

**City of Sandy – Alder Creek Water
Treatment Plant Upgrade**

Draft Conceptual Design Report



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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

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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) (Conson, 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 2014, 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

INTRODUCTION AND BACKGROUND

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 Plant (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 turbidities 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**.

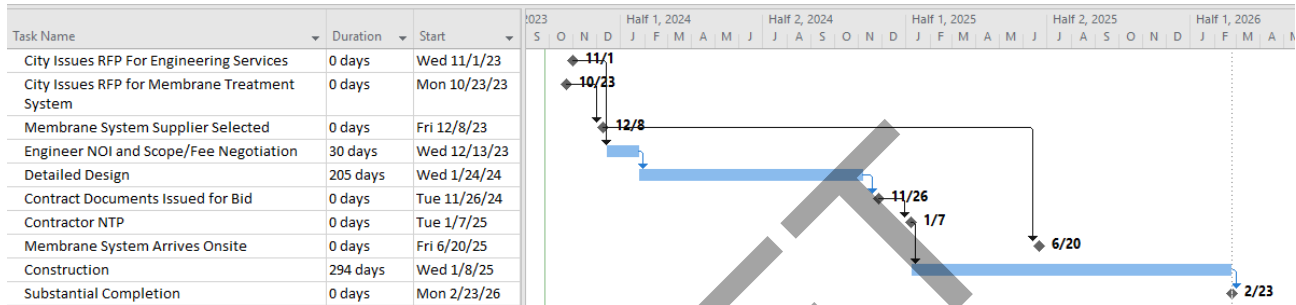


Figure 8 – Overall Project Schedule

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.

Recent WTP Production & Water Quality (2020-2022)

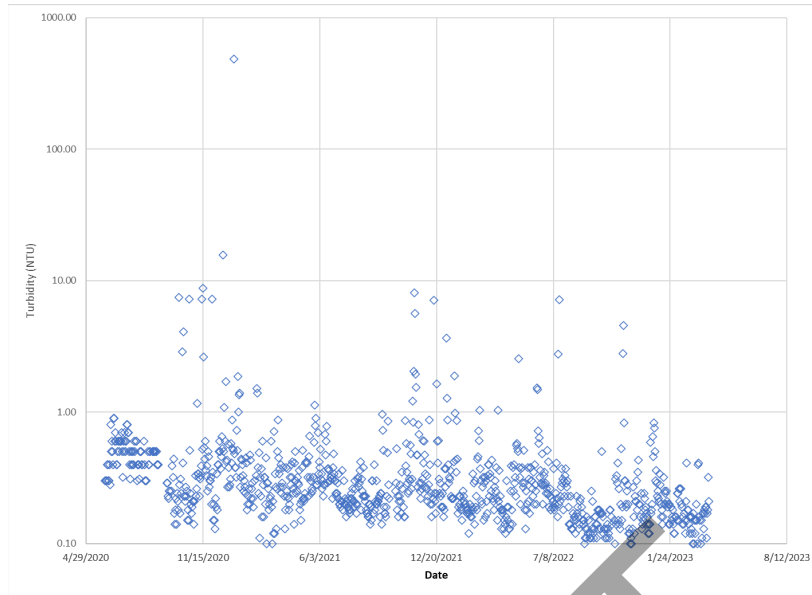


Figure 9 – Average Daily Turbidity

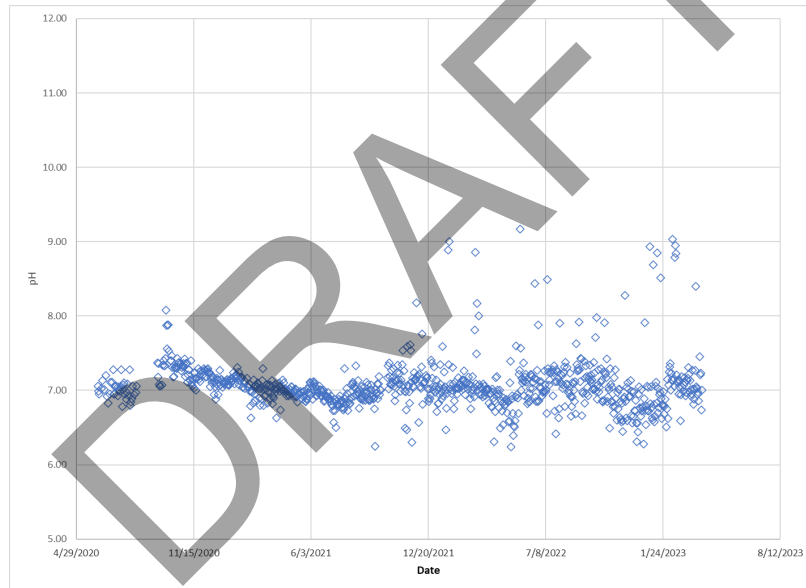


Figure 10 – Average Daily pH

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
- 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**

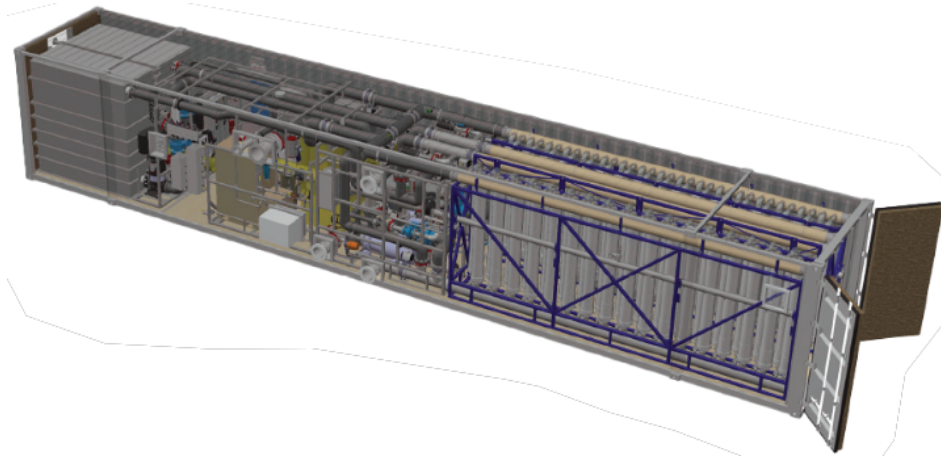


Figure 11 – Containerized LPMF System: Courtesy H2O Innovation

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 anecdotal evidence suggests 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 anecdotal evidence 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.

