EUGENE WATER & ELECTRIC BOARD

PROJECT MANUAL
FOR

E 40th Ave Storage Tanks - Excavation

CONTRACT # 21-122-PW

By and between
Eugene Water & Electric Board
And
Pacific Excavation, Inc.

FOR FURTHER INFORMATION REGARDING THIS PROJECT,
CONTACT PROJECT MANAGER LAURA FARTHING
4200 ROOSEVELT BLVD., EUGENE, OREGON 97402
PHONE 541-685-7464

EMAIL: LAURA.FARTHING@EWEB.ORG

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BID FORM

PROJECT: E. 40th Ave Storage Tanks - Excavation

BID OPENING: Tuesday, July 20th, 2021 at 2:00 PM PT

LOCATION: Eugene Water & Electric Board (EWEB)
Roosevelt Operations Center
4200 Roosevelt, Blvd
Eugene, OR 97402
Phone: 541-685-7150

THE FOLLOWING INFORMATION MUST BE RETURNED WITH YOUR RESPONSE:

- ☐ **00400 Bid Form**
- ☐ **00430-A First Tier Subcontractor Form**
- ☐ **00450 Minimum Qualifications Form**
- ☐ **00610 Bid Bond**
- ☐ **Signed addenda (or acknowledged in section B of this form)**
- ☐ **Electronic copy (CD preferred, but flash drive acceptable)**

A. EXCEPTIONS: Bidders, please note that any exceptions or stipulations to any of the requirements of this solicitation must be submitted in accordance with Section 00200, 1.1(h), Protest or Request for Changes of Specifications and/or Bidding Requirements. Exceptions that are not submitted in compliance with Section 00200, 1.1(h), may cause your bid to be ruled non-responsive.

B. ACKNOWLEDGMENT OF RECEIPT OF ADDENDA TO BID DOCUMENTS:
Bidder acknowledges receipt of Addenda and agrees to be bound by their contents.

Circle each BID addendum posted: (1) 2, 3, 4, 5, 6, 7, 8, 9, 10, None Posted

C. CCB/LCB REGISTRATION NUMBER - EWEB Rule 5-0230 Eligibility to Bid or Propose; Registration or License

Construction Contracts. EWEB shall not consider a Person's Offer to do Work as a contractor, as defined in ORS 701.005(2), unless the Person has a current, valid certificate of registration issued by the Construction Contractors Board at the time the Offer is made.

Non-complying Entities. EWEB shall deem an Offer non-responsive if it is received from a Person that fails to comply with this rule and shall reject the Offer as stated in ORS 279C.365(1)(k), unless contrary to federal law or subject to different timing requirements set by federal funding agencies.

Bidder is in compliance with the requirements of and is registered and bonded with the State of Oregon Construction Contractor's Board or Landscape Contractors Board as follows:

Registration classification: General All

Registration No.: 135019 Expiration Date: 4/23/2023

D. RESPONSIBILITY:

Prior to awarding a Public Improvement Contract, EWEB shall determine whether the lowest Responsible bidder meets the standards of Responsibility, as defined in ORS 279C.375.

E. BIDDER RESIDENCY INFORMATION:

ORS 279A.120 states, "For the purposes of awarding a public contract, a contracting agency shall":

- Give preference to goods or services that have been manufactured or produced in this state if price, fitness, availability and quality are otherwise equal; and
- Add a percent increase to the bid of a non-resident bidder equal to the percent, if any, of the preference given to the bidder in the state in which the bidder resides.

"Resident bidder" means a bidder that has paid unemployment taxes or income taxes in the state of Oregon during the 12 calendar months immediately preceding submission of the bid, has a business address in this state, and has stated in the bid whether the bidder is a "resident bidder" under this paragraph.

"Non-resident Bidder" means a Bidder who is not a "resident Bidder" as defined above

1. CHECK ONE: Bidder is a (X) RESIDENT Bidder ( ) NON-RESIDENT Bidder.
2. If resident bidder, enter your Oregon business address: (physical and mailing address)

   79 N Danebo Ave, Eugene, OR 97402

3. If a non-resident bidder, enter state of residency:

   _____

4. If a non-resident bidder, do you or your company receive, or are you or your company eligible for any preference in award of contracts with your state's government or with other governmental bodies in your state?
   CHECK ONE: ( ) YES ( ) NO

   If YES, state the preference percentage: _____%

   If YES, but not a percentage of bid price, describe the preference:

If YES, state the law or regulation that allows the preference described (legal citation):

F. ASSURANCES:

1. The Bidder hereby offers to furnish all labor, equipment, materials, and to perform all work, as bid, in strict accordance with all requirements of the above named project.

2. The Bidder certifies that Bidder has read, understands, and will comply with the drug testing requirements set forth in Section 00430-B.

3. Bidder acknowledges and agrees that, if this contract is for a Public Work subject to ORS 279C.800 to 279C.870, Bidder will comply with ORS 279C.840, as applicable.

4. Bidder certifies that all statements in the bid are true.

5. Bidder understands that this offer shall be subject to acceptance for ninety (90) calendar days from date of opening; thereafter it may be withdrawn.

G. NON-COLLUSION: ORS 279A.010 and 279A.990

By signing and submitting a bid, bidder certifies that:

1. Bidder has arrived at the specifics of the bid, including price and amounts, independently and without communication or agreement with another bidder, except as disclosed in a separately attached statement;

2. The bidder is not submitting the bid in the interest of or on behalf of any undisclosed person;

3. The bidder has not directly or indirectly induced or solicited another bidder, in order to benefit a third person, to submit a false or sham bid, to refrain from bidding or to change a bid;

4. The bidder has not directly or indirectly disclosed the bidder's bid price, a breakdown of the price, the contents of the price or information or data related to the price to another bidder;

5. The bidder has not sought through communication or agreement with a person to fix the bid price of the bidder or another bidder, to fix an overhead, profit or cost element of the bid price of the bidder or another bidder or to secure any advantage against the contracting agency or any other person interested in the public contract;

6. The bidder has not directly or indirectly expressed an interest or lack of interest in the public contract, or paid or offered to pay a fee to a person, to cause a collusive or sham bid;

7. The bid is genuine and not collusive or a sham.

H. ACKNOWLEDGMENTS:

1. **The Bidder acknowledges that the Contract consists of the following documents: Bid Form, Drug Testing Program Requirements, Minimum Qualifications, First Tier Sub-contractor Form, Performance Bond, Payment Bond, Certificate for Payment, Accounts Affidavit, Certificate of Completion, EWEB General Provisions and Supplements, Prevailing Wage Requirements, Change Order Form, Specifications, Drawings, Attachments.**

2. The Bidder declares that he/she has carefully examined the terms of this Contract, and has personally inspected and is satisfied with conditions at the Project site.

3. The Bidder hereby states that he/she shall abide by the provisions of ORS 279C.830(1) relating to Prevailing Wages Rates.

4. A bid bond and performance and payment bond are required. The bidder encloses with this bid acceptable security in the amount of ten percent (10%) of the total amount of the bid, made payable to the Owner. The bid security shall be forfeited as liquidated damages if bid is accepted by Owner and bidder fails to execute the Contract, provide the performance and payment bonds in the amount of 100% of the total amount of the bid, and provide the required evidence of insurance, as described below (Section 00700), within the time allowed.

5. Bidder further agrees:
   a. To start work within **10** calendar days after receipt from the Owner of Notice to Proceed; to prosecute the work with diligence to its completion as follows:

      Substantial Completion – **March 1, 2022**
      Final Completion – **April 1, 2022**

   b. To pay to the Owner as liquidated damages the amount of **$750.00** per calendar day for each calendar day by which actual completion time exceeds the contract completion time set forth above.

   c. To accept as full payment for the Lump Sum and Unit Price Work, the amounts computed in the Bid Schedule below. For Unit Price Work, Bidder agrees that the unit price represents a true measure of the labor, materials, and services required to furnish and install the item, including all allowances for overhead and profit.

TABLE NO. 1

Item No.	Description	Unit*	Estimated Quantity	Unit Price	Extended Price
1	Mobilization, Bonds, Insurance and Demobilization	LS	1	134,000.-	134,000.-
2	Erosion Control	LS	1	12,500.-	12,500.-
	All associated work required for mass excavation (Items 3a-3e below)				
3a	Shop drawings and approvals	LS	1	2,500.-	2,500.-
3b	Construction survey and staking	LS	1	10,000.-	16,000.-
3c	Stump Removal	LS	1	30,000.-	30,000.-
3d	Site preparation, tree protection, clearing and grubbing	LS	1	50,000.-	50,000.-
3e	Final site grading, surface restoration and site clean-up	LS	1	100,000.-	100,000.-
4	Common Excavation	CY	40,000	14.25	570,000.-
5	Rock Excavation including controlled drilling and blasting	CY	54,000	44.25	2,389,500.-
	Vibration Monitoring (Items 6a-6c below)				
6a	Seismograph monitoring and reporting, complete	LS	1	17,000.-	17,000.-
6b	Pre-blast Inspections	EA	30	1,100.-	33,000.-
6c	Post-blast Inspections	EA	15	1,100.-	16,500.-
	Bid Total:	$ 3,365,000.-			

TABLE NO. 2

The following items will not be included in the lump sum award, but they will be used to determine costs if services are requested. Estimates are not binding.

No.	Description	Unit*	Estimated Quantity	Unit Price	Extended Price
1	Additional tree removal identified by EWEB	Inches at DBH	100	135.-	13,500.-
2	Additional cost for overexcavation and select backfill material for unsuitable conditions	CY	500	82.-	41,000.-

6. EWEB is an Equal Employment Opportunity and Affirmative Action employer, and requires Contractors and their subcontractors to follow EEO/AA practices in their performance of this contract.

7. EWEB encourages contracting with minority owned, woman owned, and emerging small businesses (MWESB). The State of Oregon offers a certification process. Indicate below if your business is a MWESB and if so, which categories have been state certified.

MWESB Certified? No X Yes _____ If yes, circle categories below:

Minority Owned ___ Woman Owned ___ Emerging Small Business ___ Veteran Owned _____

The Contractor represents and warrants to the Owner that Contractor has the power and authority to enter into and perform this Contract, and that this Contract, when executed and delivered, shall be a valid and binding obligation of Contractor, enforceable in accordance with its terms. Contractor further warrants that the work of this Contract shall be performed in good and workmanlike manner, and that Contractor shall, at all times, be qualified, competent and current with any necessary licenses to perform work set forth in this Contract.

EUGENE WATER & ELECTRIC BOARD

DocuSigned by: 2DDF1A9F9C024EB...
Contract Administrator – Laura Farthing

DocuSigned by: AIC 2DDF1A9F9C024EB...
Supervisor – Wallace McCullough

DocuSigned by: karen kelley B7127E492C0345F...
Manager – Karen Kelley

DocuSigned by: Rod Price 714FAAB90CB94FD...
Assistant General Manager – Rod Price

Approved DocuSigned by: Quentin Furrow 46848599C53A4DF... For Sarah Gorsegner
Purchasing Supervisor-Sarah Gorsegner

Date 8/6/2021

CONTRACTOR:

Travis Craig
Signed

Travis Craig
Name (Print or Type)

79 N Danebo Ave, Eugene OR 97402
Address

7-20-2021
Date

Telephone: 541-726-7380

Email: Travis@pacificexc.com

Tax ID No. 93-1267825

End of Section 00400

FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

(ORS 279C.370)

PROJECT NAME: E. 40th Ave Storage Tank - Excavation BID # 21-122 PW

BID CLOSING DATE: 7/20/2021 TIME: **2:00 p.m.** (Pacific Standard Time)

FIRST-TIER SUBCONTRACTOR DISCLOSURE DUE DATE: 7/20/2021 TIME: **4:00 p.m.** (Pacific Standard Time)

This form must be submitted either with Bidders bid response or within two (2) working hours of the bid closing date/time.

List below the name of each subcontractor that will be furnishing labor or materials and that is required to be disclosed, the category of work that the subcontractor will be performing and the dollar value of the subcontract. **If the Bidder will not be using any subcontractors that are subject to the above disclosure requirements, the Bidder is required to indicate "NONE" on the form below.** (*If needed, attach additional sheets*).

	Company Name	Dollar Value	Category of Work
1.	Aggregate Resource Industries, Inc	1,157,500.-	Rock Drilling & Blasting
City, State, Phone No.:	Springfield, OR 541-747-6261		
2.			
City, State, Phone No.:			
3.			
City, State, Phone No.:			
4.			
City, State, Phone No.:			
5.			
City, State, Phone No.:			

A first-tier subcontractor is one that:

(A) Will be furnishing labor or will be furnishing labor and materials in connection with the public improvement; and
(B) Will have a contract value that is equal to or greater than five percent of the total project bid or $15,000, whichever is greater, or $350,000 regardless of the percentage of the total project bid.

After having been opened, the bids and the subcontractor disclosures shall be filed for public inspection. No modifications will be allowed once the submittal has been opened.

FAILURE TO SUBMIT THIS FORM BY THE DISCLOSURE DEADLINE WILL RESULT IN A SUBMITTED BID BECOMING NON-RESPONSIVE, AND SUCH BID SHALL NOT BE CONSIDERED FOR AWARD (Rule 5-0360).

BIDDER'S (COMPANY) NAME: Pacific Excavation

Bidder's Contact Name: Travis Craig **Phone #:** 541-726-7380

Deliver Form to Agency: EUGENE WATER & ELECTRIC BOARD
Person Designated to Receive Form: Wendy Lopez, Contract Specialist
Agency's Address: 4200 Roosevelt Blvd, Eugene, OR. 97402 **Phone No.** (541) 685-7150
Unless stated otherwise in the original solicitation, this document shall not be faxed. It is the responsibility of Bidders to submit this disclosure form and any additional sheets with the bid number and project name clearly marked, at the location indicated, by the specified disclosure deadline. See Instructions to Bidders.

End of Section 00430-A

Drug Testing Program Requirements for Public Improvement Contracts

The Contractor, by signature on this contract, certifies to EWEB the following:

1. That the Contractor has a drug-testing program in place for its employees that includes, at a minimum, the following:

a. A written employee drug-testing policy;
b. Required drug testing for all new Subject Employees, or, alternatively, required testing of all Subject Employees, every six (6) months, on a random selection basis;
c. Required testing of a Subject Employee when the Contractor has reasonable cause to believe the Subject Employee is under the influence of drugs; and
d. Required testing of a Subject Employee who is involved in:
(i) an accident causing an injury requiring treatment by a physician, or
(ii) an incident resulting in damage to property or equipment.

A drug-testing program that meets the above requirements will be deemed a "Qualifying Employee Drug-Testing Program." For the purposes of this rule, an employee is a "Subject Employee" only if that employee will be working on the Project job site.

2. Contractor shall represent and warrant to EWEB that the Qualifying Employee Drug-Testing Program is in place at the time of the Contract execution, and will continue in full force and effect for the duration of the Contract. Further, EWEB's performance obligation is contingent on Contractor's compliance with this representation and warranty.

3. That the Public Improvement Contract shall contain Contractor's covenant requiring each subcontractor providing labor for the Project to:

a. Demonstrate to the Contractor that it has a Qualifying Employee Drug-Testing Program for the subcontractor's Subject Employees, and represent and warrant to the Contractor that the Qualifying Employee Drug-Testing Program is in place at the time of subcontract execution, and will continue in full force and effect for the duration of the subcontract;

Or

b. Require the subcontractor's Subject Employees to participate in the Contractor's Qualifying Employee Drug-Testing Program for the duration of the subcontract.

END OF SECTION 00430-B

MINIMUM CONTRACTOR AND SPECIALTY SUBCONTRACTORS QUALIFICATIONS

Due to the technical and specialized nature of this project, and the intent of these provisions to obtain a first-class product, only Contractors and Subcontractors experienced as required by this solicitation document are qualified to work on this project.

The submittal form for Contractor's required qualifications listed below shall be submitted with the bid response by the bid opening due date stated on the Bid Form (00400). The submittal form for Sub-Contractor's required qualifications listed below shall be submitted with the First-Tier Sub-Contractor form within two (2) working hours of the bid closing date/time.

Failure to provide the completed forms by the required due date/time may render a bid non-Responsive and may be grounds for rejection of the bid.

REQUIREMENTS

CONTRACTOR – The following is a summary of the minimum Contractor qualifications for this project:

1. Contractor shall have:
    a. Minimum of 10 years of experience working on projects involving excavation in excess of 10,000 cubic yards of material.
    b. Experience with managing projects that involve rock removal.
    c. Off-site hauling of material through population centers.

2. Superintendent:
    a. Have managed 3 projects that involve excavation similar in scope in the last 10 years.

SUB-CONTRACTOR - As stated in Section 00700 General Conditions, a Subcontractor is defined as a Person having direct contract with the Contractor, or another Subcontractor, to perform one or more items of the Work. Information for Sub-contractors must be provided where subcontractor minimum qualifications are required. [Buyer: Consider first-tier subs in your minimum qualifications.] The following is a summary of the minimum Sub-Contractor qualifications to bid items of work on this project.

1) The blasting subcontractor shall have the following qualifications:

    a. Minimum of 5 years of demonstrated experience directly related to the controlled drilling and blasting, non-electric surface blasting of a similar nature, and other demonstrated experience working in urban settings.

2) References - EWEB reserves the right to deem a bid non-Responsive if a reference fails to provide up-to-date contact information for each reference or Non-Responsible if a reference fails to meet the Minimum Requirements for past work.

SUBMITTAL OF CONTRACTOR QUALIFICATIONS

(To be submitted with Bid response)

Bidder submits the following data and general qualifications as part of the Bid and represents and guarantees the truthfulness and accuracy thereof.

1. Bid submitted by: Pacific Excavation
   (Typed Name of Bidder)

2. Company Information

   a. Bidder has been in business continuously from the year 1999.

   b. Bidder has had experience in excavation work comparable to that required by the Contract documents for 22 years.

   c. Bidder is: An individual __ Partnership__ Corporation X

   d. Type of business General All.

3. Related Project Experience

   Bidder shall provide past performance information for up to 3 projects completed in the past 10 years similar in nature to the requirements specified. For each project the following information shall be provided:

   a. Name of Project.
   b. Description of Project including excavation work.
   c. Project start & completion dates.
   d. Original contracted Project cost.
   e. Contact person who is able to attest for Bidder's experience, including address, telephone number, and email address.

EWEB: General Contractor Qualifications

1. **Name of Project:** Hill Street Reconstruct
   -Project Location: Albany, OR
   -Project Date: April 2019 – November 2019
   -Original Contract: $3,054,344
   -Description of Project: Approximately 15,000 CY of Excavation, Asphalt Restoration, Utilities, Traffic Control, and Erosion Control.
   -Project Contact: City of Albany
   -Contact Person: Chris Cerklewski
   -Address: 333 Broadalbin St SW, Albany, OR 97321
   -Telephone Number: 541-917-7646
   -Site Superintendent: Travis Craig

2. **Name of Project:** Calloway Creek Subdivision
   -Project Location: Adair Village, OR
   -Project Date: May 2018 – June 2019
   -Project Cost: $2,830,083
   -Description of Project: Approximately 22,000 CY of Excavation, Asphalt Restoration, Utilities, Traffic Control, and Erosion Control.
   -Project Contact: K&D Engineering
   -Contact Person: Daniel Watson
   -Address: 276 NW Hickory St, Albany, OR 97321
   -Telephone Number: 541-928-2583
   -Site Superintendent: Travis Craig

3. **Name of Project:** Brooklane Heights
   -Project Location: Corvallis, OR
   -Project Date: July 2016 – May 2018
   -Project Cost: $5,059,445
   -Description of Project: Approximately 35,000 CY of Dirt/Rock Excavation, Asphalt Restoration, Utilities, Traffic Control, and Erosion Control.
   -Project Contact: Oakmont Development Company
   -Contact Person: Scott Sanders
   -Address: 4411 SW Golfview, Corvallis, OR 97333
   -Telephone Number: 541-740-3476
   -Site Superintendent: Travis Craig

SUBMITTAL OF SUPERINTENDENT QUALIFICATIONS (Part 2)

(To be submitted with Bid response)

Bidder submits the following data and general qualifications as part of the Bid and represents and guarantees the truthfulness and accuracy thereof.

1. Related Project Experience

   Bidder shall provide past performance information for at least 3 projects completed in the past 10 years similar in nature to the requirements specified. For each project the following information shall be provided:

   a. Name of Project.
   b. Description of Project.
   c. Project start & completion dates.
   d. Original contracted Project cost and Project cost at time of Final Completion.
   e. Owner's contact person who is able to attest for Bidder's experience, including address, telephone number, and email address. (This person should be notified by Contractor that EWEB may contact him/her for purposes of checking references.)

2. Resume

EWEB: General Contractor Superintendent Qualifications

1. **Name of Project:** Hill Street Reconstruct
   -Project Location: Albany, OR
   -Project Date: April 2019 – November 2019
   -Original Contract: $3,054,344
   -Description of Project: Approximately 15,000 CY of Excavation, Asphalt Restoration, Utilities, Traffic Control, and Erosion Control.
   -Project Contact: City of Albany
   -Contact Person: Chris Cerklewski
   -Address: 333 Broadalbin St SW, Albany, OR 97321
   -Telephone Number: 541-917-7646
   -Site Superintendent: Travis Craig

2. **Name of Project:** Calloway Creek Subdivision
   -Project Location: Adair Village, OR
   -Project Date: May 2018 – June 2019
   -Project Cost: $2,830,083
   -Description of Project: Approximately 22,000 CY of Excavation, Asphalt Restoration, Utilities, Traffic Control, and Erosion Control.
   -Project Contact: K&D Engineering
   -Contact Person: Daniel Watson
   -Address: 276 NW Hickory St, Albany, OR 97321
   -Telephone Number: 541-928-2583
   -Site Superintendent: Travis Craig

3. **Name of Project:** Brooklane Heights
   -Project Location: Corvallis, OR
   -Project Date: July 2016 – May 2018
   -Project Cost: $5,059,445
   -Description of Project: Approximately 35,000 CY of Dirt/Rock Excavation, Asphalt Restoration, Utilities, Traffic Control, and Erosion Control.
   -Project Contact: Oakmont Development Company
   -Contact Person: Scott Sanders
   -Address: 4411 SW Golfview, Corvallis, OR 97333
   -Telephone Number: 541-740-3476
   -Site Superintendent: Travis Craig

Travis Craig

President

Education:

Construction Engineering Management, Bachelor of Science
Oregon State University 1996
Safety Training: OSHA 10 Certification
AGC: Trench safety competent person, Fall protection

Work Experience:

Pacific Excavation – Senior Project Manager
May 2005 – Present

Senior Project Manager: Pacific Excavation, Inc.
Witham Oaks

- Engineer: OTAK
- Project Value: $13,000,000
- 29 Unit student housing project with public & private infrastructure

Senior Project Manager: Pacific Excavation, Inc.
Bonita Pump Station-LOTWP

- Engineer: Black and Veatch
- Project Value: $5.8 Million
- Construction of new CMU building, five vertical turbine pumps, mechanical piping, electrical, and site grading.

Senior Project Manager: Pacific Excavation, Inc.
Biosolids Dewatering & Pump Station Replacement – City of Bandon

- Engineer: The Dyer Partnership
- Project Value: $1.2 Million
- Construction of new biosolids dewatering facility, pumps station replacement, mechanical piping, and equipment, electrical, and site work.

Senior Project Manager: Pacific Excavation, Inc.
Thurston Wellfield – Springfield Utility Board

- Engineer: MSA
- Project Value: $1.4 Million
- Construction of new CMU building, mechanical piping, UV system, chemical feed, electrical, instrumentation, and site grading.

Senior Project Manager: Pacific Excavation, Inc.
St. Paul Pump Station Replacement – City of St. Paul

- Engineer: Ashley Engineering
- Project Value: $598,900
- Construction of two wastewater pump stations, small grinder pump station, new backwash storage tank, new valves and flowmeter vaults, system piping and appurtenances, electrical, instrumentation and controls.

Senior Project Manager: Pacific Excavation, Inc.
Cooper Creek Water Treatment Plant – City of Sutherlin

- Engineer: The Dyer Partnership
- Project Value: $5.1 Million
- Construction of new water treatment building, concrete backwash ponds, underground utilities, filter units, mechanical piping, and electrical

Senior Project Manager: Pacific Excavation, Inc.
Tertiary Filtration Phase No. 1- Metropolitan Wastewater Management Commission

- Engineer: Kennedy/Jenks Consultants
- Project Value: $5.9 Million
- Construction of new effluent filtration system, new filter pump station, new backwash waste pump station, new distribution structure, chemical feed system, yard piping, and electrical.

Senior Project Manager: Pacific Excavation, Inc.
City of Sweet Home 6.0 Water Treatment Plant

- Engineer: Erwin Consulting
- Project Value: $8.6 Million
- Construction of a 17,280 SQFT treatment plant building, three 1,400 Gal/Min filter units, concrete baffled clearwell, concrete backwash ponds, raw water holding pond, and pump station.

I-5 @ Beltline & Gateway – ODOT

- Engineer: ODOT
- Project Value: $11 Million
- Construction of new MSE wall, sound wall, storm piping, new off-ramp and on-ramp, road and intersection widening, electrical, sign structures, and site work.

City View Pump Station – EWEB

- Engineer: Eugene Water & Electric Board
- Project Value: $403,915
- Construction of new pump building with pumps and controls, site piping, and site work.

HMSC Effluent Disinfection Improvements Phase2 – OSU

- Engineer: Tetra Tech
- Project Value: $147,250
- Construction of new control and chemical building with equipment, install new wet well pumps, site work and site piping.

IP Springfield Water Intake Project – International Paper

- Engineer: Breshears/Thornton & CC Peterson Engineering
- Project Value: $244,379
- Construction of new HDPE waterline along with mass excavation for new pump station.

Odorous Air Treatment Expansion – MWMC

- Engineer: Brown & Caldwell
- Project Value: $965,350
- Construction of new HDPE air piping and headers.

Sweet Home Water Treatment Plant – City of Sweet Home

- Engineering: Erwin Consulting Engineering Project Value: $8.9 Million
- Construction of new treatment building, three mixed media filter units, concrete baffled clear well, concrete backwash ponds, raw water holding pond, and pump station. New raw water, finished water, storm drain, and sewer system piping.

Sanitary Sewer Pump Station Improvements – City of Junction City

- Engineering: Westech Engineering, Inc.
- Project Value: $2.8 Million
- Construction of two new pump submersible sewerage pump stations to replace the existing pump stations. New wet wells, valve vaults, control/generator buildings, gravity sewer and force main, decommissioning of the existing pump stations, utility improvements, new water line and electrical modifications.

Water Treatment Plant Improvements – City of Monroe

- Engineering: Southwood Engineering Corp.
- Project Value: $1 Million
- Construction of raw water intake structure in Long Tom River, replacement of a 6 in. waterline hung from a bridge over the Long Tom River, a metal treatment building, installation of membrane filters, associated pumps, piping, and electrical.

Wastewater Treatment Plant Improvements – City of Westfir

- Engineering: HGE, Inc.
- Project Value: $990,000
- Construction of gravity sewer modifications and extensions, single wall FRP tanks, filter pod and associated pumping equipment, building structure, generator, open channel UV system, and extensive mechanical and electrical construction.

Vera Street Lift Station – City of Springfield

- Engineering: City of Springfield
- Project Value: $570,000
- Install a pre-engineered 0.4 MGD wastewater lift station with 760 LF of 6 in. pressure pipe and 324 LF of 8" gravity pipe.

Willow Lake Water Pollution Control Facility – Reuse Improvements Project - City of Salem

- Engineering: HDR
- Project Value: $500,000
- Modification of existing NRS pump station to provide for disinfections of filtered water reuse water. This included the construction of a new steel contact tank, above grade piping between building and tank, modifications (demolition and new constructions) to the interior of pump station to allow for storage and pumping of liquid sodium hypochlorite. All concrete, mechanical and civil work was self performed.

Albany I-5 Transmission Line – City of Albany

- Engineering: Albany Public Works Department
- Project Value: $350,000
- Installation of new 24" DI water line. Included connections to existing services, coordination of tie ins and shutdowns, testing and chlorination.

E. Ellensdale Storm Project – City of Dallas

- Engineering: Dallas Public Works Department
- Project Value: $100,000
- Installation of 36" RCP storm pipe. Modifications to existing concrete flume, concrete collection structure.

Project Manager / Project (field) Engineer: The Natt McDougall Company (1999-2005)

Swift No. 2 Surge Arresting Structure – Cowlitz County

- Engineering: Montgomery Watson
- Project Value: $10 million
- Construction of new intake structure 10,000 CY concrete, intake gate and associated mechanical. Approximately 800 LF 16'-0" diameter welded steel pipe with concrete encasement. New steel lined valve house with mechanical piping and valves.

Franzen Reservoir Rehabilitation – City of Salem

- Engineering: Black & Veatch Corp.
- Project Value: $14 million
- Excavation, shaping and lining of existing 10-million-gallon water storage reservoir. Included installation of new welded steel/concrete encased inlet and outlet piping. Construction of concrete valve structures, liner curbing, inlet/outlet structures and new control building.

Landsburg Fish Passage Project – Seattle Public Utilities

- Engineering: Montgomery Watson
- Project Value: $10 million
- Construction on new fish screen, fish ladder, control building and 6'-0" diameter intake piping. Modifications to existing dam and roll gate replacement.

-

Walterville Fish Screen – Eugene Water & Electric Board

- Engineering: Montgomery Watson
- Project Value: $8 million
- Construction of new fish screen, fish bypass piping, outlet structure and control building.

South Suburban Sanitary District – City of Klamath Falls

- Engineering: Zbinden Carter Engineering
- Project Value: $2.3 million
- Wastewater treatment plant upgrades including new intake pump station, control building, screen building, blower building and associated site and mechanical installations and piping.

KFI Pump Station – City of Klamath Falls

- Engineering: URS
- Project Value: $1.8 million
- Caisson style pump station with new pumps, site and mechanical piping, diesel generator, control building and decommissioning of abandoned Wastewater Treatment plant.

Redmond Water Pollution Control Facility – City of Redmond

- Engineering: CH2Mhill
- Project Value: $9 million
- Complete wastewater treatment plant upgrade. New intake screen building, aeration basins, clarifiers, sludge handling facility, control building and pump station modifications. Included new site piping and mechanical and equipment installations.

Construction Engineer: Vern Bishop Planning and Construction (1996 – 1999)

Design build of various medical facilities. Public works projects both building and civil/mechanical.

SUBMITTAL OF SUBCONTRACTOR QUALIFICATIONS

(To be submitted with First-Tier Sub-Contractor Disclosure Form)

Bidder submits the following data and general qualifications as part of the Bid and represents and guarantees the truthfulness and accuracy thereof.

1. Name of Company:

2. Related Project Experience:

   Provide past performance information for up to 3 projects completed in the past 10 years similar in nature to the requirements specified and required, the following information shall be provided:

   a. Name of Project.

   b. Description of Project.

   c. Project start & completion dates.

   d. Original contracted Project cost and Project cost at time of Final Completion.

   e. Owner's contact person who is able to attest for Sub-Contractor's experience, including address, telephone number, and email address. (This person should be notified by Contractor that EWEB may contact him/her for purposes of checking references.)

   f. Scope of Sub-Contractor's responsibility

End of Section 00450

AGGREGATE RESOURCE INDUSTRIES, INC.

VIA E-MAIL

July 20, 2021

Beau Solesbee
Pacific Excavation
Beau@Pacificexc.com
541.619.4196

Re: **Prequalification's E 40th Ave Storage Tank**
Drilling & Blasting

Beau,

The following is Aggregate Resource Drilling, LLC's ("ARD") prequalification's for drilling & blasting services at the E 40th Ave Storage Tank project for EWEB.

Tualatin Sherwood Corporate Park: October 2020 - active
- Kerr Contractors & DeAtley Crushing
- 1,200,000+ tons of drilling and blasting with perimeter-controlled blasting
- Less than 150' from Tualatin Water District tanks, active Utilities & adjacent business parks
- $1,500,000.00+
- Matt DeAtley – MattDeAtley@euconcorp.com – 208.816.0625
- Tim Kerr – Tkerr@kerrcontractors.com – 971.235.5003

Sunset Heights Subdivision: January 2019 – May 2020
- AAA Development – MJM Grand
- 33 blasts within 70' of adjacent apartments and Hotel
- $650,000.00+
- Jay Schuetzle – Jay@mjmgrand.net – 509.370.0620

Gowen Interchange: June 2014 through March 2015
- Idaho Department of Transportation & Knife River Boise
- Controlled Blasting adjacent to I-90, Micron Chip factory and City of Boise Water Tanks on Gowen
- $250,000.00+
- Zach Cooper – Zach.Cooper@kniferiver.com – 208.577.1584

Bonney Quarry: January 2019 through February 2021
- Adjacent to Amazon Data Center & City of Hermiston water storage tanks
- 500,000 tons of material blasted for Amazon and Granite adjacent to Amazon Data Center
- $500,000.00+
- Arron Fitting – Arron@DeAtleyCrushing.com – 208.413.3347

PWC Diversion Dam: August 2016
- Stellar J Construction – City of Everett PUD Snohomish County
- Blasting inside active dam spillway to deepen spillway channel without damaging the adjacent structure.
- $185,000.00
- Destre Leifson – destreleifson@stellarj.com – 360.255.7996

Sincerely,
Kris Jeremiah
AGGREGATE RESOURCE DRILLING, LLC *(Contractor License # OR 130808)*

Eugene Water & Electric Board
4200 Roosevelt Blvd.
Eugene, OR 97402
(541) 685-7000
eweb.org

July 16th, 2021

ADDENDUM #1

E. 40th Ave. Storage Tanks - Excavation
ITB 21-122-PW

This addendum modifies the bidding document(s) for work only to the extent indicated herein. All other areas not specifically mentioned or affected by this addendum shall remain in full force. This addendum shall be added as a part of the original bidding document and shall become part of the work required.

CLARIFICATIONS – RESPONSE TO QUESTIONS RECEIVED:

Question: At the pre-bid EWEB indicated they would install the perimeter fencing and tree protection fencing, what tree protection is expected per bid item 3d?
Response: Bid item 3d includes maintenance of the previously installed tree protection fencing. It also includes care when working in the critical root zones to include coordination with the project arborist, pruning of roots and protection of the root zones as outlined in the specifications.

Question: Will the erosion measures and fencing noted on the Tree Removal plans (D-38084-ESC1) stay in place when the tree removal is complete?
Response: Yes. Prior erosion control measures and fencing will remain in place. Owner will maintain good conditions until excavation project commences.

Question: Will the tree removal include all the logging slash?
Response: The tree removal work happening under a separate contract will include removal of logging slash.

Question: Can you provide a bid item for the quantity of over-excavation backfill needed for the future piping excavation, or enough cross sections for all those areas so we can calculate the volume?
Response: The rock excavation in bid item 5 includes approximately 2,000 CY of excavation for future piping that will be excavated and left in place.

Question: Note 5 on C2 seems to allow soil backfill for the over-excavated areas, soil backfill may not allow all-weather access?
Response: The soil backfill for the over-excavated areas should be compacted rock excavation spoils or imported crushed rock to provide all-weather vehicle access.

Question: Can chips from the stump grinding be spread out on site as ground cover or be stockpiled on site for future use?
Response: For bidding purposes, all grindings will be disposed of off-site.

Question: Is there a surface tolerance for the subgrade elevation at the tank floors? Do we need to import crushed rock to fine grade the bottom of the tank excavation?
Response:
Surface tolerance for the tank subgrade areas is +/- 0.1 ft per the Rough Grading specification (31 22 13. 3.7). Imported crushed rock will be used to bring the tank subgrade to the shown elevation.

Question: Does note 6 on C3 (deeper excavation for future piping) apply to the entire shaded area on sheet C3? Are those quantities include in the pay quantity? Is this area to be backfilled with soil from on-site excavation (C2 note 5)?
Response: Note 6 on Sheet C-3 applies to the shaded areas delineated by the Control Points Table and Curve Table. These quantities are included in Bid Item 5, although the blasted material will remain in place for site safety. The intent is to maintain vehicle access and avoid tripping hazards between work packages.

Question: Will cars be allowed to park on the street during material removal?
Response: Closing the street to parking will require an approved traffic control plan and notification to the neighbors in accordance with City of Eugene policies.

Question: When will the tree removal and site clean up be complete?
Response: The tree removal work and site cleanup will be completed by August 30th, 2021.

Question: When will the construction fencing be installed?
Response: The fencing will be complete July 26th, 2021. EWEB will hold the fencing contract but the contractor will be responsible for maintaining the fence and repairing any damage caused by the Contractor.

Question: Please provide clarification on work hours.
Response: Work can proceed in accordance with the City of Eugene noise ordinance and be limited to the hours of 7 a.m. to 7 p.m.

Question: What permits will the contractor be required to obtain and what is the fee (01 10 00 1.6)?
Response: The Owner will obtain and pay fees for erosion control permit & building/grading permit (to include traffic control). No other state or municipal permits anticipated. Blasting or related explosives permits, if any beyond the building permit, will be the responsibility of the contractor.

Question: What is the source and location of water that EWEB is providing (01 10 00 1.8)?
Response: EWEB will provide construction water. Filling from a nearby hydrant is anticipated.

Question: Will the contractor be responsible for repairs to City streets caused by truck traffic?
Response: Normal wear and tear on public streets is to be expected. Patterson Street will be largely rebuilt during subsequent utility work under separate contract.

Question: Will there be any compaction testing required (01 10 00 1.11)?
Response:

- The only compaction required will be for areas of overblasting and filling with crushed rock back to grade. A proof roll can be used to confirm compaction.
- Compaction is not required for the areas of future piping excavation where the excavated material will remain in place.

Question: Will any sort of railing or fencing be required at the top of the cut slopes beyond what EWEB is furnishing (01 10 00 1.15)?
Response: No further railing or fencing is anticipated at the top of the cut slopes.

Question: Note 6 on plan sheet 2 calls for the contractor to provide grading to allow for tree removal, Is this part of the project scope?
Response: The note applies to additional tree removal work, as needed, under bid form Table 2, item 1.

Question: Is blasting and excavation for future site piping included in this project scope (plan sheet 7 note 4)?
Response:

- Yes. The shaded areas in Sheet C-3 reflect the future site piping excavation and are also characterized on the sections on Sheet C-4.

TECHNICAL ADDENDUM ITEMS:

Item Number	Page or Drawing	Location and Description of Change
TECHNICAL SPECIFICATIONS		
1.01	01 10 00	Paragraph 1.23: Delete 6:00 p.m." and insert "7 p.m."
1.02	31 23 16-3.5	Delete paragraph E.1b in its entirety.
Drawings		
1.03	D-38468-C2, Note 5	REPLACE the sentence, "PROVIDE COMPACTED SOILS FOR VEHICLE SITE ACCESS WITHN EXCAVATION EXTNETS NORTH OF TANK FOOTPRINTS," with "PROVIDE COMPACTED ROCK EXCAVATION SPOILS OR IMPORTED CRUSHED ROCK TO PROVIDE VEHCILE ACCESS TO THE SITE FROM PATTERSON STREET."

CLOSING DATE AND TIME

Remains unchanged.

This addendum constitutes a MATERIAL CHANGE to the bid. **ITS RECEIPT BY THE BIDDER IS TO BE ACKNOWLEDGED BY A SIGNATURE AND RETURNING A COPY OF THE ADDENDUM WITH ITS RESPONSE OR BY CIRCLING THE ADDENDUM NUMBER IN THE APPROPRIATE AREA ON THE BID FORM.**

Addendum prepared by:

Wendy Lopez, Contract Specialist

The undersigned hereby acknowledges receipt of this Addendum and agrees to be bound by the conditions therein.

Company Name: Pacific Excavation, Inc.

Signature: Francis Craig Date 7/20/2021

End of Addendum

EUGENE WATER & ELECTRIC BOARD
BID BOND

WE, PACIFIC EXCAVATION, INC., as Principal,
(Contractor Name)

and TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA, an
(Name of Surety)

CONNECTICUT corporation, authorized to transact business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns to pay unto Eugene Water & Electric Board the sum of
NOT TO EXCEED TEN PERCENT OF AMOUNT BID** ($ (**10%**)) dollars.

WHEREAS, a proposal or bid is submitted to Eugene Water & Electric Board by the Principal for the purpose of furnishing the following goods or services:

E. 40TH AVE STORAGE TANK - EXCAVATION
PROJECT #21-122-PW

The proposal or bid is made a part of this bid bond by reference.

NOW, THEREFORE, in accordance with ORS 279C.365 (5) for bids and 279C.400 (5) for proposals, if the proposal or bid submitted by the Principal is accepted, and if a Contract pursuant to the proposal or bid is awarded to said Principal, and if the Principal enters into and executes such Contract and furnishes any performance and payment bonds required by Eugene Water & Electric Board within the time fixed, then this obligation shall be void; otherwise, it shall remain in full force and effect. If the proposal or bid is not accepted, then the bid bond will be returned or voided, in accordance with ORS 279C.385.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.
Dated this 20th day of JULY, 20 21.

SURETY:

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA
Name of Surety

ONE TOWER SQUARE-2SHS HARTFORD, CONNECTICUT 06183
Surety Address

Michelle Bench
Attorney in Fact (signature)

MICHELLE BENCH
Attorney in Fact - Name (print)

541-741-0550 BONDS@KPDINSURANCE.COM
Attorney in Fact - Phone / Email

PRINCIPAL /CONTRACTOR: PACIFIC EXCAVATION, INC.

Representative's Signature

Spencer Chamberlain / President
Representative's Name and Title (print)

79 N. Danebo Ave. Eugene OR 97402
Representative's Office Address

541-726-7380 spencer@pacificexc.com
Representative's Phone / Email

BONDING COMPANY / BROKER

KPD INSURANCE LLC
Company Name

1111 GATEWAY LOOP, SPRINGFIELD, OR 97477
Office Address

541-741-0550
Office Phone

TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Michelle Bench** of **SPRINGFIELD**, **Oregon**, their true and lawful Attorney-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **17th** day of **January**, **2019.**

State of Connecticut

City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the **17th** day of **January**, **2019**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June**, **2021**

_____
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this **20th** day of **JULY**, **2021**.

_____
Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney-in-Fact and the details of the bond to which this Power of Attorney is attached.

Eugene Water & Electric Board

BOND NO. 107453846
Section 00610

EUGENE WATER & ELECTRIC BOARD
PERFORMANCE BOND

We PACIFIC EXCAVATION, INC., as Principal
(Name of Contractor or "Principal ")

and TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA,
(Name of Surety)

a(n) CONNECTICUT corporation, authorized to transact business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns to pay unto Eugene Water & Electric Board the sum of

THREE MILLION THREE HUNDRED SIXTY FIVE THOUSAND NO/100's**($3,365,000.00)
(Penal Sum of Bond)

WHEREAS, the Principal has entered into a Contract with Eugene Water & Electric Board, the specifications, terms and conditions of which are contained in Invitation to Bid/Request for Proposal No. 21-122-PW; and

WHEREAS, that Contract is made a part of this performance bond by reference; and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the certain terms, conditions, requirements, plans and specifications which are set forth in said Contract, and all authorized modifications of the Contract which increase the amount of the work and the amount of the Contract, notice of any such modifications hereby being waived by the Surety; and

WHEREAS, the Principal has agreed to perform that Contract as summarized below:
E. 40TH AVE STORAGE TANK - EXCAVATION for Eugene Water & Electric Board in strict accordance with the specifications contained in the Invitation to Bid/Request for Proposal.

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH THAT, if the Principal shall faithfully perform all matters and things as agreed under the Contract within the time prescribed therein, including the conditions listed in ORS 279C.500 to 279C.545, and shall indemnify, defend and save harmless Eugene Water & Electric Board, and their officers, employees and agents against any claim or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the said Contract by the said Principal or its Subcontractors; and shall do all things required of the Principal by the laws of the state of Oregon, then this obligation shall be void; otherwise, it shall remain in full force and effect. In no event shall the bond be released or voided until all claims accruing during the course of the warranty period of the Contract have been fully resolved and warranty period concluded, or until the full amount of the surety obligation is exhausted, whichever comes first.

SURETY agrees (1) that any extension of time allowed said Principal for completion of work or for delivery under the said Contract shall not impair this obligation or reduce any period of maintenance or warranty provided in said Contract; (2) that any change made in the terms or provisions of said Contract increasing the price to be paid to Principal, without notice to the SURETY shall not impair this obligation, PROVIDED that all such increases shall not in aggregate exceed twenty-five percent (25%) of the original Contract price without consent of SURETY, however, any such change shall automatically increase the obligation of the SURETY hereunder in a like amount,; and (3) that this obligation shall continue to bind the said Principal and SURETY notwithstanding successive payment made hereunder for successive breaches, until the full amount of the said obligation is exhausted.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.

Dated this 23rd day of July, 2021.

SURETY

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA/HARTFORD, CT
Name, City, State of Surety

Michelle Bench
Attorney in Fact (Signature)

MICHELLE BENCH, k.p.d. INSURANCE LLC
Attorney in Fact - Name and Company Name (print)

BONDING COMPANY:

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA 541-741-0550
Company Name and Phone (Print)

ONE TOWER SQUARE-2SHS, HARTFORD, CT 06183
Company Address

PRINCIPAL / CONTRACTOR:

PACIFIC EXCAVATION, INC.
(Name of Company)

Travis Craig
(Signature)

TRAVIS CRAIG - PRESIDENT
(Printed Name and Title)

BOND NO. 107453846

EUGENE WATER & ELECTRIC BOARD
PAYMENT BOND

We PACIFIC EXCAVATION, INC., as Principal
(Name of Contractor or "Principal")

and TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA,
(Name of Surety)

a(n) CONNECTICUT corporation, authorized to transact business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns to pay unto Eugene Water & Electric Board the sum of

THREE MILLION THREE HUNDRED SIXTY FIVE THOUSAND NO/100's**($3,365,000.00)
(Penal Sum of Bond)

WHEREAS, the Principal has entered into a Contract with Eugene Water & Electric Board, the specifications, terms and conditions of which are contained in Invitation to Bid/Request for Proposal No. 21-122-PW; and

WHEREAS, that Contract is made a part of this payment bond by reference; and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the certain terms, conditions, requirements, plans and specifications which are set forth in said Contract, and all authorized modifications of the Contract which increase the amount of the work and the amount of the Contract, notice of any such modifications hereby being waived by the Surety; and

WHEREAS, the Principal has agreed to perform that Contract as summarized below:
E. 40TH AVE STORAGE TANK - EXCAVATION for Eugene Water & Electric Board in strict accordance with the specifications contained in the Invitation to Bid/Request for Proposal.

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH THAT, if the Principal shall faithfully perform all matters and things as agreed under the Contract within the time prescribed therein, including the conditions listed in ORS 279C.500 to 279C.545, and shall promptly pay all persons supplying labor or materials to the Principal or its Subcontractor for prosecution of the work provided in said Contract; and shall promptly pay all contributions due the State Industrial Accident Fund and the State Unemployment Compensation Fund from the Principal or its Subcontractor in connection with the performance of the Contract; and shall pay over to the Oregon Department of Revenue all sums required to be deducted and retained from the wages of employees of the Principal and its Subcontractor pursuant to ORS 316.167; and shall permit no lien nor claim to be filed or prosecuted against Eugene Water & Electric Board on account of any labor or materials furnished; and shall indemnity, defend and save harmless Eugene Water & Electric Board, and their officers, employees and agents against any claim or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the said Contract by the said Principal or its Subcontractors; and shall do all things required of the Principal by the laws of the state of Oregon, then this obligation shall be void; otherwise, it shall remain in full force and effect. In no event shall the bond be released or voided until all claims accruing during the course of the warranty period of the Contract have been fully resolved and warranty period concluded, or until the full amount of the surety obligation is exhausted, whichever comes first.

SURETY agrees (1) that any extension of time allowed said Principal for completion of work or for delivery under the said Contract shall not impair this obligation or reduce any period of maintenance or warranty provided in said Contract; (2) that any change made in the terms or provisions of said Contract increasing the price to be paid to Principal, without notice to the SURETY shall not impair this obligation, PROVIDED that all such increases shall not in aggregate exceed twenty-five percent (25%) of the original Contract Price without consent of SURETY, however, any such change shall automatically increase the obligation of the SURETY hereunder in a like amount,; and (3) that this obligation shall continue to bind the said Principal and SURETY notwithstanding successive payment made hereunder for successive breaches, until the full amount of the said obligation is exhausted.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives.

Dated this 23rd day of July, 2021.

SURETY

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA/HARTFORD, CT
Name, City, State of Surety

Michelle Bench
Attorney in Fact (Signature)

MICHELLE BENCH, k.p.d. INSURANCE LLC
Attorney in Fact - Name and Company Name (print)

BONDING COMPANY:

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA 541-741-0550
Company Name and Phone (Print)

ONE TOWER SQUARE-2SHS, HARTFORD, CT 06183
Company Address

PRINCIPAL / CONTRACTOR:

PACIFIC EXCAVATION, INC.
(Name of Company)

Travis Craig
(Signature)

TRAVIS CRAIG - PRESIDENT
(Printed Name and Title)

End of Section 00610

TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Michelle Bench** of **SPRINGFIELD**, **Oregon**, their true and lawful Attorney-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **17th** day of **January**, **2019.**

State of Connecticut

City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the **17th** day of **January**, **2019**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June**, **2021**

_____
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this 23rd day of July, 2021.

_____
Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney-in-Fact and the details of the bond to which this Power of Attorney is attached.

CONTRACTOR AFFIDAVIT - PAYMENT OF ALL ACCOUNTS

STATE OF: _____

COUNTY OF: _____

I, _____, A representative of _____

being duly sworn, do depose and say that I pay, or supervise payment, for all labor, materials, services and supplies used by same in the construction of the _____ and other related work, under contract with the Eugene Water & Electric Board; that all persons employed on said project have been paid the full wages earned at not less than the minimum rates specified for each worker classification; that all bills for materials, services and supplies have been fully paid; and that there are no liens or encumbrances of any nature whatsoever pending against the work performed or material furnished, to the best of my knowledge and belief.

CONTRACTOR / PRINCIPAL

_____
Signature

_____
Name and Title - Print

_____
Company Name

NOTARY:

Sworn to before me this day of _____, 20___.

_____
Notary Public for Oregon - Signature

_____
Printed Name of Notary Public

My Commission Expires: _____

CERTIFICATE OF SUBSTANTIAL COMPLETION
PROCEDURE FOR PROCESSING

Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents and EWEB can fully occupy or use the Work for its intended function.

When the Contractor considers that the Work, or a portion that EWEB agrees to accept separately, is substantially complete, the EWEB Contract Administrator shall prepare a punchlist to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. If the Contract Administrator's inspection discloses any item, whether included on the Contractor's list or not, that is not in accordance with the requirements of the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Contract Administrator. The Contractor shall then submit a request for another inspection by the Contract Administrator to determine Substantial Completion. When the Work or designated portion is substantially complete, the Contractor will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion and shall establish responsibilities of EWEB and Contractor for security, maintenance, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. The Certificate of Substantial Completion shall be considered valid only when all parties' signatures appear on this document.

