CLACKAMAS COUNTY
NOTICE OF PUBLIC IMPROVEMENT CONTRACT OPPORTUNITY

INVITATION TO BID #2017-74
SE 115th Avenue Utility Extension Project
August 30, 2017

Clackamas County ("County") through its Board of County Commissioners is accepting sealed bids for the **115th Avenue Utility Extension Project** until **September 20, 2017, 2:00 PM,** Pacific Time, ("Bid Closing") at the following location:

DELIVER BIDS TO: Clackamas County Procurement Division, Attention George Marlton, Director, Clackamas County Public Services Building, 2051 Kaen Road, Oregon City, OR 97045.

Bid packets are available from 7:00 AM to 6:00 PM Monday through Thursday at the above address or may be obtained at the Clackamas County Procurement Website at http://www.clackamas.us/bids/.

Contact Information
Procurement Process and Technical Questions: Ryan Rice, 503-742-5446 or vial email at rrice@clackamas.us .

Bids will be opened and publicly read aloud at the above Delivery address after the Bid Closing. Bid results will also be posted to the Clackamas County Procurement Website shortly after the opening.

To be eligible for award under this Invitation to Bid, bidders (prime contractors) must submit a prequalification application to the County at least two business days prior to the Bid Closing. County will reject bids from bidders who are not prequalified for the class of work indicated prior to the Bid Closing.
Bidders must be prequalified in the areas of Earthwork and Drainage (EART).

State Prevailing Wage Rates
Prevailing Wage Rates requirements apply to this Project because the maximum compensation for all Owner-contracted Work is more than $50,000. Contractor and all subcontractors shall comply with the provisions of ORS 279C.800 through 279C.870, relative to Prevailing Wage Rates. The Bureau of Labor and Industries (BOLI) wage rates and requirements set forth in the following BOLI booklet (and any listed amendments to that booklet), which are incorporated herein by reference, apply to the Work authorized under this Agreement:

PREVAILING WAGE RATES for Public Works Contracts in Oregon, July 1, 2017, which can be downloaded at the following web
address: http://www.oregon.gov/boli/WHD/PWR/JULY2017/July_1_2017_PWR.pdf.
The Work will take place in Clackamas County, Oregon.

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT OPPORTUNITY

Table of Contents

SECTION 2

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
INSTRUCTIONS TO BIDDERS

Clackamas County Local Contract Review Board Rules ("LCRB Rules") govern this procurement process and are in accordance with state and federal requirements. LCRB Rules may be found at: http://www.clackamas.us/code/documents/appendixc.pdf. The Instructions to Bidders is applicable to the procurement process for Clackamas County, or any component unit thereof identified on the Notice of Public Improvement Contract Opportunity, herein after referred to as the "County."

Article 1. Scope of Work/Bidder Prequalification

The work contemplated under this contract with the County, includes all labor, materials, transportation, equipment and services necessary for, and reasonably incidental to, the completion of all construction work in connection with the project described in the Contract Documents. The Contract Documents are defined in Section 00110.20 of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County.

Only Bidders prequalified through ODOT for the classes of work described in the Contract Documents will be accepted. See Section 00120.00 of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County. Under ORS 279C.430, proof of prequalification for the classes of work described in the Notice of Public Improvement Contract Opportunity must be submitted to the County prior to Bid Closing. **IF YOU ARE UNCERTAIN REGARDING YOUR PREQUALIFICATION STATUS, PLEASE CONTACT PROCUREMENT AT 503-742-5441.**

Article 2. Examination of Site and Conditions

Before making a Bid, the Bidder shall examine the site of the work and ascertain all the physical conditions in relation thereto. See Section 00120.15 of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County.

Article 3. Interpretation of Contract Documents and Approval of Materials Equal to Those Provided in the Specifications

If any Bidder contemplating submitting a Bid for the proposed contract is in doubt as to the true meaning of any part of the Plans, Special Provisions or forms of Contract Documents, or detects discrepancies or omissions, such Bidder may submit to the Engineer written request for an interpretation thereof at least ten (10) calendar days prior to the date set for the Bid Closing.

When a prospective Bidder seeks approval of a particular manufacturer's material, process or item of equal value, utility or merit other than that designated by the Engineer in the Contract Documents, the Bidder may submit to the Engineer a written request for approval of such substitute at least ten (10) calendar days prior to the date set for the Bid Closing. The prospective Bidder submitting the request will be responsible for its prompt delivery.

Requests of approval for a substitution from that specified shall be accompanied by samples, records of performance, certified copies of tests by impartial and recognized laboratories, and such other information as the Engineer may request.

To establish a basis of quality, certain processes, types of machinery and equipment or kinds of materials may be specified in the Contract

Documents either by description of process or by designating a manufacturer by name and referring to a brand or product designation or by specifying a kind of material. Whenever a process is designated or a manufacturer's name, brand or item designation is given, or whenever a process or material covered by patent is designated or described, it shall be understood that the words "or approved equal" follow such name, designation or description, whether in fact they do so or not.
Any interpretation of the Contract Documents or approval of manufacturer's material will be made only by an Addendum duly issued. All Addenda will be posted to the Clackamas County Procurement Website (www.clackamas.us/bids/) will become a part of the Contact Documents. The County will not be responsible for any other explanation or interpretation of the Contract Documents nor for any other approval of a particular manufacturer's process or item for any Bidder.

When the Engineer approves a substitution by Addendum, it is with the understanding that the Contractor guarantees the substituted article or material to be equal or better than the one specified.

Unless the Engineer has approved substitutions of Materials, Equipment, and/or methods prior to opening of Bids, the Bidder shall furnish the items specified in the Contract. Substitution after Award is specified in 00180.31(b), 00180.31(c), and 00180.31(d).

Article 4. Security to Be Furnished by Each Bidder

Each Bid must be accompanied by either 1) a cashier's check or a certified check drawn on a bank authorized to do business in the State of Oregon, or 2) a Bid Bond described hereinafter, executed in favor of the County, for an amount equal to ten percent (10%) of the total amount Bid as a guarantee that, if awarded the contract, the Bidder will execute the contract and provide a Performance Bond and Payment Bond as required or 3) Irrevocable letter of credit issued by an insured institution as defined in ORS 706.008. The successful Bidder's check or Bid Bond will be retained until the Bidder has entered into a contract satisfactory to County and furnished a one hundred percent (100%) performance bond and one hundred percent (100%) Payment Bond. The County reserves the right to hold the Bid security as described in Article 10 hereof. Should the successful Bidder fail to execute and deliver the contract as provided for in Article 12 hereof, including a satisfactory performance bond and payment bond within twenty (20) calendar days after the Bid has been accepted by the County, then the contract award made to such Bidder may be considered canceled and the Bid security may be forfeited as liquidated damages at the option of the County. The date of the acceptance of the Bid and the award of the contract as contemplated by the Contract Documents shall mean the date of acceptance specified in the Notice of Intent to Award.

Article 5. Execution of Bid Bond

Should the Bidder elect to utilize a Bid Bond as described in Article 4 in order to satisfy the Bid security requirements, such form must be completed in the following manner:

A. Bid bonds must be executed on the County forms, which will be provided to all prospective Bidders by the County.

B. The Bid Bond shall be executed on behalf of a bonding company licensed to do business in the State of Oregon.

C. In the case of a sole individual, the bond need only be executed as principal by the sole individual. In the case of a partnership, the bond must be executed by at least one of the partners. In the case of a corporation, the bond must be executed by stating the official name of the corporation under which is placed the signature of an officer authorized to sign on behalf of the corporation followed by such person's official capacity, such as president, etc. The corporation seal should then be affixed to the bond.

D. The name of the surety must be stated in the execution over the signature of its duly

authorized attorney-in-fact and accompanied by the seal of the surety corporation.

Article 6. Execution of the Bid Proposal and Bid Schedule of Prices

Each Bid shall be made in accordance with: (i) the sample Bid Form and Bid Schedule of Prices accompanying these instructions; (ii) the appropriate signatures for a sole individual, partnership, corporation or limited liability corporation shall be added as noted in Article 5C above; (iii) numbers pertaining to base Bids shall be stated both in writing and in figures; and (iv) the Bidder's address shall be typed or printed.