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ATTACHMENT A

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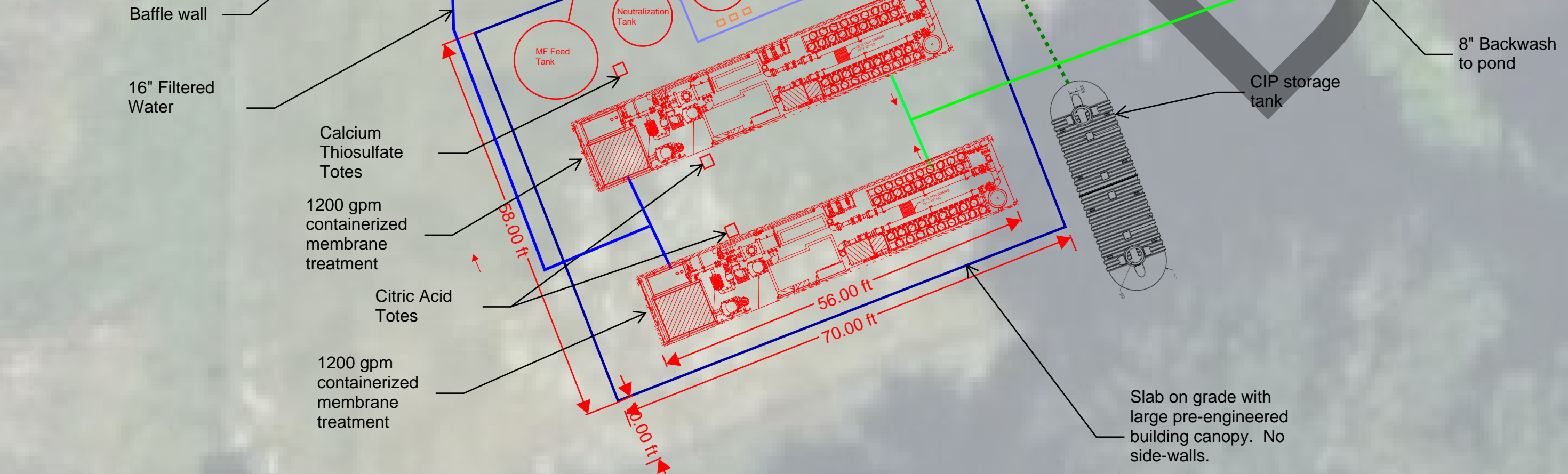
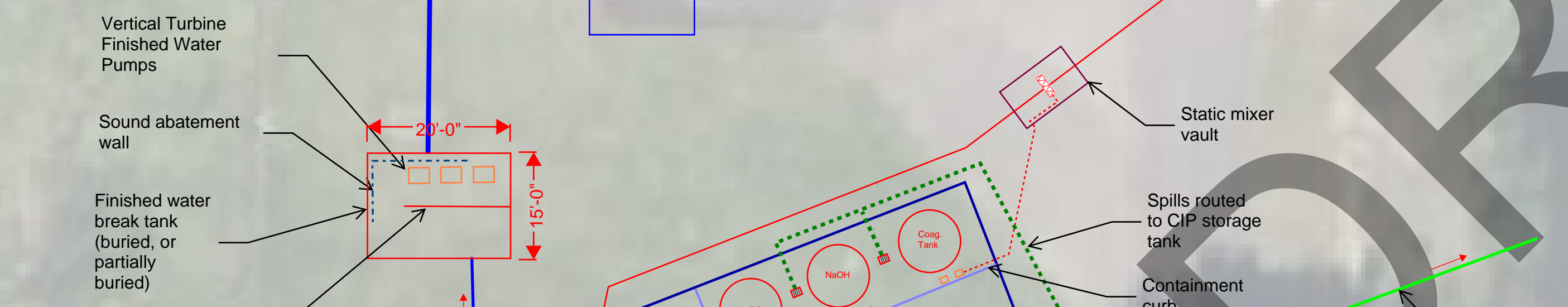
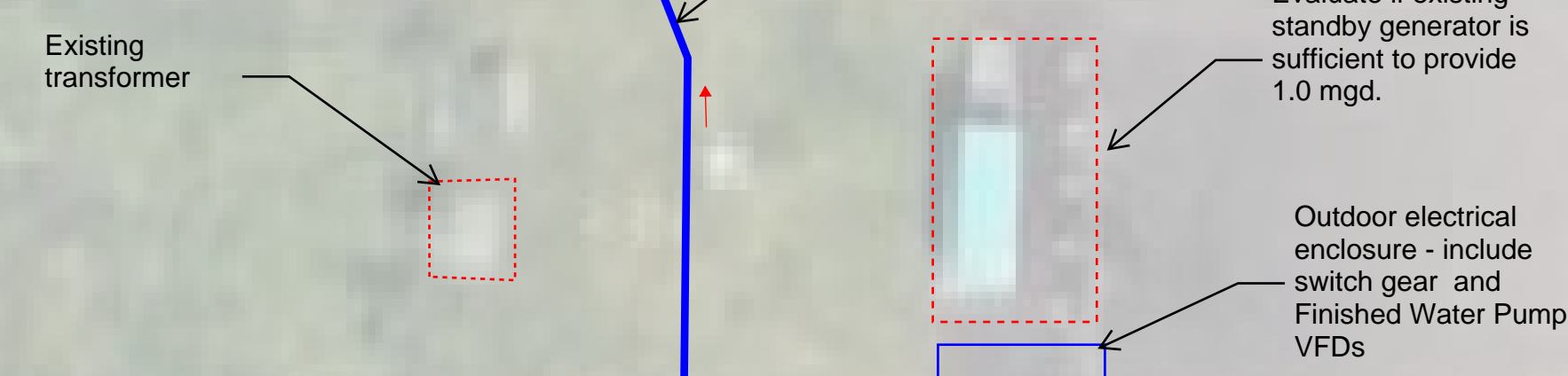
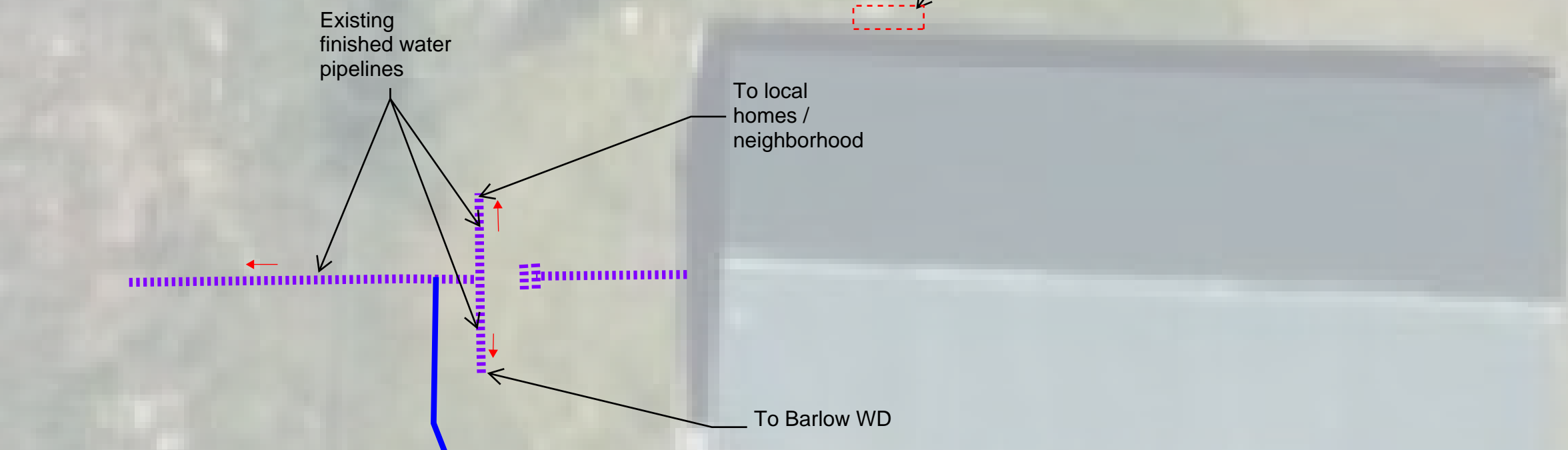
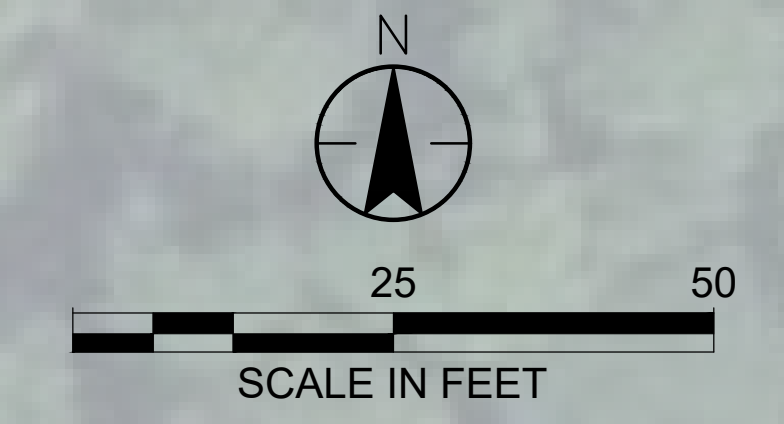
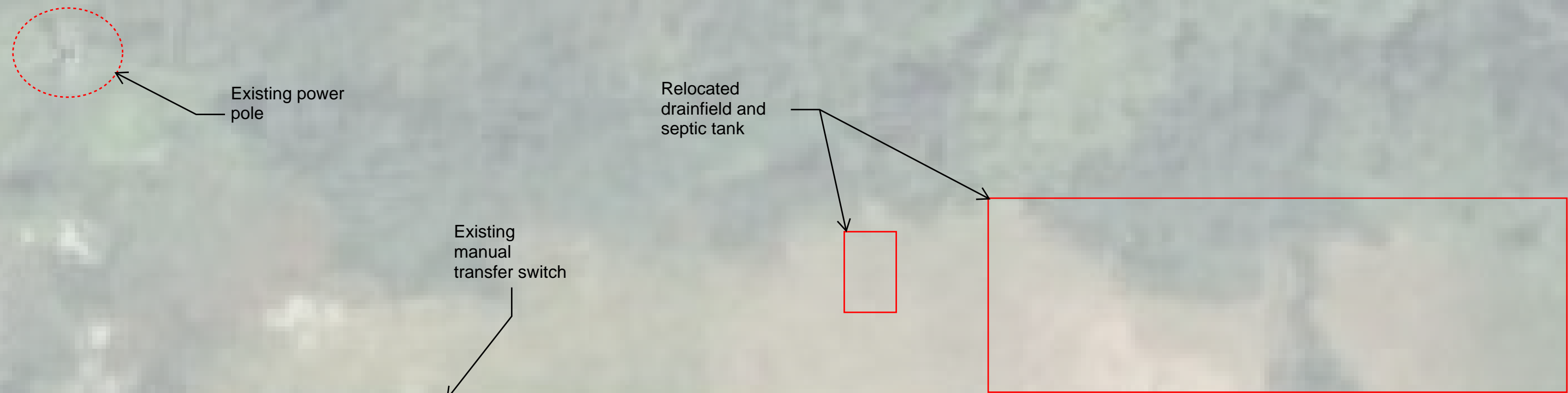
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Revision	By	App'd	Date

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Client/Project
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
Dwn.	Dsgn.	Chkd.

Title
ALDER CREEK WTP SITE PLAN

Revision:
Drawing No.

C-00X

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ORIGINAL SHEET - ANG D

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ATTACHMENT B

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	1	2	3	4	5
	VALVES	PUMPS & COMPRESSORS	PIPING ACCESSORIES	MISCELLANEOUS	MCP - MASTER CONTROL PANEL
	3 WAY MULTI-PORT VALVE	SLUDGE DIAPHRAGM PUMP	ANNULAR SEAL	BRIDGE CRANE	
	4 WAY MULTI-PORT VALVE	HORIZONTAL CENTRIFUGAL PUMP	ATMOSPHERIC VENT	CALIBRATION COLUMN	
	AIR VACUUM, AIR RELEASE, OR COMBINATION AIR VACUUM AND AIR RELEASE ASSEMBLY	GENERIC PUMP	BLIND FLANGE	CONTAINER SCALE	
D	ANGLE VALVE	CHEMICAL METERING PUMP	CAP - BREATHER	CARTRIDGE FILTER	
	BACK-PRESSURE VALVE	DRUM PUMP	CAP - SCREW / THREADED	DEMISTOR	
	BACKFLOW PREVENTER VALVE	ROTARY GEAR PUMP	CAP - WELDED	FIRE HYDRANT	
	BALL VALVE	SPLIT-CASE PUMP	CAP - QUICK DISCONNECT	GAS BOTTLE	
	BUTTERFLY VALVE	HOSE / PERISTALTIC PUMP	CHLORINE INJECTOR OR CHEMICAL EDUCTOR	HEAT EXCHANGER - PLATE TYPE	
	CHECK VALVE	PLUNGER / PISTON PUMP	DIAPHRAGM SEAL	HEAT EXCHANGER - STRAIGHT TYPE	
	CONE VALVE	PROGRESSIVE CAVITY PUMP	DRAIN	HEAT EXCHANGER - U TUBE	
	DIAPHRAGM VALVE	ROTARY LOBE PUMP	EXPANSION CHAMBER WITH RUPTURE DISK	HEATER	
	FLAP VALVE	SUBMERSIBLE SUMP PUMP	EDUCTOR	HORN	
	GATE VALVE	SUBMERSIBLE TURBINE PUMP	FLANGED	PANEL-MOUNTED HORN	
	GLOBE VALVE	VERTICAL TURBINE PUMP	FLEXIBLE CONNECTION - BELLOWS TYPE	BEACON	
	HOSE BIBB VALVE	VERTICAL CENTRIFUGAL PUMP	FLAME ARRESTOR	MISCELLANEOUS EQUIPMENT	
	NEEDLE VALVE	AIR ACTUATED DIAPHRAGM PUMP	FLOOR CLEANOUT	MIXER	
C	PINCH VALVE	VERTICAL SUMP PUMP	FLOOR CLEANOUT	MOTOR SYMBOL	
	PLUG VALVE	RECIPROCATING COMPRESSOR	FLOOR CLEANOUT	HORIZONTAL PRESSURE VESSEL	
	PRESSURE REGULATING VALVE	ROTARY SCREW COMPRESSOR	FILTER	VERTICAL PRESSURE VESSEL	
	PRESSURE RELIEF VALVE		HUB DRAIN	RADIO ANTENNA	
	SLEEVE VALVE		INLINE MIXER	REFRIGERATOR DRYER	
	TELESCOPING VALVE		PIPE MATERIAL CHANGE	SAMPLE COOLER	
	FLOAT VALVE		PULSATION DAMPENER	AUTO-BACKWASHING STRAINER	
	VALVE AND GATE ACTUATORS		REDUCER - CONCENTRIC	TANK WITH CONE SHAPED ROOF	
	DIAPHRAGM ACTUATOR		REDUCER - ECCENTRIC	TANK WITH DOME ROOF	
	E/H = ELECTROHYDRAULIC P = PNEUMATIC S = SOLENOID		REMOVABLE SPOOL PIECE	TANK WITH FLOATING COVER	
	MOTOR ACTUATOR		UNION	TANK, VESSEL, OR BIN	
	PISTON ACTUATOR		RUPTURE DISK	TEMPERING TANK	
	WEIGHT BALANCED ACTUATOR		STRAINER - BASKET TYPE	TOTE TANK	
	GATES		STRAINER - DUPLEX BASKET TYPE	WATER LEVEL	
	SLIDE GATE		STRAINER - WYE TYPE	GENERATOR	
	STOP GATE OR SHEAR GATE		SLOPE		
			TRAP		
			WALL CLEANOUT		
			TIE-IN POINT		
			BLOWERS		
			AERATOR		
			BLOWER		
			POSITIVE DISPLACEMENT BLOWER		
			SINGLE STAGE CENTRIFUGAL BLOWER		