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT NAME: _____

CONTRACT ADDRESS: _____

CONTRACT NUMBER: _____ TASK ORDER NUMBER: _____

CONTRACT NAME: _____

CONTRACTOR NAME: _____

DATE OF CERTIFICATE ISSUANCE: _____

PROJECT OR DESIGNATED PORTION SHALL INCLUDE: _____

_____

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

DEFINITION OF DATE OF SUBSTANTIAL COMPLETION

The Date of Substantial Completion of the Work or designed portion thereof is the Date certified by the EWEB Contract Administrator when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

A Punch List (as defined in Section 00700), prepared by the EWEB Contract Administrator, is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

The Owner (EWEB) accepts the Work or designed portion thereof as substantially complete and will assume full possession thereof at _____ (time) on _____ (date).

_____ _____

EWEB CONTRACT ADMINISTRATOR Date

The Contractor will complete or correct the Work on the list of items attached hereto within _____ days from the above Date of Substantial Completion.

_____ _____

CONTRACTOR BY Date

NOTICE OF FINAL COMPLETION

CONTRACT NAME: _____

CONTRACT NUMBER: _____ TASK ORDER NUMBER: _____

PROJECT ADDRESS: _____

CONTRACTOR NAME: _____

CONTRACTOR ADDRESS: _____

OWNER: EUGENE WATER & ELECTRIC BOARD
PO BOX 10148
EUGENE, OR 97440-2148

The work performed under this Contract has met the requirements of Final Completion, defined as the final completion of all requirements under the Contract, including Contract Closeout, as described in Section 00700 General Conditions, but excluding Warranty Work, further described in Section 00700, and the final payment and release of all retainage, if any.

EWEB	**CONTRACTOR**
_____	_____
Signature of EWEB Contract Administrator	Signature of Representative
_____	_____
Name - Print	Representative Name and Title - Print
_____	_____
Date	Representative's Phone

END OF SECTION 00620

CERTIFICATE FOR PAYMENT

TO EWEB: _____ ATTENTION: _____ CERTIFICATE #: _____

PROJECT NAME: _____ FROM: _____ PERIOD TO: _____

CONTRACT FOR: _____ EWEB JOB #: _____ CONTRACT DATE: _____

APPLICATION FOR PAYMENT

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Change Orders approved in previous months by EWEB.		
TOTAL:		
Approved this Month NUMBER DATE		
MONTHLY TOTALS		
Net Change by Change Orders		

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief, the Work covered by this Certificate for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by Contractor for Work for which previous Certificates of Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

Application is made for Payment, as shown in connection with Contract Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM..... $_____
2. NET CHANGE BY CHANGE ORDER..... $_____
3. CONTRACT SUM TO DATE (Line 1 and 2)..... $_____
4. TOTAL COMPLETED & STORED TO DATE..... $_____
   (Total Column G, Page 2)
5. RETAINAGE:
   a. ___% of Completed Work $_____
      (Column D + E on Page 2)
   b. ___% of Stored Material $_____
      (Column F on Page 2)
   c. Total Retainage (Line 5a + 5b).....$_____
6. TOTAL EARNED LESS RETAINAGE..... $_____
   (Line 4 less Line 5 Total)
7. LESS PREVIOUS PAYMENTS..... .... $<_____>
   (Line 6 from prior payments)
8. CURRENT PAYMENT DUE..... ..... $_____
9. ADD RETAINAGE WITHHELD THIS PAYMENT..... $_____
10. BALANCE TO FINISH..... $_____

CONTRACTOR: _____

By: _____ Date: _____

CONTRACT ADMINISTRATOR: _____

DATE: _____

CERTIFICATE FOR PAYMENT
PROCEDURE FOR PROCESSING

At least 15 working days before the date established for each progress payment, the Contractor shall submit to the EWEB Contract Administrator an itemized Certificate for Payment for operations completed in accordance with the Schedule of Work. Such certificate shall be notarized and supported by such data substantiating the Contractor's right to payment as EWEB may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage. Certificate shall include requests for payment on account of changes in the Work which have been properly authorized by Change Orders. Certificate shall not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

The Contractor warrants that title to all Work covered by a Certificate for Payment will pass to EWEB no later than the time of payment. The Contractor further warrants that upon submittal of a Certificate for Payment all work, to the best of the Contractor's knowledge, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

The issuance of the Certificate for Payment will constitute a representation by the Contract Administrator that, based on observations at the site and the data comprising the payment, the Work has progressed to the point indicated and that, to the best of the Contract Administrator's knowledge, information and belief, quality of the work is in accordance with Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the Contract Administrator. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified.

CONTINUATION SHEET

TABULATIONS BELOW ARE TO BE STATED TO THE NEAREST DOLLAR.
USE COLUMN I ON CONTRACTOS WHERE VARIABLE RETAINAGE FOR THE LINE ITEMS MAY APPLY.

CERTIFICATE #_____

CERTIFICATE DATE: _____

PERIOD FROM: _____

PERIOD TO: _____ EWEB JOB #_____

A	B	C	D	E	F	G	G	I
Item No.	Description of Work	Scheduled	Work Completed From Previous Application	Work Completed This Period	Materials Presently Stored (Not in D or E)	Total Completed and Stored to Date (D + E + F)	Balance to Finish (C-G)	Retainage

CERTIFICATE FOR PAYMENT
DOCUMENT LINE DESCRIPTIONS
CONTINUATION SHEET - PAGE 2

(A), (B), (C) These columns should be completed by identifying the various portions of the project and their scheduled value consistent with the schedule submitted to the Contract Administrator at the commencement of the project or as subsequently adjusted. The breakdown may be by sections of the Work or by Subcontractors and should remain consistent throughout the project. Multiple pages should be used when required.

Column C should be subtotaled at the bottom when more than one page is used and totaled on the last page. Initially, this total should equal the original Contract Sum. The total of column C may be adjusted by Change Orders during the project.

(D) Enter in this column the amount of completed Work covered by the previous application. This is the sum of columns D and E from the previous application. Values from column F (Materials Presently Stored) from prior payments should not be entered in this column.

(E) The value of Work completed until the time of this application, including the value of materials incorporated in the project which were listed on the previous Certificate for Payment under Material Presently Stored (column F).

(F) The value of Material Presently Stored for which payment is sought. The total of the column must be recalculated at the end of pay period. This value covers both materials newly stored for which payment is sought and materials previously stored which are not yet incorporated into the project. Mere payment by EWEB for stored materials does not result in a deduction from this column. Only as materials are incorporated into the project is their value deducted from this column and incorporated into column E (Work Completed - This Period).

(G) The total of columns D, E, and F. Calculate the percentage completed by dividing column G by column C.

(H) The difference between column C (Scheduled Value) and column G (Total Completed and Stored to Date).

(I) This column is normally used only for contracts where variable retainage is permitted on a line-item basis. It need not be completed on projects where a constant retainage is withheld from the overall contract amount.

GENERAL CONDITIONS

SECTION A - GENERAL PROVISIONS

SECTION B - ADMINISTRATION OF CONTRACT

SECTION C - WAGES AND LABOR

SECTION D - CHANGES IN THE WORK

D.1 Changes in Work
D.2 Delays
D.3 Claims Review Process

SECTION E - PAYMENTS

E.1 Schedule of Values
E.2 Applications for Payment
E.3 Payroll Certification Requirements
E.4 Dual Payment
E.5 Retainage
E.6 Final Payment

SECTION F - JOB SITE CONDITIONS

F.1 Use of Premises
F.2 Protection of Workers, Property, and the Public
F.3 Cutting & Patching
F.4 Cleaning Up
F.5 Environmental Contamination
F.6 Environmental Clean-Up
F.7 Force Majeure

SECTION G - INDEMNITY, BONDING AND INSURANCE

G.1 Responsibility for Damages/Indemnity
G.2 Performance and Payment Security
G.3 Insurance

SECTION H - SCHEDULE OF WORK

H.1 Contract Period
H.2 Schedule
H.3 Partial Occupancy

SECTION I - CORRECTION OF WORK

I.1 Correction of Work before Final Payment
I.2 Warranty Work

SECTION J - SUSPENSION AND/OR TERMINATION OF THE WORK

J.1 Owner's Right to Suspend the Work
J.2 Contractor's Responsibilities
J.3 Compensation for Suspension
J.4 Owner's Right to Terminate Contract
J.5 Termination for Convenience

SECTION K - CONTRACT CLOSE-OUT

K.1 Record Drawings
K.2 Operation and Maintenance Manuals
K.3 Release of Liens and Claims
K.4 Completion Notices
K.5 Training
K.6 Extra Materials
K.7 Environmental Clean-Up
K.8 Certificate of Occupancy
K.9 Other Contractor Responsibilities
K.10 Survival
K.11 Publicity

SECTION L - LEGAL RELATIONS & RESPONSIBILITY TO THE PUBLIC

L.1 Laws to be Observed
L.2 Federal Agencies
L.3 State Agencies
L.4 Local Agencies

SECTION A - GENERAL PROVISIONS

A.1 DEFINITION OF TERMS

In the Contract Documents the following terms shall be as defined below:

ARCHITECT means a person who is registered and holds a valid certificate in the practice of architecture in the State of Oregon, as provided under ORS 671.010 to 671.220, and includes without limitation the terms "architect," "licensed architect," and "registered architect." (See ORS 279C.100 (1))

CLAIM means a demand or assertion by Contractor seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract.

CONTRACT or Contracts means the written agreement(s), resulting from the Solicitation Document that sets forth the rights and obligations of the parties.

CONTRACT ADMINISTRATOR (see OWNER'S AUTHORIZED REPRESENTATIVE).

CONTRACT DOCUMENTS means the Solicitation Document and addenda thereto; Instructions to Bidders; General Conditions; Supplemental General Conditions, if any; the accepted Offer; the Contract (excluding the General Conditions) and amendments thereto, if any; Plans; Specifications and approved Change Orders.

CONTRACT PERIOD, as set forth in the Contract Documents, means the period beginning with the issuance of the Notice to Proceed and concluding upon Final Completion.

CONTRACT PRICE means the total maximum payments that EWEB is required to make under a Contract.

CONTRACTOR means the Person with whom EWEB enters into a Contract.

DAYS except as otherwise provided, means calendar days. (See ORS 279A.010(1)(c))

DIRECT COSTS means, unless otherwise provided in the Contract Documents, the cost of materials, including sales tax, cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits required by agreement or custom; worker's compensation insurance; project specific insurance; bond premiums, rental cost of equipment, and machinery required for execution of the work; and the additional costs of field personnel directly attributable to the Work.

EMERGING SMALL BUSINESS means (a) a business with its principal place of business located in this state; (b) a business with average annual gross receipts for the last three years not exceed $1 million for construction firms, and $300,000 for non-construction firms; (c) a business that has fewer than 20 employees; (d) an independent business; (e) a business properly licensed and legally registered in this state, and (f) a business certified by the Office of Minority, Women and Emerging Small Business.

ENGINEER means a person who is registered and holds a valid certificate in the practice of engineering in the State of Oregon, as provided under ORS 672.002 to 672.325, and includes all terms listed in ORS 672.002(2). (See ORS 279C.100(3))

FINAL COMPLETION means the final completion of all requirements under the Contract, including Contract Closeout as described in Section K but excluding Warranty Work as described in Section I.2, and the final payment and release of all retainage, if any, released.

FORCE MAJEURE means an act, event, or occurrence caused by fire, riot, war, acts of God, nature, sovereign, or public enemy, strikes, freight embargoes or any other act, event or occurrence that is beyond the control of the party to this Contract who is asserting Force Majeure.

MINORITY OR BUSINESS ENTERPRISE, as defined in ORS 200.005, means a small business concern that is at least 51% owned by one or more minorities or women, or, in the case of a corporation, at least 51% of the stock is owned by one or more minorities or women, and whose management and daily business operations are controlled by one or more such individuals.

MINORITY INDIVIDUAL, as defined in ORS 200.005, means a person who is a citizen or lawful permanent resident of the United States who is:

a) African American, having origins in any of the original peoples of Africa;
b) Hispanic, of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
c) Asian American, having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands;
d) Portuguese, a person of Portuguese, Brazilian or other Portuguese culture or origin, regardless of race;
e) American Indian or Alaskan Native, having origins in any of the original peoples of North America; or
f) a Member of another group, or another individual who is socially and economically disadvantaged, as determined by the Certification Office for Business Inclusion and Diversity.

NOTICE TO PROCEED means the official written notice from the Owner stating that the Contractor is to proceed with the Work defined in the Contract Documents. Notwithstanding the Notice to Proceed, Contractor shall not be authorized to proceed with the Work until all initial Contract requirements, including the Contract, performance bond, payment bond, and certificates of insurance, have been fully executed and submitted to Owner in a suitable form.

OFFER or OFFERS means a response(s) to a Solicitation Document.

OFFEROR means a Person who submits an Offer.

OVERHEAD means those items that may be included in the Contractor's markup (general and administrative expense, overhead and profit) and that shall not be charged as Direct Cost of the Work: wages or salary of personnel above the level of foreman (i.e., superintendents and project managers); expenses of the Contractor's offices (e.g. job trailer) including personnel; and overhead and general administrative expenses.

OWNER means the Eugene Water & Electric Board (EWEB).

OWNER'S AUTHORIZED REPRESENTATIVE means those individuals identified in writing by the Owner to act on behalf of the Owner for this Project. Owner may elect, by written notice to Contractor, to delegate certain duties of the Owner's Authorized Representative to more than one party, including without limitation, to an Architect/Engineer. May also be referred to as the EWEB Project Manager or Contract Administrator.

PERSON or PERSONS means a natural person(s) capable of being legally bound, a sole proprietorship, a corporation, a partnership, a limited liability company or partnership, a limited partnership, a for-profit or nonprofit unincorporated association, a business trust, two or more persons having a joint or common economic interest, any other person with legal capacity to contract or a public body. (See ORS 279A.010(1)(r)) "Person" or "Persons" includes an individual, limited liability entity, association, joint venture, governmental agency, and public corporation. For purposes of required conditions in construction contracts, unless the context requires otherwise, "Person" or "Persons" includes the State Accident Insurance Fund and the Department of Revenue.

(See ORS 279C.500) For purposes of the determination of the prevailing rate of wage, "Person" or "Persons" includes any employer, labor organization or any official representative of an employee or employer association. (279C.815(1))

PLANS mean the drawings that show the location, type, dimensions, and details of the Work to be done under the Contract.

PUBLIC IMPROVEMENT CONTRACTS means a public contract for a public improvement. "Public improvement contract" does not include a public contract for emergency work, minor alterations, or ordinary repair or maintenance necessary to preserve a public improvement. (See ORS 279A.010(1)(bb))

PUNCHLIST means the list of Work yet to be completed or deficiencies that need to be corrected in order to achieve Final Completion of the Contract.

RESPONSIBLE bidder or proposer means that bidder can demonstrate that they have the appropriate resources, expertise, and tools to perform the work and meet all necessary requirements. (See ORS 279B.110 for detail.)

RESPONSIVE bid or proposal means a bid or proposal that substantially complies with the invitation to bid or request for proposals and all prescribed procurement procedures and requirements.

SOLICITATION DOCUMENT an Invitation to Bid, Request for Proposals or any documents issued to invite offers in response to a Special Procurement pursuant to ORS 279B.085, and includes all documents incorporated into any of the foregoing by reference.

SPECIFICATION means any description of the physical or functional characteristics, or of the nature of a supply, equipment, service, or construction item, including any requirement for inspecting, testing, or preparing a supply, service, or construction item for delivery and the quantities or qualities of materials to be furnished under the Contract. Specifications generally will state the result to be obtained and may, on occasion, describe the method and manner of doing the Work to be performed. "Specification" may include a description of any requirement for inspecting, testing or preparing goods or services for delivery. "Specification" may also include any description of the characteristics or nature of personal services. (See ORS 279B.200(3))

SUBCONTRACTOR means a Person or company who contracts with the Contractor to provide labor only, or materials and labor, or who specially fabricates and installs a portion of the work or improvement according to drawings contained in the project or bid manual.

SUBSTANTIAL COMPLETION means the date when the Owner accepts in writing the construction, alteration or repair of the improvement to real property or any designated portion thereof as having reached that state of completion when it may be used or occupied for its intended purpose. Substantial Completion of facilities with operating systems occurs only after thirty (30) continuous Days of successful, trouble-free operation of the operating systems as provided in Section K.4.2.

SUBSTITUTIONS means items that in function, performance, reliability, quality, and general configuration are the same or better than the product(s) specified. Approval of any substitute item shall be solely determined by the Owner's Authorized Representative. The decision of the Owner's Authorized Representative is final.

SUPPLEMENTAL GENERAL CONDITIONS means those conditions that remove from, add to, or modify these General Conditions. Supplemental General Conditions may be included in the Solicitation Document or may be a separate attachment to the Contract.

WORK means the furnishing of all materials, equipment, labor, and incidentals necessary to successfully complete any individual item or the entire Contract and successful completion of all duties and obligations imposed by the Contract.

A.2 SCOPE OF WORK: The Work contemplated under this Contract includes all labor, materials, transportation, equipment and services for, and incidental to, the completion of all construction work in connection with the project described in the Contract Documents. The Contractor shall perform all Work necessary so that the Project can be legally occupied and fully used for the intended use as set forth in the Contract Documents.

A.3 INTERPRETATION OF CONTRACT DOCUMENTS:

A.3.1 Unless otherwise stated in the Contract Documents, words which have well-known technical meanings or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Contract Documents are intended to be complementary. Whatever is called for in one, is interpreted to be called for in all. However, in the event of conflicts of discrepancies among the Contract Documents, interpretations will be based on the following descending order of precedence:

a) The Contract (excluding the General Conditions) and amendments to same, including approved Change Orders, with those of later date having precedence over those of an earlier date;
b) The Supplemental General Conditions;
c) The General Conditions;
d) The Specifications;
e) The Plans;
f) The Solicitation Document and any addenda thereto;
g) The accepted Offer.

A.3.2 In the case of an inconsistency between Plans and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Owner or Owner's Authorized Representative's interpretation in writing.

A.3.3 If the Contractor finds discrepancies in, or omissions from the Contract Documents, or if the Contractor is in doubt as to their meaning, the Contractor shall at once notify the Owner or Owner's Authorized Representative. Matters concerning performance under, and interpretation of requirements of, the Contract Document will be decided by the Owner's Authorized Representative, who may delegate that duty in some instances to the Architect/Engineer. Responses to Contractor's requests for interpretation of Contract Documents will be made in writing by Owner's Authorized Representative (or the Architect/Engineer) within any time limits agreed upon or otherwise with reasonable promptness. Interpretations and decisions of the Owner's Authorized Representative (or Architect/Engineer) will be consistent with the intent of and reasonably inferable from the Contract Documents. Contractor shall not proceed without direction in writing from the Owner or Owner's Authorized Representative.

A.3.4 References to standard specifications, manuals, codes of any technical society, organization or association, to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, laws or regulations in effect in the jurisdiction where the project is occurring on the first published date of the Solicitation Document, except as may be otherwise specifically stated.

A.4 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE

A.4.1 It is understood that the Contractor, before submitting an offer, has made a careful examination of the Contract Documents; has become fully informed as to the quality and quantity of materials and the character of the Work required; and has made a careful examination of the location and conditions of the Work and the sources of supply for materials. The Owner will in no case be responsible for any loss or for any unanticipated costs that may be suffered by the Contractor as a result of the Contractor's failure to acquire full information in advance in regard to all conditions pertaining to the work. No oral agreement or conversation with any officer, agent, or personnel of the Owner, or with the Architect/Engineer either before or after the execution of this Contract, shall affect or modify any of the terms or obligations contained herein.

A.4.2 Should the Plans or Specifications fail to particularly describe the materials, kind of goods, or details of construction of any aspect of the Work, Contractor shall have the duty to make inquiry of the Owner and Architect/Engineer as to what is required prior to performance of the Work. Absent Specifications to the contrary, the materials or processes that would normally be used to produce first quality finished Work shall be considered a part of the Contract requirements.

A.4.3 Any design errors or omissions noted by the Contractor shall be reported promptly to the Owner's Authorized Representative, including without limitation, any nonconformity with applicable laws, statutes, ordinances, building codes, rules and regulations.

A.4.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Owner's Authorized Representative (or Architect/Engineer) in response to the Contractor's notices or requests for information, the Contractor must submit a written request to the Owner's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt of Contractor of the clarifications or instructions issued. If the Contractor does not concur with the decision of the Owner's Authorized Representative regarding the time and cost impacts of the clarifications or instructions, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process. If the Contractor fails to perform the obligations of Sections A.4.1 to A.4.3, the Contractor shall pay for such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations.

A.5 INDEPENDENT CONTRACTOR STATUS: The service or services to be performed under this Contract are those of an independent contractor. Contractor is not an officer, employee or agent of the Owner as those terms are used in ORS 30.265.

A.6 RETIREMENT SYSTEM STATUS: Contractor is not a contributing member of the Public Employees' Retirement System and will be responsible for any federal or state taxes applicable to payment received under this Contract. Contractor will not be eligible for any benefits from these Contract payments of federal Social Security, employment insurance, workers' compensation or the Public Employees' Retirement System, except as a self-employed individual.

A.7 GOVERNMENT EMPLOYMENT STATUS:

A.7.1 If this payment is to be charged against federal funds, Contractor certifies that he/she is not currently employed by the Federal Government. This does not preclude the Contractor from holding another contract with the Federal Government.

A.7.2 Contractor certifies that he/she is not an employee of EWEB for purposes of performing Work under this Contract.

SECTION B - ADMINISTRATION OF THE CONTRACT

B.1 OWNER'S ADMINISTRATION OF THE CONTRACT

B.1.1 The Owner's Authorized Representative will provide administration of the Contract as described in the Contract Documents (1) during construction (2) until final payment is due and (3) during the one-year period for correction of Work. The Owner's Authorized Representative will act on behalf of the Owner to the extent provided in the Contract Documents, unless modified in writing in accordance with other provisions of the Contract. In performing these tasks, the Owner's Authorized Representative may rely on the Architect/Engineer or other consultants to perform some or all of these tasks.

B.1.2 The Owner's Authorized Representative will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. The Owner's Authorized Representative will not make exhaustive or continuous on-site inspections to check the quality or quantity of Work. The Owner's Authorized Representative will neither have control over or charge of, nor be responsible for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work.

B.1.3 Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized, the Owner and Contractor shall endeavor to communicate with each other through the Owner's Authorized Representative or designee about matters arising out of or relating to the Contract. Communications by and with the Architect/Engineer's consultants shall be through the Architect/Engineer. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner's Authorized Representative.

B.1.4 Based upon the Architect/Engineer's evaluations of the Contractor's Application for Payment, or unless otherwise stipulated by the Owner's Authorized Representative, the Architect/Engineer will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

B.2 CONTRACTOR'S MEANS AND METHODS; MITIGATION OF IMPACTS:

B.2.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the work under Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the job site safety thereof and, except as stated below, shall be fully and solely responsible for the job site safety of such means, methods, techniques, sequences or procedures.

B.2.2 The Contractor is responsible to protect and maintain the Work during the course of construction and to mitigate any adverse impacts to the project, including those caused by authorized changes, which may affect cost, schedule, or quality.

B.2.3 The Contractor is responsible for the actions of all its personnel, laborers, suppliers, and Subcontractors on the project. The Contractor shall enforce strict discipline and good order among

Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of persons who are unfit or unskilled for the tasks assigned to them.

B.3 MATERIALS AND WORKMANSHIP

B.3.1 The intent of the Contract Documents is to provide for the construction and completion in every detail of the Work described. All Work shall be performed in a professional manner and unless the means or methods of performing a task are specified elsewhere in the Contract Documents, Contractor shall employ methods that are generally accepted and used by the industry, in accordance with industry standards.

B.3.2 The Contractor is responsible to perform the Work as required by the Contract Documents. Defective Work shall be corrected at the Contractor's expense.

B.3.3 Work performed and materials furnished shall be subject to inspection and/or observation and testing by the Owner's Authorized Representative to determine whether they conform to the Contract Documents. Inspection of the Work by the Owner's Authorized Representative does not relieve the Contractor of responsibility for the Work in accordance with the Contract Documents.

B.3.4 Contractor shall furnish adequate facilities, as required, for the Owner's Authorized Representative to have safe access to the Work including without limitation walkways, railings, ladders, tunnels, and platforms. Producers, suppliers, and fabricators shall also provide proper facilities and access to their facilities.

B.3.5 The Contractor shall furnish samples of materials for testing by the Owner's Authorized Representative and include the cost of the samples in the Contract Price.

B.4 PERMITS

Contractor shall obtain and pay for all necessary permits and licenses, except for those specifically excluded in the Supplemental General Conditions (Section 00800), for the construction of the Work, for temporary obstructions, enclosures, opening of streets for pipes, walls, utilities, environmental Work, equipment, transportation, etc., as required for the project. Contractor shall be responsible for all violations of the law, in connection with the construction or caused by obstructing streets, sidewalks or otherwise. Contractor shall give all requisite notices to public authorities. The Contractor shall pay all royalties and license fees. The Contractor shall defend all suits or claims for infringement of any patent rights and save harmless and blameless from loss, on account thereof, EWEB, it's Board and employees.

B.5 COMPLIANCE WITH GOVERNMENT REGULATIONS

B.5.1 Contractor shall comply with all federal, state and local laws, codes, regulations and ordinances applicable to the Work. Failure to comply with such requirements shall constitute a breach of Contract and shall be grounds for Contract termination. Damages or costs resulting from noncompliance shall be the responsibility of Contractor. Without limiting the generality of the foregoing, Contractor expressly agrees to comply with (i) Title VI and VFII of Civil Right Act of 1964, as amended; (ii) Section 503 and 504 of the Rehabilitation Act of 1973, as amended; (iii) the Americans with Disabilities Act of 1990, as amended; (iv) ORS Chapter 659, as amended; (v) all regulations and administrative rules established pursuant to the foregoing laws; and (vi) all other applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations. Owner's performance under the Contract is conditioned upon Contractor's compliance with the provisions of ORS 279C.505, 279C.510, 279C.515, 279C.520, and 279C.530, which are incorporated by reference herein.

B.5.2 Contractor shall comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations; and

a) Contractor shall not discriminate against Minority, Women or Emerging Small Business enterprises in the awarding of subcontracts ORS 279A.110).

b) Contractor shall maintain, in current and valid form, all licenses and certificates required by law, regulation or this Contract when performing the Work.

B.5.3 Unless contrary to federal law, Contractor shall certify that it shall not accept a bid or proposal from Subcontractors to perform work as described in ORS 701.005 under this Contract unless such Subcontractors are registered with the Construction Contractors Board in accordance with ORS 701.035 to 701.055 at the time they submit their bids or proposals to the Contractor.

B.5.4 Unless contrary to federal law, Contractor shall certify that each landscape contractor, as defined in ORS 671.520(2), performing Work under this Contract holds a valid landscape contractor's license issued pursuant to ORS 671.560.

B.5.5 ATTENTION: The following notice is applicable to Contractors who perform excavation Work. Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center at (503) 232-1987.

B.5.6 Failure to comply with any or all of the requirements of B.5.1 through B.5.5 shall be a breach of Contract and constitute grounds for Contract termination. Damages or costs resulting from such noncompliance shall be the responsibility of Contractor.

B.6 SUPERINTENDENCE

Contractor shall keep on the site, during the progress of the Work, a competent superintendent and any necessary assistants who shall be satisfactory to the Owner and who shall represent the Contractor on the site. Directions given to the superintendent by the Owner's Authorized Representative shall be confirmed in writing to the Contractor.

B.7 INSPECTION

B.7.1 Owner's Authorized Representative shall have access to the Work at all times.

B.7.2 Inspection of the Work will be made by the Owner's Authorized Representative at its discretion. Owner’s Authorized Representative will have authority to reject Work that does not conform to the Contract Documents. Any Work found to be not in conformance with the Contract Documents, in the discretion of the Owner's Authorized Representative, shall be removed and replaced at the Contractor's expense.

B.7.3 Unless otherwise provided, Contractor shall make arrangements, at the appropriate time(s), for all tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction. Arrangements for such tests, inspections and approval shall be made with an independent testing laboratory or entity acceptable to the Owner, or the appropriate public authority. Contractor shall bear all related costs of tests, inspections and approvals, unless otherwise agreed with the Owner. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work. The Contractor shall give the Owner’s Authorized Representative timely notice of when and where tests and inspections are to be made so that the Owner’s Authorized Representative may be present for such procedures. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Owner’s Authorized Representative.

B.7.4 As required by the Contract Documents, Work performed or material used without inspection or testing by the Owner's Authorized Representative may be ordered to be removed at the Contractor's expense.

B.7.5 If directed to do so any time before the Work is accepted, the Contractor shall uncover portions of the completed Work for inspection. After inspection, the Contractor shall restore such portions of Work to the standard required by the Contract. If the Work uncovered is unacceptable or was completed without reasonable notice to the Owner's Authorized Representative, the uncovering and restoration shall be completed at the Contractor's expense. If the Work uncovered is acceptable, and was completed with sufficient notice to the Owner's Authorized Representative, the uncovering and restoration will be paid for through a Change Order.

B.7.6 If any testing or inspection reveals failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Owner's Authorized Representative's and Architect/Engineer's services and expenses, shall be at the Contractor's expense.

B.7.7 When the United States government participates in the cost of the Work, or the Owner has an agreement with other public or private organizations, or if any portion of the Work is being performed for a third party or in close proximity to third party facilities, representatives of these organizations have the right to inspect the Work affecting their interests or property. Their right to inspect shall not make them a party to the Contract and shall not interfere with the rights of the parties of the Contract. Instructions or orders of such parties shall be transmitted to the Contractor, through the Owner's Authorized Representative.

B.8 SEVERABILITY

If any provision of this Contract is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular provision held to be invalid.

B.9 ACCESS TO RECORDS

B.9.1 Contractor shall keep, at all times on the Work site, one record copy of the complete Contract Documents, including the Plans, Specifications, Change Orders and addenda, in good order and marked currently to record field changes and selections made during construction, and one record copy of Shop Drawings, Product Data, Samples and similar submittals, and shall at all times give the Owner's Authorized Representative access thereto.

B.9.2 The Owner and its duly authorized representatives shall have access, for a period not less than three (3) years, to books, documents, papers and records of Contractor that are pertinent to the Contract including records pertaining to overhead and indirect costs, for the purpose of making audit, examination, excerpts and transcripts. If for any reason, any part of the Contract is involved in litigation, Contractor shall retain all pertinent records until all litigation is resolved. The Owner and/or its agents will continue to be provided full access to the records during litigation.

B.10 WAIVER

Failure of the Owner to enforce any provision of this Contract shall not constitute a waiver or relinquishment by the Owner of the right to such performance in the future, nor of the right to enforce any other provision of this Contract.

B.11 SUBCONTRACTS AND ASSIGNMENT

B.11.1 Contractor shall require each Subcontractor, to the extent of the Work to be performed by Subcontractor, to be bound by the terms and conditions of these General Conditions, and to assume toward the Contractor all the obligations and responsibilities which the Contractor assumes toward the Owner thereunder, unless (1) the same are clearly inapplicable to the subcontract at issue because of legal requirements or industry practices, or (2) specific exceptions are requested by Contractor and approved in writing by Owner. Where appropriate, Contractor

shall require each Subcontractor to enter into similar agreements with SUB-subcontractors at any level.

B.11.2 The Contractor shall perform not less than twenty percent (20%) of the Work with its own forces (*i.e.*, without subcontractors). The 20% requirement shall be understood to refer to the Work, the value of which totals not less than 20% of the contract price.

B.11.3 Contractor shall not assign, sell, transfer it rights, or delegate its responsibilities under this Contract, in whole or in part, without the prior written approval of the Owner. No such written approval shall relieve Contractor of any obligations of this Contract, and any transferee shall be considered the agent of the Contractor and bound to perform in accordance with the Contract Documents. Contractor shall remain liable as between the original parties to the Contract as if no assignment had occurred.

B.12 SUCCESSORS IN INTEREST

The provisions of this Contract shall be binding upon and shall accrue to the benefit of the parties to the Contract and their respective permitted successors and assigns.

B.13 OWNER'S RIGHT TO DO WORK

Owner reserves the right to perform other or additional work at or near the project site with other forces than those of the Contractor. If such work takes place within or next to the project site, Contractor will coordinate work with the other contractors or forces, cooperate with all other contractors or forces, carry out the Work in a way that will minimize interference and delay for all forces involved, place and dispose of materials being used so as not to interfere with the operations of another, and join the Work with the work of the others in an acceptable manner and perform it in proper sequence to that of the others. The Owner's Authorized Representative will resolve any disagreements that may arise between or among Contractor and other contractors over the method or order of performing all work (including the Work). In case of unavoidable interference, the Owner's Authorized Representative will establish work priority (including the Work), that generally will be in the sequence in which the contracts were awarded.

B.14 OTHER CONTRACTS

Other contracts related to or unrelated to the Work of this Contract. The Contractor of this Contract will fully cooperate with any and all other contractors without additional cost to the Owner in the manner described in Section B.13.

B.15 GOVERNING LAW: This Contract shall be governed by and construed in accordance with the laws of the State of Oregon without regard to principles of conflict of laws.

B.16 LITIGATION: Any Claim between Owner and Contractor that arises from or relates to this Contract and that is not resolved through the Claims Review Process in Section D.3 shall be brought and conducted solely and exclusively within the Circuit Court of the State of Oregon for Lane County; provided, however, if a Claim must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. In no event shall this section be construed as a waiver by EWEB on any form of defense or immunity, whether sovereign immunity, governmental immunity, immunity based on the Eleventh Amendment to the Constitution of the United States or otherwise, from any claim or from the jurisdiction of any court. CONTRACTOR BY EXECUTION OF THIS CONTRACT HEREBY CONSENTS TO THE *IN PERSONAM* JURISDICTION OF THE COURTS REFERENCED IN THIS SECTION B.16.

B.17 ALLOWANCES

B.17.1 The Contractor shall include in the Contract Price all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

B.17.2 Unless otherwise provided in the Contract Documents:

a) When finally reconciled, allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

b) Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Price but not in the allowances;

c) Whenever costs are more than or less than allowances, the Contract Price shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (i) the difference between actual costs and the allowances under Section B.17.2(a) and (ii) changes in Contractor's costs under Section B.17.2(b).

d) Unless Owner requests otherwise, Contractor shall provide to Owner a proposed fixed price for any allowance work prior to its performance.

B.18 SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

B.18.1 The Contractor shall prepare and keep current, for the Architect's/Engineer's approval (or for the approval of Owner's Authorized Representative if approval authority has not been delegated to the Architect/Engineer), a schedule and list of submittals which is coordinated with the Contractor's construction schedule and allows the Architect/Engineer reasonable time to review submittals. Owner reserves the right to finally approve the schedule and list of submittals. Submittals include, without limitation, Shop Drawings, Product Data, and Samples, as described below:

a) Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, SUB-Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

b) Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

c) Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

B.18.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review of submittals by the Architect/Engineer is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, or for approval of safety

precautions or, unless otherwise specifically stated by the Architect/Engineer, of any construction means, methods, techniques, sequences or procedures, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect/Engineer's review of the Contractor's submittals shall not relieve the Contractor of its obligations under the Contract Documents. The Architect/Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component. Informational submittals upon which the Architect/Engineer is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect/Engineer without action.

B.18.3 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect/Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect/Engineer without action.

B.18.4 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

B.18.5 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect/Engineer.

B.18.6 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect/Engineer's review or approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect/Engineer in writing of such deviation at the time of submittal and (i) the Architect/Engineer has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order has been executed by Owner authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect/Engineer's review or approval thereof.

B.18.7 In the event that Owner elects not to have the obligations and duties described under this Section B.18 performed by the Architect/Engineer, or in the event no Architect/Engineer is employed by Owner on the project, all obligations and duties assigned to the Architect/Engineer hereunder shall be performed by the Owner's Authorized Representative.

B.19 SUBSTITUTIONS

The Contractor may make Substitutions only with the consent of the Owner, after evaluation by the Owner's Authorized Representative and only in accordance with a Change Order. Substitutions shall be subject to the requirements of the bid documents. By making requests for Substitutions, the Contractor represents that the Contractor has personally investigated the proposed substitute product; represents that the Contractor will provide the same warranty for the Substitution that the Contractor would for the product originally specified unless approved otherwise; certifies that the cost data presented is complete and includes all related costs under this Contract including redesign costs, and waives all claims for additional costs related to the Substitution that may subsequently become apparent; and will coordinate

the installation of the accepted Substitution, making such changes as may be required for the Work completed in all respects.

Brand names, when used, indicate quality desired. Alternate brands must be of equal quality, merit and utility as determined in EWEB's sole judgment.

B.20 USE OF PLANS AND SPECIFICATIONS: Plans, Specifications and related Contract Documents furnished to Contractor by Owner or Owner's Architect/Engineer shall be used solely for the performance of the Work under this Contract. Contractor and its Subcontractors and suppliers are authorized to use and reproduce applicable portions of such documents appropriate to the execution of the Work, but shall not claim any ownership or other interest in them beyond the scope of this Contract, and no such interest shall attach. Unless otherwise indicated, all common law, statutory and other reserved rights, in addition to copyrights, are retained by Owner.

B.21 CONSTRUCTION STAKES, LINES, AND GRADES

B.21.1 General

No work shall be done until the Owner's Authorized Representative establishes field controls. Work performed without field controls will be subject to removal.

B.21.2 Owner's Responsibilities. The Owner shall:

a) Provide bench mark locations with datum elevations and horizontal control for the Contractor's use in establishing facility locations, lines, grades and slopes.

b) Provide locations of survey monuments to be preserved by the Contractor.

c) Deduct from payments due or to become due to the Contractor all costs to replace stakes and marks carelessly or willfully damaged or destroyed by the Contractor's operation.

B.21.3 Contractor's Responsibilities. The Contractor shall:

a) Take full responsibility for detailed dimensions, elevations, slopes, etc., measured from Owner's elevation and horizontal control.

b) Carefully preserve all the bench mark points and survey monuments. The Contractor will be charged with the resulting expense to replace these survey marks and shall be responsible for any mistakes that may be caused by their loss or disturbance.

c) Consider all Contractor provided surveying work as incidental to the project and included as part of the costs for construction.

B.22 SUBSURFACE CONDITIONS

B.22.1 Information that may be available from the Owner's Authorized Representative regarding subsurface conditions and groundwater elevations is offered as supplementary information only. Neither the Owner's Authorized Representative nor the Owner assumes any responsibility for the accuracy, completeness, or interpretation of such supplementary information. Determination of the actual subsurface conditions is the responsibility of the Contractor.

B.22.2 Logs of test holes, test pits, soils reports, groundwater levels, and other supplementary subsurface information are offered as available information of underlying materials and conditions at the locations actually tested.

SECTION C - WAGES AND LABOR

C.1 WAGE RATES ON PUBLIC WORKS: When the Contract price exceeds $50,000 or is part of a larger project exceeding $50,000, the Contractor shall comply fully with the provisions of ORS 279C.800 through 279C.870.Documents establishing those conditions, and any amendments, as determined by the Commissioner of the Bureau of Labor and Industries (BOLI), are included by reference as attachments to the Contract Documents. These documents may be accessed at http://www.boli.state.or.us/BOLI/WHD/PWR/pwr book.shtml

C.2 PAYROLL CERTIFICATION AND FEE REQUIREMENTS

C.2.1 In accordance with ORS 279C.845, the Contractor and every Subcontractor shall submit written certified statements with the Owner's Authorized Representative, on the form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker that the Contractor or the Subcontractor has employed on the Project and further certifying that no worker employed on the Project has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract, which certificate and statement shall be verified by the oath of the Contractor or the Subcontractor that the Contractor or Subcontractor has read such statement and certificate and knows the contents thereof and that the same is true to the Contractor or Subcontractor's knowledge. The certified statements shall set out accurately and completely the payroll records for the prior week including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made and actual wages paid. Certified statements shall be submitted as follows:

a) For any Project ninety (90) Days or less from the date of award of the Contract to the date of completion of Work under the Contract, the statements shall be submitted once before the first payment and once before final payment is made.

b) For any Project exceeding ninety (90) Days from the date of award of the Contract to the date of completion of Work under the Contract, the statements shall be submitted once before the first payment is made, at 90-Day intervals thereafter, and once before final payment is made.

The Contractor and Subcontractors shall preserve the certified statements for a period of three (3) years from the date of completion of the Contract.

C.2.2 Pursuant to ORS 279C.825 and in accordance with administrative rules promulgated by the Commissioner of the Bureau of Labor and Industries, EWEB must pay a fee to the Bureau of Labor and Industries equaling 1/10 of one percent (1%) of the Contract price, however, the fee shall not be less than $250 nor more than $7,500, regardless of the Contract price. The fee shall be paid when entering into the Contract. The fee is payable to the Bureau of Labor and Industries and shall be mailed or otherwise delivered to the Bureau at the following address:

Bureau of Labor and Industries
Wage and Hour Division
Prevailing Wage Unit
800 NE Oregon Street, #32

Portland, Oregon 97232

Note: Effective January 1, 2008, the fee to BOLI equaling 1/10 of one percent (1%) of the Contract price shall be paid by the Public Agency (EWEB), not the contractor.

C.3 PROMPT PAYMENT AND CONTRACT CONDITIONS

C.3.1 Pursuant to ORS 279C.505and as a condition to EWEB's performance hereunder, the Contractor shall:

a) Make payment promptly, as due, to all persons supplying to Contractor labor or materials for the prosecution of the Work provided for in this Contract.

b) Pay all contributions or amounts due the State Industrial Accident Fund and the State Unemployment Compensation Trust Fund from such Contractor or Subcontractor incurred in the performance of the Contract.

c) Not permit any lien or claim to be filed or prosecuted against the Owner on account of any labor or material furnished.

d) Pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

C.3.2 Pursuant to ORS 279C.515, and as a condition to Owner's performance hereunder, Contractor agrees:

a) If Contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the Contractor or a Subcontractor by any person in connection with the project as such claim becomes due, the proper officer(s) representing the owner may pay the claim and charge the amount of the payment against funds due or to become due Contractor under this Contract. Payment of claims in this manner shall not relieve the Contractor or the Contractor's surety from obligation with respect to any unpaid claims.

b) If the Contractor or a Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the public improvement within thirty (30) Days after receipt of payment from Owner or a contractor, the contractor or first-tier Subcontractor shall owe the person the amount due plus interest charges commencing at the end of the 10-Day period that payment is due under ORS 279C.580(3) and ending upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest charged to the Contractor or first-tier Subcontractor on the amount due shall equal three times the discount rate on 90-Day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is thirty (30) Days after the date when payment was received from Owner or from the Contractor, but the rate of interest shall not exceed thirty (30) percent. The amount of interest may not be waived

C.3.3 Pursuant to ORS 279C.580, Contractor shall include in each subcontract for property or services entered into by the Contractor and a first-tier subcontractor, including a material supplier, for the purpose of performing a construction contract:

a) A payment clause that obligates the Contractor to pay the first-tier subcontractor for satisfactory performance under its subcontract within ten (10) days out of such amounts as are paid to the Contractor by the public contracting agency under such contract; and

b) An interest penalty clause that obligates the Contractor if payment is not made within thirty (30) days after receipt of payment from the Owner, to pay to the first-tier subcontractor an interest penalty on amounts due in the case of each payment not made in accordance with the payment clause included in the subcontract pursuant to paragraph (a) of this subsection. Contractor or first-tier Subcontractor shall not be obligated to pay an interest penalty if the only reason that the Contractor or first-tier subcontractor did not make payment when payment was due is that the Contractor or first-tier Subcontractor did not receive payment from Owner or Contractor when payment was due. The interest penalty shall be for the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and shall be computed at the rate specified in ORS 279C.515(2)

c) A clause that requires each of Contractor's Subcontractor's to include, in each of their contracts with lower-tier Subcontractors or suppliers, provisions to the effect that the first-tier Subcontractor shall pay its lower-tier Subcontractors and suppliers in accordance with the provisions of subsections (a) and (b), above and requiring each of their Subcontractors and suppliers to include such clauses in their subcontracts and supply contracts.

C.3.4 All employers working under this Contract are subject employers which must comply with ORS 656.017 relating to providing Worker's Compensation coverage.

C.4 PAYMENT FOR MEDICAL CARE

Pursuant to ORS 279C.530, and as a condition to Owner's performance hereunder, Contractor shall promptly make payment, as due, to any person, partnership, association or corporation furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor all sums of which the Contractor agrees to pay for such services and all moneys and sums that the Contractor has collected or deducted from the wages of personnel pursuant to any law, contract or agreement for the purpose of providing or paying for such services.

C.5 HOURS OF LABOR

As a condition to Owner's performance hereunder, Contractor shall comply with ORS 279C.520, as amended from time to time and incorporated herein by this reference:

Pursuant to ORS 279C.520 and as a condition to Owner's performance hereunder, no person shall be employed to perform Work under this Contract for more than ten (10) hours in any one day or forty (40) hours in any one week, except in cases of necessity, emergency or where public policy absolutely requires it. In such instances, Contractor shall pay the employee at least time and a half pay:

a) For all overtime in excess of eight (8) hours a day or forty (40) hours in any one week when the work week is five consecutive days, Monday through Friday; or
b) For all overtime in excess of ten (10) hours a day or forty (40) hours in any one week when the work week is four consecutive days, Monday through Friday; and
c) For all Work performed on Saturday and on any legal holiday specified in ORS 279C.540.

Pursuant to OAR 839-025-0020(1)(c), Contractor must give written notice to their workers of the number of hours per day and days per week they may be required to work.

This section C.5 will not apply to Contractor's Work under this Contract if Contractor is currently a party to a collective bargaining agreement with any labor organization.

This Section C.5 shall not excuse Contractor from completion of the Work within the time required under this Contract.

SECTION D - CHANGES IN THE WORK

D.1 CHANGES IN WORK

D.1.1 The terms of this Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever, without prior written approval of the Owner's Authorized Representative, and then only in a manner consistent with the changes provisions of this Section D.1. Otherwise, a formal contract amendment is required, which shall not be effective until its execution, by the parties to this Contract and all approvals required by Owner's Board of Commissioners, if required, are obtained.

D.1.2 It is mutually agreed that changes in Plans, quantities, or details of construction are inherent to the nature of construction and may be necessary or desirable during the course of construction. Within the general scope of this Contract, the Owner's Authorized Representative may at any time, without notice to the sureties and without impairing the Contract, require changes consistent with this Section D.1. All change Work shall be executed under the conditions of the Contract Documents. Such changes may include, but are not limited to:

a) Modification of specifications and design.
b) Increases or decreases in quantities.
c) Increases or decreases to the amount of Work.
d) Addition or elimination of any Work item.
e) Change in the duration of the Project.
f) Acceleration or delay in performance of Work.
g) Deductive Changes.

D.1.3 The Owner and Contractor agree that Change Order Work shall be administered and compensated according to the following:

a) Unit pricing may be utilized at the Owner's option when unit prices or solicitation alternates were provided that established the cost for additional Work, and a binding obligation exists under the Contract on the parties covering the terms and conditions of the additional Work.

b) If the Owner elects not to utilize unit pricing, or in the event that unit pricing is not available or appropriate, fixed pricing may be used for Change Order Work. In fixed pricing the basis of payments or total price shall be agreed upon in writing between the parties of the Contract, and shall be established before the Work has begun, whenever feasible. The mark-ups set forth in D.1.3(c) shall be utilized by the parties as a guide in establishing fixed pricing, and will not be exceeded by Owner without adequate justification. Cost and price data relating to Change Orders shall be supplied by Contractor to Owner upon request, but Owner shall be under no obligation to make such requests.

c) In the event that unit pricing and fixed pricing are not utilized, then Change Order Work shall be performed on a cost reimbursement basis for Direct Costs. Such Work shall be compensated on the basis of the actual, reasonable and allowable cost of labor, equipment, and material furnished on the Work performed. In addition, the following markups shall be added to the

Contractor's or Subcontractor's Direct Costs as full compensation for profit, Overhead and other indirect costs for Work directly performed with the Contractor's or Subcontractor's own forces:

On Labor..... 15%
On Equipment..... 10%
On Materials..... 10%

When Change Order Work under D.1.3(c) is invoiced by an authorized Subcontractor at any level, each ascending tier Subcontractor or Contractor will be allowed a supplemental mark-up on each piece of subcontract Work covered by such Change Order as follows:

$0.00 - $5,000.00	10%
Over $5,000.00	5%

Payments made to the Contractor shall be complete compensation for Overhead, profit, and all costs that were incurred by the Contractor or by other forces furnished by the Contractor, including Subcontractors, for Change Order Work. Owner may establish a maximum cost for Change Order Work under this Section D.1.3(c), which shall not be exceeded for reimbursement without additional written authorization from Owner. Contractor shall not be required to complete such Change Order Work without additional authorization.

D.1.4 Any necessary adjustment of time that may be required as a result of a Change Order must be agreed upon by the parties before the start of the Change Order Work unless Owner's Authorized Representative authorizes Contractor to start the Work before agreement on time adjustment. Contractor shall submit any request for additional compensation (and additional time if Contractor was authorized to start Work before an adjustment of time was approved) as soon as possible but no later than thirty (30) days after receipt of the Change Order. If Contractor and Owner's Authorized Representative cannot agree on additional compensation or additional time needed to perform Change Order Work, Contractor may proceed to file a Claim under Section D.3, Claims Review Process. No other reimbursement, compensation, or payment will be made, except as provided in Section D.1.5 for impact claims.

D.1.5 If any Change Order Work under Section D.1.3 causes an increase or decrease in the Contractor's cost of, or the time required for the performance of, any other part of the Work under this Contract, the Contractor must submit a written request to the Owner's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt of the Change Order by Contractor. If the Contractor does not concur with the decision of the Owner's Authorized Representative, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

D.1.6 No request or Claim by the Contractor for additional costs shall be allowed if made after receipt of final payment application under this Contract.

D.1.7 It is understood that changes in the Work are inherent in construction of this type. The number of changes, the scope of those changes, and the effect they have on the progress of the original Work cannot be defined at this time. The Contractor is notified that numerous changes are anticipated and that there will be no compensation made to the Contractor directly related to the number of changes. Each change will be evaluated for extension of Contract time and increase or decrease in compensation based on its own merit.

