

# Specifications

Landfill Leachate Pre-Treatment Plant  
Supply & Install: Equipment & Building  
Roseburg Landfill, Douglas County, Oregon

Prepared for:

Douglas County Public Works Department  
Department, Engineering & Construction Division  
1036 SE Douglas Avenue  
Roseburg, Oregon 97470

**SCS ENGINEERS**

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(Section 01010 Revised on 9/2/2021)

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**SECTION 00800  
SUPPLEMENTARY CONDITIONS**

**PART 1 – INTRODUCTION**

1.01 DESCRIPTION

- A. These Supplementary Conditions amend or supplement the remainder of the specifications of the Contract and other provisions of the Contract Documents as indicated below.

1.02 PRECONSTRUCTION CONFERENCE

- A. A Preconstruction Conference will be held to review the project objectives, site issues, performance standards and project design documents. Details regarding the Preconstruction Conference schedule and location will be coordinated after award of the project.

**PART 2 – PLANS, CONSTRUCTION, OTHER DETAILS**

2.01 CONSTRUCTION DRAWING DETAILS

- A. When reference is made to Drawings in the Technical Specifications, the reference is to the Drawings included under separate cover.

2.02 COORDINATION OF PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS

- A. In case of discrepancy, computed dimensions shall govern over scaled dimensions; supplemental specifications shall govern over Standard Specifications; and Special Provisions shall govern over Drawings, Supplemental and Standard Specifications.

2.03 SUBSTITUTION OF EQUIPMENT

- A. For all major equipment supplied, an affidavit signed by a corporate official must be submitted with the shop drawings stating that the equipment being supplied is equal to or exceeds the requirements of the specifications prepared by the Engineer and that its lifetime performance will be no less than that obtainable from competitive equipment functioning in the same type of application and as manufactured by those companies identified in the specifications by the Engineer.

2.04 NOTICES

- A. All notices or other papers required to be delivered by the Contractor to the Owner shall be delivered to whoever else is designated to receive the specific notices or other papers, as well as delivery shall be made to the office of the OWNER: DOUGLAS COUNTY – SOLID WASTE DEPARTMENT, c/o Gabe Forrester, 1036 SE DOUGLAS AVE – ROOM 304, ROSEBURG, OR 97470 (email: [gjforres@co.douglas.or.us](mailto:gjforres@co.douglas.or.us)), with a copy to: SCS Engineers, c/o Shane Latimer & Sam Cooke, 15940 SW 72<sup>nd</sup> Ave, Portland Oregon, 97224 (email: [slatimer@scsengineers.com](mailto:slatimer@scsengineers.com) and [scooke@scsengineers.com](mailto:scooke@scsengineers.com) )

2.05 BORROW PIT

- A. The on-site soil borrow pit is for Owner use only. All fill soil for the proposed leachate plant and building shall be obtained by the Contractor and brought in from off-site. The

exception to this is that there are some stockpiled soils on-site that have been inspected by the Roseburg Landfill's contracted geotechnical engineer and found to be potentially suitable for use on this project as general fill. Contractor should make their own inspection and evaluate if the stockpiled soils can be used as general fill material with the assumption that all compaction and other requirements will be able to be met if the stockpiled soils are used.

## 2.06 TEMPORARY FACILITIES

- A. The Contractor shall provide a portable rest room and hand-washing station at the project site for use by their workers for the duration of the Work. The Contractor shall be responsible for coordinating and paying for regular servicing of the unit by a licensed sanitation company.
- B. The Contractor shall provide a portable trailer office for his or her own use. Engineer and Owner shall be allowed to use the portable trailer office, when at the site. The Contractor will be responsible for the arrangement and payment of any electrical power hook-up and disconnect, foundation, tie-downs, sanitary service, and removal from the site when the Work is complete.
- C. The Contractor shall be responsible for arranging and paying for any temporary electrical power connection necessary for use during construction.

## 2.07 TIMES OF WORK

- A. The Work on-site shall be conducted only on the days of Monday through Friday, between 7 AM until 6 PM, as well as Saturday from 7 AM to 5 PM. If work on Sunday is desired then written permission should be obtained by the Owner.

## 2.08 LAY DOWN AREA

- A. The Owner shall designate an equipment and materials lay-down area at the project site for the Contractor's use. The Contractor shall be responsible for the management of this area including protecting any equipment and materials from the elements.

## 2.09 EXISTING TREATMENT PLANT OPERATIONS

- A. The existing leachate pumping stations and force mains, 350,000 gallon storage tank, tanker load-out station, and related ancillary structures will continue to operate during the construction of the new Work. The Contractor shall take all precautions necessary to prevent his or her activities from disturbing or otherwise compromising or damaging the integrity and operation of these existing facilities for the duration of the Work and until the new plant is ready to come on-line and the Owner assumes operation of the plant.

## 2.10 DEMOLITION

- A. If pieces of existing equipment, piping, and structures need to be demolished as part of the Work, the Contractor shall demolish and remove the demolished item. Items suitable for recycling or landfill disposal shall be disposed of at the Roseburg Landfill, and other items, such as heavy equipment shall be taken off-site by the Contractor and disposed of or sold in any legal manner.

## 2.11 PERMANENT POWER SUPPLY TO NEW LEACHATE PLANT

- A. The Contractor shall coordinate with the utility company serving the site and arrange a meeting at the site to determine where the new permanent power supply (and power

transformer) to the new leachate plant shall be initiated and the schedule for providing the hook-up. Based on initial contact with Pacific Power representative, Shannon Watson, the electric power service will be from pole B25922/262002, as shown on the drawings.

- B. The Contractor shall coordinate with the Owner on the actual routing of the new buried electrical conduits from the utility hook-up to the new Control Building breaker panels.

### **PART 3 – OWNER’S SAFETY PROGRAMS**

#### **3.01 INTRODUCTION**

- A. The safety and health of all Contractors, customers, and employees of the Douglas County Solid Waste Department is of primary importance. As a result, the prevention of occupationally induced injuries and illnesses will be given precedence over operating productivity whenever necessary.

Our goal is to maintain a safety and health program conforming to all applicable OSHA standards and to lead in safety program management within our industry. To be successful will require Contractor cooperation in all safety and health matters.

- B. As a Contractor you will be required, as part of your contract, to take an active role in their own safety and health program. The following Contractor safety and health requirements, when adhered to, are meant to aid in the safety for Contractor. Additionally, potential damage to equipment and property shall be avoided. It is impossible to document all possible situations or to provide precise guidance for every contingency a Contractor may encounter in the course of their work. Adherence to the rules as written and the desire to apply safe work practices is the responsibility of the Contractor.

#### **3.02 GENERAL REQUIREMENTS**

- A. All Contractor employees shall abide by the appropriate OSHA safety and health rules and regulations at all times.
- B. Contractor and all subcontracted employees are required to sign in and out at the work site. Procedures may differ depending on the part of the work that the Contractor is working on.
- C. Contractor shall have a competent individual in charge at the job site to supervise the job, conduct an adequate accident prevention program, and ensure compliance with OSHA rules.
- D. All accidents or injuries shall be reported immediately to the Owner’s and Engineer’s Project Manager and/or Safety Manager.
- E. Contractor employees are not allowed to enter areas other than the work site, unless it is required for the performance of their job.
- F. The Contractor shall inform the Project Manager of any known hazardous conditions that exist, due to the contract work being done, in areas where the Owner’s or Engineer’s employees may be exposed to the known hazards.
- G. The Contractor shall provide Safety Data Sheets for all containers of hazardous substances brought onto the work site property.

- H. Periodic job site inspections will be conducted by the Owner's and/or Engineer's Project Manager or Safety Manager to ensure that the job is proceeding safely in accordance with safety rules.
- I. Violation of the safety rules is grounds for immediate work stoppage by the Contractor, Owner or Engineer. The site work will be stopped until the unsafe condition can be remedied or the unsafe work practice is corrected. Continued violation of the safety rules and/or persistent unsafe work conditions shall result in termination of the contract work, as determined by the Owner and Engineer.

3.03 STANDARDS OF CONDUCT

- A. Although the health & safety of Contractor's employees is the sole responsibility of the Contractor, the Douglas County Department of Solid Waste has established certain standards to aid in the smooth, safe, and efficient operations of the work. Violation of these standards is considered serious and may lead to termination of the contract. The following are prohibited:
  1. Willful damage to any Departmental property, customer property, or the property of Department employees.
  2. Possession, use, or distribution of alcohol, narcotics, or illegal drugs on Department property.
  3. Possession of firearms, ammunition, concealed weapons, or explosives (unless properly authorized).
  4. Abusive or threatening language, harassment, disrespectful behavior, workplace violence, or interfering with the work of Department employees.
  5. Theft or attempted theft from the Department or Department employees.
  6. Refusal to perform contracted work or refusal to obey instructions.
  7. Sleeping on the job.
  8. Negligence or conduct which could result in injury or damage to property.
  9. Falsification of documents.

3.04 SAFETY PROCEDURES IN AND AROUND THE LANDFILL

- A. It is the Contractor's sole responsibility to provide for all safety functions during the term of their work on the project site. Specification 01016 has been prepared to provide landfill related safety guidance.

3.05 CONTRACTOR SAFETY TRAINING

- A. Place a check by each of the following categories in which one or more of your employees has been trained and provide the completed list to the Owner and Engineer prior to conducting work at the site. It is understood that not all Contractors will have employees who are trained in all of the areas listed.

- \_\_\_ Personal Protective Equipment
- \_\_\_ First Aid and CPR
- \_\_\_ Lockout/Tagout
- \_\_\_ Confined Space Entry
- \_\_\_ Respiratory Protection
- \_\_\_ Hazardous Communication
- \_\_\_ Safety Data Sheets
- \_\_\_ Fire Prevention and Protection
- \_\_\_ Fall Protection
- \_\_\_ Scaffolding

- \_\_\_ Heavy Equipment Training/Certification (includes bulldozer, loader, forklift, excavator, grader, roller, back-hoe, skid steer and other)
- \_\_\_ Welding, Cutting, and Brazing
- \_\_\_ Electrical Safety
- \_\_\_ Trenching/Excavation
- \_\_\_ Other \_\_\_\_\_
- \_\_\_ Other \_\_\_\_\_

NOTE: If the contracting company has ten (10) or more employees, they will be required to present OSHA 300 Logs, at a minimum for the past three calendar years, prior to conducting work at the site.

The Solid Waste Department reserves the right to ask for any training records from the categories that were checked above. The County reserves the right to reject the bid of any firm that cannot document proper safety training as it relates to conducting the work included in the contract.

3.06 CONTRACTOR AGREEMENT TO COMPLY

I, \_\_\_\_\_, a representative of \_\_\_\_\_ do hereby acknowledge that my company has a fully developed health and safety program and a site-specific health and safety plan that applies to the work at the Roseburg Landfill site. As a requirement to conduct work at the Roseburg Landfill site, my company and its employees will comply with all health and safety rules, guidelines and all the written programs as well as verbal instruction which apply to the work being performed.

Signed \_\_\_\_\_  
(Contractor)

Date \_\_\_\_\_

Signed \_\_\_\_\_  
(Contractor)

Date \_\_\_\_\_

To be submitted by Contractor to Owner and Engineer prior to start of work.

**END OF SECTION**

**SECTION 01010  
SUMMARY OF WORK**

**PART 1 – GENERAL**

**1.01 LEACHATE PRE-TREATMENT PLANT SITE AND LIFT STATION WORK COVERED BY CONTRACT DOCUMENTS**

- A. The Work herein is for site development and lift station work to support the leachate membrane bioreactor (MBR) pre-treatment plant. Although there are multiple components that are described in the Specifications and shown on the Drawings, the entire pre-treatment plant, including its sub-systems and complimentary equipment, will need to act in unison seamlessly for the success of the overall system to perform to meet the projected pre-treated leachate effluent concentration standards given below. The Contractor shall warranty and guarantee that the equipment will perform as specified herein.
- B. The major items of Work include, but are not limited to, the supply and installation and/or performance of:
1. Mobilization/Demobilization: Transportation of equipment and materials.
  2. Project Management and Coordination: To include, but not limited to scheduling, budget control, project meetings, road maintenance and dust control, record keeping, temporary office facilities, surveying, preparation of as-built drawings and organize storage areas throughout the Work.
  3. Utility Marking: locate and mark private and public utilities
  4. Site Preparation:
    - a. Site preparation and access improvements, including clearing and grubbing and grading shown on the Drawings or as identified by the Contractor, and approved by Owner, to facilitate access to, or complete, the Work.
    - b. Stripping and stockpiling topsoil
  5. Erosion Controls and Temporary Storm Water Management:
    - a. Installation of initial erosion control measures as shown on the Drawings and per the project Erosion Control Plan.
    - b. Installation of additional erosion control measures required to ensure interim conditions created by the Contractor's sequence of work will comply with the Erosion Control Plan and construction site storm water permit.
    - c. Maintenance of all erosion controls throughout construction and until vegetation is established.
    - d. Removal of erosion controls once restoration is completed and vegetation has been established.
  6. Existing Utility Protection and Relocation
  7. Site Grading: earthwork required to achieve proposed grades to support Leachate Pre-Treatment Building and adjacent areas
  8. Drainage Features: swales, culverts, inlets, riprap and related materials
  9. Retaining Walls and Retaining Wall Design:
    - a. Based on preliminary retaining wall layout shown on the Drawings, prepare a final retaining wall design for Owner and Engineer approval.
    - b. Retaining wall design to be stamped by an Oregon licensed Professional Engineer (P.E.).
  10. Raw Leachate and Treated Leachate Force Mains:
    - a. Trenching, bedding, pipe laying, conduit placement and backfilling
    - b. Cleanouts and leak detection system