The Bid Schedule of Prices relates to Bids on specific Contract Documents. Only the amounts and information asked for on the Bid Schedule of Prices furnished will be considered as the Bid. Each Bidder shall Bid upon the work exactly as specified and provided in the Bid Schedule of Prices. The Bidder shall include in the Bid a sum to cover the cost of all items contemplated by the Contract.

Bidders shall complete the certifications and statements included in the Bid Section of the Bid Booklet according to the instructions. The Bid Form shall be signed by an authorized representative certifying that the Statements in the Bid Form are accurate.

Article 7. Prohibition of Alterations to Bid

Bids that are incomplete, or contain ambiguities or have differing conditions required by the Bidder, including requested changes or exceptions to the Public Improvement Contract Agreement Form or other portions of the Contract Documents, may be rejected in County's sole and absolute discretion. Refer to Section 00120.68 of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County.

Article 8. Submission of Bid

Each Bid shall be sealed in an envelope, properly addressed to the County, showing on the outside of the envelope the name of the Bidder and the name of the project. Bids will be received at the time and place stated in the Notice of Public Improvement Contract Opportunity.

Article 9. Bid Closing and Opening of Bids

All Bids must be received by the County at the place and time set for the Bid Closing. Any Bids received after the scheduled Bid Closing time for receipt of Bids will be rejected.

At the time of opening and reading of Bids, each Bid received will be publicly opened and read aloud, irrespective of any irregularities or informalities in such Bids. Refer to Section 00120.65 of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County.

Generally, Bid results will be posted to the Procurement Website within two business days of the Bid Closing.

Article 10. Acceptance or Rejection of Bids by County

Unless all Bids are rejected, the County will award a contract based on the lowest responsive Bid from a responsible Bidder. Refer to Section 00130.00 and 00130.10 of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County. If that Bidder does not execute the contract, it will be awarded to the next lowest responsible Bidder or Bidders in succession.

The County reserves the right to reject all Bids and to waive minor informalities. The procedures for contract awards shall be in compliance with the provisions of the LCRB Rules in effect at that time.

The County reserves the right to hold the Bid and Bid security of the three lowest Bidders for a period of thirty (30) calendar days from and after the time of Bid Closing pending award of the contract. Following award of the contract the Bid security of the three lowest Bidders may be held twenty (20) calendar days pending

execution of the contract. All other Bids will be rejected and Bid security will be returned.

If no Bid has been accepted within thirty (30) calendar days after the opening of the Bids, each of the three lowest Bidders may withdraw the Bid submitted and request the return of the Bid security.

Article 11. Revision or Withdrawal of Bids

At any time prior to the Bid Closing, a Bidder may revise or withdraw its Bid. This will not preclude the submission of another Bid by such Bidder prior to the time set for the Bid Closing. Information entered into the paper Bid Form by the Bidder may be changed after the paper Bid has been delivered to the County Procurement Department, provided that:

Changes are prepared according to the instructions identified in the Bid Form identified in Article 8; and changes are received at the same offices, addresses, and times identified in the paper Bid Form for submitting Bids; and the changes are submitted in writing or by electronic mail to the email address provided in the Notice of Public Improvement Contract Opportunity, signed by an individual authorized to sign the Bid.

A Bidder may withdraw its paper Bid after it has been delivered to the County Procurement Department, provided that:

The written withdrawal request is submitted on the Bidder's letterhead, received at the same offices, addresses, and times identified in the paper Bid Form for submitting Bids, either by hand delivery or by electronic mail; and the request is signed by an individual who is authorized to withdraw the Bid, and proof of authorization to sign the Bid accompanies the withdrawal request.

After the time set for the Bid Closing, no Bidder will be permitted to withdraw its Bid within the time frames specified in Article 10 for award and execution, except as provided for in that Article.

Article 12. Execution of Contract, Performance Bond and Payment Bond

The County will provide the successful Bidder with Contract Documents within seven (7) calendar days after the completion of the award protest period. The Bidder is required to execute the contract forms as provided, including a performance bond and a payment bond from a surety company licensed to do surety business in the State of Oregon, within ten (10) calendar days after receipt of the contract forms. The Contract Documents shall be delivered to the County in the number called for and to the location as instructed by the County. For Execution by the County, refer to Section 00130.50(b) of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County.

Article 13. Recyclable Products

Contractors will use recyclable products to the maximum extent economically feasible in the performance of the Contract.

Article 14. Clarification or Protest of the Solicitation Document or Specifications

Any request for clarification or protest of the solicitation document or specifications must be submitted in the manner provided for in the applicable section of the LCRB Rules to the Procurement Representative referenced in the Notice of Public Improvement Contract Opportunity.

A protest of the Solicitation Document must be received within seven (7) business days of the issuance of the Bid or within three (3) business days of issuance of an addendum.

Requests for clarification may be submitted no less than five (5) business days prior to the Bid Closing Date.

Article 15. Protest of Intent to Award

County will name the apparent successful Bidder in a “Notice of Intent to Award” letter. Identification of the apparent successful Bidder

is procedural only and creates no right in the named Bidder to the award of the contract. Competing Bidders will be notified by publication of the Notice of Intent to Award on the Clackamas County Procurement Website of the selection of the apparent successful Bidder(s) and Bidders shall be given seven (7) calendar days from the date on the "Notice of Intent to Award" letter to review the file at the Procurement Division office and file a written protest of award, pursuant to LCRB C-049-0450. Any award protest must be in writing and must be delivered by hand delivery or mail to the Procurement Division Director at: Procurement Division, 2051 Kaen Road, Oregon City, OR 97045.

Article 16. Disclosure of First-Tier Subcontractors

Without regard to the amount of a Bidder's Bid, if the Agency's cost range for a public improvement Project in the Notice of Public Improvement Contract Opportunity, or in other advertisement or solicitation documents, exceeds $100,000, the Bidder shall, within 2 working hours of the time Bids are due to be submitted, submit to the Agency, on a form provided by the Agency, a disclosure identifying any first-tier Subcontractors that will furnish labor or labor and Materials, and whose contract value is equal to or greater than:

- 5% of the total Project Bid, but at least $15,000; or
- $350,000, regardless of the percentage of the total Project Bid.

For each Subcontractor listed, Bidders shall state:

- The name of the Subcontractor;
- The dollar amount of the subcontract and
- The category of Work that the Subcontractor would be performing.

If no subcontracts subject to the above disclosure requirements are anticipated, a Bidder shall so indicate by entering "NONE" or by filling in the appropriate check box. For each Subcontractor listed, Bidders shall provide all requested information. An incomplete form will be cause for rejection of the Bid.

Disclosures may be submitted with the Bid or may be hand delivered to the Bid Closing address or emailed to procurement@clackamas.us.

Subcontractor Disclosure Forms submitted by any method will be considered late if not received by the Agency within two 2 working hours of the time designated for receiving Bids.

In the event that multiple Subcontractor Disclosure Forms are submitted, the last version received prior to the deadline will be considered to be the intended version.

Bids not in compliance with the requirements of this Subsection will be considered non-responsive.

Article 17. Wage Rates

This project is subject to both federal and State prevailing wage rate requirements. Not less than the higher of the applicable federal or existing State prevailing wage rates shall be paid to workers according to 00170.65(b) and 00170.65(e) of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County.

Applicable Wages – Prevailing wage rates published in the following wage determinations and any applicable modifications or amendments apply to this Project and are incorporated by reference:

1. U.S. Department of Labor, "General Wage Determinations Issued under the Davis_Bacon and Related Acts: Oregon Highway Construction Projects", available at http://www.wdol.gov/ (Wage Determinations OnLine.gov). and

2. Oregon Bureau of Labor and Industries (BOLI), "Prevailing Wage Rates for Public Works Contracts in Oregon" available at http://www.oregon.gov/boli/WHD/PWR/pages/index.aspx (Oregon Prevailing Wage Rate Publications).

The applicable federal prevailing wage rates and the existing State prevailing wage rates last published prior to the time of Bid Closing, which is stated on the Notice of Public Contract Opportunity page, apply to this Project. Modifications or amendments to the Davis-Bacon and BOLI wage rates applicable to this Project may occur any time before Bid Closing. Bidders are responsible to monitor the respective web page(s) for modifications and amendments up to Bid Closing.

