87
Laborer	2	$51.53	$51.53	$103.06
Supervision	3	$73.85	$73.85	$221.55
Total Count	**20**		Total Cost	**$1,293**

Blended Base Rate = $64.67

Fully-Burdened Rate = $91.46

DIV 4: Masonry

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Bricklayer				
Stone Mason				
Operator (light)				
Helper/Apprentice				
Laborer				
Supervision				
Total Count			Total Cost	

DIV 5: Miscellaneous Metals

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Struct Stl Worker	5	$71.85	$71.85	$359.25
Welder-Struct Stl	2	$71.85	$71.85	$143.70
Operator (crane)	1	$72.32	$72.32	$72.32
Operator (medium)	3	$61.61	$61.61	$184.83
Boilermaker	2	$71.05	$71.05	$142.10
Helper/Apprentice	2	$52.44	$52.44	$104.87
Supervision	3	$73.05	$73.05	$219.15
Total Count	**18**		Total Cost	**$1,226**

Blended Base Rate = $68.12

Fully-Burdened Rate = $96.34

DIVS 5-8: Buildings & Components

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Struct Stl Worker	1	$71.85	$71.85	$71.85
Operator (crane)	4	$72.32	$72.32	$289.28
Operator (medium)	1	$61.61	$61.61	$61.61
Sheetmetal Worker	2	$71.26	$71.26	$142.52
Glazier	1	$69.52	$69.52	$69.52
Roofer (composition)	2	$59.26	$59.26	$118.52
Sprinkler Installer	1	$69.97	$69.97	$69.97
Helper/Apprentice	2	$52.44	$52.44	$104.87
Supervision	2	$73.85	$73.85	$147.70
Total Count	**16**		Total Cost	**$1,076**

Blended Base Rate = $67.24

Fully-Burdened Rate = $95.09

DIVS 7-10: Coatings & Finishes

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Painter (structural)	5	$44.90	$44.90	$224.50
Tile Layer	1	$58.48	$58.48	$58.48
Plasterer	1	$60.39	$60.39	$60.39
Painter (ordinary)	3	$44.90	$44.90	$134.70
Lather	1	$63.65	$63.65	$63.65
Helper/Apprentice	2	$52.44	$52.44	$104.87
Supervision	2	$65.65	$65.65	$131.30
Total Count	**15**		Total Cost	**$778**

Blended Base Rate = $51.86

Fully-Burdened Rate = $83.87

DIV 13: Field-Erect & Shop-Fab Tanks

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Struct Stl Worker	3	$71.85	$71.85	$215.55
Welder-Struct Stl	4	$71.85	$71.85	$287.40
Operator (crane)	1	$72.32	$72.32	$72.32
Operator (medium)	1	$61.61	$61.61	$61.61
Operator (light)	1	$60.37	$60.37	$60.37
Helper/Apprentice	2	$52.44	$52.44	$104.87
Supervision	2	$73.85	$73.85	$147.70
Total Count	**14**		Total Cost	**$950**

Blended Base Rate = $67.84

Fully-Burdened Rate = $109.72

DIV 15: Piping & Mechanical

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Millwright	1	$69.45	$69.45	$69.45
Steamfitter/Pipefitter	6	$85.68	$85.68	$514.08
Plumber	2	$85.68	$85.68	$171.36
Operator (medium)	1	$61.61	$61.61	$61.61
Insulator	1	$79.76	$79.76	$79.76
Helper/Apprentice	2	$52.44	$52.44	$104.87
Supervision	2	$87.68	$87.68	$175.36
Total Count	**15**		Total Cost	**$1,176**

Blended Base Rate = $78.43

Fully-Burdened Rate = $126.84

DIV 16: Electrical and I&C

Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Electrician	6	$81.69	$81.69	$490.14
Operator (light)	1	$60.37	$60.37	$60.37
Helper/Apprentice	2	$52.44	$52.44	$104.87
Supervision	2	$83.69	$83.69	$167.38
Total Count	**11**		Total Cost	**$823**

Blended Base Rate = $74.80

Fully-Burdened Rate = $120.96

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OPCC COMMODITY STANDARDS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

NOTE: The dates indicate the ENR monthly construction economics pricing (20-city average) time of publication for each of the indicated indices & material categories

Index & Material Pricing Categories	*Pricing Date*
COST INDICES: Construction (CCI), Building (BCI), & Material (MCI)	5-Jun-23
CONCRETE: Asphalt Paving, Cement, Crushed Stone, Sand, Concrete, & Block	5-Jun-23
PIPE: Sewer, Water, & Drain Pipe: RCP, CS, PE, PVC, DIP, & COP	12-Jun-23
WOOD: Lumber, Plywood, Plyform, Part Board, Gypsum Board, & Insulation	19-Jun-23
METALS: Structural Steel, Rebar, CS Sheet, AL sheet, SS Sheet, & H-Pile	26-Jun-23

Unit Abbreviations

BAG: *70 lbs* — ***LF:*** *Linear foot*
C: *100 count* — ***MBF:*** *1,000 board-feet*
CWT: *100 lbs* — ***MSF:*** *1,000 square feet*
CY: *Cubic yard* — ***SF:*** *Square foot*
HR: *Hour* — ***TON:*** *2,000 lbs*

Monthly Data

Asphal Paving, Cement……	Type/Size	Unit	Unit Cost
Asphalt Paving	PG 58	TON	$587.46
	Cutback MC800	TON	$430.93
	Rapid set	TON	$389.28
	Slow set	TON	$410.15
Portland Cement (delivered)	Type I	TON	$206.77
Masonry Cement (delivered)	70 LB	BAG	$15.57
Crushed Stone	Base course	TON	$20.66
	Concrete course	TON	$21.77
	Asphalt course	TON	$21.65
Sand	Concrete	TON	$20.89
	Masonry	TON	$20.98
Concrete-Ready Mix (delivered)	3,000 psi	CY	$162.04
	4,000 psi	CY	$170.88
	5,000 psi	CY	$183.50
Concrete Block (delivered)	Normal - 8" x 8" x 16"	C	$217.54
	Light - 8" x 8" x 16"	C	$210.54
	12" x 8" x 16"	C	$301.05

Sewer, Water, & Drain…...	Type/Size	Unit	Unit Cost
Reinforced concrete pipe (C76)	12" Ø (rubber gasket)	LF	$27.35
	24" Ø (rubber gasket)	LF	$55.70
	36" Ø (rubber gasket)	LF	$114.12
	48" Ø	LF	$188.66
Corrugated steel pipe (galv)	12" Ø (16 gauge)	LF	$15.22
	36" Ø (14 gauge)	LF	$46.71
	60" Ø (12 gauge)	LF	$96.46
Polyethylene pipe (perf/corr)	Underdrain - 4" Ø	LF	$1.13
Polyvinylchloride Pipe	Sewer - 4" Ø (D3034)	LF	$3.22
	Sewer - 8" Ø (D3034)	LF	$10.22
	Water - 6" Ø (C900)	LF	$12.00
	Water - 8" Ø (C900)	LF	$15.94
	Water - 12" Ø (C900)	LF	$24.83
Ductile Iron Pipe (CL150)	6" Ø	LF	$27.50
	8" Ø	LF	$39.90
	12" Ø	LF	$57.92
Copper Water Tubing	Type L - 1/2" Ø	LF	$2.89
	Type L - 1-1/2" Ø	LF	$10.77

Lumber, Plywood……	Type/Size	Unit	Unit Cost
2x4	S4S - Pine	MBF	$1,146.40
2x4	S4S - Fir	MBF	$882.92
2x4	S4S - Common	MBF	$908.88
2x6	S4S - Common	MBF	$939.59
2x8	S4S - Common	MBF	$865.79
2x10	S4S - Common	MBF	$1,048.94
Plywood	5/8" thick	MSF	$995.86
Plyform	3/4" thick	MSF	$1,762.91
Particle Board (underlayment)	5/8" thick	MSF	$904.37
Gypsum Board (regular)	1/2" thick	MSF	$448.63
Roofing Insulation	Unfaced	SF	$11.20
Wall Insulation	Unfaced	SF	$10.22

Structural Steel, Rebar……	Type/Size	Unit	Unit Cost
Standard Structural Shapes	Average	CWT	$97.05
Channel Beam	6" deep - 8.2 LB/LF	CWT	$86.85
I-Beam	6" deep - 12.5 LB/LF	CWT	$103.90
Wide-Flange	8" deep - 31 LB/LF	CWT	$101.20
Reinforcing Bars	Grade 60 - #4	CWT	$73.80
Hot-Rolled Carbon Steel Plate	12 gauge - 48" x 10'	CWT	$90.95
Building Sheet & Plate-Aluminum	3003H14 - 36" x 96"	CWT	$317.97
Stainless Steel Sheet	14 gauge	CWT	$304.67
	16 gauge	CWT	$316.80
	20 gauge	CWT	$316.10
Stainless Steel Plate	304 - 1/4" x 72" x 240"	CWT	$303.52
	316 - 1/4" x 96" x 140"	CWT	$361.40
Steel Piling (H-pile)	HP10x42 (A572)	CWT	$39.71

Cost Indices	Type	Unit	Unit Cost/Index
CCI	Construction cost index	-	13,345.00
	Common labor index	-	25,080.22
	Wages	HR	48.30
BCI	Building cost index	-	8,095.33
	Skilled labor index	-	11,674.34
	Wages	HR	64.49
MCI	Material cost index	-	5,881.65
	Cement	TON	200.28
	Steel	CWT	96.03
	Lumber	MBF	972.93

NOTE: ENR ceased providing data after 31Mar14 for **Gravel** (3/4" to 1-1/2" and 3/8" to 3/4"-TON), **Masons Lime** (TON), **Standard Modular Brick** (M), **Vitrified Clay Pipe** (premium joint-12" Ø and 24" Ø-LF), **Common 4x6** (S4S-MBF), **Common 4x12** (S4S-MBF), **Regular Gypsum Board** (5/8" thick-MSF), **Type X Gypsum Board** (1/2" thick and 5/8" thick-MSF), **Epoxy-Coated Reinforcing Bar** (CWT), and **Expanded Metal Lath** (diamond & ribbed-CWT).

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WBS COST OVERVIEW

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

The DIRECT Cost column reflects the Installing Contractor's raw cost to supply and/or install the WBS item indicated. The ALLOCATED Cost column reflects addition of the Installing Contractor Burdens & Add-Ons as applied within each CSI division

Reference the next (2) OPCC worksheets titled OPCC SUMMARY and WBS COST DISTRIBUTION & BUILD-UP for additional details on the transition from DIRECT COST to ALLOCATED COST (i.e. sell price)

Summary Data

Level 1 Summary by WBS

WBS ID or #	WBS Description				WBS DIRECT Cost	WBS ALLOCATED Cost (Sell)	Comment
1	General Conditions				$322,464	$0	Cost has been allocated proportionally to each WBS item below
2	General Allowances				$142,512	$0	Cost has been allocated proportionally to each WBS item below
3	Electric Power & Control Equipment				$486,625	$1,006,827	
4	Existing Raw Water Pump Station				$160,757	$321,428	
5	Static Mixer Vault				$111,568	$221,842	
6	MF Feed Tank				$66,893	$132,485	
7	Membrane & Neutralization System				$3,209,363	$5,930,599	
8	CIP Storage Tank				$66,018	$125,760	
9	Finished Water Storage Tank				$508,073	$1,029,509	
10	Finished Water Booster Pumps				$292,480	$570,869	
11	Chemical Systems				$309,392	$620,888	
12	Generator System				$202,533	$378,470	
13	Canopy & Slab Structure				$829,832	$1,568,138	
14	Miscellaneous Site Work				$103,282	$215,397	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
0	0				$0	$0	
TOTALS					$6,811,794	$12,122,213	

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OPCC SUMMARY

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Project Delivery & Bid Scope	BID/BUILD without Preconstruction	*EQ Inspections & Start-Up Assistance*	2.45%
Prime Contractor	GENERAL CONTRACTOR as GC & CM	*EQ Spare Parts & Special Tools/Supplies*	1.24% for Start-Up Supply Only
Construction Execution	PRIME with 33% of Direct Cost by SUBS	*Packing & Freight Categories*	EQ (excluding permanent materials)
Payroll Deductions & Workers Compensation	38.00%	*Packing & Freight*	6.50%
Small Tools & Personal Safety Gear	3.50%	*Years From OPCC to Construct Mid-Point*	1.24
Tax Type & Categories Applied	TAX EXCLUDED and/or EXEMPT	*MH$ GENERAL Escalation APR*	3.00%
Tax Rate Applied - Clackamas County	0.000%	*M&CE$ GENERAL Escalation APR*	2.00%
Builders Risk Insurance - Carried by PRIME	1.75%	*EQ$ GENERAL Escalation APR*	1.00%
Liability Insurances - SUBS	0.550%	*Estimate Contingency*	20.0%
Umbrella & Vehicle Insurances - SUBS	0.250%	*Scope Contingency*	10.0%
Bonds (P&P-Supply) - SUBS	1.30%	*SPECIAL Escalation: MH$, M&CE$, & EQ$*	1.0%
Overhead & General Conditions - SUBS	5.00%	*Anticipated Construction-Only Duration*	37 weeks
Profit - SUBS	7.00%	*Special Project Consideration*	NOT APPLICABLE

Installing Contractor Cost-of-Work (COW)

Description	Basis		TOTAL
Direct Cost-of-Work	Total of DIVS 1-16 Sheets Less DIV 1s Prime Contractor Field Staff Sheet & DIV 1p Pass-Thru Costs Sheet		***$6,811,794***
Payroll Deductions & Workers Compensation	38% of Installation Labor Direct Cost (i.e. both Prime & Subcontractor's without fringes)		*$221,743*
Small Tools & Personal Safety Gear	3.5% of Installation Labor Direct Cost (i.e. both Prime & Subcontractor's without fringes)		*$20,424*
EQ Inspections & Start-Up Assistance	2.45% of Buy-Out Equipment Cost		*$101,246*
EQ Spare Parts & Special Tool/Materials	0.87% of Buy-Out Equipment Cost		*$51,337*
Packing & Freight	6.5% of Buy-Out Equipment Cost		*$268,612*
Sales Tax: NOT REQUIRED			
		Running Total A	***$7,475,156***
Overhead & General Conditions	5% of Subcontractor's Labor, Construction Materials/Consumables & Equipment, and Buy-Out Equipment Costs		*$117,419*
Profit	7% of Subcontractor's Labor, Construction Materials/Consumables & Equipment, and Buy-Out Equipment Costs		*$172,606*
		Running Total B	***$7,765,182***
Builders Risk Insurance: CARRIED BY PRIME BELOW			
Liability Insurance	0.55% of Subcontractor's Labor Costs		*$3,977*
Umbrella & Vehicle Insurances	0.25% of Subcontractor's Labor and Construction Materials/Consumables & Equipment Costs		*$4,612*
Bonds-Payment, Performance, & Supply	1.3% of Subcontractor's Labor, Construction Materials/Consumables & Equipment, and Buy-Out Equipment Costs		*$34,411*
		Running Total C	***$7,808,183***
Gross Receipts Tax: NOT APPLICABLE			
		Cost-of-Work (COW) Subtotal	***$7,808,183***

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OPCC SUMMARY

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Prime Contractor Costs

Description	Basis		TOTAL
Field Supervisory Staff Labor	DIV 1s PRIME CONTRACTOR FIELD STAFF sheet		*$402,051*
Field Supervisory Staff Travel & Living	DIV 1s PRIME CONTRACTOR FIELD STAFF sheet		*$12,247*
Field Supervisory Staff Remote Camp: NOT REQUIRED			
Tradesmen & Craft Supervision Remote Camp: NOT REQUIRED			
		Running Total D	***$414,298***
Insurances-Builders Risk, Umbrella, Liability, and/or Vehicle)	2.4% of Prime's Portion of Running Total B + 2.4% of Subcontractor's Portion of Running Total B		*$186,364*
		Running Total E	***$600,662***
General & Administrative	4% of (Prime's Portion of COW Subtotal & Running Total E) + 1% of Subcontractor's Portion of COW Subtotal		*$253,161*
Profit	6% of (Prime's Portion of COW Subtotal + Running Total E) + 2% of Subcontractor's Portion of COW Subtotal		*$393,717*
Project Engineering : BY OTHERS			
Pass-Thru Costs: NOT REQUIRED			
		Running Total F	***$1,247,540***
Bonds-Payment, Performance, Supply, and/or Maintenance	0.8% of COW Subtotal + Running Total F		*$72,446*
		Running Total G	***$1,319,986***
Gross Receipts Tax: NOT APPLICABLE			
		Prime Contractor Costs Subtotal	***$1,319,986***

Estimator Gross Adjustments

Description	Basis	TOTAL
GENERAL Escalation	1.8% composite rate on COW Subtotal + Prime Contractor Costs Subtotal	*$164,311*
ESTIMATE Contingency	20% on COW Subtotal + Prime Contractor Costs Subtotal	*$1,825,634*
SCOPE Contingency	10% on COW Subtotal + Prime Contractor Costs Subtotal	*$912,817*
SPECIAL Escalation	1% on COW Subtotal + Prime Contractor Costs Subtotal	*$91,282*
	Estimator Gross Adjustments Subtotal	***$2,994,044***

OPCC Total

OPCC GRAND TOTAL	***$12,122,213***

Glossary of OPCC Summary Terms

PROJECT DELIVERY & BID SCOPE: Identifies the bid & installation work scope approach (i.e. Bid/Build or Design/Build), which subsequently establishes the baseline burdens and add-on rates.

PRIME CONTRACTOR: Identifies the entity having the overall construction oversight and/or construction management responsibilities, which adjusts a portion of the assigned burden & add-ons.

CONSTRUCTION EXECUTION: Identifies the entity actually performing the supply/install work scope, which finalizes the balance of the assigned burden and add-on rates.

PAYROLL DEDUCTIONS & WORKERS COMP: Percent applied to the supply/install Contractor(s) base MH rate (i.e. excluding fringes) to cover the payroll taxes (FICA, FUTA, & SUTA), payroll insurances, pension contributions, union assessments, bonus programs (excluding profit sharing), training funds, industry/administrative funds, and state workers compensation insurance.

SMALL TOOLS & PERSONAL SAFETY GEAR: Percent applied to the supply/install Contractor(s) base MH rate (i.e. excluding fringes) to cover the supply and/or replacement of the small "expendable" items (i.e. hand tools, hand-held power tools, etc.), and personal protection equipment, with any single item value anticipated to be no greater than $250.

TAX TYPE & CATEGORIES APPLIED: Identifies the type of tax and the MH, M&CE, and/or EQ cost categories to which the tax percentage assigned below shall apply.

TAX RATE: Percent applied to the categories identified above which calculates the supply/install or Prime Contractor(s) tax burden.

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OPCC SUMMARY

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

BUILDERS RISK INSURANCE:	Percent applied to the direct MH, M&CE, & EQ costs to cover the capital and installation risk insurance carried either by the Owner or Prime Contractor (carried under the Prime section).
LIABILITY INSURANCES:	Percent applied to the supply/install Subcontractor(s) direct MH cost for the general liability insurances.
UMBRELLA & VEHICLE INSURANCES:	Percent applied to the supply/install Subcontractor(s) direct MH & M&CE costs for the umbrella & vehicle insurances.
PAYMENT, PERFORMANCE, & SUPPLY BONDS:	Percent applied to the supply/install Contractor(s) applicable direct MH, M&CE, & EQ costs for the bonds to ensure satisfactory completion & payment to suppliers, Vendors, & Subcontractors.
OVERHEAD & GENERAL CONDITIONS:	Percent applied to supply/install Contractor(s) direct MH, M&CE, & EQ costs for direct/indirect field overhead expenses, indirect home office expenses, and general conditions incurred during installation.
PROFIT:	Percent applied to the supply/install Subcontractor(s) direct MH, M&CE, & EQ costs for the profit.
EQ INSPECTIONS & START-UP ASSISTANCE:	Percent applied to the direct EQ costs for the tax-exempt services provided by the Manufacturer/Vendor, such as installation inspections and start-up assistance, including all related T&L costs.
EQ EXTRA MATERIALS & SPARE PARTS:	Identifies the additional buy-out EQ supplies to be provided by either the Manufacturer or Vendor, such as special tools, lubricants, & spare parts.
PACKING & FREIGHT CATEGORIES:	Identifies the EQ and/or M&CE cost categories to which the freight percentage assigned below is applied.
PACKING & FREIGHT:	Percent applied to the categories identified above for the supply/install Contractor(s) freight costs for packing, shrink-wrapping, crating, containerization and/or shipping expenses.
LABOR ESCALATION APR:	General annual percentage rate applied to direct labor (MH) and Prime Contractor staff travel and living costs, which is then pro-rated from date of this OPCC to projected mid-point of construction.
MATERIALS ESCALATION APR:	General annual percentage rate applied to direct construction materials, consumbables, and construction equipment costs (M&CE), which is then pro-rated from date of this OPCC to projected mid-point of construction.
EQUIPMENT ESCALATION APR:	General annual percentage rate applied to direct costs for process and buy-out equipment (EQ), which is then pro-rated from date of this OPCC to projected mid-point of construction.
YEARS OF ESCALATION:	Identifies the "life" of this OPCC (starting from the completion date of the OPCC), over which the APR escalation rates identified above will be applied, and reflecting the overall time anticipated to pass for executing pre-con issues that could include sampling, surveys/testing, bench tests, design development, Contractor solicitations/negotiations, Prime and/or Subcontractor site staffing, site set-up, submittals/approvals, early/long-lead equipment procurement, and planning/coordination for any special demolition, phasing, and/or shut-downs.
ESTIMATE CONTINGENCY:	Percent applied to the direct MH, M&CE, & EQ costs for the purpose of covering the potential Estimator errors/omissions, variability with the take-off and quantification efforts, and misinterpretation of the design documents.
SCOPE CONTINGENCY:	Percent applied to the direct MH, M&CE, & EQ costs for covering the potential growth due to design changes/revisions, Owner preferences, and unknown regulatory requirements.
GENERAL ESCALATION:	Composite increase(s) typically expected on the supply/install Contractor(s) direct MH and M&CE, & EQ costs, which is then pro-rated from date of this OPCC to projected mid-point of construction
SPECIAL ESCALATION:	A one-time increase applied to the supply/install Contractor(s) direct MH, M&CE, & EQ costs. This adjustment is specifically applied for the current perceived and unusual current market concerns and supply chain issues, and serves to update the internal OPCC database and historical cost data resources which are beyond the reach of General Escalation. Although this attempt has been made to account for these issues, it is strongly suggested to review and further adjust for these specific conditions prior to any bid solicitation and/or award.
ANTICIPATED CONSTRUCTION DURATION:	Identifies the total construction duration (from physical notice-to-proceed mobilization through to substantial completion) either in weeks, months, or years for the project with the labor headcount and production efficiency assigned in this OPCC, and excluding time for testing & final completion/sign-off.
SPECIAL PROJECT CONSIDERATION:	Identifies the anticipated special project considerations for demolition, rehabilitation, phasing, personal protective equipment (PPE) needs, or a combination of these.
PROJECT STAFF LABOR:	The costs attributable to the labor hours generated by all the Prime Contractor's on-site and home-office based personnel directly billable to the project.
PROJECT STAFF TRAVEL, LIVING, & OTHER:	The costs attributable to the travel, living, & miscellaneous related costs generated by all the Prime Contractor's on-site and home-office based personnel directly billable to the project.
PROJECT STAFF CAMP ALLOWANCE:	The anticipated total cost for providing all Tradesmen and Supervision with travel to/from a remote work site, as well as the establishment & maintenance of a remote camp
TRADESMEN & SUPERVISION CAMP ALLOWANCE:	The anticipated total cost for providing all Tradesmen and Supervision with travel to/from a remote work site, as well as the establishment & maintenance of a remote camp.
PASS-THRU COSTS:	Costs which bypass the typical installing Contractors burdens & mark-ups, but as part of the Prime Contractor's responsibility will still receive costs for bonds, gross receipts tax (if applicable), escalation, and contingency
INSURANCES:	An allowance for the overall project builders risk insurance, as well as the miscellaneous umbrella, vehicle, and liability insurances carried by the Prime Contractor.
GENERAL & ADMINISTRATIVE:	The costs attributable to the Prime Contractor's indirect costs that are attributable to labor, supplies, materials, equipment, tools, facilities and/or overheads, both field and home office, during execution of the project.
PROJECT & CONSTRUCTION MANAGEMENT FEE:	The anticipated profit for the Prime Contractor in executing and/or managing the project.
PROJECT ENGINEERING:	The forecasted cost of the project engineering effort, which may include geotechnical testing and design, detailed project design, and/or support and oversight during construction.
BONDS:	Percent applied to the applicable overall project MH, M&CE, & EQ costs for the bonds to ensure satisfactory completion (to the Owner) and payment to the suppliers, Vendors, & Subcontractors.