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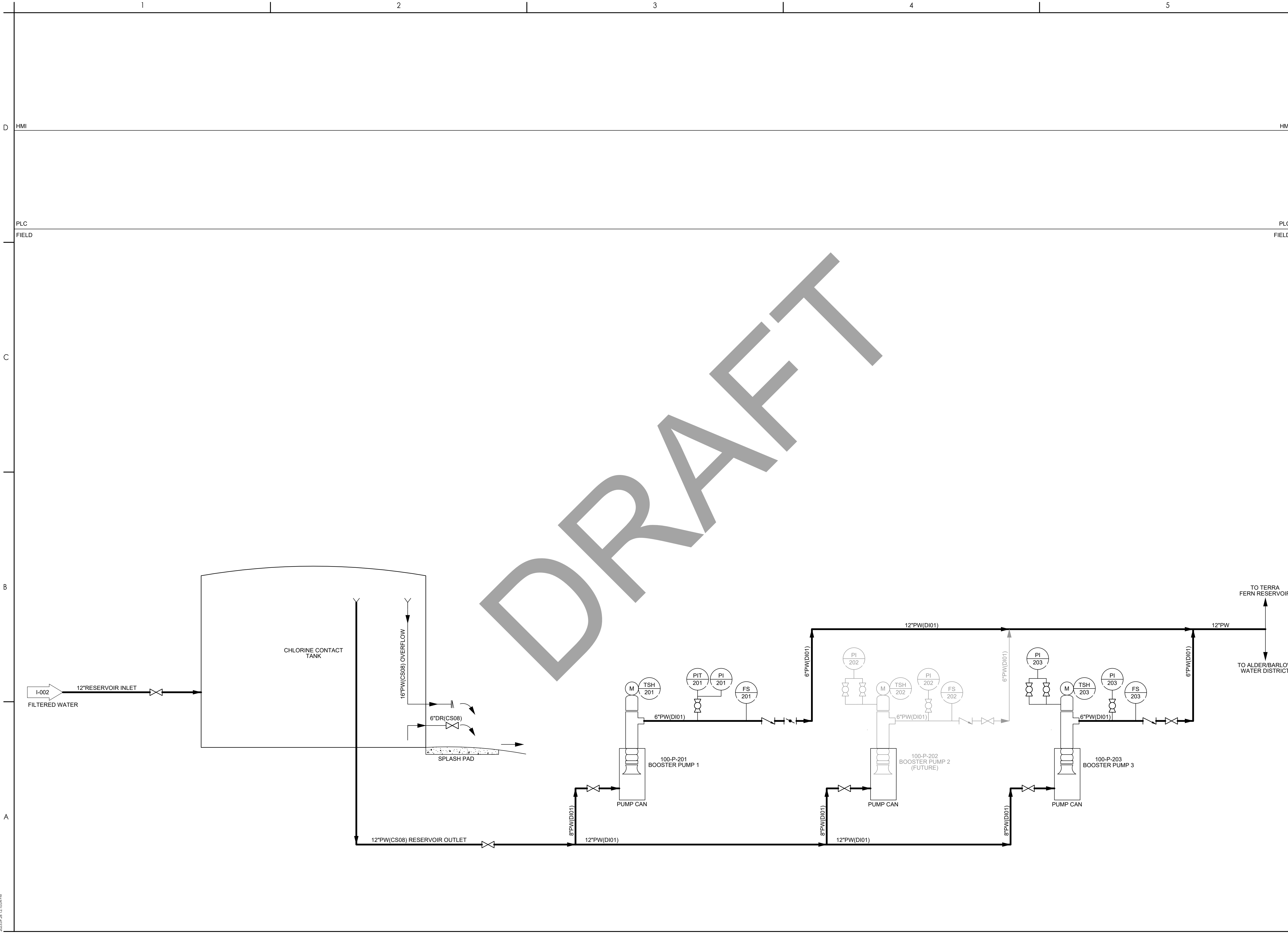
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 File Name: GI-001
 Scale: NTS

Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
 SYMBOLS AND NOMENCLATURE - 01

Revision: XXX
 Drawing No. **GI-001**

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HMI				HMI
PLC				PLC
FIELD				FIELD

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 SANDY, OREGON

Project No.: 2002006267
 File Name: I-003
 Scale: NTS

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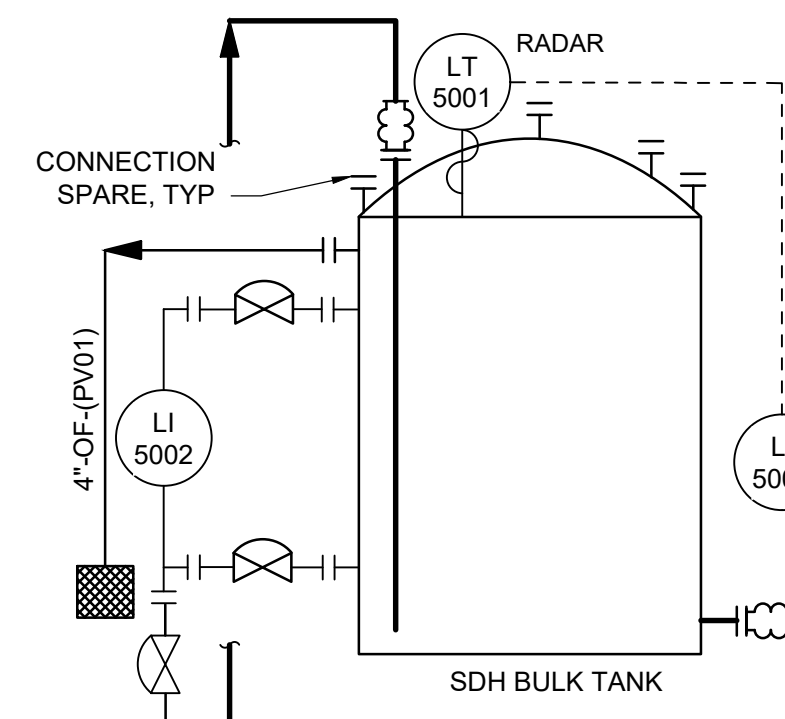
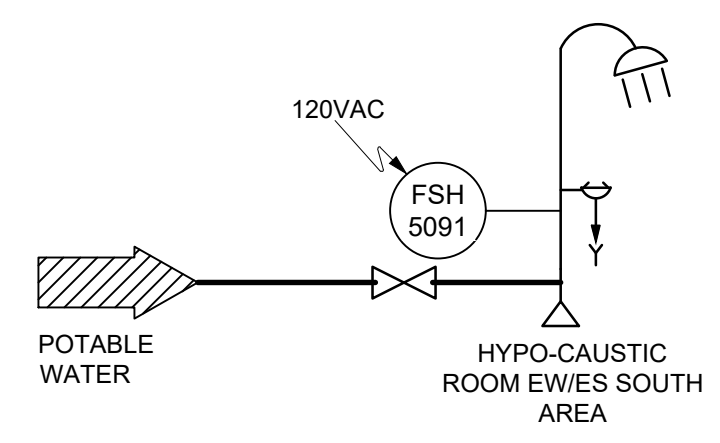
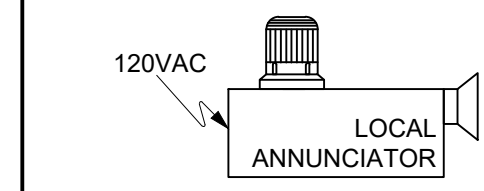
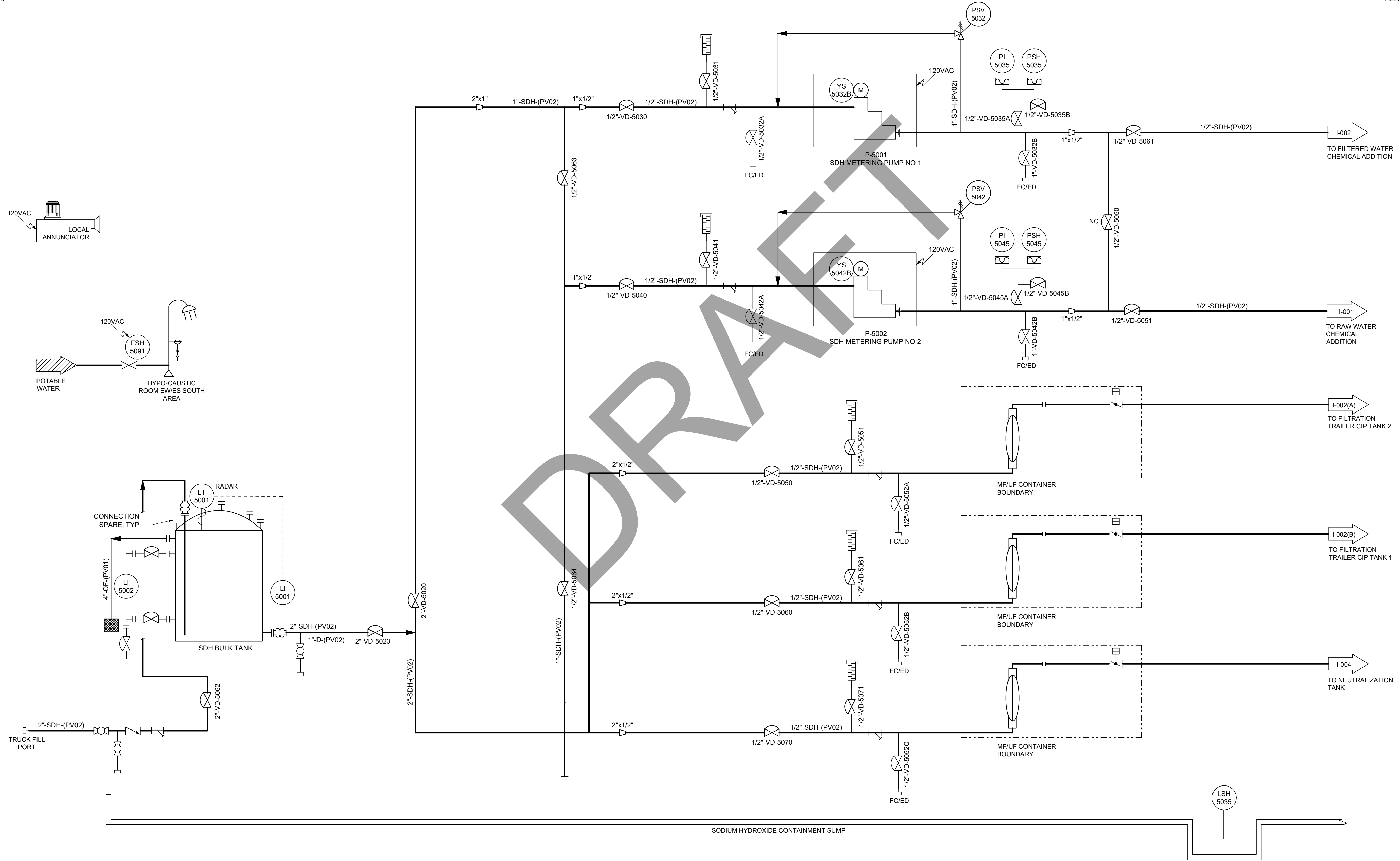
Title
 BOOSTER PUMPS P&ID