The applicable Davis-Bacon and BOLI wage rates will be included in the Contract.

Article 18. Employee Drug Testing Program

Pursuant to ORS 279C.505(2), that the bidder has an employee drug testing program in place, and will maintain such program for the entire period of this contract. Failure to maintain such program shall constitute a material breach of contract.

Article 19. Additional Terms

Sections 00120 and 00130 of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County are hereby incorporated into these Instructions. In the event of a conflict between Sections 00120 and 00130 of the General Conditions for Construction for (Certified LPA) Clackamas County and terms contained in these Instructions, the terms contained in these Instructions shall control.

SECTION 3

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

Project Name #2017-74 SE 115th Avenue Utility Extension Project

The following modify the Clackamas County "Instructions to Bidders" for this Project. Where a portion of the Instructions to Bidders has been modified by these Supplemental Instructions to Bidders, the unaltered portions shall remain in effect.

Good Faith Effort: Clackamas County encourages participation in contracts by Historically Underrepresented Businesses. "Historically Underrepresented Businesses" are State of Oregon-certified and self-identified minority, women and emerging small business as well as firms that are certified federally or by another state or entity with substantially similar requirements as the State of Oregon.

Bidders must perform Good Faith Effort (defined below) and submit **Form 1 and Form 2** for the Bidders Bid to be considered responsive. **Form 1 and Form 2** must be submitted within **two (2) hours** after the Closing Date and Time. Form 1 and Form 2 may be submitted by hand delivery to the location the Bid was due or may email the completed Forms to Procurement@clackamas.us. "Good Faith Effort" is a requirement of a prime contractor to reach out to at least three Historically Underrepresented Business Subcontractors for each division of work that will be subcontracted out and to complete the required forms. If fewer than three Historically Underrepresented Business Subcontractors are reasonably available for a particular division of work, the Bidder must specifically note the reason for there being fewer than three contacts. The outreach should be performed with sufficient time to give the subcontractors at least 5 calendar days to respond to the opportunity. Form 3, which documents the actual amount of subcontractors on the project, must be submitted with the project final pay application. Compliance with the Good Faith Effort and submission of Forms 1, 2 and 3 is a contractual requirement for final payment.

The sufficiency of the documentation or the performance of Good Faith Effort shall be in the sole and absolute determination of Clackamas County. Only those Bidders that Clackamas County has determined have not sufficiently performed Good Faith Effort shall have protest rights of the determination for such Bidder. No Bidder shall have protest rights of the sufficiency of any other Bidder completing Good Faith Effort.

SECTION 4

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

BID BOND

Project Name: #2017-74 SE 115th Avenue Utility Extension Project

We, _____, as "Principal,"
(Name of Principal)

and _____, an _____ Corporation,
(Name of Surety)

authorized to transact Surety business in Oregon, as "Surety," hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns to pay unto Clackamas County ("Obligee") the sum of ($_____)

_____ dollars.

WHEREAS, the condition of the obligation of this bond is that Principal has submitted its bid proposal for _____
_____, which bid proposal is made a part of this bond by reference, and Principal is required to furnish bid proposal security in an amount equal to ten (10%) percent of the total amount of the bid proposal pursuant to the Contract Documents

NOW, THEREFORE, if the bid proposal submitted by Principal is accepted, and if a contract pursuant to the bid proposal is awarded to Principal, and if Principal enters into and executes such contract within the time specified in the Instructions to Bidders and executes and delivers to Obligee its good and sufficient Performance Bond and Payment Bond required by Obligee within the time fixed by Obligee, then this obligation shall be void; otherwise, it shall remain in full force and effect. Obligee may require payment under this bond if Principal fails to enter into a contract with Obligee on the terms and conditions set forth on the form of contract published with the bid solicitation within twenty (20) days of the notice of intent to award.

IN WITNESS WHEREOF, we have caused this instrument to be executed and sealed by our duly authorized legal representatives this _____day of _____, 20____.

Principal:_____

By:_____
Signature

_____
Official Capacity

Attest:_____
Corporation Secretary

Surety:_____

By: Attorney-In-Fact

_____
Name

_____
Address

_____
City State Zip

_____ _____
Phone Fax

SECTION 5

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

BID PROPOSAL FORM

PROJECT #: 2017-74
PROJECT NAME: **SE 115th Avenue Utility Extension Project**
BID CLOSING: September 20, 2017, 2:00 PM, Pacific Time
BID OPENING: September 20, 2017, 2:05 PM, Pacific Time

FROM: _____
Bidder's Name (must be full legal name, not ABN/DBA)

TO: Clackamas County
Procurement Division
2051 Kaen Road
Oregon City, OR 97045

1. Bidder is (*check one of the following and insert information requested*):

____a. An individual; or

____b. A partnership registered under the laws of the State of _____; or

____c. A corporation organized under the laws of the State of _____; or

____d. A limited liability corporation organized under the laws of the State of _____;

and authorized to do business in the State of Oregon hereby proposes to furnish all material and labor and perform all work hereinafter indicated for the above project in strict accordance with the Contract Documents for the total Bid as follows:

_____ Dollars ($_____)

and the Undersigned agrees to be bound by the following documents and any other Contract Documents as defined in Section 00110.20 of Section 12, General Conditions for Construction (Certified LPA) Clackamas County:

- Notice of Public Improvement Contract Opportunity
- Instructions to Bidders
- Supplemental Instructions to Bidders
- Bid Bond
- Bid Proposal and Schedule of Prices
- Public Improvement Contract Form
- First-Tier Subcontractor Disclosure Form
- Performance Bond and Payment Bond
- Prevailing Wage Rates
- Plans, Special Provisions and Drawings
- General Conditions for Construction for (Certified LPA) Clackamas County

• ADDENDA numbered _____ through_____, inclusive *(fill in blanks)*

2. The Undersigned proposes to accept the total Bid in the attached Schedule of Prices, subject to adjustment for actual quantities completed during the course of work and any Amendment between the parties, for the items or work designated in the Contract Documents, for which any adjustments in the Contract amount will be made in accordance with Section 12, General Conditions for Construction for (Certified LPA) Clackamas County.

3. The work shall be completed within the time stipulated and specified in Section 00180.50(h) of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County.

4. Accompanying herewith is Bid Security which is equal to ten percent (10%) of the total amount of the Basic Bid.

5. The Undersigned agrees, if awarded the Contract, to execute and deliver to Clackamas County, within ten (10) calendar days after receiving the Contract forms, a Contract Form, a Federal Tax Identification Number for the Contractor, and a satisfactory Performance Bond and Payment Bond each in an amount equal to one hundred percent (100%) of the Contract sum, using forms provided by the County. The surety requested to issue the Performance Bond and Payment Bond will be:

_____.
(name of surety company - not insurance agency)

The Undersigned hereby authorizes said surety company to disclose any information to the County concerning the Undersigned's ability to supply a Performance Bond and Payment Bond each in the amount of the Contract.

6. The Undersigned further agrees that the Bid Security accompanying the Bid is left in escrow with Clackamas County; that the amount thereof is the measure of liquidated damages which the County will sustain by the failure of the Undersigned to execute and deliver the above-named Contract Form, Performance Bond and Payment Bond, each as published, and that if the Undersigned defaults in either executing the Contract Form or providing the Performance Bond and Payment Bond within ten (10) calendar days after receiving the Contract forms, then the Bid Security shall become the property of the County at the County's option; but if the Bid is not accepted within thirty (30) calendar days of the time set for the opening of the Bids, or if the Undersigned executes and timely delivers said Contract Form, Performance Bond and Payment Bond, the Bid Security shall be returned.

7. The Undersigned certifies that: (i) This Bid has been arrived at independently and is being submitted without collusion with and without any agreement, understanding, or planned common course of action with any other vendor of materials, supplies, equipment or services described in the invitation to bid designed to limit independent bidding or competition; and (ii) the contents of the Bid have not been communicated by the Undersigned or its employees or agents to any person not an employee or agent of the Undersigned or its surety on any Bond furnished with the Bid and will not be communicated to such person prior to the official opening of the Bid.

8. The undersigned **HAS, HAS NOT** (*circle applicable status*) paid unemployment or income taxes in Oregon within the past 12 months and **HAS, HAS NOT** (*circle applicable status*) a business address in Oregon. The undersigned acknowledges that, if the selected bidder, that the undersigned will have to pay all applicable taxes and register to do business in the State of Oregon before executing the Public Improvement Contract Agreement Form.