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WBS COST DISTRIBUTION & BUILD-UP

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Project Cost Breakdown by DIV & WBS

NOTE: ROSE header cells denote the DIV scope being self-performed by the Prime Contractor, while BLUE header cells denote Subcontracted work for this DIV scope (if existing) under the Prime Contractor's oversight

WBS	Description	DIV 1(s,p,g) (01) Prime Staff, GC's, & Pass-Thru	DIV 2(c) (02, 31-35) Common Site Work	DIV 2(s,w) (02, 31-35) Specialty Site Work & Wells	DIV 3 (03) Concrete	DIV 4 (04) Masonry	DIV 5(s) (05) SUPPLY Metals	DIV 5(i) (05) INSTALL Metals	DIVS 5-8 (05-08) Buildings & Components	DIVS 7-10 (07-10) Coatings & Finishes	DIV 13(f,s) (33) Field-Erect & Shop-Fab Tanks	DIVS 11-15(e) (40-45) SUPPLY Process & Mech EQ	DIVS 11-15(i) (21-23) INSTALL Process & Mech EQ	DIV 16(e) (25-28, 33) SUPPLY Power & I&C EQ	DIV 16(i) (25-28, 33) INSTALL Power & I&C EQ	TOTAL
SECTION 1: Installing Contractor Direct Costs																
1	General Conditions	$322,464														$322,464
2	General Allowances	$0	$5,302	$1,190	$5,617	$0	$705	$336	$4,178	$345	$6,215	$0	$79,327	$5,944	$33,351	$142,512
3	Electric Power & Control Equipment													$396,290	$90,335	$486,625
4	Existing Raw Water Pump Station	$0	$0	$0	$0	$0	$0	$0	$0	$12,223	$0	$50,000	$22,292	$42,600	$33,642	$160,757
5	Static Mixer Vault		$10,334		$50,226		$3,062	$1,138		$684			$29,492	$7,700	$8,931	$111,568
6	MF Feed Tank	$0	$0	$0	$3,988	$0	$0	$0	$0	$0	$0	$24,000	$18,175	$11,800	$8,931	$66,893
7	Membrane & Neutralization System				$13,078							$3,002,400	$120,333	$1,400	$72,152	$3,209,363
8	CIP Storage Tank	$0	$20,548	$0	$0	$0	$0	$0	$0	$0	$0	$30,000	$13,402	$350	$1,717	$66,018
9	Finished Water Storage Tank		$3,637				$21,788	$8,452			$414,335		$30,386	$9,000	$20,475	$508,073
10	Finished Water Booster Pumps	$0	$15,727	$0	$5,958	$0	$0	$0	$0	$0	$0	$130,000	$40,325	$67,900	$32,570	$292,480
11	Chemical Systems				$1,931							$77,500	$103,630	$45,750	$80,581	$309,392
12	Generator System	$0	$1,039	$0	$26,390	$0	$0	$0	$0	$0	$0	$150,000	$7,679	$0	$17,426	$202,533
13	Canopy & Slab Structure		$19,411		$272,906		$22,171	$12,842	$278,543	$10,110		$27,675	$127,906	$4,450	$53,818	$829,832
14	Miscellaneous Site Work	$0	$0	$79,315	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$23,967	$103,282
15																
	SECTION 1 SUBTOTALS	$322,464	$75,999	$80,505	$380,094	$0	$47,727	$22,768	$282,721	$23,363	$420,550	$3,491,575	$592,947	$593,184	$477,896	**$6,811,794**
SECTION 2: Installing Contractor Burdens & Add-Ons																
	Payroll Deducts & Workers Comp	$21,998	$8,308	$8,160	$52,928			$3,598	$8,017	$3,164	$24,084		$60,292		$31,194	$221,743
	Small Tools & Personal Safety Gear	$2,026	$765	$752	$4,875	$0		$331	$738	$291	$2,218		$5,553		$2,873	$20,424
	Equipment Inspection & Start-Up Assist						$1,169					$85,544		$14,533		$101,246
	Equipment Spare Parts & Special Tools	$0		$0			$593					$43,375		$7,369		$51,337
	Packing & Freight						$3,102					$226,952		$38,557		$268,612
	Sales Tax - NOT APPLICABLE	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	Overhead & General Conditions			$4,471			$2,630			$1,341	$22,343		$32,940	$32,682	$21,014	$117,419
	Profit	$0	$0	$6,572	$0	$0	$3,865	$0	$0	$1,971	$32,844	$0	$48,421	$48,043	$30,890	$172,606
	Builders Risk Insurance (see below)															
	Liability Insurance	$0	$0	$256	$0	$0		$0	$0	$99	$755		$1,890		$978	$3,977
	Umbrellla & Vehicle Insurances			$251						$75	$1,255		$1,850		$1,180	$4,612
	Bonds	$0	$0	$1,313	$0	$0	$768	$0	$0	$394	$6,553	$0	$9,671	$9,547	$6,166	$34,411
	Gross Receipts Tax - NOT APPLICABLE															
	SECTION 2 SUBTOTALS	$24,024	$9,074	$21,773	$57,803	$0	$12,128	$3,929	$8,755	$7,336	$90,051	$355,871	$160,617	$150,731	$94,295	**$996,389**
	RUNNING TOTAL: Sections 1-2	$346,489	$85,073	$102,278	$437,897	$0	$59,854	$26,697	$291,477	$30,699	$510,602	$3,847,446	$753,565	$743,915	$572,191	**$7,808,183**
	INCREASE FROM SECTION 1	7.5%	11.9%	27.0%	15.2%	0.0%	25.4%	17.3%	3.1%	31.4%	21.4%	10.2%	27.1%	25.4%	19.7%	**14.6%**

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WBS COST DISTRIBUTION & BUILD-UP

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Project Cost Breakdown by DIV & WBS

NOTE: ROSE header cells denote the DIV scope being self-performed by the Prime Contractor, while BLUE header cells denote Subcontracted work for this DIV scope (if existing) under the Prime Contractor's oversight

W B S Description	*DIV 1(s,p,g) (01)* Prime Staff, GC's, & Pass-Thru	*DIV 2(c) (02, 31-35)* Common Site Work	*DIV 2(s,w) (02, 31-35)* Specialty Site Work & Wells	*DIV 3 (03)* Concrete	*DIV 4 (04)* Masonry	*DIV 5(s) (05)* **SUPPLY** Metals	*DIV 5(i) (05)* **INSTALL** Metals	*DIVS 5-8 (05-08)* Buildings & Components	*DIVS 7-10 (07-10)* Coatings & Finishes	*DIV 13(f,s) (33)* Field-Erect & Shop-Fab Tanks	*DIVS 11-15(e) (40-45)* **SUPPLY** Process & Mech EQ	*DIVS 11-15(i) (21-23)* **INSTALL** Process & Mech EQ	*DIV 16(e) (25-28, 33)* **SUPPLY** Power & I&C EQ	*DIV 16(i) (25-28, 33)* **INSTALL** Power & I&C EQ	TOTAL
SECTION 3: Prime Contractor															
Field Supervisory Staff Labor															$402,051
Field Supervisory Staff Travel & Living															$12,247
Field Supervisory Staff Remote Camp: NOT REQUIRED															
Trades & Supervison Remote Camp: NOT REQUIRED															$0
Insurances (builders risk, umbrella, liability and/or vehicle)															$186,364
General & Administrative															$253,161
Profit															$393,717
Project Engineering: BY OTHERS															$0
Pass-Thru Costs: NOT REQUIRED															
Bonds (payment, performance, supply, and/or maintenance)															$72,446
Gross Receipts Tax - NOT APPLICABLE															
SECTION 3 SUBTOTAL															**$1,319,986**
RUNNING TOTAL: Sections 1-3															**$9,128,169**
INCREASE FROM SECTION 2															**16.9%**
SECTION 4: Estimator Gross Adjustments															
GENERAL Escalation															$164,311
ESTIMATE Contingency															$1,825,634
SCOPE Contingency															$912,817
SPECIAL Escalation															$91,282
SECTION 4 SUBTOTAL															**$2,994,044**
GRAND TOTAL: Sections 1-4															**$12,122,213**
INCREASE FROM SECTION 3															**32.8%**

WBS MANHOURS DISTRIBUTION

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

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Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

DIV Manhours

NOTE: ROSE header cells denote the DIV scope being self-performed by the Prime Contractor, while BLUE header cells denote Subcontracted work for this DIV scope (if existing) under the Prime Contractor's oversight

WBS	Description	*DIV 1s-1g-1p* *(01)* Prime Staff, GC's, & Pass-Thru	*DIV 2c* (02, 31-35) Common Site Work	*DIV 2s-2w* *(02, 31-35)* Specialty Site Work & Wells	*DIV 3* (03) Concrete	*DIV 4* (04) Masonry	*DIV 5i* (05) INSTALL Metals	*DIVS 5-8* (05-08) Buildings & Components	*DIVS 7-10* (07-10) Coatings & Finishes	*DIV 13f-13s* (33) Field-Erect &\ Shop-Fab Tanks	*DIVS 11i-15i* (21-23) INSTALL Process & Mech EQ	*DIV 16i* (25-28, 33) INSTALL Power & I&C EQ	TOTAL MANHOURS		
0	Prime Contractor	4,588											4,588	39	3
1	General Conditions	1,872											1,872		
2	General Allowances	0	49	10	63	0	4	9	5	27	550	209	926	39	1
3	Electric Power & Control Equipment											959	959		
4	Existing Raw Water Pump Station	0	0	0	0	0	0	0	156	0	179	193	529	4	3
5	Static Mixer Vault		84		588		17		8		191	46	934		
6	MF Feed Tank	0	0	0	54	0	0	0	0	0	112	46	212	4	1
7	Membrane & Neutralization System				145						763	368	1,276		
8	CIP Storage Tank	0	199	0	0	0	0	0	0	0	84	9	291	56	0
9	Finished Water Storage Tank		36				112			1,810	182	106	2,246		
10	Finished Water Booster Pumps	0	142	0	61	0	0	0	0	0	252	166	622	4	4
11	Chemical Systems				26						661	411	1,098		
12	Generator System	0	10	0	333	0	0	0	0	0	65	89	496	4	3
13	Canopy & Slab Structure		187		2,963		140	608	147		939	323	5,307		
14	Miscellaneous Site Work	0	0	684	0	0	0	0	0	0	0	208	892	9	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MANHOURS TOTAL	6,460	707	694	4,235		273	617	316	1,837	3,978	3,132	**22,249**		

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INSTALLATION OVERVIEW

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Project and Owner Market	Municipal & Governmental	*General Allowances*	Low: 1.5%
Installation Labor Classification	Prevailing Wage/Davis Bacon	*Pipe/Raceway Layout*	Mostly Long/Straight Runs
Installation Labor Work Schedule	(5)-8 hr days Mon-Fri	*Pipe/Raceway Supports*	Galv Steel Strut
Installation Labor Work Shifts	1 Shift (daylight)	*Area Seismic Rating*	0.06-0.10 (x G) Peak acceleration
Installation Shift Differential Pay		*Area Frost Depth*	5"-10"
Installation Labor Productivity	90% (7.2 hrs production/8 hrs)	*Area Wind Zone*	Zone II - 160 MPH
Bldg & Structure Risk Category	Category IV - Essential facility	*High/Elevated Work*	
Project Site Condition	Brownfield	*Clean Room Work*	
Site Condition Assessment	Mostly Clear Above & Below Grade	*Hazardous Work*	
Site Location Accessibility	Relatively Easy	*Hot Weather Work*	10% performed over 95°
Installed Work Congestion	10% of Work Congested	*Cold Weather Work*	5% performed under 30°
Installed Work Spread	10% of Work Spread Out	*Rain or Snow Work*	15% of work in Rain/Snow
Owner's Project Representative	Engineer	*Evening/Night Work*	
Maximum Pipe Size & Flow Rate	42"Ø: 8,650(g)-34,520(p) GPM	*DBE & MBE Work*	5% of work by DBE/MBE

Work Anticipated to be Self-Performed by Prime Contractor

☑ DIV 1 Site Mgmt & Oversight Staff	☐ DIV 4 Masonry	☐ DIVS 11-15 INSTALL EQ: Process and Mechanical
☑ DIV 1 General Conditions	☐ DIV 5 SUPPLY EQ: Miscellaneous Metals	☐ DIV 13 Field-Erected Tanks
☑ DIV 2 Common Site Work	☑ DIV 5 INSTALL EQ: Miscellaneous Metals	☐ DIV 13 Shop-Fabricated Tanks
☐ DIV 2 Specialty Site Work	☑ DIVS 5-8 Buildings & Components	☐ DIV 16 INSTALL EQ: Process & Mechanical
☐ DIV 2 Well Work	☐ DIVS 7-10 Finishes	☐ DIV 16 SUPPLY EQ: Electrical and I&C
☑ DIV 3 Concrete	☑ DIVS 11-15 SUPPLY EQ: Process & Mechanical	☐ DIV 16 INSTALL EQ: Electrical and I&C

Direct Cost Roll-Up of DIVS 1-17 Sheets

CSI 1995	CSI 2004	Description *(NIS = not in scope)*	SF	CY	TON	MH	MH $	M&CE $	EQ $	TOTAL
DIV 1s	01	*Prime Contractor Staff*								*$414,298*
DIV 1g	01	*General Conditions*				1,440	$87,564	$234,900		*$322,464*
DIV 1p	01	*Pass-Thru Costs*								
DIV 2c	02,31-35	*Common Site Work*				544	$33,071	$42,928		*$75,999*
DIV 2s	02,31-35	*Specialty Site Work*				534	$32,479	$48,025		*$80,505*
DIV 2w	33	*Well Work - NIS*								
DIV 3	03	*Concrete*		400	23.5	3,258	$210,681	$169,413		*$380,094*
DIV 4	04	*Masonry - NIS*								
DIV 5e	05	*EQ: Miscellaneous Metals*			1.9				$47,727	*$47,727*
DIV 5i	05	*INSTALL: Miscellaneous Metals*				210	$14,321	$8,447		*$22,768*
DIVS 5-8	05-08	*Buildings & Components*	4,320			475	$31,911	$250,810		*$282,721*
DIVS 7-10	07-10	*Coatings & Finishes*	1,663			243	$12,595	$10,768		*$23,363*
DIV 13f	33	*Tanks: Field Erected*	5,007		14.7	1,413	$95,867	$324,683		*$420,550*
DIV 13s	33	*Tanks: Shop Fabricated - NIS*								
DIVS 11e-15e	40-45	*EQ: Process & Mechanical*							$3,491,575	*$3,491,575*
DIVS 11i-15i	21-23	*INSTALL: Process & Mechanical*				3,060	$239,994	$352,953		*$592,947*
DIV 16e	25-28,33	*EQ: Electrical and I&C*							$593,184	*$593,184*
DIV 16i	25-28,33	*INSTALL: Electrical and I&C*				2,409	$180,186	$297,710		*$477,896*
		DIVS 1-16 DIRECT COST TOTAL				13,585	$938,670	$1,740,639	$4,132,486	***$7,226,092***

DIV 1s (01) PRIME CONTRACTOR FIELD STAFF

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Travel & Living Base Location	Local Only	*Lodging (short vs. long)*	
Per-Diem T&L Option		*Vehicle (rent vs. lease)*	$55 vs. $18 per Day
Meals, Meetings, & Incidentals		*Fuel-Oil-Maintenance*	$5 per Day
Baggage Check-In Fees		*Vehicle Sharing*	
Airport or Off-Site Parking		*Meals (exludes meetings)*	$50 per Day
Personal Vehicle Mileage		*Incidentals*	$5 per Day

Prime Contractor Field Supervisory Staff

Labor Allowances

Anticipated Project Construction Duration

37 weeks

Labor During Construction

Labor Category Allowance	Project Director	Project/Construct Manager	Construction Manager	Construction Superintendent	Construction Engineers	Inspectors & Health & Safety	Scheduling & Estimating	Start-Up, Test & Commission	Clerical & Administrative
Head Count	0.0	1.0	0.0	1.0	1.0	2.0	0.0	1.0	1.0
Project Coverage		20%		100%	100%	10%		20%	50%
Travel & Living Classification	0	VEHICLE+	0	VEHICLE	VEHICLE	HOME OFFICE	0	VEHICLE	EXEMPT
Travel & Living Coverage	0%	100%	0%	100%	100%	0%	0%	100%	0%
Meals, Meetings, & Incidentals	0	YES	0	NO	NO	NO	0	NO	NO
Shift Coverage	0	1st	0	1st	1st	1st	0	1st	1st
Work Hours per Week		40		40	40	40		40	40
Base Rate + Benefits at 38%		$126		$102	$87	$79		$110	$39
Travel & Living Cycle in Days		1		1	1			1	

Labor Summary

Labor Metric	Project Director	Project/Construct Manager	Construction Manager	Construction Superintendent	Construction Engineers	Inspectors & Health & Safety	Scheduling & Estimating	Start-Up, Test & Commission	Clerical & Administrative
LABOR Hours		296		1,480	1,480	296		296	740
LABOR Cost		$37,292		$151,497	$128,190	$23,307		$32,630	$29,134

Labor Total

Labor Hours	Labor Cost
4,588	$402,051

Labor Cost Assignment to Alternate WBS

WBS	%	WBS Hours	WBS Cost

DAY-BASED (i.e. Local) Travel Allowances

Expenses During Construction

DAILY Expense Allowance	Project Director	Project/Construct Manager	Construction Manager	Construction Superintendent	Construction Engineers	Inspectors & Health & Safety	Scheduling & Estimating	Start-Up, Test & Commission	Clerical & Administrative
Per-Diem Option									
Meals/Meetings		$50							
Vehicle		$18		$18	$18			$18	
Fuel-Oil-Maintenance (FOM)		$5		$5	$5			$5	
Incidentals		$5							

Travel Summary

Travel & Living Metric	Project Director	Project/Construct Manager	Construction Manager	Construction Superintendent	Construction Engineers	Inspectors & Health & Safety	Scheduling & Estimating	Start-Up, Test & Commission	Clerical & Administrative
DAY Cost		$78		$23	$23			$23	
DAY Count		37		185	185			37	
DAYS Cost		$2,886		$4,255	$4,255			$851	

Day-Based Travel Total

Day Count	Day Cost
444	$12,247

Day-Based Cost Assignment to Alternate WBS

WBS	%	WBS Cost
0	0%	
0	0%	

DIV 1s (01) PRIME CONTRACTOR FIELD STAFF

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

TRIP-BASED (i.e. Remote) Travel & Living Allowances

Expenses During Construction

TRIP Expense Allowance	Project Director	Project/Construct Manager	Construction Manager	Construction Superintendent	Construction Engineers	Inspectors & Health & Safety	Scheduling & Estimating	Start-Up, Test & Commission	Clerical & Administrative
Surface Travel									
Baggage Fees									
Airport Parking									
Personal Mileage									
Lodging									
Meals/Meetings									
Vehicle									
Fuel-Oil-Maintenance (FOM)									
Incidentals									

Travel & Living Summary

Travel & Living Metric	Project Director	Project/Construct Manager	Construction Manager	Construction Superintendent	Construction Engineers	Inspectors & Health & Safety	Scheduling & Estimating	Start-Up, Test & Commission	Clerical & Administrative
TRIP Cost									
TRIP Count									
TRIPS Cost									

Trip-Based Travel & Living Total

Trip Count	Trip Cost

Trip-Based Cost Assignment to Alternate WBS

WBS	%	WBS Cost
0	0%	
0	0%	

Prime Contractor Field-Supervisory Staff Camp

Considerations During Construction

Travel Metrics & Cost		Daily Cost	
Work Days per Week	0	*Meals & Tips*	$0
Rotation Cycle - Weeks	0.0	*Mobility & Tips*	$0
Rotation Cycle - Idle Days	0.0	*Mobility Fuel, Oil, & Maint*	$0
1-Way Travel Time- Hours	0.0	*Lodging & Tips*	$0
Air Transportation	$0	*Housekeeping & Tips*	$0
Ground Transport & Tips	$0	*Laundry & Tips*	$0
Baggage Fees	$0	*Incidentals*	$0

Camp Cost Assignment to Prime Contractor

☑ Yes-Assign to Prime

Camp Cost Assignment to Alternate WBS

WBS	%	WBS Cost
0	0%	
0	0%	

Camp $ per MH	Eligible MH's	Total Camp $

Miscellaneous

WBS	Description	Quantity	Trades MH	MH @ $0	M&CE $	EQ $	TOTAL
				$			
				$			
				$			
				$			
				$			
				$			
				$			
				$			
				$			
				$			
Subtotal - Miscellaneous							

Prime Contractor Field Supervisory Staff Total

	MH	MH @ $88 (avg)	T&L $	Camp $	M&CE $	EQ $	TOTAL
DIV 1s TOTAL	4,588	$402,051	$12,247				***$414,298***

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Glossary of Travel & Living Terms

CONSTRUCTION PROJECT COVERAGE: Duration of labor categories presence on site during construction, including Pre-Construction (Pre-Con) time if allowed

SHORT VS. LONG: Identifies the anticipated short-term higher cost "rental" usuallly applying for (1) month or less, versus a longer term and less expensive "lease" option

EXEMPT: Personnel originating *LOCAL* to the project site who do not have a need or expectation of generating travel & living expenses.

HOME OFFICE : Home office personnel (i.e. Denver, CO based) originating either *LOCAL* or *REMOTE* to the project site who typically would not generate any travel & living expenses.

VEHICLE: Personnel originating *LOCAL* to the project site who are reimbursed 100% for the eligible daily expenses of a vehicle and related fuel-oil-maintenance thoughout the individual's project time (re: "Construction Coverage").

VEHICLE +: Personnel originating *LOCAL* to the project site who are reimbursed 100% for the eligible daily expenses of meals, potential meetings coverage, and incidentals, all in addition to the vehicle and related fuel-oil-maintenance thoughout the individual's project time (re: "Construction Coverage").

MIXED: Personnel originating *LOCAL* to the project site who are reimbursed 100% for the eligible daily expenses of a vehicle and related fuel-oil-maintenance, miscellaneous & incidental costs, and meals and potential meetings coverage (depending on staff position) at the indicated duration (re: "Travel & Living Cycle in Days"), as well as the eligible travel expenses to & from the home office location at the indicated frequency (re: "Travel & Living Frequency") and project time (re: "Construction Coverage").

TRIPS: Personnel originating *REMOTE* to the project site who are reimbursed 100% for the eligible travel expenses to & from their remote home/home office location at the indicated frequency (re: "Travel & Living Frequency") and durations (re: "Travel & Living Cycle in Days") thoughout the individual's project time (re: "Construction Coverage").

PER-DIEM: Personnel originating *REMOTE* to the project site who receive a negotiated lump-sump daily stipend intended to cover 100% of the living costs for a full-time project area residence, as well as the travel expenses to & from their home location at the indicated/negotiated frequency thoughout the individual's project time (re: "Construction Coverage").

CAMP: Personnel originating *REMOTE* to the project site who are provided a pre-negotiated residence and boarding (i.e. meals, transportation, & laundry), along with a negotiated lump-sump daily stipend intended to cover 100% of the personal living costs for this full-time project area residence, as well as the travel expenses to & from their home location at the indicated/negotiated frequency thoughout the individual's project time (re: "Construction Coverage").

REMOTE: Personnel originating *REMOTE* to the project site who are reimbursed 100% for the eligible living expenses related to a full-time project area residence, as well as the eligible travel expenses to & from their home location at the indicated frequency (re: "Travel & Living Cycle in Days") thoughout the individual's project time (re: "Construction Coverage").

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DIV 1g (01) GENERAL CONDITIONS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Overall General Conditions Level Average

General Requirements

General Conditions Allowances

Anticipated Project Construction Duration

37 weeks

Temporary Construction Facilities

Prime Staff	Subcontractor(s)	Owner/Rep	Meeting & Kitchen	Decon & Change	Tools & Equip	Mats & Equip	Sanitation	Health & Safety
Single-Wide OfficeTrailer	*Single-Wide OfficeTrailer*	*Single-Wide OfficeTrailer*	*Single-Wide Specialty Trailer*	*Single-Wide Specialty Trailer*	*Storage Trailer Unit(s)*	*CONNEX Box 8' x 40'*	*Portable Toilet(s)*	*First-Aid & Sanitize Station*
1					0	1	1	1
Unit Cost per Month	*Unit Cost per Month*	*Unit Cost per Month*	*Unit Cost per Month*	*Unit Cost per Month*	*Unit Cost per Month*	*Unit Cost per Month*	*Unit Cost per Month*	*Unit Cost per Month*
$667						$182	$121	$91

Temporary Site & Project Conditions

WBS	Category	Category Includes…..	Trades MH	MH @ $61	M&CE $	TOTAL
	Mobilization	Site occupancy with delivery/layout/staging coordination of facilities, utilities, equipment, & materials	120	$7,297	$5,300	*$12,597*
	Field Office: Facilities	Lease, deliver, and set-up trailers, containers, toilets, & first-aid/sanitize stations	20	$1,216	$2,100	*$3,316*
	Field Office: Carpentry	Supply/install facility decks, porches, canopies, ramps, stairways, landings, & misc accessways	60	$3,649	$2,900	*$6,549*
	Field Office: Utilities	Install & connect electric, water (potable, utility, and/or fire), gas/propane, telecommunications, & internet	10	$608	$500	*$1,108*
	Field Office: Equipment	Desks, chairs, tables, file cabinets, drawing racks, shelving, water coolers, refrigerators, & microwaves			$200	*$200*
	Field Office: Tools	Landline phones, computers, software, faxes, printers, copiers, & coffee makers	20	$1,216	$1,700	*$2,916*
	Field Office: Supplies	Copy & printer paper, ink cartridges, pens/markers, coffee, tea, hot chocolate, bottled water, & cups	10	$608	$600	*$1,208*
	Field Office: Incidentals	Petty cash, lockboxes, postage, Fedex, reproduction, meetings, meals, workshops, & janitorial services	30	$1,824	$1,100	*$2,924*
	Field Staff: Safety	Training, certifications, personal protection equipment (>$250), celebrations, events, & awards			$1,800	*$1,800*
	Field Staff: Communications	Cell phones, I-Pads, portable radios, LAN, pagers, docking/charging stations, & batteries			$1,700	*$1,700*
	Field Staff: Public Relations	Advertising, solicitations, public notices, MBE programs, community service/outreach, & progress meetings			$7,500	*$7,500*
	Construction: Accessibility	Bridges, cross-overs, scaffolds, decking, ramps, platforms, landings, sidewalks, docks, & stairways	30	$1,824	$3,700	*$5,524*
	Construction: Aids	Specialty equipment such as barge(s), tower crane, crawler crane, large forklift, loader, or hoist/lift	70	$4,257	$26,500	*$30,757*
	Construction: Aids Support	Equipment mats, dunnage, spreaders, slings, rollers, dollies, maintenance, & FOG (fuel-oil-grease)	10	$608	$13,300	*$13,908*
	Construction: Permitting	Applications, permits, inspections, notifications, approvals, fees, & support documentation			$42,400	*$42,400*
	Construction: QA & QC	Submittals, samples, tests, inspections, & certifications, & miscellaneous consultants/subcontractors	140	$8,513	$43,000	*$51,513*
	Construction: Main Utilities	Install & remove supply, control, and distribution sytem for temporary construction power & water	50	$3,040	$4,000	*$7,040*
	Construction: Mobile Utilities	Gensets, work lighting, heaters, fans, compressors, pumps, welders, & miscellaneous appliances	70	$4,257	$5,400	*$9,657*
	Work Area: Accessibility	Temporary roads, ramps, re-routes, turn-arounds, overpasses, haul routes, & parking/laydown areas	60	$3,649	$5,800	*$9,449*
	Work Area: Protection	Security lighting, visual barriers, fencing, barricades, & protection for existing trees, plants, and/or structure	50	$3,040	$4,500	*$7,540*
	Work Area: Safety & Health	Signage, fall/debris nets, ventilation blowers, fire extinquishers, first-aid supplies, water, ice, & cups	30	$1,824	$2,700	*$4,524*
	Work Area: Passive Security	Guard shacks, work-time entry/exit guards, & video surveillance & recording system				
	Work Area: Active Security	24-hour watchman & monitoring of video surveillance system				
	Work Area: Transportation	Golf carts, remote parking facilities, & daily transportation to/from remote parking				
	Work Area: Housekeeping	Handling of waste dunnage & crating, general trash collection, waste containers, & tipping/disposal fees	50	$3,040	$3,800	*$6,840*
	Controls: Site	Surveys, layouts, benchmarks, monuments, aerial & progress photos/videos, & GPS			$8,600	*$8,600*
	Controls: Environmental	Stormwater, erosion, dirt, mud, dust, noise, ice, snow, excessive cold/heat, pollution, & pest	40	$2,432	$2,000	*$4,432*
	Controls: EQ & Materials	Handling, transport, storage, staging, maintenance, & damage/loss management	40	$2,432	$2,200	*$4,632*
	Controls: Passive Traffic	Barriers, cones, steel cover plates, traffic control signage/flashers, & long-term detours	30	$1,824	$1,900	*$3,724*
	Controls: Active Traffic	Day flagmen & nightly changes in barriers, traffic control signage/flashers, & short-term detours				
	Startup: Initial	Install punchlists, alignments, gross adjustments, 1st fill oils & lubricants, loop checks, and functional testin	50	$3,040	$1,800	*$4,840*
	Startup: Clean & Disinfect	Pipe, tank, and equipment flushing, cleaning, disinfecting, & fluids/waste handling & disposal	70	$4,257	$3,200	*$7,457*
	Startup: Final	Calibrations, fine adjustments, 1st fill of fuels & chemicals/reagents, & operational training/testing,	40	$2,432	$4,900	*$7,332*
	Startup: Test & Commission	Functional/operational punchlisting, O&M manuals, on-line interfacing/coordination, & performance testing	50	$3,040	$7,500	*$10,540*
	Close-Out: Project	Punchlist sign-offs, record/as-built documents, warranty initiation, & bond closure/sign-offs	60	$3,649	$13,300	*$16,949*
	Close-Out: Site	Disconnect utilities and remove carpentry, construction equipment/tools, & surplus materials	40	$2,432	$500	*$2,932*
	Demobilization	Final housekeeping, remove temporary facilities & utilities, and restore related areas	190	$11,554	$8,500	*$20,054*
1	**Subtotal - General Conditions Allowances**		1,440	$87,564	$234,900	***$322,464***

DIV 1g (01) GENERAL CONDITIONS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Tradesmen & Craft Supervision Camp

Considerations During Construction

Travel Metrics & Cost		Daily Cost	
Work Days per Week	0	*Meals & Tips*	$0
Rotation Cycle - Weeks		*Mobility & Tips*	$0
Rotation Cycle - Idle Days		*Mobility Fuel, Oil, & Maint*	$0
1-Way Travel Time- Hours		*Lodging & Tips*	$0
Air Transportation	$0	*Housekeeping & Tips*	$0
Ground Transport & Tips	$0	*Laundry & Tips*	$0
Baggage Fees	$0	*Incidentals*	$0

Camp Cost Assignment to Prime Contractor

☑ Yes-Assign to Prime

Camp Cost Assignment to Alternate WBS

WBS	%	WBS Cost
0	0%	
0	0%	

Camp $ per MH	Eligible MH's	Total Camp $

Miscellaneous

WBS	Description	Quantity	Trades MH	MH @ $0	M&CE $	EQ $	TOTAL
				$			
				$			
				$			
				$			
				$			
				$			
				$			
				$			
				$			
				$			
Subtotal - Miscellaneous							