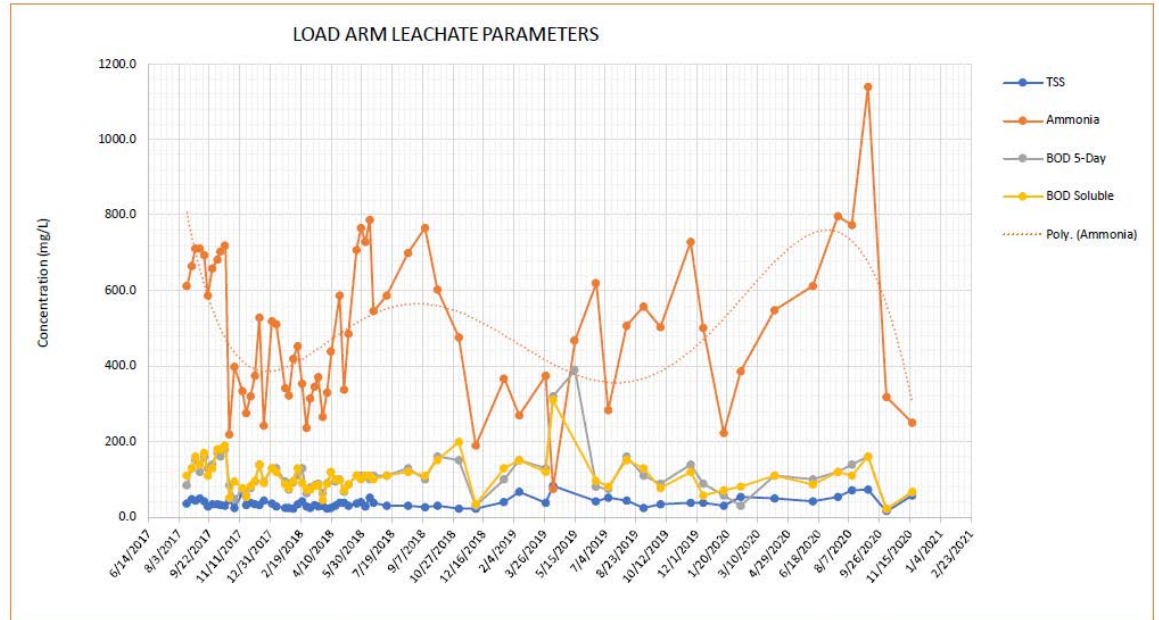
11. Leachate Treatment Supply Lift Station:
  - a. Contractor to provide standard performance and installation specifications for pre-cast concrete vault and access doors with structural and loading data/ratings.
  - b. Pre-cast concrete vault and access door
  - c. Duplex pumping system
  - d. Valves, instruments and controls
  - e. Supply safety and confined space guidelines/signage for concrete vault
12. Treated Leachate Transfer Lift Station:
  - a. Contractor to provide standard performance and installation specifications for pre-cast concrete vault and access doors with structural and loading data/ratings.
  - b. Pre-cast concrete vault and access door
  - c. Duplex pumping system
  - d. Valves, instruments and controls
  - e. Supply safety and confined space guidelines/signage for concrete vault
13. Treated Leachate Load-out Wet Well Lift Station and Vault:
  - a. Contractor to provide standard performance and installation specifications for pre-cast concrete vault and access doors with structural and loading data/ratings.
  - b. Pre-cast concrete wet well and access door
  - c. Flow meter and valve vault with access door
  - d. Duplex pumping system
  - e. Valves, instruments and controls
  - f. Supply safety and confined space guidelines/signage for concrete vault
14. Site Restoration:
  - a. New asphalt pavement and subbase per the Drawings and Specifications
  - b. Restore all existing roads and paved areas to the preconstruction condition or better.
  - c. Restore all disturbed grassed areas using topsoil, fertilizer, seed, and mulch.

## 1.02 LEACHATE PRE-TREATMENT PLANT WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work herein is for the final engineering, equipment supply, construction, start-up and initial operation of a new Leachate Pre-Treatment Plant, including an equipment supply package as well as supply and construction of a pre-treatment building and equipment installation. The Pre-Treatment Plant shall be designed to treat municipal landfill leachate from the Roseburg Landfill, Douglas County (the County or Owner). An existing 350,000-gallon tank will be used for storage of raw leachate prior to the leachate being treated in the new Pre-Treatment Plant. The Work includes the final design as well as supply and installation of the equipment and building to house the new 50,000 gallons per day (GPD) leachate MBR pre-treatment system with aerobic/anoxic treatment for total nitrogen as well as other constituent reduction. The MBR process shall include separate nitrification and denitrification process stages with circulation through an ultrafiltration unit, which will produce an effluent that consistently meets the projected publicly owned treatment works (POTW) standards (see "Pre-Treated Leachate" Concentration (mg/L), below). The pre-treated leachate concentration shall be guaranteed to be met or be lower than the pre-treatment standards, on a daily maximum basis, by the Contractor through a performance guarantee. Contractor shall provide treatment equipment that performs consistently to meet the required leachate treatment specification (if constituent concentrations in the raw leachate are consistent with what is given in the table, below, then constituent concentrations in the effluent must meet or be less than the "Pre-Treated Leachate" requirements in the table, below).

B. Although there are multiple components that are described in the Specifications and shown on the Drawings, the entire Pre-Treatment Plant including its sub-systems and complimentary equipment will need to act in unison seamlessly for the success of the overall system to perform to meet the projected pre-treated leachate effluent concentration standards given below. Contractor shall warranty and guarantee that the equipment will perform as specified herein.

C. Graphical representation of key equalized raw leachate constituents:



D. The raw un-treated leachate influent flow rate, pH and constituent concentration ranges as well as the projected pre-treated leachate effluent concentration POTW standards are as follows (Daily Maximums – POTWs have not provided their final pre-treatment requirements):

Leachate Constituents	Un-treated Leachate	Pre-treated Leachate
Ammonia	100 to 1,150 mg/L	<15 mg/L
Total Kjeldahl Nitrogen	110 to 1,240 mg/L	<25 mg/L
Total Nitrogen	1,250 mg/L	<40 mg/L
Biochemical Oxygen Demand (BOD)	30 to 400 mg/L	<100 mg/L
Chemical Oxygen Demand (COD)	80 to 1,620 mg/L	N/A
Total Suspended Solids (TSS)	30 to 100 mg/L	<30 mg/L
Total Dissolved Solids (TDS)	600 to 3,800 mg/L	N/A
Chloride	25 to 200 mg/L	N/A
pH (in standard units)	6.6 to 8.5	6.0 – 9.5
Alkalinity	880 to 2,800 mg/L	N/A
Temperature (°F, Min/Max)	60 to 75	N/A
Flow Rate (GPD, Equalized)	50,000	
<b>Definitions:</b>		
<b>Un-treated Leachate:</b> Raw leachate with high concentrations from 500K Equalization Tank		
<b>Pre-treated Leachate:</b> Leachate processed through treatment plant with low concentrations		

E. Each bidder is required to meet the performance standards for flow rate and leachate constituent concentration reductions through process treatment equipment specifically designed to reduce the un-treated leachate constituent concentrations to be equal to or

less than the pre-treated leachate constituent concentrations in 1.02 D, above. Because there are as many different configurations and equipment/tank sizes for membrane bioreactor systems as there are different equipment suppliers, the specific sizing, dimensions, size/location of tank openings, etc. for the anoxic and aerobic bioreactor tanks, as well as other equipment and tanks are left to each of the bidders to develop with the requirement that the leachate pre-treatment plant flow rate and leachate constituent concentration reductions are met. To allow a leachate treatment plant to be designed, Douglas County had to make certain assumptions based on historic and projected landfill leachate flow rate and constituent concentrations. Both the “untreated leachate” and “pre-treated” constituent concentrations are assumed to be the basis of the Contractor’s complete leachate pre-treatment plant’s ability to consistently meet (or be less than) the performance standard. If the “untreated leachate” constituent concentrations are different from what is listed in the specifications, at the time of the performance standard testing or otherwise, that will be considered to be unusual and unexpected and will need to be taken into account by Douglas County, when evaluating the performance standard test acceptance and long-term performance of the pre-treatment plant.

- F. The major items of Work for the Leachate Pre-Treatment Plant include, but are not limited to, the supply and installation of a new 50,000 GPD MBR leachate pre-treatment plant providing nitrification and denitrification for total nitrogen and other constituent concentration reduction as well as utilizing ultrafiltration membrane technology. The pre-treatment plant includes, but is not limited to, supplying and installing equipment, systems and controls necessary for the Contractor to meet the pre-treated leachate performance guarantee for concentrations of constituents measured by a third-party laboratory (shown in the “Pre-treated Leachate” column in the table, above). Any changes from what is specified below shall be approved by the Owner and Engineer:
1. **Leachate Treatment Supply Tank** – 30,000-gallon tank, located in the new Leachate Pre-Treatment Building, to accept raw leachate flow from the leachate treatment supply lift station.
  2. **Leachate Treatment Supply Pumps** - Two leachate treatment supply pumps with controls located in the new Leachate Pre-Treatment Building.
  3. **Self-Cleaning Strainer** – One automatic self-cleaning strainer at leachate treatment supply pumps discharge.
  4. **Anoxic Bioreactor Tank** – One anoxic bioreactor tank and controls with internal agitator. Access stairs, walkway platforms and lighting. Options shall be given for Aquastore Glass Fused tank or stainless steel tank.
  5. **Aerobic Bioreactor Tank** - One aerobic bioreactor tank and controls for the internal aeration of leachate. Access stairs, walkway platforms and lighting. Options shall be given for Aquastore Glass Fused tank or stainless steel tank.
  6. **Chemical Storage and metering Pumps** - Five different chemicals, as a minimum, for MBR operation (sodium hydroxide, phosphoric acid, antifoam, micro-nutrients and carbon source).
  7. **Return Activated Sludge (RAS) Circulation Pumps** - Two return activated sludge circulation pumps.
  8. **Internal Mixed Liquor Recycle (IMLR) Pumps** - Two mixed liquor recycle pumps to circulate mixed liquor from the aerobic tank to the anoxic tank.
  9. **Positive Displacement Aeration Blowers** – Two positive displacement aeration blowers and fine bubble aeration diffusers or jet aeration pump installed in the aerobic bioreactor tank.
  10. **pH Monitor/Controls** – One pH monitoring and control system to control pH of leachate in the bioreactor tank(s).

11. **Leachate Heating/Cooling Unit** – One heater/cooler with heat exchanger and other equipment for maintaining leachate temperature in the aerobic bioreactor tank.
12. **Ultrafiltration Membrane** – Ultrafilter (UF) membranes with pump system and automatic clean in place (CIP) system, including CIP chemical pumps and storage.
13. **UF Permeate Storage Tank** – One tank for storage of the pre-treated leachate prior to discharge and/or for optional reverse osmosis treatment.
14. **Waste Activated Sludge Storage Tank** – One 5,000-gallon tank for strainer backwash and MBR waste sludge storage. Option shall be given for Sludge Dewatering System.
15. **MBR and Related System Controls** – Various monitoring and controls for pumps (including variable frequency drives (VFDs)), flow monitoring, tank/vault level control, pressure monitoring, temperature control, pH control, dissolved oxygen monitoring for aeration blower control, ammonia monitoring (influent and effluent), turbidity monitoring (UF permeate), automated CIP system for UF.
16. **Non-Potable Water Supply System** – One 3,000-gallon water supply tank with booster pump, pressure tank, water softener, heater and UV disinfection system. Water for this tank will be delivered by tanker truck by Owner from the closest City water hydrant on McLain Avenue.
17. **CIP Waste Neutralization Tank** – One 1,000-gallon tank for storage and manually neutralizing membrane CIP waste (spent sodium hypochlorite and acid wastewaters).
18. **Foam Wasting Tank** – One 1,000-gallon tank for storage and dissolving of collected foam and submersible pump to pump liquid back to waste activated sludge tank.
19. **Air Compressor** – One air compressor with adequate CFM and operating pressure (e.g., 30 to 40 CFM @ 100 psi) for normal plant use.
20. **Option - Reverse Osmosis (RO) System** – Owner shall have the option to procure one two-stage RO polishing system with high pressure supply pumps, membranes, automatic CIP or other cleaning system (including CIP chemical pumps and storage), re-mineralization system and concentrate storage.
21. **Treated Leachate Effluent Tank** – One 50,000-gallon tank for storage of the treated leachate prior to pumping to the Treated Leachate Load-out Wet Well.
22. **Pre-Treatment System Start up** – As needed inoculation/seeding of the leachate pre-treatment system and a minimum of two weeks of initial leachate pre-treatment equipment commissioning with Douglas County operator training.
23. **Pre-Treatment System Operation** – A minimum of two additional months of treatment system operation support after initial two weeks of start-up with option for extension of additional operation support.
24. **Pre-Engineered Steel Building** - One new 60 ft W x 80 ft L x 29 ft H, 4,800 square foot, pre-engineered steel building (i.e., the Pretreatment Building) to house the MBR pre-treatment system, optional/future reverse osmosis polish, main motor controls center (MCC), office/laboratory, storage and all other specified equipment, including but not limited to:
  - **Doors and Windows** – One overhead door, four personnel doors and eight windows, as shown on the Drawings.
  - **Office** – One office area separated from remainder of the Pre-Treatment Building.
  - **Laboratory Area** – One laboratory area included within the office area.
  - **HVAC Systems for Office and Laboratory**- Heating, cooling and ventilation system.
  - **HVAC System for Main Control Building** – Heating and ventilation/exhaust (no cooling).
  - **Electrical Power Feed** - An electrical power feed system including connection from the existing Pacific Power utility pole primary service with

new buried service to a new pad-mounted transformer. All buried exterior electrical conduits, and aboveground conduits and wiring to serve the Pre-Treatment Building and pre-treatment plant electrical distribution system.

- **Electrical Distribution System** - An electrical distribution system motor control center and electrical wiring to serve the Pre-Treatment Building including the lighting, new leachate pre-treatment system, HVAC systems, and various other devices associated with the leachate Pre-Treatment Plant (e.g., supply pumps, circulation pumps, aeration blowers, etc.).
  - **Lighting** – All interior and exterior LED lighting of the Pre-Treatment Building.
  - **Plumbing** - A plumbing system for the Pre-Treatment Building including non-potable water storage and supply piping to hose bibbs throughout the building, vacuum breakers, chemical safety shower, eye wash station and a floor drain system with trench floor drains connected to four floor sumps and automatic submersible pumps.
  - **Process Piping** – Supply and installation of all process piping including, but not limited to: pump/tank connections, manual and control valves, sample ports, pH control system, UF unit with CIP system connections, interconnections between bioreactor and all other pumps/tanks and other process piping mounted controls.
25. **Installation of Equipment** – All equipment shall be installed in accordance with usual and customary industrial standards including: pumps/motors mounted on steel frames, raised pump/motor foundations with vibration dampening, securing all pumps and motors following manufacturer’s instructions.
26. **Supply and Install Exhaust Hood** - An exhaust fume hood rated for chemical laboratory use (resistant to corrosives).
27. **Supply and Install Controls** - A complete set of controls to provide for pumps, leachate heater and other devices associated with the Leachate Pre-Treatment Building and the leachate pre-treatment system.
28. **Supply and Install Connection for Emergency Generator** - Automatic controls, transfer switch, and plug-in for a rental emergency power generator. The generator itself is not part of the Work. Plug-in to be located on outside wall adjacent to the motor control center.
29. **Shelving and Work Benches** - Industrial shelving and work benches for the Leachate Pre-Treatment Building.
30. **Indoor Air Monitoring System** - In addition to smoke detectors and carbon monoxide detectors, wired to the PLC to communicate alarm conditions, there will be a building methane detection sensor and detection equipment with alarm for sensing the presence of methane within the pre-treatment building. This is due to the close proximity to the landfill limit of waste.
31. Contractor shall be aware of the nature of the activities at the Roseburg Landfill which may restrict access to the portions of the site due to general landfill operations.