D.2 DELAYS

D.2.1 Delays in construction include "Avoidable Delays" (Section D.2.1.1), and "Unavoidable Delays" (Section D.2.1.2). The effect of Avoidable Delays is described in Section D.2.2 and the effect of Unavoidable Delays is described in Section D.2.3.

a) Avoidable delays include any delays other than Unavoidable Delays, and include delays that otherwise would be considered Unavoidable Delays but that:

i. Could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its Subcontractors;

ii. Affect only a portion of the Work and do not necessarily prevent or delay the prosecution of other parts of the Work nor the completion of the whole Work within the Contract time;

iii. Do not impact activities on the accepted critical path schedule; or

iv. Are associated with the reasonable interference of other contractors employed by the Owner that do not necessarily prevent the completion of the whole Work within the Contract time.

D.2.1.2 Unavoidable Delays include delays other than Avoidable Delays that are:

a) Caused by any actions of the Owner, Owner's Authorized Representative, or any other employee or agent of the Owner, or by separate contractor employed by the Owner;

b) Caused by any site conditions which differ materially from what was represented in the Contract Documents or from conditions that would normally be expected to exist and be inherent to the construction activities defined in the Contract Documents. The Contractor shall immediately notify the Owner's Authorized Representative, in writing, of differing site conditions before the area has been disturbed. If Contractor fails to timely notify the Owner's Authorized Representative, any claim to additional compensation or time is waived.

The Owner's Authorized Representative will investigate the area and make a determination as to whether or not the conditions differ materially from either the conditions stated in the Contract Documents or those which could reasonably be expected in execution of this particular Contract. If Contractor and the Owner's Authorized Representative agree that a differing site condition exists, any additional compensation or additional time will be determined based on the process set forth in Section D.1.5 for Change Order Work. If the Contractor does not concur with the decision of the Owner's Authorized Representative and/or believes that it is entitled to additional compensation or time, or both, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

c) Caused by Force Majeure, but only to the extent that the events or occurrences could not have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its Subcontractors.

d) Caused by adverse weather conditions. Any adverse weather conditions must be substantiated by documentary evidence that weather conditions were abnormal for the specific time period claimed, could not have been anticipated by the Contractor, and adversely impacted the project in a manner that could not be avoided by rescheduling the Work or by

implementing measures to protect against the weather so that the Work could proceed. A rain, windstorm, high water, or other natural phenomenon for the specific locality of the Work, which might reasonably have been anticipated from the previous 10-year historical records of the general locality of the Work, shall not be construed as abnormal.

D.2.2 Except as otherwise provided in ORS 279C.315, Contractor shall not be entitled to additional compensation or additional time for Avoidable Delays.

D.2.3 In the event of Unavoidable Delays, based on principles of equitable adjustment, Contractor may be entitled to the following:

a) Contractor may be entitled to additional compensation or additional time, or both, for Unavoidable Delays described in Section D.2.1.2 (a) and (b).

b) Contractor may be entitled to additional time for Unavoidable Delays described in Section D.2.1.2(c) and (d).

In the event of any requests for additional compensation or additional time, or both, as applicable, arising under this Section D.2.3 for Unavoidable Delays, other than requests for additional compensation or additional time for differing site conditions for which a review process is established under Section D.2.1.2 (b), Contractor shall submit a written notification of the delay to the Owner's Authorized Representative within two (2) Days of the occurrence of the cause of the delay. This written notification shall state the cause of the potential delay, the project components impacted by the delay, and the anticipated additional time extension or the additional compensation, or both, as applicable, resulting from the delay. Within seven (7) Days after the cause of the delay has been mitigated, or in no case more than thirty (30) Days after the initial written notification, the Contractor shall submit to the Owner's Authorized Representative, a complete and detailed request for additional compensation or additional time, or both, as applicable, resulting from the delay. If the Contractor does not concur with the decision of the Owner's Authorized Representative and/or believes that it is entitled to additional compensation, or additional time, or both, as applicable, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

If Contractor does not timely submit the notices required under this Section D.2.1.3, then, unless otherwise prohibited by law, Contractor's Claim shall be barred.

D.3 CLAIMS REVIEW PROCESS

D.3.1 All Contractor claims shall be referred to the Owner's Authorized Representative for review. Contractor's claims, including Claims for additional compensation or additional time, shall be submitted in writing by the Contractor to the Owner's Authorized Representative within five (5) days after Contractor's initial request has been denied. Within thirty (30) Days after the initial Claim, Contractor shall submit to the Owner's Authorized Representative, a complete and detailed description of the Claim (the "Detailed Notice") that includes all information required by Section D.3.2. Unless the Claim is made in accordance with these time requirements, it shall be waived.

D.3.2 The Detailed Notice of the Claim shall be submitted in writing by Contractor and shall include a detailed, factual statement of the basis of the Claim, pertinent dates, Contract provisions which support or allow the Claim, reference to or copies of any documents which support the Claim, the dollar value of the Claim, and the time extension requested for the Claim. If the Claim involves Work to be completed by Subcontractors, the Contractor will analyze and evaluate the merits of

the Subcontractor claim prior to forwarding it and that analysis and evaluation to the Owner's Authorized Representative. The Owner's Authorized Representative and the Owner will not consider direct claims from Subcontractors, suppliers, manufacturers, or others not a party to this Contract.

D.3.3 The Owner's Authorized Representative will review all Claims and take one or more of the following preliminary actions within ten (10) Days of receipt of the Detailed Notice of a Claim: (1) request additional supporting information from the Contractor; (2) inform the Contractor and Owner in writing of the time required for adequate review and response; (3) reject the Claim in whole or in part and identify the reasons for rejection; (4) based on principles of equitable adjustment, recommend approval of all or part of the Claim; or (5) propose an alternate resolution.

D.3.4 The Owner's Authorized Representative's decision shall be final and binding on the Contractor unless appealed by written notice to the Owner within fifteen (15) Days of receipt of the decision. The Contractor must present written documentation supporting the Claim within fifteen (15) Days of the notice of appeal. After receiving the appeal documentation, the Owner shall review the materials and render a decision within thirty (30) Days after receiving the appeal documents.

D.3.5 The decision of the Owner shall be final and binding unless the Contractor requests mediation within fifteen (15) Days of receipt of the Owner's decision. The mediation process is non-binding, and in the event that matters at issue are not resolved in mediation then the decision of the Owner shall become final and binding upon Owner's written notice to Contractor. Both the Owner and the Contractor are obligated to participate in the mediation process as outlined in Section D.3.6 during a sixty (60) day period following commencement of mediation prior to either or both proceeding to litigation. However, in the event that litigation must be filed within this sixty (60) day period in order to avoid legal filing deadlines, the parties agree to seek a stay or postponement of the litigation proceedings until the sixty (60) day time period expires.

D.3.6 Should the parties arrive at an impasse regarding any Claims or disputed Claims, it is agreed that the parties shall participate in mediation as specified in Section D.3.5. The mediation process will be considered to have been commenced as of the date one party notifies the other in writing of its in request to mediate. The mediator shall be an individual mutually acceptable to both parties, but in the absence of agreement each party shall select a temporary mediator and the temporary mediators shall jointly select the permanent mediator. Each party shall pay its own costs for the time and effort involved in mediation. The cost of the mediator shall be split equally between the two parties. Both parties agree to exercise their best effort in good faith to resolve all disputes in mediation. Participation in mediation is a mandatory requirement of both the Owner and the Contractor. The schedule, time and place for mediation will be mutually acceptable, or, failing mutual agreement, shall be as established by the mediator. The parties agree to comply with Owner's administrative rules governing the confidentiality of mediation, if any, and shall execute all necessary documents to give effect to such confidentiality rules In any event, the parties shall not subpoena the mediator or otherwise require the mediator to produce records, notes or work product, or to testify in any future proceedings as to information disclosed or representations made in the course of mediation, except to the extent disclosure is required by law.

D.3.7 Unless otherwise directed by Owner's Authorized Representative, Contractor shall proceed with the Work while any Claim of Contractor is pending, including a Claim for additional compensation or additional time resulting from Change Order Work. Regardless of the review period or the final decision of the Owner's Authorized Representative, the Contractor shall continue to diligently pursue the Work as identified in the Contract Documents. In no case is the Contractor justified or

allowed to cease Work without a written stop work order from the Owner or Owner's Authorized Representative.

SECTION E - PAYMENTS

E.1 SCHEDULE OF VALUES:

The Contractor shall submit, at least ten (10) Days prior to submission of its first application for progress payment, a schedule of values ("Schedule of Values") for the contracted Work. This schedule will provide a breakdown of values for the contracted Work and will be the basis for progress payments. The breakdown will demonstrate reasonable, identifiable, and measurable components of the Work. Unless objected to by the Owner's Authorized Representative, this schedule shall be used as the basis for reviewing Contractor's applications for payment. If objected to by Owner's Authorized Representative, Contractor shall revise the schedule of values and resubmit the same for approval of Owner's Authorized Representative.

E.2 APPLICATIONS FOR PAYMENT

E.2.1 Owner shall make progress payments on the Contract monthly as Work progresses. Payments shall be based upon estimates of Work completed and the Schedule of Values. All payments shall be approved by the Owner's Authorized Representative. A progress payment shall not be considered acceptance or approval of any Work or waiver of any defects therein. Owner shall pay to Contractor interest on the progress payment, not including retainage, due the Contractor. The interest shall commence thirty (30) Days after the receipt of invoice ("application for payment") from the Contractor or fifteen (15) Days after the payment is approved by the Owner's Authorized Representative, whichever is the earlier date. The rate of interest shall equal three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is thirty (30) Days after receipt of the application for payment from the Contract or fifteen (15) Days after the payment is approved by the Owner, whichever is the earlier date, but the rate of interest shall not exceed thirty (30) percent. Notwithstanding the foregoing, in instances when an application for payment is filled out incorrectly, or when there is any defect or impropriety in any submitted application or when there is a good faith dispute, Owner shall so notify the Contractor within fifteen (15) Days stating the reason or reasons the application for payment is defective or improper or the reasons for the dispute. A defective or improper application for payment, if corrected by the Contractor within seven (7) Days of being notified by the Owner, shall not cause a payment to be made later than specified in this section unless interest is also paid. Accrual of interest will be postponed when payment on the principal is delayed because of disagreement between the Owner and the Contractor.

E.2.2 Contractor shall submit to the Owner's Authorized Representative, an application for each payment and, if required, receipts or other vouchers showing payments for materials and labor including payments to Subcontractors. Contractor shall include, in its application for payment, a schedule of the percentages of the various parts of the Work completed, based on the Schedule of Values that shall aggregate to the payment application total, and shall include, on the face of each copy thereof, a certificate in substantially the following form:

"I, the undersigned, hereby certify that the above bill is true and correct, and the payment therefore, has not been received.

Signed:

E.2.3 Generally, applications for payment will be accepted only for materials that have been installed. Under special conditions, payment requests for stored materials will be accepted at Owner's sole discretion. Such a payment, if made, will be subject to the following conditions:

a) The request for stored material shall be submitted at least thirty (30) Days in advance of the application for payment on which it appears. Applications for payment shall be entertained for major equipment, components or expenditures only.

b) The Contractor shall submit applications for payment showing the quantity and cost of the materials stored.

c) The material shall be stored in a bonded warehouse and Owner's Authorized Representative shall be granted the right to access the material for the purpose of removal or inspection at any time during the Contract Period.

d) The Contractor shall name the Owner as co-insured on the insurance policy covering the full value of the property while in the care and custody of the Contractor until it is installed. A certificate noting this coverage shall be issued to the Owner.

e) Payments shall be made for material only. The submitted invoice amount of the application for payment shall be reduced by the cost of transportation and for the cost of an inspector to check the delivery at out of town storage sites. The cost of said inspection shall be born solely by the Contractor.

f) Within sixty (60) Days of the application for payment, the Contractor shall submit evidence of payment covering the material stored.

g) Payment for stored materials shall in no way indicate acceptance of the materials or waive any rights under this Contract for the rejection of the Work or materials not in conformance with the Contract Documents.

h) All required documentation must be submitted with the respective application for payment.

E.2.4 The Owner reserves the right to withhold all or part of a payment, or may nullify in whole or part any payment previously made, to such extent as may be necessary in the Owner’s opinion to protect the Owner from loss because of:

a) Work that is defective and not remedied, or that has been demonstrated or identified as failing to conform with the Contract Documents,

b) Third party claims filed or evidence reasonably indicating that such claims will likely be filed unless security acceptable to the Owner is provided by the Contractor;

c) Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment (in which case Owner may issue checks made payable jointly to Owner and such unpaid persons under this provision, or directly to Subcontractors and suppliers at any level under Section C.3.2.1);

d) Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;

e) Damage to the Owner or another contractor;

f) Reasonable evidence that the Work will not be completed within the time required by the Contract, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

g) Failure to carry out the Work in accordance with the Contract Documents; or

h) Assessment of liquidated damages, when withholding is made for offset purposes.

E.2.5 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

a) Take that portion of the Contract Price properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Price allocated to that portion of the Work in the Schedule of Values, less retainage as provided in Section E.5;
b) Add that portion of the Contract Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner pursuant to Section E.2.3, suitably stored off the site at a location agreed upon in writing), less retainage as provided in Section E.5;

c) Subtract the aggregate of previous payments made by the Owner; and

d) Subtract any amounts for which the Owner's Authorized Representative has withheld or nullified payment as provided in the Contract Documents.

E.2.6 Contractor's applications for payment may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier.

E.2.7 The Contractor warrants to Owner that title to all Work covered by an application for payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an application for payment all Work for which payments are received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

E.2.8 If Contractor disputes any determination by Owner's Authorized Representative with regard to any application for payment, Contractor nevertheless shall continue to prosecute expeditiously the Work. No payment made hereunder shall be or be construed to be final acceptance or approval of that portion of the Work to which such partial payment relates or shall relieve Contractor of any of its obligations hereunder.

E.3 PAYROLL CERTIFICATION REQUIREMENT

Payroll certification is required before payments are made on the Contract. Refer to Section C.2 for this information.

E.4 DUAL PAYMENT

Contractor shall not be compensated for Work performed under this Contract from any party other than the parties to this Contract.

E.5 RETAINAGE

E.5.1 Retainage shall be withheld and released in accordance with ORS 279C.550 to 580.

Owner may reserve as retainage from any progress payment an amount not to exceed five percent of the payment. As Work progresses, Owner may reduce the amount of the retainage and may eliminate retainage on any remaining monthly Contract payments after 50 percent of the Work under the Contract is completed if, in the Owner's opinion, such Work is progressing satisfactorily. Elimination or reduction of retainage shall be allowed only upon written application by the Contractor, which application shall include written approval of Contractor's surety; except that when the Work is 97½ percent completed the Owner may, at its discretion and without application by the Contractor, reduce the retained amount to 100% of the value of the Work remaining to be done. Upon receipt of written application by the Contractor, Owner shall respond in writing within a reasonable time.

E. 5.2 In accordance with the provisions of ORS 279C.560, Contractor may request in writing:

a) to be paid amounts which would otherwise have been retained from progress payments where Contractor has deposited acceptable bonds and securities of equal value with Owner or in a custodial account or other mutually-agreed account satisfactory to Owner, with an approved bank or trust company to be held in lieu of the cash retainage for the benefit of Owner;

b) that retainage be deposited in an interest bearing account, in a bank, savings bank, trust company or savings association for the benefit of Owner, with earnings from such account accruing to the Contractor; or

c) that the Owner allow Contractor to deposit a surety bond for the benefit of Owner, in a form acceptable to Owner, in lieu of all or a portion of funds retained, or to be retained. Such bond and any proceeds therefrom shall be made subject to all claims and liens in the manner and priority as set forth for retainage under ORS 279C.550 to ORS 279C.625.

Where the Owner has accepted the Contractor's election of option (a) or (b), Owner may recover from Contractor any additional costs incurred through such election by reducing Contractor's final payment. Where the Owner has agreed to Contractor's request for option (c), Contractor shall accept like bonds from Subcontractors and suppliers on the project from which Contractor has required retainages.

E.5.3 The retainage held by Owner shall be included in and paid to the Contractor as part of the final payment of the Contract Price.

E.5.4 In accordance with the provisions of ORS 279C.560, Owner shall reduce the amount of the retainage if the Contractor notifies the controller of the Owner that the Contractor has deposited in a bank or trust company, in a manner authorized by the Owner's Authorized Representative, bonds and securities of equal value of a kind approved by the Owner's Authorized Representative.

E.6 FINAL PAYMENT:

E.6.1 Upon completion of all the Work under this Contract, the Contractor shall notify the Owner's Authorized Representative, in writing, that Contractor has completed Contractor's part of the Contract and shall request final payment. Upon receipt of such notice the Owner's Authorized Representative will inspect the work, and if acceptable, submit to the Owner a recommendation as to acceptance of the completed Work and as to the final estimate of the amount due the Contractor. If the Work is not acceptable, Owner will notify Contractor within fifteen (15) Days of Contractor's request for final payment. Upon approval of this final estimate by the Owner and compliance by the Contractor with provisions in Section K. 3 AFFIDAVIT/RELEASE OF LIENS AND CLAIMS, and other provisions as may be applicable, the Owner shall pay to the Contractor all monies due Contractor under the provisions of these Contract Documents.

E.6.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Owner's Authorized Representative

a) A notarized affidavit/release of liens and claims in a form satisfactory to Owner that states that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied;

b) A certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner;

c) A written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents;

d) Consent of surety, if any, to final payment; and

e) If required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner.

If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

E.6.3 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final application for payment.

SECTION F - JOB SITE CONDITIONS

F.1 USE OF PREMISES

Contractor shall confine equipment, storage of materials and operation of Work to the limits indicated by Contract Documents, law, ordinances, permits or directions of the Owner's Authorized Representative.

Contractor shall follow the Owner's Authorized Representative's instructions regarding use of premises, if any.

F.2 PROTECTION OF WORKERS, PROPERTY, AND THE PUBLIC:

F.2.1 Contractor shall maintain continuous and adequate protection of all of the Work from damage, and shall protect the Owner's Authorized Representative, Owner's workers and property from injury or loss arising in connection with this Contract. Contractor shall remedy acceptably to the Owner, any damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or caused by authorized representatives or personnel of the Owner. Contractor shall adequately protect adjacent property as provided by law and the Contract Documents.

F.2.2 Contractor shall take all necessary precautions for the safety of all personnel on the job site, and shall comply with the Contract Documents and all applicable provisions of federal, state and municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for protection of workers and the public against any hazards created by construction. Contractor shall designate a responsible employee or associate on the Work site, whose duty shall be the prevention of accidents. The name and position of the person designated shall be reported to the Owner's Authorized Representative. The Owner's Authorized Representative has no responsibility for Work site safety. Work site safety is the responsibility of the Contractor.

F.2.3 Contractor shall not enter upon private property without first obtaining permission from the property owner or its duly authorized representative. Contractor shall be responsible for the preservation of all public and private property along and adjacent to the Work contemplated under the Contract and shall use every precaution necessary to prevent damage thereto.

In the event the Contractor damages any property, the Contractor shall at once notify the property owner and make, or arrange to make, full restitution. Contractor shall report, immediately in writing, to the Owner's Authorized Representative, all pertinent facts relating to such property damage and the ultimate disposition of the claim for damage.

F.2.4 Contractor is responsible for protection of adjacent work areas including impacts brought about by activities, equipment, labor, utilities, and materials on the site.

F.2.5 Contractor shall, at all times, direct its activities in such a manner as to minimize adverse effects on the environment. Handling of all materials will be conducted so no release will occur that may pollute or become hazardous.

F.2.6 In an emergency affecting the safety of life or of the Work or of adjoining property, the Contractor, without special instruction or authorization from the Owner's Authorized Representative, shall act reasonably to prevent threatened loss or injury, and shall so act, without appeal, if instructed by the Owner's Authorized Representative. Any compensation claimed by the Contractor on account of emergency work shall be determined in accordance with Section D.

F.3 CUTTING AND PATCHING

F.3.1 Contractor shall be responsible for coordinating all cutting, fitting, or patching of the Work to make its several parts come together properly and fit to receive or be received by work of other contractors or Subcontractors shown upon, or reasonably implied by, the Contract Documents.

F.3.2 Contractor shall be responsible for restoring all cut, fitted, or patched surfaces to an original condition; provided, however, that if a different condition is specified in the Contract Documents, then Contractor shall be responsible for restoring such surfaces to the condition specified in the Contract Documents.

F.4 CLEANING UP

From time to time as may be ordered by the Owner and, in any event, immediately after completion of the Work, the Contractor shall, at his own expense, clean up and remove all refuse and unused materials of any kind resulting from the Work. If Contractor fails to do so within twenty-four hours after notification by the Owner the work may be done by others and the cost charged to the Contractor and deducted from payment due the Contractor.

F.5 ENVIRONMENTAL CONTAMINATION

F.5.1. Contractor will be held responsible for and shall indemnify, defend (with counsel of Owner's choice) and hold harmless Owner from and against any costs, expenses, damages, claims, and causes of action, (including attorney fees), or any of them, resulting from all spills, releases, discharges, leaks and disposal of environmental pollution, including storage, transportation, and handling during the performance of the Contract which occur as a result of, or are contributed by, the negligence or actions of Contractor or its personnel, agents, or Subcontractors or any failure to perform in accordance with the Contract Documents. Nothing in this section F.4.1 shall limit Contractor's liability or responsibility under Section G.3 of this Contract.

a) Contractor agrees to promptly dispose of such spills, releases, discharge or leaks to the satisfaction of Owner and proper regulatory agencies in a manner that complies with applicable federal, state, and local laws and regulations. Cleanup shall be at no cost to the Owner and be performed by properly qualified personnel.

b) Contractor shall obtain the Owner's written consent prior to bringing onto the Work site any (i) environmental pollutants or (ii) hazardous substances or materials, as the same or reasonably similar terms are used in any applicable federal, state, or local statutes, rules or ordinances. Notwithstanding such written consent from the Owner, the Contractor, at all times, shall:

i. Properly handle, use and dispose or all environmental pollutants and hazardous substances or materials brought onto the Work site, in accordance with all applicable federal, state, or local statutes, rules, or ordinances;

ii. Be responsible for any and all spills, releases, discharges, or leaks of (or from) environmental pollutants or hazardous substances or materials which Contractor has brought onto the Work site; and

iii. Promptly clean up, without cost to the Owner, such spills, releases, discharges, or leaks to the Owner's satisfaction and in compliance with all applicable federal, state, or local statutes, rules or ordinances.

F.5.2 Contractor shall report all reportable quantity releases to applicable federal, state, and local regulatory and emergency response agencies. Reportable quantities are found in 40 CFR Part 302, Table 302.4 for hazardous substances and in OAR Chapter 340 Division 108 for all products addressed therein. Upon discovery, regardless of quantity, Contractor must telephonically report

all releases to the Owner. A written follow-up report shall be submitted to Owner within 48 hours of the telephonic report. Such written report shall contain, as a minimum:

a) Description of items released (identity, quantity, manifest no., and all other documentation required by law).

b) Whether amount of items released is EPA/DEQ reportable, and, if so, when it was reported.

c) Exact time and location of release, including a description of the area involved.

d) Containment procedures initiated.

e) Summary of communications about the release Contractor has had with members of the press or officials other than Owner.

f) Description of cleanup procedures employed or to be employed at the site, including disposal location of spill residue.

g) Personnel injuries, if any, resulting from, or aggravated by, the release.

F.6 ENVIRONMENTAL CLEAN-UP

F.6.1 Unless disposition of environmental pollution is specifically a part of this Contract, or was caused by the Contractor (reference F.4 Environmental Contamination), Contractor shall immediately notify Owner of any hazardous substance(s) that Contractor discovers or encounters during performance of the Work required by this Contract. "Hazardous substance(s)" means any hazardous, toxic and radioactive materials and those substances defined as “hazardous substances,” “hazardous materials,” “hazardous wastes,” “toxic substances,” or other similar designations in any federal, state, or local law, regulation, or ordinance, including without limitation asbestos, polychlorinated biphenyl (PCB), or petroleum, and any substances, materials or wastes regulated in 40 CFR, Part 261 and defined as hazardous in 40 CFR S 261.3. In addition to notifying Owner of any hazardous substance(s) discovered or encountered, Contractor shall immediately cease working in any particular area of the project where a hazardous substance(s) has been discovered or encountered if continued work in such area would present a risk or danger to the health or well-being of Contractor's or any Subcontractor's work force.

F.6.2 Upon being notified by Contractor of the presence of hazardous substance(s) on the project site, Owner shall arrange for the proper disposition of such hazardous substance(s).

F.7 FORCE MAJEURE: Unless this contract is executed to remedy an act(s), occurrence(s), or event(s) stated herein, neither Party shall be liable to the other for delays in the execution of its obligations due to causes beyond its reasonable control including but not limited to acts of God, fires, strikes, labor disturbances, floods, epidemics, quarantine restrictions, war, insurrection or riot, acts of a civil or military authority, compliance with priority orders or preference ratings issued by the federal Government, acts of Government authorities with respect to revocation of export or re-export permits/licenses, wrecks or unusually severe weather. The Party shall, however, make all reasonable efforts to remove or eliminate such cause of delay or default and shall, upon the cessation of the cause, diligently pursue performance of its obligations under this Contract.

The Owner may terminate this Contract upon written notice after determining that delay or default caused by Force Majeure events or occurrences will prevent successful completion of the Contract.

F.8 SAFETY

F.8.1 Contractor shall take all necessary precautions for the safety of Contractor employees, subcontractors, suppliers, inspectors, and Owner employees on the job site or otherwise engaged in the undertaking of the Work and shall comply with the Contract Documents, best practices, and all applicable provisions of federal, state, and municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for protection of workers and the public against any hazards created by the Work.

F.8.2 Contractor shall designate a responsible employee or associate on the Work site, whose duty shall be to ensure safe progression of the Work. The name and position of the person designated shall be reported to the Owner. The designated person shall be capable of identifying existing and predicting hazards in the surrounding, or working conditions, and be authorized to make or require corrective measures to eliminate hazards. The Owner has no responsibility for Work site safety. Work site safety shall be the responsibility of the Contractor.

F.8.3 Contractor shall provide all safety equipment and signage required.

F.8.4 Contractor shall request all locates as required.

F.8.5 When the total value of the contract exceeds $50,000, Contractor shall submit a written Site Specific Safety and Health Plan (Safety Plan) for review and approval, the Safety Plan shall be approved by the Owner prior to any construction activity. Safety Plans may include, but are not limited to, worker training, site hazards, safety equipment, required Personal Protection Equipment, hazard mitigation measures, reporting procedures, and accident investigation procedures, Projects less than $50,000 shall be assessed for risk and the Owner may require a Safety Plan as necessary. Project emergency procedures shall be established as part of the Safety Plan. Subcontractors shall be notified, review, and be required to comply with the applicable Safety Plan. The Safety Plan shall be maintained onsite and made available to inspectors, subcontractors, employees, and emergency response personnel, authorities having jurisdiction, and Owner as requested.

F.8.6 Contractor shall include the cost of development, implementation, and maintenance of the Safety Plan in its Bid, and is included in the Contract Amount. No separate or additional payment will be made for the Safety Plan. Costs associated with the Safety Plan and Safety Management will be included in payment(s) made for the applicable deliverables.

F.8.7 A Job Safety Analysis (JSA) study shall be provided when a job or activity is determined to have a potential safety or health hazard. The JSA focuses on the relationship between the worker, the task, the tools, and the work environment. After identifying any uncontrolled hazards, the JSA shall identify ways to eliminate or reduce them.

F.8.8 When a safety incident occurs, or there is a near-miss (an unplanned event that did not result in injury, illness, or damage, but had the potential to do so), Contractor shall report incident to Owner and provide a corrective action plan for review and approval prior to continuation of construction activities associated with the incident.

F.8.9 The Contractor shall comply with all federal, state, and local safety and health regulations and laws including, but not limited to, the following:

- Oregon Revised Statutes - ORS 654 – The Oregon Safe Employment Act
- Oregon Administrative Rules - OAR 437, Divisions 1-3 - The Oregon Occupational Safety and Health Division (Or-OSHA)
- Department of Labor and Industries regulations and laws
- Oregon Department of Transportation regulations and laws
- United States Department of Labor Law - 29 CFR 1910 and 29 CFR 1926 – Occupational Safety & Health Administration

SECTION G - INDEMNITY, BONDING AND INSURANCE

G.1 RESPONSIBILITY FOR DAMAGES/ INDEMNITY

G.1.1 Contractor shall be responsible for all damage to property, injury to persons, and loss, expense, inconvenience, and delay that may be caused by, or result from, the carrying out of the Work to be done under this Contract, or from any act, omission or neglect of the Contractor, its Subcontractors, personnel, or agents.

G.1.2 To the fullest extent permitted by law, Contractor shall indemnify, defend (with counsel approved by Owner) and hold harmless the Owner, Owner's Authorized Representative, Architect/Engineer, Architect/Engineer's consultants, and their respective officers, directors, agents, employees, partners, members, stockholders and affiliated companies (collectively "Indemnities") from and against all liabilities, damages, losses, claims, expenses (including reasonable attorney fees), demands and actions of any nature whatsoever which arise out of, result from or are related to the carrying out of the work to be performed under this contract,

a) Any damage, injury, loss, expense, inconvenience or delay described in this Section G.1.2,

b) Any accident or occurrence which happens or is alleged to have happened in or about the project site or any place where the Work is being performed, or in the vicinity of either, at any time prior to the time the Work is fully completed in all respects,

c) Any failure of the Contractor to observe or perform any duty or obligation under the Contract Documents which is to be observed or performed by the Contractor, or any breach of any agreement, representation or warranty of the Contractor contained in the Contract Documents or in any subcontract,

d) The negligent acts or omissions of the Contractor, a subcontractor or anyone directly or indirectly employed by them or any one of them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder (except to the extent otherwise void under ORS 30.140), and

e) Any lien filed upon the project or bond claim in connection with the Work. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section G.1.2.

G.1.3 In claims against any person or entity indemnified under this Section G.1.2 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section G.1.2 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

G.2 BONDING REQUIREMENTS

G.2.1 Performance and Payment Bonds - When the Contract Price exceeds $100,000,or when otherwise required by the Contract Documents, the Contractor shall furnish and maintain in effect at all times during the Contract Period, a bond to cover performance and a bond to cover payment in a sum equal to the Contract Price.

G.2.2 A performance bond and payment bond form furnished by Owner, and notarized by awarded Contractor's surety company authorized to do business in Oregon is the only acceptable form of performance/payment security, unless otherwise specified in the Contract Documents.

G.2.3 Public Works Bond - When the Contract Price exceeds $100,000,or when the project is part of a larger public works project that exceeds $100,000, the Contractor and every subcontractor shall have a public works bond (minimum $30,000 coverage) filed with the Construction Contractors Board before starting work on the project, unless exempt per ORS 279C.836. The public works bond shall be obtained from a corporate surety authorized to do business in the state of Oregon.

G.3 INSURANCE

G.3.1 Primary Coverage: Insurance carried by Contractor under this Contract shall be the primary coverage, and the Owner's insurance is excess and solely for damages or losses for which the Owner is responsible. The coverages indicated are minimums unless otherwise specified in the Contract Documents.

G.3.2 Workers' Compensation: The Contractor, its Subcontractors, if any and all employers providing work, labor, or materials under this Contract are subject employers under the Oregon Workers' Compensation Law and shall comply with ORS 656.017 that requires them to provide workers' compensation coverage that satisfies Oregon Law for all their subject workers. This shall include Employer's Liability Insurance with coverage limits of not less than $1,000,000 for each accident. Contractors who perform the Work without the assistance or labor of any employee need not obtain such coverage if the Contractor certifies in writing that are exempt under ORS 656.126. [2003 c.794 §76c] The Contractor shall require proof of such Workers' Compensation by receiving and keeping on file a certificate of insurance from each Subcontractor or anyone else directly employed by either the Contractor or its Subcontractors.

G.3.3 LIABILITY INSURANCE

a) Commercial General Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this contract, Commercial General Liability Insurance covering bodily injury and property damage. This insurance shall include personal injury coverage, contractual liability coverage and products/completed operations liability. Combined single limit per occurrence shall not be less than $2,000,000. Each annual aggregate limit shall not be less than $2,000,000.

b) Automobile Liability: Contractor shall obtain, at contractor's expense, and keep in effect during the term of this contract, Automobile Liability Insurance. This coverage may be written in combination with the Commercial General Liability Insurance. Combined single limit per occurrence shall not be less than $1,000,000, or the equivalent.

c) Tail Coverage: If any of the required liability insurance is on a "claims made" basis, tail coverage will be required at the completion of this Contract for a duration of 12 months. Contractor shall furnish certification of tail coverage as described or continuous claims made liability coverage for 12 months following the Contract completion. If continuous claims made coverage is used, Contractor shall be required to keep the coverage in effect for a duration of not less than 12 months from the end of the Contract. This will be a condition of the final acceptance of Work or Services.

G.3.4 Additional Insured

The Commercial General Liability and Automobile Liability insurance coverage required for performance of the contract shall include EWEB, its' divisions, officers, and employees as Additional Insured but only with respect to the Contractor's activities to be performed under this contract.

G.3.5 Notice of Cancellation or Change

There shall be no cancellation, material change, potential exhaustion of aggregate limits or non-renewal of insurance coverage(s) without 30 days' written notice from Contractor or its insurer(s) to EWEB. Any failure to comply with the reporting provisions of this clause shall constitute a material breach of Contract and shall be grounds for immediate termination of this Contract by EWEB.

G.3.6 Certificate(s) of Insurance

As evidence of the insurance coverage required by this contract, the Contractor shall furnish Certificate(s) of insurance to the EWEB Purchasing Department, before final award can be authorized. The insurance coverage required under this contract shall be obtained from acceptable insurance companies or entities. The contractor shall be financially responsible for all deductibles, self-insured retention and/or self-insurance included hereunder.

G.3.7 Waivers of Subrogation

The Owner and Contractor waive all rights against each other and any of their subcontractors, SUB-subcontractors, agents and employees, each of the other, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require from the Subcontractors, SUB-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

SECTION H - SCHEDULE OF WORK

H.1 CONTRACT PERIOD

H.1.1 Time is of the essence on this Contract. The Contractor shall at all times carry on the Work diligently, without delay and punctually fulfill all requirements herein. Contractor shall commence Work on the site within ten (10) Days of Notice to Proceed, unless directed otherwise.

H.1.2 Unless specifically extended by Change Order, all Work shall be complete by the date contained in the Contract Documents. The Owner shall have the right to accelerate the completion date of the Work, which may require the use of overtime. Such accelerated Work schedule shall be an acceleration in performance of Work under Section D.1.2(f) and shall be subject to the Change Order process of Section D.1.

H.1.3 The Owner shall not waive any rights under the Contract by permitting the Contractor to continue or complete the Work or any part of it after the date described in H.1.2 above.

H.2 SCHEDULE

H.2.1 Contractor shall provide, by or before the pre-construction conference, a detailed schedule for review and acceptance by the Owner. Schedules lacking adequate detail, or unreasonably detailed, will be rejected. Included within the schedule are the following: Notice to Proceed, Substantial Completion, and Final Completion. Schedules will be updated monthly and submitted with the monthly payment application. Acceptance of the Schedule by the Owner does not constitute agreement by the Owner, as to the Contractor's sequencing, means, methods, or durations. Any positive difference between the Contractor's scheduled completion and the Contract completion date is float owned by the Owner. Owner reserves the right to negotiate the float if it is deemed to be in the Owner's best interest to do so. In no case shall the Contractor make a claim for delays if the Work is completed within the Contract time but after Contractor's scheduled completion.

H.3 PARTIAL OCCUPANCY OR USE

The Owner may occupy or use any completed or partially completed portion of the Work at any stage, provided such occupancy or use is consented to by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have reasonably accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, insurance or self-insurance, maintenance, heat, utilities, and damage to the Work, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents with respect to such portion of the Work. Approval by the Contractor to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use, the Owner and Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

SECTION I - CORRECTION OF WORK

I.1 CORRECTION OF WORK BEFORE FINAL PAYMENT: The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects, and that the Work will conform to the requirements of the Contract Documents. Work failing to conform to the Contract

Documents shall be deemed defective. Contractor shall promptly remove from the premises and replace, all defective materials as determined by the Owner's Authorized Representative, whether incorporated in the Work or not. Removal and replacement shall be without loss or expense to the Owner, and Contractor shall bear the cost of repairing all Work destroyed or damaged by such removal or replacement.

I.2 WARRANTY WORK

I.2.1 Neither the final certificate of payment nor any provision of the Contract Documents shall relieve the Contractor from responsibility for defective Work and, unless a longer period is specified, Contractor shall correct any defects that appear in the Work within a period of one year from the date of issuance of the written notice of substantial completion by the Owner except for latent defects that will be remedied by the Contractor at any time they become apparent. The Owner shall give Contractor notice of defects with reasonable promptness. Contractor shall perform such warranty work within a reasonable time after Owner's demand. If Contractor fails to complete the warranty work within such period as Owner determines reasonable, or at any time in the event of warranty work consisting of emergency repairs, without affecting Contractor's obligations, Owner may perform such work and Contractor shall reimburse Owner all costs of the same within ten (10) days after demand.

I.2.2 This provision does not negate guarantees or warranties for periods longer than one year including without limitation such guarantees or warranties required by other sections of the Contract Documents for specific installations, materials, processes, equipment or fixtures.

I.2.3 In addition to Contractor's warranty, manufacturer's warranties shall pass to the Owner and shall not take effect until affected Work has been accepted in writing by the Owner's Authorized Representative.

I.2.4 The one-year period for correction of Work shall be extended with respect to portions of Work performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work, and shall be extended by corrective Work performed by the Contractor pursuant to this Section, as to the Work corrected. The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

I.2.5 Nothing contained in this Section I.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the period for correction of Work as described in this Section I.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

I.2.6 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Price will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

SECTION J - SUSPENSION AND/OR TERMINATION OF THE WORK

J.1 OWNER'S RIGHT TO SUSPEND THE WORK

J.1.1 The Owner and/or the Owner's Authorized Representative has the authority to suspend portions or all of the Work due to causes including, but not limited to:

a) Failure of the Contractor to correct unsafe conditions;

b) Failure of the Contractor to carry out any provision of the Contract;

c) Failure of the Contractor to carry out orders;

d) Conditions, in the opinion of the Owner's Authorized Representative, that are unsuitable for performing the Work;

e) Time required to investigate differing site conditions; or

f) Any reason considered to be in the public interest.

J.1.2 Contractor and the Contractor's Surety shall be notified in writing of the effective date and time of the suspension and shall be notified in writing to resume Work.

J.2 CONTRACTOR'S RESPONSIBILITIES

J.2.1 During the period of the suspension, Contractor is responsible to continue maintenance at the project just as if the Work were in progress. This includes, but is not limited to, protection of completed Work, maintenance of access, protection of stored materials, temporary facilities, and clean-up.

J.2.2 When the Work is recommenced after the suspension, the Contractor shall replace or renew any Work damaged during the suspension, remove any materials or facilities used as part of temporary maintenance, and complete the project in every respect as though its prosecution had been continuous and without suspension.

J.3 COMPENSATION FOR SUSPENSION

Depending on the reason for suspension of the Work, the Contractor or the Owner may be due compensation by the other party. If the suspension was required due to acts or omissions of Contractor, the Owner may assess the Contractor actual costs of the suspension in terms of administration, remedial work by the Owner's forces or another contractor to correct the problem associated with the suspension, rent of temporary facilities, and other actual costs related to the suspension. If the suspension was caused by acts or omissions of the Owner, the Contractor shall be due compensation which shall be defined using Section D, Changes in Work. If the suspension was required through no fault of the Contractor or the Owner, neither party owes the other for the impact.

J.4 OWNER'S RIGHT TO TERMINATE CONTRACT

J.4.1 The Owner may, without prejudice to any other right or remedy and after giving Contractor seven (7) Days written notice and an opportunity to cure, terminate the Contract in whole or in part under the conditions:

a) If Contractor should voluntarily or involuntarily, seek protection under the United States Bankruptcy Code and its Contractor as debtor-in-possession or Trustee for the estate fail to assume the Contract within a reasonable time;

b) If Contractor should make a general assignment for the benefit of Contractor's creditors;

d) If a receiver should be appointed on account of Contractor's insolvency;

d) If Contractor should repeatedly refuse or fail to supply an adequate number of skilled workers or proper materials to carry on the Work as required by the Contract Documents, or otherwise fail to perform the Work in a timely manner;

e) If Contractor should repeatedly fail to make prompt payment to Subcontractors or for material or labor, or should disregard laws, ordinances or the instructions of the Owner or its Authorized Representative; or

f) If Contractor is otherwise in material breach of any part of the Contract.

J.4.2 At any time that any of the above occurs, Owner may exercise all rights and remedies available to Owner at law or in equity, and in addition, Owner may take possession of the premises and of all materials and appliances and finish the Work by whatever method it may deem expedient. In such case, the Contractor shall not be entitled to receive further payment until the Work is completed. If the Owner's cost of finishing the Work exceeds the unpaid balance of the Contract Price, Contractor shall pay the difference to the Owner.

J.5 TERMINATION FOR CONVENIENCE

J.5.1 Owner may terminate the Contract in whole or in part whenever Owner determines that termination of the Contract is in the best interest of the public.

J.5.2 The Owner will provide the Contractor and the Contractor's surety seven (7) days prior written notice of a termination for Owner's convenience. After such notice, the Contractor and the Contractor's surety shall provide the Owner with immediate and peaceful possession of the premises and materials located on and off the premises for which the Contractor received progress payment under Section E. Compensation for Work terminated by the Owner under this provision will be according to Section E. In no circumstance shall Contractor be entitled to lost profits due to termination.

SECTION K - CONTRACT CLOSE OUT

K.1 RECORD DRAWINGS: As a condition of final payment (refer also to section E.6), Contractor shall comply with the following: Contractor shall provide to Owner's Authorized Representative, record drawings of the entire project. Record drawings shall depict the project as constructed and shall reflect each and every change, modification, and deletion made during the construction. Record drawings are part of the Work and shall be provided prior to the Owner's issuance of final payment. Record drawings include all modifications to the Contract Documents unless otherwise directed.

K.2 OPERATION AND MAINTENANCE MANUALS: As part of the Work, Contractor shall submit two completed Operation and Maintenance Manuals (O&M Manual) for review by the Owner's Authorized Representative prior to submission of any pay request for more than 75% of the Work. The O&M Manuals shall contain a complete set of all submittals, all product data as required by the specifications, training information, phone list of consultants, manufacturers, installer and suppliers, manufacturer's printed data, record and shop drawings, schematic diagrams of systems, appropriate equipment indices, warranties and bonds. The Owner's Authorized Representative shall review and return one O&M Manual for any modifications or additions required. Prior to submission of its final pay request, five (5) complete and approved sets of O&M Manuals shall be delivered to the Owner's Authorized Representative by the Contractor.

K.3 RELEASE OF LIENS AND CLAIMS : As a condition of final payment, the Contractor shall submit to the Owner's Authorized Representative a notarized affidavit/release of liens and claims form, in a form

satisfactory to Owner, that states that all Subcontractors and suppliers have been paid in full, all disputes with property owners have been resolved, all obligations on the project have been satisfied, all monetary claims and indebtedness have been paid, and that, to the best of the Contractor's knowledge, there are no claims of any kind outstanding against the project. The Contractor shall indemnify, defend (with counsel of Owner's choice) and hold harmless the Owner from all claims for labor and materials finished under this Contract. The Contractor shall furnish complete and valid releases or waivers, satisfactory to the Owner, of all liens arising out of or filed in connection with the Work.

K.4 COMPLETION NOTICES

K.4.1 Contractor shall provide Owner notice of both Substantial and Final Completion. The certificate of Substantial Completion shall state the date of Substantial Completion, the responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and the time within which the Contractor shall finish all items on the punch list accompanying the Certificate. Both completion notices must be signed by the Contractor and the Owner to be valid. The Owner shall provide the final signature on the notices. The notices shall take effect on the date they are signed by the Owner.

K.4.2 Substantial Completion of a facility with operating systems (e.g., mechanical, electrical, HVAC) shall be that degree of completion that has provided a minimum of thirty (30) continuous Days of successful, trouble-free operation, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the Owner's Authorized Representative. All equipment contained in the Work, plus all other components necessary to enable the Owner to operate the facility in the manner that was intended, shall be complete on the Substantial Completion date. The Contractor may request that a punch list be prepared by the Owner's Authorized Representative with submission of the request for the Substantial Completion notice.

K.5 TRAINING:

As part of the Work, and prior to submission of the request for final payment, the Contractor shall schedule with the Owner's Authorized Representative, training sessions for all equipment and systems, as required in the individual specifications sections. Contractor shall schedule training sessions at least two weeks in advance of the date of training to allow Owner personnel adequate notice. The O&M Manual shall be used as a basis for training. Training shall be a formal session, held after the equipment and/or system is completely installed and operational in its normal operating environment.

K.6 EXTRA MATERIALS

As part of the Work, Contractor shall provide spare parts, extra maintenance materials, and other materials or products in the quantities specified in the specifications, prior to final payment. Delivery point for extra materials shall be designated by the Owner's Authorized Representative.

K.7 ENVIRONMENTAL CLEAN-UP

As part of the Final Completion Notice, or as a separate written notice submitted with or before the Notice of Final Completion, the Contractor shall notify the Owner that all environmental pollution clean-up that was performed as a part of this Contract has been disposed of in accordance with all applicable rules, regulations, laws, and statutes of all agencies having jurisdiction over such environmental pollution. The notice shall reaffirm the indemnification given under F.5.1 above.

K.8 CERTIFICATE OF OCCUPANCY

The Contractor shall not be granted Final Completion or receive final payment if the Owner has not received an unconditioned Certificate of Occupancy from the appropriate state and/or local building officials, unless failure to obtain an unconditional certificate of occupancy is due to the fault or neglect of Owner.

K.9 OTHER CONTRACTOR RESPONSIBILITIES

The Contractor shall be responsible for returning to the Owner all items issued during construction such as keys, security passes, site admittance badges, and all other pertinent items. The Contractor shall be responsible for notifying the appropriate utility companies to transfer utility charges from the Contractor to the Owner. The utility transfer date shall not be before Substantial Completion and may not be until Final Completion, if the Owner does not take beneficial use of the facility and the Contractor's forces continue with the Work.

K.10 SURVIVAL

All warranty and indemnification provisions of this Contract, and all of Contractor's other obligations under this Contract that are not fully performed by the time of Final Completion or termination, shall survive Final Completion or any termination of the Contract.

K.11 PUBLICITY

Any publicity giving reference to this solicitation, whether in the form of press releases, brochures, photographic coverage, or verbal announcement, shall be done only after prior approval of EWEB.

SECTION L - LEGAL RELATIONS & RESPONSIBILITY TO THE PUBLIC

L.1 LAWS TO BE OBSERVED

In compliance with ORS 279C.525, Section L.2 through L.4 contain lists of federal, state and local agencies of which the Owner has knowledge that have enacted ordinances or regulations relating to environmental pollution and the preservation of natural resources that may affect the performance of the Contract:

a) FEDERAL AGENCIES

Agriculture, Department of
Army Corps of Engineers
Bureau of Land Management
Bureau of Indian Affairs
Bureau of Mines
Bureau of Reclamation
Coast Guard
Defense, Department of
Forest Service
Energy, Department of
Environmental Protection Agency
Federal Energy Regulatory Commission
Geological Survey
Health and Human Services, Department of
Housing and Urban Development, Department of

Interior, Department of
Labor, Department of
Mine Safety and Health Administration
Minerals Management Service
National Oceanic and Atmosphere Administration - Fisheries
Occupational Safety and Health Administration
Solar Energy and Energy Conservation Bank
Soil Conservation Service
Transportation, Department of Federal Highway Administration
U.S. Fish and Wildlife Service
Water Resources Council

b) STATE AGENCIES

Administrative Services, Department of
Agriculture, Department of Soil and Water Conservation Commission
Columbia River Gorge Commission
Consumer & Business Services, Department of
Energy, Department of
Environmental Quality, Department of
Fish and Wildlife, Department of
Forestry, Department of
Geology and Mineral Industries, Department of
Human Resources, Department of
Land Conservation and Development Commission
Parks and Recreation, Department of
State of Oregon Standard Terms and Conditions for Public Improvement Contracts July 1998
State Lands, Division of
Water Resources Department of

c) LOCAL AGENCIES

City Councils
County Courts
County Commissioner, Board of
Design Commissions
Historical Preservation Commission
Planning Commissions

SECTION 00800

SUPPLEMENTAL GENERAL CONDITIONS

PART 1 GENERAL

These Supplemental General Conditions make additions, deletions, or revisions to Section 00700 - General Conditions as indicated herein. All provisions which are not so added, deleted, or revised remain in full force and effect. Terms used in these Supplemental General Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

SGC-A.1 DEFINITION OF TERMS

Add the following definitions to Subsection A.1 - DEFINITION OF TERMS:

"DRAWINGS: (See PLANS)"

Replace the following definitions in Subsection A.1 - DEFINITION OF TERMS:

Delete

> "SUBSTANTIAL COMPLETION means the date when the Owner accepts in writing the construction, alteration or repair of the improvement to real property or any designated portion thereof as having reached that state of completion when it may be used or occupied for its intended purpose. Substantial Completion of facilities with operating systems occurs only after thirty (30) continuous Days of successful, trouble-free operation of the operating systems as provided in Section K.4.2.

Replace with:

> "SUBSTANTIAL COMPLETION means the date when the Owner accepts in writing the construction, or any designated portion thereof, as having reached that state of completion when it may be used for its intended purpose. For the purposes of this contract, this may only occur after all water infrastructure is installed, flushed, backfilled, and passes all specified tests."

SGC-A.4EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE

Add the following after Section A.4.4:

A.4.5 Information that is available for locations and elevations of existing utilities, structures, and grades is provided for reference only. The Contractor shall verify the locations and elevations of existing structures, grades, and utilities prior to beginning construction. The owner does not assume any responsibility for the accuracy, completeness, or interpretation of the reference information.

SGC-B ADMINISTRATION OF THE CONTRACT

Add the following to Section B - ADMINISTRATION OF THE CONTRACT:

SGC-B.4 PERMITS

Permit provisions are provided in Specification Section 01010 Summary of Work.

SGC-B.7 INSPECTION

Add the following to the end of Section B.7.1

Inspection by the Owner's Authorized Representative does not relieve the Contractor of obligations to complete all work per the Contract Documents.

Add the following to Subsection B.7.3 and replace with the following:

B.7.3 The Contractor is responsible for coordinating special inspections. The Contractor shall give the Owner's authorized representative timely notice of when and where tests and inspections will be made so that the Owner's Authorized Representative may be present for such procedures. Inspection reports and test results shall be secured by the Contractor and promptly delivered to the Owner's Authorized Representative.

The Contractor shall coordinate scheduling of Owner, University of Oregon, and/or City of Eugene inspections.

The Contractor shall be responsible for all costs for re-tests that result from work that does not meet the specifications.