General Requirements Total

	MH	MH @ $61 (avg)	M&CE $	Camp $	EQ $	TOTAL
DIV 1g TOTAL	1,440	$87,564	$234,900			***$322,464***

DIV 2c (02,31-35) COMMON SITE WORK

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Clearing & Grubbing		*Stormwater Control*	(re: General General Allowances)
Primary Excavation Issue	Dust Control	*Temporary Shoring*	
Secondary Excavation Issue	Wet/Sandy Soil	*Temporary Dewatering*	Part-time Lo-Point Pumping
Hauling & Disposal Distance	10.1 - 15.0 miles roundtrip	*Temporary Erosion Control*	(re: General General Allowances)
Base, Bed, & Fill Supply	100% Import	*Temporary Traffic Control*	(re: General General Allowances)
General Excavations		*Saw-Cutting*	
General Base & Fill		*Core-Drilling*	
Structural Excavations	Excavate & Fill w/ Partial Haul	*Pot-Holing*	(re: General General Allowances)
Structural Base	Crushed Stone ¾"-1½"	*Liners & Geo-Materials*	
Trench Excavations	Excavate & Fill w/ Partial Haul	*Random Base & Fill*	Crushed Stone ¾"-1½"
Trench Bedding & Fill	Gravel ¾"-1½"	*(un-assigned)*	

Common Site Work Scope

Structural Excavations

WBS	Description	Qty	Type	Lng-Iss	Wd-Bse	Deep	Cut °	CY	TON	MH	MH @ $61	M&CE $	TOTAL
5	*Static mixer vault area*	1	1.30	12.7	10.7	6.5	45	72	93	22	$1,313	$699	*$2,012*
5	*Compacted Base*	8%	1.2	1.4	3.0			6	7	1	$68	$328	*$396*
8	*CIP storage tank area*	1	1.30	31.0	14.0	10.0	45	335	429	96	$5,808	$3,199	*$9,007*
8	*Compacted Base*	5%	1.2	1.4	3.0			17	23	3	$197	$989	*$1,187*
9	*Finished water storage tank area*	1	1.30		35.0	2.0	45	80	102	24	$1,446	$771	*$2,218*
9	*Compacted Base*	25%	1.2	1.4	3.0			20	27	4	$243	$1,177	*$1,420*
10	*Finished water booster pump area*	1	1.30	23.0	15.0	8.0	45	197	253	58	$3,505	$1,897	*$5,401*
10	*Compacted Base*	6%	1.2	1.4	3.0			12	17	2	$148	$728	*$876*
12	*Genset area*	1	1.30	21.0	14.5	1.5	45	20	26	6	$368	$195	*$563*
12	*Compacted Base*	33%	1.2	1.4	3.0			7	9	1	$82	$395	*$477*
13	*Canopy slab & truck pad area*	1	1.30	75.0	75.0	2.0	45	439	563	123	$7,473	$4,173	*$11,646*
13	*Compacted Base*	25%	1.2	1.4	3.0			110	148	21	$1,276	$6,489	*$7,765*
0		0	0.00	0.0	0.0	0.0	0						
0		0%	0.0	0.0	0.0								
0		0	0.00	0.0	0.0	0.0	0						
0		0%	0.0	0.0	0.0								
	Subtotal - Structural Excavations							1,143	1,466	361	$21,926	$21,040	***$42,966***

Temporary Dewatering

WBS	Description	Qty	Type	Long	Wide/Ø	SF	MH	MH @ $61	M&CE $	TOTAL
	Static Mixer Vault		0.0							
5	*Vault area*	1	3.0	15.0	13.0	195	42	$2,546	$5,380	*$7,926*
		0	0.0	0	0					
	CIP Storage Tank	0	0.0	0	0					
8	*Tank area*	1	3.0	31.0	14.0	434	54	$3,283	$7,071	*$10,354*
		0	0.0	0	0					
	Finished Water Booster Pumps	0	0.0	0	0					
10	*Canned pump area*	1	3.0	23.0	15.0	345	49	$3,008	$6,442	*$9,450*
		0	0.0	0	0					
		0	0.0	0	0					
	Subtotal - Temporary Dewatering					974	145	$8,838	$18,893	***$27,731***

General Allowances

This summary category is intended to provide coverage of the minor DIV 2 sitework and/or related items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the identified scope items above when these DIV costs are exported to other worksheets.***

WBS		Factor		MH	MH @ $61	M&CE $	TOTAL
2	**Subtotal - General Allowances**	5.0		38	$2,307	$2,995	***$5,302***

Common Site Work Total

	MH	MH @ $61	M&CE $	TOTAL
DIV 2c TOTAL	544	$33,071	$42,928	**$75,999**

DIV 2s (02,31-35) SPECIALTY SITE WORK

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Primary Excavation Issue	Dust Control	*Sheet Piling*	
Secondary Excavation Issue	Wet/Sandy Soil	*Sheet Piling Services*	
Hauling & Disposal Distance	10.1 - 15.0 miles roundtrip	*Asphalt Paving*	
Base, Bedding, & Fill Supply	100% Import	*Curb & Gutter*	
Excavations		*Liners & Geo-Materials*	
Excavation Base, Bed, & Fill		*Random Base & Fill*	
Deep Foundations		*Fences & Gates*	
Deep Foundation Services		*Landscape & Restore*	Seed & Plants (sm & lg)
Slurry Walls		*Dive Team*	

Specialty Site Work Scope

Landscaping & Restoration

WBS	Description	Qty	Type	Long	Wide	Acres	MH	MH @ $61	M&CE $	TOTAL
	Miscellaneous Site Work	0	0.0	0.0	0.0					
14	*Site restore/landscape-35% of total*	1	7.0	91.7	91.7	0.2	194	$11,811	$12,516	*$24,327*
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
		0	0.0	0.0	0.0					
	Subtotal - Landscaping & Restoration						194	$11,811	$12,516	***$24,327***

Miscellaneous Work

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $61	M&CE $	TOTAL
	Miscellaneous Site Work									
14	*Connect to exist pipelines-LS/EA*	1	2	16	$2,400	2	32	$1,946	$4,800	*$6,746*
14	*Septic & drainfield allowance-LS*	1	1	120	$12,000	1	120	$7,297	$12,000	*$19,297*
14	*Yard piping allowance-LS*	1	1	180	$18,000	1	180	$10,946	$18,000	*$28,946*
	Subtotal - Miscellaneous Work						332	$20,188	$34,800	***$54,988***

General Allowances

This summary category is intended to provide coverage of the minor DIV 2 sitework and/or related items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the identified scope items above when these DIV costs are exported to other worksheets.***

WBS		Factor	MH	MH @ $61	M&CE $	TOTAL
2	**Subtotal - General Allowances**	1.0	8	$480	$710	***$1,190***

Specialty Site Work Total

	MH	MH @ $61	M&CE $	TOTAL
DIV 2s TOTAL	534	$32,479	$48,025	**$80,505**

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DIV 3 (03) CONCRETE

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Concrete Cement Type	Type II (lo heat & sulfate resist)	*Foundation Style*	Thickened Slab or Pilecap
Concrete Mix Additives	1 Admixture (generic)	*Foundation Depth*	2½' with top-mount (TS) slab
Concrete Mix Strength	4,000 PSI (6½-7½ sacks/CY)	*Foundation Width*	18" (excludes haunch slope)
ACI Installation Code	ACI 350R (environmental)	*Footer Width*	2x Foundation Width
Concrete Reinforcement	A615-Plain Steel (qty in tons)	*Slope of Haunch Foundation*	45° from horizontal
Reinforcement Density	Normal	*Base Slab Wall Cantilever*	1' Past Wall (all sides)
Reinforcement Supply/Install	Rebar Subcontractor	*Elevated Channels & Troughs*	
Concrete Placement Method	Primarily Chute & Pump	*Embedments*	Typical Types & Densities

CIP Concrete Scope

Housekeeping Pad & Sidewalk Structures

WBS	Description	Qty	Type	Long	Wd-Ø	Sides	Clear	TON	CY	Component	Thick	MH	MH @ $65	M&CE $	TOTAL
	Flash Mix Vault														
5	*Injection pumps*	2	5.0	3.0	1.5	4.0		0.01	0.2	*Rectangular Pad*	0.5	4	$274	$102	*$377*
	MF Feed Tank														
6	*MF feed tank*	1	5.0		12.0	8.0	0.25	0.08	2.4	*Octagonal Pad*	0.5	42	$2,710	$1,277	*$3,988*
	Membrane System														
7	*Membrane containers*	1	5.0	56.5	11.5	4.0		0.40	12.0	*Rectangular Pad*	0.5	82	$5,317	$5,087	*$10,404*
7	*Neutralization tank*	1	5.0		8.0	8.0	0.25	0.04	1.1	*Octagonal Pad*	0.5	25	$1,631	$651	*$2,282*
7	*Neutralization pump*	1	5.0	4.5	2.0	4.0		0.01	0.2	*Rectangular Pad*	0.5	4	$287	$105	*$391*
	Chemical Systems														
11	*Storage & feed tanks*	3	5.0	2.0	2.0	4.0		0.01	0.2	*Rectangular Pad*	0.5	5	$345	$132	*$477*
11	*Chemical meter & transfer pumps*	9	5.0	1.5	2.0	4.0		0.03	1.0	*Rectangular Pad*	1.0	15	$964	$490	*$1,454*
	Generator System														
12	*Genset*	1	5.0	15.0	6.0	4.0		0.12	3.3	*Rectangular Pad*	1.0	46	$2,943	$1,644	*$4,587*
	Subtotal - Housekeeping Pads & Sidewalks							0.7	20.4			224	$14,472	$9,489	***$23,961***

Rectangular Slab Structures

WBS	Description	Qty	Type	Long	Wide	Fndtn	Factor		CY	Component	Thk/Dp	MH	MH @ $65	M&CE $	TOTAL
10	*Finished water booster pump pad*	1	5.0	20.0	12.0	3			7	*Slab*	0.78	47	$3,045	$2,913	*$5,958*
			Total $	$5,958		TON	0.5								
			Tot CY	7											
13	*Canopy area chem truck pad*	1	5.0	50.0	12.0	2	2.00		22	*Slab*	1.00	109	$7,061	$9,406	*$16,467*
			Total $	$24,892		TON	1.9		14	*Haunch*	1.50	59	$3,794	$4,631	*$8,425*
			Tot CY	36											
	Subtotal - Rectangular Slabs							2.4	43			215	$13,900	$16,950	***$30,850***

Circular Slab Structures

WBS	Description	Qty	Type	Ø	SW	Slab	Fndtn	Cntlvr	CY	Component	Thk/Dp	MH	MH @ $65	M&CE $	TOTAL
5	*FW storage tank base*	1	5.0	30.0	35.0	1	2	2.0	12	*Haunch*	1.74	50	$3,233	$3,946	*$7,179*
			Total $	$29,252		TON	2.4								
			Tot CY	42					30	*Slab*	1.00	146	$9,465	$12,608	*$22,073*
	Subtotal - Circular Slabs							2.4	42			196	$12,698	$16,554	***$29,252***

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DIV 3 (03) CONCRETE

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Rectangular Wall & Tank Structures

WBS	Description	Qty	Type	Long	Wide	SW	To/Bo	Fndtn	CY	Component	Thk/Dp	MH	MH @ $65	M&CE $	TOTAL
5	*Static mixer vault*	1	5.0	6.0	4.0	5.0	2.0	3	2	*Slab*	0.83	41	$2,654	$1,231	*$3,885*
			Total $	$20,598			Cntlvr	2.00	1	*Elevated Slab*	0.67	60	$3,889	$757	*$4,646*
			Tot CY	8			Wall Factor	2.33			0.00				
			TON	0.5			F&F Sides	2.00			0.00				
									4	*Wall*	0.83	151	$9,739	$2,329	*$12,067*
12	*Genset slab & perimeter curb*	1	5.0	18.0	11.5	1.0	1.0	2	12	*Slab*	1.00	58	$3,725	$4,962	*$8,686*
			Total $	$21,802			Cntlvr	2.00			0.00				
			Tot CY	20			Wall Factor	2.09	6	*Haunch*	1.00	26	$1,689	$2,061	*$3,750*
			TON	1.0			F&F Sides	2.00			0.00				
									2	*Wall*	0.67	127	$8,229	$1,137	*$9,366*
13	*Canopy slab structure with curb*	1	5.0	70.0	58.0	0.5	1.0	2	165	*Slab*	1.00	810	$52,404	$69,810	*$122,214*
			Total $	$165,225			Cntlvr	2.00			0.00				
			Tot CY	211			Wall Factor	2.02	44	*Haunch*	1.50	180	$11,651	$14,219	*$25,870*
			TON	12.7			F&F Sides	2.00			0.00				
									2	*Curbing*	0.50	239	$15,468	$1,672	*$17,140*
13	*Canopy area collection sump walls*	2	5.0	3.0	3.0	3.0	1.0	3			0.00				
			Total $	$15,993			Cntlvr	2.00			0.00				
			Tot CY	3			Wall Factor	2.44			0.00				
			TON	0.1			F&F Sides	2.00			0.00				
									3	*Wall*	0.67	218	$14,074	$1,919	*$15,993*
13	*Canopy chem contain walls*	1	5.0	43.7	14.0	2.5	1.0	3	36	*Slab*	1.16	246	$15,916	$15,228	*$31,144*
			Total $	$53,705			Cntlvr	2.00			0.00				
			Tot CY	47			Wall Factor	2.46			0.00				
			TON	3.4			F&F Sides	2.00			0.00				
									11	*Wall*	0.83	266	$17,231	$5,330	*$22,562*
		0	0.0	0.0	0.0	0.0	0.0	0			0.00				
								0.00			0.00				
								0.00			0.00				
								0.00			0.00				
											0.00				
	Subtotal - Rectangular Walls & Tanks							17.7	288			2,422	$156,668	$120,655	***$277,323***

Trench Structures

WBS	Description	Qty	Type	Style	Long	Wide	SW		CY	Component	Thick	MH	MH @ $65	M&CE $	TOTAL
13	*Canopy slab collection trench*	1	5.0	1.00	50	1.0	1.0		3.4	*Slab*	0.62	33	$2,114	$1,681	*$3,795*
			Total $	$13,091		TON	0.32		2.4	*Walls*	0.62	119	$7,714	$1,581	*$9,295*
		0	0.0	0.00	0	0.0	0.0				0.00				
											0.00				
	Subtotal - Trenches							0.3	6			152	$9,829	$3,262	***$13,091***

General Allowances

This summary category is intended to provide coverage of the minor DIV 3 concrete work and/or related items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the identified scope items above when these DIV costs are exported to other worksheets.***

WBS		Factor		MH	MH @ $65	M&CE $	TOTAL
2	**Subtotal - General Allowances**	1.0		48	$3,114	$2,504	***$5,617***

CIP Concrete Total

		Rebar	CY		MH	MH @ $65	M&CE $	TOTAL
	DIV 3 TOTAL	23	400		3,258	$210,681	$169,413	***$380,094***

Stantec

DIV 5 (05) METALS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Version	Estimator	Date	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	000	Jim Ward	14-Jul-23	2002006267

Assumptions

Access Assemblies	Aluminum Structure & Grate	*Guardposts & Bollards*	8" Ø Coated Steel Pipe with Fndtn
Gratings & Coverplates	Aluminum Structure & Grate	*Racks & Bents*	
Hatches & Covers	Aluminum	*Elevated Decks*	
Hoist & Crane Rails	Galv Steel Bridge Rails	*Fabrications Level*	Standard

Metals Scope

Access Ladders & Landings

WBS	Description	Qty	Type	Wide	High	Style	LF	Erect MH	MH @ $68	M&CE $	TON	Assembly $	TOTAL
	Static Mixer Vault	0	0.00	0.00	0.0	0.0							
5	*Vault access*	1	3.99	1.34	5.0	1.0	5	4	$257	$74	0.01	$591	*$922*
		0	0.00	0.00	0.0	0.0							
	Finished Water Storage Tank	0	0.00	0.00	0.0	0.0							
9	*Top accessway*	1	3.99	1.34	27.0	1.5	27	34	$2,320	$869	0.13	$6,954	*$10,143*
		0	0.00	0.00	0.0	0.0							
		0	0.00	0.00	0.0	0.0							
		0	0.00	0.00	0.0	0.0							
		0	0.00	0.00	0.0	0.0							
	Subtotal - Access Ladders & Landings						32	38	$2,576	$943	0.15	$7,546	***$11,066***

Access Handrails & Toeplates: Areas & Structures

WBS	Description	Qty	Type	Long	Wide/Ø	Style	LF	Erect MH	MH @ $68	M&CE $	TON	Assembly $	TOTAL
	Finished Water Storage Tank	0	0.00	0.00	0.0	0.0							
9	*Tank top perimeter*	1	3.99		30.0	2.0	94	43	$2,910	$1,545	0.12	$12,363	*$16,819*
			0.00			0.0							
			0.00			0.0							
			0.00			0.0							
	Subtotal - Handrails & Toeplates: Areas & Structures						94	43	$2,910	$1,545	0.12	$12,363	***$16,819***

Grating & Coverplates: Areas & Structures

WBS	Description *(NIS = not in scope)*	Qty	Type	Long	Wide/Ø	Style	SF	Erect MH	MH @ $68	M&CE $	TON	Assembly $	TOTAL
	Canopy & Slab Structure	0	0.00	0.0		0.0							
13	*Slab collection sump-FRP*	1	3.99	3.0	3.0	3.0	9	4	$247	$58	0.04	$935	*$1,240*
13	*Slab collection trench-FRP*	1	3.99	50	1.0	3.0	50	20	$1,363	$344	0.26	$5,507	*$7,214*
		0	0.00	0.0		0.0							
		0	0.00	0.0	0.0	0.0							
		0	0.00	0.0	0.0	0.0							
		0	0.00	0.0	0.0	0.0							
	Subtotal - Grating & Coverplates: Areas & Structures						59	24	$1,610	$403	0.31	$6,442	***$8,454***

Hatches & Covers: Areas & Structures

WBS	Description	Qty	Type	Long	Wide/Ø	Style	SF	Erect MH	MH @ $68	M&CE $	TON	Assembly $	TOTAL
	Staic Mixer Vault	0	0.00	0.0	0.0	0.0							
5	*Vault access*	1	3.99	3.0	3.0	2.5	9	10	$653	$154	0.04	$2,471	*$3,278*
		0	0.00	0.0	0.0	0.0							
	Finished Water Storage Tank	0	0.00	0.0	0.0	0.0							
9	*Top accessway*	1	3.99	3.0	3.0	2.5	9	10	$653	$154	0.04	$2,471	*$3,278*
		0	0.00	0.0	0.0	0.0							
		0	0.00	0.0	0.0	0.0							
		0	0.00	0.0	0.0	0.0							
		0	0.00	0.0	0.0	0.0							
	Subtotal - Hatches & Covers: Areas & Structures						18	19	$1,306	$309	0.09	$4,941	***$6,555***

Guardposts & Bollards

WBS	Description	Qty	Type	Wide/Ø	High	Style		Erect MH	MH @ $68	M&CE $	TON	Assembly $	TOTAL
	Canopy & Slab Structure	0	0.00	0.00	0.0	0.00							
13	*Process & chemical offload area*	6	1.13	0.67	7.0	1.00		61	$4,157	$4,730	0.92	$9,461	*$18,348*
		0	0.00	0.00	0.0	0.00							
		0	0.00	0.00	0.0	0.00							
		0	0.00	0.00	0.0	0.00							
	Subtotal - Guardposts & Bollards							61	$4,157	$4,730	0.92	$9,461	***$18,348***

Stantec

DIV 5 (05) METALS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Version	Estimator	Date	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	000	Jim Ward	14-Jul-23	2002006267

General Allowances

This summary category is intended to provide coverage of the minor DIV 5 miscellaneous metals and/or related work items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the identified scope items above when these DIV costs are exported to other worksheets.***

WBS		Factor		Erect MH	MH @ $68	M&CE $	TON	Assembly $	TOTAL
2	**Subtotal - General Allowances**	1.0		3	$212	$125		$705	***$1,042***
Miscellaneous Metals Total									
				Erect MH	MH @ $68	M&CE $	TON	Assembly $	TOTAL
	DIV 5 TOTAL			210	$14,321	$8,447	1.92	$47,727	***$70,495***

DIVS 3 & 5-8 (03,05-08) BUILDINGS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

PE Steel Building (SB)		*Flat Roof (FR)*	
SB Add-On's		*FR Services (re: DIVS 15-17)*	
SB Services (re: DIVS 15-17)		*Arched Fabric (AF)*	
PE Steel Roof (SR)	Galv Structurals & Kynar Panels	*AF Services (re: DIVS 15-17)*	
SR Add-On's	Bird Netting & Perimeter Skirting	*Interior Architectural Level*	
SR Services (re: DIVS 15-17)	Light-Plumb-Fire Protect	*Exterior Architectural Level*	
Precast Tilt-Up Wall System		*Climate Type for Services*	Northwest US (or similar)

Buildings/Components Scope

Pre-Engineered Steel Roof System

WBS	Description	Qty	Type	Lng-Skrt	Wd-Flrs	Hi-OC	SF-Lev	TON-Watt		MH	MH @ $67	M&CE $	TOTAL
13	*Canopy structure*	1	1.35	72.0	60.0	18.0	4,320	39.3		468	$31,440	$247,104	*$278,543*
13	*Light-Plumb-Fire Protect (re: DIVS 15-16)*	1	5	3.0	1	4	1.00	5	Watts/SF				
		0	0.00	0.0	0.0	0.0							
0		0	0	0.0	0	0	0.00	0					
		0	0.00	0.0	0.0	0.0							
0		0	0	0.0	0	0	0.00	0					
		0	0.00	0.0	0.0	0.0							
0		0	0	0.0	0	0	0.00	0					
		0	0.00	0.0	0.0	0.0							
0		0	0	0.0	0	0	0.00	0					
		0	0.00	0.0	0.0	0.0							
0		0	0	0.0	0	0	0.00	0					
		0	0.00	0.0	0.0	0.0							
0		0	0	0.0	0	0	0.00	0					
		0	0.00	0.0	0.0	0.0							
0		0	0	0.0	0	0	0.00	0					
		0	0.00	0.0	0.0	0.0							
0		0	0	0.0	0	0	0.00	0					
	Subtotal - Pre-Engineered Steel Roof System						4,320.0	39.3		468	$31,440	$247,104	***$278,543***

Miscellaneous Work

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $0	M&CE $	TOTAL
	Subtotal - Miscellaneous Work									

Demolition & Disposal

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $0	M&CE $	TOTAL
	Subtotal - Demolition & Disposal									

General Allowances

This summary category is intended to provide coverage of the minor DIVS 5-8 buildings, components, and/or related work items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the identified scope items above when these DIV costs are exported to other worksheets.***

WBS		Factor		MH	MH @ $67	M&CE $	TOTAL
2	**Subtotal - General Allowances**	1.0		7	$472	$3,707	***$4,178***

Buildings/Components Total

	SF	MH	MH @ $67	M&CE $	TOTAL
DIVS 3 & 5-8 TOTAL	4,320	475	$31,911	$250,810	***$282,721***

DIVS 7-10 (07-10) COATINGS & FINISHES

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Version	Estimator	Date	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	000	Jim Ward	14-Jul-23	2002006267

Assumptions

CIP Concrete	Varies by Structure	*Buildings - Exterior*	
Tanks - Exterior		*EIFS Structure System*	
Tanks - Interior		*EIFS Finish System*	
Pipes & Ducts	Blast/PW, Prime, & Epoxy	*Finishes Level*	Standard
Buildings - Spaces	Varies by Structure	*Contain & Clean-Up (C&C)*	Minimum
Buildings - Interior	Varies by Space	*(un-assigned)*	

Finishes Scope

CIP Concrete Finishes: Areas & Structures

WBS	Description	Qty	Type	Long	Wide/Ø	Hi/Dp	To/Bo	C&C	SF	MH	MH @ $52	M&CE $	TOTAL
	Static Mixer Vault												
5	*Vault exterior-waterproof*	1	10.0	7.7	5.7	5.8		1.2	155	6	$320	$364	*$684*
	Canopy & Slab Structure												
13	*Collection trench exterior-waterproof*	1	10.0	93.7	6.7	3.3		1.2	668	27	$1,377	$1,567	*$2,944*
13	*Collection trench interior-epoxy*	1	11.0	50	1.0	1.0	1.00	1.2	152	22	$1,155	$649	*$1,804*
13	*Canopy area sump exterior-waterproof*	2	10.0	4.3	4.3	3.8		1.2	133	5	$274	$312	*$586*
13	*Cano;y area sump interior-epoxy*	2	11.0	3.0	3.0	3.0	1.00	1.2	90	13	$684	$384	*$1,068*
13	*Chem tank containment area-epoxy*	1	11.0	43.7	14.0	2.5		1.2	300	44	$2,283	$1,282	*$3,565*
13	*Chem store contain sumps-epoxy*	3	11.0	1.0	1.0	1.0		1.2	12	2	$91	$51	*$142*
Subtotal - CIP Concrete Finishes: Areas & Structures									1,511	119	$6,186	$4,609	***$10,795***

Miscellaneous Work

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $52	M&CE $	TOTAL
	Existing Raw Water Pump Station									
4	*Restore & coat exist PS can allowance-LS*	1	1	120	$6,000	1	120	$6,223	$6,000	*$12,223*
Subtotal - Miscellaneous Work							120	$6,223	$6,000	***$12,223***

General Allowances

This summary category is intended to provide coverage of the minor DIVS 9-10 finishes and/or related work items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the identified scope items above when these DIV costs are exported to other worksheets.***

WBS		Factor		MH	MH @ $52	M&CE $	TOTAL
2	**Subtotal - General Allowances**	1.0		4	$186	$159	***$345***

Finishes Total

	SF	MH	MH @ $52	M&CE $	TOTAL
DIVS 7-10 TOTAL	1,663	243	$12,595	$10,768	***$23,363***

DIV 13f (33) FIELD-ERECTED TANKS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Version	Estimator	Date	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	000	Jim Ward	14-Jul-23	2002006267

Assumptions

Welded Tank Sidewall		*Bolted Tank Sidewall*	Epoxy Steel Panels - 1X Wall
Welded Tank Bottom		*Bolted Tank Bottom*	Flat Bottom
Welded Tank Top		*Bolted Tank Top*	Dish Top
Welded Tank Overflow		*Bolted Tank Overflow*	
Typical Freeboard	2 VLF Sideshell Depth	*Typical Specific Gravity*	1.00-1.05
Typical Roof Support	Central Column (dish top)	*(un-assigned)*	

Field Erected Tank Scope

Bolted Circular Tanks

WBS	Component Description	Qty	Type	Ø	SW-FB	TON	SF	GAL (each)	MH	MH @ $68	M&CE $	TOTAL
9	*Finished Water Storage Tank*	1	1.0	30.0	37.0	14.7	3,487	185,100	1,037	$70,351	$216,832	*$287,182*
9	*Flat Bottom*	1	1.0	1.05	2.0		707		159	$10,777	$32,576	*$43,353*
9	*Dish Top + Rafters & Center Column*	1	2.5	1.75			813		196	$13,323	$70,477	*$83,800*
	Overflow Trough Not-in-Scope											
Subtotal - Bolted Circular Tanks							5,007	185,100	1,392	$94,451	$319,885	***$414,335***

Miscellaneous Work

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $0	M&CE $	TOTAL
Subtotal - Miscellaneous Work										

General Allowances

This summary category is intended to provide coverage of the minor DIV 13 field-erected tank and/or related work items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the identified scope items above when these DIV costs are exported to other worksheets.***

WBS		Factor		MH	MH @ $68	M&CE $	TOTAL
2	**Subtotal - General Allowances**	1.0		21	$1,417	$4,798	***$6,215***