### 1.03 PROCESS EQUIPMENT AND CONTROLS

- A. The proposed MBR pre-treatment system described below was prepared to provide a description of the pre-treatment equipment and controls included on the P1 - Process Flow Diagram. The description is meant to be a guide for the final process design to be provided by the Contractor.
- B. It is the responsibility of the Contractor to provide their own design of the MBR treatment system equipment to meet or exceed the pre-treatment system performance guarantee and the Contractor will show how that equipment should be laid out and fully installed

within the proposed Pre-Treatment Building, including final process/plumbing design, electrical/control design, mechanical design, HVAC design, etc.

- C. To assist the Contractor with creating their own design of the pre-treatment system equipment, the following narrative provides information regarding the proposed control strategy and flow of leachate from the existing leachate collection system and equalization tank, already located at the landfill, through the proposed pre-treatment system and then out the existing tanker truck load out station, as shown on P1 – Process Flow Diagram. The process controls included in the narrative, below, are not the final description of the overall process control strategy but they provide guidance regarding what is expected for the final process controls. A complete and well controlled MBR pre-treatment system and support equipment shall be provided by the Contractor.
1. Raw leachate from the closed main landfill and the expansion landfill collection systems flows to Pump Vault No. 1 (PV-1) and is then pumped to the existing 350,000-gallon Leachate Storage/Equalization Tank. The Leachate Storage/Equalization Tank has existing level indication and controls that will need to be tied into the new pre-treatment control system.
  2. The raw leachate from the existing Leachate Storage/Equalization Tank follows this progression to reach the proposed pre-treatment system for treatment:
    - a. New piping connections and valves are required to transfer the leachate from the existing Leachate Storage/Equalization Tank to the two new Leachate Treatment Supply Pumps, that are arranged in parallel and are operated individually (to be scheduled to switch operation on a daily basis). The Leachate Treatment Supply Pumps flow rate and pressure will be monitored.
    - b. The new Leachate Treatment Supply Pumps discharge to new 3-inch diameter SDR 17 HDPE piping and valves, contained within 6-inch diameter SDR 17 HDPE piping buried at least 2 feet deep. The new piping will be installed to travel parallel to the south side of the Landfill Access Road. Two new cleanout access manholes will be installed at appropriate distances along the new piping. Leak detection will be monitored in both manholes.
    - c. The new raw leachate transfer piping will deliver leachate to the new Leachate Treatment Supply Tank located within the pre-treatment system building. If the Leachate Treatment Supply Tank level controls indicate that the tank is full, the Leachate Treatment Supply Pumps will not be able to operate. If not full, then leachate will be able to be pumped to the Leachate Treatment Supply Tank.
  3. The leachate within the new Leachate Treatment Supply Tank will be pumped to the Anoxic Bioreactor Tank for denitrification using the two new Leachate Treatment Supply Pumps arranged in parallel and are operated individually (to be scheduled to switch operation on a daily basis). Flow rate of the discharge from the Leachate Treatment Supply Pumps shall be monitored. Leachate discharging the pumps passes through a new Self-Cleaning Strainer (straining to 2mm size) to remove larger debris from the leachate prior to the bioreactor tanks. Pressure drop across the strainer will be monitored and if too high will shut down the Leachate Treatment Supply Pumps in the Pre-Treatment Building. The Leachate Treatment Supply Pumps will also be controlled based on the level in the Anoxic Bioreactor Tank. Additional carbon will be added to the Anoxic Bioreactor Tank, as needed to maintain the microbe population food supply if the biochemical oxygen demand is not sufficient to provide adequate denitrification. Carbon source (e.g., methanol, glycerol, acetic acid or other carbon source) will need to be pumped into either the Anoxic Bioreactor Tank and/or Aerobic Bioreactor Tank, depending on the Contractor's final design. Temperature will be monitored in both bioreactor tanks and temperature control is accomplished

- using a heating and cooling system for the return activated sludge or other method, to be determined by the Contractor (see further details, below).
4. The leachate that is in the Anoxic Bioreactor Tank will overflow to the Aerobic Bioreactor Tank for aeration from two new Positive Displacement Blowers for nitrification (for ammonia and organics reduction) before being pumped out of the Aerobic Bioreactor Tank one of two ways: 1) Two new internal mixed liquor recycle (IMLR) Pumps, with flow rate measured, are arranged in parallel and operated individually (to be scheduled to switch operation on a daily basis), that pump leachate back to the Anoxic Bioreactor Tank, and 2) Two new Leachate Return Activated Sludge (RAS) Circulation Pumps, with flow rate measured are arranged in parallel and are operated individually (to be scheduled to switch operation on a daily basis), that pump leachate through the new Ultrafiltration Membranes unit. The pH in the Aerobic Bioreactor Tank will be monitored and controlled through a new system provided by the Contractor as part of the complete treatment system. At a minimum, sodium hydroxide (for alkalinity/pH control) as well as carbon source, micro-nutrients, antifoam, phosphoric acid for optimal phosphate will all be stored and pumped to one or the other bioreactor tank(s) to optimize the treatment system performance, based on the Contractor's final design. Dissolved oxygen (DO) will be measured with a DO sensor and the Positive Displacement Aeration Blowers will be controlled for the addition of air into the Aerobic Bioreactor Tank so that optimal concentrations of oxygen can be maintained for proper nitrification of the leachate and air flow rate will be measured. Either fine bubble aeration diffusers or jet pump aeration will be used to create the aeration in the Aerobic Bioreactor Tank.
  5. The Leachate RAS Circulation Pumps will serve three functions: 1) To pump out treated leachate and activated sludge from the Aerobic Bioreactor Tank in order to send it to the Ultrafiltration Membrane unit where the return activated sludge is returned to the Aerobic Bioreactor Tank, 2) To pump out treated leachate and activated sludge from the Aerobic Bioreactor Tank in order to send it to the Ultrafiltration Membrane unit where the treated leachate permeates through the ultrafilter membrane (Note: A separate permeate storage tank and pumps are not shown, but may be required in order to have the permeate make it to the new 50,000-gallon Treated Leachate Effluent Storage Tank, based on the Contractor's final process design), and 3) To waste sludge from the return activated sludge solids stream to the Waste Activated Sludge Storage Tank, will be controlled by the operator based on the desired sludge age of the MBR system operation. Waste sludge will be removed from the storage tank by a County provided tanker truck that will dispose of the sludge in a manner consistent with Roseburg Landfill's requirements.
  6. The ultrafiltration membrane unit will operate as part of the MBR treatment train provided in 1.03 C3, 4 and 5, above, and will be controlled based on pressure and flux rate across the membranes so that at high pressure and low flux rate, the Ultrafiltration Membrane unit will alarm, indicating the need for membrane cleaning. The Ultrafiltration Membrane unit will also have an automated clean-in-place (CIP) system for proper operation and maintenance (O&M) of the Ultrafiltration Membrane. CIP waste will be collected in the new CIP Waste Neutralization Tank and after neutralizing to an acceptable pH, the waste will be removed from the storage tank by a County provided tanker truck that will condition and/or dispose of the sludge in a manner consistent with Roseburg Landfill's requirements. The permeate that passes through the Ultrafiltration Membrane unit, as treated leachate, will be monitored for turbidity so that membrane damage can be checked. The permeate will flow into the Treated Leachate Effluent Storage Tank either directly from the Ultrafiltration Membrane unit or from a separate permeate storage tank and pumps (NOTE: A separate permeate storage tank and pumps are shown, but may not be required in order to have the permeate make it to the new 50,000-gallon Treated Leachate Effluent

Storage Tank). The need for the separate permeate storage tank will be determined by the Contractor.

7. To operate the MBR within the proper temperature range, either the RAS discharge from the Ultrafiltration Membrane unit will flow through a system designed to heat and cool the RAS (as either heating or cooling is needed) or a different method of temperature control, to be determined by the Contractor. Temperature of the RAS (or other stream to accomplish the same intended temperature control) will be monitored upstream of the leachate temperature control unit to determine if heating or cooling of the leachate is required.
8. Treated leachate from the MBR pre-treatment system will ultimately end up in the new 50,000-gallon Treated Leachate Effluent Storage Tank. The treated leachate ammonia concentration will be monitored in the permeate discharge pipe flowing to the Treated Leachate Effluent Storage Tank and if ammonia is too high an alarm will be given so that a decision can be made regarding process control changes and/or re-treatment of the treated leachate.
  - a. Treated leachate will be pumped from the Treated Leachate Effluent Storage Tank by two new Treated Leachate Transfer Pumps, located outside of the pre-treatment building in a separate pump vault. These pumps are arranged in parallel and are operated individually (to be scheduled to switch operation on a daily basis). If the Treated Leachate Effluent Storage Tank is full, then no additional permeate will be allowed to flow through the Ultrafiltration Membrane unit until the tank level decreases sufficiently.
  - b. The effluent from the Treated Leachate Transfer Pumps discharges to a new 3-inch diameter SDR 17 HDPE piping and valves, contained within 6-inch diameter SDR 17 HDPE piping buried at least 2 feet deep. The new treated leachate piping will be installed to exit the new pre-treatment facility area and travel parallel to the south side of the Landfill Access Road immediately adjacent to the raw leachate transfer piping. The same two new cleanout access manholes, installed south of the Landfill Access Road, that are utilized by the raw leachate transfer piping will be used for the treated leachate transfer piping too.
  - c. The new treated leachate transfer piping will deliver treated leachate to the new below ground 6,000-gallon (working volume) Treated Leachate Load Out Wet Well and Lift Station, located close to the existing 350,000-gallon Leachate Equalization/Storage Tank. If the Treated Leachate Loadout Wet Well and Lift Station level controls indicate that the wet well is full, the Treated Leachate Transfer Pumps will not be able to operate. If not full, then treated leachate will be able to be pumped to the Treated Leachate Loadout Wet Well and Lift Station.
  - d. When a treated leachate tanker truck is ready to haul away treated leachate for disposal, the Treated Leachate Loadout Wet Well and Lift Station Pumps will be used, as controlled by the truck driver from the controls in the Existing Tanker Truck Loadout Station.

#### 1.04 WORK BY OTHERS

- A. Work may be conducted at or near the site by other contractors and/or Douglas County staff during the performance of the work under this contract. The Contractor shall conduct its operations to minimize interference of other contractors or staff, and shall cooperate fully with such individuals and the project representatives to provide continued safe access to perform their respective contracts and duties. The following work will be performed by other contractors or staff during the contract period for this contract:
  1. Active transport of municipal solid waste (MSW) refuse into the landfill for disposal.



2. Leachate hauling/disposal from existing 350,000-gallon tank and existing tanker truck load-out station.
3. Operation and maintenance of the existing leachate collection, storage and pumping equipment.
4. Landfill gas to energy operation at the neighboring building.
5. Landfill disposal cell maintenance and other landfill related work.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**END OF SECTION**

**SECTION 01016  
SAFETY REQUIREMENTS AND PROTECTION OF PROPERTY**

**PART 1 – GENERAL**

1.01 HEALTH AND SAFETY CONSIDERATIONS

- A. The site is a landfill and there may be potential threats to worker health associated with the landfill. The Contractor is solely and completely responsible for coordinating with the appropriate landfill personnel to identify the landfill's potential health and safety threats, then disseminating the information to their workforce.
- B. Contractor is solely and completely responsible for their health and safety program, as set forth in Article 19; "Protection of Persons and Property," of the Agreement. This requirement applies continuously for the duration of the Contract. The Owner, Engineer, and their representatives are not responsible for safety.
- C. Employ a person who is qualified and experienced in construction safety, whose prime responsibility will be accident prevention during construction. Such person(s) shall be at the work site and be authorized to supervise and enforce compliance with the Health and Safety Plan.
- D. Provide all equipment required to implement the Health and Safety Plan.

1.02 HEALTH AND SAFETY PLAN

- A. Develop and implement in accordance with the Agreement, OSHA regulations, 29 CFR 1910, 29 CFR 1926, and any other applicable federal, state or local regulations. At a minimum, the plan shall address the items listed below as well as any additional items required by site-specific project conditions and/or local, state, and federal regulations.
  - 1. Key Personnel and on-site Competent Person.
  - 2. Comprehensive workplan.
  - 3. Hazard analysis for each site task.
  - 4. Employee training.
  - 5. Personal protective equipment.
  - 6. Medical surveillance.
  - 7. Frequency and types of air monitoring, personnel monitoring and environmental sampling techniques and instrumentation to be used.
  - 8. Site control measures.
  - 9. Decontamination procedures.
  - 10. Emergency response plan.
  - 11. Spill containment program.

1.03 EXCAVATION SAFETY

- A. Maintain a temporary barrier (i.e., orange plastic fencing) around excavation at all times while open to restrict access.

1.04 SAFETY PROCEDURES IN AND AROUND THE LANDFILL

It is the Contractor's responsibility to provide for all safety functions during the term of their work on the project site.

- A. All Work conducted in and around landfills shall be done in accordance with State and local requirements and OSHA Safety and Health Standards 29 CFR and shall conform to

the Landfill Gas Division of the Solid Waste Association of North America (SWANA) A Compilation of Landfill Gas Field Practices and Procedures dated August, 2011.