SGC-B.21 CONSTRUCTION STAKES, LINES AND GRADES

Add to the end of Subsection B.21.2 Contractor's Responsibilities.

d) Contractor is responsible for laying out the work from the dimensions provided on the contract documents and from electronic files provided by EWEB.

e) Contractor is responsible for all measurements required for the execution of the work.

f) Furnish, at the Contractor's own expense, stakes, equipment, tools, materials, and all labor as required in layout of any parts of the work from the control points provided by the Owner.

g) The Engineer may suspend work at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking of the work.

SGC-B.18 SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Add the following to Subsection B.18 - SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES:

B.18.8 Submittal procedures and requirements are provided is Section 01300. In case of discrepancy between Section 01300 and Paragraph B.18 of the General Conditions, Section 01300 shall govern.

B.23 COPIES OF DOCUMENTS: The Owner shall furnish to the Contractor 5 copies of the Contract Documents which may include bound reduced drawings, if any, together with 5 sets of full-scale Drawings, without charge after the bid is awarded. Additional quantities of the Contract Documents will be furnished at reproduction cost plus mailing cost if applicable.

SGC C WAGES AND LABOR

Delete Sections C.2.1 a and b in their entirety. Add the following

a) Submit certified statements to OWNER once before the first payment and monthly thereafter for each week during which the Contractor employs a worker in accordance with ORS 279C.870.

SGC-G.1 RESPONSIBILITY FOR DAMAGES/INDEMNITY

Add the following:

G.1.4 EWEB will supply Contractor with select parts and components to be used in the performance of this contract. Contractor shall assume responsibility for securing these parts against theft, damage, or other loss upon obtaining them for installation at project site. Any loss of material by Contractor shall require Contractor to replace those lost parts with exact make, model, and size parts at no additional cost to EWEB. Furthermore, delays in project completion while obtaining or awaiting receipt of any such replacement parts shall be owned by the Contractor and shall not considered a legitimate reason to assert Force Majeure.

SGC-H.1 CONTRACT PERIOD

Add the following to Subsection H.1– CONTRACT PERIOD:

H.1.4 Contractor and Owner recognize that time is of the essence and that the Owner will suffer financial loss if the Work is not completed within the times specified in the contract documents, plus any extensions allowed in accordance with the General Conditions. This includes, but is not limited to, additional engineering and inspection costs, administration costs, and other related expenses. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that the Contractor shall pay the Owner:

a) $750 as liquidated damages for each day that expires after the time specified for Substantial Completion until the Work is substantially complete.

b) $750 as liquidated damages for each day that expires after Final Completion until the work is completed and ready for final payment, if the Contractor neglects, refuses, or fails to complete the remaining Work within the Contract Time or any proper extension granted by the Owner.

Add the following to SGC H.2

H.2.2 The Contractor shall submit weekly updates to the construction schedule and planned operations, in the form of a 2-week look-ahead schedule. The Contractor shall be responsible for coordination and notifications regarding all disruptions due to scheduled work.

H.2.3 The Contractor shall designate a contact person to be responsible for coordination and notifications. This contact person shall notify the Owner prior to contact with other agencies, property owners, and the public.

SGC I CORRECTION OF WORK
Add the following to after subsection I.1

I.1.2 The contractor shall submit in writing to the Owner a schedule and plan to repair defective work within seven days of being notified. The contractor shall remedy all defective work within 30 days of notification.

SGC J CONTRACT CLOSEOUT

Contract closeout requirements specified in Section J of the General Conditions are summarized in Section 01750.

END OF SECTION

OREGON BUREAU OF LABOR AND INDUSTRIES – BOLI

PREVAILING WAGE RATES

No bid will be considered unless the bid contains a statement by the bidder that provisions of ORS 279C.800 through ORS 279C.870 pertaining to prevailing wage rates shall be complied with.

State of Oregon, Bureau of Labor and Industries (BOLI) wage rates are required for all Work on this contract. Prevailing Wage Rates dated January 1, 2021, are incorporated into this bid/contract by reference and can be accessed at the website:

https://www.oregon.gov/boli/employers/Pages/prevailing-wage-rates.aspx

The Work will take place in Lane County Region #5.

End of Section 00830

CHANGE ORDER
PROCESSING PROCEDURE

The EWEB Project Manager (also called the "Contract Administrator") or Contractor may use a Change Order document to propose a change to the plans, specifications, character of the work, quantity of work, and/or timeline, however, if it is necessary to exceed the last approved contract amount by 25% or more, the change order may be subject to competitive bidding and/or Board approval. (Note: Changes to the general and special terms of the Contract must be made by formal amendment and not by use of a Change Order.) Change orders are generally used for construction projects.

The Change Order will clearly describe

a) The change in the Work;

b) The amount of the adjustment in the contract sum, if any; and

c) The extent of the adjustment in the contract time, if any.

Formal Change Order Process:

- Contractor or EWEB Project Manager will draft a proposed change order.
- The Change Order (CO) is prepared and forwarded to Purchasing for review.
- Purchasing will review the added/deducted scope of work and proposed cost and will return to the PM for further processing, or with revisions.
- Contractor signs and returns to the Project Manager.
- If Board approval is necessary, the Change Order will be presented to the Board by the department at the Board's next scheduled meeting.
- Once approved by the Board, the Project Manager will sign and route for department signatures.
- The Project Manager will then forward a copy of the fully signed Change Order and approved Board consent (approval) form to Purchasing, who will file it and/or make changes to the purchase order in EWEB's purchase order system.

Field Change Order Process:

Changes in the plans and specifications, requested in writing by the Contractor **that do not materially affect the Work or cost of the work or are within the Project Manager's Delegated Signature Authorization,** may be granted directly by the Project Manager. A Field Change Order allows such changes. The form is filled out and marked as a "Field Change Order". The Supervisor must sign but may do so later. Review by Purchasing is not required. The Project Manager will forward a copy to Purchasing, to be filed in the Contract folder.

CHANGE ORDER

PROPOSED CHANGES ARE NOT AUTHORIZED UNTIL THIS CHANGE ORDER IS EXECUTED BY BOTH PARTIES.

PART A: Change Order Request

PROJECT NAME _____ CHANGE ORDER #_____

CONTRACTOR NAME: _____

CONTRACT NUMBER: _____ TASK ORDER #___ PO # _____ WO#_____ Blanket #_____

FIELD CHANGE ORDER? (Check here) ☐

==========

Description of Proposed Change to Scope of Work (if any):

==========

PART B: Change Order

Contractor is directed to make the following changes to this Contract only when fully signed below.

The original contract sum was..... **$**_____

Net change by all previous Change Orders..... **$**_____

The contract sum prior to this Change Order was..... **$**_____

The contract sum will be (increased) (decreased) (unchanged) by this Change Order..... **$**_____

The new contract sum, including this Change Order, will be..... $_____

Last Board approved amount..... **$**_____

Total percentage of all Change Orders over last Board approved amount..... _____%

The Contract Time will be ___increased ___decreased ___unchanged by ____ days.

The new Date of Completion, once approved, will be _____.

==========

PART C: Authorization

[CONTRACTOR NAME]	**EUGENE WATER & ELECTRIC BOARD**
_____	_____
CONTRACTOR REPRESENTATIVE - SIGNATURE	PROJECT MANAGER - SIGNATURE
_____	_____
PRINT NAME	PRINT NAME
_____	_____
TITLE	MANAGER / SUPERVISOR SIGNATURE
_____	_____
EMAIL	PRINT NAME
	DATE: _____

TECHNICAL SPECIFICATIONS AND DRAWINGS

FOR

E. 40th AVENUE 7.5 MG TANKS – EXCAVATION AND BLASTING PROJECT

FOR

EUGENE WATER & ELECTRIC BOARD

JULY 2021

MURRAYSMITH, INC.
888 SW 5th Avenue
Suite #1170
Portland, OR 97204
(503) 225-9010

TECHNICAL SPECIFICATIONS
FOR
E. 40th AVENUE 7.5 MG TANKS – EXCAVATION AND BLASTING PROJECT
FOR
EUGENE WATER & ELECTRIC BOARD

TABLE OF CONTENTS

SECTION 01 10 00 - SUMMARY OF WORK

PART 1 GENERAL

This Summary of Work supplements and amplifies certain sections of the General Conditions and Supplementary General Conditions. The General Conditions and Supplementary General Conditions shall apply except as modified herein. These Special Provisions and additional technical specifications may contain occasional requirements not pertinent to the project. However, these specifications shall apply in all particulars insofar as they are applicable to this project.

1.1 APPLICABLE STANDARD SPECIFICATIONS AND PLANS

Eugene Water & Electric Board, Water Distribution Design and Construction Standards, (including all revisions at date of bid opening), apply except as may be modified herein. In the case of discrepancy, unless noted otherwise herein, the more restrictive provisions shall apply.

1.2 SCOPE OF WORK

The work to be performed under these specifications and drawings consists of mass excavation to include rock blasting and removal in the extents shown on the Drawings and associated work.

The above general outline of principal features of the work does not in any way limit the responsibility of the CONTRACTOR(s) to perform all work and furnish all equipment, labor and materials required by the specifications and drawings. The drawings and specifications shall be considered and used together. Anything appearing as a requirement of either shall be accepted as applicable to both even though not so stated therein or shown.

No attempt has been made in these specifications or drawings to segregate work covered by any trade or subcontract under one specification. Such segregation and establishment of subcontract limits will be solely a matter of specific agreement between the CONTRACTOR and its subcontractors and shall not be based upon any inclusion, segregation, or arrangement in or of these specifications.

1.3 CODE REQUIREMENTS

All work shall be done in strict compliance with the requirements of:

A. International Building Code
B. Uniform Mechanical Code
C. Uniform Plumbing Code
D. National Electric Code
E. National Electric Safety Code
F. Oregon State Department of Labor and Industries

G. City of Eugene Erosion Control Practices

In case of disagreement between codes or these specifications, the more restrictive shall prevail.

1.4 COORDINATION WITH OTHER CONTRACTORS AND WITH OWNER

Certain work within this contract may require connection to and coordination with the work of other contractors and OWNER. The CONTRACTOR under these specifications shall cooperate fully with all other contractors and OWNER and carefully fit its own ork to such other work as may be directed by the ENGINEER. The CONTRACTOR shall not commit or permit any act to be committed which will interfere with the performance of work by any other contractor or the OWNER.

1.5 ACCESS TO WORK

Access to the work shall be provided as may be required by the OWNER or its representatives, and all authorized representatives of the state and federal governments and any other agencies having jurisdiction over any phase of the work, for inspection of the progress of the work, the methods of construction or any other required purposes.

1.6 PERMITS AND LICENSES

Unless provided for otherwise in these contract documents, all permits, licenses and fees shall be obtained by the CONTRACTOR and all costs shall be borne by the CONTRACTOR. CONTRACTOR shall pay all plan check fees and other fees necessary to obtain permits and shall accommodate special inspections required thereof. CONTRACTOR shall be responsible for compliance with all permit provisions and shall accommodate all special inspections required thereof, all at no additional expense to the OWNER beyond prices as bid.

The following permits will be obtained and fees paid by the OWNER:

- City of Eugene, 1200-CN Erosion Control Permit.
- City of Eugene, Building/Grading Permit.

1.7 SITE INVESTIGATION AND PHYSICAL DATA

The CONTRACTOR acknowledges that it is satisfied as to the nature and location of the work and the general and local conditions, including but not limited to those bearing upon transportation, disposal, handling and storage of materials, availability of water, roads, groundwater, access to the sites, coordination with other contractors, and conflicts with pipelines, structures and other contractors. Information and data furnished or referred to herein is furnished for information only. Any failure by the CONTRACTOR to become acquainted with the available information and existing conditions will not be a basis for relief from successfully performing the work and will not constitute justification for additional compensation.

The CONTRACTOR shall verify the locations and elevations of existing pipelines, structures, grades and utilities, prior to construction. The OWNER assumes no responsibility for any conclusions or interpretations made by the CONTRACTOR based on the information made available.

1.8 TEMPORARY UTILITIES FOR CONSTRUCTION PURPOSES

The CONTRACTOR shall make all arrangements necessary to provide all temporary utilities for construction purposes and shall pay all costs associated those temporary utilities. Water for construction purposes will be furnished by the OWNER at no cost. The CONTRACTOR shall furnish all valves, hoses, connections and other devices as necessary to obtain enough water for construction and for filling and testing of water lines as required. Fire hydrant use is allowed only by permission of the utility owner. Backflow protection is required on all connections to potable water systems.

1.9 PRIVATE ROADS AND DRIVEWAYS

Bridges at entrances to business properties where vehicular traffic is necessary shall be provided and maintained. Bridges shall be adequate in width and strength for the service required. No private road or driveway may be closed without approval of the ENGINEER unless written authority has been given by the owner whose property has been affected. Driveways shall be left open and ready for use at the end of the work shift. All expenses involved in providing for construction, maintenance, and use of private roads or driveways, shall be borne by the CONTRACTOR and the amount thereof absorbed in the unit prices of the CONTRACTOR’s bid.

1.10 TRAFFIC CONTROL AND PROTECTION

The CONTRACTOR shall maintain traffic control and protection in the work areas 24 hours per day. Traffic control shall conform to the standards set forth in the "Oregon Manual on Uniform Traffic Control Devices" issued by the Oregon Department of Transportation.

The CONTRACTOR shall conduct its operations to keep one lane of traffic open for public and private access at all times on City, County and Public streets, roads and highways. If required by the State, the CONTRACTOR shall conduct its operations to keep both directions of traffic open on State Highways. Permits obtained for the project may have more stringent requirements than noted in this section.

Prior to beginning construction, the CONTRACTOR shall submit a detailed street closure and traffic control plan to the ENGINEER and City of Eugene for approval. As construction proceeds, the CONTRACTOR shall notify the ENGINEER as to the status of street closures and detours.

On streets where traffic is heavy, the ENGINEER may require the construction of two-way bridges of adequate design. These bridges shall be provided with guard rails and shall be well

lighted at all times. Detours as required by the ENGINEER shall be surfaced with gravel or crushed rock and maintained in good condition. Detours for pedestrians shall not exceed one block in length, and foot bridges over the trenches shall be provided with adequate handrails.

All work shall be carried on with due regard for safety to the public. Open trenches shall be provided with barricades of a type that can be seen at a reasonable distance, and at night they shall be distinctly indicated by adequately placed lights.

1.11 MATERIALS AND COMPACTION TESTING

The OWNER shall provide the services of a licensed, independent agency to perform materials and compaction testing for this project. Materials and compaction tests will be required to show that specified densities of compacted backfill and asphaltic concrete surfacing are being achieved by the CONTRACTOR's compaction methods. The CONTRACTOR shall provide the OWNER'S REPRESENTATIVE with copies of recent Proctor tests for the backfill and paving material in addition to copies of compaction tests performed in the field.

After the OWNER'S REPRESENTATIVE is satisfied that the CONTRACTOR's method of compaction consistently meets specified compaction requirements, the testing frequency may be reduced. The OWNER'S REPRESENTATIVE may direct testing at a higher frequency upon failure to obtain specified densities or if the CONTRACTOR changes compaction equipment or methods of compaction. All test locations shall be determined by the OWNER'S REPRESENTATIVE.

The CONTRACTOR shall be responsible for scheduling and coordinating field services for the materials and compaction testing.

1.12 LIMITS OF THE WORK AND STORAGE OF SPOILS

The limits of the site which may be used for construction, storage, materials handling, parking of vehicles and other operations related to the project include the project site as shown on the drawings and adjacent public rights-of-way subject to permission of the public owner of that right-of-way. The limits of work also include rights of access obtained by the CONTRACTOR, subject to all public laws and regulations and rights of access by utility companies and other holders of easement rights.

1.13 PROTECTION OF EXISTING STRUCTURES AND WORK

The CONTRACTOR must take all precautions and measures necessary to protect all existing structures and work. Any damage to existing structures and work shall be repaired by removing the damaged structure or work, replacing the work and restoring to original condition satisfactory to the ENGINEER.

1.14 SALVAGE AND DEBRIS

Unless otherwise indicated on the drawings or in the specifications, all castings, pipe, equipment, demolition debris, spoil or any other discarded material or equipment shall become the property of the CONTRACTOR and shall be disposed of in a manner compliant with applicable Federal, State, and local laws and regulations governing disposal of such waste products. No burning of debris or any other discarded material will be permitted.

1.15 SAFETY STANDARDS AND ACCIDENT PREVENTION

The CONTRACTOR shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. The required and/or implied duty of the ENGINEER to conduct construction review of the CONTRACTOR's performance does not, and is not intended to, include review of the adequacy of the CONTRACTOR's safety measures in, on, or near the construction site.

The CONTRACTOR shall comply with the safety standards provisions of applicable laws and building and construction codes. The CONTRACTOR shall exercise every precaution at all times for the prevention of accidents and protection of persons, including employees, and property. During the execution of the work the CONTRACTOR shall provide and maintain all guards, railing, lights, warnings, and other protective devices which are required by law or which are reasonably necessary for the protection of persons and property from injury or damage.

1.16 PUBLIC SAFETY AND CONVENIENCE

General Rule: The CONTRACTOR shall ensure the safety of the public during its performance of the Work and shall minimize any public inconvenience in addition to any other requirement imposed by law. These duties include, but are not limited to, the matters listed below.

Access: The CONTRACTOR shall not unreasonably restrict access to public facilities, commercial property, fire hydrants, residential property, and other areas where the public can be expected to be present, such as sidewalks and streets without first obtaining approval of the OWNER. Driveways shall be closed only with the approval of the OWNER or after obtaining specific permission from the property owner or owners. In addition, the CONTRACTOR shall not obstruct or interfere with travel over any public street or sidewalk without approval of the OWNER.

Public Transit: The CONTRACTOR shall not interfere with the normal operation of any public transit vehicles unless otherwise authorized.

Work Site: The CONTRACTOR shall keep the Project site safe in compliance with applicable law. Safety includes, but is not limited to: 1) providing an approved type of secured and

adequate barricades or fences that are easily visible from a reasonable distance around open excavations; 2) closing up or covering with steel plates all open excavations at the end of each Working Day in all street areas and in all other areas when it is reasonably required for public safety; 3) marking all open work and obstructions by lights at night; 4) installing and maintaining all necessary signs, lights, flares, barricades, railings, runways, stairs, bridges, and facilities; 5) observing any and all safety instructions received from the OWNER; and 6) following all laws and regulations concerning worker and public safety. In the event that the law requires greater safety obligations than that imposed by the OWNER, the CONTRACTOR shall comply with the law.

Emergency: Emergency vehicles, including but not limited to police, fire, and disaster units shall be provided access to the work site at all times.

Cleanliness: The CONTRACTOR shall, on a continuing basis, keep the surfaces of all public and private roadways, sidewalks, and other pathways free of dirt, mud, cold plane grindings, and other matters that the CONTRACTOR may place upon the road. The cost of performing such work shall be included in the CONTRACTOR's Bid and no additional payment will be made for performing this task.

Parking: The CONTRACTOR shall make any necessary contacts with all applicable governmental bodies to arrange for the removal of parked automobiles, vehicles and other obstructions if they would interfere with the performance of the CONTRACTOR'S work.

Accidents: The CONTRACTOR'S Project Manager or superintendent shall be in charge of accident prevention. CONTRACTOR shall take all actions necessary to prevent damage, injury and loss to persons and property as a result of accidents.

Project Health and Safety Plan: CONTRACTOR shall develop, publish, and implement an overall Project Health and Safety Program for the Project. This Program shall conform to all applicable codes. Contractor shall submit the written Safety Program to the OWNER within 15 days after the receipt of the written Notice to Proceed. The Plan shall be assembled to address project specific health and safety issues to both the public and on-site personnel. The plan shall include the following items when they apply:

- Employee Orientation
- Safety Inspections
- Instruction and Training
- Accident Reporting
- Signs and Barricades
- Fire Prevention and Protection
- Welding, Cutting, and Burning
- Painting and Surface Treatment
- Electricity
- Hazardous Materials
- Hazardous Communications Program
- Job Hazard Analysis
- First Aid/Medical Facilities
- Personal Protective Equipment
- Confined Space Entry Plan
- Shoring Plan
- Fall Protection Plan
- Emergency Action Plan

- Machinery and Mechanized Equipment
- Excavations
- Sanitation
- Chlorine Safety
- Housekeeping
- Safety Training Requirements and Certification
- Pedestrian Access Around Work Site During Construction and After Hours

If the project requires other health and safety issues to be addressed, they too shall be included in the Project Health and Safety Plan. The Program shall subsequently be distributed to and implemented by the CONTRACTOR's personnel as well as its Subcontractors and Suppliers. CONTRACTOR shall fully implement and comply with the Safety Program and shall submit to the OWNER a letter signed by CONTRACTOR'S owner/president affirming such implementation and compliance within 15 days after on-site work has started. CONTRACTOR shall notify the OWNER when safety meeting will be held so that Owner's personnel may attend. A copy of the approved Health and Safety Plan must be maintained on-site at all times during the life of the Project.

The OWNER has no responsibility for Work site safety. Work site safety is the responsibility of the CONTRACTOR. The CONTRACTOR is required to have a competent person on site at all times during construction activities.

1.17 SANITARY FACILITIES

The CONTRACTOR shall provide and maintain sanitary facilities for its employees and its subcontractors' employees that will comply with the regulations of the local and State Departments of Health and as directed by the ENGINEER.

1.18 STREET CLEANUP

The CONTRACTOR shall clean daily all dirt, gravel, construction debris, and other foreign material resulting from its operations from all streets and roads.

1.19 VEHICLE PARKING

The vehicles of the CONTRACTOR's and subcontractors' employees shall be parked in accordance with local parking ordinances. The project site should be used for parking and material storage. Patterson Street shall not be used for parking or stockpiling.

1.20 PROTECTION OF WATER QUALITY

The work to be performed may involve connections to an existing potable water system. If such work is included in the project, the CONTRACTOR shall take such precautions as are necessary or as may be required to prevent the contamination of the water. Such contamination may include but shall not be limited to deleterious chemicals such as fuel,

cleaning agents, paint, demolition and construction debris, sandblasting residue, etc. In the event contamination does occur, the CONTRACTOR shall, at its own expense, perform such work as may be necessary to repair any damage or to clean the affected areas of the water mains to a condition satisfactory to the ENGINEER.

1.21 "OR EQUAL" CLAUSE

To establish a basis of quality, certain processes, types of machinery and equipment or kinds of material may be specified on the drawings or herein by designating a manufacturer's name and referring to its brand or product designation. It is not the intent of these specifications to exclude other processes, equipment or materials of a type and quality equal to those designated. When a manufacturer's name, brand, or item designation is given, it shall be understood that the words "or equal" follow such name or designation, whether in fact they do so or not. If the CONTRACTOR desires to furnish items of equipment by manufacturers other than those specified, they shall secure the approval of the ENGINEER prior to placing a purchase order.

No extras will be allowed the CONTRACTOR for any changes required to adopt the substitute equipment. Therefore, the CONTRACTOR's proposal for an alternate shall include all costs for any modifications to the drawings, such as structural and foundation changes, additional piping or changes in piping, electrical changes or any other modifications which may be necessary or required for approval and adoption of the proposed alternate equipment. Approval of alternate equipment by the ENGINEER before or after bidding does not guarantee or imply that the alternate equipment will fit the design without modifications.

1.22 SURVEYS

Based upon the information provided by the Contract Documents, the CONTRACTOR shall develop and make all detail surveys necessary for layout and construction, including exact component location, working points, lines, and elevations. Prior to construction, the field layout shall be approved by the OWNER's representative. The CONTRACTOR shall have the responsibility to carefully preserve bench marks, reference points, and stakes, and in the case of destruction thereof by the CONTRACTOR or resulting from its negligence, the CONTRACTOR shall be charged with the expense and damage resulting therefore and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points, and stakes.

1.23 WORK HOUR LIMITATIONS

All work shall be conducted between the hours of 7:00 a.m. and 6:00 p.m. on non-holiday weekdays only. No weekend work will be allowed. Requests for variations in work hours shall be made in writing for consideration by the ENGINEER. No work shall be conducted outside of the above-described days and hours without prior approval of the ENGINEER.

1.24 DUST PREVENTION

All unpaved streets, roads, detours, haul roads, or other areas where dust may be generated shall receive an approved dust-preventive treatment or be routinely watered to prevent dust. Applicable environmental regulations for dust prevention shall be strictly enforced.

1.25 EROSION AND SEDIMENTATION CONTROL

The OWNER will obtained a National Pollutant Discharge Elimination system (NPDES) 1200-CN Permit for this project. The CONTRACTOR shall be responsible for compliance with all 1200-CN permit provisions.

Erosion control measures shall be maintained throughout the project site until approved permanent cover such as a healthy stand of grass, other permanent vegetation, or other ground covering is established. When approved permanent ground cover is established, all temporary erosion control measures shall be removed from the construction site. Erosion control measures shall be installed as approved, per the erosion control drawing(s) in the above referenced document. Erosion control measures including stabilized construction entrances and sediment barriers must be established in conjunction with site clearing and grading.

During construction, and until permanent vegetation or other ground covering is established, the erosion control facilities shall be upgraded as needed for unexpected storm events or site conditions and with the purpose of retaining sediment and sediment-laden water on the construction site.

1.26 NOISE LIMITATIONS

The project area is located within a residential zoned area. All applicable City, County ordinances, and State and Federal regulations shall be complied with.

1.27 STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

A. Materials and equipment stored overnight shall be placed neatly on the job site. Unusable materials (i.e. rejected or damaged liner material, old concrete chunks, metal scraps, etc.) shall be expeditiously removed from the job site.

   Provide appropriate barricades, signs, and traffic control devices in like-new condition where necessary to protect the public from any hazards associated with the storage of materials and equipment used for this project.

B. No equipment and/or materials shall be stored outside the immediate work area on public right-of-ways, in the following locations, or in the following manner:

   1. In any maintained landscaped or lawn area.

2. In a manner that would totally eliminate an individual residents' street parking.

3. In front of any business.

The “immediate work area” is the area where work is taking place or will be taking place within one calendar day. The CONTRACTOR shall immediately move stored material or equipment which causes a nuisance or creates complaints.

1.28 COMPETENT PERSON DESIGNATION

CONTRACTOR shall designate a qualified and experienced “competent person” at the site whose duties and responsibilities shall include enforcement of applicable OSHA regulations regarding excavations, the prevention of accidents, and the maintenance and supervision of construction site safety precautions and programs.

1.29 EMERGENCY MAINTENANCE SUPERVISOR

The CONTRACTOR shall submit to the ENGINEER the names, addresses, and telephone numbers of at least two employees responsible for performing emergency maintenance and repairs when the CONTRACTOR is not working. These employees shall be designated, in writing by the CONTRACTOR, to act as its representatives and shall have full authority to act on its behalf. At least one of the designated employees shall be available for a telephone call any time an emergency arises.

1.30 PREVAILING WAGE RATES FOR PUBLIC WORKS CONTRACTS IN OREGON

Prevailing wage rates are required for this project, see Division 0 for specific requirements.

1.31 OREGON PRODUCTS

CONTRACTOR's attention is directed to the provisions of Oregon Law, ORS 279A.120 regarding the preference for products that have been manufactured or produced in Oregon. CONTRACTOR shall use Oregon-produced or manufactured materials with respect to common building materials such as cement, sand, crushed rock, gravel, plaster, etc., and Oregon-manufactured products in all cases where price, fitness, availability and quality are otherwise equal.

END OF SECTION

SECTION 01 22 20 - UNIT PRICE MEASUREMENT AND PAYMENT

PART 1 GENERAL

Measurement and payment will be on a unit price basis in accordance with the prices set forth in the proposal for individual work items. Where work is required but does not appear as a separate item in the proposal, the cost for that work shall be included and absorbed in the unit prices named in the proposal. CONTRACTOR shall make a careful assessment of contract documents when preparing the bid.

1. Mobilization, bonds, insurance and demobilization: Payment for mobilization, bonds, insurance and demobilization will be on a lump sum basis. The amounts paid for mobilization in the contract progress payment will be based on the percent of the original contract amount that is earned from other contract items, as follows:

    A. When 5 percent is earned, either 100 percent of the amount for mobilization or 5 percent of the original contract amount, whichever is the least.
    B. When all work is completed, amount of mobilization exceeding 5 percent of the original contract amount.

    This schedule of mobilization progress payments will not limit or preclude progress payments otherwise provided by the contract.

2. Erosion control: Lump Sum payment under this item shall cover all elements of installing and maintaining erosion control measures, complying with the 1200CN permit conditions, and providing reporting as required.

3. All associated work required for mass excavation: Measurement and payment for all work required to support complete mass excavation for future improvements, other than as provided for under separate unit prices, will be made on a single lump sum basis. General work categories are described in the price breakdown below.

    a. Shop drawings and approvals;

    b. Construction survey and staking;

    c. Tree protection, stump removal, clearing, and grubbing;

    d. Site preparation, backfill to subgrade, and grading;

    e. Final site grading, surface restoration, and site clean-up.

4. Common excavation: Payment for common excavation will be made on a per cubic yard in situ soil removed. Common excavation will be measured by surveying coordinates and elevations of the pre-construction surface and the underlying solid rock surface prior to excavation of the rock; the total quantity of common excavation will be calculated from

these measurements. Common excavation measurement will be subject to approval by the Engineer. Cost of surveying common excavation measurement shall be the responsibility of the Contractor.

5. Rock excavation: Payment for rock excavation associated with construction of the new tank structures, the site stormwater detention facility, and piping improvements will be made at the unit price per cubic yard of rock excavated. Pay limits for the shall be to the depth and extents shown on the Drawings. No payment will be made for rock excavation beyond these limits.

   Rock excavation is defined in Section 31 23 18, Rock Removal, and as determined by the Engineer. Rock excavation will be measured by surveying coordinates and elevations of the solid rock surface prior to and following excavation of the rock; the total quantity of rock excavated will be calculated from these measurements. Rock measurement will be subject to approval by the Engineer. Cost of surveying rock measurement shall be the responsibility of the Contractor. No additional payment will be made for excavation beyond these limits to remove solid rock and/or boulders, nor will payment be made for select backfill beyond these limits placed to fill voids left by removing solid rock and/or boulders.

   Rock excavation may be performed by a mix of blasting and mechanical removal. The unit price will apply rock quantity regardless of removal method.

6. Vibration Monitoring: Payment for vibration monitoring for the duration of the blasting activities will be paid on a lump sum basis. Pre-blast and post-blast inspections of residential structures will be paid on a per each basis.

7. Additional tree removal identified by EWEB: Payment for removal of trees beyond those identified in the Drawing will be on a per inch diameter-breast height (DBH) basis. Only trees identified by the OWNER prior to removal will be considered for additional payment.

8. Additional cost for overexcavation and select backfill material for unsuitable conditions: Payment for overexcavation and select structural backfill material for unsuitable tanks structure foundation conditions, unsuitable site stormwater detention facility and unsuitable site piping soil conditions will only be considered as approved by the Engineer in writing. When such pre-approval is obtained, payment will be made on a per cubic yard basis for the backfill material. Unsuitable material is assumed to be common excavation. Measurement will be agreed upon by CONTRACTOR and ENGINEER prior to overexcavation.

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. This Section contains administrative and procedural requirements for submittals for review, information, and for Project closeout.

B. Section includes:

1. Schedule of Submittals.
2. Submittal requirements.
3. Submittal procedures.
4. Engineer review.
5. Resubmittal procedures.
6. Product data.
7. Shop Drawings.
8. Samples.
9. Design data.
10. Test reports.
11. Certificates.
12. Manufacturer's instructions.
13. Manufacturer's field reports.
14. Construction progress schedules.
15. Breakdown of contract price.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.

B. Informational Submittals: Written and graphic information and physical Samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SCHEDULE OF SUBMITTALS

A. Within 10 days after the Effective Date of the Contract, Contractor shall submit to Engineer a preliminary Schedule of Submittals, including proposed list of major products proposed for use, with specification section reference, name of manufacturer, supplier, trade name, subcontractor and model number of each product. Provide a schedule of specific target dates for the submission and return of submittals and shop drawings required by the Contract Documents.

B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

C. The list and schedule shall be updated and resubmitted when requested by the Engineer.

D. Contractor's Schedule of Submittals will be deemed acceptable if it provides a workable arrangement for reviewing and processing the required submittals.

1.4 SHOP DRAWING AND SAMPLE SUBMITTAL REQUIREMENTS

A. Before submitting a Shop Drawing or Sample, Contractor shall have:

1. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

2. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

3. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

4. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

B. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

C. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review of each such variation.

1.5 SUBMITTAL PROCEDURES

A. Contractor shall submit Shop Drawings and Samples to Engineer for review in accordance with the accepted Schedule of Submittals.

B. Transmit each submittal with Engineer-accepted transmittal form certifying compliance with requirements of Contract Documents.

C. Sequentially number transmittal forms. Mark transmittal forms for resubmittals with original number and sequential alphabetic suffix.

D. Show each Submittal with the following numbering and tracking system:

1. Submittals shall be numbered according to specification section. For example, the first product submittal for Section 05 50 00 would be “05 50 00-1”. Resubmittals of that submittal would be “05 50 00-1.1”, followed by “05 50 00-1.2”, and so on. The second product submittal for that Section would be “05 50 00-2”.

2. Submittals containing product information from multiple sections of the specifications will not be reviewed. Contractor and/or their supplier shall divide submittals in a manner that meets the numbering and tracking system requirements stated herein.

3. Alternative method of numbering may be used if acceptable to Engineer.

E. Identify: Project, Contractor, subcontractor and supplier, pertinent drawing and detail number, and specification Section number appropriate to submittal.

F. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.

G. Coordinate submission of related items.

1. All shop drawings for interrelated items shall be scheduled for submission at the same time.

2. The Engineer may hold shop drawings in cases where partial submission cannot be reviewed until the complete submission has been received or where shop drawings cannot be reviewed until correlated items affected by them have been received. When such shop drawings are held, the Engineer will advise the Contractor in writing that the shop drawing submitted will not be reviewed until shop drawings for all related items have been received.

H. When hard copies of submittals are provided by the Contractor, six copies of all materials shall be provided to the Engineer. Two copies of reviewed submittals will be kept by the Engineer, two copies of reviewed submittals will be transmitted to the Owner, and two copies of reviewed submittals will be returned to the Contractor. If the Contractor requests that more than two copies of the reviewed submittal be returned, then the Contractor shall submit the appropriate quantity of submittals.

I. When electronic transmittals of submittals are provided by the Contractor under established protocols described elsewhere in the Contract Documents or as jointly

developed by the Owner, Engineer and Contractor, provide electronic submittals in portable document format (PDF) in addition to the source document format (Word, Excel, AutoCAD, etc.). Reviewed submittals will be returned to the Contractor as PDF electronic files.

J. For each submittal for review, allow not less than 14 days for Engineer review, excluding delivery time to and from Contractor.

K. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.

L. Allow space on submittals for Contractor and Engineer review stamps or comments.

M. When revised for resubmission, the Contractor shall identify changes made since previous submission. A narrative of changes shall be provided, and shop drawings or calculations shall indicate that a revision was made.

N. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with review comments.

O. Submittals not requested will not be recognized nor processed.

P. Incomplete Submittals: Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Engineer.

1.6 ENGINEER REVIEW

A. Informational submittals and other similar data are for Engineer's information, do not require Engineer's responsive action, and will not be reviewed or returned with comment.

B. The Engineer’s review of submittals and shop drawings is not a check of any dimension or quantity and will not relieve the Contractor from responsibility for errors of any sort in the submittals and shop drawings.

C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.

D. The Engineer will review the submitted data and shop drawings and return to the Contractor with notations thereon indicating "No Exception Taken", "Make Corrections Noted", "Rejected", "Revise and Resubmit", or "Submit Specified Item".

E. If more than two submissions of an item are required to meet the Project specifications, Contractor shall be responsible for Engineer’s charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to

secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

F. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

G. Engineer's review will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

H. Engineer's review of a separate item as such will not indicate approval of the assembly in which the item functions.

I. Engineer's review of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 1.4.C and Engineer has given written acceptance of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such accepted variation from the requirements of the Contract Documents in a Field Order.

J. Engineer's review of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 1.4 A. and B.

K. Engineer's review of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

L. Neither Engineer's receipt, review, return of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

M. Contractor shall perform the Work in compliance with the requirements and commitments set forth in returned Shop Drawings and Samples, subject to the provisions of Paragraph 1.6.I.

1.7 RESUBMITTAL PROCEDURES

A. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

B. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required review of an item with no more than two submittals. Engineer will record Engineer's time for reviewing a third or subsequent submittal of a Shop Drawings, sample, or other item requiring review, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

C. If Contractor requests a change of a previously reviewed submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

PART 2 PRODUCTS

2.1 CONSTRUCTION PROGRESS SCHEDULES

A. Within 10 days after the Effective Date of the Contract, prepare and submit to the Owner a practicable schedule showing the order in which the Contractor proposes to carry out the Work, the dates on which the important features of the work will start, and the contemplated dates for completing same. A time-scaled bar chart schedule shall include the following:

- Construction activities
- Submittal and review of critical shop drawings
- Procurement and delivery of critical materials
- Duration of work, including completion times of all stages and their sub-phases

B. Attention is drawn to typical local climatic weather patterns and Work shall be coordinated accordingly.

C. Complete project schedule shall be revised and resubmitted to the Owner every **4** weeks for review.

D. Submit a two week lookahead schedules weekly at the construction meeting. The previous week's completed work shall be shown on the schedule for a total of 3 weeks shown.

2.2 BREAKDOWN OF CONTRACT PRICE

A. Within 10 days after the Effective Date of the Contract, submit a complete breakdown of all lump sum bid items showing the value assigned to each part of the work, including an allowance for profit and overhead adding up to the total lump sum contract price.

B. Breakdown of lump sum bids shall be coordinated with the items in the schedule and shall be in sufficient detail to serve as the basis for progress payments during construction.

C. Engineer will review the contract price breakdown and may request items to be further broken down or for more items be added in order to facilitate tracking of work progress for payment.

D. Preparatory work, bonds, and insurance required in setting up the job will be allowed as a separate entry on the cost breakdown but shall not exceed 5 percent of the total base bid.

E. Upon acceptance of the breakdown of the contract price by the Engineer, it shall be used as the basis for all requests for payment.

2.3 PRODUCT DATA

A. Product Data: Action Submittal: Submit to Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents. Submitted data shall be sufficient in detail for determination of compliance with the Contract Documents.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

1. Note submittal will be returned to Contractor without review of submittal if products, models, options, and other data are not clearly marked or identified.

C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. After review, produce copies and distribute according to Paragraph 1.5.M and for record documents.

2.4 SHOP DRAWINGS

A. Shop Drawings: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer licensed in the state of Project responsible for designing components shown on Shop Drawings.

1. Include signed and sealed calculations to support design.

2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.

3. Make revisions and provide additional information when required by authorities having jurisdiction.

D. All dimensioned shop drawings shall be scalable and provided as full-sized (22-inch x 34-inch) sheets. PDF electronic files shall print as scalable full-sized sheets.

E. After review, produce copies and distribute according to Paragraph 1.5.M and for record documents.

2.5 SAMPLES

A. Samples: Action Submittal: Submit to Owner for assessing conformance with information given and design concept expressed in Contract Documents.

B. Samples for Selection as Specified in Product Sections:

1. Submit to Owner samples for aesthetic, color, and finish selection.

2. Submit to Owner samples of finishes, textures, and patterns for selection.

C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.

D. Include identification on each Sample, with full Project information.

E. Submit number of Samples specified in individual Specification Sections; Engineer will retain one Sample.

F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.

G. After review, produce copies and distribute according to Paragraph 1.5.M and for record documents.

2.6 DESIGN DATA

A. Informational Submittal: Submit data for Engineer's knowledge as Contract administrator or for Owner.

B. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

2.7 TEST REPORTS

A. Informational Submittal: Submit reports for Engineer's knowledge and records as Contract administrator or for Owner.

B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

2.8 CERTIFICATES

A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product but must be acceptable to Engineer.

2.9 MANUFACTURER'S INSTRUCTIONS

A. Informational Submittal: Submit manufacturer's installation instructions for Engineer's knowledge as Contract administrator or for Owner.

B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Engineer in quantities specified for Product Data.

C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

2.10 MANUFACTURER'S FIELD REPORTS

A. Informational Submittal: Submit reports for Engineer's knowledge and records as Contract administrator or for Owner.

B. Submit report within 48 hours of observation to Engineer for information.

C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

2.11 PROJECT HEALTH AND SAFETY PROGRAM

A. Develop, publish, and implement an overall Project Health and Safety Program for the Project. This Program shall conform to all applicable codes. The written Safety Program shall be provided within 30 days after the receipt of the written Notice to Proceed. The Plan shall be assembled to address project specific health and safety issues to both the

public and on-site personnel. The plan shall include at a minimum the following items when they apply:

1. Employee orientation
2. Safety inspections
3. Instruction and training
4. Accident reporting
5. Signs and barricades
6. Fire prevention and protection
7. Welding, cutting, and burning
8. Painting and surface treatment
9. Electricity
10. Machinery and mechanized equipment
11. Excavations
12. Sanitation
13. Chlorine safety
14. Hazardous materials
15. Hazardous communications program
16. Job hazard analysis
17. First aid/medical facilities
18. Personal protective equipment
19. Confined space entry plan
20. Shoring plan
21. Fall protection plan
22. Emergency Action Plan
23. Housekeeping
24. Safety training requirements and certification
25. Pedestrian access around work site during construction and after hours
26. Neighboring residences/community access and safety

B. If the project requires other health and safety issues to be addressed, they too shall be included in the Project Health and Safety Program. The Program shall subsequently be distributed to and implemented by the Contractor's personnel, as well as its Subcontractors and Suppliers, the Owner and Engineer. Contractor shall fully implement and comply with the Safety Program and shall submit to the Owner a letter signed by Contractor's owner/president affirming such implementation and compliance within 15 days after on-site work has started. Contractor shall notify the Owner and Engineer when safety meetings will be held so that Owner's and Engineer's personnel may attend. A copy of the Health and Safety Program must be maintained on-site at all times during the life of the Project.

2.12 OTHER REQUIRED SUBMITTALS

A. Other required submittals include the items listed below. This list is provided for Contractor's convenience only and may not be complete in all respects. Contractor shall provide all submittals specified or required, whether or not listed here.

1. Contractor Emergency Contact List.
2. Erosion and Sediment Control Plan.
3. Traffic Control and Protection Plan.

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes provisions for temporary protection of trees and other plant life in preparation for site or building excavation Work.

B. Related Sections:

1. Section 31 10 00 - Site Clearing.
2. Section 31 22 13 - Rough Grading.
3. Section 31 23 16 - Excavation.

C. This specification shall be applied concurrently and in conjunction with other plant material protection measures herein described and specified.

1.2 REFERENCE STANDARDS

A. ANSI A300 – Tree Care Operations Standards

B. Pruning practices shall conform with recommendations “Structural Pruning: A Guide For The Green Industry”; Published by Urban Tree Foundation, Visalia, California; most current edition.

1.3 DEFINITIONS

A. Designated Trees: Existing Trees to Remain as indicated on Drawings.

B. Critical Root Zone (CRZ): The CRZ for trees 4 inches in caliper or smaller shall be an area with a radius at least 5 feet from the trunk. The CRZ for trees over 4 inches in caliper shall be an area with a radius of at least 1 foot 6 inches from the trunk for every 1 inch of caliper size.

C. Zone of Protection: As indicated on Drawings.

D. Weed: A plant that is undesirable where it is growing.

1.4 PROHIBITED ACTIVITIES

A. Cutting of roots 1 inch in diameter or larger without approval. Damaging tree bark, branches.

B. Removal of protective fencing or notice posted on trees prior to approval of Substantial Completion.

C. Activities prohibited within the Zone of Protection (without prior approval) are, but not limited to: construction, operation of machinery, storage of materials, paving, grading, cutting, filling, travel within, dumping, disposal of liquids, and parking of vehicles or equipment.

1.5 SUBMITTALS

A. Contractor shall provide a Certified Arborist who is currently certified by the International Society of Arboriculture (ISA), approved by the Engineer, to perform all tree root and canopy pruning and other necessary preservation measures outlined in this specification as needed during the course of the construction work at existing trees to remain. Submit Certified Arborist credentials to Engineer for approval.

B. Submit product literature for temporary protection fencing for approval.

PART 2 MATERIALS

2.1 TEMPORARY PROTECTION FENCING

A. Provide 42 inch high orange mesh construction fencing with agricultural metal stakes to be set at 10 feet on center minimum.

2.2 TREE PROTECTION SIGN

A. Heavy-duty, waterproof signs, 8.5 inches x 11 inches, colored background with black 2 inch high or larger letters block letters. The signs shall be attached to the tree protection fence every 50 feet o.c. The tree protection sign shall read “Tree, Plant, and Root Protection Area- Keep Out”.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect all trees specified on the Drawings for protection prior to construction.

1. Document any unusual conditions with a written memorandum and photographs.
2. Submit copies of documentation to Engineer and Owner prior to beginning work.

B. Verify all conditions on the Drawings with actual conditions at the Site regarding tree protection prior to any site disturbance.

C. The Engineer must be present during demolition of existing conditions occurring within the drip line of trees designated to remain.

D. Notify Engineer 24 hours prior to inspections and/or tagging of protected trees.

3.2 PROTECTION

A. Install temporary protection fencing specified above and as shown in the Drawings at drip lines of trees designated to remain prior to the commencement of construction.

B. Clearly designate protected trees and keep them clear of any material storage, excessive personnel use, or vehicular movement underneath the tree canopy and tree root protection zone.

C. Provide other barricades and guards as necessary or required to protect trees designated on the Drawings to remain, from damage above and below grade, as directed by the Engineer.

D. Protect root systems of trees and plant life to remain.

1. Protect from damage due to noxious materials in solution caused by runoff or spillage during mixing and placement of construction materials.

2. Protect from flooding, erosion, or excessive wetting resulting from dewatering operations and compaction.

3. Protect against unauthorized cutting, breaking, skinning roots and branches, or bruising bark.

4. Protect from smothering and compaction. Do not store construction materials or permit vehicles to drive or park within the drip line area of any tree to remain.

5. Protect from dumping of refuse in close proximity.

E. Where cutting is necessary, Contractor and Certified Arborist shall review conditions with the Engineer before proceeding and comply with directives of the Engineer.

3.3 EXCAVATION AROUND TREES

A. Excavate within drip lines of trees only where indicated on the Drawings or as directed by Engineer.

B. Where trenching for utilities is required within drip lines, tunnel under or around roots by hand excavating.

1. Where possible trench toward trunk of tree and tunnel under central root mass to avoid severing all lateral roots on side of trench.

2. Do not cut main lateral roots or tap roots over one inch in diameter.

3. Temporarily support and protect trees from damage until permanently covered with approved backfill.

C. Do not allow exposed roots to dry out before backfill is placed.

1. Provide temporary earth or burlap cover.
2. Water roots daily when exposed and maintain in a moist condition.

D. Backfill roots only upon inspection approval from the Arborist.

1. Backfill around root excavations only with clean imported topsoil free from materials deleterious to root growth.

2. Backfill to eliminate voids and compact only by means of manual tamping at root areas.

3. Water sufficiently to settle topsoil and eliminate voids or air pockets around roots.

4. Allow for natural settlement of soil surface, and furnish and apply topsoil sufficient to bring to original finish grade after backfill settlement.

E. If during excavation, any condition arises that threatens the survivability of the protected tree, or an unknown condition arises that affects the stability or integrity of the root system, notify the Engineer immediately.

3.4 ROOT PRUNING

A. Root pruning shall be in conformance with ANSI A300 (part 8) latest edition. Use approved root-pruning devices.

B. Prior to any excavating into the existing soil grade within the CRZ, root prune where identified on the plans to a depth of 24 inches below existing grade or as directed by the Owner's Representative.

C. Prune roots encountered during construction. Make clean, vertical cuts. Do not leave split or frayed ends. Obtain Owner's Representative's approval prior to cutting roots larger than 1 inch in diameter.

D. Cover exposed roots overnight with 4 layers of wet burlap or 5 inches of wet Mulch. Backfill exposed roots with Soil Material as specified in Division 32 as soon as Work is completed.

3.5 REPAIR AND REPLACEMENT OF DAMAGED TREES

A. In the event of damage to existing trees:

1. Immediately prune limbs smaller than 3-inch caliper or roots smaller than 2-inch caliper to repair trees damaged by construction operations.

2. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees.

3. Any such pruning and/or repairs shall be approved in advance and at completion by Engineer.

4. The Engineer shall reserve the right, at cost to the Contractor, to obtain the services of a Consulting Arborist with current membership in the American Society of Consulting Arborists (ASCA) to determine the severity of damage.

5. The Contractor is responsible for the cost of repairs caused by their actions or by the actions of subcontractors engaged by the Contractor.

B. Remove and replace dead or damaged trees which are determined by the Engineer to be incapable of restoration to normal growth patterns at no additional cost to Owner.

1. Provide new trees of the same species as those removed or damaged, with size and/or quantity to be determined by Engineer.

2. Furnish replacement trees and plant life to the Site and plant, maintain, and warranty as directed by the Engineer.

3. If trees are not replaceable with the same species, and size, compensate the Owner for the replacement cost of the trees based on the evaluation of a Certified Consulting Arborist obtained by the Engineer.

4. The Contractor is responsible for additional costs of removing damaged trees and labor for planting new specimens.

3.6 DESIGNATED TREE REMOVAL PROCEDURES

A. If designated tree removal is specified by Engineer, furnish labor, material, and equipment necessary for removing and/or salvaging existing trees, if necessary, as designated on the Drawings for removal.

1. Verify location and species with Engineer prior to removal.

B. Salable logs or timber may be sold to Contractor’s benefit upon notification and prior approval of Owner. Upon approval, remove salable logs or timber promptly from site.

3.7 DESIGNATED TREE TRANSPLANTING PROCEDURES - NOT USED

3.8 GRADING AND FILLING AROUND TREES

A. Maintain existing grade within drip line of trees unless otherwise indicated on the Drawings or directed by the Engineer.

3.9 MAINTENANCE OF PROTECTIVE MEASURES

A. Maintain protective measures throughout the construction process. Immediately repair any alteration to protection measures throughout construction process.

Repair or reinstall protective measures immediately upon alteration. Monitor protective measures daily.

B. Remove and clear area of debris and fencing, barricades, etc., upon final written approval of Engineer.

3.10 DAMAGE OR LOSS TO EXISTING PLANTS TO REMAIN

A. Actual tree damage such as trunk scoring and broken limbs or damaged roots inside the Zone of Protection will be assessed according to the percentage of loss of tree value. Percentage of tree value will be determined by the Owner's Representative. Tree value will be determined from “Evaluation of Landscape Trees, Shrubs, and Other Landscape Plants” by International Society of Arboriculture.