9. The Undersigned agrees, if awarded a contract, to comply with the provisions of ORS 279C.800 through 279C.870 pertaining to the payment of the prevailing rates of wage.

10. Contractor's CCB registration number is _____. As a condition to submitting a bid, a Contractor must be registered with the Oregon Construction Contractors Board in accordance with ORS 701.035 to 701.055, and disclose the registration number. Failure to register and disclose the number will make the bid unresponsive and it will be rejected, unless contrary to federal law.

11. The successful Bidder hereby certifies that all subcontractors who will perform construction work as described in ORS 701.005(2) were registered with the Construction Contractors Board in accordance with ORS 701.035 to 701.055 at the time the subcontractor(s) made a bid to work under the contract.

12. The successful Bidder hereby certifies that, in compliance with the Worker's Compensation Law of the State of Oregon, its Worker's Compensation Insurance provider is _____, Policy No. _____, and that Contractor shall submit Certificates of Insurance as required.

13. Contractor's Key Individuals for this project (supply information as applicable):

Project Executive:_____, Cell Phone: _____,
Project Manager: _____, Cell Phone: _____,
Job Superintendent: _____, Cell Phone: _____,
Project Engineer: _____, Cell Phone: _____.

14. The Undersigned pursuant to ORS 279A.110, the Bidder has not discriminated and will not discriminate against a disadvantaged business enterprise, a minority-owned business, a woman-owned business, a business that a service-disabled veteran owns, or an emerging small business in obtaining any required subcontracts. The Bidder understands that it may be disqualified from Bidding on this public improvement project if the Agency finds that the Bidder has violated subsection (1) of ORS 279A.110.

REMINDER: Bidder must submit a First-Tier Subcontractor Disclosure Form.

By signature below, Contractor agrees to be bound by this Bid.

NAME OF FIRM _____

ADDRESS _____

_____

TELEPHONE NO _____

EMAIL _____

SIGNATURE 1) _____
Sole Individual

or 2) _____
Partner

or 3) _____
Authorized Officer of Corporation

***** *END OF BID* *****

SECTION 6

FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM
PROJECT: #2017-74 SE 115th Avenue Utility Extension Project

BID OPENING: September 20 2017, 2:00 PM, Pacific Time

Failure to submit this Form by the disclosure deadline will result in a nonresponsive bid.

INSTRUCTIONS:

This First-Tier Subcontractor Disclosure Form ("Form") must be submitted and received at the location specified in the Notice of Public Improvement Contract Opportunity by the advertised Bid Closing, or within two working hours after the advertised Bid Closing Time.

The Form may be mailed, hand-delivered or emailed to: Procurement@clackamas.us. It is the responsibility of Bidders to submit this Form and any additional sheets with the Project name clearly marked on the envelope or the subject line of the email.

Subcontractor lists may be submitted with the bid in the same envelope or email at the Bid Closing date and time. Subcontractor lists **MUST** be submitted within **two (2) hours** of the Bid Closing date and time.

List below the name of each subcontractor that will be furnishing labor, or labor and materials, for which disclosure is required, the category of work that the subcontractor will be performing, and the dollar value of the subcontract. Enter **"NONE"** if the value of the project bid is less than $100,000 or there are no subcontractors that need to be disclosed. ATTACH ADDITIONAL SHEETS IF NECESSARY.

	SUBCONTRACTOR NAME	DOLLAR VALUE	CATEGORY OF WORK
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

The above listed first-tier subcontractor(s) are providing labor, or labor and material, with a Dollar Value equal to or greater than:

a) 5% of the total Contract Price, but at least $15,000. If the Dollar Value is less than $15,000 do not list the subcontractor above; or
b) $350,000 regardless of the percentage of the total Contract Price.

Firm Name:_____

Bidder Signature:_____ Phone #_____

SECTION 9

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

PERFORMANCE BOND

Bond No.:_____
Solicitation: 2017-74
Project Name: **SE 115th Avenue Utility Extension Project**

_____(Surety #1)	Bond Amount No. 1:	$_____
_____(Surety #2)*	Bond Amount No. 2:*	$_____
** If using multiple sureties*	Total Penal Sum of Bond:	$_____

We, _____as Principal, and the above identified Surety(ies), authorized to transact surety business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns firmly by these presents to pay unto Clackamas County, the State of Oregon and the Oregon Department of Transportation, the sum of (Total Penal Sum of Bond) _____ (Provided, that we the Sureties bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety); and

WHEREAS, the Principal has entered into a contract with Clackamas County, along with the plans, specifications, terms and conditions of which are contained in the above-referenced Solicitation; and

WHEREAS, the terms and conditions of the contract, including, but not limited to applicable plans, standard specifications, special provisions, schedule of performance, and schedule of contract prices, are made a part of this Performance Bond by reference, whether or not attached to the contract (all hereafter called "Contract"); and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and all authorized modifications of the Contract which increase the amount of the work, the amount of the Contract, or constitute an authorized extension of the time for performance, notice of any such modifications hereby being waived by the Surety:

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal herein shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things undertaken by Contractor to be performed under the Contract, upon the terms set forth therein, and within the time prescribed therein, or as extended as provided in the Contract, with or without notice to the Sureties, and shall indemnify and save harmless Clackamas County, the State of Oregon and the Oregon Department of Transportation, and their respective elected officials, officers, employees and agents, against any direct or indirect damages or claim 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 Contract by the Principal or its subcontractors, and shall in all respects perform said contract according to law, then this obligation is to be void; otherwise, it shall remain in full force and effect for so long as any term of the Contract remains in effect.

If the County determines that any of the above conditions have not been met, the County may require payment under this bond at its sole and absolute discretion and Surety shall issue prompt payment of the full value of this bond without set-off or dispute or requirement for an opportunity to cure.

Nonpayment of the bond premium will not invalidate this bond nor shall Clackamas County, be obligated for the payment of any premiums.

This bond is given and received under authority of Oregon Revised Statutes Chapter 279C and the Clackamas County Local Contractor Review Board Rules, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, WE HAVE CAUSED THIS INSTRUMENT TO BE EXECUTED AND SEALED BY OUR DULY AUTHORIZED LEGAL REPRESENTATIVES.

Dated this _____ day of _____, 20____.

PRINCIPAL: _____

By: _____
Signature

_____
Official Capacity

Attest: _____
Corporation Secretary

SURETY: _____
[Add signatures for each if using multiple bonds]

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

_____
Name

_____
Signature

_____
Address

_____
City State Zip

_____
Phone Fax

SECTION 10

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

PAYMENT BOND

Bond No.: _____
Solicitation: 2017-74
Project Name: **SE 115th Avenue Utility Extension Project**

_____(Surety #1)	Bond Amount No. 1:	$ _____
_____(Surety #2)*	Bond Amount No. 2:*	$ _____
* *If using multiple sureties*	Total Penal Sum of Bond:	$ _____

We, _____, as Principal, and the above identified Surety(ies), authorized to transact surety business in Oregon, as Surety, hereby jointly and severally bind ourselves, our respective heirs, executors, administrators, successors and assigns firmly by these presents to pay unto Clackamas County, the State of Oregon and the Oregon Department of Transportation, the sum of (Total Penal Sum of Bond) _____ _____ (Provided, that we the Sureties bind ourselves in such sum "jointly and severally" as well as "severally" only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each Surety binds itself, jointly and severally with the Principal, for the payment of such sum only as is set forth opposite the name of such Surety); and

WHEREAS, the Principal has entered into a contract with Clackamas County, along with the plans, specifications, terms and conditions of which are contained in above-referenced Solicitation; and

WHEREAS, the terms and conditions of the contract, together with applicable plans, standard specifications, special provisions, schedule of performance, and schedule of contract prices, are made a part of this Payment Bond by reference, whether or not attached to the contract (all hereafter called "Contract"); and

WHEREAS, the Principal has agreed to perform the Contract in accordance with the terms, conditions, requirements, plans and specifications, and schedule of contract prices which are set forth in the Contract and any attachments, and all authorized modifications of the Contract which increase the amount of the work, or the cost of the Contract, or constitute authorized extensions of time for performance of the Contract, notice of any such modifications hereby being waived by the Surety:

NOW, THEREFORE, THE CONDITION OF THIS BOND IS SUCH that if the Principal shall faithfully and truly observe and comply with the terms, conditions and provisions of the Contract, in all respects, and shall well and truly and fully do and perform all matters and things by it undertaken to be performed under said Contract and any duly authorized modifications that are made, upon the terms set forth therein, and within the time prescribed therein, or as extended therein as provided in the Contract, with or without notice to the Sureties, and shall indemnify and save harmless Clackamas County, the State of Oregon and the Oregon Department of Transportation, and their respective elected officials, officers, employees and agents, against any claim for direct 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 Contract by the Contractor or its subcontractors, and shall promptly pay all persons supplying labor, materials or both to the Principal or its subcontractors for prosecution of the work provided in the Contract; and shall promptly pay all contributions due the State Industrial Accident Fund and the State Unemployment Compensation Fund from the Principal or its subcontractors 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 subcontractors pursuant to ORS 316.167, and shall permit no lien nor claim to be filed or

prosecuted against Clackamas County on account of any labor or materials furnished; and shall do all things required of the Principal by the laws of this State, then this obligation shall be void; otherwise, it shall remain in full force and effect for so long as any term of the Contract remains in effect.

If the County determines that any of the above conditions have not been met, the County may require payment under this bond at its sole and absolute discretion and Surety shall issue prompt payment of the full value of this bond without set-off or dispute or requirement for an opportunity to cure.

Nonpayment of the bond premium will not invalidate this bond nor shall Clackamas County be obligated for the payment of any premiums.

This bond is given and received under authority of Oregon Revised Statutes Chapter 279C and the Clackamas County Local Contractor Review Board Rules, the provisions of which hereby are incorporated into this bond and made a part hereof.

IN WITNESS WHEREOF, WE HAVE CAUSED THIS INSTRUMENT TO BE EXECUTED AND SEALED BY OUR DULY AUTHORIZED LEGAL REPRESENTATIVES:

Dated this _____day of _____, 20____.

PRINCIPAL: _____

By: _____
Signature

_____
Official Capacity

Attest: _____
Corporation Secretary

SURETY: _____
[Add signatures for each if using multiple bonds]

BY ATTORNEY-IN-FACT:
[Power-of-Attorney must accompany each bond]

_____
Name

_____
Signature

_____
Address

_____
City State Zip

_____
Phone Fax

SECTION 11

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT

AGREEMENT FORM

This Public Improvement Contract for the **SE 115th Avenue Utility Extension Project** (the "Contract"), is made by and between the Clackamas County, a political subdivision of the State of Oregon, hereinafter called "County," and Contractor Name (No DBA/ABN), hereinafter called the "Contractor" (collectively the "Parties"), shall become effective on the date this Contract has been signed by all the Parties and all County approvals have been obtained, whichever is later.

1. Contract Price, Contract Documents and Work.
The Contractor, in consideration of the sum of Dollars ($) (the "Contract Price"), to be paid to the Contractor by County in the manner and at the time hereinafter provided, and subject to the terms and conditions provided for in the Instructions to Bidders and other Contract Documents as defined in Section 12, General Conditions for Construction for (Certified LPA) Clackamas County, all of which are incorporated herein by reference, hereby agrees to perform all Work described and reasonably inferred from the Contract Documents. The Contract Price is the prices fixed in the Contractor's Bid Proposal for said work as set forth herein under the Schedule of Bid Prices.

Also, the following documents are incorporated by reference in this Contract and made a part hereof:

- Notice of Public Improvement Contract Opportunity
- Instructions to Bidders
- Supplemental Instructions to Bidders
- Bid Bond
- Bid Proposal and Schedule of Prices
- Public Improvement Contract Form
- First-Tier Subcontractor Disclosure Form
- Performance Bond and Payment Bond
- Prevailing Wage Rates
- Plans, Special Provisions and Drawings
- General Conditions for Construction for (Certified LPA) Clackamas County

2. Representatives.
Contractor has named as its' Authorized Representative to act on its behalf.

The County designates David Queener as its Authorized Representative in the administration of this Contract. The above-named individual shall be the initial point of contact for matters related to Contract performance, payment, authorization, and to carry out the responsibilities of the County.

3. Key Persons.
The Contractor's personnel identified below shall be considered Key Persons and shall not be replaced during the project without the prior written permission of County, which shall not be unreasonably withheld. If the Contractor intends to substitute personnel, a request must be given to County at least 30 days prior to the intended time of substitution. When replacements have been approved by County, the Contractor shall provide a transition period of at least 10 working days during which the original and replacement personnel shall be working on the project concurrently. Once a replacement for any of these staff members is authorized, further replacement shall not occur without the prior written permission of County. The Contractor's project staff shall consist of the following personnel:

Project Executive: shall be the Contractor's project executive, and will provide oversight and guidance throughout the project term.

Project Manager: shall be the Contractor's project manager and will participate in all meetings throughout the project term.

Job Superintendent: shall be the Contractor's on-site job superintendent throughout the project term.

Project Engineer: shall be the Contractor's project engineer, providing assistance to the project manager, and subcontractor and supplier coordination throughout the project term.

4. Contract Dates.
CONTRACT COMPLETION DATE 1: Upon issuance of Notice to Proceed
SUBSTANTIAL COMPLETION DATE: October 31, 2017
FINAL COMPLETION DATE: December 31, 2018

Time is of the essence for this Contract. It is imperative that the Work in this Contract reach Second Notification and Third Notification by the above specified dates.

5. Insurance Certificates.
In accordance with Section 00170.70 of Section 12, General Conditions for Construction for (Certified LPA) Clackamas County, Contractor shall furnish proof of the required insurance naming Clackamas County and the State of Oregon and the Oregon Department of Transportation as an additional insured. Insurance certificates may be returned with the signed Contract or may emailed to Procurement@clackamas.us.

6. Tax Compliance.
Contractor must, throughout the duration of this Contract and any extensions, comply with all tax laws of this state and all applicable tax laws of any political subdivision of this state. Any violation of this section shall constitute a material breach of this Contract. Further, any violation of Contractor's warranty in this Contract that Contractor has complied with the tax laws of this state and the applicable tax laws of any political subdivision of this state also shall constitute a material breach of this Contract. Any violation shall entitle County to terminate this Contract, to pursue and recover any and all damages that arise from the breach and the termination of this Contract, and to pursue any or all of the remedies available under this Contract, at law, or in equity, including but not limited to: (A) Termination of this Contract, in whole or in part; (B) Exercise of the right of setoff, and withholding of amounts otherwise due and owing to Contractor, in an amount equal to County's setoff right, without penalty; and (C) Initiation of an action or proceeding for damages, specific performance, declaratory or injunctive relief. County shall be entitled to recover any and all damages suffered as the result of Contractor's breach of this Contract, including but not limited to direct, indirect, incidental and consequential damages, costs of cure, and costs incurred in securing replacement performance. These remedies are cumulative to the extent the remedies are not inconsistent, and County may pursue any remedy or remedies singly, collectively, successively, or in any order whatsoever.

The Contractor represents and warrants that, for a period of no fewer than six calendar years preceding the effective date of this Contract, has faithfully complied with: (A) All tax laws of this state, including but not limited to ORS 305.620 and ORS chapters 316, 317, and 318; (B) Any tax provisions imposed by a political subdivision of this state that applied to Contractor, to Contractor's property, operations, receipts, or income, or to Contractor's performance of or compensation for any work performed by Contractor; (C) Any tax provisions imposed by a political subdivision of this state that applied to Contractor, or to goods, services, or property, whether tangible or intangible, provided by Contractor; and (D) Any rules, regulations, charter provisions, or ordinances that implemented or enforced any of the foregoing tax laws or provisions.

7. Confidential Information.
Contractor acknowledges that it and its employees or agents may, in the course of performing their responsibilities under this Contract, be exposed to or acquire information that is confidential to County or the State of Oregon. Any and all information of any form obtained by Contractor or its employees or agents in the performance of this Contract shall be deemed confidential information of County and of State ("Confidential Information"). Contractor agrees to hold Confidential Information in strict confidence, using at least the same degree of care that Contractor uses in maintaining the confidentiality of its own confidential information, and not to copy, reproduce, sell, assign, license, market, transfer or otherwise dispose of, give, or disclose Confidential Information to third parties or use Confidential Information for any purpose unless specifically authorized in writing under this Contract.