Field Erected Tank Total

	TON	SF	MH	MH @ $68	M&CE $	TOTAL
DIV 13f TOTAL	14.7	5,007	1,413	$95,867	$324,683	***$420,550***

DIVS 11i-15i (21-23) MECHANICAL INSTALLATION

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Piping System Material 1	DIP-MJ-Cement Lined-UG	30%	*Tagging & Labeling*	Standard (plastic & 316SS)
Piping System Material 2	SDR 11 (press) HDPE-Butt Weld	25%	*Area & Structure Ductwork*	
Piping System Material 3	Sch 80 PVC-Socket Weld	25%	*Air & Liquid Distributors*	
Piping System Material 4	Sch 40 Galv CS-Thread	10%	*Face Pipe Assemblies*	
Piping System Material 5	2X Contained-Tubing in PVC	10%	*Media*	
Pipe Installation Code	ASME B31.3 - Process Piping		*Media Supports*	
Pipe Insulation & Jacketing	2" Fiberglass & 0.013" PVC		*Tank Insulation*	
Pipe Protection & Coating	Enamel or Acrylic Paint		*Tank Insulation Jacketing*	
Equipment & Tank Ductwork	PVC Duct, Ftgs, & Dampers		*Tank Heat-Tracing*	

Mechanical Installation Scope

Process Equipment Installation Summary

Breakdown of this section's subtotal by all the major equipment scope items is provided in the DIVS 11-17 PROCESS EQUIPMENT sheets

WBS	Description *(NIS = not in scope)*	Qty	Type	%	MH	MH @ $78	M&CE $	TOTAL
	Equipment Rig & Set (re: DIVS 11-17)	1	1.00		518	$40,596	$39,487	*$80,083*
	Equipment Pipe & Valve (re: DIVS 11-17)	1	1.00		1,617	$126,788	$230,820	*$357,608*
2	*Pipe & Valve Insulation Allowance*	1	1.00	15%	109	$8,558	$28,999	*$37,558*
2	*Pipe & EQ Coating Allowance*	1	1.20	30%	198	$15,519	$9,280	*$24,799*
2	*Static Ventilation Allowance*	3	1.00		39	$3,055	$1,765	*$4,821*
2	*Tagging & Labeling Allowance*	1			32	$2,507	$881	*$3,388*
	Subtotal - Process Equipment Installation Summary				2,512	$197,023	$311,233	***$508,256***

DIVS 5-8 PE Steel Roof Structure Mechanical, HVAC, Fire Protection, & Plumbing

WBS	Description	Qty	Type	Floors	A-Level	Scope	SF	MH	MH @ $78	M&CE $	TOTAL
13	*Canopy structure*	1	5	1	1.00	1.02	4,320	455	$35,660	$36,024	*$71,684*
0	0	0	0	0	0.00	0.00					
	Subtotal - DIVS 5-8 PE Steel Roof Mechanical						4,320	455	$35,660	$36,024	***$71,684***

Miscellaneous Work

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $0	M&CE $	TOTAL
	Subtotal - Miscellaneous Work									

Demolition & Disposal

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $78	M&CE $	TOTAL
	Existing Raw Water Pump Station									
4	*Remove exist RW pumps & piping-LS/EA*	1	2	24	$240	2	48	$3,765	$480	*$4,245*
	Subtotal - Demolition & Disposal						48	$3,765	$480	***$4,245***

General Allowances

This summary category is intended to provide coverage of the minor DIV 15 mechanical, piping, and/or related work items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the scope items in the "Process & Mechanical EQ Installation" section above.***

WBS		Factor	MH	MH @ $78	M&CE $	TOTAL
2	**Subtotal - General Allowances**	1.0	45	$3,547	$5,216	***$8,763***

Mechanical Installation Total

	MH	MH @ $78	M&CE $	TOTAL
DIV 15 TOTAL	3,060	$239,994	$352,953	***$592,947***

DIV 16i (25-28,33) ELECTRICAL INSTALLATION

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

Raceway System Material 1	Sch 80 PVC (hung)	40%	*Tagging & Labeling*	Standard (plastic & 316SS)
Raceway System Material 2	Rigid Galv Steel-RGS (hung)	30%	*Site Lighting Units*	Varies by Area/Purpose
Raceway System Material 3	Sch 80 PVC (In Slab/UG)	30%	*Typical Motor Efficiency*	90% (average)
Raceway System Material 4			*Local Power Factor*	0.80 (anticipated)
Raceway System Material 5			*1Ø Controls Voltage*	120V
Local/Field Switches	Safety Disconnects Only		*3Ø Low Voltage*	480V
Equipment Installed	All Electrical Gear & Equipment		*3Ø Medium Voltage*	
Grounding & Lightning	Buildings		*3Ø High Voltage*	
Pipe & EQ Heat-Tracing	Self-Regulating Tape @ 6 W/LF		*(un-assigned)*	

Electrical Installation Scope

Process Equipment Installation Summary

Breakdown of this section's subtotal by all the major equipment scope items is provided in the DIVS 11-17 PROCESS EQUIPMENT sheets

WBS	Description *(NIS = not in scope)*	Qty	Type	%	MH	MH @ $75	M&CE $	TOTAL
	Equipment Rig & Set (re: DIVS 11-17)	1	1.00		240	$17,977	$2,998	*$20,975*
	Equipment Wire & Switch (re: DIVS 11-17)	1	1.00		954	$71,326	$211,799	*$283,125*
2	*Grounding & Lightning Allowance*	1	4.00		41	$3,100	$1,049	*$4,149*
2	*Pipe Heat-Tracing Allowance*	1	0.50	15%	67	$4,978	$15,250	*$20,228*
2	*Tagging & Labeling Allowance*	1			17	$1,256	$656	*$1,912*
	Subtotal - Process Equipment Installation Summary				1,319	$98,638	$231,750	***$330,388***

DIVS 5-8 PE Steel Roof Structure Electrical, Lighting, HVAC, & Fire Protection

WBS	Description	Qty	Type	Floors	A-Level	Scope	SF	MH	MH @ $75	M&CE $	TOTAL
13	*Canopy structure*	1	5	1	1.00	0.10	4,320	81	$6,082	$5,240	*$11,321*
	Subtotal - DIVS 5-8 PE Steel Roof Electrical						4,320	81	$6,082	$5,240	***$11,321***

Site Lighting Units

WBS	Description	Qty	Type	Lumens Each	Install	Lamp	Total Watts	MH	MH @ $75	M&CE $	TOTAL
	Finished Water Storage Tank										
9	*Tank/roof area-Post/Railing light-LED*	2	8.0	36,000	1.11	1.53	800	17	$1,284	$2,876	*$4,160*
	Finished Water Booster Pumps										
10	*Pump area-16' AL pole light-LED*	1	16.0	36,000	1.11	1.53	400	17	$1,284	$3,090	*$4,373*
	Generator System										
12	*Genset area-16' AL pole light-LED*	1	16.0	36,000	1.11	1.53	400	17	$1,284	$3,090	*$4,373*
	Subtotal - Site Lighting Units						1,600	51	$3,851	$9,056	***$12,906***

Miscellaneous Work

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $75	M&CE $	TOTAL
	Miscellaneous Site Work									
14	*480 VAC feeder allowance-LS*	1	1	160	$12,000	1	160	$11,967	$12,000	*$23,967*
	Subtotal - Miscellaneous Work						160	$11,967	$12,000	***$23,967***

Demolition & Disposal

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Total Units	MH	MH @ $75	M&CE $	TOTAL
	Existing Raw Water Pump Station									
4	*Remove exist RW PS elect & controls-LS*	1	1	24	$120	1	24	$1,795	$120	*$1,915*
	Subtotal - Demolition & Disposal						24	$1,795	$120	***$1,915***

DIV 16i (25-28,33) ELECTRICAL INSTALLATION

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

General Allowances

This summary category is intended to provide coverage of the minor DIVS 16-17 electrical, wiring, and/or related work items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the scope items in the "Divs 11-17 Process Equipment" installation section above.***

WBS		Factor		MH	MH @ $75	M&CE $	TOTAL
2	**Subtotal - General Allowances**	1.0		25	$1,835	$3,872	***$5,707***

Electrical Installation Total

	MH	MH @ $75	M&CE $	TOTAL
DIV 16i TOTAL	1,660	$124,168	$262,038	***$386,206***

DIV 16e (25-28,33) ELECTRICAL EQUIPMENT

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Assumptions

480V EQ Rating	NEMA 1 Gasketed (Std)	*120V EQ Rating*	NEMA 12 (Std)
4.16KV EQ Rating		*Process Controls EQ*	Standard SCADA
12.47KV EQ Rating		*Site Controls EQ*	Security & Surveillance
SWGR Main Breakers	All Voltages - (1) Main Only	*Process & Site Controls*	Local Monitor & Control Only
MCC Main Breakers	All Voltages - (1) Main Only	*Power/Controls Siting*	Centralized
Walk-In SWGR & MCC		*(un-assigned)*	

Electrical Equipment Scope

120V Power Equipment

WBS	Description (NIS = not in scope)	Qty	AMP	MH	MH @ $75	M&CE $	EQ $	TOTAL
3	*PNLBRD (panelboard) Package with Main Breaker - 24 pole*	1	100	10	$726	$722	$2,645	*$4,093*
0	*ON-OFF Local Control Switches - NIS*	0						
0	*HAND-OFF-AUTO Local Control Switches - NIS*	0						
0	*LCP (local control panel) Components - NIS*	0						
0	*Fabrication, Assembly, Testing, & Enclosure(s) - NIS*	0						
0	*Engineering & Testing - NIS*	0						
0	*Lightning & Surge Protection Devices - NIS*	0						
	Subtotal - 120V Power Equipment			10	$726	$722	$2,645	***$4,093***

480V Power Equipment

WBS	Description (NIS = not in scope)	Qty	AMP	KW	MH	MH @ $75	M&CE $	EQ $	TOTAL
3	*PNLBRD (panelboard) Package with Main Breaker - 42 pole*	1	200		15	$1,090	$1,011	$3,795	*$5,896*
0	*GENSET Package with ATS, Integral Fuel System, & Noise Enclosure - NIS*	0						$0	
0	*GENSET Paralleling Gear Package - NIS*	0							
3	*SWBRD (Switchboard) Package & Main Breaker(s) Allowance*	1			39	$2,924	$1,129	$32,200	*$36,253*
3	*MCC (motor control center) Package & Main Breaker(s) Allowance - 3 section(s)*	1			55	$4,126	$1,275	$56,810	*$62,211*
3	*XFRMR (transformer) Package & Main Breaker Allowance - 50 KVA*	1			34	$2,542	$785	$3,565	*$6,893*
3	*Metering, Monitoring, & Communication Device Allowance*	1						$2,990	*$2,990*
3	*Lightning & Surge Protection Device Allowance*	1						$1,495	*$1,495*
3	*Test & Analyze (i.e. arc-flash study, short-circuit study, harmonic analysis)*	1			11	$801	$315	$1,035	*$2,151*
	Subtotal - 480V Power Equipment				154	$11,483	$4,515	$101,890	***$117,888***

4.16KV Power Equipment

WBS	Description (NIS = not in scope)	Qty	KW	MH	MH @ $0	M&CE $	EQ $	TOTAL
0	*GENSET Package with ATS, Integral Fuel System, & Noise Enclosure - NIS*	0					$0	
0	*GENSET Paralleling Gear Package - NIS*	0						
0	*SWBRD (Switchboard) Package & Main Breaker(s) - NIS*	0						
0	*MCC (motor control center) Package & Main Breaker(s) - NIS*	0						
0	*XFRMR (transformer) Package & Main Breaker - NIS*	0						
0	*Metering, Monitoring, & Communication Devices - NIS*	0						
0	*Lightning & Surge Protection Devices - NIS*	0						
0	*Testing & Analysis - NIS*	0						
	Subtotal - 4.16KV Power Equipment							

12.47KV Power Equipment

WBS	Description (NIS = not in scope)	Qty	KW	MH	MH @ $0	M&CE $	EQ $	TOTAL
0	*GENSET Package with ATS, Integral Fuel System, & Noise Enclosure - NIS*	0					$0	
0	*GENSET Paralleling Gear Package - NIS*	0						
0	*SWBRD (Switchboard) Package & Main Breaker(s) - NIS*	0						
0	*MCC (motor control center) Package & Main Breaker(s) - NIS*	0						
0	*XFRMR (transformer) Package & Main Breaker - NIS*	0						
0	*Metering, Monitoring, & Communication Devices - NIS*	0						
0	*Lightning & Surge Protection Devices - NIS*	0						
0	*Testing & Analysis - NIS*	0						
	Subtotal - 12.47KV Power Equipment							

DIV 16e (25-28,33) ELECTRICAL EQUIPMENT

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Date	Estimator	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	14-Jul-23	Jim Ward	000	2002006267

Process Controls Equipment

WBS	Description (NIS = not in scope)	Qty	MH	MH @ $75	M&CE $	EQ $	TOTAL
3	*Process Control System, HMI, RTU, & Software Package Allowance*	1	219	$16,343	$8,943	$77,050	*$102,337*
3	*Fabrication, Vent/AC, Assembly, Testing, & Indoor (coated steel) Enclosure(s)*	1				$21,045	*$21,045*
3	*Engineering, Programming, Testing, & Training Allowance*	1				$74,060	*$74,060*
3	*UPS, Antenna, Lightning, & Surge Protection Device Allowance*	1	82	$6,129	$1,677	$26,565	*$34,371*
3	*Integration Allowance (i.e. this process control system to existing)*	1	16	$1,226	$671	$6,670	*$8,566*
	Subtotal - Process Controls Equipment		317	$23,698	$11,291	$205,390	***$240,379***

Site Controls Equipment

WBS	Description (NIS = not in scope)	Qty	MH	MH @ $75	M&CE $	EQ $	TOTAL
0	*Health & Safety System Components Package - NIS*	0					
3	*Security System Components Package Allowance*	1	95	$7,142	$6,895	$19,665	*$33,702*
3	*Surveillance System Components Package Allowance*	1	153	$11,444	$11,048	$31,510	*$54,002*
3	*Fabrication, Assembly, Testing, & Indoor (coated steel) Enclosure(s)*	1				$5,290	*$5,290*
3	*Engineering, Programming, Testing, & Training Allowance*	1				$11,040	*$11,040*
3	*UPS, RTU, Antenna, Lightning, & Surge Protection Device Allowance*	1				$16,675	*$16,675*
3	*Integration Allowance (i.e. these control systems to existing)*	1	9	$697	$673	$2,185	*$3,555*
	Subtotal - Site Controls Equipment		258	$19,283	$18,616	$86,365	***$124,264***

Miscellaneous Work

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Unit EQ $	MH	MH @ $0	M&CE $	EQ $	TOTAL
	Subtotal - Miscellaneous Work										

Demolition & Disposal

WBS	Description	Qty	Each	Unit MH	Unit M&CE $	Unit EQ $	MH	MH @ $0	M&CE $	EQ $	TOTAL
	Subtotal - Demolition & Disposal										

General Allowances

This summary category is intended to provide coverage of the minor DIVS 16-17 electrical equipment and/or related work items that could be needed but are currently either too small to consider or cannot yet be quantified. ***NOTE: The absence of an assigned WBS code below indicates this allowance cost is being allocated across the identified scope items above when these DIV costs are exported to other worksheets.***

WBS		Factor		MH	MH @ $75	M&CE $	EQ $	TOTAL
2	**Subtotal - General Allowances**	1.0		11	$828	$527	$5,944	***$7,299***

Electrical Equipment Total

	MH	MH @ $75	M&CE $	EQ $	TOTAL
DIV 16e TOTAL	749	$56,018	$35,672	$402,234	***$493,924***

WBS CONNECTED ELECTRICAL LOADS

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Version	Estimator	Date	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	000	Jim Ward	14-Jul-23	2002006267

Assumptions

NOTE: These load values have been established on the connected electrical load, with breaker & starter loads based on the size utilized. Total probable load(s) are used for sizing transformer(s) & generator(s), based on a forecast of 80% of the total connected load to account for the installed spare(s) & part-time equipment load(s)

	Voltage	Amps	KVA	KW
Total Connected Load	480	1,434	1,191	953
	Percent	**Amps**	**KVA**	**KW**
Total Probable Load	80%	**1,147**	**953**	**762**

1500 KVA Transformer - would be an 1800 amp service

WBS Load Summary

Connected Load for WBS Items 4-51

WBS	Area/Name	Voltage	Amps	KVA
4	Existing Raw Water Pump Station	480	121	100
5	Static Mixer Vault	480	0	0
6	MF Feed Tank	480	0	0
7	Membrane & Neutralization System	480	800	664
8	CIP Storage Tank	480	0	0
9	Finished Water Storage Tank	480	3	2
10	Finished Water Booster Pumps	480	402	334
11	Chemical Systems	480	28	23
12	Generator System	480	6	5
13	Canopy & Slab Structure	480	74	62
14	Miscellaneous Site Work			
15	Existing Building		200	
16				
17				
18	Standby Generator Size - maybe a 500 kw			
19	generator per Papp...			
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
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37				
38				
39				
40				
41				
42				
43				
44				
45				
46				
47				
48				
49				
50				
51				

30 hp each x 2

100 hp each x 3

likely heat trace per Papp

Load for WBS Items 52-99

	Name	Voltage	Amps	KVA
52				
53				
54				
55				
56				
57				
58				
59				
60				
61				
62				
66				
67				
68				
69				
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DIVS 11-16 (40-45) PROCESS EQUIPMENT

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Date	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	14-Jul-23	000	2002006267

Equipment Scope

			DIVS 11-16 EQ & Related Components	*DIVS 11-15 EQ Buyout*	*DIV 15 EQ & Piping Installation*				*DIV 16 EQ Buyout*	*DIV 16 Power and I&C Installation*			
WBS	Item *(NIS-not in scope)*	Qty		TOTAL	MH	MH $	M&CE $	TOTAL	TOTAL	MH	MH $	M&CE $	TOTAL
	Existing RW Pump Station												
4	*PS hatch intrusion switch*	1							$150	7	$504	$1,213	$1,717
4	*Ultrasonic level LIT*	1			5	$389	$379	$768	$1,600				
4	*120 VAC power & signal*	1								11	$807	$1,941	$2,748
4	*High/Low safety float switch assembly*	1			2	$146	$142	$288	$350				
4	*120 VAC signal*	1								7	$504	$1,213	$1,717
4	*HC pump-1500 gpm @ 50'-SS*	2		$50,000	76	$5,997	$9,616	$15,614					
4	*480 VAC power*	2								49	$3,672	$8,831	$12,503
4	*120 VAC signal*	2								11	$819	$1,971	$2,790
4	*VFD unit (30 hp)-Free standing-NEMA 4*	2							$39,000	27	$2,002	$4,815	$6,817
4	*PS & PI assembly (pipe mount w/ valve)*	2			7	$529	$849	$1,378	$1,500				
4	*120 VAC signal*	2								13	$1,009	$2,426	$3,435
	MF Feed Tank												
5	*HDPE feed tank-12' Ø x 10'*	1			126	$9,847	$16,382	$26,229					
5	*High/Low safety float switch assembly*	1			6	$438	$426	$864	$350				
5	*120 VAC signal*	1								7	$504	$1,213	$1,717
5	*Radar level LIT*	1			5	$389	$379	$768	$3,000				
5	*120 VAC power & signal*	1								11	$807	$1,941	$2,748
5	*High/Low safety float switch assembly*	1			6	$438	$426	$864	$350				
5	*120 VAC signal*	1								7	$504	$1,213	$1,717
5	*Free chlorine analyzer AIT*	1			5	$389	$379	$768	$4,000				
5	*120 VAC power & signal*	1								11	$807	$1,941	$2,748
	Static Mixer Vault												
6	*CIP structure-11' x 7'*	1			23	$1,783	$3,246	$5,030					
6	*Power & control connectivity*	1								11	$807	$1,941	$2,748
6	*Vault hatch intrusion switch*	2							$300	13	$1,009	$2,426	$3,435
6	*16" magnetic flowmeter FIT*	1			45	$3,556	$5,916	$9,472	$11,500				
6	*120 VAC power & signal*	1								11	$807	$1,941	$2,748
6	*12" static mixer-FRP*	1		$24,000	18	$1,411	$2,263	$3,674					
	Membrane System												
7	*Membrane system containers budget*	2		$3,000,000									
7	*Membrane containers*	2			148	$11,605	$19,306	$30,911					
7	*480 VAC power*	2								113	$8,473	$20,379	$28,852
7	*Pressure PIT*	1			6	$441	$707	$1,148	$1,400				
7	*120 VAC power & signal*	1								11	$807	$1,941	$2,748
7	*8" BFV-pneumatic actuator*	6			189	$14,816	$23,758	$38,575					
7	*120 VAC air control solenoid power*	6								40	$3,026	$7,278	$10,304
	EQ SHEET TOTAL			**$3,074,000**	665	$52,176	$84,172	**$136,348**	**$63,500**	359	$26,868	$64,625	**$91,493**
	TOTAL: ALL DIVS 11-17 EQ SHEETS			**$3,491,575**	2,134	$167,384	$270,308	**$437,691**	**$190,950**	1,194	$89,304	$214,796	**$304,100**

Stantec

DIVS 11-16 (40-45) PROCESS EQUIPMENT

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Date	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	14-Jul-23	000	2002006267

Equipment Scope

			DIVS 11-16 EQ & Related Components	*DIVS 11-15 EQ Buyout*	*DIV 15 EQ & Piping Installation*				*DIV 16 EQ Buyout*	*DIV 16 Power and I&C Installation*			
WBS	Item *(NIS-not in scope)*	Qty	TOTAL	MH	MH $	M&CE $	TOTAL	TOTAL	MH	MH $	M&CE $	TOTAL
7	*Neutralization tank-8' Ø x 10'*	1		49	$3,830	$6,371	$10,200					
7	*High/Low safety float switch assembly*	1		2	$146	$142	$288					
7	*120 VAC signal*	1							7	$504	$1,213	$1,717
7	*Differential pressure DPIT*	1		11	$882	$1,414	$2,296					
7	*120 VAC power & signal*	1							11	$807	$1,941	$2,748
7	*Radar level LIT*	1		5	$389	$379	$768					
7	*120 VAC power & signal*	1							11	$807	$1,941	$2,748
7	*High/Low safety float switch assembly*	1		2	$146	$142	$288					
7	*120 VAC signal*	1							7	$504	$1,213	$1,717
7	*HC neut pump-145 gpm @ 70' (1+0)*	1		77	$6,018	$10,011	$16,029					
7	*480 VAC power (5 hp)*	1							19	$1,412	$3,397	$4,809
7	*120 VAC signal*	1							5	$410	$985	$1,395
7	*PS & PI assembly (w/ valve)*	1		3	$265	$424	$689					
7	*120 VAC signal*	1							7	$504	$1,213	$1,717
7	*½" seal water solenoid assembly*	1		7	$547	$910	$1,457					
7	*120 VAC power*	1							4	$303	$728	$1,030
7	*3" BFV-pneumatic actuator*	2		36	$2,822	$4,525	$7,348					
7	*120 VAC air control solenoid power*	2							13	$1,009	$2,426	$3,435
7	*4" BFV-pneumatic actuator*	2		45	$3,528	$5,657	$9,184					
7	*120 VAC air control solenoid power*	2							13	$1,009	$2,426	$3,435
7	*pH analyzer AIT*	1	$1,200	4	$292	$284	$576					
7	*120 VAC power & signal*	1							11	$807	$1,941	$2,748
7	*ORP analyzer AIT*	1	$1,200	4	$292	$284	$576					
7	*120 VAC power & signal*	1							11	$807	$1,941	$2,748
	CIP Storage Tank											
8	*Tank-7½' Ø x 20'-HDPE*	1	$30,000	63	$4,924	$8,191	$13,114					
8	*High/Low safety float switch assembly*	1		2	$146	$142	$288	$350				
8	*120 VAC signal*	1							7	$504	$1,213	$1,717
	Finished Water Storage Tank											
9	*Structure-30' Ø x 37'*	1		122	$9,585	$17,449	$27,034					
9	*Power & control connectivity*	1							29	$2,169	$5,216	$7,385
9	*Tank hatch intrusion switch*	1						$150	7	$504	$1,213	$1,717
9	*Differential pressure DPIT*	1		11	$882	$1,414	$2,296	$4,500				
9	*120 VAC power & signal*	1							11	$807	$1,941	$2,748
9	*High/Low safety float switch assembly*	1		2	$146	$142	$288	$350				
9	*120 VAC signal*	1							7	$504	$1,213	$1,717
9	*Free chlorine analyzer AIT*	1		5	$389	$379	$768	$4,000				
9	*120 VAC power & signal*	1							11	$807	$1,941	$2,748
	EQ SHEET TOTAL		**$32,400**	449	$35,227	$58,259	**$93,487**	**$9,350**	190	$14,178	$34,102	**$48,280**

Stantec

DIVS 11-16 (40-45) PROCESS EQUIPMENT

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Date	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	14-Jul-23	000	2002006267

Equipment Scope

			DIVS 11-16 EQ & Related Components	*DIVS 11-15 EQ Buyout*	*DIV 15 EQ & Piping Installation*			*DIV 16 EQ Buyout*	*DIV 16 Power and I&C Installation*			
WBS	Item *(NIS-not in scope)*	Qty	TOTAL	MH	MH $	M&CE $	TOTAL	TOTAL	MH	MH $	M&CE $	TOTAL
	Finished Water Booster Pumps											
10	*Canned VT pumps-700 gpm @ 175' (2+1)*	2	$120,000	148	$11,605	$19,306	$30,911					
10	*480 VAC power*	2							38	$2,824	$6,793	$9,617
10	*120 VAC signal*	4							22	$1,639	$3,941	$5,580
10	*VFD unit (75 hp)-Free standing-NEMA 4*	2						$65,000	27	$2,002	$4,815	$6,817
10	*PS & PI assembly (w/ valve)*	2		7	$529	$849	$1,378	$1,500				
10	*120 VAC signal*	2							13	$1,009	$2,426	$3,435
10	*VT pump can Only*	1	$10,000	34	$2,646	$4,243	$6,888					
10	*Pressure PIT*	1		6	$441	$707	$1,148	$1,400				
10	*120 VAC power & signal*	1							11	$807	$1,941	$2,748
	Chemical Systems											
11	*Acid & CaCl2 tote connect stations*	3		21	$1,641	$2,730	$4,371					
11	*6' x 6' Platform Chemical Weigh Scale*	3		7	$584	$568	$1,152	$19,500				
11	*120 VAC power & signal*	3							45	$3,389	$8,152	$11,541
11	*Tote containment basin-5' x 5'*	3	$3,600	4	$292	$284	$576					
11	*AOD transfer pumps-2.5 gpm*	3	$4,500	42	$3,282	$5,461	$8,743					
11	*Air control solenoid station*	3		17	$1,323	$2,121	$3,444					
11	*120 VAC solenoid power*	3							12	$908	$2,184	$3,091
11	*NaOH truck unload panel*	1						$3,500	16	$1,210	$2,911	$4,122
11	*Store & feed tank-8' Ø x 8'-HDLPE*	1	$7,500	49	$3,830	$6,371	$10,200					
11	*Site gauge assembly-magnetic*	1	$1,800	4	$353	$566	$918					
11	*Radar level LIT*	1		5	$389	$379	$768	$3,000				
11	*120 VAC power & signal*	1							11	$807	$1,941	$2,748
11	*1" BFV-pneumatic actuator*	3		40	$3,175	$5,091	$8,266					
11	*120 VAC air control solenoid power*	3							20	$1,513	$3,639	$5,152
11	*Metering pump-5 gph (1+1)*	2	$11,000	31	$2,469	$3,960	$6,429					
11	*120 VAC power & signal*	2							22	$1,614	$3,882	$5,496
11	*PS & PI assembly (w/ valve)*	2		7	$529	$849	$1,378	$1,500				
11	*120 VAC signal*	2							13	$1,009	$2,426	$3,435
11	*AOD transfer pumps-2.5 gpm*	1	$1,500	14	$1,094	$1,820	$2,914					
11	*Air control solenoid station*	1		6	$441	$707	$1,148					
11	*120 VAC solenoid power*	1							4	$303	$728	$1,030
11	*PS & PI assembly (w/ valve)*	1		3	$265	$424	$689	$750				
11	*120 VAC signal*	1							7	$504	$1,213	$1,717
11	*NaOCl truck unload panel*	1						$3,500	16	$1,210	$2,911	$4,122
11	*Store & feed tank-8' Ø x 8'-HDLPE*	1	$7,500	49	$3,830	$6,371	$10,200					
11	*Site gauge assembly-magnetic*	1	$1,800	4	$353	$566	$918					
	EQ SHEET TOTAL		**$169,200**	498	$39,071	$63,370	**$102,441**	**$99,650**	277	$20,748	$49,903	**$70,651**