Additionally, for construction near a known landfill area, the following steps should be taken to prevent injury:

1. A combustible gas and H<sub>2</sub>S indicator must be utilized at all times during trenching and drilling, or when construction occurs within 10 feet of an open excavation.
  2. When trenching or drilling deeper than 2 feet into any waste and in the presence of detectable concentrations of methane, the waste or other fill material is to be wetted and the operating equipment used in the presence of waste or detectable concentrations of methane shall be provided with spark-proof exhausts.
  3. Foam fire extinguishers shall be provided on all equipment working in the landfill.
  4. Personnel within or near an open trench or drill hole shall:
    - a. be fully clothed
    - b. wear shoes with non-metallic soles
    - c. wear a hard hat and safety goggles or glasses
  5. Exhaust blowers shall be on hand to be used in cases where trenches may show a build-up of methane or lack of oxygen.
  6. Smoking is not permitted in any area within 500 feet of the excavation and only in designated smoking areas or off site.
  7. An attempt should be made to keep personnel away from the downwind proximity of any open trench, unless the trench is constantly monitored and declared safe.
  8. The operator of trenching equipment within an area where waste or where methane is detected, should wear an organic vapor and acid gas respirator while operating the equipment in or astride any trench.
  9. Before personnel are permitted to enter an open trench, the trench should be carefully monitored for methane, H<sub>2</sub>S and oxygen sufficiency. The personnel should also be provided with a continuous methane and oxygen monitor in their work area as long as they are in the excavation.
- B. For construction near (within 1,000 feet) of a known landfill area, the following safety precautions should be taken:
1. The areas under construction must be checked with a combustible gas and H<sub>2</sub>S indicator before and during excavation to determine if methane or H<sub>2</sub>S gas is in the area.
  2. Any excavations must be monitored for methane, H<sub>2</sub>S and oxygen deficiency if personnel are to be sent in. This must be carried out continuously, unless the presence of methane, H<sub>2</sub>S and oxygen deficiency in the area can definitely be ruled out.
  3. Should methane gas be found in the area, those precautions applicable to digging in the landfill shall also apply to this situation.

#### 1.05 ACCIDENT REPORTS

- A. Contractor shall adhere to the County's accident reporting procedures. If serious injury or damage occurs, the accident shall be reported immediately by telephone or messenger to the Engineer and to appropriate local authorities. In addition, the Contractor must promptly report in writing to the Engineer all accidents occurring in connection with the Work, giving full details, names, and statements of witnesses.
- B. If a claim is made by anyone against the Contractor or any Subcontractor resulting from an accident, the Contractor shall promptly report the facts in writing to the Engineer and Owner, giving full details of the claim, including investigation and restitution.

- C. In addition, a summary report shall be made to the Engineer with each Payment Application which shall indicate the date, time, name of the injured, details of the accident and current status.

#### 1.06 COMPLAINTS

- A. All complaints received by the Contractor shall be reported to the Engineer and Owner no later than the working day following receipt thereof. Such reports shall include the name, address, date, time received, date and time of action complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Each complaint shall be assigned a separate number, and all complaints shall be numbered consecutively in order of receipt. In the event that more than one complaint is received from the same complainant, each latter complaint shall show all previous complaint numbers registered by the same complainant.
- B. In addition, a summary report shall be made to the Engineer with each Payment Application which shall indicate the date, time, and name of the person investigating the complaint and the amount of damages claimed (or estimate thereof), including the amount of settlement, if any.
- C. When settlement of a claim is made, the Engineer and Owner shall be furnished with a copy of the release of claim by the claimant. The Engineer shall be notified immediately, throughout the statutory period of liability, of any formal claims or demands made by attorneys on behalf of claimants; of the serving of notice, summons, subpoena, or other legal documents incidental to litigation; and for any out-of-court settlement or court verdicts resulting from litigation.

#### 1.07 FIRE PREVENTION AND PROTECTION

- A. Execute all Work in a fire-safe manner. Supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. Comply with applicable fire-prevention laws. Where these laws do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.

#### 1.08 SECURITY

- A. If the Contractor deems it necessary to employ watchmen to safeguard the Work, equipment, or the public, employ only licensed and uniformed watchmen, physically capable of adequately patrolling the entire work area.

#### 1.09 PROTECTION OF PROPERTY

- A. Employ such means and methods as necessary to adequately protect all property against damage. In the event of damage to such property, immediately restore the property to a condition at least equal to its original condition and to the satisfaction of the Owner, at Contractor's expense.

#### 1.10 SITE RESTORATION AND CLEANUP

- A. At all times during the Work, keep the premises clean and orderly; and upon completion of the Work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.
- B. Stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, shrubbery, or fences; remove all excavated materials from grassed

and planted areas and leave these surfaces in a condition equivalent to their original condition.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION (NOT USED)**

**PART 4 – MEASUREMENT AND PAYMENT**

- A. Work covered by this Section is incidental to the project or as identified in other Sections.

**END OF SECTION**

**SECTION 01665  
TESTING OF PIPELINES**

**PART 1 – GENERAL**

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, tools, equipment and related items required to perform integrity and leakage tests of all piping systems with varying materials.

**PART 2 – PRODUCTS (NOT USED)**

**PART 3 – EXECUTION**

3.01 GENERAL

- A. The entire length of all pipelines shall be field-tested.
- B. Notify Engineer at least 24 hours prior to the start of any test.
- C. Repair any leaks discovered during testing. Repair all known and visible leaks whether or not the leakage rate is within allowable limits.

3.02 TEST PROCEDURES – All non-HDPE Piping

- A. Manufacturer's pipeline testing procedures can be followed, if approved by Engineer and allowed by appropriate inspection personnel for permit compliance (if applicable). The manufacturers may have ultrasonic testing recommendations along with their installation guidelines. If manufacturer's pipeline testing procedures are not provided then the test procedures specified below shall be implemented.
- B. Disconnect all items connected to the pipeline system that might be damaged if subjected to the specified test pressure and plug or cap ends during the test procedures. Repair or replace items that are damaged during the testing procedure at no expense to the Owner.
- C. Segment all pipelines by capping, plugging, or closing of valves. Plastic pipelines shall be tested at 60 psi air pressure.
- D. Provide adequate gauges with pressure testing equipment to indicate the internal pipe pressure during the test.
- E. The test shall be conducted for a period of 2 hours, during which the pressure shall not drop more than 5 psi of the specified test pressure.

3.03 TEST PROCEDURES – HDPE Piping

- A. Manufacturer's pipeline testing procedures can be followed, if approved by Engineer and allowed by appropriate inspection personnel for permit compliance (if applicable). The manufacturers may have ultrasonic testing recommendations along with their installation guidelines. If manufacturer's pipeline testing procedures are not provided then the test procedures specified below shall be implemented.
- B. Pressure test the HDPE pressure pipe using water in accordance with ASTM F2164. Do not exceed the pressure rating of the lowest pressure-rated component in the test section. The minimum test requirements include:

1. Test at a pressure equivalent to 50 percent above normal operating pressure (e.g., 140 psi operating pressure for 4-inch pipe and 100 psi operating pressure for 6-inch pipe). Do not exceed the design pressure (e.g., 220 psi for 4-inch pipe and 200 psi for 6-inch pipe).
  2. Add makeup water as necessary to maintain maximum test pressure for 4 hours.
  3. Reduce test pressure by 10 psi and monitor pressure for 1 hour. Do not increase pressure or add makeup water.
- C. Test is passing if no leakage is observed and pressure during test phase remains steady (within 5 percent of test phase pressure) for 1-hour test phase.
- D. Repair any visible leaks or piping failing the test and re-test.

**END OF SECTION**

**SECTION 02215  
SITE PREPARATION**

**PART 1 – GENERAL**

1.01 SUMMARY

- A. Preparation.
- B. Existing utilities.
- C. Clearing and grubbing.
- D. Stripping and stockpiling topsoil.

1.02 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled, or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site at the Contractor's expense.

1.03 PROJECT CONDITIONS

- A. The Work is being conducted at a landfill and some of the excavation and grading activities will take place close to the limit of waste, as shown on the drawings. It is also possible that the limit of waste shown on the drawings varies from what is present in the field. Therefore, there is the potential to encounter waste during site preparation and excavation activities.
- B. Traffic: Minimize interference with landfill operations, adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  - 1. Do not close or obstruct access road to site without permission from Owner and coordination with other site contractors.
  - 2. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  - 3. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
  - 4. Provide traffic control as required.
- C. Do not commence ground disturbing construction activities until temporary erosion- and sedimentation-control measures are in place.

1.04 REFERENCES

- A. State of Oregon Department of Transportation (ODOT):
  - 1. Oregon Standard Specifications for Construction, latest edition.

**PART 2 – PRODUCTS (NOT USED)**



## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- A. Protect and maintain benchmarks and survey control points from disturbance during construction. Identify existing benchmarks that will interfere with construction to Owner. Contractor to install additional benchmarks as needed to complete the Work.
- B. Protect existing site improvements, including but not limited to existing subsurface utilities, existing buried and above ground piping, existing facilities at the 350,000 gallon tank and tanker truck loadout areas, to remain from damage during construction.
  - 1. Avoid damaging improvements identified by Owner to remain intact.
  - 2. Restore any damaged improvements to their original condition, as acceptable to Owner.

### **3.02 EXISTING UTILITIES**

- A. Locate, identify, and mark all existing utilities in the project area, particularly all existing underground utilities.
- B. If the existing utility location is not known, use hydro-excavation, hand-digging and/or other methods to reveal the utility location as required to not damage utility.

### **3.03 CLEARING AND GRUBBING**

- A. Remove obstructions, trees, stumps, shrubs, and other vegetation to permit installation of new construction. Perform clearing and grubbing in accordance with ODOT Specification Section 00320.

### **3.04 TOPSOIL STRIPPING**

- A. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.
- B. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Maintain to prevent windblown dust and erosion by water.

**END OF SECTION**

**SECTION 02230  
EARTHWORK, TRENCHING, BACKFILLING, AND COMPACTION**

**PART 1 – GENERAL**

1.01 DESCRIPTION

A. Section includes:

1. Excavating, providing, placing, compacting, grading, and restoration of earthen materials grading.
2. Trenching, backfilling, and compacting of earthen materials for underground utility installation.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
2. ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depths).

B. Oregon Department of Transportation (ODOT):

1. Oregon Standard Specifications for Construction, latest edition.

C. Douglas County Public Works Department:

1. Specifications for Right-of-Way Activities, latest edition.

1.03 SUBMITTALS

A. Bedding material sieve analysis.

B. Coarse aggregate base course sieve analysis and modified Proctor analysis.

C. Structural fill sieve analysis and modified Proctor analysis.

D. Asphalt concrete pavement mix design.

E. Seed mix and fertilizer.

F. Retaining wall design.

**PART 2 – PRODUCTS**

2.01 BACKFILL MATERIAL

A. Bedding Material:

1. Conform to ODOT Specification Section 02630.11 Open-Graded Aggregate.

- B. Crushed Aggregate Base Course:
  - 1. Conform to ODOT Specification Section 02630.10 Dense-Graded Aggregate, 1"-0.
- C. General Fill:
  - 1. Soil excavated from the trench that is free of objects greater than 3 inches in diameter, frozen material, foreign materials, organics, peat, and free liquids.
- D. Structural Fill:
  - 1. On-site soils or imported granular fill for use below proposed Leachate Pre-Treatment Building and pavement.
  - 2. Maximum particle size of 6-inches in any dimension, with upper 3-feet free of material greater than 3-inches in any dimension.
  - 3. Compacted to a minimum of 95 percent of the modified Proctor maximum dry density at a moisture content within 3 percent of the modified Proctor optimum moisture content.

2.02 RIPRAP

- A. Riprap shall meet the requirements of ODOT Standard Specifications Section 00390, Class 100 Riprap.

2.03 RIPRAP GEOTEXTILE

- A. Riprap geotextile shall meet the requirements of ODOT Standard Specifications Section 02320, Table 02320-2, Type 2.

2.04 ASPHALT PAVING

- A. Binder and surface courses: conform to ODOT Standard Specifications Section 00744, Asphalt Concrete Pavement, Level 3 ACP. Where saw cut in the site road, binder and surface courses thickness shall match the existing asphalt.

2.05 TOPSOIL, SEED, AND FERTILIZER

- A. Topsoil:
  - 1. Natural silty clay loam soils available from the overlying portions of the trenching and grading areas.

- B. Seed Mixture:

1. Swale Bottom Seed Mix:		
	<u>Botanical Name</u>	<u>Common Name</u> <u>Percent by Weight</u>
	Hordeum brachyantherum	meadow barley      30
	Agrostis exarata	spike bentgrass      15
	Glyceria occidentalis	western mannagrass      10
	Alopecurus geniculatus	water foxtail      10
	Beckmannia syzigachne	American sloughgrass      10
	Elymus glaucus	blue wildrye      10
	Deschampsia caespitosa	tufted hairgrass      5
	Deschampsia danthonioides	annual hairgrass      5
	Deschampsia elongata	slender hairgrass      5

2.	Swale Edge Mix:		
	<u>Botanical Name</u>	<u>Common Name</u>	<u>Percent by Weight</u>
	Hordeum brachyantherum	meadow barley	30
	Agrostis exarata	spike bentgrass	20
	Festuca idahoensis ssp. roemeri	Roemer's fescue	15
	Festuca rubra	native red fescue	15
	Elymus glaucus	blue wildrye	10
	Deschampsia caespitosa	tufted hairgrass	5
	Deschampsia danthonioides	annual hairgrass	5

3.	Slopes Seed Mix:		
	<u>Botanical Name</u>	<u>Common Name</u>	<u>Percent by Weight</u>
	Lolium perenne	Perennial Ryegrass	40
	Festuca rubra var commutata	Chewing's Fescue	25
	Festuca rubra	Creeping Red Fescue	25
	Agrostis capillaris	Colonial Bentgrass	5
	Trifolium repens	Dutch White Clover	5

C. Fertilizer:

1. Fertilizer shall meet the requirements:
  - a. Swales (Slow Release), 100 lbs/acre
    - Nitrogen: 10%
    - Phosphate: 2%
    - Potash: 8%
  - b. Slopes 200 lb/acre
    - Nitrogen: 10%
    - Phosphate: 10%
    - Potash: 10%

D. Mulch:

1. Mulch shall meet the requirements of ODOT Standard Specifications 01030.15.

E. Slope Matting and Channel Matting:

1. See 02270 Erosion Control specification.

**PART 3 – EXECUTION**

3.01 INSPECTION

- A. Examine the areas and conditions where Work will be performed and notify the Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Locate and protect features such as benchmarks, existing structures, utilities, culverts, leachate lines and cleanouts, and existing monitoring wells from damage.
- B. Notify utility company to locate utilities, if applicable.
- C. Perform construction staking to identify required excavation lines, grades, and slopes, and to provide construction control points.

- D. Excavated refuse, if it is encountered, shall be moved to the working face of the landfill for disposal.
- E. Provide for dust control.
- F. During earthwork activities Contractor shall maintain the grade in such condition that it will be drained at all times. Contractor shall install temporary drains and drainage ditches to intercept or direct surface-water which may affect the promotion or condition of the Work.