8. Counterparts.
This Contract may be executed in several counterparts, all of which when taken together shall constitute an agreement binding on all Parties, notwithstanding that all Parties are not signatories to the same counterpart. Each copy of the Contract so executed shall constitute an original.

9. Integration.
The Contract Documents constitute the entire agreement between the parties. There are no other understandings, agreements or representations, oral or written, not specified herein regarding this Contract. Contractor, by the signature below of its authorized representative, hereby acknowledges that it has read this Contract, understands it, and agrees to be bound by its terms and conditions.

10. Liquidated Damages
The Contractor acknowledges that the County will sustain damages as a result of the Contractor's failure to substantially complete the Project in accordance with the Contract Documents and Special Provision Section 00180.85. These damages may include, but are not limited to delays in completion, use of the Project, and costs associated with Contract administration and use of temporary facilities.

In witness whereof, Clackamas County executes this Contract and the Contractor does execute the same as of the day and year first above written.

11. Contractor DATA:
(Insert Contractor Name & Address)

Contractor CCB # Expiration Date:
Oregon Business Registry # Entity Type: State of Formation:

Payment information will be reported to the IRS under the name and taxpayer ID# provided by the Contractor. Information must be provided prior to contract approval. Information not matching IRS records could subject Contractor to 28 percent backup withholding.

Contractor Name (No DBA/ABN)	Clackamas County Board of County Commissioners
_____ Date	_____ Chair Date
_____ Name / Title Printed	_____ Recording Secretary
	APPROVED AS TO FORM
	_____ County Counsel Date

SECTION 12

CLACKAMAS COUNTY
PUBLIC IMPROVEMENT CONTRACT
PROJECT INFORMATION, PLANS, SPECIFICATIONS AND DRAWINGS

PROJECT: #2017-74 SE 115th Avenue Utility Extension Project

Project Scope:
The Clackamas County Development Agency is seeking the services of qualified contractor to complete construction of the SE 115th Utility Extension Project. This project will extend water and sewer lines from SE Jennifer to the end of 115th Avenue in order to provide service to currently unserved properties.

Key Dates:
Construction is expected to take approximately 30 days.

- All Basic Bid Work may begin as soon as the Notice to Proceed is issued
- Substantial completion: October 31, 2017
- Final Completion: December 31, 2017

Engineers Estimate: $225,000.00

Time is of the essence for this Project. Note the Liquidated Damages requirements as described in the Special Provisions for Roadway Construction 00180.85(b).
Liquidated Damages are required to ensure the utilities are in place for occupied temporary housing prior to winter months.

The Scope further includes the following Plans, Specifications and Drawings:

- SPECIAL PROVISIONS AND REVISIONS TO STANDARD SPECIFICATIONS SE 115TH AVENUE UTILITY EXTENSION PROJECT dated August, 2017;
- SE 115th AVENUE UTILITY EXTENSION PROJECT DRAWING SET; SHEETS 1-18.

SPECIAL PROVISIONS AND REVISIONS TO STANDARD SPECIFICATIONS

SE 115th AVENUE UTILITY EXTENSION PROJECT

CLACKAMAS COUNTY

DEVELOPMENT AGENCY,

CLACKAMAS COUNTY, OREGON

AUGUST 2017
Prepared by:

AKS ENGINEERING & FORESTRY

CLACKAMAS COUNTY
DEVELOPMENT AGENCY

SPECIAL PROVISIONS

FOR

SE 115th AVENUE UTILITY EXTENSION PROJECT
CLACKAMAS COUNTY, OREGON

PROFESSIONAL OF RECORD CERTIFICATION(s):

	I certify the Special Provisions Section(s) listed below are applicable to the design for the subject project. Modified Special Provisions were prepared by me or under my supervision. Section 00210, 00220, 00225, 00280, 00290, 00305, 00310, 00320, 00331, 00340, 00350, 00405, 00420, 00440, 00442, 00445, 00470, 00490, 00495, 00641, 00744, 00746, 00850, 00855 01140, 01150, 01160, 01170, 02010, 02020, 02030, 02040, 02050, 02070, 02080, 02320, 02415, 02440, 02450, 02470, 02475, 02480, 02485, 02490, 02560, 02630
Date Signed: 8/23/17	

TABLE OF CONTENTS FOR SPECIAL PROVISIONS AND REVISIONS TO STANDARD SPECIFICATIONS

APPENDICES

SPECIAL PROVISIONS

WORK TO BE DONE

The Plan Set for this project is entitled: SE 115TH AVENUE UTILITY EXTENSION PROJECT

The scope of work includes installation of approximately 630 LF of new sanitary sewer main, approximately 403 LF of new water main, new sanitary sewer and water services, and pavement restoration.

APPLICABLE SPECIFICATIONS

The Specification that is applicable to the Work on this Project is the 2015 edition of the "Oregon Standard Specifications for Construction" produced by the Oregon Department of Transportation and the Oregon Chapter of the APWA, Clackamas River Water Standard Specifications and Details, and Clackamas County Water Environment Services (WES) Service District #1 (CCSD#1) Specifications and Details.

All number references in these Special Provisions shall be understood to refer to the Sections and subsections of the Standard Specifications and Supplemental Specifications bearing like numbers and to the Sections and subsections contained in these Special Provisions in their entirety. Unless specifically noted in these Revisions to Standard Specifications, all specifications included in the 2015 edition of the "Oregon Standard Specifications for Construction" shall be strictly adhered to.

CLASS OF PROJECT

This is a Clackamas County Project and it is NOT federally funded.

CLASS OF WORK

Asphalt Concrete Paving (ACP)
Earthwork and Drainage (EART)
Temporary Traffic Control (TTC)

SUBMITTALS

Contractor shall provide submittals for all materials to be used to complete the work. All submittals shall be reviewed and approved by the Project Engineer prior to installation.

SECTION 00110 – ORGANIZATION, CONVENTIONS, ABBREVIATIONS AND DEFINITIONS

Comply with Section 00110 of the Standard Specifications supplemented and/or modified as follows:

00110.05(d) References to Laws, Acts, Regulations, Rules, Ordinances, Statutes, Orders, and Permits

Add the following to the first bullet (Statutes and Rules):

Clackamas County's Local Contract Review Board (LCRB) Rules are accessible online on the County's website (http://www.co.clackamas.or.us/docs/code/appendixc.pdf).

00110.10 Abbreviations

Add the following:

CCDA -	Clackamas County Development Agency
CDF -	Controlled Density Fill (synonymous with CLSM – Controlled Low Strength Material)
CRW -	Clackamas River Water
DTD -	Clackamas County Department of Transportation and Development
LCRB -	Local Contract Review Board
ODFW -	Oregon Department of Fish and Wildlife
ODOT -	Oregon Department of Transportation
PCC -	Portland Cement Concrete
UNS -	Utility Notification System
WES -	Water Environment Services of Clackamas County

00110.20 Definitions

Add or modify definitions as follows:

Agency - The term "Agency" shall refer to Clackamas County, including the Board of County Commissioners, employees and agents of the County authorized to administer the conditions of these contract documents.

Agreement - The written agreement between the Owner and Contractor covering the work to be performed under the contract.

Amendment - A contract modification for Additional Work, Changed Work, Extra Work, Field Directives, or other changes. An Amendment changes the contract value, scope,

and/or time. Amendments require formal approval by the Board of County Commissioners, pursuant to LCRB Rule Division 160, prior to approval of such work.

Approved Equal - Materials or services proposed by the contractor and approved by the County as equal substitutes for those materials or services specified.

Award - Same as “Notice to Award”.

BCC - The Clackamas County Board of County Commissioners

Bid - A written offer by a bidder on forms furnished by the County to do work stated in the bid documents at the prices quoted. "Bid" is synonymous with "proposal" in these bid documents.

Bid Booklet - The bound paper version included in the Solicitation Documents.