Stantec

DIVS 11-16 (40-45) PROCESS EQUIPMENT

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Date	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	14-Jul-23	000	2002006267

Equipment Scope

			DIVS 11-16 EQ & Related Components	*DIVS 11-15 EQ Buyout*	*DIV 15 EQ & Piping Installation*				*DIV 16 EQ Buyout*	*DIV 16 Power and I&C Installation*			
WBS	Item *(NIS-not in scope)*	Qty		TOTAL	MH	MH $	M&CE $	TOTAL	TOTAL	MH	MH $	M&CE $	TOTAL
11	*Radar level LIT*	1			5	$389	$379	$768	$3,000				
11	*120 VAC power & signal*	1								11	$807	$1,941	$2,748
11	*½" BFV-pneumatic actuator*	2			22	$1,764	$2,828	$4,592					
11	*120 VAC air control solenoid power*	2								13	$1,009	$2,426	$3,435
11	*Metering pump-5 gph (1+1)*	2		$11,000	31	$2,469	$3,960	$6,429					
11	*120 VAC power & signal*	2								22	$1,614	$3,882	$5,496
11	*PS & PI assembly (w/ valve)*	2			7	$529	$849	$1,378	$1,500				
11	*120 VAC signal*	2								13	$1,009	$2,426	$3,435
11	*AOD transfer pumps-2.5 gpm*	1		$1,500	14	$1,094	$1,820	$2,914					
11	*Air control solenoid station*	1			6	$441	$707	$1,148					
11	*120 VAC solenoid power*	1								4	$303	$728	$1,030
11	*PS & PI assembly (w/ valve)*	1			3	$265	$424	$689	$750				
11	*120 VAC signal*	1								7	$504	$1,213	$1,717
11	*Coagulant truck unload panel*	1							$3,500	16	$1,210	$2,911	$4,122
11	*Store & feed tank-8' Ø x 8'-HDLPE*	1		$7,500	49	$3,830	$6,371	$10,200					
11	*Site gauge assembly-magnetic*	1		$1,800	4	$353	$566	$918					
11	*Radar level LIT*	1			5	$389	$379	$768	$3,000				
11	*120 VAC power & signal*	1								11	$807	$1,941	$2,748
11	*Metering pump-5 gph (2+1)*	3		$16,500	47	$3,704	$5,940	$9,644					
11	*120 VAC power & signal*	3								32	$2,421	$5,823	$8,244
11	*PS & PI assembly (w/ valve)*	3			10	$794	$1,273	$2,067	$2,250				
11	*120 VAC signal*	3								20	$1,513	$3,639	$5,152
	Emergency Generator												
12	*480V genset & ATS package-300 kW*	1		$150,000	50	$3,892	$3,786	$7,679					
12	*LCP*	1								13	$1,009	$2,426	$3,435
12	*480 VAC power*	1								38	$2,824	$6,793	$9,617
	Canopy & Slab Structure												
13	*Structure-70' x 58'*	1			74	$5,795	$10,551	$16,346					
13	*Power & control connectivity*	1								35	$2,623	$6,308	$8,931
13	*Ultrasonic sump level LIT*	1			5	$389	$379	$768	$1,600				
13	*120 VAC power & signal*	1								11	$807	$1,941	$2,748
13	*High/Low safety float switch assembly*	1			2	$146	$142	$288	$350				
13	*120 VAC signal*	1								7	$504	$1,213	$1,717
13	*Slide rail sump pumps-100 gpm @ 50'-SS (1+*	2		$17,000	59	$4,642	$7,722	$12,364					
13	*480 VAC power (3 hp)*	2								38	$2,824	$6,793	$9,617
13	*120 VAC signal*	2								11	$819	$1,971	$2,790
13	*PS & PI assembly (pipe mount w/ valve)*	2			7	$529	$849	$1,378	$1,500				
13	*120 VAC signal*	2								13	$1,009	$2,426	$3,435
	EQ SHEET TOTAL			**$205,300**	401	$31,415	$48,922	**$80,337**	**$17,450**	316	$23,616	$56,801	**$80,417**

Stantec

DIVS 11-16 (40-45) PROCESS EQUIPMENT

CLASS 5 ESTIMATE - PRIVILEGED & CONFIDENTIAL

Project Name	Location	Estimator	Date	Version	Job #
Sandy Alder Creek WTP Design Concept	Sandy, OR	Jim Ward	14-Jul-23	000	2002006267

Equipment Scope

	DIVS 11-16 EQ & Related Components		*DIVS 11-15 EQ Buyout*	*DIV 15 EQ & Piping Installation*				*DIV 16 EQ Buyout*	*DIV 16 Power and I&C Installation*			
WBS	Item *(NIS-not in scope)*	Qty	TOTAL	MH	MH $	M&CE $	TOTAL	TOTAL	MH	MH $	M&CE $	TOTAL
13	*Water tempering system*	1	$3,500	63	$4,924	$8,191	$13,114					
13	*120 VAC power & signal*	1							15	$1,130	$2,717	$3,847
13	*Eyewash/shower station-Outdoor-Insul & HT*	2	$6,800	35	$2,735	$4,550	$7,286					
13	*FS package with audio & visual alarms*	2		4	$292	$284	$576	$900				
13	*120 VAC power & signal*	2							30	$2,259	$5,435	$7,694
13	*Washdown hose & reel assembly*	1	$375	17	$1,368	$2,275	$3,643					
13	*Water FS*	1		2	$176	$283	$459	$100				
13	*120 VAC FS signal*	1							7	$504	$1,213	$1,717
	END											
EQ SHEET TOTAL			**$10,675**	121	$9,495	$15,583	**$25,078**	**$1,000**	52	$3,894	$9,365	**$13,258**

SECTION 00 41 00

PROPOSAL PRICING FORM

PROJECT TITLE: Alder Creek Water Treatment Plant Upgrade (Project)

THIS BID IS SUBMITTED TO:

City of Sandy (as Buyer):
39250 Pioneer Boulevard
Sandy, OR 97055
Attn: Jenny Coker
(505) 668-6927
Jcoker@ci.sandy.or.us

The undersigned Seller having carefully examined the drawings, specifications, and all addenda thereto, and other Procurement Documents for furnishing Goods and Special Services for Project, and become familiar with all local conditions including labor affecting the cost thereof, does hereby propose to furnish all labor, mechanics, superintendence, tools, materials, equipment and all utilities, fuel, transportation, applicable taxes and duties, and services necessary to perform and complete said work, and work incidental thereto, in a workmanlike manner, as described in the Procurement Documents, in accordance with the bid prices hereinafter set forth.

Note: Unit and lump sum prices must be shown in words and figures in the proposal for each item being bid and in the event of discrepancy, the words shall control.

Envelope 2 - Procurement of Membrane Filtration Equipment and Special Services: Capital costs for complete Membrane System as specified in the procurement documents and drawings for the Project.

CONTRACT PRICES FOR PROCUREMENT OF MEMBRANE FILTRATION EQUIPMENT AND SPECIAL SERVICES

Item 1: Price for Performance Pilot Test

The Contract Price for the Pilot Study has been determined by the Buyer as fair and reasonable.

Seventy-Five Thousand Dollars and no cents
($ 75,000.00)

Item 2: Price for Special Engineering Services

The Contract Price for Special Engineering Services has been determined by the Buyer as fair and reasonable.

One Hundred and Twenty-Five Thousand Dollars and no cents
($ 125,000.00)

Item 3: Contract Price for Containerized Membrane Filtration Systems including

Ancillary Equipment

_____ dollars

($ _____)

Item 4: Total Contract Price
Add Items 1, 2, and 3.

_____ dollars

($ _____)

Item 5: Membrane Module Price*

Indicate the Membrane Module Price in current dollars as of the Proposal Opening Time.

_____ dollars

($ _____)

Item 6: Indicate the Proposer's maximum instantaneous membrane flux (see notes)

_____ Gallons/ ft2-day **(words)**

_____ Gallons/ ft2-day **(number)**

Notes:
1). Maximum membrane flux shall be calculated using the feed side of the membrane proposed by the Proposer as an instantaneous value. Any proposal with maximum membrane flux exceeding 60.0 gallons/ ft2-day will be rejected by the Buyer.

2). Maximum membrane flux does not include the contractual requirements for redundancy and reliability.

Item 7: Indicate the number of membrane modules per membrane unit proposed

_____ **(words)**

_____ **(number)**

Item 8: Membrane Module Warranty Period*

Per Paragraphs 2.08 and 2.09 of the Proposal Form, indicate the Membrane Module Warranty Period (Full and Pro-Rata Replacement) in months.

120 months

~~**Item 7: Membrane Module Pricing Mechanism***~~

~~Per Paragraph 2.08 of the Proposal Form, the Proposer shall indicate if membrane module pricing is fixed or variable with the CPI. Proposer shall indicate the method by writing the words "fixed membrane module price" or "variable with CPI membrane module price" in the space below.~~ **[Addendum #3]**

Item 8: Container Monthly Storage Price – Additive Bid item

Per Paragraph 6.01 of the Proposal Form, the Proposer shall indicate pricing for monthly storage of membrane containers.

dollars/month

($)

Item 9: Additional Capacity – Additive Bid item

Per Paragraph 6.01 of the Proposal Form and Section 11 30 00, Containerized Hollow Fiber Membrane Equipment Membrane Treatment System, the Proposer shall indicate pricing for additional capacity.

dollars

($)

PERFORMANCE, PAYMENT, AND MAINTENANCE BOND

The Undersigned agrees, if awarded the Procurement Agreement, to furnish bonds as required by the Procurement Documents for the faithful performance of the furnishing of Goods and Special Services under the Procurement Agreement.

PROPOSAL SECURITY

Proposal security consisting of certified check, cashier's check, or bid bond (Section 00 61 27, Proposal Bond) and made payable to Buyer, in the amount of $_____, which represents five (5) percent of the Total Amount Bid, is enclosed herewith.

The proposal security accompanying this proposal shall be returned to the Seller unless, in case of the Buyer's acceptance of the Proposal, the Seller fails to execute the Procurement Agreement and submit performance and payment bonds within 15 days after its acceptance. In such a case, the Proposal Security shall become the property of the Buyer and shall be considered as payment for damages due to delay and other inconveniences suffered by the Buyer on account of such failure of the Seller. It is understood that the Buyer reserves the right to reject any and all proposals.

RESPECTFULLY SUBMITTED ON (DATE) _____
This Proposal is submitted by:

Corporation

_____
(Corporation Name)

_____
(State of Incorporation)

_____
(Signature of Officer Authorized to Sign)

_____
(Printed or Typed Name and Title of Officer Authorized to Sign)

_____
(CORPORATE SEAL)

_____
(Signature of Attesting Party)

_____
(Printed or Typed Name of Attesting Party)

_____
(Corporation Business Address)

_____
(Phone No.)

_____
(Person to Whom Notices and Correspondence Regarding This Proposal Should Be Addressed)

_____
(Corporation Business Address)

_____
(Phone No. and Email Address)

END OF SECTION

SECTION 00 52 00 PROCUREMENT AGREEMENT

This agreement is between the City of Sandy ("Buyer") and
_____ ("Seller").

ARTICLE 1 – RECITALS

1.01 The Project for which the Goods and Special Services are to be provided under the Contract Documents is generally described as follows: City of Sandy Alder Creek Water Treatment Plant Upgrade Project that will include an on-site proof of performance pilot test and furnishing a complete set of two (2) hollow fiber membrane containers each with a firm capacity of 2.0 mgd.

1.02 The Seller manufactures membrane filtration systems used in water treatment plants.

1.03 Seller shall furnish the Goods and Services as specified or indicated in the Contract Documents.

ARTICLE 2 -- GOODS AND SPECIAL SERVICES

2.01 The Seller shall provide and operate a membrane filtration pilot system on the buyer's Alder Creek water treatment plant site to validate the Seller's membrane filtration media and system, design parameters, and operating guarantees. If the Buyer determines that the pilot test is successful, the Buyer will provide the Seller with written notice. The Buyer reserves the right to evaluate the Seller's performance during the pilot study and use that as a basis for evaluating successful completion.

2.02 The Buyer will execute the Agreement, subject to Seller's exceptions herein, and administer the Contract for Special Engineering Services associated with the preparation of Shop Drawings and other Submittals required for the project.

2.03 The Buyer is not obligated under this Agreement beyond Special Engineering Services and pilot testing until it issues a "Notice to Commence Fabrication" to the Seller. A Notice to Commence Fabrication may be issued at any time for a period of 365 days after the effective date of the Agreement.

2.04 Upon "Notice to Commence Fabrication" from the Buyer to the Seller, the Seller shall then:

A. Fabricate and deliver membrane filtration equipment and ancillary components (the "Goods") to the Facility,

B. Assist during installation and commission the Goods,

C. Deliver operational and maintenance manuals,

D. Provide operations assistance for one year after installation of the Goods, and

E. Warranty the membrane modules and system per the Contract Documents.

2.05 The Buyer retains the right to assign the remaining portion of the work, which includes the production, delivery and commissioning of the goods and all associated Special Services, to a Contractor.

2.06 The Seller shall deliver the required Bonds and insurance certificates in accordance with Article 4 of the General Conditions.

A. At the time of the effective date of the Agreement, a Performance Bond shall be provided for the Special Engineering Services for the full amount stated in Proposal.

B. Another Performance Bond and the Payment Bond shall be provided upon issuance of the "Notice to Commence Fabrication" in the full amount of the stated amount in Proposal.

2.07 The Buyer retains the right to terminate this Agreement after the pilot test and contract with another entity to provide membrane filtration equipment for the Facility.

ARTICLE 3 – ENGINEER

3.01 The Contract Documents were prepared by Stantec Consulting Services Inc., 601 SW 2nd Ave, Suite 1400, Portland, OR 97204, Attn: Adam Odell, PE, Adam.Odell@stantec.com, 503.220.5409, hereinafter called "Engineer" and who is to assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents.

ARTICLE 4 – POINT OF DESTINATION

4.01 The Goods shall be delivered to the point of destination: The Alder Creek Water Treatment Plant, which contains no known address, but is accessible from a private gravel road in between Whiskey Creek Rd. and E. Terra Fern Drive 7 miles east of Sandy, OR.

ARTICLE 5 – CONTRACT TIMES

5.01 TIME IS OF THE ESSENCE

A. All time limits for Milestones for the delivery of Goods and the furnishing of services as stated in the Contract Documents are of the essence of the Contract.

5.02 DAYS TO ACHIEVE THE PROOF OF PERFORMANCE PILOT TEST

A. The dates for the pilot study are set forth in the following table:

Item No.	Pilot Study Contract Time	Notice to Begin Contract Times	Calendar Time (Days)
	Pilot Study		
A	Draft Work Plan	With Proposal	
B	Final Work Plan	Receipt of Engineer's Comments	7
C	Deliver pilot equipment	Effective Date of Agreement	14
D	Have Pilot Plant Operational at site	Effective Date of Agreement	28
D	Complete pilot study program	Effective Date of Agreement	118
E	Submit Draft Pilot Summary Report	Effective Date of Agreement	118

F	Submit Final Pilot Summary Report	Receipt of Engineer's Comments	14

5.03 DAYS TO ACHIEVE SUBMITTAL OF SHOP DRAWINGS AND SAMPLES

A. All Shop Drawings and Samples required by the Contract Documents will be submitted to the Buyer for Engineer's review and approval in accordance with the following schedule.

Special Engineering Services

Item	Notice to Begin Contract Times	Calendar Time (Days)
1. First Shop Drawing Submittal	Effective Date of Agreement	45
2. First Shop Drawing Approval	Effective Date of Agreement	90
3. Second Shop Drawing Submittal	Effective Date of Agreement	75
4. Second Shop Drawing Approval	Effective Date of Agreement	120

5.04 DAYS TO ACHIEVE DELIVERY OF GOODS

A. The Goods are to be complete and ready for the Buyer's receipt of delivery at the Facility in accordance with the following schedule:

Goods

Item	Notice to Begin Contract Times	Calendar Time (Days)
1. Goods, excluding Computer Equipment, Membrane Modules, and Spare Parts	Notice to Commence Fabrication	240
2. Computer Equipment	Notice of Completed Installation	10
3. Membrane Modules	Notice of Completed Installation	14
4. Spare Parts	Notice of Completed Installation	30

1. The Seller shall not start to manufacture any Goods until the Shop Drawings have been approved and the Buyer has issued a "Notice to Commence Fabrication." The Goods, excluding the membrane modules, are to be fabricated and ready for delivery prior to 315 240 days after the "Notice to Commence Fabrication" is issued.

2. The Seller shall hold the spare parts, membrane modules and computer equipment and deliver to the Facility for installation during commissioning. The spare parts, computer equipment and membrane modules will be delivered in a timely manner as not to impede or delay the commissioning.

5.05 PROJECT MILESTONES FOR SPECIAL SERVICES AND SELLER'S WARRANTEE AND GUARANTEE

A. The furnishing of Special Services to the Buyer will commence upon the execution of the Agreement between the Buyer and the Seller. The Seller shall deliver all Special Services required by the Contract Documents based upon the following milestones.

1. Special Engineering Services

   a. Upon execution of the Agreement, the Seller will begin to provide Special Engineering Services required for Shop Drawings and Samples.

2. Special Services

a. Upon the issue of a Notice to Commence Fabrication, the following Contract Times will commence.

Special Services

Contract Time	Notice to Begin Contract Times	Calendar Time (Days)
1. Installation Manuals	Notice to Commence Fabrication	150
2. Commissioning	Notice of Completed Installation	30
3. Operator Training	Notice of Completed Commissioning	15
4. Preliminary O&M Manual	Notice of Completed Installation	15
5. Acceptance Testing	Notice of Completed Operator Training	45
6. Final O&M Manual	Notice of Substantial Completion	45
7. Warranty Period	Notice of Substantial Completion	365

b. Operational and Maintenance Manuals shall be delivered at the times indicated in Section 01 73 00, Installation, Operations and Maintenance Manuals.

c. In accordance with Section 01 62 00, Installation of Membrane Equipment, Special Services associated with the Installation of the Goods, shall commence with the delivery of the Goods and shall be completed when the “Notice of Completed Installation” is issued by the Engineer.

d. In accordance with Section 01 66 00, Commissioning of Membrane Equipment, commissioning shall commence after the “Notice of Completed Installation” is issued and associated work has been completed. Upon completion of commissioning, a “Notice of Completed Commissioning” will be issued by the Engineer.

e. In accordance with Section 01 73 10, Training of Operations and Maintenance Personnel, Operator Training shall commence after the “Notice of Completed Commissioning.” Upon completion of Operator Training, a “Notice of Training Completion” will be issued by the Engineer.

f. In accordance with Section 01 67 00, Acceptance Testing of Membrane Equipment, acceptance testing shall not commence until after the prerequisite “Notice of Training Completion” is issued. Upon completion of Acceptance Testing, the “Notice of Substantial Completion” will be issued by the Engineer.

g. In accordance with Section 01 68 00, Operations Assistance, operations assistance shall be provided in accordance with the requirements of that Section. The Correction Period shall commence on the date when the “Notice of Substantial Completion” is issued.

B. For the purposes of Seller’s warranty and guarantee, the following Project milestones are as follows:

1. In accordance with Section 01 74 00, Membrane System and Module Warranty, the Membrane Module Warranty Period shall commence on the date when the Acceptance Testing first begins.

2. The Correction Period shall commence on the date the “Notice of Substantial Completion” is issued.

5.06 LIQUIDATED DAMAGES

A. The Buyer and the Seller recognize that time is of the essence of this Agreement and that the Buyer will suffer damages if the Special Engineering Services are not delivered to the Buyer within the times specified in Paragraph 5.02, above. They also recognize that the timely performance of services by other parties involved in the Buyer's Project are materially dependent upon the Seller's specific compliance with the requirements of Paragraph 5.02 plus any extensions thereof allowed in accordance with Article 7 of the General Conditions. Further, they recognize the delays, expense, and difficulties involved in proving the actual losses or damages suffered by the Buyer if complete acceptable submittals are not delivered on time. Accordingly, and instead of requiring proof of such losses or damages, the Buyer and the Seller agree that as liquidated damages for delay (but not as a penalty), the Seller shall pay the Buyer $2,500.00 for each day that expires after the times or dates specified in Paragraph 5.02 for deliveries of acceptable submittals. By execution of this Agreement, the Buyer and the Seller expressly agree that these liquidated damage amounts are reasonable under the circumstances existing at the time this Agreement is executed.

B. The Buyer and the Seller recognize that time is of the essence of this Agreement and that the Buyer will suffer damages if 1) the Goods, associated with the Membrane Filtration System are not fabricated and ready for delivery to the Buyer within the time specified in Paragraph 5.03 above, or 2) if the membrane modules are not delivered in a timely manner as stated in Paragraph 5.03 above. They also recognize that the timely performance by other parties involved in the Buyer's Project are materially dependent upon the Seller's specific compliance with the requirements of Paragraph 5.03 plus any extensions thereof allowed in accordance with Article 7 of the General Conditions. Further, they recognize the delays, expense, and difficulties involved in proving the actual losses or damages suffered by the Buyer if complete acceptable Goods or membrane modules are not delivered on time. Accordingly, and instead of requiring proof of such losses or damages, the Buyer and the Seller agree that as liquidated damages for delay (but not as a penalty) the Seller shall pay Buyer $2,500.00 for each day that expires after the times or dates specified in Paragraph 5.03 for delays involving delivery of the Goods. By execution of this Agreement, the Buyer and the Seller expressly agree that these liquidated damage amounts are reasonable under the circumstances existing at the time this Agreement is executed.

C. The Buyer and the Seller recognize that time is of the essence of this Agreement and that the Buyer will suffer damages if the Special Services are not delivered in a timely manner as stated in Paragraph 5.04, above. They also recognize that the timely performance by other parties involved in the Buyer's Project are materially dependent upon the Seller's specific compliance with the requirements of Paragraph 5.04 plus any extensions thereof allowed in accordance with Article 7 of the General Conditions. Further, they recognize the delays, expense, and difficulties involved in proving the actual losses or damages suffered by the Buyer if complete acceptable Goods, membrane modules or Special Services are not delivered on time. Accordingly, the Buyer and the Seller agree that as liquidated damages for delay (but not as a penalty) the Seller shall pay Buyer $1,000.00 for each day that expires after the times or dates specified in Paragraph 5.04 for delays involving delivery of the Special Services. By execution of this Agreement, the Buyer and the Seller expressly agree that these liquidated damage amounts are reasonable under the circumstances existing at the time this Agreement is executed.

D. The Buyer may deduct the amount of liquidated damages from monies due the Seller under this Agreement. Liquidated damages shall not exceed five (5) percent of the contract price.

E. The liquidated damages provided in this Section shall be Buyer's sole and exclusive remedy for Seller's late delivery of Special Engineering Services, Goods, and Special Services.

F. If Seller is prevented from achieving the delivery times, milestone submittal dates or response times as defined in Articles 5.02A.5, 5.03D, and 5.03E, for any reason beyond Seller's reasonable control and not attributable to its actions or inactions, Seller shall not be assessed liquidated damages and shall be entitled to an adjustment of the Contract Times in an amount equal to the duration of the reason or event causing the delay in delivery.

G. Upon receipt of Buyer's Notice to Commence Fabrication of Equipment that satisfies Seller's requirements for meeting the delivery schedule, Seller shall commence fabrication of equipment. The place of delivery specified therein shall be firm and fixed, provided that Buyer may notify Seller no later than 45 days prior to the scheduled shipment date of the products of an alternate point of delivery (the "Alternate Delivery Site"). Provided the parties agree to a variation to take into account any additional cost [or delay] incurred by Seller in implementing this change, the Alternate Delivery Site shall become the agreed place of delivery for all purposes under this Agreement. In such event the following conditions shall apply: (i) title and risk of loss shall pass to the Buyer upon delivery of the products to the Alternate Delivery Site; (ii) any amounts payable to the Seller upon delivery or shipment shall become payable upon delivery of the products to the Alternate Delivery Site; (iii) any additional expenses incurred by the Seller in connection with such shipment to storage shall become payable by the Buyer upon submission of the Seller's invoice(s) (including but not limited to costs of any additional transportation, preparation for and placement into storage, handling, inspection, preservation, insurance, storage, removal charges and any applicable taxes); (iv) transportation of the products from the storage facility to their place of installation shall be the Buyer's responsibility; and, (v) if the Contract includes Services, subject to the terms and conditions in the Contract the Seller shall resume provision of Services to Buyer when instructed to do so by Buyer provided that all amounts due hereunder plus any cost incurred by Seller in delaying such Services have been paid.

5.07 LIQUIDATED DAMAGES FOR PILOT STUDY

A. During the Pilot Study, should the results indicate system performance capabilities that are less than those defined in Sections 11 30 00, Hollow Fiber Membrane Equipment, the Seller shall modify its equipment to meet the minimum defined system performance capabilities, repeat the entire duration of the Pilot Study, and pay for liquidated damages to account for the loss suffered by the Buyer due to schedule delay. Liquidated damages shall be assessed at $500 per day starting at the determination of Pilot Study initial attempt failure until the commencement of the Pilot Study second attempt up to a maximum amount of $5,000. Should the second attempt of Pilot Study yield system performance results that are less than those defined herein, the Seller will be deemed non-responsive and the Buyer may begin to negotiate with the next lowest responsive Proposer.

B. The liquidated damages provided in this Section shall be Buyer's sole and exclusive remedy for Seller's failure to meet the Pilot Study requirements of this Agreement.

C. Liquidated damages shall be assessed per day of delay and in the event that there are multiple items where the Contract Times has been exceeded Liquidated Damages shall not be combined.

ARTICLE 6 – CONTRACT PRICE

6.01 The Buyer shall pay Seller for furnishing the Goods and Special Services in accordance with the Contract Documents in current funds as follows:

A. The prices stated in Seller's Proposal, attached hereto as an exhibit.

B. Seller shall pay all applicable taxes and duties.

C. The Contract Price for membrane units and ancillary equipment shall remain valid for 180 days after the effective date of the agreement. If the "Notice to Commence Fabrication" is issued after 180 days from the effective date of the agreement (up to a maximum of 3 years), the Contract Price will be adjusted through Change Order. Contract Price adjustment will be the ratio of the Producers Price Index (PPI) of the PPI of month that the "Notice to Commence Fabrication" is issued, to the PPI of 180 days after the effective date of the agreement.

D. Membrane modules shall be made available for purchase by the Buyer at the pricing offered in the Proposal Pricing Form and that the pricing for future membrane modules, as part of a warranty claim or replacement purchase, shall be in accordance with the methods described in 01 74 00, Membrane System and Module Warranty. Membrane Module Pricing shall remain effective for a period of 20 years after the proposal date.

E. In the event that the City (or Contractor if the Contract is assigned) does not issue the "Notice of Completed Installation" within 500 days after the "Notice to Commence Fabrication", 40 percent of the Contract Price shall be adjusted through Change Order by the ratio of the PPI of the month the "Notice of Completed Installation" to the month of 500 days after the "Notice to Commence Fabrication".

1. This Change Order mechanism is provided in the event that there is an unforeseen delay during construction. The above provision is provided as the sole compensation to the Seller for the delay in the delivery of membrane modules and applicable Special Services described in Paragraph 5.03.A of the Agreement.

2. The applicable provisions of Paragraph 5.03.A remain contractual obligations of the Seller.

F. By issuance of a Change Order, all Alternate Proposal pricing in the Proposal Form shall remain open and subject to acceptance by the Buyer for a period of 2 years after the proposal date.