Revision: XX
 Drawing No.
I-003

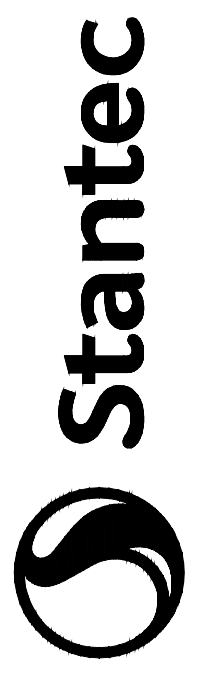
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A B C D HMI PLC FIELD HMI PLC FIELD



ORIGINAL SHEET - ANSI D



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Revision	By	Appd	Issued

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CITY OF SANDY

SANDY PROGRAM
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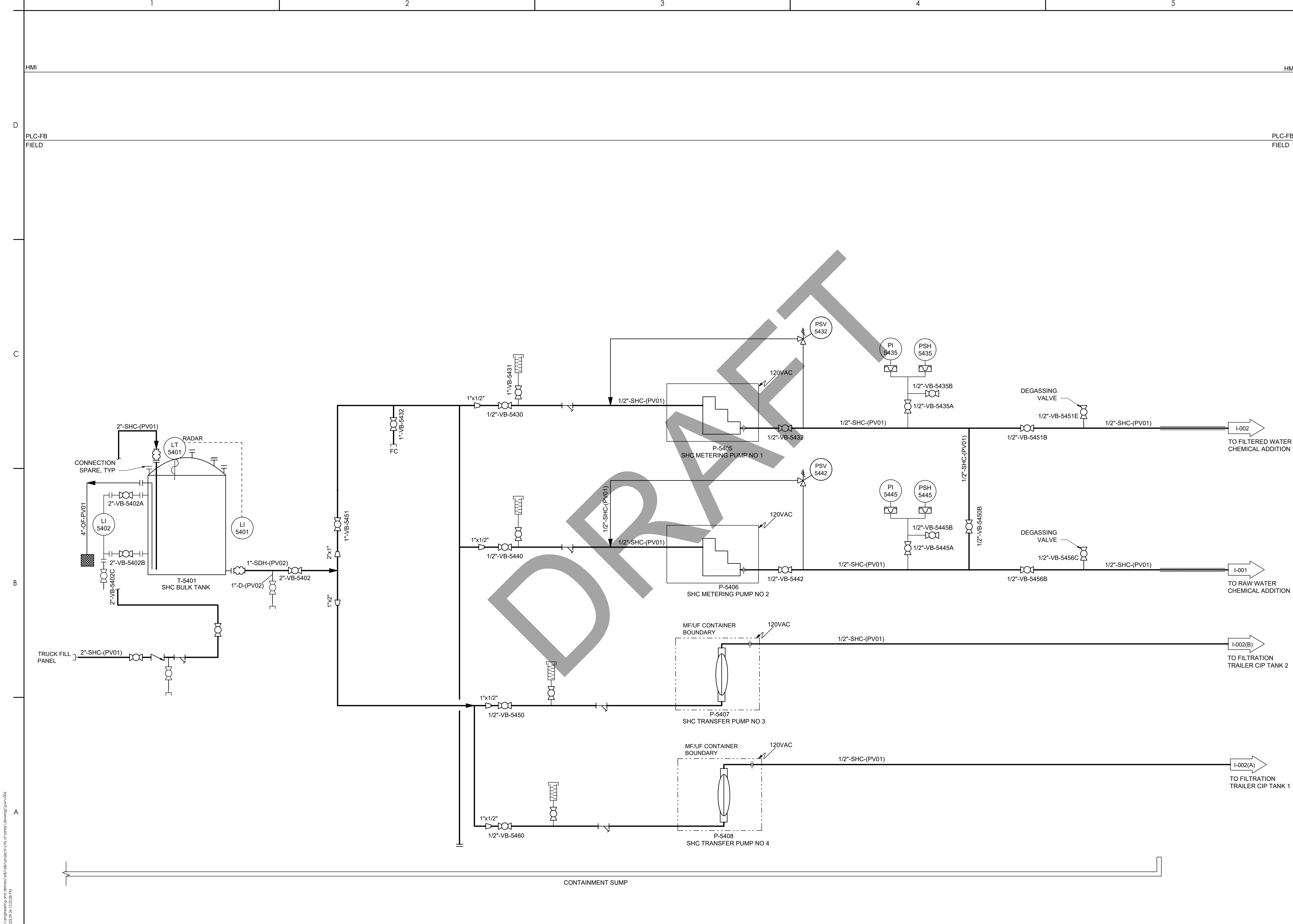
SANDY, OREGON

Project No.: 2002006267
File Name: I-005
Scale: NTS

Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title
FILTRATION AREA
CHEMICAL FEED - SODIUM HYDROXIDE

Revision: XXX
Drawing No. **I-005**



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SANDY PROGRAM OWNERS REP	SANDY, OREGON
Project No.:	2002006267
File Name:	I-006
Scale:	NTS
Dwn.	XX
Dsgn.	XX
Chkd.	XX
	YYYY.MM.DD
	YYYY.MM.DD
Title FILTRATION BUILDING CHEMICAL FEED - SODIUM HYPOCHLORITE	
Revision:	XXX
Drawing No.	I-006