B. Any remedial work on damaged existing trees recommended by the consulting arborist shall be completed by the Contractor at no cost to the Owner. Remedial work shall include but is not limited to: soil compaction remediation and vertical mulching, pruning and or cabling, insect and disease control including injections, compensatory watering, additional mulching, and could include application tree growth regulators.

C. Remedial work may extend up to two years following the completion of construction to allow for any requirements of multiple applications or the need to undertake applications at required seasons of the year.

END OF SECTION

SECTION 02 30 00

SUBSURFACE INVESTIGATION

PART 1 GENERAL

1.1 SUMMARY

A. Subsurface investigations and reporting have been performed for the purpose of obtaining data for the planning and design of this project. Copies of such reporting are attached to the Contract Documents as Supplementary Information.

1.2 LIMITATIONS

A. The subsurface investigations and reporting are being made available solely for the convenience of the Bidder and shall not relieve the Bidder or the Contractor of any risk, duty to make examinations and investigations as required by Section 00700. B.22 of the General Conditions, or any other responsibility under the Contract Documents.

B. It is mutually agreed to by all parties:

1. Written reports are reference documents and are not part of the Contract Documents.

2. Subsurface investigations are for the purpose of obtaining data for planning and design of the project.

3. Data concerning borings and test pits is intended to represent with reasonable accuracy conditions and material found in specific borings and test pits at the time the borings and test pits were made.

C. It is expressly understood and agreed the Owner and Engineer assume no responsibility whatsoever in respect to the sufficiency or accuracy of the investigation thus made, the records thereof, or of the interpretations set forth therein, or made by the Owner in his use thereof; and there is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations, or records thereof, are representative of those existing throughout such areas, or any part, or that unforeseen developments may not occur.

D. The Owner’s subsurface investigations and reporting are made available to Bidder or Contractor only on the basis of the understandings and agreement herein stated.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 31 05 13

SOILS FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes soil and subsoil materials intended to be referenced by other sections, generally for fill and grading purposes. Materials are indicated by "Type" to assist in referencing from other sections and on Drawing notes.

B. Section includes:

1. Subsoil materials.
2. Topsoil materials.

1.2 RELATED SECTIONS

A. Section 31 10 00 – Site Clearing.
B. Section 31 22 13 - Rough Grading.
C. Section 31 23 16 – Excavation.
D. Section 31 23 17 - Trenching.
E. Section 31 23 18 – Rock Removal.
F. Section 31 23 23 - Fill.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO T99 - Standard Specification for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop.

B. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

2. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

3. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
B. Materials Source: Submit name of imported materials source.
C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Furnish materials of each type from same source throughout the Work.

B. Soil Testing:

1. Soil sampling and testing to be completed by an independent laboratory approved by the Engineer.

2. Frequency of testing shall be determined by the Engineer.

3. All soil testing shall be paid for by the Contractor.

C. Compaction Tests:

1. Maximum density at optimum moisture content determined by ASTM D698 (AASHTO T99).

2. In-place density in accordance with Nuclear Testing Method, ASTM D6938.

D. Soil Classification: All imported materials shall be classified in accordance with ASTM D2487.

PART 2 PRODUCTS

2.1 SUBSOIL MATERIALS

A. Subsoil Type S1, Select Native Material:

1. Select earth obtained from on-site excavations approved for use by Engineer.

2. Graded.

3. Free of peat, humus, vegetative matter, organic matter and rocks larger than 6 inches in diameter.

4. Processed as required to be placed in thickness as prescribed and at the optimum moisture content to obtain level of compaction required by these specifications.

B. Subsoil Type S2, Imported Fill Material:

1. Imported earth approved for use by Engineer.
2. Meeting the requirements of Subsoil Type S1.

2.2 TOPSOIL MATERIALS

A. Topsoil Type TS1, Select Native Topsoil Material:

1. Top 6 - 12 inches of existing soil containing organic matter.

2. Engineer decision shall be final as to determination of what material is topsoil quality.

3. Graded.

4. Free of roots, rocks larger than 1/2-inch subsoil, debris, large weeds and foreign matter.

a. Screening: Single screened.

B. Topsoil Type TS2, Imported Topsoil Material:

1. Imported borrow.

2. Friable loam.

3. Reasonably free of roots, rocks larger than 1/2-inch, subsoil, debris, large weeds, and foreign matter.

a. Screening: Single screened.

4. Acidity range (pH) of 5.5 to 7.5.

5. Containing minimum of 4 percent and maximum of 25 percent inorganic matter.

2.3 SPOILS

A. All excess material not suitable or not required for backfill and grading shall be hauled off site and disposed of at a location provided by the Contractor and approved by the Owner.

B. Make arrangements for disposal of the material at no additional cost to the Owner.

C. Landfill permit to be obtained by the Contractor and provided to Owner prior to commencement of disposal.

2.4 SOURCE QUALITY CONTROL

A. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698 (AASHTO T99).

B. When tests indicate materials do not meet specified requirements, change material or vary compaction methods and retest. Additional testing shall be completed and paid for by the Contractor with no reimbursement by the Owner.

C. Furnish materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXCAVATION

A. Excavate material of every nature and description to the lines and grades as indicated on the Drawings and/or as required for construction of facilities.

B. When practical, do not excavate wet top soil.

C. Remove excess excavated subsoil and topsoil not intended for reuse from Site.

D. Remove excavated materials not meeting requirements for subsoil materials and topsoil materials from Site.

3.2 STOCKPILING

A. No stockpiling of soils will be allowed on the project site.

END OF SECTION

SECTION 31 05 16

AGGREGATES FOR EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes range of coarse and fine aggregate materials intended to be referenced by other Sections, generally for fill and grading purposes. Materials are indicated by "Type" to assist in referencing from other Sections and in Drawing notes.

B. Section Includes:

1. Coarse aggregate materials.
2. Fine aggregate materials.

1.2 RELATED SECTIONS

A. Section 31 05 13 - Soils for Earthwork.
B. Section 31 22 13 - Rough Grading.
C. Section 31 23 19 - Dewatering.
D. Section 31 23 23 - Fill.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.

2. AASHTO T27 - Sieve Analysis of Fine and Coarse Aggregates.

3. AASHTO T99 - Standard Specification for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop.

4. AASHTO TP61 - Standard Method of Test for Determining the Percentage of Fracture in Coarse Aggregate

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

4. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

5. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
B. Materials Source: Submit name of imported materials suppliers.
C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
D. Results of aggregate sieve analysis and standard proctor tests for all granular material.

1.5 QUALITY ASSURANCE

A. Furnish each aggregate material from a single source throughout the Work.

B. Aggregate Testing:

1. Aggregate sampling and testing to be completed by an independent laboratory approved by the Engineer.

2. The frequency of testing shall be determined by the Engineer.

3. All aggregate testing shall be paid for by the Contractor.

C. Compaction Tests:

1. Maximum density at optimum moisture content determined by ASTM D698 (AASHTO T99).

2. In-place density in accordance with Nuclear Testing Method, ASTM D6938.

D. Aggregate Classification: All imported materials shall be classified in accordance with ASTM D2487.

PART 2 PRODUCTS

2.1 COARSE AGGREGATE MATERIALS

A. Coarse Aggregate Type A1, Dense-Graded Aggregate: Crushed rock with 3/4 inch-0, 1-1/2 inch-0 and 2-1/2 inch-0 gradation as shown in the Drawings and meeting the requirements provided below.

1. Grading: Dense-Graded Aggregate shall be crushed rock, including sand. Uniformly grade the aggregates from coarse to fine.

2. Sieve analysis shall be determined according to AASHTO T27.

3. The aggregates shall conform to one of the grading requirements Table 310516-A.

Table 310516-A
Grading Requirements for Dense-Graded Aggregate
Separated Sizes
Percent Passing (by weight)

Sieve Size	2-1/2" - 0	1-1/2" - 0	3/4" - 0
3”	100		
2-1/2”	95 - 100		
2”	-	100	
1-1/2"	-	95 - 100	
1-1/4”	55 - 75	-	
1”	-	-	100
3/4"	-	55 - 75	90 - 100
1/2"	-	-	-
3/8”	-	-	55 - 75
1/4"	30 - 45	35 - 50	40 - 60
No. 4*	-	-	-
No. 10	[1]	[1]	[1]

[1] Of the fraction passing the 1/4 inch sieve, 40% to 60% shall pass the No. 10 sieve.
* Report percent passing sieve when no grading requirements are listed.

4. Fracture of Rounded Rock:

   a. Determined according to AASHTO TP61.

   b. Provide at least one fractured face based on the following percentage of particles retained on the 1/4-inch sieve for the designated size:

Minimum % of Fractured Particles
by Weight of Material

Designated Size	Retained on 1/4-Inch Sieve
1 1/2" – 0 and larger	50
Smaller than 1 1/2" – 0	70

5. Durability:

   a. Crushed rock aggregate shall meet the following durability requirements:

Test	Test Method	Requirements
Abrasion	AASHTO T 96	35.0% maximum
Degradation (Coarse Aggregate)	ODOT TM 208	30.0% maximum
Passing No. 20 Sieve, Sediment Height	ODOT TM 208	3.0” maximum

6. Sand Equivalent -- Crushed rock aggregate will be tested according to AASHTO T 176, and shall have a sand equivalent of not less than 50.

B. Coarse Aggregate Type A2, Granular Drain Backfill Material: Crushed or uncrushed rock or gravel as shown in the Drawings.

1. Material shall be clean and free-draining.
2. Sieve analysis shall be according to AASHTO T27.
3. Grading: Meeting the gradation requirements provided in Table 310516-B below.

Table 310516-B
Grading Requirements for Granular Drain Backfill Material
Separated Sizes
Percent Passing (by weight)

Sieve Size	Separated Sizes 1 1/2" – 3/4"	Separated Sizes 3/4" – 1/2"
2”	100	
1-1/2"	90 - 100	
1”	20 - 55	100
3/4"	0 - 15	85 - 100
1/2"	-	0 - 15
3/8”	0 - 5	-

2.2 SAND

A. Sand: Sand material shall consist of granular material, naturally produced or produced from crushed gravel, or dredge sand that is reasonably free of organic material, mica, clay, fly ash and other deleterious material, meeting the gradations of Table 310516-C.

Table 310516-C
Grading Requirements for Sand
Separated Sizes
Percent Passing (by weight)

Sieve Size	Coarse Sand	Medium Sand	Fine Sand
1”	100	100	100
3/8”	95 - 100	95 - 100	-

#4	80 - 100	70 - 95	90 - 100
#30	10 - 30	10 - 45	-
#100	-	2 - 10	2 - 10
#200	0 - 8	0 - 7	0 - 4
Sand Equivalent	50 min.	50 min.	50 in.

2.3 SOURCE QUALITY CONTROL

A. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM C136 and ASTM D698 (AASHTO T99).

B. Sand - Testing and Analysis: Perform in accordance with ASTM C136 and ASTM D698 (AASHTO T99).

C. When tests indicate materials do not meet specified requirements, change material and retest. Additional testing shall be completed and paid for by the Contractor with no reimbursement by the Owner.

PART 3 EXECUTION

3.1 STOCKPILING

A. Stockpile materials imported to the site at locations approved by the Owner for redistribution as specified.

B. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.

C. Prevent intermixing of aggregate types or contamination.

D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

1. Grade surface of stockpiles to prevent ponding of water.
2. Cover stockpiles to minimize the infiltration of water.

3.2 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

B. When borrow area is indicated, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes clearing site of incidental paving and curbs, debris, grass, trees, and other plant life in preparation for site or building excavation work.

1.2 RELATED SECTIONS:

A. Section 01 56 39 - Tree and Plant Protection.
B. Section 31 22 13 - Rough Grading.
C. Section 31 23 18 - Rock Removal.

1.3 DEFINITIONS

A. Clearing: Removal of interfering or objectionable material lying on or protruding above ground surface.

B. Grubbing: Removal of vegetation and other organic matter including stumps, buried logs, and roots greater than 2-inch caliper to a depth of 12 inches below subgrade.

C. Interfering or Objectionable Material: Trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead, or decaying; topsoil.

D. Limits of Disturbance: Work area boundary as shown on the Plans.

E. Root Wad: Tree stump and root mass including all roots greater than 1-inch diameter.

F. Stripping: Removal of topsoil remaining after applicable scalping is completed.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Clearing, Grubbing and Stripping Plan: Drawings clearly showing proposed limits to clearing, grubbing and stripping activities at Site.

C. Certification or disposal permit for landfill and/or waste disposal site.

D. A copy of written permission of private property owners, with copy of fill permit for said private property, as may be required for disposal of materials.

1.5 QUALITY ASSURANCE

A. Existing Conditions: Determine the extent of Work required and limitations before proceeding with Work.

B. Obtain Owner's approval of staked clearing, grubbing, and stripping limits prior to commencing clearing, grubbing, and stripping.

C. Conform to applicable local, state and federal codes for environmental requirements and disposal of debris,

1. Burning on project site will not be permitted.
2. Use of herbicides will not be permitted.

D. Permits: The Owner will obtain a tree removal permit, if needed. The Contractor is responsible for obtaining all other necessary permits required for completion of the Work described in this Section.

E. Protection of Persons and Property: Meet all federal, state and local safety requirements for the protection of laborers, other persons, and property in the vicinity of the work and requirements of the General Provisions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Existing Materials: All materials, equipment, miscellaneous items and debris involved, occurring or resulting from demolition, clearing and grubbing work shall become the property of the Contractor at the place of origin, except as otherwise indicated in the Drawings or specifications.

B. Wound Paint: Emulsified asphalt formulated for use on damaged plant tissues.

PART 3 EXECUTION

3.1 GENERAL

A. Limb and remove tree trunks within limits shown.

B. Remain within project property lines and easements at all times.

C. Do not injure or deface vegetation or structures that are not designated for removal.

3.2 EXAMINATION

A. Verify existing plant life designated to remain is tagged or identified.
B. Identify waste and salvage areas for temporary placing materials.

3.3 PREPARATION

A. Carefully coordinate the work of this Section with all other work and construction.

B. Call Local Utility Line Information service at 1-800-332-2344, not less than three working days before performing Work.

C. Request underground utilities to be located and marked within and surrounding construction areas.

1. Disconnect or arrange for disconnection of utilities (if any) affected by required work.

2. Keep all active utilities intact and in continuous operations.

D. Prepare Site only after:

1. Erosion and sediment controls are in place.

a. Limit areas exposed uncontrolled to erosion during installation of temporary erosion and sediment controls and in compliance with City of Eugene erosion control permit requirements.

2. Tree and vegetation protection is installed.

a. Protect existing site improvements, trees and shrubs to remain to preclude damage during construction.

b. Follow the provisions set forth in Section 01 56 39, Tree and Plant Protection, for all temporary tree and plant protection measures.

3. Temporary fencing and dust prevention measures are installed along the property limits.

4. Notification of utility agencies; disconnect or arrange for disconnection of utilities (if any) affected by required work. Keep all active utilities intact and in continuous operation.

3.4 PROTECTION

A. Utilities: Locate, identify, and protect utilities located by utilities and indicated in the Drawings to remain from damage.

B. Survey control: Protect benchmarks, survey control points, and existing structures from damage or displacement.

C. Preservation and Trimming of Trees, Shrubs and Other Vegetation:

1. Avoid injury to trees, shrubs, vines, plants, grasses and other vegetation growing outside of the areas to be cleared and grubbed and those trees and shrubs designated to be preserved.

2. Protect existing trees and shrubs against cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of roots by stockpiling construction materials, excavated materials, excess foot or vehicular traffic and parking of vehicles within drip line.

3. Provide temporary guards, as necessary, to protect trees and vegetation to be left standing.

4. Temporarily cover exposed roots with wet burlap to prevent roots from drying out; cover with earth as soon as possible.

5. Provide protection for roots and limbs over 1 1/2-inch diameter cut during construction operations. Coat cut faces with emulsified asphalt.

6. Repairable damage to trees and shrubs designated to remain shall be made by a professional tree surgeon approved by the Owner. Cost shall be borne by the Contractor.

D. Landscaped Areas:

1. When any portion of the Work crosses private property or landscaped areas, excavate topsoil separately and pile it on the opposite side of the trench from the subsoil.

2. Conduct Work in a manner that will restore original conditions as nearly as practicable.

3. Remove and replace any trees, shrubs, plants, sod or other vegetative material as needed to complete Work.

4. Plants or shrubs killed or destroyed shall be replaced and paid for by the Contractor.

5. It is the intent of this paragraph that the Contractor shall leave the surface and plantings in substantially the same conditions as before the Work is undertaken.

E. Miscellaneous Site Features: Protect all existing miscellaneous site features from damage by excavating equipment and vehicular traffic, including but not limited to existing structures, fences, mailboxes, sidewalks, paving, and curbs.

F. Repair and Replacement:

1. Damaged items, including but not restricted to those noted above, shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of work of this contract.

2. Any damage to existing facilities or utilities to remain as caused by the Contractor's operations shall be repaired at the Contractor's expense.

3.5 LIMITS

A. Not to extend beyond the temporary fenced work area as shown in Drawings:

B. Remove rubbish, trash, and junk from entire area within the Limits of Disturbance as material is generated. Stockpiling shall not be permitted without written approval of Owner.

3.6 CLEARING AND GRUBBING

A. Clear and grub areas within limits shown in approved Clearing, Grubbing and Stripping Plan.

B. Remove trees, saplings, snags and stumps , shrubs, brush, vines, grasses, weeds and other vegetative growth within the clearing limits as shown in the Drawings, except those trees and shrubs noted to remain in the Drawings or as directed by the Owner.

C. Clearing shall be performed in such a manner as to remove all evidence of the presence of vegetative growth from the surface of the project site and shall be inclusive of sticks and branches of thickness or diameter greater than 3/8-inch and of grasses, weeds, exceeding 12 inches in height except as otherwise indicated.

D. Clear undergrowth and deadwood, without disturbing subsoil.

E. Grubbing: Clear areas required for access to site and execution of Work and remove all stumps, root wads, and roots over 1-inch diameter to the following depths:

1. Future Structures and Building Areas	24 Inches
2. Roads and Parking Areas	18 Inches
3. All other Areas	12 Inches

3.7 TREE REMOVAL

A. Exercise care in cutting, felling, trimming, and handling of those trees shown for removal to prevent damage to neighboring trees and structures to remain.

B. No trees may be removed unless approved and permitted by the Owner's Representative.

C. Do not top trees unless otherwise specified or approved by Owner in writing.

D. Refer to Section 01 56 39, Tree and Plant Protection, for tree protection requirements.

3.8 REMOVAL AND DISPOSAL

A. Native vegetation may be mulched and used on Site.

B. Asphalt and Gravel Surfaces:

1. Asphalt, concrete, and gravel surfaces designated for removal shall be done to full depth.

2. Asphalt, concrete, and gravel removed at Site may be reused at Site where shown in the Drawings or following approval of the Engineer.

3. Haul removed asphalt, concrete, and gravel which is unsuitable for reuse or that exceeds quantity required.

C. Remove debris, rock, abandoned piping and extracted plant life from Site.

D. Remove from the Site all debris, materials, equipment and items found thereon and materials and debris resulting from the Work, except as otherwise indicated.

1. All existing improvements designated on the Drawings or specified to be removed including but not limited to structures, pipelines, walls, footings, foundations, slabs, pavements, curbs, fencing and similar structures occurring above, at, or below existing ground surface shall be included in the Work.

2. Unless otherwise specified, any resulting voids shall be thoroughly cracked out for drainage and backfilled with suitable excavated or imported material compacted to the density of the adjacent soil.

E. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.

F. Do not burn or bury materials on site. Leave site in clean condition.

G. Removal: All material resulting from demolition, clearing and grubbing, and trimming operations shall be removed from the Site and disposed of in a lawful manner. Materials placed on property of private property owners shall be by written permission only.

H. Cleanup: During and upon completion of work, promptly remove all unused tools and equipment, surplus materials and debris.

I. Adjacent areas shall be returned to their existing condition prior to the start of Work.

3.9 CLEANUP

A. During the time Work is in progress, make every effort to maintain the Site in a neat and orderly condition.

B. All refuse, broken pipe, excess fill material, cribbing and debris shall be removed as soon as practicable.

C. Should the Work not be maintained in a satisfactory condition, the Owner may cause the work to stop until the cleanup of the Work has been done to the satisfaction of the Engineer.

D. The Work will not be considered complete or the final payment certificate issued until all rubbish, unused material, or equipment shall have been removed and the premises left in a condition satisfactory to the Owner and the Engineer.

END OF SECTION

SECTION 31 22 13

ROUGH GRADING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes rough grading and filling associated with contouring of Site in preparation for building excavation and subsequent site work.

B. Section Includes:

1. Excavating topsoil.
2. Excavating subsoil.
3. Cutting, grading, filling, and rough contouring of Site.

1.2 RELATED SECTIONS:

A. Section 31 05 13 - Soils for Earthwork.
B. Section 31 05 16 - Aggregates for Earthwork.
C. Section 31 10 00 - Site Clearing.
D. Section 31 23 16 - Excavation.
E. Section 31 23 18 - Rock Removal.
F. Section 31 23 23 - Fill.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO T99 - Standard Specification for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop.

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

3. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

4. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).

5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.
B. Soils for Earthwork: As specified in Section 31 05 13, Soils for Earthwork.
C. Aggregates for Earthwork: As specified in Section 31 05 16, Aggregates for Earthwork.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C136, ASTM D2419, and ASTM D2434.

PART 2 PRODUCTS

2.1 MATERIALS

A. Subsoil Fill: Type S1 and S2 as specified in Section 31 05 13, Soils for Earthwork.

B. Topsoil: As specified in Section 31 05 13, Soils for Earthwork.

1. Type TS1, Select Native Topsoil Material, as may be available.
2. TS2, Imported Topsoil Material, as may be required.

C. Structural Fill: Type A1, Dense-Graded Aggregate as specified in Section 31 05 16, Aggregates for Earthwork. Size of aggregate as shown in the Drawings.

D. Granular Fill: Type A2, Granular Drain Backfill Material as specified in Section 31 05 16, Aggregates for Earthwork. Size of aggregate as shown in the Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify survey bench mark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPARATION

A. Call Local Utility Line Information service at 1-800-332-2344 not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.

2. Notify Engineer of any potential conflicts resulting from utility locations and the Drawings.

3. Notify utility company to remove and relocate utilities, as may be necessary.

B. Identify required lines, levels, contours, and datum.

C. See Section 31 10 00, Site Clearing for additional requirements in protection of existing utilities, survey control, plant life and landscaped areas in coordination with the Work of this Section.

3.3 TOPSOIL EXCAVATION

A. Excavate and stockpile topsoil as specified in Section 31 15 13, Soils for Earthwork.

3.4 SUBSOIL EXCAVATION

A. Excavate subsoil from areas to be further excavated, re-landscaped, or re-graded as shown in the Drawings.

B. When practical, do not excavate wet subsoil. When wet subsoil must be excavated, and is to be reused on site for the Work, process wet material to obtain optimum moisture content.

C. Stockpile excavated material in designated areas in accordance with Section 31 05 13, Soils for Earthwork.

D. When excavating through roots, perform Work by hand and cut roots with sharp axe.

3.5 TEMPORARY SLOPES

A. Temporary excavation slopes in soil shall be in conformance with OR-OSHA requirements and sloped no steeper than 1H:1V. Temporary excavation slope configurations in soil shall be confirmed at the time of construction.

B. Temporary excavation slopes in hard rock (R3 and greater) shall be in conformance with OR-OSHA requirements and sloped no steeper than 1H:4V. Loose rock shall be scaled from the surface. Temporary excavation slope configurations in rock shall be confirmed at the time of construction.

C. Direct surface water away from the top of temporary excavation slopes and away from natural slopes with grades towards excavations.

D. Benching Slopes: Horizontally bench existing slopes greater than 5H:1V to key placed fill material within slope and to provide firm bearing as shown in details in the Drawings.

E. Stability: Replace damaged or displaced subsoil as specified for fill.

F. Plastic Sheeting:

1. Temporary slopes shall be covered with plastic sheeting to reduce the risk of erosion during wet weather.

2. At seams, plastic sheeting shall be lapped by a minimum of 3 feet to prevent water from migrating under sheeting.

3. Sheeting shall extend past the top of temporary excavation cuts at 10 feet, where space permits.

4. Bury the top end of sheeting above temporary excavation cuts to prevent surface water from running under sheeting and onto excavated slopes.

5. Plastic sheeting along slopes shall be weighted and/or staked down to prevent potential disturbance and damage from wind.

6. Plastic sheeting shows visible signs of damage shall be promptly repaired or removed and replaced.

3.6 FILLING

A. General:

1. Grading and filling operations shall not take place when weather conditions and moisture content of fill materials prevent the attainment of specified density.

2. Vertical curves or roundings at abrupt changes in slope shall be established as approved by Engineer.

3. Bring all graded areas to a relatively smooth, even grade and slope by blading or dragging. Remove high spots and fill depressions.

B. Fill areas to contours and elevations shown in the Drawings with unfrozen materials.

C. Topsoil Fill:

1. Scarify prepared subgrade to depth of 4 inches immediately prior to placing topsoil.

2. Place topsoil in areas to be seeded to depths indicated in the Drawings, minimum depth of 6 inches.

3. Place topsoil material loose; do not compact, do not place in wet or muddy conditions.

D. Place material in continuous layers as follows:

1. Subsoil Fill: Maximum 8 inches compacted depth.

2. Structural Fill: Maximum 12 inches compacted depth.

3. Granular Fill: Maximum 12 inches compacted depth.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Slope grade away from building minimum 2 percent slope for minimum distance of 10 feet, unless noted otherwise.

G. Make grade changes gradual. Blend slope into level areas.

H. Repair or replace items indicated in the Drawings to remain which are damaged by excavation or filling. All costs shall be borne by the Contractor.

3.7 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 1/10 of a foot from required elevation.

3.8 FIELD QUALITY CONTROL

A. Perform laboratory material tests in accordance with ASTM D698 (AASHTO T99).

B. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D2922.
2. Moisture Tests: ASTM D3017.

C. Frequency and location of testing is dependent upon type of material placed. See Section 01 45 00, Quality Control for testing requirements.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest at the sole expense of the Contractor.

END OF SECTION

SECTION 31 23 16

EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes excavation required for building foundations, site structures, or under slabs-on-grade or paving. Excavating for utilities outside structures is included in Section 31 23 17, Trenching.

B. Section Includes:

1. Excavating for building foundations.
2. Excavating for paving, roads, and parking areas.
3. Excavating for slabs-on-grade.
4. Excavating for site structures.
5. Excavating for landscaping.

1.2 RELATED SECTIONS

A. Section 31 05 13 - Soils for Earthwork.
B. Section 31 10 00 - Site Clearing.
C. Section 31 22 13 - Rough Grading.
D. Section 31 23 17 - Trenching.
E. Section 31 23 18 - Rock Removal.
F. Section 31 23 19 - Dewatering.
G. Section 31 23 23 - Fill.
H. Section 31 50 00 - Excavation Support Systems.
I. Supplemental Information: Geotechnical report; bore hole locations and findings of subsurface materials.

1.3 DEFINITIONS

A. Common Excavation: All excavation required for Work, regardless of the type, character, composition or condition of the material encountered. Common Excavation shall further include all debris, junk, broken concrete, and all other material. All excavation shall be classified as Common Excavation, unless provided as Rock Excavation for under Section 31 23 18, Rock Removal.

B. Common Material: All soils, aggregate, debris, junk, broken concrete, and miscellaneous material, and rock that can be removed with the equipment specified in the Rock Removal specification.

C. Concrete Excavation: The removal of pieces of concrete larger than 1 cubic yard in volume that requires drilling, splitting and breaking methods, or a necessitating a trench width increase of 18 inches or more than the width of the preceding 10 feet of trench. Concrete excavation includes materials composed of Portland cement concrete that are not identified other than manholes, structures, sewer pipe, or other appurtenances.

D. Exploratory Excavation: The removal and replacement of material from locations shown on the Drawings, or as directed for the purpose of investigating underground conditions and identifying potential utility conflict between existing and proposed utilities.

E. Overbreak: Material beyond and outside of the slope limits established by the Owner's Representative, which becomes displaced or loosened during excavation and is excavated.

F. Pothole Excavation: Pothole excavation is the removal and replacement of all materials via coring, vacuum extraction, or similar method, not classified as exploratory excavation, for the purposes of locating an underground utility and to investigate underground conditions.

G. Rock Removal: As defined in Section 31 23 18, Rock Removal.

H. Spoils: Excavated materials from Site unsuitable for use as fill or not required for backfill and grading.

I. Unsuitable Materials: See Spoils.

1.4 REFERENCES

A. Local utility standards when working within 24 inches of utility lines.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Excavation Support Plan and Utility Protection Plan as specified in Section 31 50 10, Excavation Support Systems.

1.6 QUALITY ASSURANCE

A. Allowable Tolerances: Final grades shall be plus or minus 0.1-foot.

B. Provide adequate survey control to avoid unauthorized overexcavation.

C. Weather Limitations:

1. Material excavated when frozen or when air temperature is less than 32 degrees F shall not be used as fill or backfill until material completely thaws.

2. Material excavated during inclement weather shall not be used as fill or backfill until after material is suitably moisture conditioned for proper compaction.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 PREPARATION

A. Prior to commencing work in this Section, become familiar with site conditions. In the event discrepancies are found, notify the Engineer as to the nature and extent of the differing conditions.

B. Call Local Utility Line Information service at 1-800-332-2344 not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.

2. Coordinate with and notify utility companies should it be necessary to remove or relocate facilities.

C. Identify required lines, levels, contours, and datum.

D. See Section 31 10 00, Site Clearing for additional requirements in protection of existing utilities, survey control, plant life and landscaped areas in coordination with Work in this Section.

3.2 SITE CONDITIONS

A. Quantity Survey: The Contractor shall be responsible for calculations for quantities and volume of cut and fill from existing site grades to finish grades established under this contract as indicated in the Drawings or specified and shall include the cost for all earthwork in the total basic bid.

B. Dust Control: Must meet all federal, state and local requirements. Protect persons and property from damage and discomfort caused by dust. Water surfaces as necessary and when directed by Engineer to quell dust.

C. Soil Control: Soil shall not be permitted to accumulate on surrounding streets or sidewalks nor to be washed into sewers.

3.3 EXISTING UNDERGROUND UTILITIES

A. Protect active utilities encountered, located or otherwise, and notify persons or agencies owning same.

3.4 PRESERVATION OF EXISTING IMPROVEMENTS

A. Protect adjacent existing structures which may be damaged by excavation work.

B. Conduct operations in such a manner that existing street facilities, utilities, railroad tracks, structures, and other improvements, which are to remain in place, will not be damaged. Furnish and install cribbing and shoring or whatever means necessary to support material around existing facilities, or to support the facilities themselves, and maintain such supports until no longer needed.

3.5 EXCAVATION

A. General:

1. Method of excavation shall be the Contractor's option, but care shall be exercised as final grade is approached to leave it in undisturbed condition.

2. If the final grade for supporting structures is disturbed, it shall be restored to requirements of these Specifications and satisfaction of the Engineer at no additional cost to Owner.

3. The Contractor is advised that footings should be poured as soon as possible to minimize unfavorable final grade conditions from developing.

4. Provide all measures to ensure public safety.

B. Control of Water:

1. Provide and maintain equipment to remove and dispose of water during the work of this Section and keep excavations dry and free of frost or ice.

2. Bearing surfaces that become softened by water or frost must be re-excavated to solid bearing at Contractor's expense and backfilled with compacted crushed rock at Contractor's expense.

3. Grade top perimeter of excavation to prevent surface water from draining into excavation.

C. Frozen Ground: Frost protection shall be provided for all structural excavation work. Foundation work shall not be placed on frozen ground.

D. Excavate material of every nature and description to the lines and grades as indicated in the Drawings and/or as required for construction of the facility.

1. Allow for forms, shoring, working space, granular base, topsoil and similar items, wherever applicable.

2. Trim excavations to neat lines. Remove loose matter and lumped subsoil.

E. Excavated Materials: Soils excavated at Site will be treated and used as one of two general categories of material as provided below.

1. Fill:

a. Subsoil Type S1, Select Native Fill, as approved for use by Engineer.

b. Make arrangements for stockpiling of spoils off-site and include as part of contract work in preparing of project bids. See Section 01 10 00, Summary of Work, for information on an Owner-provided temporary soils stockpile location.

2. Spoils:

a. Ensure there is sufficient suitable material available to complete embankments and other required fillings prior to disposing of any excavated materials.

b. Make arrangements for disposal of spoils and include as part of contract work in preparing of project bids.

c. Landfill permit or written permission from private property owner to be receiving materials.

F. Shoring:

1. As specified in Section 31 50 00, Excavation Support Systems.

G. Slope existing banks with machine to the specified angle shown on the plans or less until shored.

1. Shape, trim, and finish cut slopes to conform to lines, grades, and cross-sections shown, with proper allowance for topsoil or slope protection, where shown.

2. Protection of excavation side slopes:

a. Use excavation methods that will not shatter or loosen excavation slopes.

b. Where practical, excavate materials without previous loosening and in limited layers or thickness to avoid breaking the material back of the established slope line.

c. Avoid overbreaks. Overbreak is incidental to the Work, except in cases where the Owner's Representative determines that such overbreak was unavoidable.

d. Excavation in rock or rocky cuts:

1) Once completed, thoroughly test the slopes with bars or other approved means to remove all loose, detached, broken, or otherwise unstable material.

2) Remove jutting points. Scale slopes using mine scaling rods or other approved methods to remove loose or overhanging materials and provide a safe, trim, neat, and stable condition.

3) Dispose of the materials removed under this subparagraph in the same manner as other excavated material.

e. Remove all exposed roots, debris, and all stones more than 3 inches in size which are loose or could become loosened.

3. Construct slopes free of all exposed roots.

4. Construct slopes free of unstable rock and loose stones exceeding 3 inches in diameter.

5. Round tops of cut slopes in soil to not less than a 6-foot radius, provided such rounding does not extend off-site, outside of easements, outside of rights-of-way, or adversely impacts existing facilities, adjacent property, or completed Work.

6. Trim all surfaces neatly and smoothly.

H. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with Section 31 23 17, Trenching and Section 31 23 23, Fill.

I. Notify Engineer of unexpected subsurface conditions.

J. Overexcavation for Unsuitable Foundation Conditions:

1. Cross-sectional dimensions and depths of excavations shown in the Drawings shall be subject to such changes as may be found necessary by the Engineer to secure foundations free from soft, weathered, shattered and loose material or other objectionable materials.

2. Overexcavation of subgrade materials within footprint of a tank shall be backfilled with lean mix Portland cement concrete having a minimum unconfined compressive strength of 500 psi.

3. Overexcavation of subgrade materials within footprint of a tank shall be backfilled with Coarse Aggregate Type A1, 1-1/2 inch – 0 gradation, as specified in Table 310516-A of Section 31 05 16, Aggregates for Earthwork. All material placed shall be compacted to 95 percent of maximum dry density.

4. Unsuitable materials shall be removed and replaced only as directed in writing by Engineer.

K. Rock Removal:

1. Remove rock material as defined and specified in Section 31 23 18, Rock Removal.
2. Concrete removal, as defined herein, shall be treated as Rock Removal.

L. Stockpile excavated material in area(s) designated on or off site in accordance with Section 31 05 13, Soils for Earthwork.

M. Excavation of Existing Surfaces:

1. Remove surfacing as shown on the Drawings.

2. Surfacing to be removed shall be cut in neat, straight lines with vertical edges along the limits of pavement removal. The cut lines for removal of asphaltic or cement concrete pavement shall be reviewed and approved by the Engineer in the field before cutting.

3. Demolish and remove curbs as directed by the Engineer or as shown.

a. Make a vertical saw cut between any existing curb that is to remain and portion that is to be removed.

b. Remove pavement adjacent to the curb as shown on the Drawings or as directed by the Engineer.

3.6 FIELD QUALITY CONTROL

A. Perform excavation and controlled fill operations in accordance with the requirements of this Section.

B. Coordinate the visual inspection and approval of all bearing surfaces by Engineer before installing subsequent work.

3.7 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability and store excavated materials at a distance from top of excavation.

B. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 31 23 18

ROCK REMOVAL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes removal of subsurface rock during excavation by mechanical method or use of explosives to assist in removal. The use of explosives for rock removal is anticipated for this project.

B. Section Includes:

1. Removing identified and discovered rock during excavation.

1.2 RELATED SECTIONS:

A. Section 31 22 13 - Rough Grading.

B. Section 31 23 16 - Excavation.

C. Section 31 23 18.20 - Controlled Blasting for Rock Removal.

D. Supplemental Information: Geotechnical report; bore hole locations and findings of subsurface materials.

1.3 DEFINITIONS

A. Common Excavation: All excavation required for Work, regardless of the type, character, composition or condition of the material encountered. All excavation shall be classified as Common Excavation, unless provided for under Rock Removal below.

B. Common Material: All soils, aggregate, debris, junk, broken concrete, and miscellaneous material encountered in Common Excavation, excluding rock as defined below.

C. Rock: Material which, by actual demonstration, cannot be reasonably excavated with suitable machinery as defined herein. The Engineer may waive the requirements for actual demonstration if the material encountered is well-defined rock.

D. Rock Removal: Removal of rock as defined herein by systematic and continuous drilling, hammering, ripping, breaking, splitting, blasting or other methods approved by the Engineer.

E. Suitable Machinery: A track-mounted hydraulic excavator of the 52,800 to 72,500-pound class equipped with a bucket with rock teeth and a track mounted dozer with single shank ripper and a minimum weight of 80,000 pounds.

F. Structural Fill: Approved materials to be replace excavated earth or rock that will support a structure.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate proposed method of blasting, delay pattern, explosive types, type of blasting mat or cover for rock removal.

C. Equipment: Manufacturer information regarding pound class of machinery proposed for rock removal.

D. Survey Report: Submit survey report mapping extent and locations of rock encountered, to be used in calculating total volume of rock removal.

1.5 PROJECT CONDITIONS

A. Conduct survey of rock uncovered in excavation for structures or trenching for utilities prior to removal of material.

B. Conduct survey and document conditions of buildings near locations of rock removal, and photograph existing conditions identifying existing irregularities.

1.6 SCHEDULING

A. Schedule Work to avoid disruption to occupied residences nearby.

PART 2 PRODUCTS - Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions and note subsurface irregularities affecting Work of this section.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Engineer Approval for Rock Removal:

1. Prior to commencement of rock removal, expose all material anticipated to be rock by removing the common material above it and then notify the Engineer.

2. The Contactor or the Contractor's representative, in association with the Engineer, will measure the amount of material to be removed in an effort to reach a mutually agreeable volume for anticipated rock removal.

3. Prior to commencing the proposed rock removal, the Contractor must receive written approval by the Engineer stating the approximate volume of expected rock removal to receive payment.

4. During rock removal activities, should it become apparent the previously agreed upon volume of rock removal will be exceeded, notify the Engineer immediately. Should the Contractor proceed with rock removal in excess of the previously agreed upon volume, the Contractor will do so at their own risk and expense.

C. Within the footprint of the tanks, common excavation of soft material at subgrade elevation shall be completed to or overexcavated to bedrock that is at least very soft (R1) with closed joints. Additional overexcavation at abrupt transitions of rock hardness at the subgrade elevation may be required. Engineer shall evaluate subgrade materials to specify what areas and subgrade materials shall be overexcavated. Backfill overexcavated areas of subgrade approved by the Engineer with material as specified in subsection 3.5.J.2 of Section 31 23 16 Excavation.

3.3 ROCK REMOVAL BY MECHANICAL METHOD

A. Rock removal by blasting is anticipated for the overall quantity of rock in order to meet project schedule. Rock removal by mechanical methods is anticipated to be used when efficient.

B. Excavate and remove rock by mechanical method.

1. Use an excavator or single shank ripper to fracture rock.
2. Drill holes and use expansive tools and wedges to fracture rock.

C. Cut away rock at bottom of excavation to at least the minimum subgrade elevation.

D. Utilize appropriate size and type of tooling to remove fractured and loose rock debris to provide sound and unshattered base for footings and foundations. Engineer shall evaluate subgrade materials to approve removal of loose debris prior to crushed rock structural fill placement back to subgrade elevation.

E. In utility trenches, excavate to 6 inches below invert elevation of pipe and 24 inches wider than pipe diameter.

F. For vaults and other structures, excavate to the depth necessary to install the structure and to remove unsuitable subgrade materials as directed by Engineer and to a maximum of 18 inches beyond the outside walls of the vault or structure.

G. Remove excavated materials from site.

H. Correct overbreak and unauthorized rock removal requiring structural backfill in accordance with this specification for the reservoir subgrade. Rock placed above subgrade elevation shall be placed in accordance with the backfilling and compacting requirements of Section 31 23 16, Excavation for other structures and as directed by Engineer.

I. If rock is mechanically removed with the minimum specified equipment, it will be considered common excavation and not paid for under this pay item. If equipment larger than the suitable machinery as defined herein is brought on the project site for the sole purpose of rock removal it will not be paid as rock removal without demonstrating the minimum specified equipment cannot reasonably remove the rock.

3.4 ROCK REMOVAL BY CONTROLLED BLASTING

A. Rock removal by means of controlled blasting shall strictly adhere to the requirements of Section 31 23 18.20, Controlled Blasting for Rock Removal, of these contract documents.

END OF SECTION

SECTION 31 23 18.20

CONTROLLED BLASTING FOR ROCK REMOVAL

PART 1 GENERAL

1.1 SUMMARY

A. This Section covers the purchase, transportation, handling, storage, and use of explosives, blasting agents, and blasting accessories in drill-and-blast operations required for rock excavation.

B. The Work covered in this Section includes pre-blast inspections, blast design, evaluation of existing nearby structures, blast limitations, materials, equipment, labor, supervision for the transportation and storage of explosives, drilling and loading of blast holes, protection of existing facilities, test blasts, blast-effects monitoring, post-blast inspections, and damage repairs.

1.2 RELATED SECTIONS

A. Section 31 05 16 - Aggregates for Earthwork.

B. Section 31 23 16 - Excavation

C. Section 31 23 18 - Rock Removal.

D. Section 31 23 23 - Fill.

1.3 DEFINITIONS

A. Air Overpressure (also Airblast): Fluctuating changes in ambient air pressure caused by blasting. Airblast is expressed in units of pounds per square inch (psi) or decibels (dB).

B. ANFO: A blasting agent containing no essential ingredients other than prilled ammonium nitrate and fuel oil.

C. Buffer Holes: Holes with reduced energy charges drilled adjacent to smooth wall, trim or open line-drilled holes at the perimeter of the excavation. The explosive charge in buffer holes is generally between 50 and 75% of the charge used in normal production blast holes. Buffer holes are usually drilled parallel to adjacent holes at the excavation perimeter.

D. Backbreak (also Overbreak): Rock broken beyond the limits of the last row of holes. For slope cuts, this is typically the pre-split or trim blast line.

E. Bench: A horizontal ledge from which holes are drilled down into the material to be blasted.

F. Bench Height: The vertical distance from the top of the bench to the floor or the top of the next lower bench.

G. Blast Pattern: The plan of drill holes as laid out for blasting.

H. Blast Site (also Blast Area): The area where explosive material is handled during loading of blast holes.

I. Blasting Mat: A mat of woven steel wire rope, scrap tires, or other suitable material to cover blast holes for the purpose of preventing flyrock.

J. Blasting Supervisor (also Blasting Specialist, Blaster-in-Charge, Blaster): The qualified person in charge of and responsible for the loading and firing of a blast.

K. Blasting Vibration (or Vibration): The energy from a blast that manifests itself in vibrations which may be transmitted through the earth away from the immediate blast area.

L. Burden: The distance from the borehole to the nearest free face, or the distance between boreholes measured perpendicular to the spacing.

M. Cap Scatter: Deviation between the rated firing time and the actual firing time of a blasting cap. A deviation of between 1 and 15 percent of the rated cap period is typical for blasting caps in good condition.

N. Close-in Blasting (also Tight Blasting): Refers to drilling and rock excavation activities in proximity to existing structures, where the distance from the blast hole to the structure is less than or equal to the final excavation depth.

O. Controlled Blasting: Refers to the use of explosives and blasting accessories in carefully spaced and aligned drill holes to produce a free surface or shear plane in the rock along the specified excavation back slope. Controlled blasting techniques include, but are not limited to, pre-splitting, trim blasting, cushion blasting, and line drilling.

P. Cushion Blasting: See Trim Blasting

Q. Delay Interval: The nominal time between the detonation of delay detonators of adjacent periods in a delay series; the nominal time between successive detonations in a blast.

R. Flyrock: Rocks propelled from the blast area by the force of detonation.

S. Free Face: A rock surface exposed to air which provides room for expansion upon fragmentation.

T. Guide Hole: An unloaded hole that is drilled between normally spaced pre-split holes to facilitate controlled blasting by directing the pre-split crack.

U. Line Drilling: A method of controlling overbreak, in which a series of very closely spaced holes are drilled along the perimeter of the excavation. Line holes are generally not loaded with explosives.

V. Maximum Charge Weight per Delay: For purposes of vibration control, any charges firing within any 8-millisecond time period are considered to have a cumulative effect on vibration and airblast effects. Therefore, the maximum charge per delay equals the sum of the weight of all charges firing within any 8-millisecond time period. For instance, if two 10-1b charges fire at 100 ms and one 15-1b charge fires at 105 ms, the maximum charge per delay would be 35 lbs.

W. Misfire: A blast or specific borehole that failed to detonate as planned. Also, explosive materials that failed to detonate as planned.

X. Mudcapping: A mud-covered or unconfined charge fired in contact with a rock surface without the use of a borehole.

Y. Occupied Building: Structure on or off the construction limits that is occupied by humans or livestock.

Z. Peak Particle Velocity (PPV): The maximum of the three ground vibration velocities measured in the vertical, longitudinal, and transverse directions. Velocity units are expressed in inches per second (ips).

AA. Pre-Blast Survey: Documentation of existing conditions at structures near an area where blasting is to be conducted.

BB. Pre-Splitting: A controlled blasting technique in which the perimeter charges are detonated first in the firing sequence or as a separate blast ahead of production blasting. This technique is designed to generate a fracture in the plane of the pre-split holes drilled along the perimeter of the excavation.

CC. Precision Presplitting: A specialized method of pre-splitting described by Konya (2015) where the strength of the explosive is adjusted to fail the web of rock between holes with the minimum energy required so as not to damage the perimeter rock surface.

DD. Primary Initiation: The method whereby the blaster initiates the blasts from a remote and safe location.

EE. Production Holes: Blast holes in the main body of the rock mass that is being removed by drilling and blasting.

FF. Production Blasting: Refers to rock fragmentation blasts resulting from more widely spaced production holes, drilled throughout the main area adjacent to the perimeter line.

GG. Residential Building: Includes single and multi-family dwellings, hotels, motels, and any other structure containing sleeping quarters.

HH. Scaled Distance: The distance from a blast measured in feet, divided by the square root of the charge per delay period measured in pounds. These "square root" scaled distance values are used in calculations regarding ground vibration prediction and control. For airblast calculations, cube root scaling is used whereby distance is divided by the cube root of the maximum charge per delay.

II. Secondary Blasting: Blasting to reduce the size of boulders resulting from a primary blast.

JJ. Spacing: The distance between boreholes. In bench blasting, the distance is measured to the free face and perpendicular to the burden.

KK. Slurry: An explosive material that generally consists of an aqueous solution of inorganic oxidizer fuel, and a thickener. Slurry explosives can be packaged in cartridges or delivered in bulk. Also referred to as water gel or emulsion.

LL. Stemming: Crushed stone, tamped clay or some other inert earth material placed in the unloaded collar area of blast holes for the purpose of confining explosive charges and limiting rock movement and airblast.

MM. Sub-drilling: The portion of a blast hole that is drilled below or beyond the desired excavation depth or limit or final lines and grades. Subdrilling is typically utilized to prevent high or tight areas of unfractured rock between blast holes.

NN. Trim Blasting (also Cushion Blasting): A controlled blasting technique similar to pre-splitting, except that the trim blast is timed to fire after the production round. Trim blast holes are generally lightly loaded. The spacing of trim blast holes is commonly greater than is typical for pre-splitting.

OO. Precision Trim Blasting: A specialized method of pre-splitting described by Konya (2015) where the strength of the explosive is adjusted to fail the web of rock between holes with the minimum energy required so as not to damage the perimeter rock surface.

PP. USBM RI 8507 PPV Frequency Plot: A plot of measured peak particle velocity vs. measured frequency on logarithmic horizontal and vertical scales, examples of which

are shown in Appendix A of "Structure Response and Damage Produced from Surface Mine Blasting", U.S. Bureau of Mines, Report of Investigation 8507, by D.E. Siskind, et al, dated 1980.

1.4 REFERENCES

A. General

1. Specific laws and regulations listed below are provided for general reference and shall not relieve the Contractor from the responsibility of knowing about and complying with all applicable regulations associated with the Work.

B. Laws and Regulations

1. United States Code (U.S.C.): 18 U.S.C. 40 – Importation, Manufacture, Distribution and Storage of Explosive Materials

2. U.S. Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF): 27 CFR 555 – Commerce in Explosives and ATF Explosives Rulings, Latest Revision.

3. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA): 29 CFR 1910.109 – Explosives and Blasting Agents and 29 CFR 1926 Subpart U – Blasting and the Use of Explosives.

4. U.S. Department of Transportation (USDOT): 49 CFR, Parts 146-149, 171-179, 383, 385, and 390-397.

5. Idaho Division of Building Safety, General Safety & Health Standards: Section 320 – Blasting and Use of Explosives.

6. International Society of Explosive Owner’s Representatives (ISEE), 2011, Blaster’s Handbook, 18th edition

7. Konya, C.J., 2015, Rock Blasting and Overbreak Control, 5th edition

8. National Fire Protection Association, NFPA 495, Explosive Materials Code.

1.5 SUBMITTALS

A. The following Preconstruction Submittals shall be provided for review by the Owner’s Representative at least 30 days prior to starting drilling and blasting operations, including test blasts.

1. Blasting Safety Plan

a. The Contractor shall prepare and submit a Blasting Safety Plan. The Blasting Safety Plan must be approved prior to conducting any blasting operations, and

before any explosives, blasting agents, primers, or initiators are delivered to the job site.

b. The Blasting Safety Plan shall be specific, detailed and address all safety issues pertinent to the project site. Generic plans simply stating that "all regulations will be followed" will not be acceptable.

c. The Blasting Safety Plan shall include:

1) A complete description of the warning, clearing and guarding procedures that will be employed to ensure personnel, staff, visitors, and all other persons are at safe locations during blasting. This information will include details regarding visible warning signs or flags, audible warning signals, method of determining blast areas (all areas affected by potentially harmful blast effects), access blocking methods, guard placement and guard release procedures, primary initiation method, and the system by which the blaster-in-charge will communicate with site security guards.