ARTICLE 7 – PAYMENT PROCEDURES

7.01 SUBMITTAL AND PROCESSING OF PAYMENTS

A. Seller shall submit Applications for Payment in accordance with Article 13 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

7.02 PROGRESS PAYMENTS

A. Buyer shall make progress payments on account of the Contract Price on the basis of Seller's Applications for Payment as follows:

1. Progress Payments for Special Engineering Services:

a. The Buyer shall pay Seventy-Five Thousand Dollars ($75,000.00) for Pilot Testing Services provided as part Paragraph 10.01.A.1.a.1 of the General Conditions, to the Seller upon the Buyer's approval of the first Application for Payment for Pilot Testing Services, submitted in accordance with Paragraph 10.01.A.1 of the General Conditions, and accompanied by the Engineer's recommendation for payment in accordance with Paragraph 10.2.A of the General Conditions less such amounts as Engineer may determine in accordance with Paragraph 10.02.A.3 of the General Conditions.

b. The Buyer shall pay One Hundred and Twenty Five Thousand Dollars ($125,000.00) for Special Engineering Services provided as part, Paragraph 10.01.A.1.a.2 of the General Conditions to the Seller upon the Buyer's approval of the Application for Payment for Special Engineering Services, submitted in accordance with Paragraph 10.01.A.1 of the General Conditions, and accompanied by the Engineer's recommendation for payment in accordance with Paragraph 10.02.A of the General Conditions less such amounts as Engineer may determine in accordance with Paragraph 10.02.A.3 of the General Conditions.

2. Progress Payments for Goods and Special Services.

a. The Buyer shall make progress payments on the Total Contract Price for Goods and Special Services in accordance with Article 10 of the General Conditions and based upon the following schedule:

Payment Schedule

Payment	Contract Milestone(s)	Percentage of Total Contract Price
First Application	Notice to Commence Fabrication	75
Second Application	Delivery of Goods	90
Final Application	Notice of Substantial Completion	100

b. The Buyer shall pay the above percentages of the Total Contract Price provided as part Paragraph 13.01 of the General Conditions to the Seller upon the Buyer's approval of the Application for Payment, submitted in accordance with Paragraph 13.01 of the General Conditions, and accompanied by the Engineer's recommendation for payment in accordance with Paragraph 13.02 of the General Conditions less such amounts as Engineer may determine in accordance with Paragraph 13.02 of the General Conditions.

c. The Total Contract Price is the Total Contract Price as indicated in the Proposal Pricing Form as adjusted through change order less liquidated damages assessed as part of the Contract.

7.03 FINAL PAYMENT

A. Upon the Buyer's approval of the final Application for Payment, accompanied by the Engineer's recommendation for payment in accordance with Article 13 of the General Conditions, the Buyer shall make the final payment to bring the total payment to 100 percent of the Contract Price as adjusted for changes to the Contract Price or less any prior payments to the Seller. This payment, at the Engineer's recommendation, may be less such amounts, as Engineer shall determine in accordance with the Agreement or any applicable provisions of the General Conditions.

B. The Final Payment shall be accompanied by a "Notice of Contract Completion" executed by both parties.

ARTICLE 8 -- INTEREST

8.01 Subject to the provisions of Article 13 of the General Conditions, all monies not paid within 60 days after the receipt of the Seller's Application for payment shall accrue interest at the rate of the 6 percent per annum.

ARTICLE 9 - SELLER'S REPRESENTATIONS

9.01 In order to induce Buyer to enter into this Agreement, Seller makes the following representations:

A. Seller has examined and carefully studied the Contract Documents and the other related data identified in the Proposal Documents.

B. If specified or if, in Seller's judgment, any local condition may affect cost, progress or the furnishing of the Goods and Special Services, Seller has visited the Facility location and become familiar with and is satisfied as to the local conditions that may affect cost, progress or the furnishing of the Goods and Special Services.

C. Seller is familiar with and is satisfied as to all local federal, state and local Laws and Regulations that may affect cost, progress and the furnishing of the Goods and Special Services.

D. Seller has carefully studied and correlated the information known to Seller, and information and observations obtained from Seller's visits, if any, to the Point of Destination, with the Contract Documents.

E. Seller has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Seller has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Seller.

F. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing Goods and Special Services.

G. The Seller has provided test data from either full-scale operation(s) or pilot test data from facilities of similar water quality to the Project as information and design concepts for its proprietary membrane system. In providing the information and design concepts for this Project, the Seller has considered and incorporated the concept of “linear scalability” into its design. Linear scalability means that: 1) the Seller has considered and evaluated the design and operational requirements and results of pilot or demonstration testing, and 2) that the equipment provided by the Seller is warranted to produce water in proportion to the design and operational parameters established and demonstrated during pilot testing.

H. The concept of linear scalability relates to the surface area of the membrane and to its corresponding ability to produce water as a dependent variable on an incremental and proportional basis. Dependent variables are the parameters of specific or instantaneous design (e.g., membrane flux, process flows, temperatures, times, maximum pressures, and chemical dosages or consumption) requirements for filtration, backwashing, cleaning, and integrity testing processes that are established on a module basis during piloting and/or incorporated into the unit and system design provided by the Seller to meet the design capacity requirements established in the Contract Documents.

I. The concept of linear scalability excludes the independent variables that involve membrane removal performance and overall system performance established in the Contract Documents. Such independent variables include the water quality removal requirements, removal efficiency, and the minimum design requirements for Maintenance/Recovery Clean interval when the membrane system is operated within its intended process design range.

J. Seller’s relationship to the Buyer in performance of this Agreement is that of an Independent Contractor. The personnel performing services under this Agreement shall at all times be under the Seller’s exclusive direction and control and not employees of the Buyer. Seller shall pay all wages, salaries and other amounts due to its employees in connection with this agreement and shall be responsible for all applicable state, federal, and local reports and obligations respecting them such as labor wages, social security, income tax withholding, unemployment compensation and similar matters.

ARTICLE 10 – CONTRACT DOCUMENTS

10.01 CONTENTS

A. The Contract Documents consist of the following:

1. Standard General Conditions for Procurement Contracts [Addendum #3]

2. Procurement Agreement

3. Exhibits to this Agreement (enumerated as follows):

    a. Exhibit A-1 to Agreement between Buyer and Seller dated _____, Assignment of Contract; Consent to Assignment; and Acceptance of Assignment.

    b. Exhibit A-2 to Agreement between Buyer and Seller dated _____ Agreement to Assignment by Seller's Surety.

    c. Seller's completed Proposal Form and Proposal Pricing Form.

    d. Documentation submitted by Seller prior to Notice of Award

4. Performance Bond

5. Payment Bond

6. Section 00 80 50 Supplementary Conditions to EJCD Procurement General Conditions, P-200 (2000 Edition)

7. Conceptual Design Report – Alder Creek Water Treatment Plant Upgrade Project

8. Addenda (Numbers _____to _____, inclusive)

9. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

    a. Notice to Commence Fabrication

    b. Notice of Completed Installation

    c. Notice of Completed Commissioning

    d. Notice of Training Completion

    e. Notice of Substantial Completion

    f. Final Acceptance

    g. Written Amendment(s)

    h. Change Order(s)

    i. Field Order(s)

    j. Engineer's Written Interpretation(s).

B. The documents listed in Paragraph 10.01 A. are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 10.

D. The Contract Documents may only be amended or supplemented as provided in Paragraph 3.04 of the General Conditions.

E. 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. Standard General Conditions for Procurement Contracts [Addendum #3]
2. Agreement
3. Addenda
4. Section 00 80 50 Supplementary Conditions to EJCD Procurement General Conditions, P-200 (2000 Edition)
5. Specification Section 01 74 00, Membrane System and Module Warranty
6. Exhibits to the Agreement
7. Performance Bond
8. Payment Bond.
9. Certificates of Insurance
10. Final Acceptance(s)
11. Change Order(s)
12. Engineer's Written Interpretation(s)
13. Field Order(s)
14. Notice(s) of Substantial Completion
15. Notice(s) of Training Completion
16. Notice(s) of Completed Commissioning
17. Notice(s) of Completed Installation
18. Notice(s) to Commence Fabrication
19. Project Specifications shall be used to govern the quality of the Goods.
20. Submittals provided by the Seller in fulfillment of the Contract.

F. In the event of a conflict between a schedule or a schedule update and a specific requirement of these Contract Documents, the Contract Documents shall, at all times, have precedence. Submittal or acceptance of a schedule or schedule update shall not supersede the requirements of the Contract Documents.

ARTICLE 11 – MISCELLANEOUS

11.01 DEFINED TERMS

A. Terms used in this Agreement will have the meanings indicated in the General Conditions and the Supplementary Conditions.

11.02 ASSIGNMENT

A. Buyer has the right to assign the Contract for furnishing Goods and Special Services hereunder and Seller shall accept such assignment. Forms documenting the assignment of the Contract, and consent of Seller's surety to the assignment are attached as exhibits to this Agreement.

1. The Contract will be executed in the name of Buyer initially and may be assigned to a Construction Contractor designated by Buyer. The assignment will occur on the effective date of the agreement between Buyer and the Construction Contractor. As of the date of acceptance of assignment by the Construction Contractor, all references in the Contract Documents to Buyer shall mean the designated Construction Contractor whose responsibilities will include the installation and erection of the Goods.

2. The assignment of the Contract shall relieve Buyer from all further obligations and liabilities under the Contract. After assignment, Seller shall become a subcontractor or Seller to the assignee and, except as noted herein, all rights, duties, and obligations of Buyer under the Contract shall become the rights, duties and obligations of the assignee.

3. After assignment:

a. All performance warranties and guarantees required by the Contract Documents will continue to run for the benefit of Buyer and, in addition, for the benefit of the assignee.

1) Seller shall submit Applications for Payment to the Contractor who shall forward the Application for Payment to the Engineer.

2) Buyer will provide payment directly to the Seller.

b. Except as provided in this Paragraph 11.02.A.3.b., all rights, duties and obligations of Engineer to assignee and Seller under this Contract will cease.

1) Engineer will review Seller's Applications for Payment and make recommendations to assignee for payments as provided in Paragraphs 10.02 and 10.06 of the General Conditions.

2) Upon the written request of either the assignee or Seller, Engineer will issue with reasonable promptness such clarifications or interpretations of the Contract Documents, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. Such written clarifications and interpretations will be final and binding on assignee and Seller unless:

a) an appeal from Engineer's clarification or interpretation is made within the time limits and in accordance with the dispute resolution procedures set forth in Article 13 of the General Conditions; or

b) if no such dispute resolution procedures have been set forth, a written notice of intention to appeal is delivered by assignee or Seller to the other within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision (unless otherwise agreed to in writing by assignee and Seller), to exercise such rights or remedies as the appealing party may have with respect to such clarification or interpretation in accordance with applicable Laws and Regulations.

3) When rendering a clarification or interpretation under Paragraph 11.02.A.3.b.2), Engineer will not show partiality to assignee or Seller and will not be liable in connection with any clarification or interpretation rendered in good faith.

c. Upon assignment, Seller shall provide Construction Contractor with revised insurance certificates listing both Construction Contractor and Buyer as additional insureds.

B. No other assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto 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). 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 Documents.

11.03 SUCCESSORS AND ASSIGNS

A. Buyer and Seller each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

11.04 CHOICE OF LAW AND VENUE

A. The laws of the State of Oregon shall govern the formation, interpretation, and performance of this Agreement. Venue for mediation and/or actions arising out of this Agreement shall be in Clackamas County, Oregon.

11.05 ENTIRE AGREEMENT

A. This Agreement that includes the Contract Documents contains the entire agreement, between the parties and supersedes all prior negotiations, discussions, obligations, and rights of the parties regarding the subject matter of this Agreement. There is no other written or oral understanding between the parties. No modification, amendment or alteration of this Agreement shall be valid unless it is in writing and signed by the parties hereto.

11.06 COUNTERPARTS

A. This Agreement may be executed in counterparts, which when taken together shall constitute a single signed original as though all parties had executed the same page.

11.07 AUTHORITY TO EXECUTE AGREEMENT

A. Each person signing on behalf of a corporation, partnership, joint venture or governmental entity hereby declares that he or she, or it has the authority to sign on behalf of his or her or its respective corporation, partnership, joint venture, entity and agrees to hold the other party or parties hereto harmless if he or she or it does not have such authority.

11.08 SELLERS TOTAL LIMITATION OF LIABILITY

A. Notwithstanding any other provisions of the Contract Documents, the Seller's total liability for direct damages arising at any time under any of the Contract Documents or otherwise in connection with completing the Contract (whether arising under breach of contract, tort, strict liability, or any other theory of law) shall not exceed the amount of the Contract Price. In no event shall either party be liable for any indirect, penalty, incidental, special, or consequential damages. Seller's aggregate liability under the Contract (whether arising under breach of contract, tort, strict liability, or any other theory of law) shall not exceed the amount of the Contract Price.

BUYER: City of Sandy, Oregon

By: _____

Title _____

Executed on _____/_____, 20____ (month/day/year)

Attest By:

_____

Title _____

Approved As to Form:

_____

_____

SELLER: _____

By: _____

_____
[Corporate Seal]

Attest: _____

Address for giving notice:

_____

_____

Agent for service of process:

_____

_____

_____
(If Seller is a corporation or a partnership, attach evidence of authority to sign.)

EXHIBIT A-1 to Agreement Between BUYER and SELLER Dated:
_____

ASSIGNMENT OF CONTRACT; CONSENT TO ASSIGNMENT; AND ACCEPTANCE OF ASSIGNMENT

This assignment will be effective on the Effective Date of the Agreement between the Buyer and the construction contractor "Contractor". The Contract between the City of Sandy, Oregon ("Buyer") and _____
("Seller" as "MSS") for furnishing Goods and Special Services under the Contract Documents entitled **Membrane Equipment Procurement – Alder Creek Water Treatment Plant Upgrade Project** is hereby assigned, transferred, and set over to _____, ("Contractor"). Contractor shall be totally responsible for the performance of Seller and for the duties, rights, and obligations of Buyer, not otherwise retained by Buyer, under the terms of the Contract between Buyer and Seller. Upon assignment of this Procurement Agreement, Seller agrees to perform its obligations and duties to Buyer under the supervision and control of and as a subcontractor or Seller to the Contractor.

ASSIGNMENT DIRECTED BY:

City of Sandy, Oregon

_____
(Buyer)

(If Buyer is a corporation, attach evidence of authority to sign. If Buyer is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of Buyer-Seller Agreement.)

By: _____

Title: _____

Executed on _____/_____ /_____

ASSIGNMENT ACKNOWLEDGED AND ACCEPTED BY:

_____
Seller

(If Seller is a corporation, attach evidence of authority to sign.)

By: _____
(Signature)

_____
(Title)

ASSIGNMENT ACCEPTED BY:

_____
Contractor

(If Construction Contractor is a corporation attach evidence of authority to sign.)

By: _____

AGREEMENT TO ASSIGNMENT BY SELLER'S SURETY

Surety hereby acknowledges and agrees that the Contract for furnishing Goods and Special Services under the Contract Documents entitled **Membrane Equipment Procurement – Alder Creek Water Treatment Plant Upgrade Project** by and between the City of Sandy, Oregon ("Buyer") and _____ _____ ("Seller as MSS") may be assigned, transferred, and set over to _____ _____ ("Contractor"), in accordance with Paragraph 11.02 of Agreement between Buyer and Seller.

Surety further agrees that, upon assignment of the Contract, the Contractor shall have all the rights of the Buyer under the Performance Bond.

(Corporate Seal)

Surety Company _____

By: _____
Signature and Title
(Attach Power of Attorney)

END OF SECTION

SECTION 00 80 50 SUPPLEMENTARY CONDITIONS TO EJCDC PROCUREMENT GENERAL CONDITIONS, P-700 (2000 EDITION)

These Supplementary Conditions amend or supplement the Standard General Conditions for Procurement Contracts No. P-700 (2019 Edition) and other provisions of the Procurement Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

Modify Article 1.01A.4 to read:

4. *Bid*--See Proposal

Modify Article 1.01A.5 to read:

5. *Bidder*--See Proposer

Modify Article 1.01A.29 to read:

29. *Seller*--The person, firm, or corporation with whom Buyer has entered into the Procurement Agreement to furnish Goods and Special Services.

Add new articles at the end of Article 1.01:

"36. *Substantial Completion*--The time at which the Work progresses to the point where, in the opinion of Engineer, the Work is sufficiently complete, in accordance with the Contract Documents, so that the Work can be safely and conveniently utilized for the purpose for which it is intended.
The Work will be considered Substantially Complete after successful completion of the demonstration period.

37. *Construction Contractor*-- The person, firm or corporation with whom the Buyer will enter into a Contract for the general construction of and the installation of the Seller's equipment."

38. *Backwash*--The periodic reversal of flow through a filter which may be accompanied by water in conjunction with air or oxidants at a low concentration (less than 10 mg/L of total chlorine) generally associated with the intermittent waste stream from an ultrafiltration or microfiltration membrane system used to remove particulate matter.

39. *Calendar Day*--See Day

40. *Chemical Washing*--The periodic application of a concentrated chemical solution at high concentration (i.e. more than 10 mg/L of free chlorine or the addition of an acid which results in a pH of less than 4 or the addition of a base that results in a pH of greater than 10 or a surfactant or enzymatic cleaning agent) to a membrane for a short duration of time (twice per day maximum for a total duration of less than 60 minutes) for the intended purpose of maintaining membrane permeability or reducing membrane fouling by a factor of less than 33 percent of the total amount of fouling that may be observed by the membrane

41. *Buyer*—City of Sandy.

42. *Clean In Place*--The periodic application of a concentrated chemical solution at high concentration (i.e., more than 10 mg/L of free chlorine or the addition of an acid which results in a pH of less than 4 or the addition of a base that results in a pH of greater than 10, or a surfactant or enzymatic cleaning agent) a membrane for an extended duration of time (more than 60 minutes per day) for the intended purpose of reducing membrane fouling by a factor of more than 33 percent of the total amount of fouling that may be observed by the membrane.

43. *Contractor*--See Construction Contractor.

44. *Contract Year*--A period of 365 calendar days or 366 days every 4th year beginning with year 2000.

45. *Component Equipment*--describes any item of equipment that is designed and fabricated or manufactured by others but incorporated by and supplied by the Seller in fulfillment of the Contract.

46. *Defective*--See Non-Conforming

47. *Drawing Clarification / Plan Clarification*--An answer from the Buyer or Engineer, in response to an inquiry from the Seller, intended to make the requirement(s) of the drawings or plans clearly understood. Drawing clarifications or plan clarifications may be sketches, drawings or in narrative form and will not change any requirements of the drawings or plans. Responses to the Seller's inquiries shall be as outlined in Section 9.2 of these Procurement General Conditions.

48. *Final Acceptance*--Refers to such time as the Seller has fulfilled all its obligations, other than warranties and guarantees, under the Contract Documents.

49. *MF*--Membrane Filtration.

50. *MSS*—Membrane System Supplier, see Seller.

51. *Module*--A grouping of hollow fiber membranes that are secured into a common potting compound.

52. *Notice of Acceptability*--The written notice issued by the Engineer that the Seller has furnished all Goods and Special Services, and delivered all maintenance and operating instructions, schedules, guarantees, certificates of inspection, and other documents as required by the Contract Documents.

53. *Notice to Commence Fabrication*--A written notice given by Buyer to Seller fixing the date(s) on which the Contract Times for the production and delivery of Goods commence to run and on which Seller shall start to perform under the applicable portion of the Contract.

54. *Notice of Completed Commissioning*--The written notice issued by the Engineer indicating that the Seller has completed the commissioning of the membrane system. The notice shall indicate that the Engineer has reviewed the status of membrane system commissioning to its satisfaction, identified items to be corrected, and that those items that require correction by the Seller have been successfully completed as to allow training of the Buyer's Operational and Maintenance Personnel to commence.

55. *Notice of Completed Installation*--The written notice issued by the Engineer that the Seller has reviewed the installation of the Goods and identified all item to be corrected ant that those items that require correction by the Contractor have been completed as to allow Commissioning of the membrane system to commence.

56. *Notice of Completed Training*--The written notice issued by the Engineer that the Seller has completed training of the Buyer's as a prerequisite to Acceptance Testing of the membrane system.

57. *Notice of Substantial Completion*--The written notice issued by the Engineer to the Seller that Acceptance Testing has been successfully completed.

58. *Phase*--Separate portions of the Project, each of which is subject to Buyer

obtaining funds before Seller is authorized to proceed.

59. *Proposer*--Any person, firm, or corporation submitting a Proposal for providing the Goods and Special Services.

60. *Proposal*--The offer or proposal of the Proposer submitted on the prescribed form setting forth the price(s) for furnishing the Goods and Special Services:

61. *Proposal Documents*--Request for Proposals or advertisement, if any, Procurement Instructions to Proposers, other Proposal information and requirements, Proposal forms and attachments, contract and Bond forms, and the proposed Contract Documents, including any Addenda issued prior to receipt of Proposals.

62. *Proposers Equipment*--describes equipment that has been designed by, manufactured by or fabricated specifically for and supplied by the Seller in fulfillment of the contract.

63. *Special Engineering Services*--The preparation and delivery of shop drawings and other submittals required by the Buyer.

64. *Submittal*--Any documentation specifically prepared by or for the Seller and provided to the Buyer to illustrate fulfill with the requirements of the Contract. Examples of submittals include but are not limited to Applications for Payment, Bonds, Change Orders, Certificates, Manuals, Samples, Shop Drawings, and Schedules.

65. *Successful Proposer*--The Proposer Submitting a responsive Proposal to whom the Buyer makes an award.

66. *System*--Hollow fiber membrane filtration system equipment. The System is comprised Units and ancillary equipment.

67. *Unit(s)*-- A Unit is an assembly of equipment that includes piping, valves, instrumentation, controls, ancillary equipment, appurtenances, support systems, and filtration modules required to treat the raw water.

68. *Train*--A grouping of membrane filtration units that share common ancillary equipment.

69. *Work*--A general description for providing Goods and Special Services as required by the Contract Documents.

70. *Working Days*--is used to describe traditionally accepted business workdays of Monday through Friday inclusive, exclusive of any official organizational or official government holidays for the applicable organization."

ARTICLE 2 - PRELIMINARY MATTERS

Add the following to Article 2.01:

"B. The Seller shall deliver the required Bonds and Insurance certificates in accordance with Article 4 of the General Conditions.

1. At the time of the effective date of the Agreement, a Performance Bond shall be provided for the Special Engineering Services and Pilot Testing for the amount of $175,000 dollars.

2. Another Performance Bond and a Payment Bond for the remaining portion of the Contract Price shall be provided upon issuance of the "Notice to Commence Fabrication." The Performance Bond shall provide coverage for the performance of the Seller under this Contract until expiration and exclude any continuing obligations of the Seller under this control until expiration and

exclude any continuing obligations of the Suppler, including, but not limited to, the Seller's Membrane System Equipment and Module and Warranty, or other warranties that survive the completion of the Contract."

Delete Article 2.03 in its entirety and replace with the following:

"2.03 Commencement of Contract Times

A. The Contract Times will commence to run on the Effective Date of the Agreement."

Delete Article 2.07 in its entirety and replace with the following:

"2.07 Within 14 days after the Contract Times start to run, a conference attended by Seller, Buyer, Engineer and others as appropriate will be held in Sandy, OR to establish a working understanding among the parties as to the Goods and Special Services and to discuss the schedule referred to in Article 5 of Section 500, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records."

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT AND AMENDING

Add three new articles at the end of Article 3.02:

"C. The Specifications may vary in form, format and style. Some specification sections are written in varying degrees of streamlined or declarative style and some sections may be relatively narrative by comparison. Omissions of such words and phrases as "the Seller shall," "in conformity with," "as shown," or "as specified" are intentional in streamlined sections. Omitted words and phrases shall be supplied by inference. Similar types of provisions may appear in various parts of a section or articles within a part depending on the format of the section. The Seller shall not take advantage of any variation of form, format or style in making claims for extra Work.

D The cross referencing of specification sections under the subarticle heading "Related Sections include but are not necessarily limited to:" and elsewhere within each specification section is provided as an aid and convenience to the Seller. The Seller shall not rely on the cross referencing provided as a complete listing of all specifications sections that may impact the Work of a particular specification section. The Seller shall be responsible to coordinate the entire work under the Procurement Documents and provide a complete Project whether or not the cross referencing is provided in each section or whether or not the cross referencing is complete or correct.

E It is the intent of the Procurement Documents that the equipment be compatible and coordinated to produce a fully integrated and operational system. It is the responsibility of the Seller furnishing any one item of equipment, or all equipment included in the Procurement Documents, to assure complete compatibility and coordination of the equipment they are furnishing.

F OSHA Requirements – All work under this Contract shall be performed in accordance with all applicable safety codes, ordinances and other regulations. Particular emphasis shall be given to the applicable regulations of the State of Oregon promulgated pursuant thereto. For purposes of this Contract neither the Buyer, nor the Engineer, nor their respective officers, employees, consultants and inspectors are to be considered experts in safety, and all safety will be the responsibility of the Seller. The Seller shall review its work for compliance with applicable safety requirements and notify the Buyer and the Engineer if there are specific requirements of the Goods that require modifications to the plans and specifications to address safety considerations of the Seller's Goods. This responsibility shall include public safety as well as workers' safety.

G Seller shall comply with the applicable State of Oregon Administrative Rules."

Add Article 3.04B.1 as follows:

"1. RFI form attached to this section is the proper instrument to be used for Engineer's written interpretations or clarifications to the contract documents."

ARTICLE 4 - BONDS AND INSURANCE

Delete Article 4.01A in its entirety and replace with the following:

"4.01 Bonds

A. Seller shall furnish performance and payment bonds, each in an amount equal to the Contract Price, to Buyer. The bonds shall be delivered in accordance with Article 2.1 and shall remain in effect one year after the date final payment is due to Construction Contractor, except as provided otherwise by Laws or Regulations."

Delete Article 4.02 in its entirety and replace with the following:

"4.02 Insurance

A. Seller shall provide insurance of the types and coverages and in the amounts stipulated in the Section 00 83 17, Insurance Specifications for Seller. Seller shall, for the protection and benefit of the Buyer, procure, pay for and maintain in full force and effect, at all times during the performance of the on-site portion of the Work until final payment of the Work or for such duration as required, policies of insurance set forth in this Article, in form and substance acceptable to Buyer. Seller hereby agrees to deliver to Buyer, at least ten (10) days prior to any equipment or personnel being brought onto the site of the Work or the Project site, Certificates of Insurance in form and substance satisfactory to Buyer evidencing the required coverage below:

1. General Requirements. The insurance required to be purchased and maintained by Seller shall be as follows:

a. Include at a minimum the specific coverages and be written for not less than the limits of liability specified herein or required by laws or regulations, whichever is greater. Coverage requirements can be met with any combination of primary and excess limits.

b. Include products/completed operations coverage, which must extend for lawsuits brought in the United States to any product manufactured in the United States and shipped to any foreign country.

c. Include contractual liability insurance covering Seller's indemnity obligations.

d. Contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least thirty (30) days prior written notice has been given to the Indemnified Parties.

2. Buyer, Engineer, and their officers, directors, shareholders, partners, employees, agents, consultants and sub-contractors.

a. Remain in effect at least until final payment and at all times thereafter when Seller may be correcting, removing, or replacing defective Work. Evidence of coverage must be provided through term of project.

b. With respect to completed operations insurance, and any other

insurance coverage written on a claims-made basis, remain in effect for at least two (2) years after final payment (and Seller shall furnish the Indemnified Parties evidence satisfactory to the Indemnified Parties of continuation of such insurance at final payment and one 1 year thereafter).

c. Contain a cross liability or severability of interest clause or endorsement. Insurance covering the specified additional insureds shall be primary insurance, and all other insurance carried by the additional insureds shall be excess insurance.

d. With respect to workers' compensation and employers' liability, comprehensive automobile liability, commercial general liability, and umbrella liability and, if applicable, transportation insurance, Seller shall require its insurance carriers to waive all rights of subrogation against the Indemnified Parties.

e. Comply with all applicable insurance laws of the country in which the Work is to be performed, including but not limited to, admitted and compulsory coverage.

3 Commercial General Liability Insurance (use ISO Commercial General Liability Policy Form 2002 Edition or equivalent). This insurance shall be occurrence type written in comprehensive form and shall protect the Seller, and the Indemnified Parties as additional insured, against claims arising from injuries, sickness, disease, or death of any person or damage to property arising out of performance of the Work. The policy shall also include personal injury liability coverage, contractual liability coverage, completed operations and products liability coverage, and contain a per project aggregate endorsement. Seller's policy must be primary, with no contribution from Buyer coverage. Sellers insurance carrier must waive subrogation against Buyer.