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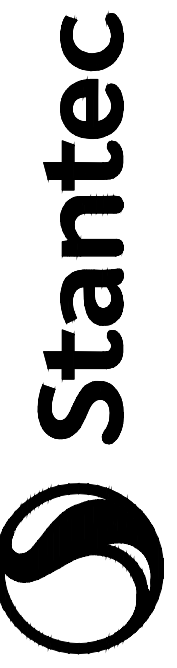
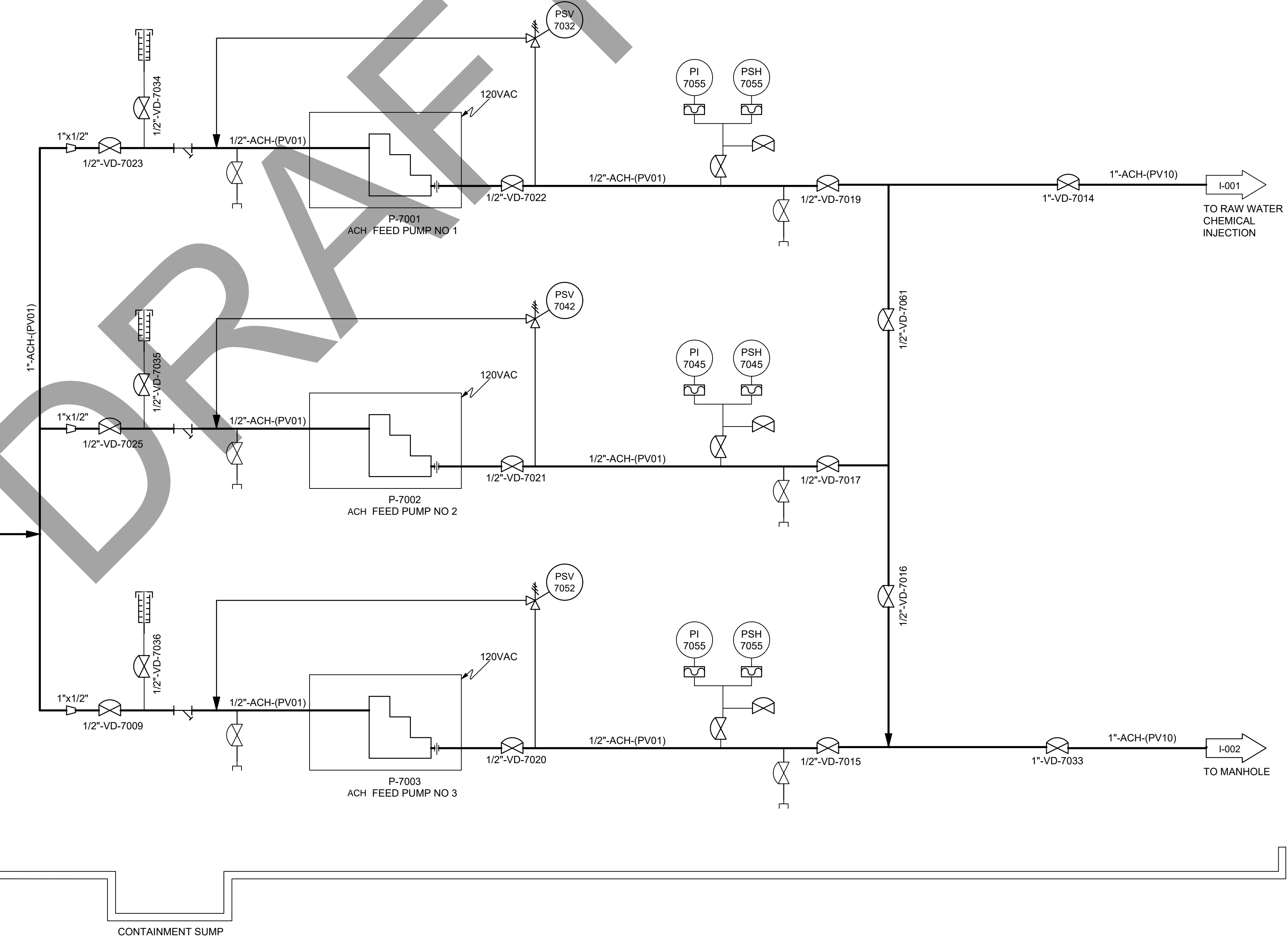
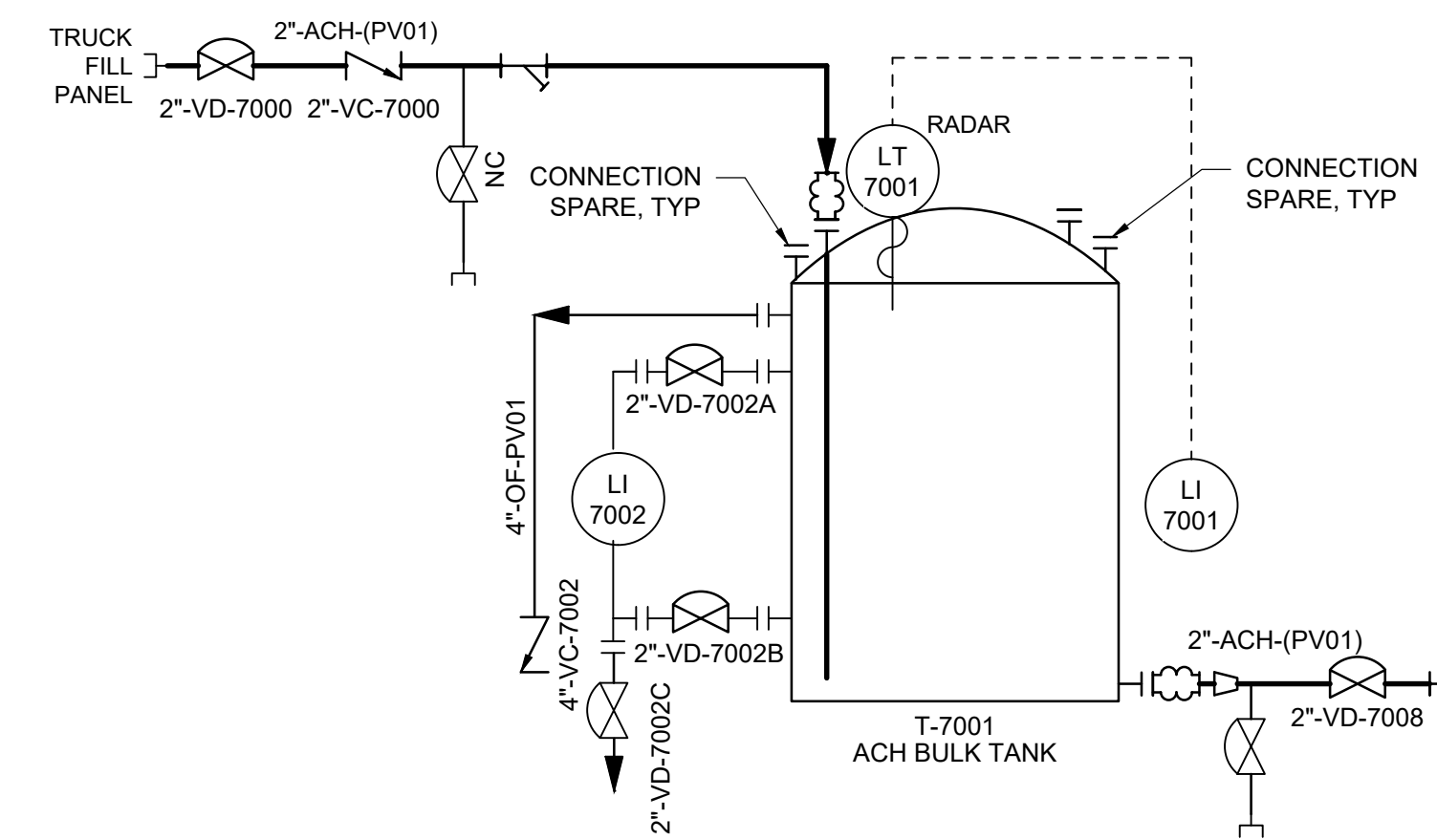
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SANDY PROGRAM
OWNERS REP

SANDY, OREGON

Project No.: 2002006267

File Name: I-007

Scale: NTS

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Title
 FILTRATION BUILDING
 CHEMICAL FEED - ALUMINUM
 CHLOROHYDRATE

Revision: XXX

Drawing No.

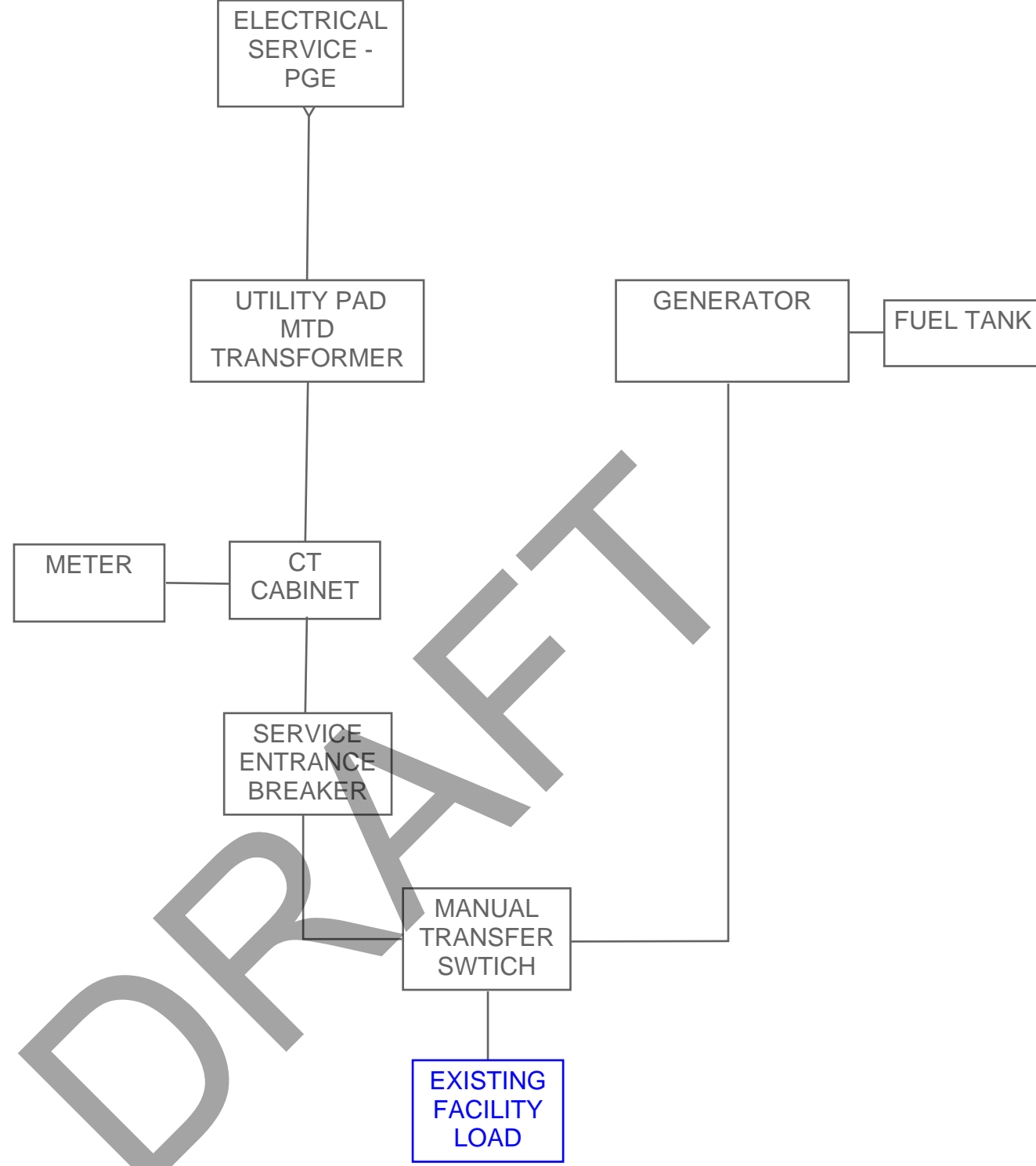
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ATTACHMENT C

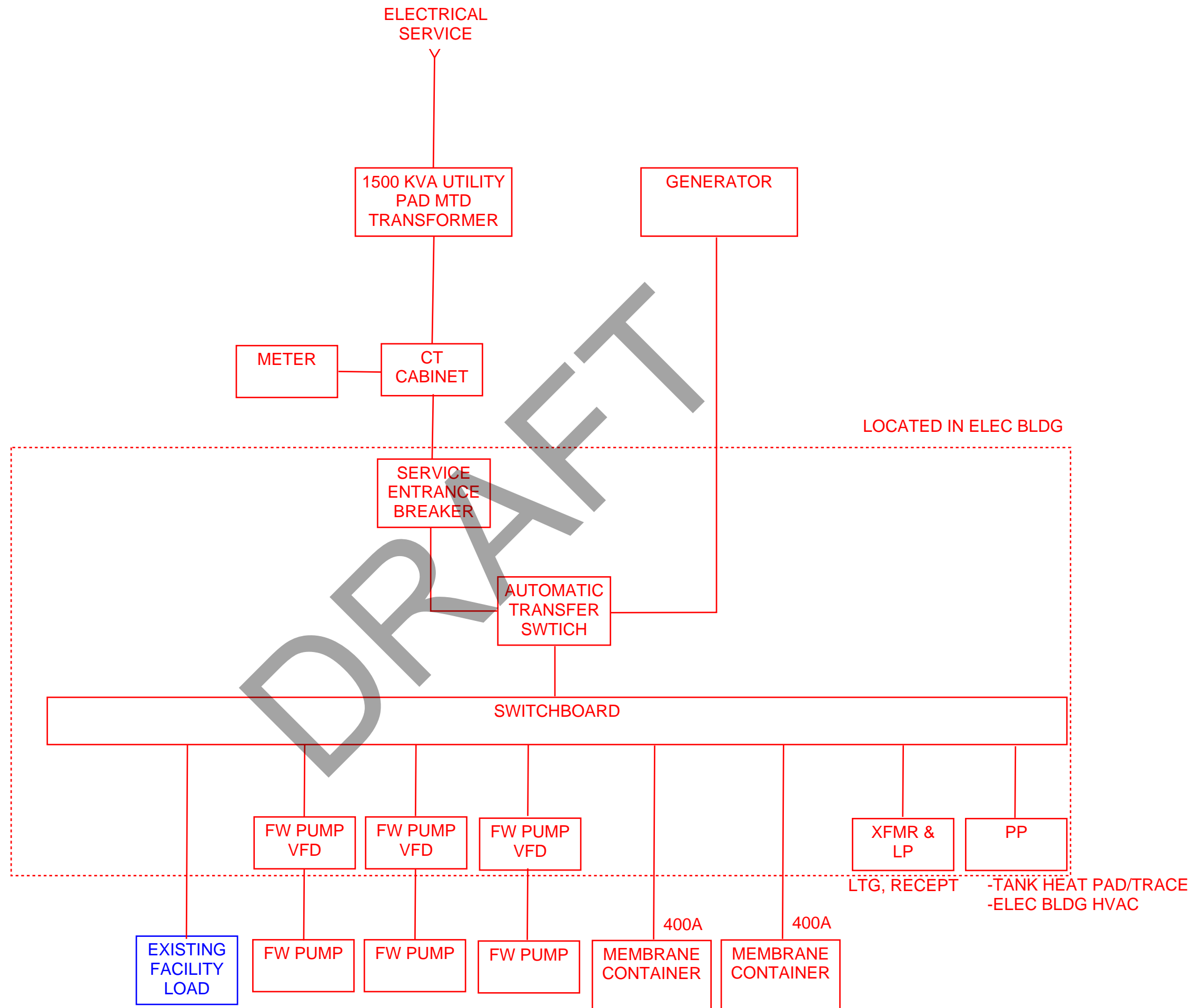
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EXISTING FACILITY SIMPLIFIED ONE-LINE