### 3.03 EARTHWORK

#### A. General:

- 1. Earthwork needed for the cut and fill operations to construct the retaining wall support structure shall be completed by Contractor based on their coordination of the retaining wall design. The Contractor's plans for the retaining wall and support structure earthwork shall be provided to Engineer for review and approval a minimum of 30 days prior to the work being conducted.

### 3.04 EXCAVATION

- A. Contractor shall perform all excavation of every description, regardless of the type, nature, or condition of material encountered within the limits of the Project to the lines and grades and cross sectional requirements indicated on the Construction Drawings.
- B. Ensure transition slopes from adjacent areas are consistent with requirements shown on the Construction Drawings.
- C. Only use excavated materials for engineered fill if the material is demonstrated by laboratory testing, including the performance of ASTM D1557, to be suitable for engineered fill.
- D. During the process of excavation, maintain the subgrade in such condition that it will drain at all times. install temporary drains and drainage ditches to intercept or direct surface-water which may affect the promotion or condition of the Work.
- E. Stockpile surplus soil at Engineer designated location.
- F. Tolerances:
  - 1. Line designating limit of paved area: plus 1.0 feet, minus 0.0 feet.
  - 2. Grade below paved area: plus 0.0 feet.
  - 3. Grade of side slopes external to paved area: plus or minus 0.2 feet.
  - 4. Grade of side slopes external to paved area shall not exceed 3 horizontally to 1 vertically.
- G. Provide for visual inspection of final subgrade surface.

### 3.05 SUBGRADE PREPARATION

- A. Verify that survey work necessary to define subgrade preparation work is complete prior to beginning work.
- B. Subgrade material may, at Engineer's discretion, be assessed using observational procedures such as proof rolling with loaded dump trucks making passes in perpendicular

directions, or assessment of compaction equipment after field determined minimum number of passes.

- C. In areas where subgrade achieved by excavation, condition of subgrade may be assessed by moistening soil and proof-rolling with compactor to observe for excessive deflections. If excessive deflections observed, re-compact area or excavate soil and proceed with engineered fill.
- D. Examples of unsuitable soil include soil contaminated by organic materials or soil that has become saturated due to rainfall.
- E. If excavation of unsuitable material is required to correct unacceptable subgrade conditions, excavate unsuitable material and replace with compacted Structural Fill.
- F. Prepare subbase in accordance with Geotechnical Report and Addendum.
- G. Begin engineered fill placement only when Owner or their designated representative has accepted underlying subgrade.
- H. Finish grade area inside the limits of work to within 0.2 feet of design subgrade.
- I. Finish surface in area to be lined by rolling with a steel drum roller or other method that removes vertical surface protrusions, ruts, and holes greater than 0.5 inches.

### 3.06 STRUCTURAL FILL

- A. Clear all brush, stumps, roots and organic matter from the borrow area and from the area to receive structural fill.
- B. On slopes steeper than 20 percent cut benches a minimum of 5-feet wide in existing slopes.
- C. Prepare subgrade to provide a minimum fill width of 5 feet or the width of the compaction equipment, whichever is greater.
- D. Scarify moisture condition and compact subgrade soil to a minimum of 92 percent relative compaction as determined by ASTM D1557.
- E. Begin structural fill placement only when Engineer has accepted underlying subgrade.
- F. Place engineered fill to the lines, grades and dimensions indicated on the Construction Drawings.
- G. Place in loose lift thickness not exceeding 9 inches.
- H. Compact using pad-foot type compactor, or other equivalent method, that achieves the specified relative compaction. All methods must achieve soil bonding between lifts and even distribution of soil moisture content.
- I. Compact each lift to a minimum of 95 percent of the modified Proctor maximum dry density at a moisture content within 3 percent of the modified Proctor optimum moisture content, as determined by ASTM D1557.

- J. Where finished grades are outside the limits of the paved area and building area track-walk finished slopes with tracks perpendicular to slopes.

### 3.07 TRENCHING

#### A. General:

1. Unauthorized trenching: Removal of materials beyond the elevations or dimensions indicated on the Drawings without authorization of Engineer shall be at the Contractor's expense, including backfill and compaction.
2. Excavate to the dimensions and elevations shown on the Drawings to permit proper installation of underground utilities.
3. Grade bottom of trench so that pipes and conduits can be laid without sags or humps.
4. Unsuitable soil: Remove organics, foreign materials, soft soils, oversize materials, clayey or silty soils encountered at required trench elevations as directed by the Engineer; replace the excavated material with compacted granular backfill material.

#### B. Saw Cutting:

1. Saw cut and strip away concrete and asphalt surfaces prior to trenching.
2. Re-saw cut damaged asphalt and concrete prior to placing asphalt base course as directed by the Engineer.

#### C. Dewatering:

1. Dewater excavation to facilitate soil excavation and pipe installation below the water table.
2. Construct berms or flumes to direct surface water away from open excavation.
3. Water removed from the excavation shall be directed to either a tanker truck provided by Contractor, for off-site disposal by Contractor, or to a holding area to be provided by Contractor. With Owner's permission, the water removed from the excavation may be mixed with leachate for off-site disposal.

- D. Do not backfill trenches until an inspection has been made and backfilling is authorized by the Engineer.

- E. Perform all trenching work in accordance with OSHA requirements.

### 3.08 PIPE INSTALLATION

- A. Leachate pipe shall be installed in accordance with Flexible Pipe requirements of ODOT Standard Specifications Part 00400.

- B. Leachate and force main pipe shall be installed in accordance with the Drawings and Specifications and pipe manufacturer's instructions as well as ODOT Standard Specifications.

### 3.09 TRENCH BACKFILLING

#### A. General:

1. Clear trenches of trash and debris before placing bedding material.
2. Backfill trenches to pre-construction grades unless indicated otherwise.

3. Carefully place all backfill material, foundation layer, bedding, pipe zone, haunch, side and overlay in such a way as to protect pipes.
4. Do not backfill with frozen material.
5. Reconsolidate and compact stockpiled soil into excavation prior to backfilling with off-site fill materials.
6. If backfill settles below the adjacent ground surface, prior to 2 years following completion of Work, Contractor shall refill trenches and mechanically compact the surface. If backfill settlement damages structures, pavement, landscaping or buried utilities, Contractor shall repair damaged facilities to the satisfaction of the Owner.

B. Backfill in Paved Areas:

1. Backfill using bedding material to bottom of crushed aggregate base course material.
2. Backfill upper 12 inches of trenches with crushed aggregate base course in 6-inch lifts. Mechanically compact to at least 95 percent of modified Proctor maximum dry density, as defined by ASTM D1557.

C. Backfill in Non-Paved Areas:

1. Backfill trenches in non-paved areas with granular backfill or general fill in 8 to 12-inch lifts; mechanically compact to at least 85 percent of modified Proctor maximum dry density as defined by ASTM D1557.

D. Testing:

1. Engineer shall perform field density testing once per 500 linear feet of trenching and once per lift of backfill.

### 3.10 GRADING

- A. Uniformly grade areas within limits of disturbed areas and backfilled trenches, including adjacent transition areas.

### 3.11 RIPRAP INSTALLATION

- A. Install riprap geotextile in accordance Section 00390 of ODOT Standard Specifications.
- B. Install riprap in accordance with Section 00390 ODOT Standard Specifications.

### 3.12 ASPHALT PAVING

- A. Place and compact asphalt in accordance with the ODOT Standard Specifications Section 00744.

### 3.13 GRASSED AREA RESTORATION

- A. Place topsoil, seed, fertilizer, and mulch to maximize the germination and viability of the grass seed, and minimize the soil and seed loss due to erosion.
- B. Topsoil:
1. Place and spread to a uniform depth of 4 inches or such greater depth as designated by the Engineer.



2. Remove rocks, twigs, and other foreign material. Dress the entire surface to present a uniform appearance. Appropriate pitch shall be maintained.
- C. Seed:
1. Application rate shall be 5 pounds per 1,000 square feet of area.
  2. Apply by light disking or harrowing just prior to the final raking and leveling of the topsoil.
- D. Erosion Mat:
1. Place on seeded area within 3 days of seed application.
  2. Overlap mats 6 inches or less and anchor using staples.
  3. Maintain the areas of erosion mat and repair any areas damaged by wind, erosion, traffic, fire, or other causes prior to final acceptance of Work under the contract.

**END OF SECTION**

**SECTION 02270  
EROSION AND SEDIMENT CONTROL**

**PART 1 – GENERAL**

1.01 DESCRIPTION

- A. Scope: Contractor shall provide erosion and sediment control measures and devices to minimize sediment runoff from the construction site as shown on the Drawings, and where deemed necessary by the Engineer.
- B. General Description: Work shall consist of the application of measures to control erosion, minimize the off-site migration of sediment, and to minimize the siltation of rivers, streams, lakes, etc., throughout the life of the Project, which includes the duration of the Work and until vegetation is established. Erosion and sediment control measures, as described herein, shall be applied to erodible material exposed by any activity on the Project.

1.02 REFERENCES

- A. Oregon Department of Transportation (ODOT):
  - 1. Oregon Standard Specifications for Construction, latest edition
- B. Construction Site Erosion and Sediment Control Plan, Roseburg Landfill
- C. Stormwater Pollution Control Plan, Roseburg Landfill

1.03 QUALITY ASSURANCE

- A. General:
  - 1. Contractor shall repair any areas damaged by erosion for a period of 2 years following completion of construction.

1.04 PROVISIONS

- A. Contractor Compliance:
  - 1. In the event that erosion and sediment control measures are required due to Contractor's negligence, carelessness, or failure to install such controls as part of scheduled Work, the Engineer may order that Work be performed by Contractor at their own expense.
- B. Work Suspension: Contractor shall comply with the requirements specified herein and as shown on the Plans. Any violation of these requirements may result in the issuance of a written Notice of Suspension of the Work. Suspension of Work will not be lifted until Contractor has completely corrected the violation. Time extensions requested as a result of delays occasioned by such suspensions will not be considered.

1.05 SUBMITTALS

- A. Submit silt sock, channel erosion mat, non-channel erosion mat, and inlet protection product identification and material specifications to Engineer at least two (2) weeks prior to installation.

## **PART 2 – PRODUCTS**

### **2.01 SEDIMENT FENCE, FILTER SOCK, INLET PROTECTION, CHECK DAM**

- A. All products used in this section shall meet requirements of ODOT Standard Specifications Section 00280.

### **2.02 CHANNEL EROSION MAT**

- A. Channel erosion mat shall be Type E, ODOT Specification 00280.14 (e), selected from the Qualified Products List (QPL) listed in ODOT Standard Specifications Section 00160.05.
- B. Slope Erosion Mat shall be either:
  - 1. Slopes steeper than 3H:1V, erosion mat shall be Type C, ODOT Specification 00280.14 (e), selected from the Qualified Products List (QPL) listed in ODOT Standard Specifications Section 00160.05.
  - 2. Slopes 3H:1V or flatter, erosion mat shall be Type A, ODOT Specification 00280.14 (e), selected from the Qualified Products List (QPL) listed in ODOT Standard Specifications Section 00160.05

## **PART 3 – EXECUTION**

### **3.01 INSPECTION**

- A. Examine areas and conditions where Work will be performed and notify Engineer in writing of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected or approved by Engineer.

### **3.02 CONSTRUCTION REQUIREMENTS**

- A. Implementation: No work shall be started until the erosion control schedules and methods of operation have been accepted by Engineer and implemented by Contractor.
- B. Clearing: Clear only areas necessary to facilitate construction. Where possible, maintain a vegetative buffer zone between the disturbed working area and any watercourse.
- C. Stockpiles: Protect excavated materials from being eroded into any waters or onto any adjacent lands. Stockpile excavated material on the high side of excavated areas. Place silt sock downslope and at least 10 feet away from stockpiles as directed by Engineer. Stabilize stockpiles that will remain inactive more than 7 days.
- D. Tracking: Remove sediment tracked onto public or private roads by the end of each working day. Do not flush with water.
- E. Sediment Control: When sediment control devices are designated on the Drawings or by Engineer, install prior to the initial grading and clearing operations and complete installation before proceeding with any other site Work. Maintain all devices at full functionality until final restabilization and restoration or as otherwise directed by Engineer to remove them.
- F. Erosion Control: Provide erosion control measures such as erosion matting, straw bale, earth berm, dike, or other diversion devices that will safely convey runoff through disturbed areas to prevent scour or gully erosion.

- G. Inspections: Perform inspections in accordance with Construction Site Erosion Control Plan. Provide copies of inspection reports to Engineer.
- H. Maintenance and Repairs: Functionality of all erosion and sediment control devices must be maintained at all times. Devices disturbed during construction operation shall be fully repaired by the end of the day on which they were disturbed. All erosion and control devices shall be maintained for the winter season and during other times when the Project is closed down.
- I. Temporary Use of Permanent Features: When the contract contains items of work, which are of an erosion control or storm water nature, and are intended to be a permanent installation, Contractor may employ these items to control erosion and storm water during construction activities. However, these items shall be fully restored and fully functioning for its intended permanent use prior to acceptance of the Work.
- J. Inactive Areas: If disturbed areas of the site remain inactive for more than 14 days, implement temporary site stabilization measures, which may include temporary seeding and/or placement of mulch. Disturbed areas are classified as inactive if no site grading, landscaping, or utility work is occurring in those particular areas and no precipitation events are limiting these activities. Such areas must be noted in inspection reports.
- K. Dust Control: This shall be performed as needed throughout construction to reduce surface and air transport of dust. Watering for dust control shall not produce runoff. Water source must be approved by Engineer.

### 3.03 INSTALLATION

- A. Erosion control products shall be installed and maintained per manufacturer's instructions and ODOT Standard Specification Section 00280.
- B. Install check dam in accordance with ODOT Standard Detail Drawing RD1006 – Compost Filter Sock Dam – Type 6.
- C. Install inlet protection in accordance with ODOT Standard Detail Drawing RD 1010 – Inlet Protection – Compost Filter Sock or Wattle – Type 7, Area Drain.
- D. Install sediment fence in accordance with ODOT Standard Detail Drawing RD 1040 – Sediment Fence.
- E. Install erosion matting in accordance with ODOT Standard Detail Drawing RD 1055 – Slope and Channel Matting.
- F. Install construction entrance in accordance with ODOT Standard Detail Drawings RD 1000 – Construction Entrances, Type 1.

### 3.04 STREET CLEANING

- A. Any sediment tracked onto a paved public or private road will be removed by street sweeping, not flushing, before the end of each working day.