2) Detailed description of how explosives will be stored, transported, and used at the project work site(s). Plans will explain how storage magazines and explosive transport vehicles will satisfy all applicable ATF, OSHA, federal, state, and local laws and regulations. This plan will also indicate how explosives will be inventoried, secured, and guarded to prevent theft or unauthorized use. Explosive shall not be stored overnight on the property.

3) Safety Data Sheets (SDSs) and specific details about hazard communication programs for employees.

4) A description of the equipment that will be used to monitor the presence of lightning and the approach of electrical storms, and in the event of such, evacuation and site security plans.

5) Detailed contingency plans for handling of misfires caused by cutoffs or other causes.

6) Fire prevention plan details, including, smoking policies, procedures and limitations for work involving any open flames or sparks, description and location of all firefighting equipment, and firefighting and evacuation plans.

7) A description of the Contractor’s initial and ongoing blasting and fire safety training programs.

8) Description of the personal protective equipment that will be used by the Contractor's personnel, including but not limited to, safety glasses, hard-toe footwear, hard hats, and gloves.

9) Methods for preventing spills or losses of explosives, drilling fluids, oil, or any other pollutants to either ground or surface water during all handling and hole charging operations. Include details of all containment methods and contingency plans for quickly and effectively cleaning up any spilled materials.

10) A copy of all applicable federal, state, and local laws, codes, regulations, and ordinances pertaining to blasting and storage of explosives.

11) A copy of the approved Blasting Safety Plan shall be maintained on site at all times when blasting activities are ongoing and/or when explosives are stored on site.

2. Emergency Response Plan:

a. The Contractor shall prepare and submit an Emergency Response Plan which shall be submitted and approved prior to bringing any explosive materials onto the project site. The Emergency Response Plan shall include the following:

1) A description of specific actions to be taken by the Contractor in the event of spillage, loss, or theft of explosives.

2) Documentation of types and quantities of explosive materials and storage locations shall be readily available.

3) Points of contact and telephone numbers for local emergency response agencies.

4) Points of contact and telephone numbers for project contacts such as Blasting Consultant, General Contractor, Owner, etc.

3. General Blasting Plan

a. The Contractor shall prepare and submit a General Blasting Plan that includes a description of intended storage, transportation, handling, placement, and usage of explosive materials.

b. The blasting plan shall include initial blast design. Design each blast to avoid damage to existing facilities, adjacent property, and completed work. Consider the effects of blast-induced vibrations and air blast and fly rock potential in the design of each blast.

c. The Contractor's blasting consultant shall assist the Contractor in preparation of this plan and shall spend at least 24 hours in development and review of this plan.

d. The General Blasting Plan shall be submitted under a signed letter from the blasting consultant stating that the Blasting Consultant has reviewed the plan.

e. The General Blasting Plan shall be revised and reviewed by the Contractor's Blasting Consultant anytime the Contractor significantly changes drilling and blasting methods.

f. The General Blasting Plan shall include:

1) Details of controlled blasting techniques. Include plan and cross-section drawings showing hole locations, spacing, diameter and loading details for production blast holes, buffer holes, and pre-split, guide, or trim blast holes.

2) All blast plan drawings shall indicate explosive types, amounts, priming method, initiator types, delay periods, and locations, charge firing times, stemming type and quantities, and typical charge weights.

3) Methods of drilling, including equipment descriptions, hole alignment techniques and measures that will be used to prevent excessive deviation of drilled holes.

4) Method of surveying and establishing excavation limits, final grades, and tolerances.

5) Hole Charging Methods, including primer make-up, placement of charges and inert stemming and method of securing detonators until tie-in.

6) Initiation system hook-up and primary initiation methods.

7) Methods of safe and approved disposal of all explosive packaging materials.

8) Method of informing the Owner's Representative of the Contractor's blasting schedule.

9) Plans for preventing damage to nearby facilities, including but not limited to: utilities, buildings and drainage structures. The Contractor's Blasting Consultant shall inspect, establish, and monitor Peak Particle Velocity and Airblast limits for each existing structure and include appropriate measures to prevent damage to such structures.

10) A description of blast monitoring equipment and a listing of individuals who will operate such equipment. Submittal shall indicate that all equipment meets the requirements contained in this specification.

11) A description of specific measures taken to maintain good public relations with nearby residents and public agencies that own or use nearby property,

and the measures that the Contractor shall take to respond to any complaints about drilling and blasting operations and effects.

g. Review of the blasting plan by the Owner and Engineer shall not relieve the Contractor of their responsibility for the accuracy and adequacy of the plan when implemented in the field.

4. Personnel Qualifications

a. Blasting Supervisor (Blaster-in-Charge)

1) A detailed description of the education, training, and experience of all proposed persons that will be immediately in charge of drilling and blasting operations demonstrating compliance with the requirements of this Section.

2) A list of any lawsuits that were the result of property damage or personal injuries associated with blasting to which the Blaster-in-Charge has been a party, and the results of those suits. This shall include any suits which were settled out of court.

3) The Contractor's' submittal shall include names, addresses and telephone numbers of at least three persons involved in previous, relevant projects who can verify prior successful experience for each Blasting Supervisor.

4) Separate qualifications shall be submitted for each Blasting Supervisor (Blaster-in-Charge).

b. Blasting Consultant

1) The qualifications of the recognized blasting consultant(s) who the Contractor plans to retain to facilitate the development or review of all blasting designs and blast-effect control measures.

2) The Contractor's' submittal shall include names, addresses and telephone numbers of at least three persons who can verify prior successful experience for the Blasting Consultant(s).

c. Monitoring Consultant

1) The qualifications of the vibration monitoring consultant who will record and assess ground vibration levels during the blasting work.

5. Product Data

a. Safety Data Sheets and Manufacturer's Product Information (cut sheets) for all explosives, blasting agents, primers and initiator products, blasting devices, lightning detectors, seismographs, blasting mats, and all other blasting equipment. This information may be included in Blasting Safety Plan and/or General Blasting Plan submittals.

b. A description of the software to be used to interpret blast-induced vibration and air overpressure. If subsequently requested by the Owner's Representative, provide a copy of the software and/or user manual.

6. Vibration Monitoring Plan

a. Monitoring firm qualifications.

b. Seismograph equipment description and proposed data collection.

c. Locations of monitoring equipment. The seismographs require electrical power. The site does not have an existing electrical service. Agreements for temporary power from nearby properties may need to be negotiated.

d. Vibration values for cosmetic damage, structural damage and threshold to trigger a monitoring alarm.

B. The following are to be submitted to the Owner's Representative at least 14 days prior to commencing blasting operations and do not require the Owner's Representative's approval:

1. Copies of licenses or certificates for each Blaster-in-Charge as required by federal, state or local laws, regulations, and ordinances.

2. Copies of letters to owners of nearby private and public utilities notifying them of the Contractor's intention to conduct drilling and blasting operations, if required by any federal, state, or local laws, regulations, and ordinances.

C. The following Progress Submittals shall be provided to the Owner's Representative for review within the timeframes listed.

1. Individual Blast (Shot) Plans:

a. The Contractor shall prepare and submit Individual Blast (Shot) Plans for each blast at least 24 hours prior to drilling any blast holes. No loading of any explosives shall be permitted until the individual blast plan has been approved by the Owner's Representative.

b. Individual Blast Plans for Test Blasts shall be prepared with the assistance of and submitted under a signed letter from the Contractor's Blasting Consultant.

The Blasting Consultant is not required to sign the Individual Blast Plans for production shots, provided they are signed by an on-site blasting supervisor.

c. Acceptance by the Owner's Representative shall not relieve the Contractor of responsibility to produce satisfactory results as set forth in these specifications.

d. Individual Blast Plans shall be numbered in sequence and include the following information:

1) The proposed date and time of the blast.

2) Scaled plan view and cross section drawings showing the location, orientation, number, diameter, and length of blast holes relative to stations, slopes and elevations indicated.

3) The amount, type, diameter, weight, and linear loading density of explosives in all blast holes.

4) Maximum weight of explosive per hole or decked charge, total weight of explosives used, maximum charge weight per delay and powder factor.

5) Drawings or plan text shall clearly show detonator types, delays, quantities, and charge firing times.

6) Proposed locations of seismographs to be used for monitoring blast effects.

7) Measures to control flyrock, vibration, and air-overpressure.

e. For steep slopes located near existing structures where blasted material may impact the structure, the Contractor shall include in the Individual Blast Plan any site- or location-specific measures required to avoid damage to the structure.

f. If the Contractor intends to blast within 100 feet of concrete aged less than 28 days, a plan prepared by the Contractor's Blasting Consultant indicating details of controlled blasting techniques that will be used to prevent damage to the concrete shall be submitted to the Owner's Representative.

1) These plans shall indicate the age of the concrete-at the time of blasting, and include calculations indicating levels of expected strain in the concrete.

2) Plans shall also indicate how concrete strain levels and peak particle velocities for such blasting will be monitored and reported to the Owner's Representative.

2. Post-Blast Reports

a. The post blast report is an as-built record of each blast. It shall be submitted within 24 hours of a blast and prior to loading of any subsequent holes. The reports shall be numbered in sequence and include the following information:

1) Printed air blast and ground vibration monitoring data from all seismographs. Upon request, the Contractor shall submit copies of digitally recorded blast monitoring files to the Owner's Representative.

2) A written description of any deviations between the information contained in the corresponding Individual Blast Plan as it was drilled, loaded, delayed, initiated, and fired.

3) Drilling logs of the blast holes, including the total footage of pre-split, guide, and trim blast holes.

4) A copy of the digital video recording of each the blast.

b. Post-Blast Reports shall be signed by the Blasting Supervisor.

3. Test Blast Evaluations

a. Within 7 days after each test blast, the Contractor shall submit to the Owner's Representative, a report prepared by the Blasting Consultant that contains the Blasting Consultant's evaluation of the test blast and any recommendations to improve the Contractor's drilling and blasting practices.

4. Vibration Monitoring Reports

a. Weekly summaries of recorded vibrations.

b. A written data summary containing a description of the monitoring method and seismograph installation, a summary of peak measured vibrations, and a discussion of the source of peak vibrations and the potential that construction activities produced any damage.

1.6 BLASTER QUALIFICATIONS

A. General

1. All blasters and supervising blasters-in-charge shall be properly qualified and licensed in accordance with applicable federal, state, and local government laws, regulations, and ordinances.

2. The Contractor shall not allow prohibited persons as defined by ATF (27 CFR 555) to transport, handle, or use explosive materials.

B. Blasting Supervisor (Blaster-in-Charge)

1. Blasting Supervisors (Blasters-in-Charge) shall have a minimum of 5 years of demonstrated experience, directly related to controlled blasting, non-electric surface blasting of similar nature and other demonstrated experience of satisfactory performance on previous jobs.

2. All blasting supervisors shall be able to document supervision of the completion of at least three projects with satisfactory results of similar scope and complexity.

3. Unless a variance is approved by the Owner's Representative, the blasting supervisor shall each have completed at least five 8-hour days of classroom training within the past 5 years related to controlled and production blasting methods, practices, and design.

1.7 QUALITY ASSURANCE

A. The Contractor shall retain the services of an experienced blasting consultant for the duration of the project. The blasting consultant shall be an independent consultant who derives primary source of income from providing specialized blasting consulting services and shall not be an employee of the contractor nor an explosive distributor.

B. The Blasting Consultant shall have at least 5 years of experience in preparing controlled blasting designs, blast effects monitoring, and maintaining good public relations. This experience shall include specific experience with surface blasting using non-electric initiation on at least 5 projects of similar scope and complexity.

C. The blasting consultant shall have successfully completed at least two-years of college level courses in science or engineering or equivalent continuing education and training, and demonstrate an understanding of geology, controlled blasting methods, and blast effects monitoring.

D. The retained blasting consultant shall inspect the work site prior to blasting, assist the Contractor in development of the General Blast Plan, assist the Contractor in blast effects monitoring, and be on site during test blasts.

E. If requested by the Owner's Representative, the Contractor shall make the Blasting Consultant available to conduct a one-day, on-site visit during each month that blasting operations are being conducted.

1.8 PROJECT REQUIREMENTS

A. Blasting Operations

1. The Contractor shall comply with all laws, ordinances, applicable safety code requirements, and regulations concerning the handling, storage, loading,

preparation, and usage of explosives and blasting agents and protection of life and property. The Contractor's safety manager shall ensure that ongoing blasting work complies with all applicable regulations.

2. The firing systems for the general blast holes shall be controlled using delay detonators. Explosives used for a single period of delay shall be the minimum required. Blast designs shall consider the potential for cap scatter when selecting the delay timing.

3. Blast designs shall include measures to prevent misfires and ensure complete detonation of all explosives. If any products or methods are causing excessive cutoffs or other forms of misfires, the Owner’s Representative may require the Contractor to suspend the use of problematic products or methods. All associated costs of redesigned blasts or delays caused by this action will be at the Contractor's expense.

4. The methods of handling, storage, preparation, transportation, and usage of explosive shall be selected to minimize occurrences of spillage or loss of any explosives, oils or other pollutants.

5. Close-in blasting is not anticipated for this project. Close-in blasting may require additional measures, evaluation of structures, and blasting methods not contained in these specifications. No close-in blasting will be allowed without the approval of the Owner’s Representative.

6. The blasting methods and products selected and blast and shot patterns shall:

    a. Be sufficient to complete the excavation to the lines and grades shown on the plans to the specified tolerances without producing unacceptable overbreak and with the least disturbance to adjacent material.

    b. Limit the explosive charges to the minimum required for removal of material by excavating equipment.

    c. Minimize the production of fumes, dust, airblast, flyrock, and ground vibrations to not result in the annoyance of nearby residents.

7. Limit blasting vibrations (peak particle velocities) and airblast as follows:

    a. Vibration

        1) Unless a variance is approved by the Owner’s Representative, the Peak Particle Velocity measured at the closest existing structures on the project site, including bridges, piers, drainage structures, buildings, and new construction shall not exceed 4 inches per second (ips).

2) Unless a variance is approved by the Owner's Representative, the Peak Particle Velocity measured at adjacent exposed or buried structures (including groundwater wells), equipment, pipelines, buildings, and private, public, community, or institutional buildings located off the project site shall not exceed 0.75 inches per second (ips).

3) Vibrations measured on the ground at 100 feet from the blast shall not exceed 4.0 inches per second.

b. Airblast

1) In no case shall blasting noise (air-overpressure or airblast), measured near the nearest occupied building located either on or off the project site exceed 133 dB.

8. Control flyrock so that it does not project past the guarded area of the shot or off the project site (either on the fly or by rolling after initial impact). Flyrock shall not result in personal injury or unacceptable damage to property or the Work.

B. Structure Protection and Inspection

1. Blasting shall not result in damage to buildings, structures, underground or overhead utilities, and highways due to blasting-induced ground vibrations, airblast, or flyrock.

2. Nearby structures shall be physically protected whenever the use of explosives has the potential to cause any material disturbed by blasting activities to come in contact with the structure. The method of protection shall be durable enough to prevent the structure from being damaged by flyrock or debris generated by the blast.

3. The Contractor shall also inspect any steep slopes located close to and above structures for loose material that may have been created by blasting that could fall and damage the structure. The Contractor shall remove any such material to the satisfaction of the Owner's Representative.

C. Production of Riprap and Aggregates

1. Consideration shall be given to designing blasts that will produce fractured rock suitable for use as riprap and/or suitable for processing to produce other aggregates, subject to the following:

a. The rock meets the specified physical and durability requirements.

b. Production of riprap and aggregates is technically, operationally, and economically practical within the limitations and requirements of this Section.

D. Natural Gas Facilities:

1. Note where controlled blasting activities are in the vicinity of existing natural gas lines activities may be restricted.

a. It is anticipated no blasting of materials shall be allowed with 200 feet of existing natural gas mains. Be aware the owners of existing natural gas facilities reserve all rights to be more restrictive than this.

b. The Contractor shall submit all data for planned blasting to Northwest Natural.

c. Controlled blasting in the vicinity of existing natural gas facilities shall be strictly prohibited without written authorization from Northwest Natural.

1.9 PUBLIC RELATIONS

A. Contractor shall maintain good working relationships with the public.

B. The Owner will coordinate all public relations plans and meetings. Prior to any blasting on site, the Contractor's representative shall meet with the Owner and adjacent private property owners to inform them about anticipated drilling and blasting operations and answer any questions they may have with regards to blast effects such as vibration, air-blast overpressure, schedule and flyrock. The Contractor shall make the blasting consultant available to attend this meeting.

1.10 PREPARATORY MEETING

A. Prior to commencing any blasting activities (including mobilization of magazines or delivery of explosives to the site), the Contractor, including the Blaster(s)-in-Charge and all field personnel to be involved in blasting activities shall meet with the Owner and the Owner’s Representative(s) to review the plans and specifications, work plans, and submittals. Drilling and blasting may commence upon approval of all required Submittals and after the completion of the Preparatory Meeting.

1.11 VIBRATION MONITORING QUALIFCATIONS

A. The vibration monitoring firm shall have a minimum of 5 years of demonstrated experience, directly related to ground vibration monitoring of controlled blasting and heavy civil construction work of similar nature and other demonstrated experience of satisfactory performance on previous jobs.

B. The vibration monitoring firm shall be able to document completed work of at least three projects with satisfactory results of similar scope and complexity.

PART 2 PRODUCTS

2.1 EXPLOSIVE MATERIALS

A. Only fully non-electric blasting systems shall be used. Cap and fuse method shall not be allowed.

B. Only explosives in cartridges, prepared by the explosive's manufacturer shall be used. The use of bulk explosives will not be allowed for this project. Partial cartridges may be acceptable if approved by the Owner's Representative.

C. Explosives, blasting agents, primers, initiators, and ancillary blasting materials shall be kept in original packaging with clearly marked date codes. All explosives and initiating devices used shall be less than one year old. No blasting product shall be brought to the job site if the date code is missing or illegible.

D. If the Owner's Representative determines that a blasting product appears to be in a damaged or deteriorated condition, the suspect product shall not be used until its condition can be determined. Products found to be damaged or in a deteriorated condition shall be immediately returned to the supplier for safe disposal.

2.2 BLASTING MATS

A. Blasting mats shall be a commercially manufactured product specifically designed for control of flyrock, and may consist of steel wire rope, steel wire rope and rubber, sisal rope, or manila rope.

B. Blasting mats shall be in serviceable condition, as determined by the Owner's Representative.

2.3 BLASTING MONITORING EQUIPMENT

A. Equipment for on-site and off-site particle velocity and air overpressure monitoring shall be four channel (one overpressure and three seismic channels) units capable of digitally storing collected data. Equipment must be capable of printing ground motion time histories and summaries of peak motion intensities, frequencies, and USBM RI8507 PPV Frequency Plots. Printed report records must also include date, time of recording, operator name, instrument-number and date of last calibration. In addition, seismographs shall conform the following requirements:

1. Instruments shall have a frequency response between 2 and 250 Hz for particle velocity and a flat frequency response from 2 to 200 Hz for air overpressure.

2. The digitizing sampling rate for peak particle velocity and air overpressure measurements shall be least 1,024 samples per second.

3. Seismographs shall be capable of performing a self-test of velocity transducers and printed event records shall indicate whether or not the sensor test was successful.

4. Seismographs shall be capable of recording overpressure from 88 to 148 decibels (dB), and particle velocity from 0.005 to 5.0 in/sec.

5. Seismographs shall have adequate memory to record events, on all measurement channels for a time period equal to maximum planned blast duration plus one second.

6. All seismograph software systems shall be capable of saving or exporting back-up copies of all event files in a format supported by the software submitted by the Contractor for interpretation of blast-induced vibration and air overpressure.

B. Digital video camera equipment capable of recording in high-definition (minimum 1080p). The video camera shall have a field of view and zoom that will allow the entire blast area to be recorded.

2.4 LIGHTNING DETECTION EQUIPMENT

A. Lightning Detection equipment shall be capable of detecting lightning for a distance of at least 50 miles from the site.

2.5 VIBRATION MONITORING SEISMOGRAPHS

A. Seismographs will be stand-alone 3-channel units capable of recording vibrations in three orthogonal directions.

B. The seismographs are connected via wireless modems to a computer at the monitoring firm's office. Data from the instruments are downloaded daily to this computer. If vibrations exceed the preset trigger threshold, the data are downloaded immediately, and text message and e-mail alerts are sent to the monitoring firm personnel and to designated key project personnel.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. An Individual Blast Plan shall be submitted and approved by the Owner's Representative for each blast prior to commencing drilling of blast holes.

B. Prior to commencing drilling and blasting operations, the Contractor shall establish adequate survey control for the layout of all line drill, pre-split, trim blasting, and production holes. The horizontal and vertical control for all pre-split, smoothwall, and

production holes shall be such to assure that all blast holes are drilled on the specified pattern and the location and to the depths as indicated on the Individual Blast Plan.

C. For all final rock slopes greater than 10 feet in height, rock excavation shall utilize controlled blasting techniques to prevent overbreak and minimize damage to the final rock face. Blast patterns shall be designed so that the explosive energy is directed toward the developed free face and not into the back or sidewalls of the excavation.

D. The Contractor may need to employ special measures to protect structures from flyrock and blasted rock. These measures are subject to approval by the Owner's Representative.

E. The Contractor shall perform blasting operations in a manner to minimize air-overpressure and ground motion near on-site structures. If blast-induced air overpressure or particle velocity exceeds the performance requirements specified herein, blasting shall be suspended until a re-designed blasting plan is submitted to and approved by the Owner's Representative.

F. Excavation Limits and Tolerances

1. Unless otherwise indicated, final rock faces created by pre-splitting or trim blasting shall not deviate by more than 1.0 foot from a plane passing through adjacent drill holes, except where the character of the rock is such that, as determined by the Owner's Representative, irregularities are unavoidable due to geologic conditions. The tolerance will be measured perpendicular to the plane of the slope.

G. Flyrock Control

1. Blasting mats shall be placed over faces or breakouts to be blasted as required to protect existing structures, new construction, personnel, and equipment from flyrock.

2. If flyrock projects outside of the guarded area of the blast, the Contractor shall file a report to the Owner's Representative explaining the cause of the flyrock and methods to be employed on the subsequent blasts to reduce the throw of flyrock. The Owner's Representative shall review the report and approve the proposed modifications before any subsequent blast holes are drilled.

3. If flyrock projects outside the project area or damages property, all blasting operations shall cease until the Contractor's Blasting Consultant reviews the incident. The Blasting Consultant shall submit a report to the Owner's Representative describing the cause of the incident and provide a recommended corrective solution. The Owner's Representative shall review the report and approve the proposed modifications before any subsequent blast holes are drilled.

H. Lightning Protection

1. The Contractor shall maintain and operate lightning detection equipment during the entire period of blasting operations or whenever explosives are present on the site.

2. When the detection equipment indicates a lightning strike within 50 miles of the site, the Blaster-in-Charge shall evaluate the hazard to blasting operations and be prepared to terminate the loading of blastholes, clear the area of all personnel, and guard the shot until the hazard has passed.

I. Misfires

1. After a blast has been fired, the Blasting Supervisor and one assistant under his direct supervision shall make a careful inspection of the blast area. The Owner's Representative may be present for this inspection. Inspections shall determine whether there are any indications that a misfire might have occurred or whether the blast created any other imminent dangers (such as unstable ground conditions).

   a. If misfires or other dangerous conditions are found, the Blasting Supervisor shall secure the area and safely correct all hazards before any other work is allowed in the affected area.

   b. If the misfire poses a problem that cannot be safely corrected by the Blasting Supervisor, a consultant or explosive company representative skilled in the correction of misfires shall be called to rectify the problem.

   c. The all-clear signal, allowing other work to resume in the area, shall not be given until affected blast site is clear of all hazards.

J. Other Limitations:

1. Blasting shall not be permitted when in the opinion of the Owner's Representative it may be detrimental to existing structures. The Owner's Representative's decision will be final.

2. Whenever, in the opinion of the Owner's Representative, proposed blasting may cause harm to persons, cause damage to structures, or create unacceptable rock instability, cease blasting immediately and review the blast design. The Contractor may resume excavation of the rock with an approved re-designed blast plan or by mechanical means.

3. Whenever the peak particle velocity exceeds vibration limits, change the design of subsequent blasts, as necessary to reduce peak particle velocity to within the limits established by the Contractor's Blasting Consultant. Submit the new blasting plan to the Owner's Representative for approval prior to commencing additional blasting.

3.2 BLASTING SCHEDULE

A. Blasting shall be performed only within the period of time occurring 30 minutes after dawn and 30 minutes before sunset and also between the hours of 7:00 am and 7 pm. No nighttime blasting will be allowed, unless it is authorized under special circumstances with the express approval of the Owner's Representative.

B. Placement and detonation of explosives shall, to the extent reasonably possible, take place during the same work shift. Explosives shall never be placed one day and left overnight for detonation on a subsequent day.

3.3 DELIVERY, STORAGE, AND HANDLING OF EXPLOSIVES

A. Comply with federal, state, and local laws, regulations, and ordinances, applying to the purchase, transportation, storage, handling, and use of all explosive materials.

B. Where explosives are transported on public roads, the carriage shall be in accordance with applicable federal, state, and local laws, regulations, and ordinances.

1. The Contractor shall be solely responsible for compliance with all applicable laws, regulations, and ordinances. If a conflict exists, the strictest requirement shall apply.

C. On-Site Storage:

1. The location, access, and construction of explosive storage magazines and day-use magazines shall be in accordance with ATF 27 CFR 555 and all other applicable federal, state, and local laws, ordinances, and regulations.

2. The location of the on-site storage facilities shall be no less than 100 feet away from any stream, body of water, or spring located on or off or adjacent to the site.

3. No more than a one-week supply of explosives shall be stored on site at any time.

4. All second-class magazines used for day storage shall be located at least 150 feet from active work areas.

5. Maintain inventory control of all blasting equipment and supplies. Copies of inventory logs shall be kept as required by ATF rules and be made available for review at the request of the Owner's Representative.

6. Storage places shall be identified with signs stating clearly and boldly, DANGEROUS EXPLOSIVES.

7. Signs shall be attached to poles in plain sight from all approaches to the magazine sites. Signs must not be attached directly to magazines. Signs shall also include the warning "Never Fight Explosive Fires."

D. Explosive Losses

1. The Contractor shall use care to prevent the loss of any explosives, oils or other pollutants to the ground, groundwater, or surface water as a result of spillage, misfires, or any other cause. If, in the Owner's Representative's judgment, poor handling practices or blasting malfunctions cause excessive losses of explosives, oils, or other pollutants, blasting activities shall cease until the Owner's Representative approves a revised explosive loss prevention plan.

2. If any explosives or other pollutants are spilled, immediately clean up the spilled explosives and dispose of them in accordance with the Contractor's Emergency Response Plan.

3. Spills of any amount shall be immediately reported to the Owner's Representative.

3.4 PREPARATION AND PROTECTION

A. Warning systems, procedures, and protection devices shall be established prior to blasting. Warning systems shall comply with applicable local, state, and federal requirements, and shall include, at a minimum:

1. A system of audible signals to warn of impending blasts. The following audible signals shall be sounded:

a. A Warning Signal shall be sounded 5 minutes prior to the Blast Signal

b. A Blast Signal shall be sounded 1 minute prior to initiating the blast

c. An All Clear Signal shall be sounded after the Blasting Supervisor has inspected the blast and determined that the area is clear of all hazards.

2. Signboards and flags indicating areas where blasting operations are occurring.

a. Signs shall be clearly visible and legible from all points of access to the area and shall clearly describe the audible signal system for warning of impending blasts including the length and nature of audible blast warning and all clear signals.

B. The blaster-in-charge shall determine when to sound the Warning Signal. Blasting will be performed only after ensuring that all people and equipment have been removed to a safe location.

C. Blasting shall occur only when a representative of the Owner's Representative is present to witness each blast.

D. The Contractor shall not complete the final hookup (connection of the initiation system to the shot) of the shot until permission is obtained from the Owner's Representative and Northwest Natural Gas (where applicable).

3.5 TEST BLASTS

A. Before any full-scale blasting is conducted, a series of test blasts shall be performed to demonstrate to the Owner's Representative that the Contractors proposed controlled blasting methods are satisfactory. These test blasts shall be designed by the Contractor's Blasting Consultant. The Contractor's Blasting Consultant shall be on site to facilitate test-blasting activities.

B. Test blasts shall accomplish the following:

1. Demonstrate that the proposed drilling and blasting methods, as described in the General Blasting Plan, will not produce ground vibrations and airblasts that exceed the limits specified herein, nor produce excessive flyrock that projects off the project area or results in damage to property.

2. Demonstrate that the results of pre-splitting trim blasting, and other controlled blasting measures intended to minimize overbreak produce satisfactory results.

C. Following each test blast and prior to conducting additional drilling and blasting, the Contractor shall remove a sufficient amount of material from the test section so that the effects of any controlled blasting measures can be observed by the Owner's Representative.

D. After each test blast, the Contractor's Blasting Consultant shall review the test blast results and blast effects monitoring data. The Blasting Consultant shall prepare a written report containing their evaluation and recommendations for improving the Contractor's drilling and blasting operations.

E. Additional Test Blast Requirements

1. The test blasts shall be within the limits of the rock excavation, as shown on the Drawings.

   The Contractor shall initially perform up to three test blasts to demonstrate to the Owner's Representative that the Contractor's methods are sufficient to produce stable foundations and final slopes. Two test blasts will be required, and one test blast will be held in reserve and may be required at the direction of the Owner's Representative.

2. Test blasts shall conform to the following requirements:

    a. Test Blasts shall be typical of blasts performed throughout the project, not necessarily the first blast.

    b. Test blast sections shall be less than 50 feet in length.

    c. Once satisfactory rock slopes, grades, subgrades and foundation conditions, and suitable shot rock gradations are achieved during the test blasts, the Contractor shall hold to this design through the rest of the production blasting program.

3. The Owner's Representative may require the Contractor to perform additional test blasts if any of the following occur:

    a. The Contractor significantly changes either blasting patterns or blasting methods.

    b. Production blasting results in damage to final slopes, grades, subgrades or foundations.

    c. Production blast results fail to meet the performance requirements.

3.6 DRILLING

A. General

1. Before drilling pre-split holes, the Contractor shall completely remove all overburden and looser decomposed rock along the top of the excavation for a distance of at least 30 feet (laterally) beyond the limits of the production shot, or to the end of the cut.

2. In consultation with the Owner's Representative, potentially unstable boulders or other loose material uphill of the pre-split holes should be identified and removed prior to blasting.

3. Blast holes shall be drilled on the pattern submitted by the Contractor on the Individual Blast Plan, as approved by the Owner's Representative.

4. Drilling logs shall be kept for each blast hole and shall show the approximate depth of zones of soft or weathered rock, mud pockets, voids, and discontinuities, as well as the rate of penetration and the color and character of drill cuttings. This information should be used to properly load blast holes, including stemming decks across weak zones and voids. Copies of the logs should be included in the Post-Blast Report.

5. Immediately after drilling, blast holes shall be covered or otherwise protected to prevent overburden, drill cuttings, detonators, or other materials from falling into the holes before loading.

6. All blast holes shall be checked and measured before loading any explosives. If more than 5 percent of the blast holes are found to be short, either because they were not drilled to the full depth or because they have become plugged, the Owner's Representative may require the Contractor to deepen or clean out the holes.

B. Hole Diameter

1. Unless a variance is approved by the Owner's Representative, the maximum diameter of production blast holes shall be 4 inches.

2. Pre-split or trim blast holes shall be between 2.5 and 3 inches in diameter.

C. Drilling Equipment and Tolerances

1. Production blast holes shall be drilled within two blast hole diameters of the staked collar location.

2. Pre-split holes, trim blast, and guide holes shall be drilled within three inches of the staked collar location.

3. The Contractor shall control pre-split, trim blast, and guide hole drilling operations such that no hole deviates from the plane of the planned slope by more than 9 inches. If pre-split, trim blast, or guide holes routinely fail to meet this tolerance, the Owner's Representative may require the Contractor to reduce the bench height.

4. Drilling equipment used to drill pre-split, trim blast, and guide holes shall have mechanical, electromechanical, or electronic devices affixed to the equipment to accurately determine the angle at which the drill steel enters the rock. Pre-split hole drilling will not be permitted if these devices are missing or inoperative.

5. If more than 5% of the holes are drilled outside of these tolerances, at the option of the Owner's Representative, the Contractor may be required to fill out-of-tolerance holes with crushed stone and re-drill them at the proper locations.

3.7 PRE-SPLITTING

A. Length and Spacing of Holes

1. The center-to-center spacing of pre-split holes shall be between 12 and 30 inches. For the test blasts, it is expected (but not explicitly required) that the spacing will be 18 inches for 0.5H:1V slopes and 30 inches for 0.25H:1V slopes.

    a. A tighter spacing or the use of guide holes may be required if satisfactory results cannot be achieved, as determined by the Owner's Representative.

    b. The spacing shall not exceed 30 inches, unless the Owner's Representative approves a variance. Justification to increase hole spacing shall be based on the Owner's Representative's opinion that test blasts have produced satisfactory results.

2. The length of pre-split holes shall not exceed 30 feet unless the Contractor can demonstrate to the Owner's Representative that the specified excavation tolerances can be maintained, and a uniform slope can be produced.

3. Where the cut height requires multiple lifts, a 2-foot offset between lifts is permitted to allow for drilling equipment clearances, as shown on the Drawings.

4. The row of pre-split holes shall extend laterally a minimum of 30 feet beyond the limits of the production holes to be detonated, or to the end of the cut.

B. Explosives

1. Explosive materials shall be suitable and appropriate for the hole conditions (wet or dry).

2. Unless a variance is approved by the Owner's Representative, the maximum diameter of explosive used in pre-split holes (except for a concentrated charge placed at the bottom of the hole) shall not be greater than one half the diameter of the pre-split hole.

3. Unless a variance is approved by the Owner's Representative, only standard explosives manufactured specifically for pre-splitting shall be used.

    a. If fractional portions of standard explosive cartridges are used, they shall be firmly affixed to the detonating cord in such a manner that they will not slip or bridge across the hole. Spacing of fractional cartridges along the length of the detonating cord shall be as necessary to achieve the desired results but shall not exceed 36 inches without approval by the Owner's Representative.

4. The top charge shall be placed far enough below the collar, and the weight reduced as necessary to avoid overbreak and heave.

5. The bottom charge shall not be large enough to cause overbreak.

C. Stemming

1. The upper portion of all pre-split holes, from the top of the uppermost charge to the collar of the hole shall be stemmed with dry, angular, granular material that passes a 3/8-inch sieve.

D. Firing Sequence

1. As long as equally satisfactory cut slopes are produced, the Contractor may either pre-split the face prior to drilling the production holes or pre-split the face and production blast at the same time, provided that the pre-split holes are fired first.

2. If required to reduce ground vibrations, pre-split holes may be delayed; however, the maximum hole-to-hole delay shall be 25 milliseconds.

E. Precision Pre-Splitting

1. The use of precision pre-splitting techniques, as described by Konya (2015), are not anticipated for this project.

3.8 TRIM (CUSHION) BLASTING

A. If the horizontal distance from the cut face to the existing free face is less than 15 feet, the Contractor may trim blast in lieu of pre-splitting.

B. The difference in delay time between the trim line and the nearest production row shall be at least 25 milliseconds but not more than 75 milliseconds.

C. All other specified requirements for pre-split holes shall apply to trim blast holes.

3.9 PRODUCTION BLASTING

A. General

1. Maintain a burden distance not more than one half the bench height and between 25 and 35 times the diameter of the explosive charge in the blast hole.

2. Production blast holes shall not be drilled closer than 6 feet to the controlled blast line unless specifically approved by the Owner’s Representative.

3. The row of production blast holes immediately adjacent to the excavation line (pre-split face) shall be inclined approximately parallel to the excavation line.

4. The bottom of production blast holes (excluding subdrill depth) shall not be lower than the bottom of the pre-split holes.

5. Whenever practical, detonation of production blast holes shall be on a delay sequence toward a free face.

B. Explosives

1. Explosive materials shall be suitable and appropriate for the hole conditions (wet or dry).

2. The maximum diameter of explosive cartridges that may be loaded into production blast holes shall be a function of the lift height (or individual hole length, if shorter than the design lift height).

   a. For lifts (or individual holes) up to 10 feet deep, explosive cartridges shall not exceed 1.25 inches in diameter.

   b. For lifts (or individual holes) between 10 and 15 feet deep, explosive cartridges shall not exceed 2 inches in diameter.

   c. For lifts (or individual holes) between greater than 15 feet deep, explosive cartridges shall not exceed 4 inches in diameter.

C. Stemming

1. All production holes shall be stemmed with dry, angular, granular material that passes a 3/8-inch sieve.

2. Unless otherwise approved by the Owner's Representative, the height of the stemming column shall be no less than 0.7 times the burden or 20 times the diameter of the explosive charge, whichever is greater.

D. Protection of Pre-Split Face

1. It is the Contractor's responsibility to take all necessary precautions to minimize blast damage to the pre-split face.

2. If the Owner's Representative determines that production blasting is causing excessive back-break the Contractor may be required to drill a line of buffer holes between the production blast holes and the pre-split face.

   a. If required, the row of buffer holes shall be located approximately 3 feet from the pre-split face in a plane parallel to the pre-split holes.

   b. Buffer holes shall be 3 inches in diameter and shall be spaced 36 inches center-to-center.

c. The explosive load in buffer holes shall be 50 percent of the full load that could be placed in a 3-inch-diameter hole. Buffer holes shall be fired on a delay sequence toward a free face.

3.10 RIPRAP AND AGGREGATE PRODUCTION

A. If the Contractor determines that production of riprap and/or aggregate will be operationally practical and provide an economic benefit to the project, the Contractor shall test the rock to verify that it meets the specified physical and durability requirements. Refer to Section 31 05 16, Aggregates for Earthwork.

3.11 MONITORING

A. The Contractor shall provide seismographs conforming to the requirements of this Section.

B. The Contractor shall monitor each blast at locations determined by either the Owner's Representative or the Contractor's Blasting Consultant to demonstrate that the blasting induced ground vibrations and air blast overpressure at the closest structures are within the limitations specified by this Section.

C. Blast effects measurements shall be made in conformance to ISEE Seismograph Field Practice Guidelines.

D. The Owner's Representative may perform independent blast monitoring.

E. The Contractor shall record a high-definition digital video of each blast using a camera that conforms to the requirements of this Section. The video shall include coverage before, during, and after initiation of the shot that clearly depicts the layout of the shot, the behavior of the shot, and the resulting muck pile. The digital file of each shot shall be named to identify the project, date, and shot number.

3.12 SUSPENSION OF BLASTING

A. Blasting operations may be suspended by the Owner's Representative for any of the following reasons:

1. The Contractor's safety precautions are inadequate.

2. Air overpressure (airblast) or ground vibration (peak particle velocity) levels exceed specified limits contained in this Section.

3. Existing structural conditions are aggravated, or adjacent improvements are damaged by blasting.

4. Blasting endangers the stability of or causes damage to facilities outside the prescribed limits of excavation.

5. The results of the blasting, in the opinion of the Owner's Representative, are not satisfactory.

6. Excessive loss of explosives, oils, or other pollutants as a result of poor handling practices.

7. The Contractor's personnel are acting unsafely around the blast area immediately, before, during or after blasting operations.

8. Flyrock either projects outside the guarded area of the shot, projects outside the limits of the site, damages adjacent structures, or results in either a personal injury, damage to equipment, or damage to the Work.

9. The Contractor fails to submit Individual Blast Plans and Post Blast Reports.

B. Blasting operations shall not resume until the Owner's Representative has approved the Contractor's revised blasting plan with modifications correcting the conditions causing the suspension.

C. Delays or suspensions of blasting operations as a result of improper Contractor actions or inactions shall not be compensated, nor shall they form the basis for a claim.

3.13 PRE-BLAST/POST-BLAST INSPECTIONS

A. The Contractor shall make pre-blast inspections of structures and privately-owned residences located within 500 feet of the areas to be blasted. .

B. Work with the Owner to contact the Property Owners. Document the contact in writing in the form of an email to the Property Owner. Submit written documentation for properties that opt out of the pre-blast inspection.

C. Notify the Owner of the inspection schedule for each residence at least 7 days prior to the inspection. A representative of the Owner may be present for these inspections.

D. Conduct pre-blast inspections prior to the first use of explosives.

E. The purpose of the survey is to document the existing condition of structures prior to blasting and is intended to be used as evidence in ascertaining whether and to what extent damage may have occurred because of blasting. The surveys shall include measurement and documentation of all observed cracks, settlement, deformation, and any other inconsistency that could be construed as caused by blasting.

F. Record, at a minimum, the following information for each structure surveyed:

1. Age and type of construction

2. Location and character of cracks.

3. Evidence of settlement and leakage.

4. Other pertinent information

G. Record pre-blast survey information on forms prepared specifically for pre-blast surveys.

1. Supplement pre-blast surveys with time stamped photographs and videotaped recording.

H. Submit copies of the written records and photographs or videotapes to respective property owner and the Owner prior to the start of blasting.

I. If requested by the homeowner, perform a post-blast inspection to document the condition of the structure after work is completed.

3.14 DAMAGE REPAIR

A. When blasting operations damage existing structures, offsite properties, or a portion of the Work, or material surrounding or supporting the Work, the Contractor shall, at their expense, promptly repair or replace damaged items to the condition that existed prior to the damage and to the satisfaction of the Owner's Representative.

B. Any damage to structures shall be immediately reported to the Owner's Representative.

C. Nothing contained herein shall relieve the Contractor of responsibility for claims arising from their construction operations. Failure to inspect any structure required by these contract documents, or inadequacy of the inspections shall not relieve the Contractor of their responsibility. The Contractor shall indemnify the Owner's Representative from such claims.

END OF SECTION

SECTION 31 23 19

DEWATERING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes temporary dewatering and surface water control systems for open excavations and utility trenches.

B. Section includes:

1. Dewatering systems.
2. Surface water control systems.
3. System operation and maintenance.
4. Water disposal.

1.2 RELATED SECTIONS

A. Section 02 30 00 - Subsurface Investigations.
B. Section 31 05 16 - Aggregates for Earthwork.
C. Section 31 23 16 - Excavation.
D. Section 31 50 00 - Excavation Support and Protection.

1.3 SUBMITTALS

A. Dewatering Plan:

1. Descriptions of proposed groundwater and surface water control facilities including, but not limited to, equipment; methods; standby equipment and power supply; pollution control facilities; discharge locations to be utilized; and provisions for immediate temporary water supply as required by this Section.

2. Plan to be reviewed by the Engineer prior to the beginning of construction activities requiring dewatering. Review by the Engineer of the design shall not be construed as a detailed analysis of the adequacy of the dewatering system, nor shall any provisions of the above requirements be construed as relieving the Contractor of its overall responsibility and liability for the work.

1.4 DEFINITIONS

A. Dewatering includes the following:

1. Lowering of ground water table and intercepting horizontal water seepage to prevent ground water from entering excavations, trenches, tunnels, and /or shafts.

2. Reducing piezometric pressure within strata to prevent failure or heaving of excavations, trenches, tunnels, and /or shafts.

3. Disposing of removed water.

B. Surface Water Control: Removal of surface water within open excavations.

1.5 QUALITY CONTROL

A. All dewatering operations shall be adequate to assure the integrity of the finished project and shall be the responsibility of the Contractor.

B. Provide all labor, materials, and equipment necessary to dewater trench and structure excavations, in accordance with the requirements of the Contract Documents.

C. Secure all necessary permits to complete the requirements of this Section.

D. Control the rate and effect of the dewatering in such a manner as to avoid all objectionable settlement and subsidence.

E. Where the critical structures or facilities exist immediately adjacent to areas of proposed dewatering, reference points shall be established and observed at frequent intervals to detect any settlement which may develop.

1. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with the Contractor.

2. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the Contractor.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Dewatering, where required, may include the use of well points, sump pumps, temporary pipelines for water disposal, rock or gravel placement, and other means. Standby pumping equipment shall be maintained on the jobsite.

PART 3 EXECUTION

3.1 DEWATERING

A. Provide all equipment necessary for dewatering.

1. Have on hand, at all times, sufficient pumping equipment and machinery in good working condition.

2. Have available, at all times, competent workers for the operation of the pumping equipment.

3. Adequate standby equipment shall be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failure.

B. Dewatering for structures and pipelines shall commence when groundwater is first encountered and shall be continuous until such times as water can be allowed to rise in accordance with the provisions of this Section or other requirements.

C. Site Grading:

1. At all times, site grading shall promote gravity drainage.

2. Surface runoff shall be diverted from excavations.

3. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and be pumped or drained by gravity from the excavation to maintain a bottom free from standing water.

D. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation.

E. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with drain rock.

F. Maintain the water level below the bottom of excavation in all work areas where groundwater occurs during excavation construction, backfilling, and up to acceptance.

G. Flotation shall be prevented by maintaining a positive and continuous removal of water. The Contractor shall be fully responsible and liable for all damages which may result from failure to adequately keep excavations dewatered.

H. If well points or wells are used, they shall be adequately spaced to provide the necessary dewatering and shall be sand-packed and/or other means used to prevent pumping of fine sands or silts from the subsurface. A continual check shall be maintained to ensure that the subsurface soil is not being removed by the dewatering operation.

I. Dispose of water from the work in a suitable manner without damage to the environment or adjacent property. No water shall be drained into work built or under

construction without prior consent of the Engineer. Water shall be filtered using an approved method to remove sand and fine sized soil particles before disposal into any drainage system.

J. The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures, pipelines, and sewers.

K. Dewatering of trenches and other excavations shall be considered as incidental to the construction of the work and all costs thereof shall be included in the various contract prices in the bid forms.

END OF SECTION

SECTION 31 23 23

FILL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes backfilling required at building perimeter and site structures to subgrade elevations, fill under interior and exterior slabs-on-grade or pavement, and fill under landscaped areas. Backfilling for utilities within building proper is included within this Section.

B. Section includes:

1. Backfilling building perimeter to subgrade elevations.
2. Fill for over-excavation.

1.2 RELATED SECTIONS

A. Section 31 05 13 - Soils for Earthwork.
B. Section 31 05 16 - Aggregates for Earthwork.
C. Section 31 22 13 - Rough Grading.
D. Section 31 23 16 - Excavation.
E. Section 31 23 24 - Flowable Fill.
F. Supplemental Information: Geotechnical report; bore hole locations and findings of subsurface materials.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):

1. AASHTO T99 - Standard Specification for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop.

B. ASTM International (ASTM):

1. ASTM C403 - Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance

2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

4. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

5. ASTM D4832 - Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.

1.4 DEFINITIONS

A. Controlled Low Strength Material (CLSM): Also referred to as Flowable Fill elsewhere in these Specifications; see Section 31 23 24, Flowable Fill. A self-compacted, cementitious material.

B. Imported Material: Materials obtained from sources offsite, suitable for specified use.

C. Lift: Loose (uncompacted) layer of material.

D. Optimum Moisture Content:

1. Determined in accordance with ASTM Standard specified to determine maximum dry density for relative compaction.

2. Determine field moisture content on basis of fraction passing 3/4-inch sieve.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Imported Materials:

1. Materials Source: Submit name and location of imported fill materials suppliers.

2. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

3. Submit results of aggregate sieve analysis and standard proctor test for granular material.

1.6 QUALITY ASSURANCE

A. Aggregate fill materials: In accordance with Quality Assurance requirements stated in Section 31 05 16, Aggregates for Earthwork.

B. Allowable Tolerances: Final grades shall be plus or minus 0.1-foot.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Subsoil Fill: Type S1, Native Fill Material, and S2, Imported Fill Material, as specified in Section 31 05 13, Soils for Earthwork.

B. Imported Granular Fill: Coarse Aggregate Type A1, Dense-Graded Aggregate with gradation as shown in the Drawings and specified in Section 31 05 16, Aggregates for Earthwork.

C. Concrete:

1. Lean concrete as specified in Section 31 23 24, Flowable Fill, with compressive strength of 100 psi.

D. Drain Rock: Coarse Aggregate Type A2, Granular Drain Backfill Material with gradation as shown in the Drawings and specified in Section 31 05 16, Aggregates for Earthwork.

E. Foundation Stabilization Material: Coarse Aggregate Type A1, Dense-Graded Aggregate, 2-1/2" - 0 gradation as specified in Section 31 05 16, Aggregates for Earthwork.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to Work in this Section, become familiar with Site conditions. In the event discrepancies are found, notify Engineer as to the nature and extent of the differing conditions.

B. Verify sub-drainage, damp-proofing, or waterproofing installation has been inspected.

C. Verify structural ability of unsupported walls to support loads imposed by fill.

3.2 SITE CONDITIONS

A. Quantity Survey: The Contractor shall be responsible for calculations for quantities and volume of cut and fill from existing site grades to finish grades established under this contract as indicated in the Drawings or specified and shall include the cost for all earthwork in the total basic bid.

B. Dust Control:

1. Must meet all federal, state and local requirements.
2. Meet requirements provided in Section 01 10 00, Summary of Work.

3. Protect persons and property from damage and discomfort caused by dust.
4. Water surfaces as necessary and when directed by Engineer to quell dust.

C. Soil Control: Soil shall not be permitted to accumulate on surrounding streets or sidewalks nor to be washed into sewers.

3.3 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. Control of Water:

1. Excavated areas shall be kept free of water and frost.

2. Bearing surfaces which become softened by water or frost shall be re-excavated to solid bearing at Contractor's expense and backfilled with compacted crushed rock at Contractor's expense.

3. See Section 31 23 19, Dewatering for additional details.

C. Cut out soft areas of subgrade not capable of compaction in place and replace with specified granular fill material. See Article 3.5, Overexcavation for Unsuitable Foundation Conditions in Section 31 23 16, Excavation, for additional details.

D. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

E. Subgrade to be approved by Engineer prior to placement of structures and commencement of backfill activities.

F. Do not allow or cause any work performed or installed to be covered up or enclosed prior to required tests and approvals. Should any Work be enclosed or covered up, uncover at Contractor's expense.

3.4 BACKFILLING

A. Backfill areas to contours and elevations shown in the Drawings with unfrozen materials.

B. Do not place materials when weather conditions and/or moisture content prevent attainment of specified density.

C. Maintain optimum moisture content of backfill materials to attain required compaction density.

D. Employ placement method that does not disturb or damage other work.

E. Mechanical tampers permitted in confined areas.

F. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

G. Foundation Base for Structures:

1. Bring excavation to required subgrade elevation shown in the Drawings.

2. Place foundation base material to required grade shown in the Drawings.

3. Place foundation base material in 6-inch lifts and compact to 95 percent maximum dry density (per ASTM D698).

4. Foundations established near finished site grades:

a. Place a 3-inch thick layer of Coarse Aggregate Type A1, Dense-Graded Aggregate, ¾-inch-0 gradation in the bottom of footing excavations to minimize disturbance of silty foundation soils during wet weather.

b. Lightly compact material with a light-weight hand-operated vibratory plate compactor.

c. To provide uniform support, slabs should be underlain by a minimum 8-inch thick granular base course consisting of Dense-Graded Aggregate 1-1/2- 0 or 3/4-inch - 0 gradation.

d. The base course material shall be installed in a single lift and compacted to at least 95% of the maximum dry density. See Drawings for details.