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

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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 (MHS), construction materials/consumables & construction equipment (M&CES), 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



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 limited 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			✓



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
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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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
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 concrete, 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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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

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

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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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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. <ul style="list-style-type: none"> 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	200200627

Model Clarifications

1	<p>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:</p> <table border="1"> <thead> <tr> <th>Bids Solicited & Received</th> <th>1</th> <th>2 - 3</th> <th>4 - 5</th> <th>6 - 7</th> <th>8 or more</th> </tr> </thead> <tbody> <tr> <td>Potential Cost Deviation From This OPCC Scope & Estimate</td> <td>+25% to +100%</td> <td>+10% to +25%</td> <td>0% to +10%</td> <td>0% to -10%</td> <td>-10% to -20%</td> </tr> </tbody> </table>	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%
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 <u>all</u> 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 throughout 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 include, 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 specialized/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.

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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		Closest RSMeans City Rate	State	Construction Work Schedule	
Prevailing Wage/Davis Bacon		Portland	OR	(5)-8 hr days Mon-Fri	
Rate Escalation Factor	1.00	County of Site Location		Overtime Factors on Base Rate	
Trade Supervision Premium	\$2.00	Clackamas County		Hrs <= 8 Hrs > 8	
Incidental Overtime Allowance	0.0%	Trades Labor Rate Data Source		M-F	1X Base 1½X Base
Non-Specific Rate Adjustment		2023 RSMeans Publication: Labor Rates for the Construction Industry		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 Compositd & Weighted Labor Rate

OPCC Straight-Time (ST) Labor Base Rate				OPCC Over-Time (OT) Labor Base Rate			
Base	Fringes	Fringes %	Total	Base	Fringes	Fringes %	Total
\$43.68	\$22.39	51.3%	\$66.07				

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		TOTAL MH per Week	TOTAL \$ per Week	TOTAL \$ per MH Rate
	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					
(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	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	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	0	\$0	0	\$0	0	\$0	0	\$0	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	0	\$0	0	\$0	0	\$0	0	\$0	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	0	\$0	8	\$703	0	\$0	8	\$878	0	\$0	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	0	\$0	0	\$0	0	\$0	0	\$0	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	0	\$0	0	\$0	0	\$0	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	0	\$0	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



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

<i>DIVS 1-2: General Requirements & Sitework</i>					<i>DIV 3: Concrete</i>					<i>DIV 4: Masonry</i>				
Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost	Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost	Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost
Operator (crane)	2	\$72.32	\$72.32	\$144.64	Carpenter	4	\$64.18	\$64.18	\$256.72	Bricklayer				
Operator (medium)	4	\$61.61	\$61.61	\$246.44	Rodman	4	\$71.85	\$71.85	\$287.40	Stone Mason				
Driver (heavy)	2	\$47.83	\$47.83	\$95.66	Cement Finisher	3	\$61.98	\$61.98	\$185.94	Operator (light)				
Operator (mechanic)	1	\$70.16	\$70.16	\$70.16	Operator (crane)	1	\$72.32	\$72.32	\$72.32	Helper/Apprentice				
Operator (oilier)	1	\$60.37	\$60.37	\$60.37	Operator (medium)	1	\$61.61	\$61.61	\$61.61	Laborer				
Pile Driver	1	\$64.95	\$64.95	\$64.95	Helper/Apprentice	2	\$52.44	\$52.44	\$104.87					
Helper/Apprentice	2	\$52.44	\$52.44	\$104.87	Laborer	2	\$51.53	\$51.53	\$103.06					
Laborer	4	\$51.53	\$51.53	\$206.12										
Supervision	3	\$74.32	\$74.32	\$222.96	Supervision	3	\$73.85	\$73.85	\$221.55	Supervision				
Total Count	20			Total Cost \$1,216	Total Count	20			Total Cost \$1,293	Total Count				Total Cost
Blended Base Rate = \$60.81					Blended Base Rate = \$64.67									
Fully-Burdened Rate = \$86.00 \$98.34					Fully-Burdened Rate = \$91.46									
<i>DIV 5: Miscellaneous Metals</i>					<i>DIVS 5-8: Buildings & Components</i>					<i>DIVS 7-10: Coatings & Finishes</i>				
Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost	Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost	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	Struct Stl Worker	1	\$71.85	\$71.85	\$71.85	Painter (structural)	5	\$44.90	\$44.90	\$224.50
Welder-Struct Stl	2	\$71.85	\$71.85	\$143.70	Operator (crane)	4	\$72.32	\$72.32	\$289.28	Tile Layer	1	\$58.48	\$58.48	\$58.48
Operator (crane)	1	\$72.32	\$72.32	\$72.32	Operator (medium)	1	\$61.61	\$61.61	\$61.61	Plasterer	1	\$60.39	\$60.39	\$60.39
Operator (medium)	3	\$61.61	\$61.61	\$184.83	Sheetmetal Worker	2	\$71.26	\$71.26	\$142.52	Painter (ordinary)	3	\$44.90	\$44.90	\$134.70
Boilermaker	2	\$71.05	\$71.05	\$142.10	Glazier	1	\$69.52	\$69.52	\$69.52	Lather	1	\$63.65	\$63.65	\$63.65
Helper/Apprentice	2	\$52.44	\$52.44	\$104.87	Roofer (composition)	2	\$59.26	\$59.26	\$118.52	Helper/Apprentice	2	\$52.44	\$52.44	\$104.87
					Sprinkler Installer	1	\$69.97	\$69.97	\$69.97					
					Helper/Apprentice	2	\$52.44	\$52.44	\$104.87					
Supervision	3	\$73.05	\$73.05	\$219.15	Supervision	2	\$73.85	\$73.85	\$147.70	Supervision	2	\$65.65	\$65.65	\$131.30
Total Count	18			Total Cost \$1,226	Total Count	16			Total Cost \$1,076	Total Count	15			Total Cost \$778
Blended Base Rate = \$68.12					Blended Base Rate = \$67.24					Blended Base Rate = \$51.86				
Fully-Burdened Rate = \$96.34					Fully-Burdened Rate = \$95.09					Fully-Burdened Rate = \$83.87				
<i>DIV 13: Field-Erect & Shop-Fab Tanks</i>					<i>DIV 15: Piping & Mechanical</i>					<i>DIV 16: Electrical and I&C</i>				
Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost	Labor Trade	Trade Count Ratio	Initial Means Prevail Rate	Final OPCC Direct Rate	Trade Cost	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	Millwright	1	\$69.45	\$69.45	\$69.45	Electrician	6	\$81.69	\$81.69	\$490.14
Welder-Struct Stl	4	\$71.85	\$71.85	\$287.40	Steamfitter/Pipefitter	6	\$85.68	\$85.68	\$514.08	Operator (light)	1	\$60.37	\$60.37	\$60.37
Operator (crane)	1	\$72.32	\$72.32	\$72.32	Plumber	2	\$85.68	\$85.68	\$171.36	Helper/Apprentice	2	\$52.44	\$52.44	\$104.87
Operator (medium)	1	\$61.61	\$61.61	\$61.61	Operator (medium)	1	\$61.61	\$61.61	\$61.61					
Operator (light)	1	\$60.37	\$60.37	\$60.37	Insulator	1	\$79.76	\$79.76	\$79.76					
Helper/Apprentice	2	\$52.44	\$52.44	\$104.87	Helper/Apprentice	2	\$52.44	\$52.44	\$104.87					
Supervision	2	\$73.85	\$73.85	\$147.70	Supervision	2	\$87.68	\$87.68	\$175.36	Supervision	2	\$83.69	\$83.69	\$167.38
Total Count	14			Total Cost \$950	Total Count	15			Total Cost \$1,176	Total Count	11			Total Cost \$823
Blended Base Rate = \$67.84					Blended Base Rate = \$78.43					Blended Base Rate = \$74.80				
Fully-Burdened Rate = \$109.72					Fully-Burdened Rate = \$126.84					Fully-Burdened Rate = \$120.96				



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	200200627

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

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

Pricing Date

5-Jun-23
5-Jun-23
12-Jun-23
19-Jun-23
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