**END OF SECTION**

**SECTION 02610  
PRECAST CONCRETE MANHOLE**

**PART 1 – GENERAL**

1.1 SUMMARY

- A. Precast manhole, connections, and appurtenances for the cleanouts.

1.2 REFERENCES

- A. American Society of Testing and Materials (ASTM) C913 – Standard Specification for Precast Concrete Water and Wastewater Structures.
- B. ASTM C990 – Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
- C. American Concrete Institute (ACI) 318 - Building Code Requirements for Structural Concrete.
- D. Oregon Department of Transportation (ODOT) Standard Specifications for Construction, 2021.

1.3 SUBMITTALS

- A. Submit shop Drawings of manholes, and appurtenances.

1.4 QUALITY ASSURANCE

- A. Precast concrete producer shall demonstrate adherence to the standards set forth in the National Precast Concrete Association Quality Control Manual.

**PART 2 – PRODUCTS**

2.1 MATERIALS

- A. Precast Concrete Manhole:
  - 1. A maximum of one 4-inch-thick adjusting ring shall be used before placing the manhole casting.
  - 2. Pipe connections shall be made using a cast-in flexible pipe to structure connector, secured using stainless steel clamps, made by Press-Seal Corporation or equal
  - 3. Manhole steps shall conform to Section 00470.45 of the ODOT Standard Specifications for Construction.

B. MANHOLE CASTING

- 1. Per Drawings.

**PART 3 – EXECUTION**

2.2 INSTALLATION

- A. Install in accordance with Manufacturer's recommendations to line and grade shown on the Drawings. Ensure the manhole is level and plumb.

- B. Place manhole on compacted bedding material.
- C. Backfill in accordance with Section 02230.

**END OF SECTION**

**SECTION 11200  
PUMPS AND CONTROLS**

**PART 1 – GENERAL**

1.01 SUMMARY

- A. The Contractor shall furnish all labor, materials, equipment and supplies, and shall perform all work necessary for the complete construction of pumps and controls as shown on the Drawings and specified herein.
- B. Section Includes:
  - 1. Dry pit pumps, controls and lift station for raw and treated leachate.
  - 2. Wet well duplex submersible pump lift station for treated leachate.
  - 3. Initial operation of packaged pumping stations.

1.02 REFERENCES

- A. Oregon Department of Transportation (ODOT):
  - 1. Oregon Standard Specifications for Construction, latest edition.

1.03 SYSTEM DESCRIPTION

- A. Raw Leachate Treatment Supply Pump Vault
  - 1. Pumping station: Field assembled; with concrete vault; dry pump non-clog duplex pumps; automatic control for permanent, dry pump installation. Pump system shall be controlled by liquid level controls located inside the existing 350,000-Gallon Leachate Storage/Equalization Tank and the Raw Leachate Treatment Supply Tank.
- B. Treated Leachate Transfer Pump Vault
  - 1. Pumping station: Field assembled; with concrete vault; dry pump non-clog duplex pumps; automatic control for permanent, dry pump installation. Pump system shall be controlled by liquid level control located in the Treated Leachate Effluent Storage Tank and the Treated Leachate Load Out Wet Well. Flow shall also be controlled by an actuated butterfly valve that opens when the pumps are activated and closes when the pumps are turned off.
- C. Treated Leachate Loadout Wet Well and Lift Station
  - 1. Pumping station: Field assembled; within precast concrete vault, submersible non-clog pumps, and automatic control for submersible installation. Pump system shall be controlled by manual controls located at the Tanker Truck Load-Out Pump Station.

1.04 PERFORMANCE REQUIREMENTS

- A. Pump Controls Leachate Treatment Supply Pump Vault:
  - 1. Locate hand/off/auto switch in control panel near the pump vault.

2. Locate liquid level indicators consisting of "pump off," "pump on," and "high level" in existing 350,000-Gallon Leachate Storage/ Equalization Tank and Leachate Treatment Supply Tank. Signal alarm condition automatically when "high level" in Leachate Treatment Supply Tank is activated. Pump shall not start if low level in Existing 350,000 Gallon Storage/Equalization Tank is activated. Set "pump off", "pump on" and "high level" elevations in accordance with best practices based on field testing. Set pumps to automatically switch operation from one pump to another after each day, but with capability to switch operation after each pumping cycle.
  3. If current primary pump fails to start, secondary pump shall be activated and alarm showing pump failure shall be activated.
  4. Integrate controls with Pre-treatment System programmable logic controller (PLC). All pump controls are shown on the P&ID.
- B. Pump Controls Treated Leachate Transfer Pump Vault:
1. Locate hand/off/auto switch in control panel near the pump vault.
  2. Locate liquid level indicator consisting of "pump off," "pump on," and "high level" in Treated Leachate Effluent Storage Tank. Signal alarm condition automatically when "high level" float is activated. Set "pump off", "pump on" and "high level" elevations in accordance with best practices based on field testing. Set pumps to automatically switch operation from one pump to another after each day, but with capability to switch operation after each pumping cycle.
  3. If current primary pump fails to start, secondary pump shall be activated and alarm showing pump failure shall be activated.
  4. When "pump on" switch activates, butterfly valve on the piping shall open, followed by the pump turning on 15 seconds later. When the "pump off" switch activates, the pump shall turn off followed by the butterfly valve closing 5 seconds after the pump turns off.
  5. Integrate controls with Pre-treatment System PLC. All pump controls are shown on the P&ID.
- C. Pump Controls Treated Leachate Loadout Wet Well and Lift Station:
1. Locate hand/off/auto switch in control panel near truck leachate load\*out facility.
  2. Locate liquid level indicator consisting of "pump off," "pump on," and "high level" in Treated Leachate Loadout Wet Well and Lift Station. Signal alarm condition automatically when "high level" float is activated. Set "pump off", "pump on" and "high level" elevations in accordance with best practices based on field testing. Set pumps to automatically switch operation from one pump to another after each day. If liquid level indicator indicates that liquid level in wet well is low, pump shall not start.
  3. If current primary pump fails to start, secondary pump shall be activated and alarm showing pump failure shall be activated.
  4. Integrate controls with Pre-treatment System PLC. All pump controls are shown on the P&ID.
- D. Integrate Controls with Pre-treatment System PLC.
- E. Sound, Vibration, and Thermal Control: Dampen or suppress noise, absorb vibration, accommodate thermal expansion and stresses, and adjust or correct for misalignment in piping systems.



## 1.05 SUBMITTALS

- A. Shop Drawings:
  - 1. Submit drawings showing equipment and shipping dimensions and weights, location of accessories, and clearances required.
- B. Product Data (submit for each type of pump vault and the lift station):
  - 1. Include catalog data for vault, cover, hinged door, slide rail assembly (for wet well), lifting assembly (for wet well), discharge piping, valves, junction box, level controls, and control panel.
  - 2. Include pump catalog data, performance curve, breakaway fittings data, and access frame data.
  - 3. Include control panel data and panel wiring schematic.
  - 4. Include recommended spare parts list.
- C. Test Reports:
  - 1. Submit written report showing factory pump inspections and tests have been successfully performed.
- D. Manufacturer's Installation Instructions: Submit manufacturer's published instructions for pump, and panel systems procedures.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- F. Manufacturer's Field Reports:
  - 1. Submit report of each visit of manufacturer's representative to provide technical assistance during installation, if any.
  - 2. Submit start-up report before final acceptance of pumps to document pumping station operation meets performance requirements.

## 1.06 CLOSEOUT SUBMITTALS

- A. Submit two copies of executed certification of pumps and controls after performance testing.
- B. Submit two copies of spare parts list and rebuild kits.
- C. Provide two copies of the Operations and Maintenance Manual containing operating and maintenance requirements for pumping station and schedule of recommended maintenance.

## 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- B. Protect piping systems and pieces from entry of foreign materials and water by temporary covers, completing sections of work, and isolating parts of completed system.
- C. Accept system components on site in manufacturer's original containers or configuration. Inspect for damage.

- D. Store sensitive materials for field assembly in dry area in original shipping containers.
- E. Support vault with rigging approved by the Owner to structural lift points during handling.
- F. Repair damage to vault according to manufacturer's instructions.

#### 1.08 WARRANTY

- A. Without limiting/modifying the scope of the warranty in the Agreement, furnish 5-year prorated manufacturer's warranty on pump seals.

### **PART 2 – PRODUCTS**

#### 2.01 PUMPS

- A. Leachate Treatment Supply Pumps:
  - 1. Flygt C 3060 HT or approved equal.
  - 2. Pump operating conditions: 103 gpm at 63 feet of total dynamic head (per individual pump).
  - 3. Submersible non-clog constant speed with horizontal discharge, fittings, piping, and pump brackets.
  - 4. Discharge Size: 1 15/16-inches.
  - 5. Substitutions: Approved in writing by Owner and Engineer.
- B. Treated Leachate Transfer Pumps:
  - 1. Flygt C 3126 HT or approved equal.
  - 2. Pump operating conditions: 260 gpm at 80 feet of total dynamic head (per individual pump).
  - 3. Submersible non-clog constant speed with horizontal discharge, fittings, piping, and pump brackets.
  - 4. Discharge Size: 3 15/16-inches.
  - 5. Substitutions: Approved in writing by Owner and Engineer.
- C. Treated Leachate Loadout Wet Well and Lift Station:
  - 1. Flygt C3126 MT or approved equal.
  - 2. Pump operating conditions: 380 gpm at 48 feet of total dynamic head (per individual pump).
  - 3. Submersible non-clog constant speed with horizontal discharge, fittings, piping, and pump brackets.
  - 4. Discharge Size: 3 15/16-inches.
  - 5. Substitutions: Approved in writing by Owner and Engineer.

#### 2.02 LEACHATE TREATMENT SUPPLY PUMP VAULT

- A. Concrete Vault:
  - 1. Precast reinforced concrete vault conforming to all applicable ASTM specifications for precast concrete with H20 load rating.
  - 2. Precast concrete vault to be supplied by Rogue Valley Precast, or equal.
  - 3. Pipe connections shall be made using a cast-in flexible pipe to structure connector, secured using stainless steel clamps, made by Press-Seal Corporation or equal.

4. Manhole steps shall conform to Section 00470.45 of the ODOT Standard Specifications for Construction.

B. Access:

1. Provide AASHTO HS20 load rated access doors.
2. Hardware and hinges: Concealed stainless steel hinges with tamper-proof fasteners.
3. Doors: Open 90 degrees and capable of locking in this position with a stainless-steel positive locking arm and aluminum release handle.

## 2.03 TREATED LEACHATE TRANSFER PUMP VAULT

A. Concrete Vault:

1. Precast reinforced concrete vault conforming to all applicable ASTM specifications for precast concrete with H20 load rating.
2. Precast concrete vault to be supplied by Rogue Valley Precast, or equal.
3. Pipe connections shall be made using a cast-in flexible pipe to structure connector, secured using stainless steel clamps, made by Press-Seal Corporation or equal
4. Manhole steps shall conform to Section 00470.45 of the ODOT Standard Specifications for Construction.

B. Access:

1. Provide AASHTO HS20 load rated access doors.
2. Hardware and hinges: Concealed stainless steel hinges with tamper-proof fasteners.
3. Doors: Open 90 degrees and capable of locking in this position with a stainless-steel positive locking arm and aluminum release handle. Doors provided by Halliday Products or equal.

## 2.04 TREATED LEACHATE LOADOUT WET WELL AND LIFT STATION

A. Concrete Wet Well:

1. Precast reinforced concrete vault conforming to applicable ASTM specifications for precast concrete with H20 load rating.
2. Volume: Working volume of the Treated Leachate Loadout Wet Well and Lift Station is 6,000 gallons as defined by the pump on and pump off level control locations shown in the Drawings.
3. Joints: Made to receive rubber gasket and butyl mastic sealer especially made for this purpose.
4. Base: Integrally cast with extended base conforming to applicable ASTM standards or to minimum dimensions shown on the drawings. No base wings required.
5. Concrete Cover: Reinforced concrete
6. Pipe connections shall be made using a cast-in flexible pipe to structure connector, secured using stainless steel clamps, made by Press-Seal Corporation or equal
7. Manhole steps shall conform to Section 00470.45 of the ODOT Standard Specifications for Construction.
8. Access:
  - a. Provided AASHTO HS20 load rated access doors.
  - b. Hardware and hinges: Concealed stainless steel hinges with tamper-

- proof fasteners.
- c. Doors: Open 90 degrees and capable of locking in this position with a stainless-steel positive locking arm and aluminum release handle. Doors provided by Halliday Products or equal.

B. Valve Vault

1. Concrete Vault:
  - a. Precast reinforced concrete vault conforming to all applicable ASTM specifications for precast concrete.
  - b. Precast concrete vault to be supplied by Rogue Valley Precast, or equal
  - c. Pipe connections shall be made using a cast-in flexible pipe to structure connector, secured using stainless steel clamps, made by Press-Seal Corporation or equal
  - d. Manhole steps shall conform to Section 00470.45 of the ODOT Standard Specifications for Construction.
2. Access:
  - a. Provided AASHTO HS20 load rated access doors.
  - b. Hardware and hinges: Concealed stainless steel hinges with tamper-proof fasteners.
  - c. Doors: Open 90 degrees and capable of locking in this position with a stainless-steel positive locking arm and aluminum release handle. Doors provided by Halliday Products or equal.

2.05 VALVES

- A. Valves General: To be the type, size, and class shown on the plans. Valves shall have a 316 stainless steel body with standard flanged ends. Valves shall be at least the same class as the pipe on which they are used. Insofar as possible, all valves shall be by the same manufacturer.
- B. Swing Check Valves: Shall be 316 stainless steel mounted with rubber faced 316 stainless steel clapper disc seated by a 316 stainless steel clapper arm against a 316 stainless steel seat ring. The clapper shall have a lever and spring to assist closure. The spring tension shall be adjustable to set the speed of closure of the valve to the operating conditions in field. The clapper shall be secured to a stainless-steel shaft set in bronze bushings. Bushings shall be secured to the valve body with cap screws and sealed with O-rings. Swing check valves shall have flange fittings and be manufactured by Davis Valve, Stayflow, or equal.
- C. Actuated Butterfly Valve: Butterfly valve shall be electric actuated butterfly valve rated for 200 psi working pressure with BUNA seals and 316 stainless steel body and disc. Butterfly valve shall be in full compliance with the requirements of API 609 and MSS SP-67. Valves shall have flange fittings and be manufactured by Valworx or equal.
- D. Manual Butterfly Valve: Butterfly valve shall be rated for 200 psi working pressure with BUNA seals and 316 stainless steel body and disc. Butterfly valve shall be in full compliance with the requirements of API 609 and MSS SP-67. Valves shall have lever handle, flange fittings and be manufactured by Valworx or equal.
- E. Electric Actuators: Electric valve actuators shall be sized to match the valve that are installed on. Actuators shall be quarter turn operation with a 4X weatherproof enclosure,

a visual valve position indicator, and manual override. Actuators shall be manufactured by Valzorz, Limitorque, or equal.