4. Workers' Compensation and Employers' Liability Insurance. This insurance shall protect Seller against all claims under applicable state workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. Seller shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all states" or "other states" provision whether or not required by law (includes sole proprietors and partners). Seller's insurance carrier shall waive subrogation against Buyer. If leased workers are used, an Alternate Employer Endorsement shall be added to the U.S. Government extension endorsements as appropriate (U.S.L. & H., etc.).

5. Comprehensive Automobile Liability Insurance. This insurance shall be occurrence type written in comprehensive form and shall protect Seller and the Indemnified Parties as additional insureds, against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, either on or off the project Site whether they are owned, non-owned, or hired. Seller's insurance carrier must waive subrogation against Buyer.

6. Umbrella Liability Insurance. This insurance shall protect the Seller and the Indemnified Parties as additional insureds, against claims in excess of the limits provided under workers' compensation and employers' liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall at least follow the form of the primary insurance.

7. Equipment Insurance. Seller shall provide and maintain insurance or shall self- insure, against loss or damage to all property, whether owned or

leased by Seller, which is utilized by Seller to perform the Work and which is not permanently incorporated in the Facility, including without limitation, tools, construction equipment, protective fencing, scaffolding, and temporary structures. Seller waives any claim against the Indemnified Parties for loss or damage to such property. Seller shall include a similar requirement in its subcontracts or lower-tier purchase orders, and shall require its lower-tier Seller(s) to provide such a claim waiver for the benefit of Seller and the Indemnified Parties.

8. Seller expressly agrees that Buyer is authorized to withhold payments to Seller until Buyer receives evidence of insurance as required herein. In the event that a claim is presented against the Additional Insured Parties, and there is no insurance provided by Seller or the carrier providing such insurance disclaims or denies coverage, any such claims, loss, cost, expense, liability, damage or injury arise or are made, asserted or threatened against the Additional Insured Parties, and each of them, shall give Buyer the right to withhold from any payments due or to become due to Seller any amount the Buyer deems sufficient to protect and indemnify the Additional Insureds and each of them, from and against any and all such claims, loss cost, expense, liability, damage or injury, including legal fees and disbursements. Buyer, in its discretion, may require Seller to furnish a surety bond satisfactory to Buyer guaranteeing such protection, which bond shall be furnished by Seller within fourteen (14) calendar days after written demand has been made therefore.

9. Seller shall make this Article and these insurance requirements binding on all of its lower-tier Sellers, including, but not limited to, the duty to name the Additional Insured Parties as additional insured on the lower-tier Seller(s) insurance policy(ies) on a primary and non-contributory basis.

10. Professional Liability Insurance. In the event that any of the Work requires professional services by the Seller or its lower-tier Sellers, evidence of professional liability is required. The liability limits shall be not less than:

*$*1,000,000 each occurrence *$*1,000,000 general aggregate

11. Transportation Insurance. This insurance shall be of the "all risks" type and shall protect the Seller and the Buyer from all insurable risks of physical loss or damage to equipment and materials in transit to the Jobsite including, but not limited to, transit outside the United States via navigable waters, rail or truck and until the Buyer receives the equipment and materials at the Jobsite. The coverage amount shall be not less than the full amount of equipment and materials shipped. Transportation insurance shall provide for losses to be payable to the Seller and the Buyer as their interests may appear.

12. Include the following additional insureds in Articles 4.2 B.2., 3., 4., and 5. above.

City of Sandy
Stantec Consulting Services, Inc.

ARTICLE 5 - SELLERS RESPONSIBILITIES

Modify Article 5.06A to read:

"A. Replace wording "review and approval" in all Articles of 5.6 A of the General Conditions with 'review for compliance'."

Add two new Articles after Article 5.06A that read:

"1. Shop Drawings submitted as herein provided by Seller and reviewed by Engineer for conformance with the design concepts shall be executed in conformity with the Contract Documents unless otherwise required by Buyer.

2. When Shop Drawings are submitted of the purpose of showing the installation in greater detail, their review shall not excuse Seller from requirements included in the Contract Documents."

Modify Article 5.06B:

B. Insert "and issuance of a "Notice to Commence Fabrication" after "submittal."

Add two new Articles after 5.06C.4. that read:

"5. See Section 01340.

6. Shop Drawings and Sample submittals not conforming to requirements of this Article 5.6 and Section 01340 will be returned to Seller without action for resubmittal and the resulting delay shall be entirely the responsibility of Seller."

Modify Article 5.06C. 6.:

6. Shop Drawings and Sample submittals not conforming to requirements of this Paragraph 5.06 and Section 01 33 03, Submittals for Membrane Procurement Contracts, will be returned to Seller without action for resubmittal.

Add new Article after 5.06D.2. that read:

"3. Engineer's check and review of Shop Drawings and Samples, Standard Specifications and descriptive literature submitted by Seller will be only for general conformance with design concept, except as otherwise provided, and shall not be construed as:

a. permitting any departure from the Contract Requirements;

b. relieving Seller of the responsibility for any error in details dimensions or otherwise that may exist in such submittals;

c. constituting a blanket approval of dimensions, quantities, or details of the material or equipment shown; or

d. approving departures from additional details or instructions previously furnished by Engineer. Such check or review shall not relieve Seller of the full responsibility of meeting all of the requirements of the Contract Document."

Add new Article after 5.06E.1. that reads:

"2. Engineer will review an initial shop drawing submittal and one resubmittal for any particular item requiring a shop drawing. Items requiring more than two reviews the additional review time will be at the sole expense of the Seller. Engineer will log his time and expenses which will be used by the Buyer to calculate the cost of a deductive change order for the additional review time. Buyer will deduct these costs from the amounts due Seller on the next application for payment.

Modify Article 5.06E. 2.:

2. Engineer will review an initial shop drawing submittal and one resubmittal for any particular item requiring a shop drawing. Items requiring more than two reviews the additional review time will be at the sole expense of the Seller and shall not exceed, in the aggregate, $2,500.00. Engineer will log his time and expenses which will be used by the Buyer to calculate the cost of a deductive change order for the additional review time. Buyer will deduct these costs from the amounts due Seller on the next application for payment.

Delete Article 5.08B in its entirety and replace with the following:

"B. Seller warrants the guarantees to Buyer that all Goods and Special Services will materially conform with the Contract Documents, including any Samples approved by Engineer, and the Goods will be free from defects in material and workmanship. Engineer shall be entitled to rely on representation of Seller's warranty and guarantee."

Add new item 3 under Article 5.08C:

"3. for Membrane Modules, the provision of Section 01 74 00, Membrane

System and Module Warranty."

Delete Article 5.08E in its entirety and replace with the following:

"E. Buyer shall within warranty period, notify Seller of any breach of Seller's warranties or guarantees. If Seller provides such written notice within the Warranty Period, Seller shall, at its sole option and as Buyer's sole remedy, repair or replace the parts or equipment that are the subject of the claimed breach or refund the purchase price therefore, if Seller determines that any claimed breach is not covered by this warranty, Buyer shall pay Seller its then customary charges for any repair or replacement made by Seller. If Buyer receives notice of a suit or claim. If Seller fails to defend such suit or claim, Seller will be bound in any subsequent suit or claim against Seller by Buyer by any factual determination in the prior suit. The warranties contained herein are conditioned upon the Buyer not being in material default of any obligation to Seller."

Add Articles after 5.08E:

"F. The Seller shall submit to the Buyer all Membrane warranty and guarantees documentation.

G. The Seller's warrants and guarantees to the Buyer include the concept of linear scalability as described in Article 7 of the Agreement, Article 8 of the General Conditions, Section 01 74 00, Membrane System and Module Warranty and elsewhere in the Contract Documents.

H. The provisions of the Seller's Membrane Module Warranty, including provisions fur membrane module replacement pricing, shall remain in effect as a continuing obligation.

I. All product warranties and performance guarantees shall only be enforceable if (a) all equipment is properly installed, inspected regularly and is in good working order, (b) all operations are consistent with Seller recommendations, (c) operating conditions at the Site have not materially changed and remain within anticipated specifications, and (d) no reasonably unforeseeable circumstances exist or arise."

Delete Article 5.09A and replace with the following:

"A. Seller shall indemnify and hold harmless Buyer, Engineer, and their officers, directors, shareholders, partners, employees, agents, consultants, contractors and subcontractors from any and all claims, costs, losses, and demands or judgments for damages or claims (including but not limited to fees and charges of Engineers, Architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs), to the extent (i) caused by the negligent act or omission of Seller, or its officers, directors, shareholders, partners, employees, agents, consultants, contractors or subcontractors, or anyone for whom the Seller is responsible and (ii) any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death or damage to Buyer's property (other than the Goods and Special Services themselves)."

Add new Articles following 5.09:

"5.10 Access to Goods in Production

A. The Seller shall provide representatives of the Buyer, testing agencies, and governmental agencies with jurisdictional interests proper and safe access to Goods in the process of production at reasonable times as is necessary for the performance of their functions in connection with the Contract Documents.

5.11 Confidentiality of Documents:

A. Subject to regulations governing Public Records in Oregon, all Special Services performed by the Seller, including but not limited to all drafts, data, correspondence, proposals, reports, and estimates compiled or composed by the Seller, pursuant to the Agreement, are for the sole use of the Buyer, its agents and employees. Neither the documents nor their contents shall be released to any third party without the prior written consent of the Buyer. This provision does not apply to information that (a) was publicly known, or otherwise known to the Seller, at the time that it was disclosed to the Seller by the Buyer, (b) subsequently becomes publicly known through no act or omission by the Seller, or (c) otherwise becomes known to the Seller other than through disclosure by the Buyer. Neither the documents nor their contents shall be released to any third party without the prior Written consent of the Buyer.

5.12 Industry Standards:

A. The Seller agrees that the Special Services rendered under this Agreement shall be performed in accordance with the standards customarily adhered to by an experienced and competent professional membrane filtration equipment supply firm using the degree of care and skill exercised by reputable professionals practicing in the same field of service. Where approval by the Buyer, the Engineer, or other representatives of the Buyer is required, it is understood to be general approval only and does not relieve the Seller of responsibility for complying with all applicable laws, codes, and good engineering practices.

5.13 Maintenance of Records:

A. The Seller shall maintain books, records, logs, documents and other evidence sufficient to record all actions taken with respect to the providing of Goods and Special Services, throughout the performance of the Agreement and for a period of ten years following completion of the obligations under the Agreement. The Seller further agrees to allow the Buyer to inspect, copy, and audit such books, records, documents and other evidence at all reasonable times. Upon request, the Seller agrees to provide the Buyer with backup copies for all electronic documents generated by the Seller in performing under the terms of this Agreement or to provide the Buyer with proof of insurance coverage for valuable papers and records. The Seller shall make available all requested data and records during normal business hours. Failure to make requested records available for audit by the date requested will result in the immediate termination of the Agreement.

5.14 Cleaning

A. The Seller, while on the Buyer's site, shall on a daily basis remove dirt, debris, waste and rubbish from its own working area and maintain desks, offices and control stations in a professional manner and dispose of used materials in an appropriate manner."

ARTICLE 6 - SHIPPING AND DELIVERY

Delete Article 6.02A in its entirety and replace with the following:

"A Seller shall deliver the Goods, excluding the membrane modules, F.O.B., the Point of Destination within a delivery window of 28 days after the Contract Times set forth in the Agreement, or other date agreed to by Buyer and Seller.

1. The membrane modules, spare parts and computer equipment (if applicable) shall be retained by the Seller at its location and will be delivered F.O.B. to the Point of Destination during the commissioning of the Goods."

Delete Articles 6.02C and 6.02D in their entirety and replace with the following:

"C The Contractor will provide facilities for receipt and unloading of the Goods at the Point of Destination. When the equipment has been received by the Contractor, title shall pass from the Seller to the Contractor. Additional costs arising from delivery

prior to or after the delivery window will be the responsibility of Seller."

Change Article 6.03A to read:

"A Risk of loss and insurable interests transfers from Seller to Contractor upon Contractor's receipt of the Goods. The Contractor shall be responsible for the unloading of the Goods and may reject Goods that visually appear to have been damaged during shipment."

ARTICLE 7 - CHANGES: SCHEDULE AND DELAY

Revise Article 7.01B as follows:

Replace 15 with 10; Replace 45 with 30.

Add new Article after 7.01C:

"D. Change Orders prepared by the Engineer covering changes which are required by the Buyer, or because of any request for Change Order of the Seller for a change to the Contract Time or Contract Price, shall be in writing and shall state the dollar amount or establish the method of payment, any adjustment in contract time and when negotiated prices ate involved, shall provide for the Seller's signature indicating acceptance using the form provided.

E. If notice to the surety of any change in the Procurement Agreement is required by the provisions of any Bond, the giving of such notice will be the Seller's responsibility, and the amount of each applicable Bond may be adjusted accordingly."

Add new Article after 7.03A.3:

"4. CPR form attached to this section is the instrument to be used to track and document individual changes in contract time or price which will then be used as detailed documentation for a Change Order."

Revise Article 7.03B as follows:

Replace 15 with 10.

Add new Article after 7.03E:

"F. Change Order Form: The Seller shall use the attached Change Order Form for all Change Orders associated with the Goods and Services. No additions or deletions to this form shall be allowed."

ARTICLE 8 - BUYER'S RIGHTS

Modify Article 8.01A. 2. as follows:

Insert, "and shall not exceed, in the aggregate, $2,500.00," after "facility".

Delete Article 8.01A.3 in its entirety and replace with the following:

"3. Seller shall bear all expenses, for inspections and tests at the Point of Destination, but Seller shall be entitled to reimbursement from Buyer for Seller's expenses for re- inspection or retesting if, on the basis of an initial inspection or testing, the installation of the Goods are determined to be improper or incomplete."

Modify Article 8.01A.4 as follows:

Replace 30 with 14.

Modify Article 8.01C.1 as follows:

~~Insert, "for a period of 11 months during the correction period," after "intended".~~ Addendum #3

Modify Article 8.02A as follows:

Insert, "or for such times as provided by a warranty provision that remains in effect after final payment as a continuing obligation," after "the expiration of the correction

period,"

Delete Article 8.02C in its entirety and replace with the following:

"C Remedying Non-Conforming Goods or Special Services

1. If Buyer notifies Seller in writing that the Goods are non-conforming, the Seller shall modify, repair or replace the Goods to remedy the non-conformance. Seller shall provide within 10 days the proposed remedy and a schedule that shall make the Goods conforming within a reasonable time.

2. If Buyer notifies Seller in writing that any of the Special Services are nonconforming or have delayed the Buyer's Project, the Seller shall promptly provide conforming Special Services acceptable to Buyer subject to the following provisions:

a. The Seller will be assessed Liquidated Damages for the delays in the timely delivery of Special Services until they are determined to be in conformance.

3. If the Seller fails to take action as required by the Buyer or the Engineer to remedy nonconforming Goods, after 15 days written notice to the Seller, the Buyer shall at its option remedy any such deficiency instead of requiring removal or replacement. Buyer acknowledges and agrees that Buyer, by exercising this option, voids any and all warranties for the Goods. Cost for the Buyer's remedy is subject to the provisions of Article 5.8 and Article 8.2E.

4. In an emergency where delay would cause serious risk of loss or damage, the Buyer may take such action as is necessary to avoid such risk of loss or damage without issuing prior notice or waiting for action by the Seller.

5. If the Goods are determined to be non-conforming as part of a warranty notice or claim pursuant to Article 5.8 or the warranty provisions of Section 01740, Membrane System and Module Warranty, the Seller shall be notified in writing that the applicable conditions for breach of contract or breach of warranty exist.

6. Cost of Remedy

a. If the Goods are determined to be non-conforming before the date of the Notice of Substantial Completion, and a remedy is required, the Seller shall pay for all costs of the remedy, including modification, repairs, removal, and replacement of the Goods.

b. If the Goods are determined to be non-conforming as part of a warranty. claim pursuant to Article 5.8, after the date of the Notice of Substantial Completion and prior to the end of the correction period for the Goods, and the Seller's remedy is to modify or repair the Goods.

c. If the Goods are determined to be non-conforming as part of a warranty claim pursuant to Article 5.8, after the date of the Notice of Substantial Completion and the Seller's remedy is the replacement of existing Goods, Goods shall be delivered to the Buyer F.O.B. Point of Destination. Buyer shall provide the labor associated with the removal and replacement of the non-conforming Goods provided by the Seller as a remedy.

d. In the event that the Seller's remedy involves a change to or addition of Seller's equipment, the Seller shall be responsible for all costs as described in Article 8.2.E for the remedy of the non-conforming Goods and to provide Special Services required for the remedy.

Add new Article after 8.02C. 6.:

"7. Goods repaired or replaced are not covered by any warranty except to the extent repaired or replaced by Seller, an authorized representative of Seller, or under specific instructions by Seller, in which cases, the Goods will be covered under warranty up to the end of the warranty period applicable to the original Goods."

Modify Article 8.02E as follows:

E. Seller shall pay all claims, costs, losses, and damages, including but not limited to all fees and charges for re-inspection, re-testing and for any engineers, architects, attorneys and other professionals, and all court or arbitration or other dispute resolution costs arising out of or relating to the non-conforming Goods or Special Services or breach of warranties, including the correction or removal and replacement of the nonconforming Goods and the replacement of property of Buyer destroyed by the correction or removal and replacement of the non-conforming Goods, to the proportionate extent caused by Seller's breach of the warranty. In no event shall Seller be liable for any consequential, indirect, incidental, special, exemplary, or punitive damages, lost profits or revenues or diminution in value, including without limitation, remanufacturing costs and rework costs, de-installation, or re-installation costs.

Add new items under Article 8.02E:

"1. With respect to breach of contract claim by the Buyer the following provisions apply:

a. In the event that the Seller's membrane filtration system does not satisfy the conditions of linear scalability as described in the Contract Documents, and Seller's remedy is not agreeable to the Buyer, the Buyer shall declare Seller in breach of Contract in accordance with Article 11.4.B.

2. With respect to a breach of warranty claim by the Buyer, the following provisions apply.

a. In the event that the membrane modules are non-conforming due to defects in materials, workmanship, membrane integrity or irreversible flux loss as described in Section 01 74 00, Membrane System and Module Warranty, and the Seller's remedy is not agreeable to the Buyer, the Buyer shall declare a breach of warranty exists.

b. Buyer shall provide Seller with reasonably prompt written notice setting forth in sufficient detail the reasons for declaring that it believes a breach of warranty has occurred. Seller shall have ten days from receipt of the written notice declaring the breach (or such longer period of time as Buyer may grant in writing) within which to cure the alleged breach.

3. If incurred prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents and a commensurate reduction in the Contract Price. If the costs exceed the unpaid balance of the Contract Price, the costs in excess of the Contract Price shall be paid by the Seller to the Buyer. The provisions of this Article shall be in addition to all other rights and remedies available to the Buyer under the Procurement Agreement and any applicable laws."

Delete Article 8.03 in its entirety and replace with the following:

"8.3 Correction Period

A. Seller's responsibility for correcting all nonconformities in the Goods will extend for a period of one year after the date of the Notice of Substantial Completion, or for such longer period of time as may be prescribed by Laws or Regulations or by the terms of any specific provisions of the Contract Documents."

ARTICLE 9 - ROLE OF ENGINEER

Add after Article 9.04A:

"B. The acceptance at any time of materials or equipment by or on behalf of Buyer shall not be a bar to future rejection if they are subsequently found to be defective, inferior in quality, or not equal to the material or equipment specified or are not as represented to Engineer or Buyer."

ARTICLE 10 - PAYMENT

Delete Section 10.01 in its entirety and replace with the following:

10.01 Applications for Progress Payments

"A. Seller shall submit Applications for Payment filled out and signed by Seller and accompanied by such supporting documentation as is required by the Contract Documents and also as Buyer or Engineer may reasonably require for review and approval. The timing and amounts of progress payments shall be as stipulated in the Agreement.

1. Applications for Progress Payments for Special Engineering Services

   a. The Seller shall submit Applications for Payment to the Engineer for review, completed and signed by the Seller. The Applications for Payment shall be submitted according to the following schedule:

      1) The first Application for Payment shall be submitted after the Engineer has reviewed and approved all pilot testing and the report.

      2) The second Application for Payment shall be submitted after the Engineer has reviewed and approved all Shop Drawings (Refer to Section 01 34 00, Shop Drawing Procedures; Tables A and B) and all other related submittals as required by the Contract Documents.

2. Applications for Progress Payments for Equipment:

   a. The Seller shall submit Applications for Payment to the Engineer for review, completed and signed by the Seller. The Applications for Payment shall be submitted according to the following schedule:

      1) The first Application for Payment shall be submitted following initial contract award.

      2) The second Application for Payment shall be submitted when the Buyer has issued a "Notice to Commence Fabrication."

      3) The third Application for Payment shall be submitted after the delivery of the Goods in accordance with Article 5 of the Agreement. The Application for Payment will be accompanied by a bill of sale and other documentation satisfactory to the Buyer warranting that the Contractor has received the Goods free and clear of all liens, charges, security interest, and encumbrances. Such documentation shall include releases and waivers from all parties who, during the Seller's execution of its responsibilities under the Contract Documents, might have obtained or

filed any such lien, change, security, or encumbrance.

4) The fourth Application for Payment shall be submitted after the "Notice of Substantial Completion" has been issued by the Engineer.

B. In the event of the Assignment of the Agreement from the Buyer to the Contractor, the payment procedures shall not be altered. The Buyer will provide payment directly to the Seller."

Delete Article 10.02A.1. in its entirety and replace with the following:

"1. Engineer's recommendation of payment requested in Applications for Payment for Shop Drawings will constitute a representation by Engineer, based on Engineer's review of the Application for Payment and the accompanying data that the Shop Drawings have been reviewed as required by the Contract Documents and Seller is entitled to payment of the amount recommended."

Modify Article 10.02 A. 3. as follows:

3. Engineer may refuse to recommend that all or any part of a progress payment be made, or Engineer may recommend nullifying all or any part of any payment previously recommended if, in Engineer's opinion, such recommendation would be incorrect or if on the basis of subsequently discovered evidence or subsequent inspections or tests Engineer considers such refusal or nullification necessary to protect Buyer from loss because the Contract Price has been reduced, Goods are found to be non-conforming, or Seller has failed to furnish acceptable Special Services.

Modify Article 10.03A. as follows:

A. Subject to Paragraph 10.02.A., the amounts of the progress payments will be as provided in the Agreement. Buyer shall within 30 days after receipt of each invoice from Seller pay the Seller. Buyer shall notify Seller promptly of any deficiency in the documentation and shall not unreasonably withhold payment.

Modify Article 10.04. as follows:

Neither party will have any rights to set-off hereunder except to the extent agreed to be an undisputed claim. In any action related to Buyer's election to withhold payments due to Seller, Buyer shall bear the burden of proving default by Seller. and that its election to withhold was justified.

Delete Article 10.05 and replace with the following:

10.05 Final Application for Payment

"A. After the correction period and following the completion of the Final Inspection as per Article 8.1.C, and after Seller has corrected all non-conformities to the satisfaction of Buyer and Engineer, furnished all Special Services, and delivered all documents required by the Contract Documents, Engineer will issue to Buyer and Seller a Notice of Acceptability. Seller may then make application for final payment following the procedure for progress payments. The final Application for Payment will be accompanied by all documentation called for in the Contract Documents, a list of all unsettled claims and such other data and information as Buyer or Engineer may reasonably require."

ARTICLE 11 - CANCELLATION, SUSPENSION, AND TERMINATION

Delete Article 11.01A.1 in its entirety and replace with the following:

"1. Buyer may not cancel this Agreement after Sales Confirmation unless all the details are approved in writing by the parties, including Buyer's agreement to pay a stated amount of termination charges. Unless otherwise agreed to in writing by Seller, the termination charges shall be as follows and, for certainty, such

amounts below shall include Seller's reasonable profit forming part of the Purchase Price based upon the percentages set forth.

Termination Charge	Milestone
0% of the Purchase Price	After Sales Confirmation but prior to release to purchase materials
25% of the Purchase Price	After release to purchase materials but prior to release for fabrication
75% of the Purchase Price	After release for fabrication but prior to Equipment Completion
95% of the Purchase Price	After Equipment Completion but prior to release for shipment
100% of the Purchase Price	After release for shipment

2. The Seller shall be entitled to a reasonable allowance for overhead and profit with respect to all work on the Project completed in accordance with the Contract Documents prior to cancellation by the Buyer pursuant to this Paragraph 11.01."

Add the following items after 11.04B.2.b:

"c. Buyer may terminate for the following reasons, including but not limited to:

1) If the Seller commences a voluntary case under any chapter of the Bankruptcy Code, as now or hereafter in effect, of if the Seller takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to bankruptcy or insolvency

2) If a petition is filed against the Seller: under any chapter of said Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against the Seller under any other federal or state law in effect at the time relating to bankruptcy or insolvency

3) If the Seller makes a general assignment for the benefit of creditors

4) If a trustee, receiver, custodian, or agent of the Seller is appointed under applicable law, or under contract, whose appointment or authority to take charge of property of the Seller is for the purpose of enforcing a lien against such property or for the purpose of general administration of such property for the benefit of the Seller's creditors

5) If the Seller admits in writing an inability to pay its debts generally as they become due; or

6) If the Seller breaches the Procurement Agreement or any provision of the Contract Documents and such breach continues for a period of 15 days after written notice to correct the breach from the Buyer to the Seller

7) Fails to provide competent management and supervision, competent staff or materials or equipment meeting the requirements of the Procurement Agreement

8) Disregards laws or regulations of any public body having jurisdiction

9) Commits serious violations of approved or legislated safety requirements

10) Has assigned any part of the obligations under the Procurement Agreement without the Buyer's prior written consent

ARTICLE 12 - LICENSES AND FEES

Add after Article 12.01B:

"C. Seller grants Buyer a non-exclusive royalty free license to use any process or apparatus claimed in any patent owned by Seller but only to the extent that this license is required by Buyer to build and operate the Project described in this contract using membranes supplied by Seller. All other rights are reserved."

Modify Article 12.02A. as follows:

A. Subject to Paragraph 12.01.A, Seller shall indemnify and hold harmless Buyer, Engineer and their officers, directors, partners, employees, agents, consultants, contractors, and subcontractors from and against all claims, costs, losses, damages, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) as finally determined by a court of competent jurisdiction in any suit for infringement of any U.S. or Canadian patent (or European patent for Goods that Seller sells to Buyer for end use in a member state of the E.U.) that has issued as of the delivery date, solely by reason of the sale or normal use of any Goods sold to Buyer hereunder and from reasonable expenses incurred by Buyer in defense of such suit if Seller does not undertake the defense thereof, provided that BUYER promptly notifies Seller of such suit and offers Seller either (i) full and exclusive control of the defense of such suit when Goods of Seller only are involved, or (ii) the right to participate in the defense of such suit when products other than those of Seller are also involved. Seller's warranty as to use patents only applies to infringement arising solely out of the inherent operation of the Goods according to their applications as envisioned by Seller's specifications.

Modify Article 12.02B. as follows:

Replace "within a reasonable time of receiving notice thereof" with "promptly when receiving notice thereof."

Delete Article 12.02D and replace with the following:

"D. If determination is made that Seller has infringed upon intellectual property rights of another, Seller may, at its election, and as Buyer's sole and exclusive remedy under this indemnification provision, (i) obtain the necessary licenses for Buyer's benefit, or (ii) replace the Goods and provide related design and construction as necessary to avoid the infringement at Seller's own expense or, (iii) remove the infringing Goods and refund to the Buyer the purchase price."