Asphalt Paving, Cement.....				Lumber, Plywood.....			
	Type/Size	Unit	Unit Cost		Type/Size	Unit	Unit Cost
Asphalt Paving	PG 58	TON	\$587.46	2x4	S4S - Pine	MBF	\$1,146.40
	Cutback MC800	TON	\$430.93	2x4	S4S - Fir	MBF	\$882.92
	Rapid set	TON	\$389.28	2x4	S4S - Common	MBF	\$908.88
	Slow set	TON	\$410.15	2x6	S4S - Common	MBF	\$939.59
Portland Cement (delivered)	Type I	TON	\$206.77	2x8	S4S - Common	MBF	\$865.79
Masonry Cement (delivered)	70 LB	BAG	\$15.57	2x10	S4S - Common	MBF	\$1,048.94
Crushed Stone	Base course	TON	\$20.66	Plywood	5/8" thick	MSF	\$995.86
	Concrete course	TON	\$21.77	Plyform	3/4" thick	MSF	\$1,762.91
	Asphalt course	TON	\$21.65	Particle Board (underlayment)	5/8" thick	MSF	\$904.37
Sand	Concrete	TON	\$20.89	Gypsum Board (regular)	1/2" thick	MSF	\$448.63
	Masonry	TON	\$20.98	Roofing Insulation	Unfaced	SF	\$11.20
Concrete-Ready Mix (delivered)	3,000 psi	CY	\$162.04	Wall Insulation	Unfaced	SF	\$10.22
	4,000 psi	CY	\$170.88	Structural Steel, Rebar.....			
	5,000 psi	CY	\$183.50	Standard Structural Shapes	Average	CWT	\$97.05
Concrete Block (delivered)	Normal - 8" x 8" x 16"	C	\$217.54	Channel Beam	6" deep - 8.2 LB/LF	CWT	\$86.85
	Light - 8" x 8" x 16"	C	\$210.54	I-Beam	6" deep - 12.5 LB/LF	CWT	\$103.90
	12" x 8" x 16"	C	\$301.05	Wide-Flange	8" deep - 31 LB/LF	CWT	\$101.20
Sewer, Water, & Drain.....				Reinforcing Bars	Grade 60 - #4	CWT	\$73.80
Reinforced concrete pipe (C76)	12" Ø (rubber gasket)	LF	\$27.35	Hot-Rolled Carbon Steel Plate	12 gauge - 48" x 10'	CWT	\$90.95
	24" Ø (rubber gasket)	LF	\$55.70	Building Sheet & Plate-Aluminum	3003H14 - 36" x 96"	CWT	\$317.97
	36" Ø (rubber gasket)	LF	\$114.12	Stainless Steel Sheet	14 gauge	CWT	\$304.67
	48" Ø	LF	\$188.66		16 gauge	CWT	\$316.80
					20 gauge	CWT	\$316.10
Corrugated steel pipe (galv)	12" Ø (16 gauge)	LF	\$15.22	Stainless Steel Plate	304 - 1/4" x 72" x 240"	CWT	\$303.52
	36" Ø (14 gauge)	LF	\$46.71		316 - 1/4" x 96" x 140"	CWT	\$361.40
	60" Ø (12 gauge)	LF	\$96.46	Steel Piling (H-pile)	HP10x42 (A572)	CWT	\$39.71
Polyethylene pipe (perf/corr)	Underdrain - 4" Ø	LF	\$1.13	Cost Indices			
Polyvinylchloride Pipe	Sewer - 4" Ø (D3034)	LF	\$3.22	Type			
	Sewer - 8" Ø (D3034)	LF	\$10.22	CCI	Construction cost index	-	13,345.00
	Water - 6" Ø (C900)	LF	\$12.00		Common labor index	-	25,080.22
	Water - 8" Ø (C900)	LF	\$15.94		Wages	HR	48.30
Ductile Iron Pipe (CL150)	Water - 12" Ø (C900)	LF	\$24.83	BCI	Building cost index	-	8,095.33
	6" Ø	LF	\$27.50		Skilled labor index	-	11,674.34
		8" Ø	LF	\$39.90		Wages	HR
Copper Water Tubing	12" Ø	LF	\$57.92	MCI	Material cost index	-	5,881.65
	Type L - 1/2" Ø	LF	\$2.89		Cement	TON	200.28
	Type L - 1-1/2" Ø	LF	\$10.77		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).



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	
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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	





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&CES 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&CES, & 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



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.

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, consumables, 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.					



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

	Description	DIV 1(s,p,g) (01) <small>Prime Staff, GC's, & Pass-Thru</small>	DIV 2(c) (02, 31-35) <small>Common Site Work</small>	DIV 2(s,w) (02, 31-35) <small>Specialty Site Work & Wells</small>	DIV 3 (03) <small>Concrete</small>	DIV 4 (04) <small>Masonry</small>	DIV 5(s) (05) <small>SUPPLY Metals</small>	DIV 5(i) (05) <small>INSTALL Metals</small>	DIV 5-8 (05-08) <small>Buildings & Components</small>	DIV 7-10 (07-10) <small>Coatings & Finishes</small>	DIV 13(f,s) (33) <small>Field-Erect & Shop-Fab Tanks</small>	DIV 11-15(e) (40-45) <small>SUPPLY Process & Mech EQ</small>	DIV 11-15(i) (21-23) <small>INSTALL Process & Mech EQ</small>	DIV 16(e) (25-28, 33) <small>SUPPLY Power & I&C EQ</small>	DIV 16(i) (25-28, 33) <small>INSTALL Power & I&C EQ</small>	TOTAL
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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									\$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				\$3,988								\$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		\$20,548											\$3,402	\$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		\$15,727		\$5,958							\$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		\$1,039		\$26,390							\$150,000	\$7,679		\$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	\$79,315								\$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			\$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							\$593				\$43,375		\$7,369			\$51,337
	Packing & Freight							\$3,102				\$226,952		\$38,557			\$268,612
	Sales Tax - NOT APPLICABLE																
	Overhead & General Conditions			\$4,471				\$2,630		\$1,341	\$22,343		\$32,940	\$32,682	\$21,014		\$117,419
	Profit			\$6,572				\$3,865		\$1,971	\$32,844		\$48,421	\$48,043	\$30,890		\$172,606
	Builders Risk Insurance (see below)																
	Liability Insurance			\$256						\$99	\$755		\$1,890		\$978		\$3,977
	Umbrella & Vehicle Insurances			\$251						\$75	\$1,255		\$1,850		\$1,180		\$4,612
	Bonds			\$1,313				\$768		\$394	\$6,553		\$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%



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)	DIV 2(c) (02, 31-35)	DIV 2(s,w) (02, 31-35)	DIV 3 (03)	DIV 4 (04)	DIV 5(s) (05)	DIV 5(i) (05)	DIV 5-8 (05-08)	DIV 7-10 (07-10)	DIV 13(f,s) (33)	DIV 11-15(e) (40-45)	DIV 11-15(i) (21-23)	DIV 16(e) (25-28, 33)	DIV 16(i) (25-28, 33)	TOTAL
		Prime Staff, GC's, & Pass- Thru	Common Site Work	Specialty Site Work & Wells	Concrete	Masonry	SUPPLY Metals	INSTALL Metals	Buildings & Components	Coatings & Finishes	Field-Erect & Shop-Fab Tanks	SUPPLY Process & Mech EQ	INSTALL Process & Mech EQ	SUPPLY Power & I&C EQ	INSTALL Power & I&C EQ	

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 & Supervision 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%



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

Work Anticipated to be Self-Performed by Prime Contractor

<input checked="" type="checkbox"/> DIV 1 Site Mgmt & Oversight Staff	<input type="checkbox"/> DIV 4 Masonry	<input type="checkbox"/> DIVS 11-15 INSTALL EQ: Process and Mechanical
<input checked="" type="checkbox"/> DIV 1 General Conditions	<input type="checkbox"/> DIV 5 SUPPLY EQ: Miscellaneous Metals	<input type="checkbox"/> DIV 13 Field-Erected Tanks
<input checked="" type="checkbox"/> DIV 2 Common Site Work	<input checked="" type="checkbox"/> DIV 5 INSTALL EQ: Miscellaneous Metals	<input type="checkbox"/> DIV 13 Shop-Fabricated Tanks
<input type="checkbox"/> DIV 2 Specialty Site Work	<input checked="" type="checkbox"/> DIVS 5-8 Buildings & Components	<input type="checkbox"/> DIV 16 INSTALL EQ: Process & Mechanical
<input type="checkbox"/> DIV 2 Well Work	<input type="checkbox"/> DIVS 7-10 Finishes	<input type="checkbox"/> DIV 16 SUPPLY EQ: Electrical and I&C
<input checked="" type="checkbox"/> DIV 3 Concrete	<input checked="" type="checkbox"/> DIVS 11-15 SUPPLY EQ: Process & Mechanical	<input type="checkbox"/> 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 <input type="button" value="v"/>
Per-Diem T&L Option	<input type="button" value="v"/>
Meals, Meetings, & Incidentals	<input type="button" value="v"/>
Baggage Check-In Fees	<input type="button" value="v"/>
Airport or Off-Site Parking	<input type="button" value="v"/>
Personal Vehicle Mileage	<input type="button" value="v"/>
Lodging (short vs. long)	<input type="button" value="v"/>
Vehicle (rent vs. lease)	\$55 vs. \$18 per Day <input type="button" value="v"/>
Fuel-Oil-Maintenance	\$5 per Day <input type="button" value="v"/>
Vehicle Sharing	<input type="button" value="v"/>
Meals (excludes meetings)	\$50 per Day <input type="button" value="v"/>
Incidentals	\$5 per Day <input type="button" value="v"/>

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%	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 Cost Assignment to Alternate WBS			
Labor Hours	Labor Cost	WBS	%	WBS Hours	WBS Cost
4,588	\$402,051				

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-Based Cost Assignment to Alternate WBS			
Day Count	Day Cost	WBS	%	WBS Cost	
444	\$12,247				



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

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" usually 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 throughout 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 throughout 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") throughout the individual's project time (re: "Construction Coverage").
PER-DIEM: Personnel originating REMOTE to the project site who receive a negotiated lump-sum 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 throughout 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-sum 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 throughout 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") throughout 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 Office Trailer	Single-Wide Office Trailer	Single-Wide Office Trailer	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						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 system 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 extinguishers, 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 testing	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	
Work Days per Week	0
Rotation Cycle - Weeks	
Rotation Cycle - Idle Days	
1-Way Travel Time- Hours	
Air Transportation	30
Ground Transport & Tips	30
Baggage Fees	30

Daily Cost	
Meals & Tips	30
Mobility & Tips	30
Mobility Fuel, Oil, & Maint	30
Lodging & Tips	30
Housekeeping & Tips	30
Laundry & Tips	30
Incidentals	30