## 2.06 PRESSURE INDICATOR

- A. Pressure indicator shall be suitable for liquids with stainless steel wetted materials. Pressure indicator shall have a range of 0 – 300 psig with a 4-20 mA output, manufactured by Dwyer Instruments, or equal.

## 2.07 LIQUID LEVEL INDICATORS

- A. Liquid level indicators shall be used in the :
  - 1. Raw Leachate Treatment Supply Tank.
  - 2. Treated Leachate Effluent Storage Tank.
  - 3. Treated Leachate Load Out Wet Well.
  - 4. Existing 350,000 Gallon Leachate Storage Tank.
- B. Each liquid level indicator shall read continuous liquid level and activate the transfer pumps for the storage tanks or wet well.
- C. Liquid level indicators shall be guided wave radar level measurement with a rod probe, manufactured by Endress+Hauser, model FMP51.

## 2.08 VACUUM RELIEF VALVE

- A. The combination air / vacuum relief shall be installed as shown on the drawings on the raw leachate piping to prevent backflow of the raw leachate.
- B. Air / Vacuum relief valve shall be a combination air and vacuum valve for reclaimed and non-potable water. Valve shall be supplied by A.R.I., valve model D-021, combination air valve.

## 2.09 FLOW METER

- A. The treated leachate flowmeter shall be installed as shown on the drawings on the treated leachate piping to measure flow to the truck loadout.
- B. The flowmeter shall be an electromagnetic flow meter for permanent installation. Flowmeter shall be supplied by Endress + Hauser, model Proline Promag W400 Electromagnetic flowmeter or equal.

## 2.10 GENERAL CONTROL REQUIREMENTS

- A. The control system shall be designed to operate the required number of pumps specified on the drawing at the following power characteristics:
  - 1. 480-volt, 3 phase, 4 wire, 60 hertz.
  - 2. For operation of:
    - a. Leachate Treatment Supply Pump Vault: 3.6 HP (Flygt C 3060 HT pumps).
    - b. Treated Leachate Transfer Pump Vault: 11 HP (Flygt C 3126 HT pumps).
    - c. Treated Leachate Loadout Wet Well Lift Station: 11 HP (Flygt C 3126 MT pumps).

- B. The control function shall provide for the operation of the pumps under normal conditions, and shall alternate the pumps on each pump down cycle to equalize the run time. As the flow decreases, the pumps shall cut off at the elevations as shown on the plans.
- C. The equipment listed below is a guide and does not relieve the supplier from supplying a system that will function as required.
- D. Control Panels
  - 1. Enclosure shall be a NEMA 3R Painted steel enclosure. The enclosure shall be a pole mount type with a minimum depth of 10 inches sized to adequately house all the components. The enclosure door gaskets shall be rubber composition with a retainer or seamless formed in place to assure a positive weatherproof seal. The gasket material shall not retain memory. The door shall open a minimum of 180 degrees.

## 2.11 CONTROLS ELECTRICAL

- A. The panel power distribution shall include all necessary components and be completely wired. All conductor terminations shall be as recommended by the device manufacturer.
- B. All circuit breakers shall be heavy duty thermal magnetic or motor circuit protectors. Each motor breaker shall be adequately sized to meet the pump motor operating characteristics. The control circuit shall individually be controlled by a heavy duty breaker.
  - 1. Circuit breakers shall be indicating type, providing "on-off-trip" positions of the operating handle. When the breaker is tripped automatically, the handle shall assume a middle position indicating "trip."
  - 2. Thermal magnetic motor breakers shall be quick-make and quick-break on manual and automatic operation and have inverse time characteristics secured through the use of bimetallic tripping elements supplemented by a magnetic trip.
  - 3. Breakers shall be designed so that an overload on one pole automatically trips and opens all legs. Field installed handle ties shall not be acceptable.
- C. Motor starters shall be open frame, across the line NEMA rated with individual overload protection in each leg. Motor starter contact and coil shall be replaceable from the front of the starter without removing from its mounted position. Overload heaters shall be block type, utilizing melting alloy spindles, and shall have visual trip indication. Overload shall be sized for the full load amperage draw of the pumps. Definite purpose contactors, fractional size starters and IEC contactor relays shall not be acceptable.
- D. Control transformers shall be provided to provide the 120 VAC and/or 24 VAC for control circuits when required. Transformers shall be fused on the primary and secondary circuits. The secondary windings shall be grounded.
- E. A lightning-transient protector with tell-tale warning lights on each phase to indicate loss of protection on the individual phases shall be provided. The device shall be solid state with a response time of less than 5 nanoseconds with withstanding surge capacity of 6500 amperes. Unit shall be instant recovery, long life, and have no holdover currents.
- F. The Phase Monitor shall monitor Under Voltage, Phase Reversal, Loss of Power, and Phase Imbalance. The motor starter circuits shall be de-energized upon sensing of any of the faults and shall automatically restore service upon return to normal power. The Phase Monitor shall be available to monitor Over Voltage as an option.

## 2.12 CONTROLS ALARM SYSTEM

- A. The alarm light shall be a weatherproof, shatterproof, red light fixture with an LED bulb to indicate alarm conditions. The alarm light shall be turned on by the high level alarm and flash until the condition has been corrected. An open contact shall be provided for remote monitoring.

## 2.13 LIQUID LEVEL INDICATOR SYSTEM

- A. An intrinsically safe control shall be provided for the liquid level indicator system. The system shall provide for the automatic and manual control and alternation of the pumps. The liquid level control system shall allow only one pump to run at any time. Alternating pumps on a daily basis with capability to alternate upon each successful pump cycle.
- B. Intrinsically safe relays shall be plug-in style with LED indicating float switch has activated the relay. MPE # 030-120-118. Intrinsic relay shall be rated for use in Class I, Groups A, B, C, D, Class II Groups E, F, G and Class III Hazardous Locations. The relay shall be UL listed 73VL, UL 913.

## 2.14 CONTROLS ANCILLARY EQUIPMENT

- A. A three-position 'P1-P2-Alternate' switch shall be provided to select lead pump.
- B. Lift Station control panel shall have an exterior mounted emergency stop button to power down both pumps in the event of an emergency.
- C. A three position HOA switch shall be provided for each pump with corresponding green and red panel indicator lights to display status as operating or in alarm condition. The switch shall be NEMA 4x rated with 10 amp contacts except when provided on a dedicated controller unit. A position indicating legend plate shall be provided. The HOA switches shall be mounted on the inner dead front door unless provided in the controller units.
- D. A green run pilot indicator shall be mounted on the dead front door. Level indicator lights or indicators shall be provided.
- E. An elapsed time meter shall be mounted on the dead front door. The meter shall operate on 120 VAC, shall indicate in hours [6 digits] and tenths and shall be non-resettable.
- F. The alternator shall be a plug in, solid state unit with lead-lag-auto selector and test switches except when provided in a dedicated control device. The unit shall operate on 120 vac and provide DPDT 10 amp rated contacts. Two LEDs shall indicate the next position to run as lead pump.
- G. One 20-amp ground fault circuit interrupter (GFCI) type duplex receptacle shall be provided on the side of the control panel for operation of 115VAC devices. The GFCI shall be protected by a 20-amp QOU type circuit breaker.
- H. Three spare 20-amp QOU type circuit breakers shall be provided for connection to future equipment.
- I. A thermal heater and thermostat shall be installed to maintain the internal temperature of the enclosure above the dew point.
- J. Control wiring shall be copper, tinned, UL1015, 18ga. minimum.



## 2.15 MINI-CAS UNIT

- A. One Mini-Cas 120 unit shall be supplied for each pump to monitor the pump for over-temperature and leakage.
- B. The unit is to be able to be powered by 24VAC, 24VDC, or 120VAC, and to contain LED indication for power on, over-temp, and leakage conditions. The unit shall contain an over-temp reset bush-button to reset the unit after the fault has cleared, as well as a selector switch that that allows the selection of manual or auto reset.
- C. The sensor input circuitry is to contain both hardware and software filters for noise immunity, as well as sensor input short circuit protection.

## 2.16 MISCELLANEOUS

- A. A final as built drawing encapsulated in mylar shall be attached to the inside of the front door. Schematics shall be done in ladder logic with wire numbers and line numbers. Real time cross referencing of relay contact to line numbers shall be given as well as written description of component function on each circuit of the drawings. From/to wire and termination reports shall be shown on the as built drawings. Drawings shall be available in HTML format. Terminal strip layouts shall be provided for ease of connecting external devices.
- B. All component parts in the control panel shall be permanently identified with engraved legend plates as designated on the drawings. A list of all legends shall be available in Excel format and attached with the schematics on the panel door.
- C. All equipment shall be tested to the operational requirements. Each control function shall be activated to check for proper indication.
- D. All equipment shall be guaranteed for a period of 1 year from the date of installation. The guarantee is effective against all defects in workmanship and/or defective components. The warranty is limited to replacement of or repair of the defective equipment.
- E. The manufacturer shall be a UL508 shop and provide evidence on the end product.

## **PART 3 – EXECUTION**

### 3.01 EXAMINATION

- A. Verification of existing conditions before starting work.
- B. Verify inlet and discharge piping connections are the size, location, and elevation on Drawings.

### 3.02 PUMP VAULTS, WET WELL, AND LIFT STATION INSTALLATION

- A. Place, compact, and level aggregate bedding as shown on the Drawings.
- B. Install vault or wet well at proper grade and to alignment on Drawings on aggregate base. Do not install concrete vaults or wet well when bedding is saturated or frozen. Dewater excavation to keep excavation dry.
- C. Set access doors and covers level without tipping, to correct elevations.



- D. Assemble vault components including pipe connections, cover, pump support rail system, level controls, and junction box.
- E. Connect to inlet and discharge piping with flexible connectors.
- F. Seal joints water-tight between inlet and discharge pipes and vault wall.

### 3.03 PUMP INSTALLATION

- A. Install pump including fittings, brackets, discharge piping, valves and discharge. Wire pump to junction box.

### 3.04 CONTROL PANEL INSTALLATION

- A. Mount and wire control panel for pumping station operation including duplex motor controls, circuit breaker, starter, control transformer, fuse box, terminal block, alternator, alarm and running lights, and auxiliary power supply generator.
- B. Wire in accordance with requirements of National Electrical Code.
- C. Number each conductor.
- D. Locate and connect direct burial cable from control panel to vault junction box.

### 3.05 STATION START-UP, INITIAL TESTING AND OPERATION

- A. Notify Engineer and Owner at least 5 days prior to flow rate testing.
- B. Provide start-up and initial testing of system for a two-week period or until the plant is operating consistently with no failures within a 72 hour period. Coordinate and operate pumps and related equipment and controls in conjunction with other construction prior to the start-up period.
- C. Correct failures during testing by repairing or replacing malfunctioning parts or equipment or faulty workmanship, regardless of cause, within 72 hours after notification from Engineer.
- D. After correcting failures caused by defective equipment, material, or faulty workmanship, retest until failures are eliminated.
- E. Confirm general sequencing of pump and float operations at tanks, vaults, wet well and their control panels are in accordance with performance requirements.
- F. Document and certify start-up results in start-up report.
- G. Provide two months of treatment system operation support with option to extend operational support after start-up.

### 3.06 MANUFACTURER'S FIELD SERVICE

- A. Furnish factory trained representative and/or field technical assistance during the following periods of pumping station installation:
  - 1. Unloading of station materials and components.

2. Start-up, testing, and demonstration of station systems-vault, pump, and control panel.

3.07 ADJUSTING

- A. Adjust vaults, pumps, appurtenances, and control panel systems so station operates to performance requirements and in accordance with specifications.

3.08 DEMONSTRATION

- A. Demonstrate operation of pumping stations - vault components, pump systems, and control panel.

**END OF SECTION**

**SECTION 13000**  
**LEACHATE PRE-TREATMENT BUILDING**

**PART 1 – PRE-TREATMENT BUILDING**

1.01 INTRODUCTION

- A. It is Douglas County's intent to have a new Pre-Treatment Building constructed as part of the Work to house and contain the Leachate Pre-Treatment System. The Contractor shall be responsible for providing all final architectural/engineering design and documentation, energy code analysis, plan drawings and product certifications, and licensed engineering seal, required by the state and local Building Department to acquire the Building Permit.
- B. The Pre-Treatment Building shall be a pre-engineered steel building equipped with features such that County personnel can work in the building throughout the year. The minimum floor area of the building shall be 4,800 square feet (dimensions: 60-ft wide by 80-ft-long by 26-ft clear height). The Contractor shall be responsible for all materials, labor (and any required changes in the building and foundation design) required to construct the building at a finished floor elevation as shown on the Drawings.
- C. The Pre-Treatment Building shall be constructed on one level which requires that the sloped area where the building will be located undergo cut and fill excavation to structurally support the Pre-Treatment Building and pavement surrounding the building. The area beneath and surrounding the Pre-Treatment Building shall be elevated with fill and a retaining wall structure constructed as shown on the Drawings. The Contractor shall be responsible for all materials, labor (and any required changes to the Pre-Treatment Building support structure and final structural design of the retaining wall structure) required to construct the Pre-Treatment Building support structure and retaining walls as shown on the Drawings.
- D. The Pre-Treatment Building and retaining wall support structure is being built at a landfill with parts of the Work constructed in close proximity to the limit of waste. There is the potential to encounter waste during the site preparation and excavation activities associated with the Work.
- E. Basic requirements of the Pre-Treatment Building to be provided by the Contractor include:
  - 1. Designed to meet Building Code requirements, including any wind load and seismic requirements.
  - 2. Reinforced concrete footing/foundation and insulated floor slab.
  - 3. Smooth finish concrete interior floor.
  - 4. Broom finish concrete exterior approach, thresholds and pavement surrounding the Pre-Treatment Building to the outer edge of the concrete.
  - 5. Safety shower and eye wash station.
  - 6. Eave overhangs of a minimum 2 feet with vented soffits, roof gutters and downspouts.
  - 7. Wall and ceiling insulation in accordance with the Energy Code and for occupation in the winter. Minimum R-26 in walls (with minimum R-3.5 thermal blocks), and R-32 (with minimum R-3.5 thermal blocks) in ceiling.
  - 8. Interior wall surfaces that are moisture-resistant.
  - 9. 20 year warranty on finish of exterior steel wall and roof panels.
  - 10. Breaker and lighting panels.
  - 11. Interior lighting suitable for facility operations, general chemistry, and light repair work.