H. For areas receiving surface structures or existing paved areas to be constructed or replaced, such as roadways, driveways, parking lots, and sidewalks:

1. Place Coarse Aggregate Type A1, Dense-Graded Aggregate, ¾-inch-0 gradation in 6-inch lifts.

2. Compact with vibratory equipment to 95 percent maximum dry density (per ASTM D698), unless otherwise specified or shown in the Drawings.

I. Make gradual grade changes. Blend slope into level areas.

J. Remove surplus backfill materials from Site in accordance with Section 31 23 16, Excavation.

3.5 FIELD QUALITY CONTROL

A. All testing and reporting shall be conducted and completed by an independent laboratory provided by the Owner. Initial testing will be paid for by the Owner. Subsequent testing after failure of initial acceptance testing shall be paid by the Contractor.

B. Perform laboratory material tests in accordance with ASTM D698 (AASHTO T99).

C. In-place compaction testing for structural fill material shall be at a minimum of one test per each 2,500 square feet of material placed. The Engineer shall be provided with the results of each compaction test at the time of testing.

D. Perform in place compaction tests in accordance with the following:

1. Density Tests: ASTM D2922.
2. Moisture Tests: ASTM D3017.

E. When tests indicate Work does not meet specified requirements, remove Work, replace and retest at the sole expense of the Contractor.

F. When testing of subgrade is not possible or feasible as detailed above, proof roll compacted fill surfaces under slabs-on-grade, pavers, paving, and as may be otherwise required by the Engineer.

3.6 PROTECTION OF FINISHED WORK

A. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION

SECTION 31 23 24

FLOWABLE FILL

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes flowable lean concrete mix used for structural backfill and other subgrade Site Work.

B. Section Includes:

1. Structural backfill.

1.2 RELATED SECTIONS

A. Section 31 23 16 - Excavation.
B. Section 31 23 23 - Fill.

1.3 DEFINITIONS

A. Flowable Fill: Also referred to as Controlled Low Strength Material (CLSM) and lean cement concrete fill elsewhere in the Specifications.

B. Utility: Any buried pipe, duct, conduit, manhole, tank, or cable.

1.4 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C33 - Standard Specification for Concrete Aggregates.
2. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
3. ASTM C150 - Standard Specification for Portland Cement.
4. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
5. ASTM C403 - Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
6. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
7. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

8. ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

9. ASTM C1040 - Standard Test Methods for Density of Unhardened and Hardened Concrete in Place By Nuclear Methods.

10. ASTM D4832 - Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

C. Field Quality-Control Submittals:

1. Mix Design:

a. Furnish flowable fill mix design for each specified strength.

b. Furnish separate mix designs when admixtures are required for the following:

1) Flowable fill Work during hot and cold weather.
2) Air entrained flowable fill Work.

c. Identify design mix ingredients, proportions, properties, admixtures, and tests.

2. Furnish test results to certify flowable fill mix design properties meet or exceed specified requirements.

D. Delivery Tickets:

1. Furnish duplicate delivery tickets indicating actual materials delivered to Project Site.

1.6 QUALITY ASSURANCE

A. In-place testing of Flowable Fill: In accordance with ASTM C403.
B. Compressive testing of Flowable Fill: In accordance with ASTM D4832.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Minimum Conditions: The following minimum conditions shall be met at time of flowable fill placement.

1. Do not install flowable fill during inclement weather.
2. Ambient temperature must be at least 34 degrees F (4 degrees C) and rising.
3. Flowable fill shall be at 40 degrees F (4 degrees C).
4. Subgrade on which flowable fill is to be placed shall be free of disturbed or soft material, debris and water.

1.8 FIELD MEASUREMENTS

A. Verify field measurements before installing flowable fill to establish quantities required to complete the Work.

PART 2 PRODUCTS

2.1 FLOWABLE FILL

A. Flowable Fill:

1. Composed of cement, pozzolans, fine aggregate, water, and admixtures.

2. Low cement content.

3. Non-segregating, self-consolidating, free-flowing and excavatable material which will result in a hardened, dense, non-settling fill.

4. Compressive strength at 28 days of 100 to 200 psi, if not otherwise shown in Drawings or specified.

2.2 MATERIALS

A. Portland Cement: ASTM C150, Type I – Normal.
B. Fine Aggregates: ASTM C33.
C. Water: Clean and not detrimental to concrete.

2.3 ADMIXTURES

A. Air Entrainment: ASTM C260.
B. Chemical Admixture: ASTM C494.
C. Fly Ash: Not permitted.
D. Plasticizing: ASTM C1017 Type I, plasticizing.

2.4 MIXES

A. Mix and deliver flowable fill according to ASTM C94, Option C.

B. Flowable Fill Design Mix:

ITEM	PROPERTIES
Cement Content	75 to 100 lb/cu yd
Fly Ash Content	None
Water Content	As specified
Air Entrainment	5 to 35 percent
28-Day Compressive Strength	Maximum 200 psi.
Unit Mass (Wet)	80 to 110 pcf
Temperature, Minimum at Point of Delivery	50 degrees F (10 degrees C)

C. Provide water content in design mix to produce self-leveling, flowable fill material at time of placement.

D. Design mix air entrainment and unit mass are for laboratory design mix and source quality control only.

2.5 SOURCE QUALITY CONTROL

A. Test and analyze properties of flowable fill design mix and certify results for the following:

1. Design mix proportions by weight of each material.

2. Aggregate: ASTM C33 for material properties and gradation.

3. Properties of plastic flowable fill design mix including:

    a. Temperature.
    b. Slump.
    c. Air entrainment.
    d. Wet unit mass.
    e. Yield.
    f. Cement factor.

4. Properties of hardened flowable fill design mix including:

    a. Compressive strength at 1 day, 7 days, and 28 days. Report compressive strength of each specimen and average specimen compressive strength.

    b. Unit mass for each specimen and average specimen unit mass at time of compressive strength testing.

B. Prepare delivery tickets containing the following information:

1. Project designation.
2. Date.
3. Time.
4. Class and quantity of flowable fill.

5. Actual batch proportions.
6. Free moisture content of aggregate.
7. Quantity of water withheld.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify excavation specified in Section 31 23 16, Excavation and trenching specified in Section 31 23 17, Trenching is complete.

B. Verify utility installation as specified in elsewhere in the specifications is complete and tested before placing flowable fill.

C. Verify excavation is dry and dewatering system is operating, as may be required, prior to placement of flowable fill.

3.2 PREPARATION

A. Support and restrain utilities to prevent movement and flotation during installation of flowable fill.

B. Protect structures and utilities from damage caused by hydraulic pressure of flowable fill before fill hardens.

C. Protect utilities and foundation drains to prevent intrusion of flowable fill.

3.3 INSTALLATION - FILL, BEDDING, AND BACKFILL

A. Place flowable fill by chute, pumping or other methods as approved by Engineer.

B. Place flowable fill in lifts to prevent lateral pressures from exceeding structural capacity of structures and utilities.

C. Place flowable fill evenly on both sides of utilities to maintain alignment.

D. Place flowable fill to elevations indicated on Drawings without vibration or other means of compaction.

3.4 FIELD QUALITY CONTROL

A. Perform inspection and testing according to ASTM C94.

1. Take samples for tests for every 100 cubic yards of flowable fill, or fraction thereof, installed each day.

2. Sample, prepare and test four compressive strength test cylinders according to ASTM D4832. Test one specimen at 3 days, one at 7 days, and two at 28 days.

3. Measure temperature at point of delivery when samples are prepared.

B. Further construction proceeding upon placed flowable fill will be permitted only after initial set is attained, as measured by ASTM C 403.

1. Perform in place penetration (density) tests using handheld penetrometer to measure penetration resistance of hardened flowable fill.

2. Perform tests at locations as directed by Engineer.

C. Defective Flowable Fill: The Engineer reserves the right to reject all flowable fill failing to meet the following test requirements or flowable fill delivered without the following documentation.

1. Test Requirements:

a. Minimum temperature at point of delivery.
b. Compressive strength requirements for each type of fill.

2. Documentation: Duplicate delivery tickets.

D. No traffic or construction equipment shall be allowed on flowable fill for a least 24 hours after placement.

3.5 CLEANING

A. Remove spilled and excess flowable fill from Project Site.

B. Restore facilities and Site areas damaged or contaminated by flowable fill installation to existing condition before installation.

END OF SECTION

EUGENE WATER & ELECTRIC BOARD

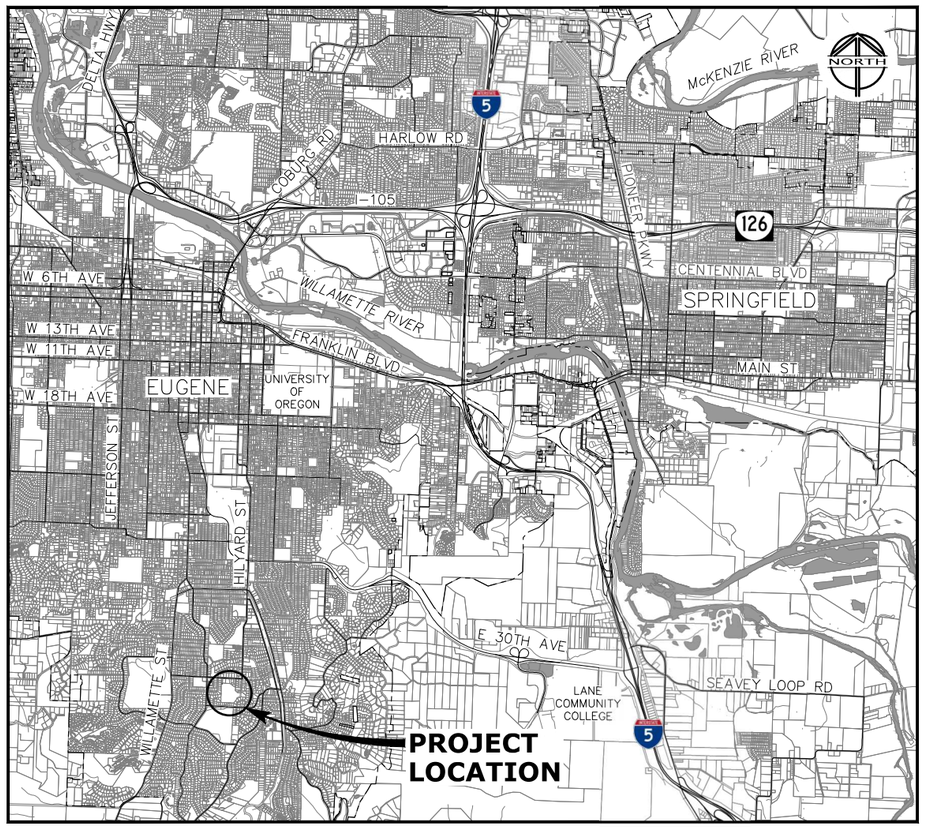
EUGENE, OREGON

E. 40TH AVENUE 7.5 MG STORAGE TANKS - EXCAVATION

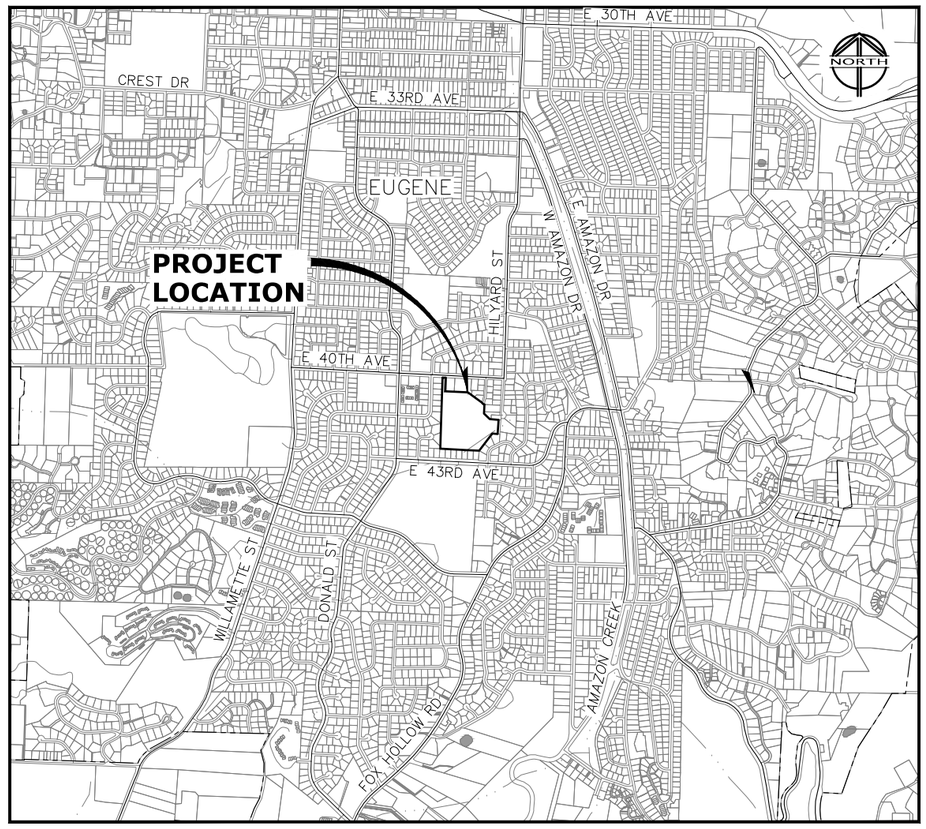
EWEB PROJECT 21-122-PW

INDEX OF DRAWINGS

811 Know what's **below.** **Call** before you dig.



VICINITY MAP
SCALE: 1"=3,000'



LOCATION MAP
SCALE: 1"=1,000'

ATTENTION: OREGON LAW REQUIRES THE CONTRACTOR TO FOLLOW THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. THE CONTRACTOR MAY OBTAIN COPIES OF THE RULES BY CALLING THE UTILITY NOTIFICATION CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-246-6699.)

REV NO.	REV DATE	REVISION DESCRIPTION	DWN	STD	CHK	APP

murraysmith
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OREGON 97204
P 503.225.9010

REGISTERED PROFESSIONAL ENGINEER 85640 OREGON DECEMBER 29, 2006 MICHAEL L. McKILLIP
RENEWS 12-31-22

EWEB

FUNC	BY	CHK	APP
DES	URNESS	MLM	TPB
DWN	DKH		
STANDARDS CHECK			

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

WATER DISTRIBUTION
E. 40TH AVENUE
7.5 MG STORAGE TANKS
COVER SHEET, INDEX OF DRAWINGS, VICINITY MAP, AND LOCATION MAP

EWEB WORK ORDER NO.	1801700
SCALE:	NONE
DATE:	06/30/2021
DWG NO:	D-38468-G1
PROJECT SHEET NO:	1 OF XX
REV	0

G:\PDX_Projects\20\2888 - EWEB E. 40th Ave Reservoir\CAD\Sheets EWEB_G-Excavation.dwg G1 6/30/2021 6:19 PM JDEVURNESS 23.0s (LMS Tech)

GENERAL NOTES

1. OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER SET FORTH IN OAR 952-001-0090. CALL 1-800-322-2344 TO NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION.

2. ALL WORK TO COMPLY WITH EWEB'S WATER DISTRIBUTION DESIGN & CONSTRUCTION STANDARDS, CURRENT EDITION, ARE INCORPORATED HEREIN BY REFERENCE. ALL STANDARD DETAIL REFERENCES ON THESE DRAWINGS REFER TO STANDARD DETAILS CONTAINED WITHIN THIS DOCUMENT.

3. DESIGN CHANGE REQUESTS MUST BE APPROVED BY THE CONSULTING ENGINEER & EWEB PRIOR TO THE CHANGES BEING IMPLEMENTED.

4. COMPLY WITH ALL CITY OF EUGENE REQUIREMENTS FOR WORK IN AND RESTORATION OF CITY STREETS AND PUBLIC RIGHT-OF-WAYS.

5. ALL FACILITIES, STRUCTURES, AND OTHER AREAS THAT ARE DISTURBED, DAMAGED, OR REMOVED DURING CONSTRUCTION SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS.

6. CONTRACTOR IS RESPONSIBLE FOR GRADING, STAGING, AND NECESSARY SITE IMPROVEMENTS TO ALLOW FOR TREE REMOVAL.

7. CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY LOCATES.

8. PROTECT ALL PROPERTY CORNERS, SURVEY MONUMENTS, AND CONTROL POINTS. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND PAYING FOR THE REPLACEMENT OF ANY EXISTING MONUMENTATION DAMAGED OR REMOVED DURING CONSTRUCTION. NEW MONUMENTATION SHALL BE REESTABLISHED BY A LICENSED SURVEYOR.

9. SURVEY PROVIDED BY BRANCH ENGINEERING. ELEVATIONS ARE BASED ON RTK GPS OBSERVATIONS TAKEN ON JUNE 6, 2018 USING THE OREGON REAL-TIME GEODETIC NETWORK AND GEOID 12A(NAVD88). HORIZONTAL DATUM IS OREGON STATE PLANE SOUTH 3602, NAD 83. VERTICAL DATUM IS NGVD 29. UNIT OF MEASURE = FOOT.

10. CONSTRUCTION LAYOUT (ALL ACTUAL LINES AND GRADES) SHALL BE STAKED BY A PROFESSIONAL SURVEYOR, REGISTERED IN THE STATE OF OREGON, BASED ON COORDINATES, DIMENSIONS, BEARINGS, AND ELEVATIONS, AS SHOW, ON THE PLANS.

11. PROJECT CONTROL SHALL BE FIELD VERIFIED AND CHECKED FOR RELATIVE VERTICAL POSITION BASED ON THE BENCHMARK STATED HEREON, PRIOR TO BEGINNING CONSTRUCTION LAYOUT.

12. WHEN DIMENSIONS AND COORDINATE LOCATIONS ARE REPRESENTED - DIMENSIONS SHALL HOLD OVER COORDINATE LOCATION. NOTIFY THE CIVIL ENGINEER OF RECORD IMMEDIATELY UPON DISCOVERY OF ANY DISCREPANCIES.

13. CONTRACTOR TO REFERENCE GEOTECHNICAL INVESTIGATION AND SEISMIC HAZARD STUDY REPORT BY FEI DATED MARCH 12TH, 2021 FOR THE SITE SOILS CONDITIONS.

14. THE LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION ONLY AND ARE NOT GUARANTEED TO BE COMPLETE OR ACCURATE. CONTRACTOR SHALL VERIFY ELEVATIONS, PIPE SIZE, AND MATERIAL TYPES OF ALL UNDERGROUND UTILITIES PRIOR TO COMMENCING WITH CONSTRUCTION AND SHALL BRING ANY DISCREPANCIES TO THE ATTENTION OF THE CONSULTING ENGINEER AND EWEB, 72 HOURS PRIOR TO START OF CONSTRUCTION TO PREVENT GRADE AND ALIGNMENT CONFLICTS.

15. THE ENGINEER OR OWNER IS NOT RESPONSIBLE FOR THE SAFETY OF THE CONTRACTOR OR HIS CREW. ALL O.S.H.A. REGULATIONS SHALL BE STRICTLY ADHERED TO IN THE PERFORMANCE OF THE WORK.

16. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL ROADWAYS, KEEPING THEM CLEAN AND FREE OF CONSTRUCTION MATERIALS AND DEBRIS, AND PROVIDING DUST CONTROL AS REQUIRED.

17. CONTRACTOR SHALL MAINTAIN ALL UTILITIES TO EXISTING BUILDINGS AT ALL TIMES DURING CONSTRUCTION.

18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND SCHEDULING ALL WORK WITH THE CONSULTING ENGINEER AND EWEB.

19. CONTAMINATED SOILS (I.E., VISUAL OR OLFACTORY SIGNS OF PETROLEUM OR CHEMICAL CONTAMINATION) ARE NOT KNOWN TO EXIST ON THE SITE. IF CONTAMINATION IS ENCOUNTERED, STOP WORK IN THE IMMEDIATE VICINITY AND NOTIFY ENGINEER AND EWEB. WORK IN OTHER AREAS MAY PROCEED.

20. CONSTRUCTION OF PUBLIC IMPROVEMENTS SHALL COMPLY WITH THE CITY'S STANDARD SPECIFICATIONS AND DRAWINGS.

21. THE CONTRACTOR SHALL NOT PERFORM WORK WITHOUT EWEB INSPECTIONS.

22. CONSTRUCTION SITE SHALL BE MANAGED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION SITE MANAGEMENT PLAN (CSMP). CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING COMPONENTS OF THE CSMP UNTIL PROJECT FINAL ACCEPTANCE IS ISSUED.

ABBREVIATIONS

@	AT
ABAN(D)	ABANDON(ED)
AC	ASPHALTIC CONCRETE
ADPT	ADAPTER
APPROX	APPROXIMATE
ASSY	ASSEMBLY
AVE	AVENUE
BM	BENCHMARK / BEAM
BO	BLOW-OFF
CAV	COMBINATION AIR RELEASE
CB	CATCH BASIN
C/L	CENTER LINE
CONC	CONCRETE
CONST	CONSTRUCTION
CPLG	COUPLING
CR	CRUSHED ROCK
D	DRAIN
DEF	DEFLECTION
DEFL	DEFLECT
DEQ	DEPARTMENT OF ENVIRONMENTAL QUALITY
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DWG	DRAWING
E	EAST
EA	EACH
EL, ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EQ	EQUAL
ESC	EROSION AND SEDIMENT CONTROL
EWEB	EUGENE WATER & ELECTRIC BOARD
EXIST	EXISTING
EXIST GR	EXISTING GRADE
FH	FIRE HYDRANT
FIN GR	FINISH GRADE
FITG	FITTING
FLEX	FLEXIBLE
FLG	FLANGED
FO	FIBER OPTIC
FT	FEET / FOOT
G	GAS
GR	GRADE
GRV	GRAVEL
GV	GATE VALVE
HORIZ	HORIZONTAL
HWY	HIGHWAY
IE	INVERT ELEVATION
JT	JOINT
LF	LINEAR FOOT
LT	LEFT
MAX	MAXIMUM
MATL	MATERIAL
MECH	MECHANICAL
MIN	MINIMUM
MJ	MECHANICAL JOINT
N	NORTH
NO.	NUMBER
OC	ON CENTER
OD	OUTSIDE DIAMETER
OVHD	OVERHEAD
PE	PLAIN END
PERM	PERMANENT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PW	POTABLE WATER
R	RADIUS
R/W, ROW	RIGHT OF WAY
RDCR	REDUCER
REINF	REINFORCE(D)(ING)(MENT)
REQ'D	REQUIRED
RT	RIGHT
S	SOUTH
SCHED	SCHEDULE
SD	STORM DRAIN
SHT	SHEET
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
SQ YD	SQUARE YARD
ST	STORM WATER, STREET
STA	STATION
STD	STANDARD
STRUCT	STRUCTURE / STRUCTURAL
S/W	SIDEWALK
TEMP	TEMPORARY
THRD	THREAD (ED)
TRAF	TRAFFIC (CONTROL)
TYP	TYPICAL
VERT	VERTICAL
W	WEST, WATER
W/	WITH
WL	WATERLINE
WW	WASTEWATER/SANITARY SEWER

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE	℄	℄
RIGHT-OF-WAY	R/W	R/W
EASEMENT		
CENTERLINE		
CURB		
CONTOUR MINOR		
CONTOUR MAJOR	200	200
SANITARY SEWER LINE	8"SS	8"SS
STORM DRAIN	8"SD	SD
WATER MAIN	W6DI	W12DI
ABANDON PIPE		
VALVE		
BLOW OFF ASSEMBLY		
REDUCER		
FIRE HYDRANT		
PLUG/CAP		
BLOW OFF		
COUPLING		
MANHOLE		
CATCH BASIN		
FITTING/BEND		
METER		

REV NO.	REV DATE	REVISION DESCRIPTION	DWN	STD	CHK	APP

murraysmith
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PORTLAND, OREGON 97204
P 503.225.9010

REGISTERED PROFESSIONAL ENGINEER 85640 OREGON DECEMBER 29, 2006 MICHAEL L. McKILLIP
RENEWS 12-31-22

EWEB

FUNC	BY	CHK	APP
DES	URNESS	MLM	TPB
DWN	DKH		
STANDARDS CHECK			

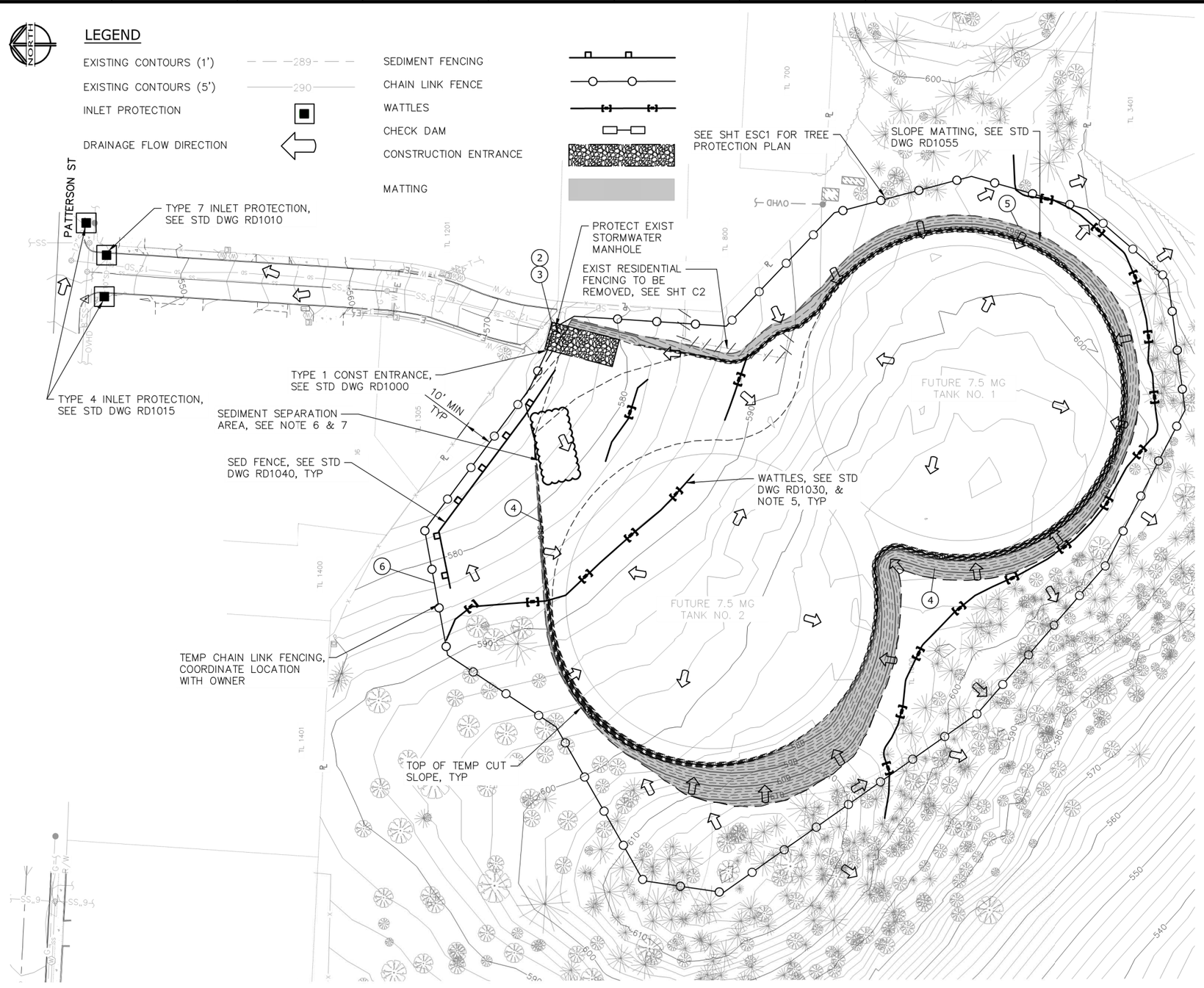
LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

WATER DISTRIBUTION
E. 40TH AVENUE
7.5 MG STORAGE TANKS
GENERAL NOTES, ABBREVIATIONS, AND LEGEND

EWEB WORK ORDER NO. 1801700
SCALE: NONE
DATE: 06/30/2021
DWG NO. D-38468-G2
PROJECT SHEET NO: 2 OF XX
REV 0

LEGEND

EXISTING CONTOURS (1')
EXISTING CONTOURS (5')
INLET PROTECTION
DRAINAGE FLOW DIRECTION
SEDIMENT FENCING
CHAIN LINK FENCE
WATTLES
CHECK DAM
CONSTRUCTION ENTRANCE
MATTING



PLAN
SCALE: 1"=40'

GRADING EROSION AND SEDIMENT CONTROL NOTES

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES. BASE ESC MEASURES TO REMAIN IN PLACE AFTER COMPLETION OF THE WORK.
2. "STOCK PILE AREA" SHALL BE DESIGNATED PRIOR TO EXCAVATION CUT ACTIVITIES. ALL EXCAVATED MATERIALS SHALL BE HAULED OFFSITE.
3. ALL "SEDIMENT BARRIERS (TO BE INSTALLED AFTER GRADING)" SHALL BE INSTALLED IMMEDIATELY FOLLOWING ESTABLISHMENT OF FINISHED GRADE AS SHOWN ON THESE PLANS.
4. LONG TERM SLOPE STABILIZATION MEASURES "INCLUDING SEEDING, JUTE MATTING, WATTLES, AND ROCK CHECK DAMS" SHALL BE IN-PLACE OVER ALL EXPOSED SOILS BY OCTOBER 1.
5. WATTLES SHALL BE INSTALLED PARALLEL ALONG CONTOURS DOWNSLOPE OF OPEN EXCAVATIONS WHEN NOT ACTIVELY WORKING IN THE AREA.
6. PONDING WATER SHALL BE PUMPED TO A SEDIMENT SEPARATION CONTAINER PRIOR TO DISCHARGING TO STORM FACILITIES ON SW PATTERSON STREET. DISCHARGE RATE SHALL NOT EXCEED DOWNSTREAM STORM CAPACITY EQUAL TO 10 GPM.
7. LOCATION OF SEDIMENT SEPARATION AREA IS CONCEPTUAL. FINAL LOCATION TO BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
8. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL ADHERE TO THE SPECIFICATIONS,UNLESS OTHERWISE AUTHORIZED.
9. SLOPES AND DISTURBED AREAS TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
10. LONG TERM SLOPE AND DISTURBED AREAS STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE. SEE SPECIFICATIONS. IN ADDITION, ALL SLOPES OF 2:1 OR GREATER SHALL RECEIVE MATTING.
11. TEMPORARY SLOPE AND DISTURBED AREAS STABILIZATION MEASURES SHALL BE ACCOMPLISHED BY: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, IN ACCORDANCE WITH SECTION 31 22 13, ROUGH GRADING.
12. STOCKPILED SOIL OR STRIPPINGS SHALL BE HAULED OFFSITE. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
13. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
14. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
15. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS IN THE VICINITY OF THE SITE USED FOR HAULING SOIL ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
16. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
17. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
18. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERM OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
19. USE BMPS SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
20. EMERGENCY EROSION CONTROL MATERIALS MUST BE KEPT ON SITE AT ALL TIMES.

EROSION CONTROL NOTES

(1) INSTALL, INSPECT, CLEAN, AND MAINTAIN SEDIMENT FENCE TO PREVENT SEDIMENT LADEN WATER FROM LEAVING THE SITE THROUGHOUT CONSTRUCTION. SEDIMENT FENCE SHALL BE INSTALLED PARALLEL TO SLOPE CONTOURS. ADDITIONAL SEDIMENT FENCE MAY BE REQUIRED BASED ON SITE CONDITIONS AND MEANS AND METHODS DEVELOPED BY CONTRACTOR. OVERLAY SEDIMENT FENCE 6" MINIMUM.

(2) INSPECT, CLEAN, AND MAINTAIN GRAVEL CONSTRUCTION ENTRANCE TO PREVENT SEDIMENT AND SEDIMENT LADEN WATER FROM LEAVING THE SITE THROUGHOUT CONSTRUCTION.

(3) ADDITIONAL TRACKING CONTROL MEASURES SUCH AS A WHEEL WASH MAY BE NECESSARY IF CONSTRUCTION ENTRANCE IS NOT SUFFICIENT.

(4) INSTALL SLOPE MATTING AND PLASTIC SHEETING ON ALL SLOPES 2:1 OR GREATER, UNLESS CUT SLOPE IS COMPETENT ROCK.

(5) PROVIDE MEANS FOR RUNOFF AT TOP OF CUT SLOPE TO DRAIN TO SEDIMENT SEPARATION AREA.

(6) TEMPORARY TARPING SHALL BE ATTACHED TO EXISTING SITE FENCING TO MITIGATE CONSTRUCTION RELATED DUST. SEE SHEET ESC-1 FOR ADDITIONAL DUST CONTROL NOTES.

REV NO.	REV DATE	REVISION DESCRIPTION	DWN	STD	CHK	APP

murraysmith
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OREGON 97204
P 503.225.9010

REGISTERED PROFESSIONAL ENGINEER
OREGON
DECEMBER 28, 2009
MICHAEL L. McKILLIP
RENEWS 12-31-22

EWEB

FUNC	BY	CHK	APP
DES	URNESS	MLM	TPB
DWN	DKH		
STANDARDS CHECK			

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

WATER DISTRIBUTION
E. 40TH AVENUE
7.5 MG STORAGE TANKS
EROSION AND SEDIMENT CONTROL PLAN

EWEB WORK ORDER NO. 1801700
SCALE: 1"=40'
DATE: 06/30/2021
DWG NO: D-38468-ESC1
PROJECT SHEET NO: 3 OF XX
REV 0

6/30/2021 7:07 PM JOEY URNESS

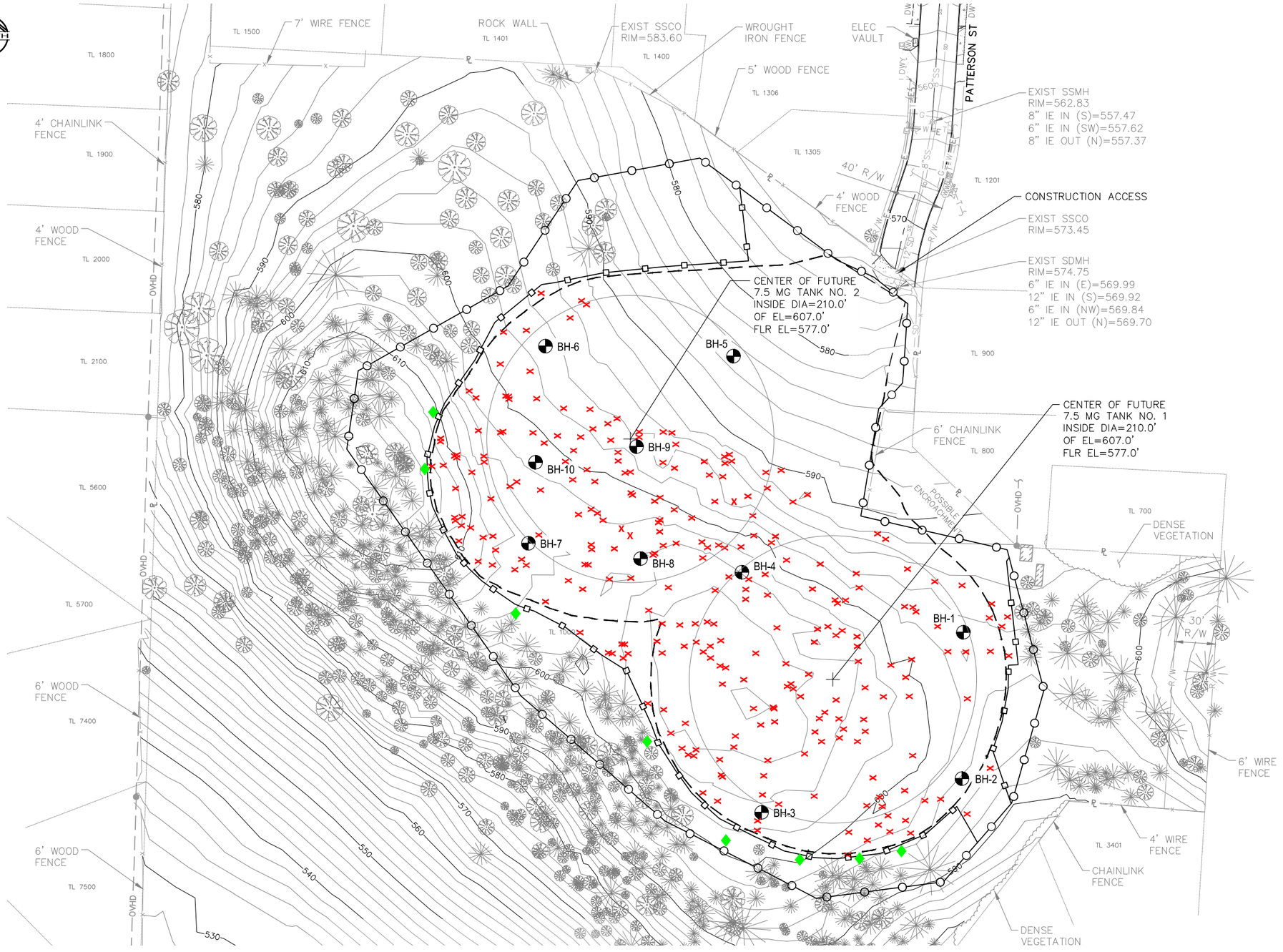
NOTES:

1. REFERENCE TREE REMOVAL BID PACKAGE DATED MAY 21, 2021 FOR TREES PREVIOUSLY REMOVED FROM THE SITE. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL STUMPS AND OTHER ORGANIC MATERIAL DURING EXCAVATION.

2. CONTRACTOR SHALL MAINTAIN EXISTING TEMPORARY CHAIN LINK FENCING AND TREE PROTECTION FENCING DURING EXCAVATION. FENCING TO REMAIN AFTER COMPLETION OF THE WORK.

LEGEND

- FUTURE EXCAVATION LIMITS
- EXISTING TREES TO REMAIN
- EXISTING TREE PROTECTION FENCE
- EXISTING TEMP CHAIN LINK FENCE
- EXISTING TREE STUMPS TO BE REMOVED
- EXISTING TREE STUMPS AND ROOT MASSES TO REMAIN



PLAN
SCALE: 1"=40'

REV NO.	REV DATE	REVISION DESCRIPTION	DWN	STD	CHK	APP

murraysmith
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OREGON 97204
P 503.225.9010

REGISTERED PROFESSIONAL ENGINEER 65840 DECEMBER 29, 2006 MICHAEL L. McKILLIP
RENEWS 12-31-22

EWEB

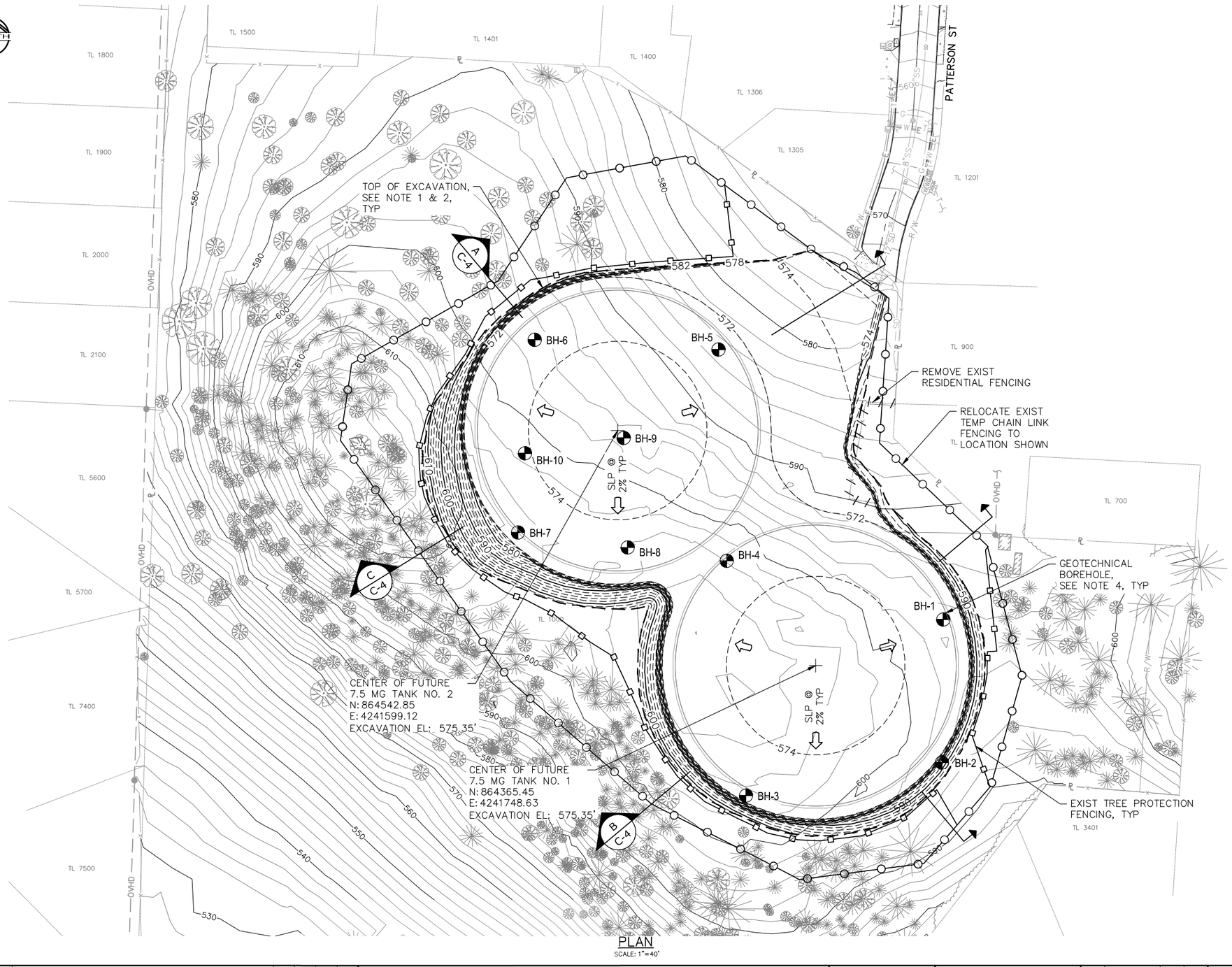
FUNC	BY	CHK	APP
DES	URNESS	MLM	TPB
DWN	DKH		
STANDARDS CHECK			

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

WATER DISTRIBUTION
E. 40TH AVENUE
7.5 MG STORAGE TANKS
EXISTING CONDITIONS PLAN

EWEB WORK ORDER NO. 1801700
SCALE: 1"=40'
DATE: 06/30/2021
DWG NO: D-38468-C1
PROJECT SHEET NO: 4 OF XX
REV 0

G:\PDX_Projects\20\2888 - EWEB E. 40th Ave Reservoir\CAD\Sheets\EWEB_C - Excavation-Package.dwg C1 6/30/2021 7:05 PM JOEY.URNESS 23.0s (LMS Tech)



PLAN
SCALE: 1"=40'

NOTES:

1. MAXIMUM CUT SLOPE FOR AREAS WITH COMPETENT ROCK SHALL BE 1/4:1.

2. MAXIMUM CUT SLOPE FOR UNDISTURBED NATIVE SOIL ABOVE TOP OF ROCK SHALL BE 1:1.

3. ELEVATIONS SHOWN ARE BASED ON NGVD 29 DATUM.

4. REFER TO GEOTECHNICAL REPORT IN SUPPLEMENTAL INFORMATION FOR BORING LOGS AND GEOTECHNICAL ASSESSMENT.

5. IN THE CASE THAT OVERBLASTING BENEATH THE TANKS OCCURS, CONTRACTOR SHALL BUILD BACK SUBGRADE WITH STRUCTURAL FILL PER SPECIFICATIONS. PROVIDE COMPACTED SOILS FOR VEHICLE SITE ACCESS WITHIN EXCAVATION EXTENTS NORTH OF TANK FOOTPRINTS.

6. SEE SHEET C3 FOR SITE PIPING EXCAVATION PLAN.

DESIGN NOTES:

1. EXISTING ROCK SURFACE DEVELOPED DURING DESIGN IS BASED ON THE DEPTH TO BEDROCK SHOWN ON FIGURE 2A OF THE GEOTECHNICAL REPORT. SIMPLE PLANAR INTERPOLATION WAS USED TO CREATE THE SURFACE BETWEEN BOREHOLES. EXISTING ROCK SURFACE NOT SHOWN FOR CLARITY.

2. THE PROPOSED EXCAVATION SURFACE UTILIZES THE EXISTING ROCK SURFACE AND EXISTING GROUND SURFACE TO CREATE THE PROPOSED CUT SLOPES SHOWN. CUT SLOPES ARE ASSUMED TO BE 1/4:1 BELOW TOP OF ROCK, AND 1:1 ABOVE TOP OF ROCK.

3. EXTENTS OF EXCAVATION SHOWN ARE APPROXIMATE. SITE CONDITIONS MAY VARY. CONTRACTOR SHALL ADJUST EXCAVATION EXTENTS AS REQUIRED TO PROVIDE MAXIMUM CUT SLOPES PER NOTE 2 AND 3 THIS SHEET.

REV NO.	REV DATE	REVISION DESCRIPTION	DWN	STD	CHK	APP

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REGISTERED PROFESSIONAL ENGINEER 65640 — MICHAEL L. McKILLIP — DECEMBER 28, 2005 — RENEWS 12-31-22

EWEB

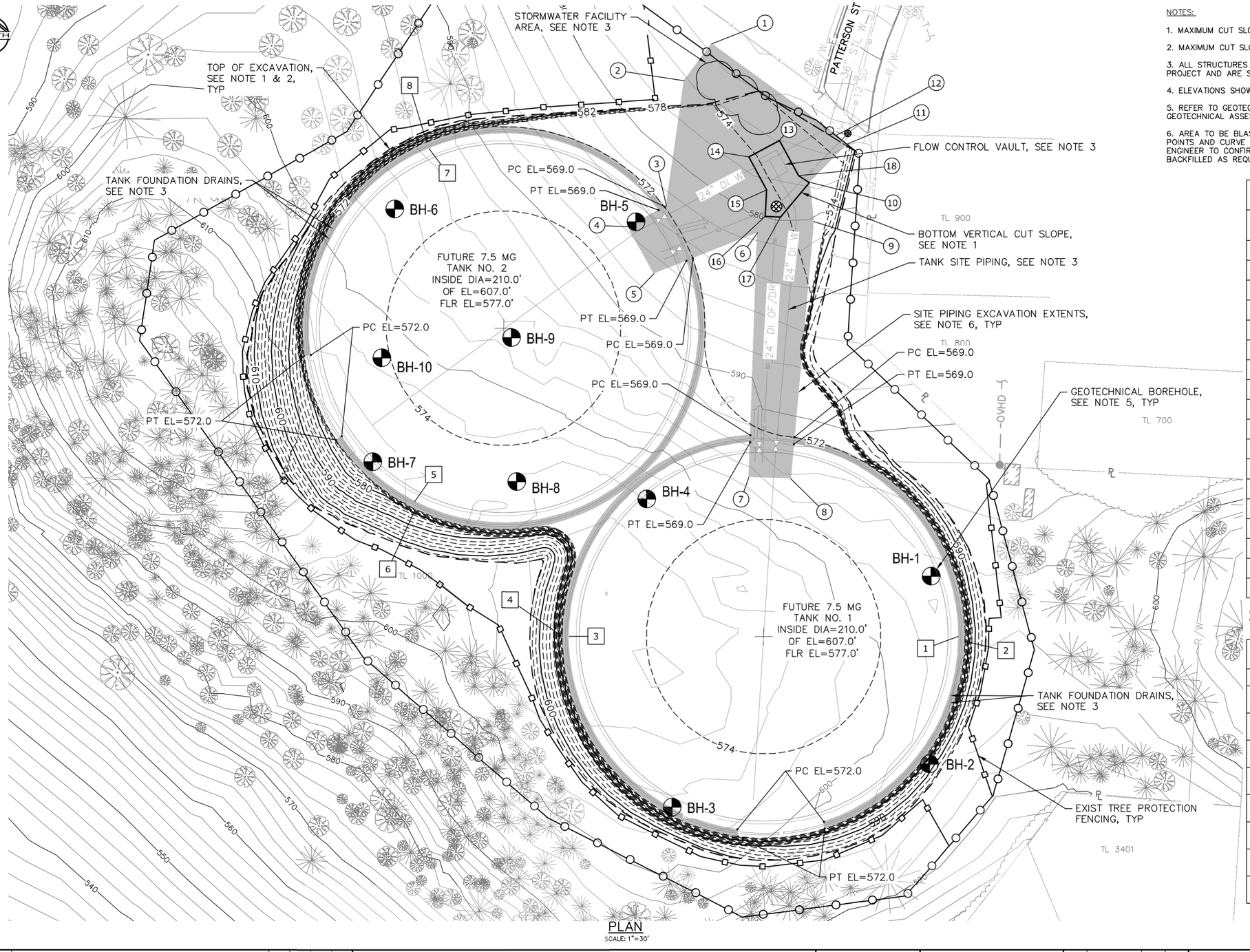
FUNC	BY	CHK	APP
DES	URNESS	MLM	TPB
DWN	DKH		
STANDARDS CHECK			

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

WATER DISTRIBUTION
E. 40TH AVENUE
7.5 MG STORAGE TANKS
TANK EXCAVATION PLAN

EWEB WORK ORDER NO. 1801700
SCALE: 1"=40'
DATE: 06/30/2021
DWG NO: D-38468-C2
PROJECT SHEET NO: 5 OF XX
REV 0

G:\PDX_Projects\20\2888 - EWEB E. 40th Ave Reservoir\CAD\Sheets\EWEB_C - Excavation-Package.dwg C2 6/30/2021 7:05 PM JORY.URNESS 23.0s (LMS Tech)



PLAN
SCALE: 1"=30'

NOTES:

1. MAXIMUM CUT SLOPE FOR AREAS WITH COMPETENT ROCK SHALL BE 1/4:1.
2. MAXIMUM CUT SLOPE FOR UNDISTURBED NATIVE SOIL ABOVE TOP OF ROCK SHALL BE 1:1.
3. ALL STRUCTURES AND SITE PIPING ARE TO BE CONSTRUCTED AS PART OF A FUTURE PROJECT AND ARE SHOWN FOR REFERENCE ONLY.
4. ELEVATIONS SHOWN ARE BASED ON NGVD 29 DATUM.
5. REFER TO GEOTECHNICAL REPORT IN SUPPLEMENTAL INFORMATION FOR BORING LOGS AND GEOTECHNICAL ASSESSMENT.
6. AREA TO BE BLASTED TO A GREATER DEPTH FOR FUTURE SITE PIPING PER CONTROL POINTS AND CURVE TABLE. CONTRACTOR SHALL SPOT CHECK AREAS AS DIRECTED BY ENGINEER TO CONFIRM DEPTH HAS BEEN ACHIEVED. AFTER CONFIRMING DEPTH, AREAS TO BE BACKFILLED AS REQUIRED TO PROVIDE FINAL GRADING PER SHEET C2.