Camp Cost Assignment to Prime Contractor

Yes-Assign to Prime

Camp Cost Assignment to Alternate WBS

WBS	%	WBS Cost
0	0%	
0	0%	

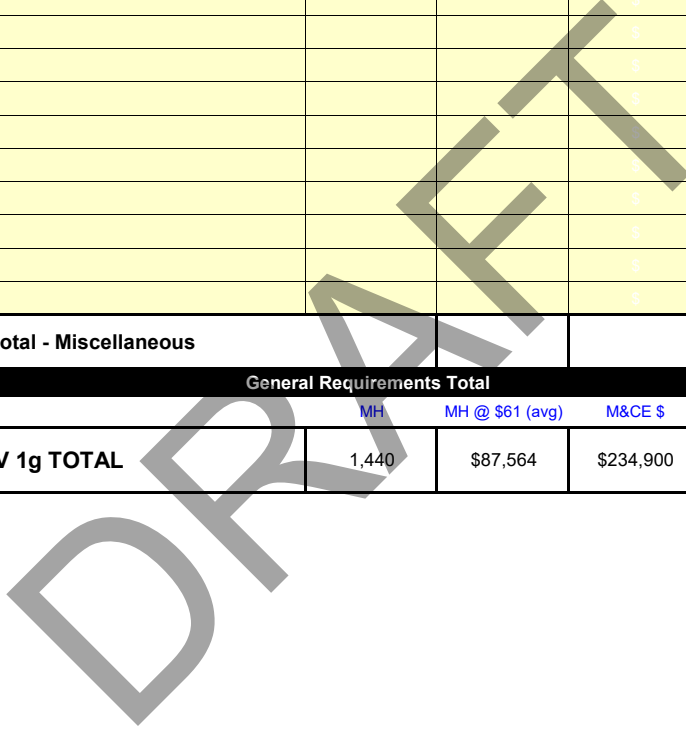
Camp \$ per MH	Eligible MH's	Total Camp \$

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
Secondary Excavation Issue	Wet/Sandy Soil
Hauling & Disposal Distance	10.1 - 15.0 miles roundtrip
Base, Bed, & Fill Supply	100% Import
General Excavations	
General Base & Fill	
Structural Excavations	Excavate & Fill w/ Partial Haul
Structural Base	Crushed Stone ¾"-1½"
Trench Excavations	Excavate & Fill w/ Partial Haul
Trench Bedding & Fill	Gravel ¾"-1½"
	Temporary Shoring
	Temporary Dewatering
	Temporary Erosion Control (re: General General Allowances)
	Temporary Traffic Control (re: General General Allowances)
	Saw-Cutting
	Core-Drilling
	Pot-Holing (re: General General Allowances)
	Liners & Geo-Materials
	Random Base & Fill
	(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
	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
	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
	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
	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
	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
	Compacted Base	25%	1.2	1.4	3.0			110	148	21	\$1,276	\$6,489	\$7,765
		0	0.00		0.0								
		0%	0.0	0	0								
		0%	0.00		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											
5	Vault area	1	3.0	15.0	13.0	195	42	\$2,546	\$5,380	\$7,926	
CIP Storage Tank											
8	Tank area	1	3.0	31.0	14.0	434	54	\$3,283	\$7,071	\$10,354	
Finished Water Booster Pumps											
10	Canned pump area	1	3.0	23.0	15.0	345	49	\$3,008	\$6,442	\$9,450	
		0	0.00		0.0						
		0	0.00		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						
		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
				\$710	\$1,190

Specialty Site Work Total					
WBS	Factor	MH	MH @ \$61	M&CE \$	TOTAL
2	DIV 2s TOTAL	534	\$32,479	\$48,025	\$80,505



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&C \$	TOTAL
Flash Mix Vault															
5	Injection pumps	2	5.0	3.0	1.5	4.0	0.00	0.01	0.2	Rectangular Pad	0.5	4	\$274	\$102	\$377
MF Feed Tank															
6	MF feed tank	1	5.0	0.0	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	0.00	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	0.00	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	0.00	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	0.00	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	0.00	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&C \$	TOTAL	
10	Finished water booster pump pad	1	5.0	20.0	12.0	3	0.00	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	Cntlv	CY	Component	Thk/Dp	MH	MH @ \$65	M&C \$	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	



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

<i>Access Assemblies</i>	Aluminum Structure & Grate	▼	<i>Guardposts & Bollards</i>	8" Ø Coated Steel Pipe with Fndtn	▼
<i>Gratings & Coverplates</i>	Aluminum Structure & Grate	▼	<i>Racks & Bents</i>		▼
<i>Hatches & Covers</i>	Aluminum	▼	<i>Elevated Decks</i>		▼
<i>Hoist & Crane Rails</i>	Galv Steel Bridge Rails	▼	<i>Fabrications Level</i>	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													
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													
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													
9	Tank top perimeter	1	3.99		30.0	2.0	94	43	\$2,910	\$1,545	0.12	\$12,363	\$16,819
		0	0.00										
		0	0.00										
		0	0.00										
		0	0.00										
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													
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	0.00										
		0	0.00										
		0	0.00										
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
Static Mixer Vault													
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										
Finished Water Storage Tank													
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	0.00										
		0	0.00										
		0	0.00										
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												
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	0.00									
		0	0.00									
Subtotal - Guardposts & Bollards							61	\$4,157	\$4,730	0.92	\$9,461	\$18,348



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	
<i>General Allowances</i>							
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	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

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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)	AF Services (re: DIVS 15-17)
SR Add-On's	Interior Architectural Level
SR Services (re: DIVS 15-17)	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	0.00	0.0	0.0	0.0						
0		0	0	0.0	0	0	0.00	0				
0		0	0.00	0.0	0.0	0.0						
0		0	0	0.0	0	0	0.00	0				
0		0	0.00	0.0	0.0	0.0						
0		0	0	0.0	0	0	0.00	0				
0		0	0.00	0.0	0.0	0.0						
0		0	0	0.0	0	0	0.00	0				
0		0	0.00	0.0	0.0	0.0						
0		0	0	0.0	0	0	0.00	0				
0		0	0.00	0.0	0.0	0.0						
0		0	0	0.0	0	0	0.00	0				
0		0	0.00	0.0	0.0	0.0						
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



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	200200627

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
0	Overflow Trough Not-in-Scope	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		0	0.0	0.0	0.0							
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	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 Area & Structure Ductwork Air & Liquid Distributors Face Pipe Assemblies Media Media Supports Tank Insulation Tank Insulation Jacketing Tank Heat-Tracing	Standard (plastic & 316SS)	▼
Piping System Material 2	SDR 11 (press) HDPE-Butt Weld	▼	25%			▼
Piping System Material 3	Sch 80 PVC-Socket Weld	▼	25%			▼
Piping System Material 4	Sch 40 Galv CS-Thread	▼	10%			▼
Piping System Material 5	2X Contained-Tubing in PVC	▼	10%			▼
Pipe Installation Code	ASME B31.3 - Process Piping	▼				▼
Pipe Insulation & Jacketing	2" Fiberglass & 0.013" PVC	▼				▼
Pipe Protection & Coating	Enamel or Acrylic Paint	▼				▼
Equipment & Tank Ductwork	PVC Duct, Ftgs, & Dampers	▼				▼

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	
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	
<i>Existing Raw Water Pump Station</i>											
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
<i>General Allowances</i>						
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. <i>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.</i>						
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

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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

<table border="0" style="width: 100%;"> <tr> <td style="width: 20%;">480V EQ Rating</td> <td style="width: 30%;">NEMA 1 Gasketed (Std) ▼</td> </tr> <tr> <td>4.16KV EQ Rating</td> <td>▼</td> </tr> <tr> <td>12.47KV EQ Rating</td> <td>▼</td> </tr> <tr> <td>SWGR Main Breakers</td> <td>All Voltages - (1) Main Only ▼</td> </tr> <tr> <td>MCC Main Breakers</td> <td>All Voltages - (1) Main Only ▼</td> </tr> <tr> <td>Walk-In SWGR & MCC</td> <td>▼</td> </tr> </table>	480V EQ Rating	NEMA 1 Gasketed (Std) ▼	4.16KV EQ Rating	▼	12.47KV EQ Rating	▼	SWGR Main Breakers	All Voltages - (1) Main Only ▼	MCC Main Breakers	All Voltages - (1) Main Only ▼	Walk-In SWGR & MCC	▼	<table border="0" style="width: 100%;"> <tr> <td style="width: 20%;">120V EQ Rating</td> <td style="width: 30%;">NEMA 12 (Std) ▼</td> </tr> <tr> <td>Process Controls EQ</td> <td>Standard SCADA ▼</td> </tr> <tr> <td>Site Controls EQ</td> <td>Security & Surveillance ▼</td> </tr> <tr> <td>Process & Site Controls</td> <td>Local Monitor & Control Only ▼</td> </tr> <tr> <td>Power/Controls Siting</td> <td>Centralized ▼</td> </tr> <tr> <td>(un-assigned)</td> <td>▼</td> </tr> </table>	120V EQ Rating	NEMA 12 (Std) ▼	Process Controls EQ	Standard SCADA ▼	Site Controls EQ	Security & Surveillance ▼	Process & Site Controls	Local Monitor & Control Only ▼	Power/Controls Siting	Centralized ▼	(un-assigned)	▼
480V EQ Rating	NEMA 1 Gasketed (Std) ▼																								
4.16KV EQ Rating	▼																								
12.47KV EQ Rating	▼																								
SWGR Main Breakers	All Voltages - (1) Main Only ▼																								
MCC Main Breakers	All Voltages - (1) Main Only ▼																								
Walk-In SWGR & MCC	▼																								
120V EQ Rating	NEMA 12 (Std) ▼																								
Process Controls EQ	Standard SCADA ▼																								
Site Controls EQ	Security & Surveillance ▼																								
Process & Site Controls	Local Monitor & Control Only ▼																								
Power/Controls Siting	Centralized ▼																								
(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
1	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

Electrical Equipment Total

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



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

' Load for WBS Items 52-99

WBS	Area/Name	Voltage	Amps	KVA	Name	Voltage	Amps	KVA
4	Existing Raw Water Pump Station	480	121	100	52			
5	Static Mixer Vault	480	0	0	53			
6	MF Feed Tank	480	0	0	54			
7	Membrane & Neutralization System	480	800	664	55			
8	CIP Storage Tank	480	0	0	56			
9	Finished Water Storage Tank	480	3	2	57			
10	Finished Water Booster Pumps	480	402	334	58			
11	Chemical Systems	480	28	23	59			
12	Generator System	480	6	5	60			
13	Canopy & Slab Structure	480	74	62	61			
14	Miscellaneous Site Work				62			
15	Existing Building		200		66			
16					67			
17					68			
18	Standby Generator Size - maybe a 500 kw generator per Papp...				69			
19					70			
20					71			
21					72			
22					73			
23					74			
24					75			
25					76			
26					77			
27					78			
28					79			
29					80			
30					81			
31					82			
32					83			
33					84			
34					85			
35					86			
36					87			
37					88			
38					89			
39					90			
40					91			
41					92			
42					93			
43					94			
44					95			
45					96			
46					97			
47					98			
48					99			
49								
50								
51								

30 hp each x 2

100 hp each x 3

likely heat trace per Papp

DRAFT



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		



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



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



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	1/2" 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'-HDPE	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



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	

DRAFT