Bid Documents - The following documents together comprise the Bid Documents:

- Invitation to Bid, Instructions to Bidders, Bid Form, Bid Proposal, Schedule of Prices, Bid
- Bond, Performance Bond
- Certificate of Insurance, Prevailing Wage Rates
- The "Oregon Standard Specifications for Construction" by ODOT and APWA, 2015 edition.
- Plans and drawings
- Other bid documents included or referenced in the bid documents
- Addenda, if any
- The Agreement Form and Special Provisions

Bonds - The bond or surety bond is a written document given by the surety and principal to the obligee to guarantee a specific obligation.

Change Order - A price agreement for Extra Work, Changed Work, Field Directives, or other changes. A Change Order does not change the contract value, scope, or time until it is incorporated into an Amendment. Change Orders will be agreed upon, in writing, by the County Project Manager and the Contractor's designated representative.

Contract - The written contract agreement, including amendments, signed by the Contractor and Clackamas County, which describes the work to be done, the contract amount, and defines the relationships and obligations of the Contractor and the County.

County - The term "County" shall mean Clackamas County, including the Board of County Commissioners, employees and agents of the County authorized to administer the conditions of these contract documents.

Department - Synonymous with Agency.

Engineer - The County's Project Manager either acting directly or through an authorized representative(s). When referring to approval of extra work or other Contract modifications, "Engineer" also refers to the County's legal authority according to the LCRB rules.

Invitation to Bid - The public announcement (Notice to Contractors) inviting bids for work to be performed or materials to be furnished.

Legal Holiday - As defined in 00170.65 "Minimum Wage and Overtime Rates for Public Works Projects".

Lump Sum - A method of payment providing for one all-inclusive cost for the work or for a particular portion of the work.

Notice of Award - A written notice from the County notifying bidders that the County intends to award to the responsible bidder submitting lowest responsive bid.

ODOT Procurement Office - Clackamas County Purchasing Department.

Owner - Synonymous with Agency.

Project Manager - The Owner's representative who directly supervises the engineering and administration of the contract.

Sewer District - Where the term "Sewer District" appears in the contract documents it shall mean "Water Environment Services of Clackamas County (WES)," or "Clackamas County Service District Number 1 (CCSD#1)".

Shop Drawings - Synonymous with Working Drawings.

Solicitation Document - Synonymous with Bid Documents.

Standard Drawings - The Agency-prepared detailed drawings for Work or methods of construction that normally do not change from project to project. The Standard Drawings include the ODOT Standard Drawings.

State - Where the term “State” or “State of Oregon” or “ODOT” appears in the contract documents it shall mean “Clackamas County”, “State of Oregon”, or “ODOT” as applicable because of context.

Substantial Completion - The work or specified parts of the work which are sufficiently complete, in accordance with the contract documents, such that they can be utilized by the County for the purposes intended as determined by the Engineer.

Water District – Where the term “Water District” appears in the contract documents it shall mean “Clackamas River Water.”

Work Day - Any and every calendar day from January 1 to December 31 of every year, excluding Saturdays, Sundays and legal holidays.

END OF SECTION

SECTION 00120 – BIDDING REQUIREMENTS AND PROCEDURES

Comply with Section 00120 of the Standard Specifications supplemented and/or modified as follows:

00120.00 Prequalification of Bidders - Delete and replace with the following:

See Bid Documents.

00120.01 General Bidding Requirements - Delete and replace with the following:

See Bid Documents.

00120.05 Requests for Solicitation Documents - Delete and replace with the following:

Bid documents may be obtained from the Clackamas County Purchasing Department as indicated in the Advertisement for Bid. Anyone requesting Bid Documents will receive the Contract Booklet along with ½ size reductions of the Construction Plans.

Copies of the Oregon Standard Specifications for Construction and Supplements may be purchased from the Oregon Department of Transportation from the Plan Distribution Center in Salem, Oregon.

00120.15 Examination of Work Site and Solicitation Documents; Consideration of Conditions to be Encountered - Delete the third paragraph.

00120.17 Use of Agency-Owned Land for Staging or Storage Areas
Contractor may use County owned property at the south end of 115th Ave for staging, with County approval only. Approval will require the placement of 6" deep, 1.5"-0 aggregate for all areas accessed. Driving, parking or stockpiling of materials will not be allowed on native surfaces. All site preparation, placement of rock and maintenance is at Contractor's expense.

00120.25 Subsurface Investigations - Replace the first two sentences of the first paragraph with the following:

The Agency or its consultant has conducted subsurface or geologic investigations of the Project Site, and the results of these investigations are available at the Engineer's office.

00120.30 Changes to Plans, Specifications, or Quantities before Opening of Bids - Delete and replace with the following:

The County reserves the right to make necessary changes or corrections to the bid documents at any time prior to the opening of bids. The County will notify bidders whose names, addresses, and telephone/FAX numbers appear on the Plan Holder's List, of changes or corrections by email, mail, messenger, or facsimile (FAX). The County may elect to notify bidders by telephone initially and follow up with one of the above notification methods.

The County is not responsible for failure of bidders to receive notifications of changes or corrections made by the County, and sent as stated above. Bids opened and found not to be based on the changes or corrections will not be considered and will be deemed non-responsive.

00120.40 Preparation of Bid - Delete and replace paragraph (f) with the following:

(f) Disclosure of First-Tier Subcontractors - Within two working hours after the date and time of the deadline when the bids are due to the public contracting agency for a public improvement, a bidder shall submit to the public contracting agency a disclosure of the first-tier subcontractors 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.

The disclosure of first-tier subcontractors shall include:

(a) The name of each subcontractor; and

(b) The dollar value of work; and

(c) The category of work that each subcontractor will be performing.

If no subcontracts subject to the above disclosure requirements are anticipated, a bidder shall so indicate by entering "NONE" or filling in the appropriate check box.

The public contracting agency shall consider the bid of any contractor that does not submit a subcontractor disclosure to the public contracting agency to be a non-responsive bid and may not award the contract to the contractor.

Subcontractor lists may be submitted with the bid in the same envelope at the bid closing date and time. Those subcontractor lists submitted after the bid closing shall be delivered

in a separate sealed envelope that clearly identifies the contents. However, the subcontractor lists must be submitted within two (2) hours of the bid closing date and time.

00120.45 Submittal of Bids - Delete and replace with:

See Instructions to Bidders, Section 2.11 and Section 2.12.

00120.50 Submitting Bids for More than One Contract - Delete this subsection.

00120.60 Revision or Withdrawal of Bids - Delete and replace with the following:

00120.60 Revision or Withdrawal of Proposals - A revision to a proposal after it has been submitted, but prior to the deadline for submission, will be allowed provided it is submitted in a sealed envelope and signed by an authorized individual. Revisions must include bid schedule, bid guarantee, signature page, and be submitted prior to the time set for receiving proposals.

A bidder may withdraw a proposal after it has been submitted provided the withdrawal request is in writing from an individual authorized to sign the proposal and received prior to the time set for opening proposals.

00120.68 Mistakes in Bids - Add the following section:

(a) General - Clarifications to or withdrawal of a bid after bid opening because of an inadvertent, non-judgmental mistake in the bid requires careful consideration by the County to protect the integrity of the competitive bidding system and to assure fairness to all bidders. Bid corrections or withdrawal by reason of a non-judgmental mistake is permissible, but only to the extent it is not contrary to the interest of the County or the fair treatment of other bidders.

(b) Mistakes Discovered After Bid Closing But Before Award - This subsection prescribes standards to be applied in situations where mistakes in bids are discovered after the time and date set for bid closing, but before award.

(1) Minor Informalities - are insignificant mistakes of form that are evident from the bid documents and do not affect price, quality, quantity, delivery, or contractual obligations except in the case of informalities involving unit price. Minor informalities can be waived or corrected promptly without prejudice to other bidders or to the County. Examples include, but are not limited to:

- Return of the number of signed bids or the number of other documents required by the bid documents;

- Failure to sign the bid form in the designated block so long as a signature appears in the bid documents evidencing an intent to be bound;

- Failure to acknowledge receipt of an addenda to the bid documents, but only if:

  - it is clear from the bid that the bidder received the addenda and intended to be bound by its terms, or;

  - the addenda involved had a negligible effect on price, quality, quantity, or delivery.