CONTROL POINTS TABLE

PT NO.	NORTHING	EASTING	ELEVATION	
1	N864706.40	E4241718.70	565.00	
2	N864685.10	E4241702.93	565.00	
3	N864613.21	E4241692.73	570.50	
4	N864601.13	E4241670.57	570.50	
5	N864574.22	E4241685.61	570.50	
6	N864597.78	E4241745.05	570.00	
7	N864457.15	E4241740.21	570.50	
8	N864456.37	E4241764.22	570.50	
9	N864604.17	E4241777.45	570.00	
10	N864626.67	E4241775.05	563.00	
11	N864630.49	E4241768.79	563.00	
12	N864648.48	E4241796.43	563.00	
13	N864654.02	E4241790.66	566.00	563.00*
14	N864650.88	E4241757.68	570.00	566.00*
15	N864641.31	E4241740.12	570.00	566.00*
16	N864622.44	E4241750.40	570.00	563.00*
17	N864607.16	E4241749.57	570.00	563.00*
18	N864606.69	E4241758.27	566.00	563.00*

*FOR POINTS 13 THROUGH 18, ELEVATIONS GIVEN AT TOP AND BOTTOM OF VERTICAL CUT.

CURVE TABLE

CURVE NO.	PC	PT	DELTA	RADIUS	LENGTH
1	N864258.95 E4241783.31	N864476.09 E4241766.03	153°01'57"	112.00'	299.14'
2	N864480.09 E4241766.38	N864254.87 E4241783.67	153°37'01"	116.00'	311.01'
3	N864254.48 E4241733.51	N864477.19 E4241740.91	168°16'51"	112.00'	328.95'
4	N864481.20 E4241741.05	N864250.40 E4241733.88	168°56'19"	116.00'	342.03'
5	N864480.67 E4241505.97	N864581.59 E4241704.21	166°30'55"	112.00'	325.50'
6	N864583.07 E4241707.93	N864478.45 E4241502.64	166°33'46"	116.00'	337.22'
7	N864527.40 E4241488.19	N864610.74 E4241688.20	150°36'59"	112.00'	294.42'
8	N864612.67 E4241691.75	N864526.85 E4241484.23	150°55'09"	116.00'	305.55'

REV NO.	REV DATE	REVISION DESCRIPTION	DWN	STD	CHK	APP

murraysmith
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OREGON 97204
P 503.225.9010

REGISTERED PROFESSIONAL ENGINEER 65840 OREGON DECEMBER 29, 2006 MICHAEL L. McKILLIP RENEWS 12-31-22

EWEB

FUNC	BY	CHK	APP
DES	URNESS	MLM	TPB
DWN	DKH		
STANDARDS CHECK			

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

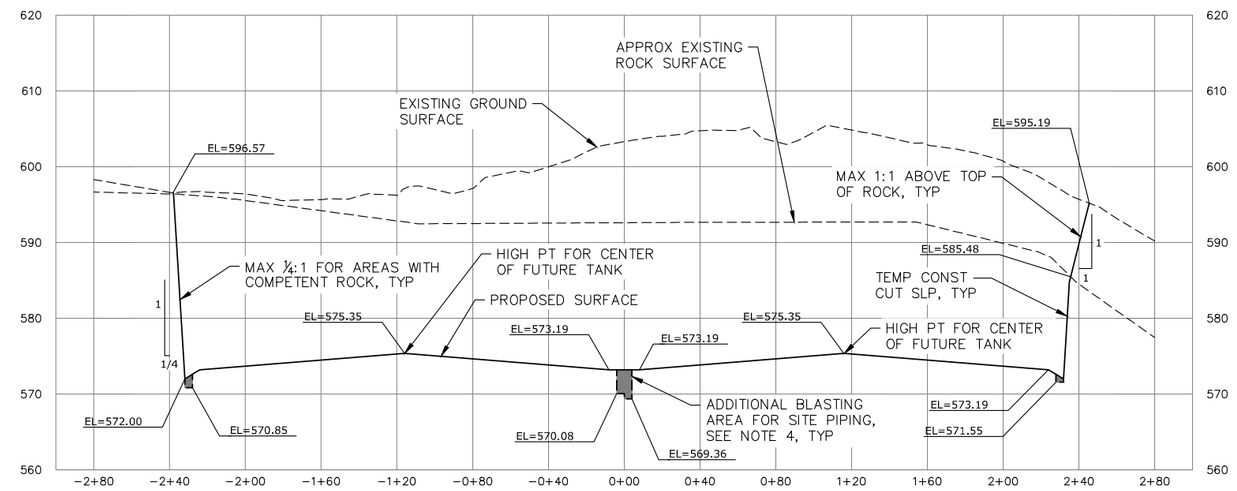
WATER DISTRIBUTION
E. 40TH AVENUE
7.5 MG STORAGE TANKS
SITE PIPING EXCAVATION PLAN

EWEB WORK ORDER NO. 1801700
SCALE: 1"=40'
DATE: 06/30/2021
DWG NO: D-38468-C3
PROJECT SHEET NO: 6 OF XX
REV 0

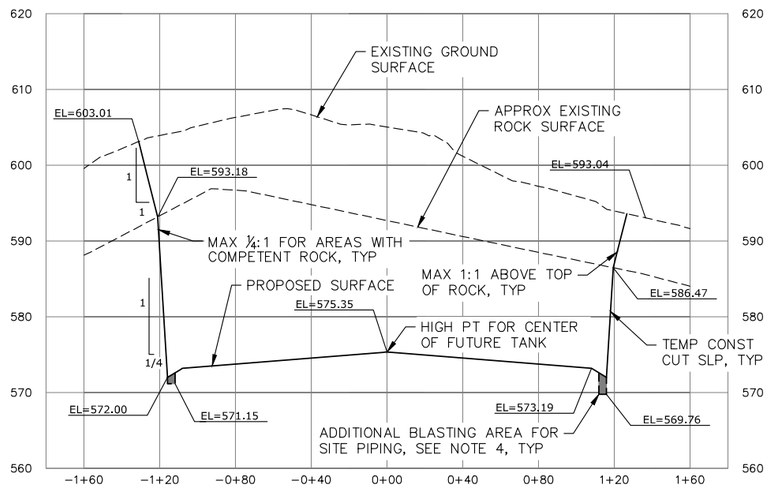
G:\PDX_Projects\20\2888 - EWEB E. 40th Ave Reservoir\CAD\Sheets\EWEB_C - Excavation-Package.dwg C3 7/1/2021 11:54 AM JORY.URNESS 23.0s (LMS Tech)

NOTES:

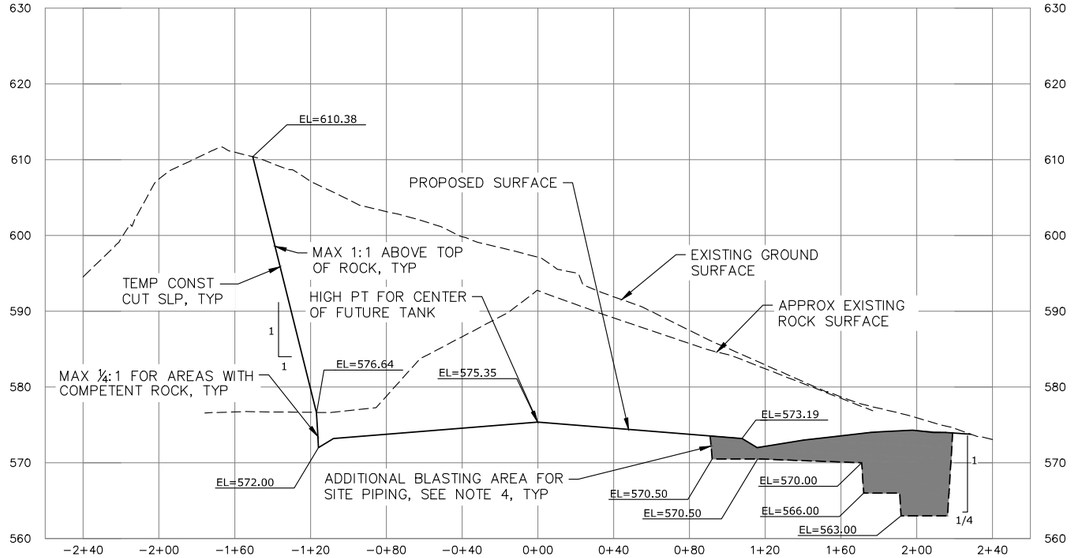
1. ELEVATIONS SHOWN ARE BASED ON NGVD29 DATUM.
2. IN THE CASE THAT OVERBLASTING BENEATH THE TANK OCCURS, CONTRACTOR SHALL BUILD BACK SUBGRADE WITH STRUCTURAL FILL TO THE ELEVATIONS SHOWN ON THE SECTION VIEWS.
3. TEMPORARY CONSTRUCTION CUT SLOPES SHOWN ARE BASED ON ASSUMPTIONS DETAILED IN THE DESIGN NOTES ON SHEET C2.
4. SEE SHEET C3 FOR SITE PIPING EXCAVATION PLAN.



EXCAVATION SECTION A (C2)
SCALE: 1"=40' HORIZ, 1"=10' VERT



EXCAVATION SECTION B (C2)
SCALE: 1"=40' HORIZ, 1"=10' VERT



EXCAVATION SECTION C (C2)
SCALE: 1"=40' HORIZ, 1"=10' VERT

REV NO.	REV DATE	REVISION DESCRIPTION	DWN	STD	CHK	APP

murraysmith
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OREGON 97204
P 503.225.9010

REGISTERED PROFESSIONAL ENGINEER 65640 OREGON DECEMBER 29, 2006 MICHAEL L. McKILLIP
RENEWS 12-31-22

EWEB

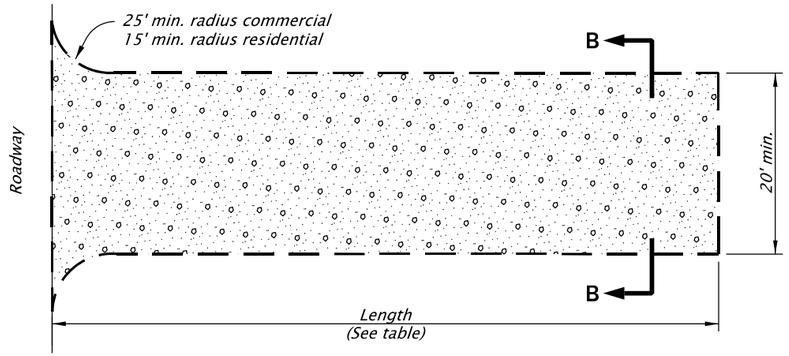
FUNC	BY	CHK	APP
DES	URNESS	MLM	TPB
DWN	DKH		
STANDARDS CHECK			

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

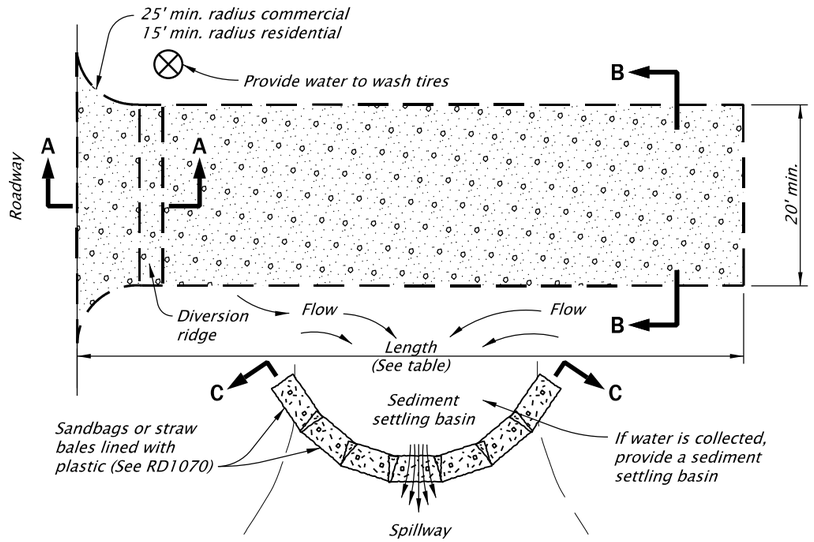
WATER DISTRIBUTION
E. 40TH AVENUE
7.5 MG STORAGE TANKS
EXCAVATION SECTIONS

EWEB WORK ORDER NO. 1801700
SCALE: 1"=40'
DATE: 06/30/2021
DWG NO: D-38468-C4
PROJECT SHEET NO: 7 OF XX
REV 0

G:\PDX_Projects\20\2888 - EWEB E. 40th Ave Reservoir\CAD\Sheets\EWEB_C - Excavation-Package.dwg C4 6/30/2021 7:05 PM JOEY.URNESS 23.0s (LMS Tech)



CONSTRUCTION ENTRANCE - TYPE 1
NOT TO SCALE



CONSTRUCTION ENTRANCE - TYPE 2
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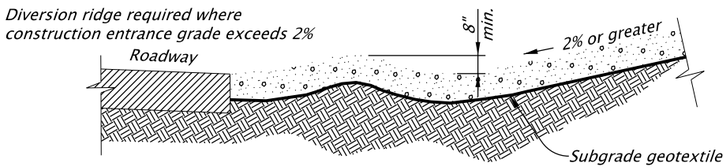
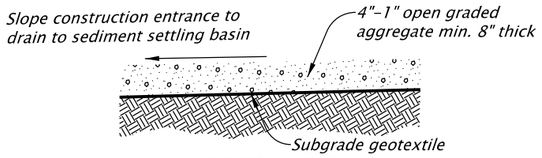
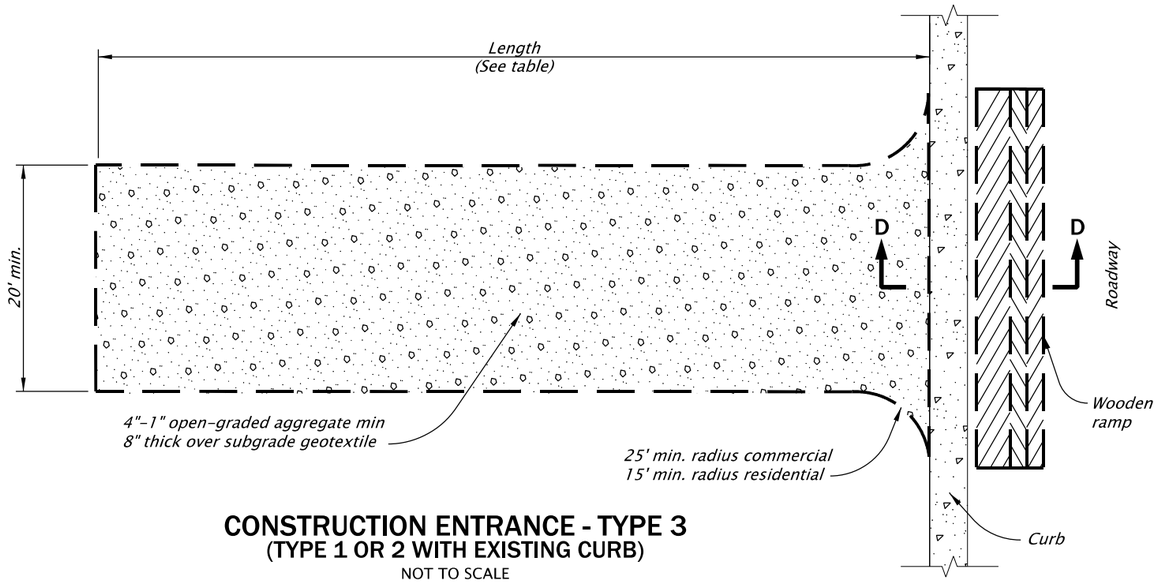


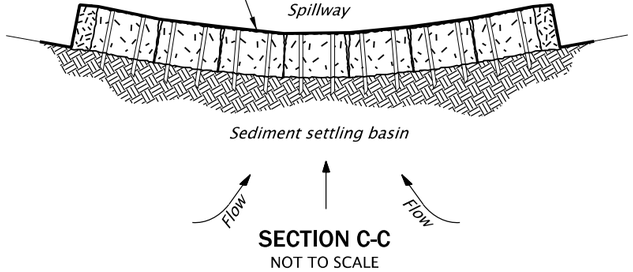
SECTION A-A
NOT TO SCALE



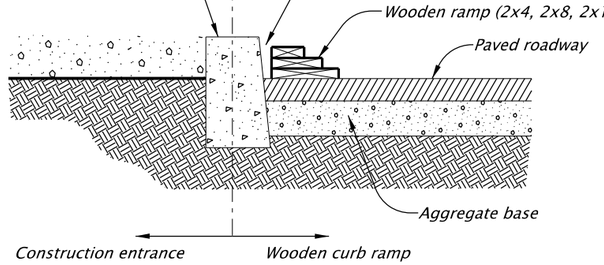
SECTION B-B
NOT TO SCALE



CONSTRUCTION ENTRANCE - TYPE 3
(TYPE 1 OR 2 WITH EXISTING CURB)
NOT TO SCALE



SECTION C-C
NOT TO SCALE



WOODEN CURB RAMP SECTION D-D
NOT TO SCALE

NOTES:
1. *The Type 1 entrance is a simple entrance without a diversion ridge or settling basin.*
2. *The wooden ramp may be used on either Type 1 or Type 2 entrances in situations where there is curb and the curb is not removed for the construction entrance.*

CONSTRUCTION ENTRANCE TABLE MINIMUM LENGTH	
Length (FT)	*Area Of Exposed Soil (Acre)*
20	*0.25*
50	*0.25 < A < 1.0*
100	*A > 1.0*

CALC. BOOK NO. 6408

SDR DATE July, 2020

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

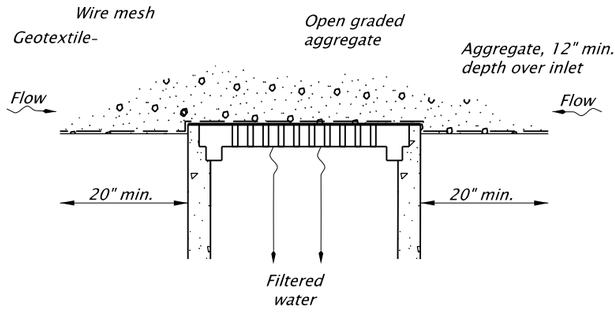
CONSTRUCTION ENTRANCES

2021

DATE	REVISION DESCRIPTION

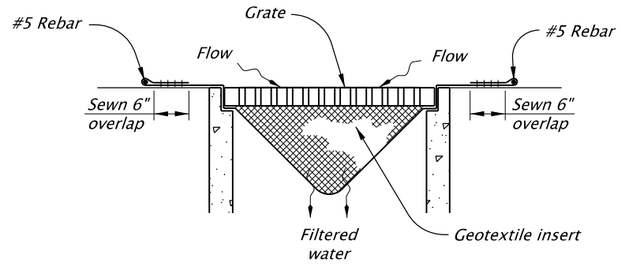
RD1000

RD1000



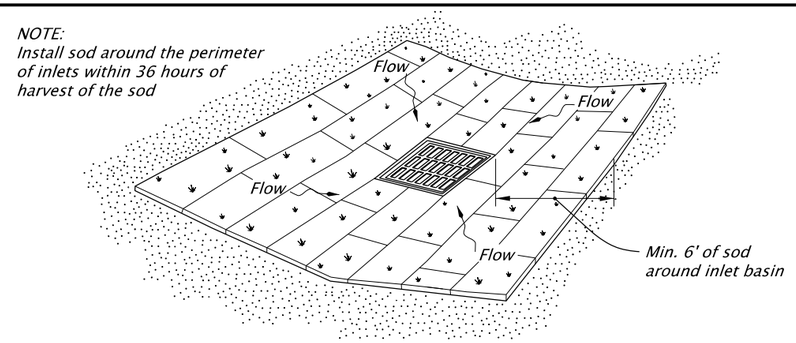
GEOTEXTILE/WIRE MESH/AGGREGATE - TYPE 2

NOT TO SCALE



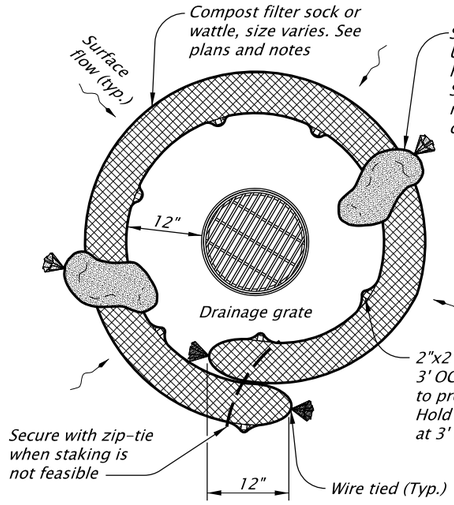
PREFABRICATED FILTER INSERT - TYPE 3

NOT TO SCALE

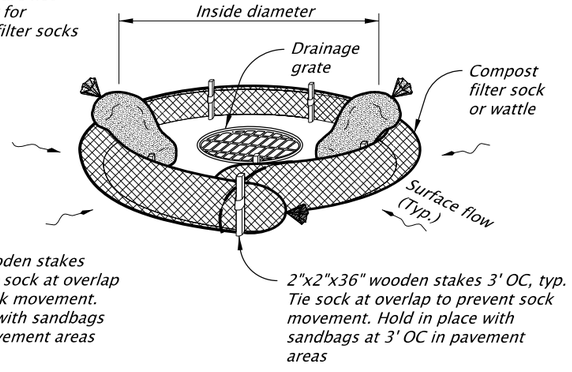


SOD PROTECTION - TYPE 6

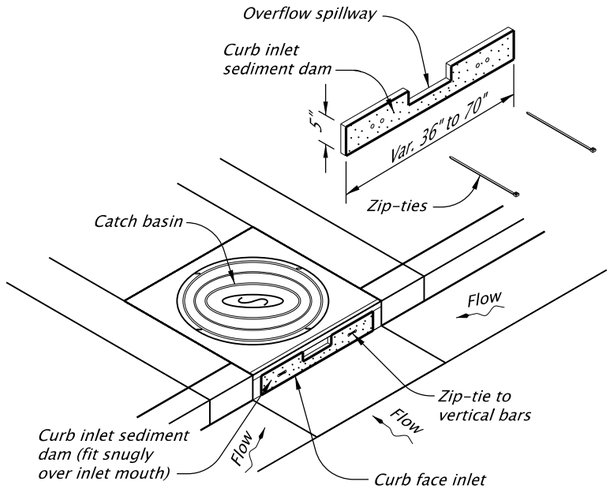
NOT TO SCALE



AREA DRAIN PLAN

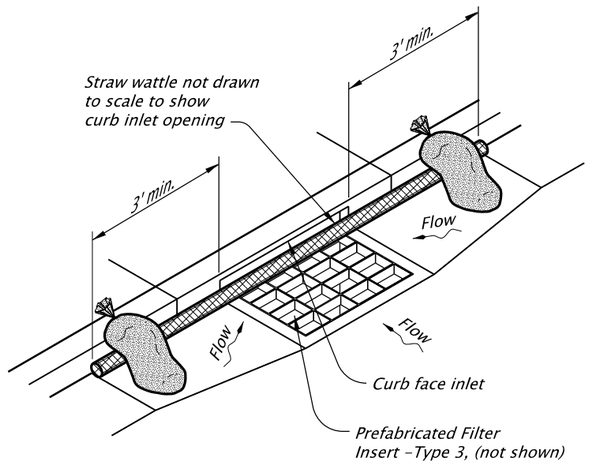


AREA DRAIN PERSPECTIVE VIEW



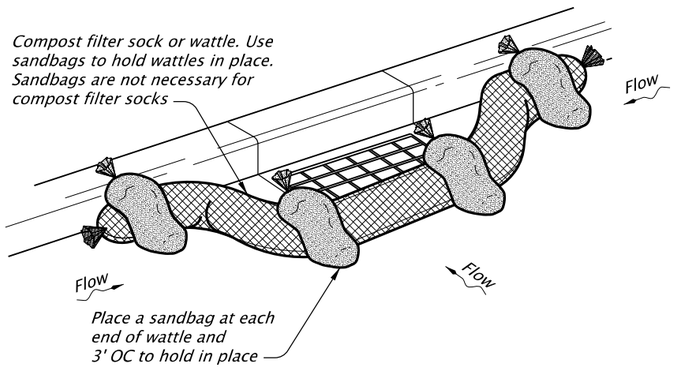
CURB INLET SEDIMENT DAM - TYPE 10

NOT TO SCALE



WATTLE BARRIER WITH FILTER INSERT - TYPE 11

NOT TO SCALE



CURB INLET PERSPECTIVE VIEW

COMPOST FILTER SOCK OR WATTLE - TYPE 7

NOT TO SCALE

NOTES:
Type 2 - Geotextile/wire mesh/aggregate
Place the wire mesh over the grate.
Place sediment fence geotextile over the wire mesh and perimeter area around structure.
Install aggregate over the geotextile fabric.

Type 3 - Prefabricated filter inserts
Install prefabricated filter inserts according to the plans, special provisions, and manufacturer recommendations.
Prefabricated inserts with provisions for overflow are allowed only when accompanied by additional BMP's to prevent the potential of sediments entering project storm systems.
Field fabricated inserts are not allowed.

Type 7 - Compost filter sock
Drive 2"x2" wood stakes a minimum of 6" into ground and flush with the top of the sock.
Overlap ends of sock per manufacturers recommendations (12"min., 36" max.).
Use 8" to 12" dia sock on curbside in traffic areas.
(Type 7 cont.)
Use 12" to 18" dia sock in non-traffic areas or areas where the larger socks can be used safely.
use synthetic mesh socks for temporary installations.

Type 10 - Curb inlet sediment dam
Fit curb inlet sediment dam snugly into inlet mouth. Curb inlet sediment dam is required for use with inlet filter insert where at-grade inlet grate and curb inlet are combined at a catch basin.

Type 11 - Wattle barrier with filter insert
Install prefabricated filter insert per Type 3 detail.
Install wattles over opening and 36" to each side of opening tight against curb. Adjust wattle to force storm water to flow through filter insert or wattle prior to leaving the site.
Adjust, replace or modify the inlet protection as needed to prevent sediment laden water from entering the catch basin.

CALC. BOOK NO. _ 6402, 6406, 6407 _

SDR DATE . _ _ _ _ _ _ July, 2020 _ _ _ _ _ _ _ _ _

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

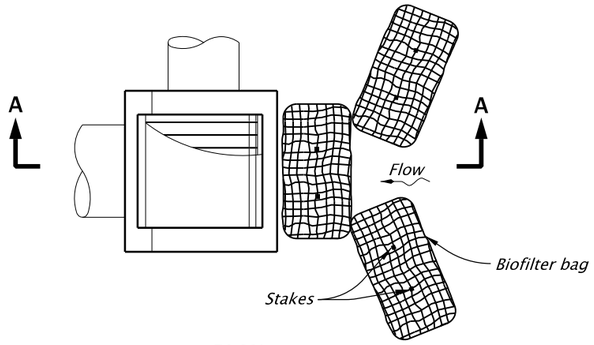
INLET PROTECTION
TYPE 2, 3, 6, 7, 10 AND 11

2021

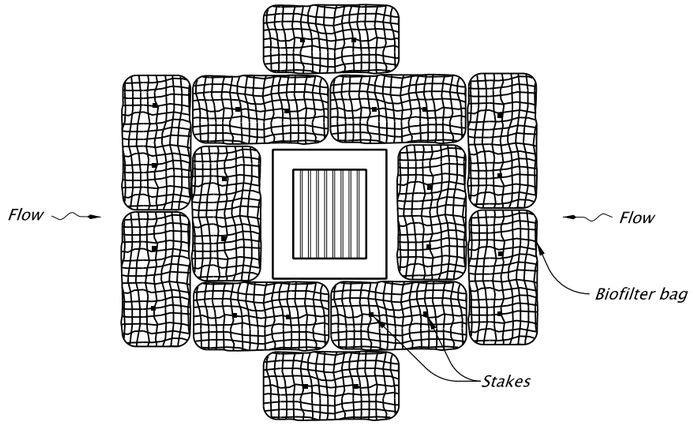
DATE	REVISION DESCRIPTION

RD1010

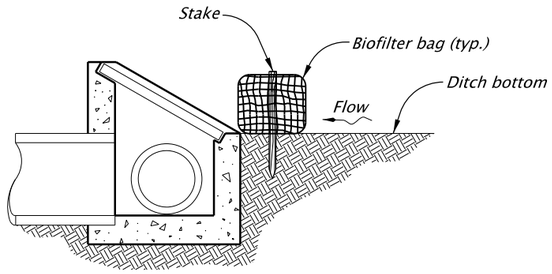
RD1010



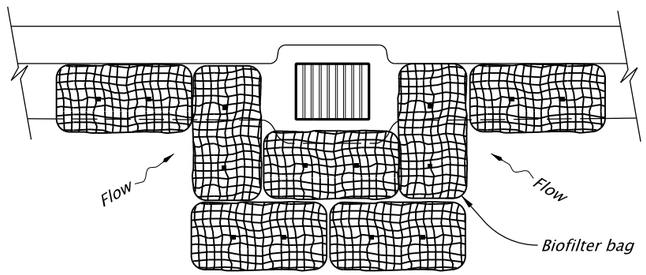
PLAN
DITCH INLET



PLAN
AREA DRAIN



SECTION A-A
DITCH INLET



PLAN
CATCH BASIN

BIOFILTER BAGS - TYPE 4

NOT TO SCALE

NOTES:

1. *Stake biofilter bags with 2"x2"x36" wood stakes, and use a minimum 2 stakes per bag. Drive stakes a minimum of 6" into the ground and flush with the top of the bags.*
2. *Omit stakes when bags are placed on pavement surface.*
3. *Overlap all bag joints 6".*
4. *Biofilter bags used on active roadways are easily displaced and made ineffective if struck by vehicles. If struck by a cyclist, falls with injury could result. On active roadways alternative inlet protection should be considered.*

CALC. BOOK NO. 6402, 6406, 6407

SDR DATE July, 2020

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

OREGON STANDARD DRAWINGS

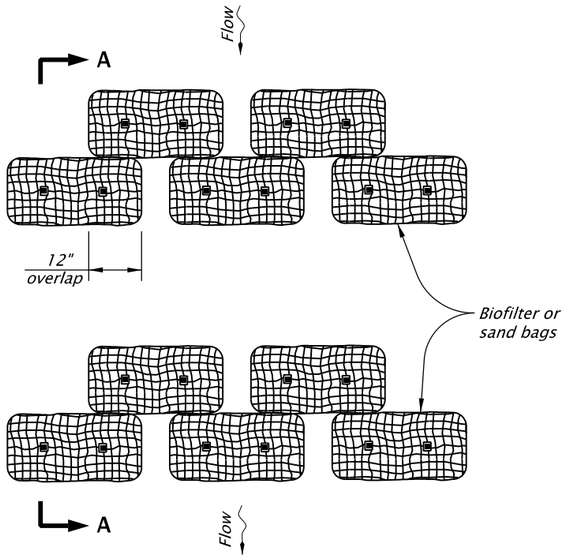
INLET PROTECTION TYPE 4

2021

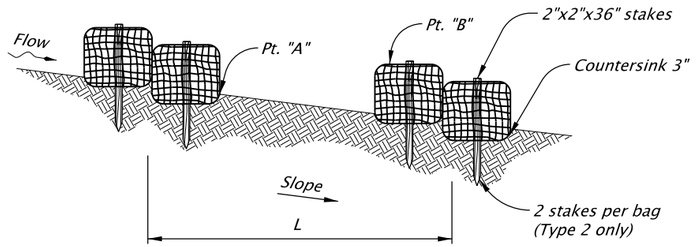
DATE	REVISION DESCRIPTION

RD1015

RD1015



PLAN



SECTION A-A

BIOFILTER BAG / SAND BAG BARRIER - TYPE 2 AND 4

NOT TO SCALE

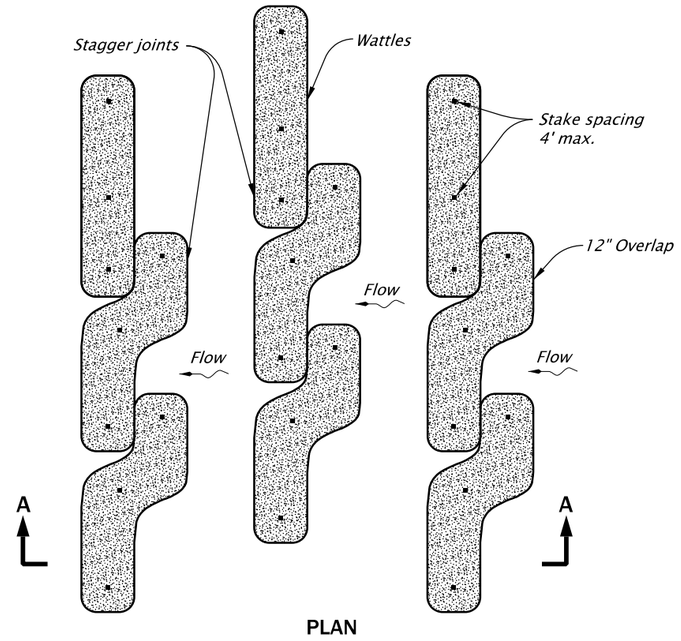
NOTES:

1. *For Type 2 barrier, drive stakes flush with top of bag and into undisturbed ground a min. of 12". Omit stakes if bags are placed on paved surface.*

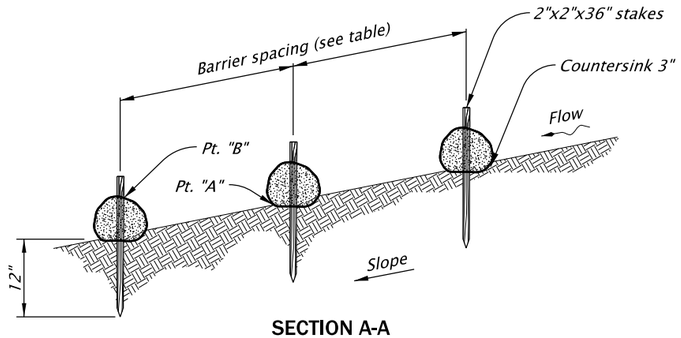
2. *For Type 2 and Type 4 barriers, space bags (L) so that the elevation of point "A" is less than or equal to the elevation of point "B".*

Type 2 – Biofilter bags
Type 3 – Wattles
Type 4 – Sand bags

BARRIER SPACING		
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS		
% SLOPE	% SLOPE	MAXIMUM SPACING ON SLOPE
10% Flatter	1:10 or Flatter	300'
10 > % ≥ 15	10 > X ≥ 7.5	150'
15 > % ≥ 20	7.5 > X ≥ 5	100'
20 > % ≥ 30	5 > X ≥ 3	50'
Steeper than 30%	Steeper than 1:3	25'



PLAN



SECTION A-A

FIBER ROLL BARRIER - TYPE 3

NOT TO SCALE

CALC. BOOK NO. N/A

SDR DATE January, 2021

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

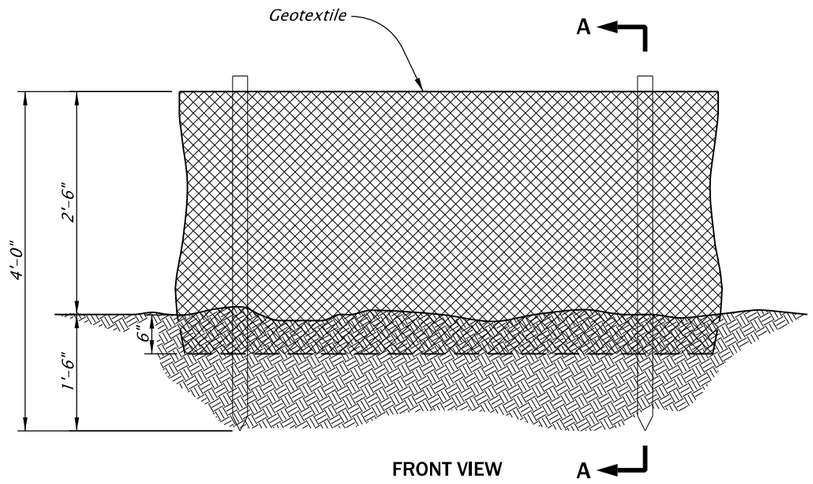
OREGON STANDARD DRAWINGS

SEDIMENT BARRIER TYPE 2, 3 AND 4

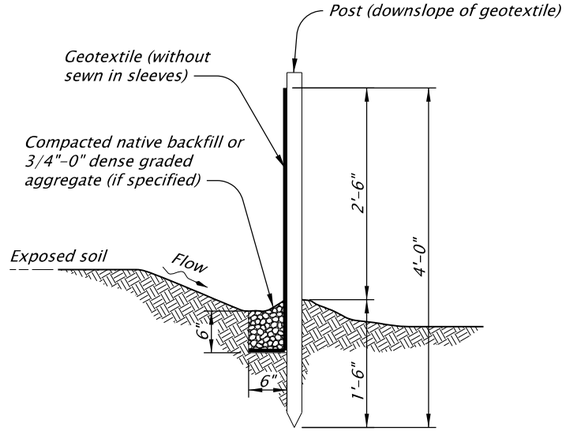
2021

DATE	REVISION DESCRIPTION
Jan 2021	Removed Calc book numbers

Effective Date: June 1, 2021 - November 30, 2021



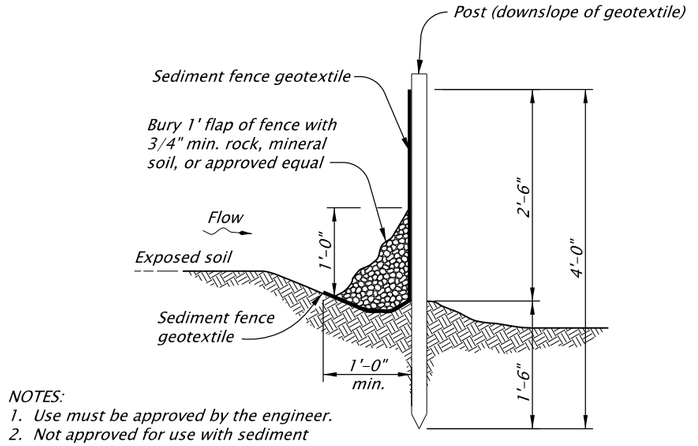
FRONT VIEW



SECTION A-A

SEDIMENT FENCE AND GEOTEXTILE BURY DETAIL - TYPE 1

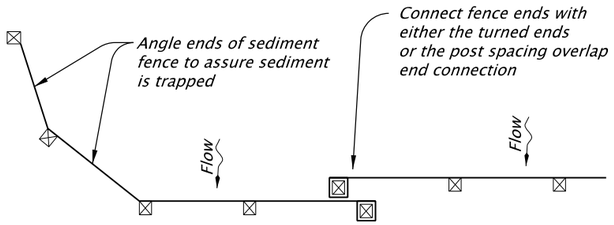
NOT TO SCALE



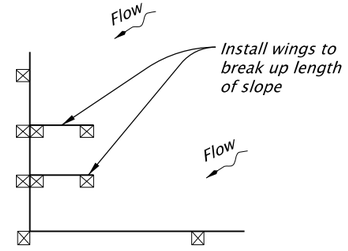
NOTES:
1. Use must be approved by the engineer.
2. Not approved for use with sediment fencing with sewn-in post sleeves.

ALTERNATE SEDIMENT FENCE WITHOUT TRENCHING - TYPE 2

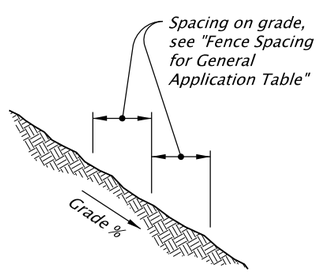
NOT TO SCALE



PLAN VIEW



TERMINATION AT CORNER OR PROPERTY LINE



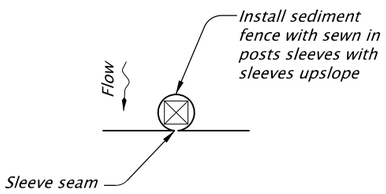
GENERAL NOTES:
1. Use 2"x2" wood fence posts.
2. Posts to be installed on downhill side of sediment fence geotextile. Position posts to prevent separation from geotextile.
3. Compact filter fabric trench backfill and soil on uphill side of fence.
4. Locate fence no closer than three feet to the toe of a slope.
5. Wing spacing shall comply with "Fence Spacing for General Application Table".

FENCE SPACING FOR GENERAL APPLICATION TABLE

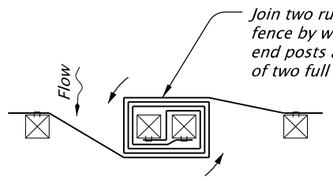
INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS	
GRADE	MAXIMUM SPACING ON GRADE
Grade < 10%	300'
10% ≤ Grade < 15%	150'
15% ≤ Grade < 20%	100'
20% ≤ Grade < 30%	50'
30% ≤ Grade	25'

POST SPACING TABLE

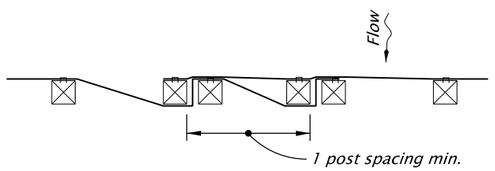
6'	Sediment Fence with Geotextile elongation less than 50%
4'	Sediment Fence with Geotextile elongation 50% or more



GEOTEXTILE WITH POST SLEEVES



TURNED ENDS CONNECTION



POST SPACING OVERLAP CONNECTION

GEOTEXTILE END CONNECTIONS

NOT TO SCALE

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

CALC. BOOK NO. 6403, 6404, 6405

SDR DATE July, 2020

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

SEDIMENT FENCE

2021

DATE	REVISION DESCRIPTION

RD1040

RD1040

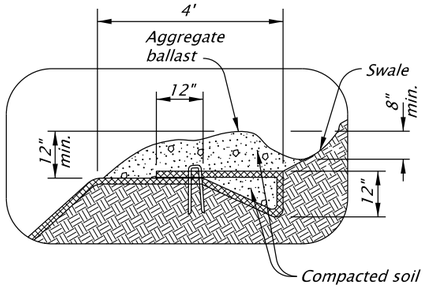


FIGURE A1:
TOP OF BANK ANCHOR TRENCH, H>3' AND TERMINAL SLOPE
NOT TO SCALE

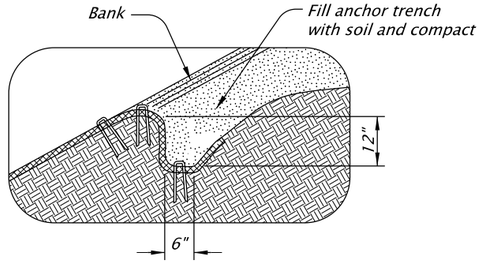


FIGURE A2:
TOP OF BANK ANCHOR TRENCH, H<3'
NOT TO SCALE

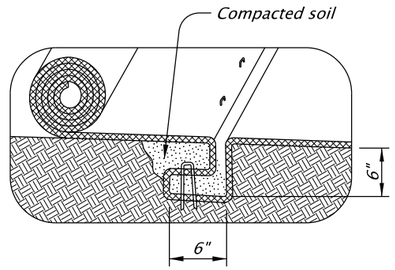


FIGURE A3:
CHANNEL CHECK SLOT
NOT TO SCALE

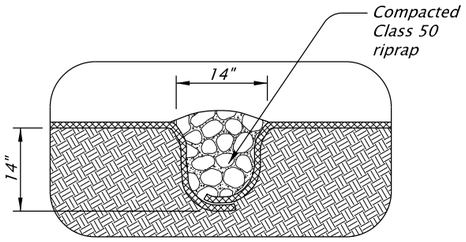


FIGURE A4:
CHANNEL CHECK SLOT WITH ROCK BACKFILL
NOT TO SCALE

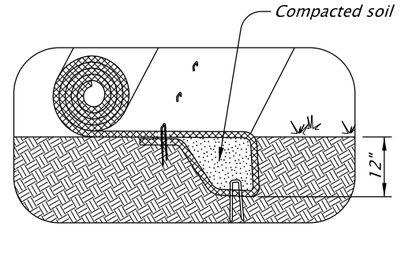
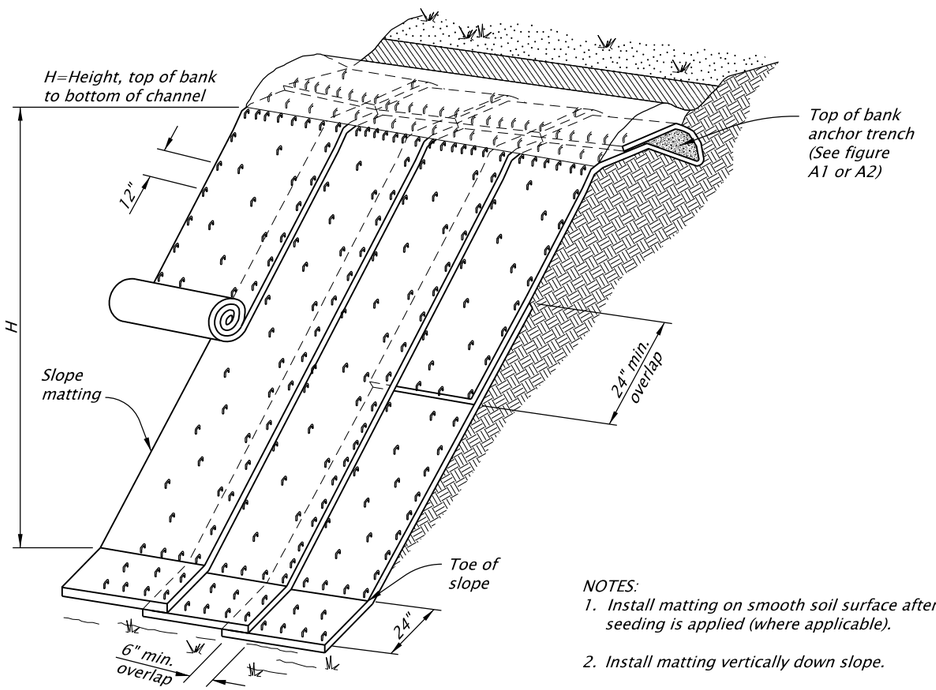
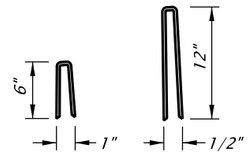


FIGURE A5:
INITIAL CHANNEL ANCHOR TRENCH
NOT TO SCALE

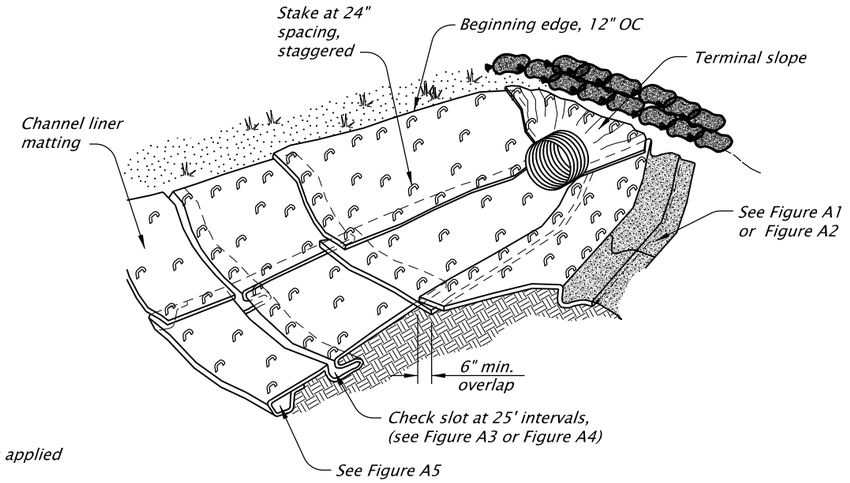


SLOPE MATTING ISOMETRIC VIEW
NOT TO SCALE

NOTES:
1. *Install matting on smooth soil surface after seeding is applied (where applicable).*
2. *Install matting vertically down slope.*
3. *Install matting so edge overlaps are shingled away from prevailing winds.*
4. *Place fastener at 12" OC on matting edges*
5. *Overlap upper mat over lower mat, and fasten.*
6. *Stagger alternate rows of fasteners placed at 24" OC*
7. *Extend mat 24" beyond toe of slope; fold mat back under 4" and fasten.*
8. *Matting Types A through E: Furnish fully biodegradable product. Matting with plastic or photodegradable components will not be accepted.*



STAPLES
NOT TO SCALE



CHANNEL MATTING ISOMETRIC VIEW
NOT TO SCALE

NOTES:
1. *Install matting on smooth soil surface after seeding is applied (where applicable).*
2. *Install channel liner matting, in the direction of water flow. Anchor upstream end of mat with check slot for culvert outfalls, place mat under pipe 12" minimum upstream from pipe outlet.*
3. *Construct check slots across channel bottom at 25' spacing and at the end of each mat (Fig. A3 or A4).*
4. *Overlap side channel liner matting edges 6" over the center channel liner matting and fasten edges 12" OC Continue overlap and stapling pattern for each additional side channel liner mat.*
5. *Lap upstream matting end 12" over beginning edge of downstream matting. Fasten 12" OC*
6. *Anchor top edge of side channel matting in trench and fasten 12" OC (Fig. A2).*
7. *Fasten matting interior at 24" OC with staggered spacing.*
8. *Construct initial anchor trench at downstream end of matting and terminal slope anchor at upstream end.*
9. *Matting Types A through E: Furnish fully biodegradable product. Matting with plastic or photodegradable components will not be accepted.*

CALC. BOOK NO. N/A

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user and should not be used without consulting a Registered Professional Engineer.

SDR DATE January, 2021

NOTE: All material and workmanship shall be in accordance with the current Oregon Standard Specifications

OREGON STANDARD DRAWINGS

SLOPE AND CHANNEL MATTING

2021

DATE	REVISION DESCRIPTION
Jan 2021	Removed Calc book numbers

RD1055