ARTICLE 13 - DISPUTE RESOLUTION

Delete Article 13.01 in its entirety and replace with the following:

13.1 Dispute Resolution Method

A. Disputes between the Buyer and Seller will be resolved as set forth in Article 13.3.

13.2 Mediation – Not Used

13.3 Arbitration

A. All Claims or counterclaims, disputes, or other matters in question between Buyer and Seller arising out of or relating to the Contract Documents or the breach thereof (except for Claims which have been waived by the making or acceptance of final payment as provided by Article 10.7) will be decided by binding arbitration in

accordance with the rules of the American Arbitration Association, subject to the limitations of this Article 13.3. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. No demand for arbitration of any Claim or counterclaim, dispute, or other matter that is required to be referred to Engineer initially for decision in accordance with Article 9.5 will be made until the earlier of: (i) the date on which Engineer has rendered a written decision, or (ii) the 31st day after the parties have presented their final evidence to Engineer if a written decision has not been rendered by Engineer before that date. No demand for arbitration of any such Claim or counterclaim, dispute, or other matter will be made later than 30 days after the date on which Engineer has rendered a written decision in respect thereof in accordance with Article 9.6; and the failure to demand arbitration within said 30 day period will result in Engineer's decision being final and binding upon Buyer, and Seller. If Engineer renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned.

C. Notice of the demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the 30 day period specified in Article 13.3.B, and in all other cases within a reasonable time after the claim or counterclaim, dispute, or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such Claim or other dispute or matter in question would be barred by the applicable statute of limitations.

D. No arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and

2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings

E. The award rendered by the arbitrators will be final, judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal."

Request for Information (RFI)

Project: **City of Sandy** **RFI No:** _____
Alder Creek Water Treatment Plant Upgrade Project

Stantec Project No.: 2002006267 **Date:** _____

Owner Project No. _____ **Contractor Project No.** _____

Request:

_____ _____ Owner _____ Contractor _____ Stantec
Engineering Signature

Reply: **Date:**

_____ _____ Owner _____ Contractor _____ Stantec
Engineering Signature

Contract Change Order Agreement

Project: **City of Sandy** **Date:** _____
Alder Creek Water Treatment Plant Upgrade Project

Change Order No. _____ **Contractor:** _____

Stantec Project No.: 2002006267 **Contractor Project No.** _____

_____

SUMMARY OF PROPOSED CHANGE: _____

ITEM	QUANTITY	UNIT PRICE	INCREASE OR DECREASE
A.			
B.			
SUBTOTAL		_____	_____
FINAL CONTRACT PAYMENT		_____	_____

Additional contract time for substantial completion: _____ calendar days.

The Contractor accepts the above adjustment to the contract. By accepting this change, the Contractor agrees that it shall be full payment and final settlement of all claims for contract time and for direct, indirect, and consequential costs, including costs of delays related to any work either covered or affected by the change.

SIGNATURES:

Contractor: _____ Date: _____

Engineer: _____ Date: _____

APPROVED BY: _____ _____ _____
City of Sandy Date Authorized Official

Change Proposal Request (CPR)

Project: **City of Sandy**
Alder Creek Water Treatment Plant Upgrade Project

CPR Date: _____

CPR No. _____

Stantec Project No.: 2002006267

Date Sent to Contractor: _____

Owner Project No. _____

Date Received from Contractor: _____

We hereby request the cost of the following proposed change in your contract on subject project and the return of this completed form. A breakdown of your costs shall be attached. Do not proceed with this work until authorized by Owner.

Description of the proposed change: _____

Proposed by: _____
Title: _____

All work shall be in accordance with the terms, stipulations, and conditions of the original Contract Documents. If the work herein provided is approved by Change Order, the time of completion will be increased by ___ calendar days.

Add: _____
Deduct: _____
Net Changed: _____
Contractor: _____
By: _____
Date: _____

Stantec Recommendation:	_____ Approval _____ Non Approval
By: _____	Date: _____
Reason for Non Approval:	_____

OWNER'S ACTION: _____ ACCEPTED _____ NOT ACCEPTED

BY: _____ Date: _____

COMMENTS: _____

Certificate of Substantial Completion

Project Name: **Alder Creek Water Treatment Plant Upgrade Project**	Stantec Project No: 2002006267
Project Owner: City of Sandy	Owner's Project No:
Project Contractor:	Date of Contract:
This Certificate of Substantial Completion Applies to: D All work under the Contract Documents D The following specific portions:	
Date of Substantial Completion:	

The work performed under this Contract has been reviewed and found to be substantially complete. The Date of Substantial Completion of the project or portion thereof designated above is hereby declared and is also the date of commencement of warranties required by the Contract Documents, except as stated below.

A list of items to be completed or corrected, is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The date of commencement of warranties for items on the attached list will be the date of final payment unless otherwise agreed to in writing.

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be provided in the Contract Documents except as amended as follows: D Amended Responsibilities D Not Amended
Owner's Responsibilities:
Contractor's Responsibilities:
The following documents are attached to and made part of this certificate:

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Executed by the Engineer	Date:
Accepted by the Contractor	Date:
Accepted by the Owner	Date:

END OF SECTION

SECTION 01 74 00 MEMBRANE SYSTEM AND MODULE WARRANTY

PART 1 -- GENERAL

1.01 SUMMARY

A. Section includes:

1. Membrane system and module warranty information.

2. This section covers the membrane system equipment and module warranty. This section addresses the requirements in conjunction with the provisions of Paragraphs 9.01, 9.03 and 9.04 of the General Conditions.

B. Related specification sections include but are not necessarily limited to:

1. Division 00, Procurement and Contracting Requirements.

2. Division 01, General Requirements.

3. Section 11 30 00, Hollow Fiber Membrane Equipment

1.02 QUALITY ASSURANCE

A. Referenced standards:

1. ASTM International:

a. D6908, Standard Practice for Integrity Testing of Water Filtration Membrane Systems.

B. Seller's Quality Assurance/Quality Control (QA/QC) Procedures

1. Submit for approval, prior to the shipment of the membrane modules, reports in letter format for each membrane module. At a minimum, the reports shall include:

a. The membrane module model and part number, manufacturing lot number and serial number. Indicate the nominal and absolute pore size, inside and outside fiber diameter, effective fiber length, and effective feed side surface area of the membrane module.

b. The membrane module normalized specific flux (permeability, gfd/psi at 20°C).

c. A certification by the membrane module supplier that:

1) Each membrane module has passed the Seller's QA/QC (integrity) tests.

d. Certification of wet testing for each membrane module conducted at the Seller's facilities. Seller shall certify that each membrane module has passed the QA/QC tests for membrane element integrity. Acceptable QA/QC tests include bubble point or pressure hold tests above the minimum value recommended by the Seller and approved by the Engineer.

e. Identify modules that have undergone pinning or repair for more than 0.1 percent of original fibers at the factory.

2. Certificates of Warranty

a. Submit a listing of chemical constituents, concentrations and exposure times that would void the membrane warranty.

1.03 DEFINITIONS

A. Log Reduction Value (LRV): The filtration removal efficiency expressed as $\log_{10}$ for a target organism or surrogate.

B. Membrane Module(s): Hollow fiber membranes arranged as a module that is a sub-assembly of a MF/UF Unit.

C. Membrane Integrity Failure Occurrence:

1. A loss of integrity (e.g., partial or complete fiber breaks) that results in less than 4-log (LRV of 4 or 99.99 percent filtration efficiency for a removal of 3 micron or larger particles) as determined by an air pressure based Direct Integrity Test such as the:

a. Pressure Decay Test.

b. Diffusive Airflow Test.

c. Correlated Airflow Measurement Test:

1) A pressure decay test, applying Hagen-Poisseville equation per ASTM D6908.

d. Other conforming integrity tests that satisfy the criteria for test resolution and sensitivity as described by any recognized independent method developed by a consortium of membrane module manufacturers or described and accepted as a method by the primacy agency.

2. MF/UF System: The complete MF/UF System is comprised of multiple MF/UF Units and all ancillary equipment.

D. MF/UF Unit(s): One (1) complete filtration unit including valves, pumps, controls, and piping capable of producing filtered water.

E. Substantial Completion: See Division 0, General Conditions.

1.04 SUBMITTALS

A. Shop Drawings

1. Membrane Warranty

a. Submit design calculations to substantiate the 4-Log Membrane LRVs for air pressure integrity testing. Perform calculations based upon a broken fiber·lumen(s) or a microporous defect of 3 microns to determine the worst-case membrane integrity defect scenario.

b. Provide a listing of chemical constituents, concentrations and exposure times that would result in voiding the membrane warranty.

c. For each of the above chemical constituents, identify the instrumentation required and alarm limits necessary to satisfy the warranty provisions of this section.

2. MF Membrane Modules:

a. Include module construction details.

1) Materials of construction.

2) Dimensions.

3) Standard commercial part numbers and materials for elastomeric seals. Note that Buna-N seals are not acceptable.

b. Include standard performance parameters.

1) Operating temperature.

2) pH and oxidant tolerance (continuous and intermittent).

3) Range of membrane flux.

4) Clean water normalized specific flux (permeability or resistivity).

5) Minimum bubble point or maximum pressure decay test parameters.

c. Include storage and handling requirements.

d. Provide standard operating and maintenance data including storage solutions (concentration and volume) used during shipment and recommended rinsing solutions (concentration and volume) and long-term/short-term storage protocols.

B. Factory Test Reports

1. Prior to delivery of the membrane modules, submit the following:

a. Seller shall identify each membrane module by a unique serial number and indicate the membrane lot.

b. Seller shall provide the membrane specification sheets that specify each membrane module's normalized specific flux (gfd/psi at 20°C), nominal pore size, and the nominal inside and outside surface area of the filter module.

c. Certification of wet testing for each membrane module conducted at the Seller's facilities. Seller shall certify that each membrane module has passed the QA/QC tests for membrane element integrity. Acceptable QA/QC tests include bubble point or pressure hold tests above the minimum value recommended by the membrane module supplier and as approved by the Engineer.

C. Certificates of Warranty

1. The listing of chemical constituents, concentrations, and exposure time that would void the membrane warranty.

1.05 MEMBRANE SYSTEM WARRANTY

A. During the Correction Period, the Seller shall furnish an equipment warranty certificate assuring the containerized membrane filtration units and system (including membrane modules) will meet the service conditions specified in Section 11 30 00, Hollow Fiber Membrane Equipment, Paragraph 2.01.

B. Seller warrants satisfactory performance of the Goods to achieve equipment performance (e.g., design flows, water recovery, backwash, chemical washing, and Clean-In-Place (CIP) intervals) and water quality (e.g., integrity failure) objectives and complies with the concept of linear scalability as defined in the Agreement.

C. In the event that the Buyer does not believe that the Goods meet the specifications, including the criteria of linear scalability, the Buyer shall notify the Seller that the conditions for a breach of contract exist. Seller shall provide at no cost to the Buyer pilot equipment of the type and kind evaluated during the pilot testing, if not available to the Buyer, to verify the compliance with the specifications. In the event that the Buyer determines that the equipment does not comply with the specifications including the concept of linear scalability, the Seller shall provide an acceptable remedy to the Buyer in accordance with the General Conditions. If an acceptable remedy is not obtained, the Buyer shall notify the Seller that a breach of contract exists.

D. If the Goods are non-conforming and unable to conform to the equipment performance objectives for criteria other than linear scalability, the Buyer will notify the Seller in accordance with the procedures identified in Paragraph 9.03 of the General Conditions. Buyer shall make available to the Seller electronic records for Seller review. Seller shall be given 10 days to develop a plan to remedy the non-conformance.

E. If within 60 days after the notification to the Seller it has become apparent to the Buyer that the remedy is not acceptable, the Buyer will provide notice to the Seller that the conditions for breach of contract exist. If within 30 days an acceptable remedy is not obtained, the Buyer shall notify the Seller that a breach of contract exists.

F. Buyer recognizes that to remedy system warranty provisions, the Seller may need to modify operational protocols. Seller recognizes that any change to the operational protocols must be acceptable to the Buyer. Buyer recognizes that any changes to operational protocols by the Seller pursuant to this warranty provision are acceptable under the following conditions:

1. That the specified design parameters (e.g., production capacity, water quality, system recovery, and chemical cleaning interval) are obtained.

2. That the change in operational parameters and protocols (e.g., backwash, chemical washing, or chemical cleaning) will not represent an increase in operational or membrane replacement costs to the Buyer.

1.06 MEMBRANE MODULE WARRANTY

A. General:

1. Seller warrants that the membrane modules will be used for the treatment of water for drinking purposes and that in accordance with Paragraph 5.08 of the General Conditions the membrane modules are fit for the intended purpose.

2. Membrane modules and elements purchased by the Buyer or otherwise provided under the Agreement or as a future membrane replacement shall be provided with the same warranty as the membrane modules and elements provided as part of the original equipment installation.

3. Seller warrants that the membrane modules and elements will be free from non-conformance in:

a. Materials.

b. Workmanship.

c. Membrane integrity failure.

d. Irreversible flux loss.

B. Membrane Module and Element Warranty Periods

1. Seller shall warrant the performance of the supplied MF/UF membrane modules for a period of not less than ten (10) years (inclusive of the three (3) years full replacement warranty period) from the date of Substantial Completion.

a. The warranty shall guarantee the performance of the membrane modules so as to meet the MF/UF system design and performance criteria specified in Section 11 30 00, Hollow Fiber Membrane Equipment.

b. Membrane modules that within the first year become non-conforming, as defined by the requirements specified herein, must be replaced with new membrane modules at no cost to the Buyer.

2. Seller’s membrane module and element warranty periods have been established in the Proposal.

a. Seller’s membrane module warranty period shall commence with the date of Substantial Completion and continue until the end of the pro-rata warranty period submitted by the Seller with the Bid.

b. The membrane module and element warranty periods shall consist of two (2) parts: a full replacement warranty period and a pro-rata warranty period.

1) The full replacement warranty period shall last for a period of at least three (3) years after the date of Substantial Completion as described below:

a) For membrane modules or elements supplied as part of the original equipment installation, the date of Substantial Completion is when the full replacement warranty period commences.

b) For membrane modules or elements provided after the start of Substantial Completion, the full replacement warranty period begins the date the membrane module or element is placed into service.

c) Buyer shall record and maintain records of the date of installation for all membrane modules and elements.

2) The pro-rata warranty period of seven (7) years shall commence with the end of the full replacement warranty period and last until the end of the pro-rata warranty period as submitted by the Seller in the Bid.

C. In the event that the Goods do not meet the performance requirements specified, including the criteria of linear scalability, the Buyer shall notify the Seller in writing requesting warranty replacement modules.

1. Following return notification, the Seller shall have an optional 10-day period to provide on-site troubleshooting and/or repair of the defective Goods.

D. In the event that the capacity or quality cannot be regained through these efforts, an adequate number of modules will be replaced as per the terms of the warranty to recover system performance within the parameters specified in Section 11 30 00, Hollow Fiber Membrane Equipment.

E. If within 60 days after the notification to the Seller it has become apparent to the Buyer that the remedy is not acceptable, the Buyer will provide notice to the Seller that the conditions for breach of contract exist.

1. If within 30 days following such notice an acceptable remedy is not obtained, the Buyer shall notify the Seller that a breach of contract exists.

F. Buyer recognizes that to remedy system warranty provisions, the Seller may need to modify operational protocols.

1. Seller recognizes that any changes to the operational protocols must be acceptable to the Buyer.

2. Buyer recognizes that any changes to operational protocols by the Seller pursuant to this warranty provision are acceptable under the following conditions:

a. That the specified design parameters (e.g., production capacity, water quality and system recovery) are obtained.

b. That the change in operational parameters and protocols (e.g., backwash, chemical cleaning, or recovery cleaning) will not represent an increase in operational or membrane replacement costs to the Buyer.

c. Revised protocol is subject to review and approval by the Buyer and/or Engineer.

G. Limitation of Membrane Module and Element Warranty

1. Buyer recognizes that the occurrence of any of the following shall void the membrane module and element warranties:

    a. Physical damage or faulty installation of the membrane modules or elements by anyone other than Contractor, Seller, or Seller's authorized representative.

    b. Unauthorized alteration of components manufactured by the Seller.

    c. Catastrophic exposure to chemicals or deleterious substances not normally associated with water treatment as a result of accidents, vandalism or other acts that are outside the bounds of routine and normal water treatment plant operations.

    d. Use of water treatment chemicals, chemical cleaning solutions or cleaning procedures other than chemicals, solutions and procedures approved by the Seller.

    e. Exposure of the membrane modules or elements to treated water or water treatment chemicals at concentrations above levels or contact times acceptable to the Seller.

        1) Seller is responsible for providing the Buyer a listing of the known water treatment and cleaning chemicals and concentrations and times of exposure that could result in membrane damage.

        2) Operation or cleaning of any membrane module or element outside the stated chemical limits shall void the remaining portion of the membrane module or element warranty.

    f. Improper maintenance of equipment, as defined in the Technical/O&M Manual.

    g. Failure of the Buyer to maintain operational logs as required by the Seller.

        1) The maintenance of electronic logs is subject to the following conditions:

            a) Seller is responsible for providing the Buyer a listing of the operational data points that are to be electronically logged.

            b) Seller is responsible for the control programming of data points that are to be electronically logged.

            c) Seller shall identify minimum frequencies of logging of all operational data points required by the Seller to maintain membrane module and element warranty provisions.

            d) Seller shall establish the alarm and shutdown limits that would result in the operation of the equipment outside of Seller acceptable limits.

            e) Seller shall be solely responsible for the identification and programming of system interlocks that would result in the operation of the system outside of the parameters required by the Seller.

                (a) Buyer will not be responsible for errors in Seller developed programming that would result in improper operation of the system.

h. In the event of a warranty claim, failure of the Buyer to provide the Seller with operational logs.

2. Buyer will assume responsibility of maintaining a hand-written log if an occurrence develops that is totally outside the bounds of routine and normal operation or automated operation.

   a. Such items would include obtaining water analyses, or catastrophic events (e.g., discharges of foreign objects or chemicals that are outside the normal operation of a water treatment facility).

3. Changes in the Seller established operational and maintenance guidelines cannot be applied retroactively to invalidate the membrane module or element warranties.

4. Seller is solely responsible for the identification of water quality parameters normally associated with water treatment and water treatment chemicals and cleaning solutions (for procedures approved by the Seller), and for identification of instrumentation and control programming required to satisfy and maintain membrane module and element warranty provisions for operation and cleaning.

5. Buyer recognizes that to satisfy warranty requirements, the Seller may provide membrane replacement modules or elements that embody changes in module or element design and construction features.

   a. Buyer recognizes that the replacement of membrane modules or elements pursuant to this warranty with a different membrane module or element is acceptable under the following conditions:

      1) That the specified design and operational parameters (e.g., design flows, water quality, system recovery and chemical cleaning intervals) are obtained.

      2) That the change in membrane modules or elements will not represent an increase in the operational or membrane module or element replacement costs to the Buyer.

      3) The revised module or element must also be in compliance with regulatory requirements.

H. Membrane Module and Element Pricing

~~1. Seller shall establish the membrane module and element prices (as indicated in the Proposal Pricing Form) and guarantees that:~~

~~a. Membrane modules and elements have been provided to the Buyer at prices not exceeding the prevailing market price.~~

~~b. In the Proposal Pricing Form, the Seller shall indicate the cost escalated Consumer Price Index (CPI) used to calculate the replacement price.~~

~~1) The CPI adjustment is the most recent Month CPI Index divided by the CPI Index for the month of the Bid submittal.~~

~~c. The CPI Index to be used shall be the "CPI-U, US City Average, all Items (non-seasonally adjusted)" as compiled by the U.S. Department of Labor.~~ [Addendum #3]

2. During the full replacement warranty period, the Seller shall provide replacement modules and elements for non-conforming modules and elements at no cost to the Buyer.

~~3. Module and element prices during the pro-rata warranty period shall be calculated as follows:~~

~~a. Pro Rata Module Price = (Module Price x applicable CPI adjustment x Months of Beneficial Use)/Membrane Module Pro-Rata Warranty Period (Months).~~ [Addendum #3]

I. Membrane Module Integrity:

1. Membrane Integrity Test Frequency:

a. Membrane Integrity testing shall be performed daily.

2. LRV Determination

a. The operating Log Reduction Value (LRV) shall be determined at the maximum design flux and maximum Transmembrane Pressure (TMP), if calculated using the test result on an intermittent basis.

b. The LRV shall be determined at the operating flux and TMP, if calculated using the test result on a continuous basis using the result of the last direct integrity test.

c. The LRV calculation shall include the applicable adjustment for the "concentration factor" as described in the Direct Integrity Test provisions of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).

d. If empirical data is used for the calculation of LRV, the Seller will provide adequate evidence (e.g., results of challenge testing at the Seller membrane integrity test pressure, air and water flow/pressure drop data) to support the correlation between air pressure integrity test result and LRV based upon a "flow limiting orifice" criteria for a broken lumen at the membrane - membrane pot interface for approval by the Engineer.

3. Membrane Integrity Failure

a. Membrane modules shall be considered to have non-conforming integrity failure if the number of Membrane Integrity Failure Occurrences per membrane unit exceeds three (3) occurrences in a three (3) month period or six (6) occurrences in a 12 month period.

1) Seller will define the number of fiber breaks per Unit that constitutes Membrane Integrity Failure Occurrence for their particular membrane module.

b. If a Membrane Integrity Failure Occurrence is identified:

1) Module(s) may be isolated from service and the system retested. If isolation of the modules(s) restores Unit integrity requirements, the Unit may be placed back into service.

2) The individual modules shall be pin repaired, or replaced if pin repair is not possible, and the Unit will be retested and returned to service. The membrane module serial number and number of membrane fibers repaired shall be recorded. The Membrane Integrity Failure Occurrence shall be documented by the Buyer.

3) For subsequent Membrane Integrity Failure Occurrences, module(s) may be isolated from service and the Unit placed back into service unless the cumulative area isolated from the Unit reduces the MF/UF System Firm Capacity below that which is required.

4) If module(s) cannot be isolated from service, then all defects in that Unit shall be repaired or replaced (if repair is not possible), and the Unit retested and placed back into service.

5) The membrane module serial number and number of membrane fibers repaired shall be recorded.

c. Individual membrane module(s) shall be considered to have integrity failure under the following conditions:

1) Prior to Acceptance Testing

a) If more than 0.05 percent of the fibers are pinned prior to commencement of the Acceptance Testing.

2) After Acceptance Testing

a) If for a single membrane module, more than 0.05 percent of the fibers have required repair (e.g., by pinning or gluing) in any 12 consecutive months.

3) Anytime

a) An individual membrane fiber shall be defined as requiring repair if it visually leaks during an air pressure integrity test at the integrity test pressure.

b) If a module assembly fails the air pressure integrity test and cannot be repaired by pinning or gluing, then the module is considered defective.

c) If the cumulative repairs from the date of manufacture raise the flux rate 0.1 percent above the design flux rate.

d) If more than 0.2 percent of the fibers have required repairs over the life of the membrane module. An individual membrane fiber shall be defined as requiring repair if it visually leaks during an air pressure integrity test at the integrity test pressure.

d. If a membrane unit exceeds the maximum amount of Membrane Integrity Failure Occurrences, all membrane modules within the membrane unit shall be replaced unless:

1) Seller can demonstrate, through lot traceability, that the Membrane Integrity Failure Occurrence is attributed to a specific lot of membrane modules within a previously defined range of consecutive serial numbers.

2) The lot size shall be established by the membrane module manufacturer but shall not be less than 25 modules.

3) The number of membrane modules that are accountable for the Membrane Integrity Failure Occurrences are “localized” to less than 10 percent of the membrane modules located on the membrane unit.

e. If it is demonstrated that the membrane integrity failure defect is attributed to a specific lot or localized, then all membrane modules that have had more than a single previous occurrence of repair shall be replaced, even though they may be located in another membrane unit or may not have exceeded the criteria for individual membrane module integrity failure.

f. If more than two (2) membrane units require complete replacement within a 12 month period, the Buyer shall retain the option to replace all remaining membrane modules.

g. After Final Acceptance, if a membrane module is determined to be non-conforming with respect to membrane integrity, the Seller will remedy in accordance with the requirements set forth in this section.

1) Non-conforming membrane modules may be returned to service under the conditions outlined in this section.

2) If within 60 days after the notification to the Seller it has become apparent to the Buyer that membrane modules are not able to meet the provisions of the warranty, the Buyer will provide the Seller with a breach of warranty claim.

J. Irreversible Flux Loss

1. Membrane modules or elements shall be considered to have non-conforming irreversible flux loss under the following condition.

Definition of “clean water” resistance: The temperature corrected membrane resistance is defined as the “clean water” membrane resistance, as indicated in the Proposal Pricing Form, taken at a minimum of one (1) hour after startup of the membrane unit after completion of the chemical cleaning process, and taken five (5) minutes after completion of the most recent backwash. The temperature correction shall be calculated at 20°C using a viscosity correction factor. The equations and units used to calculate “clean water: resistance are as follows:

$$R = \frac{\Delta P}{J\mu}$$

Where: R = Membrane Resistance (psid/gfdcp)
J = Membrane Flux (gfd)
μ = Viscosity of water (cp)
∆P = Differential Pressure (psid)

a. Irreversible Flux loss will be stated to have occurred if the MF/UF Units are not able to obtain a minimum of a 30-day clean-in-place (CIP) intervals respectively for 3 consecutive CIP intervals when operated at or below the temperature adjusted membrane design capacity using backwash (MF/UF Units only) and chemical washing procedures and frequencies established and demonstrated for the particular system during the Performance Testing Period.

b. Prior to the end of the first year or operation, each unit will be tested for permeability.

1) Prior to the permeability test, a CIP will be performed.

a) Seller will be allowed to observe the automated CIP cycle.

b) Bid temperature corrected flux rate will be set for each cell prior to the permeability test.

c) The permeability test duration will be run for a minimum of 5 minutes.

2) If the permeability is not at least 95 percent of the bid permeability, the modules will be considered to have non-conforming irreversible flux loss.

2. In the event that the Seller does not believe that the feed water quality is similar to that defined as the design water quality in Section 11 30 00, Hollow Fiber Membrane Equipment, then the Seller may seek relief from its warranty obligations hereunder to the extent that its failure to meet these obligations is caused by a change in the influent water quality that is outside the range of the design influent water quality parameters.

a. However, relief shall require demonstration that there is a defensible water quality parameter and/or duration that is outside of the influent water quality range that caused the warranty violation.

3. Should the Buyer and the Seller fail to agree on the cause of the warranty violation that is related to influent water quality, the matter shall be sent to binding arbitration.

a. The Buyer and the Seller shall jointly select an arbitration panel consisting of water treatment professionals appointed by each party.

b. The panel will consist of two members of each party or other mutually agreed upon number.

c. The panel will then select 1 additional member as mutually agreed upon.

4. The Buyer recognizes that to remedy warranty provisions for irreversible flux loss, the Seller may modify operational protocols.

a. Seller recognizes that changes to the operational protocols must be acceptable to the Buyer.

b. The Buyer recognizes that the changes to operational protocols by the Seller pursuant to this warranty provision are acceptable under the following conditions:

1) That the specified design parameters (e.g., production capacity, water quality, system recovery and CIP interval) are obtained.

2) That the change in operational parameters and protocols (e.g., backwash, Maintenance Clean or CIP) will not represent an increase in the operational or membrane replacement cost to the Buyer.

c. If more than two units require membrane replacement at any time within Membrane Module Warranty Period for irreversible flux loss, the Buyer shall retain the option to replace all remaining membrane modules using the applicable membrane module price.

PART 2 -- PRODUCTS – (NOT USED)

PART 3 -- EXECUTION – (NOT USED)

PART 4 -- SUPPLEMENTAL INFORMATION

4.01 MEMBRANE LIMITS

Normal Operation

Transmembrane Pressure	-3 bar to + 3 bar (-43.5 psi to + 43.5 psi)
pH	1 to 10
Temperature	0 to 40 degrees C. Consult Pall before using any water treatment polymers

Membrane Cleaning (Includes CIP/MC Processes)

Temperature	40 degrees C. maximum
Sodium Hypochlorite	5,000 mg/L maximum
Hydrogen Peroxide	200 mg/L maximum
NaOH	40 g/L maximum
Citric Acid	300 g/L maximum

Membrane Storage

Store modules between 1 and 40 degrees C. Do Not Freeze.

Short Term Storage: If not in use, flush daily with up to 100 mg/L of free available chlorine.

Long Term Storage: First perform a Clean in Place, store wet, completely filled with 50-mg/L sodium hypochlorite solution.

END OF SECTION