12. Four (4) exterior lights on outside of building located adjacent to exterior doors.
13. Interior wall power receptacles - 110 volt throughout the building interior and on the exterior within 5 feet of each exterior door plus 240 volt at each of three (3) work benches.
14. Four (4) exterior, heavy-duty, half lite insulated steel personnel doors.
15. One (1) exterior overhead insulated sectional door.
16. One (1) interior, half lite insulated interior door for office/lab.
17. Air conditioning and electric heating of office space and electric heating of the pre-treatment area using ceiling mounted unit heaters (but not air conditioning). Two (2) exhaust fans, with louvered vents, shall be installed near the roof peaks, as shown on the Drawings. Controls for pre-treatment area heating and exhaust fans to be mounted below each unit with thermostats provided for unit heaters and on/off switches provided for exhaust fans.
18. Non-potable water supply tank with circulation pump, pressure tank, UV disinfection system and plumbing, as needed to accommodate non-potable water supply for membrane and equipment cleaning, an emergency shower, and eye wash station. This is required because a potable water line is not being installed to the Pre-Treatment Building. During normal operations, all water has to be hauled by Roseburg Landfill staff to the tank from the County's water hydrant located about 0.3 miles down the Landfill Access Road – McLain West Avenue)
19. Non-potable water service piping with separate distribution lines to supply interior hose bibb stations, as shown on Pre-Treatment Building layout, to service/clean the treatment system equipment, including the UF membrane modules, the floors as well as the tanks and pump areas.
20. Floor drain system with minimum 8 inch width x 8 inch depth grate covered trench type drain network throughout the building and four (4) grate covered floor drain sumps, as shown on the Drawings. Floor drains should be pitched to drain into the floor sumps with a minimum of 1/8 inch per foot pitch from the furthest point away from the sumps. Four (4) automatic submersible sump pumps shall be supplied and installed for discharging the four (4) building floor drain sumps to the Raw Leachate Treatment Supply Tank.
21. Space for operation and maintenance of the following:
  - a. Leachate Treatment Plant Motor Control Center (MCC), and other related switchgear and controls.
  - b. Chemical feed and storage area shall be installed in the location shown on the Drawings, with mounted platforms and outlets for metering pumps and space below the metering pumps for chemical drums and/or totes.
  - c. Three (3) parts storage areas with industrial shelving and heavy duty work benches.
  - d. An enclosed temperature regulated room to use as an office and for installation of computerized leachate treatment system data monitoring and control equipment (i.e., SCADA system). A small general water chemistry lab; with sink, water heater, and bench top space shall be included within the office space. Interior ceiling height to be a minimum of 8 feet.
22. Supplemental specifications are provided on the Drawings.
23. Final design considerations and requirements provided by the Contractor include:
  - a. Final design calculations and plans for the pre-engineered metal building; including all calculations and signed and sealed plans and product approvals or certifications required to obtain the Building Permit, including, but not limited to; building envelope energy calculations, wall and roof thermal insulation, structural calculations for building and surrounding retaining wall support structure, personnel doors, windows and overhead door.
  - b. Contractor does not need to submit supplemental final plans for the leachate treatment supply pumps/vault, treated leachate transfer

pumps/vault, treated leachate load out wet well and lift station/pumps. These plans have already been prepared by the Engineer. However, if the Contractor finds issues with the Engineer's design that are determined to need to be changed, the changes and all materials and labor required to make the change(s) will be at no additional expense to the Owner.

## 1.02 PRE-TREATMENT BUILDING LOCATION

- A. The Contractor shall install and construct the new Pre-Treatment Building in the area shown on the Drawings. The proposed area has been cleared of large trees, however, there will be cut and fill excavation necessary to bring the site to the appropriate elevations from the pre-existing sloped site area. Refer to Section 02230 Earthwork, Trenching, Backfilling and Compaction.

## 1.03 OTHER FEATURES / EQUIPMENT

- A. Personnel Doors (exterior and interior):
  - 1. Heavy-duty industrial duty half lite exterior doors: 18-gauge double panel, fire rating per applicable building codes, water resistant, R-9 insulation, dead bolt locks, door sweep and weather stripping to seal out moisture. Medium-duty industrial duty half lite interior doors: Non-locking lever handle for interior doors, door closers and stainless steel kick plates on all doors. Minimum of 36 inch opening width and 80 inch height for all doors.
- B. Overhead Door:
  - 1. Sectional overhead door, push-up style, weather stripping on all sides and weather seal on bottom, colored anodized aluminum or steel construction, 20-gauge panels and heavy duty materials and design that will meet wind load criteria for area. 12 foot wide by 16 foot height with windows at approximately 5 to 6 foot height. Overhead sectional door shall have a mechanical door opener operated by exterior key pad, interior switches and by remote.
- C. Laboratory/Office Cabinetry, Bench Top and Desk:
  - 1. Cabinetry shall be steel construction and blue epoxy paint or similar finish in standard widths, heights and lengths, with adjustable shelf, self-closing drawers, dark grey chemical resistant counter top. Cabinetry includes a double door unit with a drawer over each door, and a stack of drawers unit. Desk counter with dark grey surface and typical desk drawers (i.e., center pencil drawer, bottom filing drawer, etc.).
- D. Laboratory Exhaust Hood:
  - 1. Industrial grade laboratory fume hood shall be installed in the office/laboratory space shown on the Drawings and shall conform with requirements of fume hoods used for corrosive applications.
- E. HAZMAT Cabinet:
  - 1. One Flammable Liquid Safety cabinet, yellow, 18 inch deep by a minimum of 34 inches wide and approximately 65-inches high, free-standing type unit.

F. Storage Room Shelving:

1. Three painted steel, 24-inch deep by 36-inch wide and 75" high, 800-pound shelf capacity, gray or blue finish.

1.04 GEOTECHNICAL ENGINEERING REPORT

- A. See the geotechnical report and addendum prepared based on borings advanced within the area proposed for the retaining wall support structure and Pre-Treatment building, prepared by KA Engineering. Note that the original geotechnical report had geotechnical requirements that were revised after the design evolved with the revisions provided within the geotechnical report addendum, based on additional information obtained about the proposed location slope stability, etc. Contractor may make their own evaluation of the site conditions, if desired, and with approval from Owner.

**END OF SECTION**

**SECTION 15067  
FORCE MAIN POLYETHYLENE PIPE**

**PART 1 – GENERAL**

1.01 REFERENCES

- A. American Society for Testing Materials (ASTM).
  - 1. ASTM D1248 - Standard Specification for Polyethylene Plastic Molding and Extrusion Materials.
  - 2. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fitting Materials.
  - 3. ASTM F2620 – Standard Practice for Heat Fusion of Polyethylene Pipe and Fittings.

1.02 SUBMITTALS

- A. Submit a minimum of 5 days prior to fusion welding a list of those individuals certified for polyethylene pipe fusion welding with copies of their current certificates.
- B. Submit a minimum 5 days prior to fusion welding details, including make, model and serial number, of the welding system proposed for this Project.
- C. Submit a minimum of 10 days prior to shipment pipe and fittings product data and Manufacturer's quality control data, demonstrating Material complies with Part 2 of this Section.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Exercise care during loading, transit, and unloading to prevent damage by abrasion, puncturing, or both.
- B. Store HDPE pipe with support to prevent developing a permanent set.
- C. Stack the heaviest series of HDPE pipe on the bottom.
- D. Stack HDPE pipe no more than eight high or consistent with the Manufacturer's recommendations.
- E. Document any HDPE pipe damaged during transportation, loading, unloading, delivery or storage. Provide documentation to Owner.
- F. Repair or replace HDPE pipe damaged during delivery, storage or handling.

**PART 2 – PRODUCTS**

2.01 PIPING

- A. HDPE force main pipe and fittings shall be made of HDPE material with a minimum material designation code of PE4710 and with a minimum cell Classification of 445474C. The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black of not less than 2 percent. The manufacture of the HDPE resin shall certify the cell classification indicated.
- B. SDR17 with a pressure rating of 125 psi at 73.4 degrees F.

## 2.02 FITTINGS

- A. Joints: heat fusion process (ASTM D3261) as per manufacturer instruction. In inaccessible areas, electrofusion joints will be allowed on a case by case basis. Mechanical joints are acceptable at manhole inlets of differing material.
- B. Fittings to be molded unless otherwise approved by Owner. Long sweep bends to be continuous fittings with no welds.

## **PART 3 – EXECUTION**

### 3.01 INSTALLATION

- A. Install pipe in accordance with manufacturer's instructions and Section 02230.
- B. Inspect pipe, fittings, and other appurtenances before installation to verify quality of material
- C. Ream pipe and tube ends. Remove burns.
- D. Remove dirt and foreign material, inside and outside, from pipe and fitting materials before assembly.
- E. Make straight field cuts without chipping or cracking pipe.
- F. Make HDPE butt fusion welds in accordance with manufacturers recommended procedures. Provide sufficient cooling periods prior to testing, bending or backfilling a pipe section.
- G. Remove interior weld beads to facilitate future pipe cleaning and video inspection.
- H. Install pipe, valves and fittings to the line and grade specified on the Drawings, and in accordance with manufacturer's recommendations.
- I. HDPE Flanged Connections shall be butt-fused to HDPE pipe. Outside diameter and drillings shall comply with ANSI B16.1. Back up flanges shall comply with ANSI B16.6 unless otherwise specified.
- J. Lay pipe from the low end toward the high point. Provide continuous smooth invert. Cut in and connect to existing pipe as required. Consult with Owner if adjustments to inverts are required at connections to existing pipe.
- K. Remove any pipe showing kinks, buckles, cuts, gouges, or any other damage that, in the opinion of the Engineer, will affect performance of the pipe.
- L. Tape or otherwise seal open pipe ends when handling on site to minimize potential for debris to collect in pipe.
- M. The maximum allowable tolerance for grade is 0.10 foot. Pipe invert elevations will be documented by Engineer every 25 linear feet by survey or every 50 feet if elevations are set using a total station or laser equipment, as well as key points. The minimum average slope shall be in accordance with the Drawings.



- N. Engineer will observe the following during welding of HDPE pipe: pipe size, temperature of welding equipment, pipe cleaning procedure, weld bead size, heat and cool times, fusing pressure and hold pressure.
- O. Maximum allowable depth of cuts, gouges or scratches on the exterior surface of pipe or fittings shall be limited to 10% of the wall thickness. Interior of the pipe shall be free of cuts, gouges, and scratches.
- P. Jet clean pipe with water using sewer cleaning equipment when construction is completed, prior to final acceptance.
- Q. Construct bedding material and specified backfill materials over pipe with care, to avoid damage to pipe. Minimize traffic and turning of traffic over pipe.
- R. Backfill in accordance with Section 02221.
- S. Test pipe in accordance with Section 01665.

**END OF SECTION**

**SECTION 15068  
POLYETHYLENE CORRUGATED CULVERT PIPE**

**PART 1 – GENERAL**

1.01 REFERENCES

- A. American Society for Testing Materials (ASTM).
  - 1. ASTM F2306 - Standard Specification for 12 inch to 60 inch Annular Corrugated Profile-Wall Polyethylene Pipe and Fittings for Gravity-Flow Sewer and Subsurface Drainage Applications

**PART 2 – PRODUCTS**

2.01 PIPING

- A. Polyethylene culvert pipe and fittings shall be made of HDPE material with a minimum cell classification of 435400C. The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black of not less than two (2) percent. The manufacturer of the HDPE resin shall certify the cell classification indicated. The corrugated culvert pipe shall be manufactured by Advanced Drainage Systems (ADS) as N-12 Dual Wall with the following characteristics: corrugated exterior, smooth wall interior, water-tight, HDPE pipe or Engineer approved equal.

**PART 3 – EXECUTION**

3.01 INSTALLATION

- A. Install pipe in accordance with manufacturer's instructions, drawings and Section 02230.

**END OF SECTION**

**SECTION 26270  
LEAK DETECTION SYSTEMS**

**PART 1 – GENERAL**

1.01 SUMMARY

- A. Section includes requirements for leak detection systems located in the force main cleanout manholes.
- B. The leak detection systems shall send an alarm signal to the programmable logic controller (PLC) in the pre-treatment building when a leak is detected in a cleanout manhole. Required sensitivity for leak detection systems is <0.5 cm of liquid buildup shall be detected.
- C. Contractors shall design, furnish and install a complete and working leak detection system per Specifications and Drawings, including all parts and labor.
- D. All work shall be performed and installed in accordance with the latest revision of the National Electric Code and manufacturer's written recommendations.

1.02 SUBMITTALS

- A. Submit shop drawings and cut sheets for all leak detection panels and included equipment, conduit, electrical boxes and leak detection sensor.

**PART 2 – PRODUCTS**

2.01 GROUNDING

- A. Contractor shall design, furnish and install grounding for the leak detection system.

2.02 WIRING

- A. Contractor is responsible for wire sizing.
- B. Wiring in conduits: XHHW-2
  - 1. Minimum size = 12 AWG; contractor shall size wiring
- C. Wiring in panels: THHN/THWN-2
  - 1. Minimum size = 14 AWG; contractor shall size wiring
- D. Manufacturers:
  - 1. Southwire
  - 2. Alpha
  - 3. Okonite
  - 4. Engineer approved equal

2.03 CONDUIT

- A. Contractor is responsible for conduit sizing.

- B. Conduit under non-paved surfaces shall be schedule 40 PVC, and under paved surfaces shall be schedule 80 PVC.

#### 2.04 LEAK DETECTION SENSOR

- A. Leak detector sensor shall be an optic leak detector manufactured by Flowline, model Universal Polypropylene Optic Leak Detector, Model L010-1305, or Engineer approved equal.
- B. Leak detection sensor shall be able to be easily replaced with rewiring not required if it fails.
- C. Leak detection sensor shall be tested before and after installation.

### **PART 3 – EXECUTION**

#### 3.01 ELECTRICAL INSTALLATION

- A. All work shall be performed and installed in accordance with the latest revision of the National Electric Code and manufacturer's written recommendations.

**END OF SECTION**