(2) Mistakes Where Intended Correct Bid is Evident - If the mistake and the intended correct bid are clearly evident on the face of the bid form, or can be substantiated from accompanying documents, the County may accept the bid (i.e., typographical errors, errors in extending unit prices, transposition errors, and arithmetical errors). For discrepancies between unit prices and extended prices, unit prices will prevail.

(3) Mistakes Where Intended Correct Bid is not Evident - The County will not accept a bid in which a mistake is clearly evident on the face of the bid form but the intended correct bid is not similarly evident or cannot be substantiated from accompanying documents.

00120.70 Rejection of Bids - Delete and replace with the following:

00120.70 Rejection of Bids - A bid will be considered irregular and may be rejected if:

- The bid section provided is not used or is altered.

- The bid is incomplete or incorrectly completed.

- The bid has unauthorized additions, deletions, alternate bids, or conditions.

- A member of a joint venture and the joint venture submit bids for the same project. Both bids may be rejected.

- The bid has entries not typed or in ink, or has signatures or initials not in ink.

- Each erasure, change, or correction is not initialed.

- The price per unit cannot be determined.

- The Department finds that it is in the public interest to do so (ORS 279.035).
- The bid guaranty is insufficient or improper.
- The standard bid bond form is not used or is altered.
- Pre-Qualification submission requirements are not met.
- The Oregon Construction Contractors Board registration number and expiration date are not shown on the bid if required by the bid document. This requirement applies to State-funded projects, with the exception of aggregate production and landscape projects.
- A disclosure of first-tier subcontractors/material suppliers, if required under 00120.40(f), is not received within two working hours of the time bids are due to be submitted, or the disclosure form is not complete.
- The Agency determines that any Pay Item is significantly unbalanced to the potential detriment of the Agency.

00120.95 Opportunity for Cooperative Arrangement – Delete this section**.**

END OF SECTION

SECTION 00130 – AWARD AND EXECUTION OF CONTRACT

Comply with Section 00130 of the Standard Specifications supplemented and/or modified as follows:

00130.00 Consideration of Bids - Delete third paragraph.

00130.10 Award of Contract - Delete and replace with the following:

If Clackamas County accepts a bid and awards a contract, the County will send the successful bidder written notice of acceptance and award and three (3) copies of the Contract Booklet ready for execution. The documents will be sent within thirty (30) calendar days of the Notice of Intent to Award, or within the number of calendar days specified in the contract documents or written in a mutual agreement. The County will have complied with this time limit if, within the number of days specified, the notice of acceptance and Contract Booklet copies are:

- Dated and delivered by the County to the bidder before the time limit;
- Deposited through the U.S. Post Office with postage prepaid; or
- Delivered through a private delivery service with delivery charges prepaid.

00130.15 Right to Protest Award - Delete and replace with the following:

See Bid Documents.

00130.30 Contract Booklet - Add the following:

Other documents are part of the contract documents by reference. These include, but are not limited to:

- The "Oregon Standard Specifications for Construction", 2015 Edition, as published by the Oregon Department of Transportation (ODOT).
- “Oregon Standard Drawings” latest edition, as published by ODOT.
- Water Environment Services, Standard Drawings and Details
- Clackamas River Water, Standard Drawings and Details

- Clackamas County Standard Drawings located at www.clackamas.us/engineering/roadway.html

00130.40 Contract Bonds, Certificates, and Registrations - Delete and replace with the following:

See Bid Documents.

00130.70 Release of Bid Guaranties - Delete and replace with the following:

Security deposited by unsuccessful bidders will be returned as soon as practicable after the bid opening.

END OF SECTION

SECTION 00140 – SCOPE OF WORK

Comply with Section 00140 of the Standard Specifications supplemented and/or modified as follows:

00140.30 Agency-Required Changes in the Work - Delete and replace the last paragraph with the following:

Upon receipt of an Engineer's written order modifying the Work, the Contractor shall perform the Work as modified.

If an Amendment incorporating changes to the Work increases the Contract amount, the Contractor shall notify its Surety of the increase and shall provide the Agency with a copy of any resulting modification to bond documents. The Contractor's performance of Work pursuant to Amendments shall neither invalidate the Contract nor release the Surety. Payment for changes in the Work shall be made in accordance with 00195.20. Contract Time adjustments shall be made in accordance with 00180.80.

00140.31 "As-Built" Records - Add the following section:

Maintain a current and accurate record of the work completed during the course of this contract. This may be in the form of "as-built" drawings kept by accurately marking a designated set of the contract plans with the specified information as the Work proceeds. Accurate, complete and current "as-built" drawings are a specified requirement for full partial payment of the work completed. At project completion and as a condition of final payment, the Contractor shall deliver to the Project Manager a complete and legible set of "as-built" drawings.

The "as-built" drawings must show the information listed below. Where the term "locate" or "location" is used, it shall mean record of position with respect to both the construction vertical datum and either construction horizontal datum or a nearby permanent improvement.

1) Record location of underground services and utilities as installed.

2) Record location of existing underground utilities and services that are to remain and that are encountered during the course of the work.

3) Record changes in dimension, location, grade or detail to that shown on the plans.

4) Record changes made by change order.

5) Record details not in the original plans.

6) Provide fully completed shop drawings reflecting all revisions.

00140.70(c) Consideration of Proposal - Add the following to the end of this paragraph:

Cost Reduction Proposals will not be considered during the bidding process.

END OF SECTION

SECTION 00150 – CONTROL OF WORK

Comply with Section 00150 of the Standard Specifications supplemented and/or modified as follows:

00150.00 Authority of the Engineer - Delete and replace the first sentence with the following:

Except as indicated elsewhere in the Contract (e.g. Amendment approval by the BCC), the Engineer has full authority over the Work and its suspension.

00150.15 Construction Stakes, Lines and Grades - Delete and replace subsections (b) and (c) with the following:

Refer to Section 00305 for items of Work on this project to be performed by Agency and Contractor forces.

00150.40 Cooperation and Superintendence by Contractor:

00150.40(a) General - Add the following:

- Attend weekly construction meeting with the Engineer at the County office, 150 Beavercreek Rd, Oregon City, Or 97045. Day and time to be determined.

00150.50 Cooperation with Utilities: Add the following to the end of Paragraph (c):

- The Contractor shall make excavations and borings ahead of the work where necessary to determine the exact location of underground pipes or other features, which might interfere with construction. The Contractor shall support and protect pipes or other services where they cross the trench and shall be responsible for all damages incidental in interruptions of service that may be caused by Contractor operations. Where a new utility line crosses an existing pipeline or other conduit, the trench backfill shall be well compacted in a manner that provides for the required backfill and compaction standards while protecting the utility in question.

00150.70 Detrimental Operations – Add the following:

Portions of this project will be constructed in close proximity to existing private improvements. All private improvements disturbed by the Contractor's operations shall be repaired or replaced to equal or better condition at the Contractor's expense. In

addition, prior to construction, the Contractor shall provide to the Engineer a DVD showing all private property which may be disturbed during construction.

END OF SECTION

SECTION 00160 – SOURCE OF MATERIALS

Comply with Section 00160 of the Standard Specifications supplemented and/or modified as follows:

00160.20 Preferences for Materials – Add “Federal highway funds are NOT involved on this Project.”

END OF SECTION

SECTION 00165 – QUALITY OF MATERIALS

Comply with Section 00165 of the Standard Specifications.

END OF SECTION

SECTION 00170 – LEGAL RELATIONS AND RESPONSIBILITIES

Comply with Section 00170 of the Standard Specifications supplemented and/or modified as follows:

00170.02 Permits, Licenses, and Taxes – Add the following:

The portion of this project that will be constructed in Clackamas County road right of way and streets will not require any further street opening permits from Clackamas County to perform the work required under this contract.

00170.61(a) Workers' Compensation - In the paragraph, replace "00170.70(d)" with "the Agreement".

Add the following subsection:

00170.67 Fees - The fee required by ORS 279C.825(1) will be paid by the Agency to the Commissioner of the Oregon Bureau of Labor and Industries under the administrative rules of the Commissioner.

00170.70 Insurance - Delete and replace with the following:

See Bid Documents.

Add the following as Additional Insured's under the Contract:

Clackamas County and its officers, agents, and employees
Clackamas County Board of Commissioners
AKS Engineering & Forestry, LLC and its officers, agents, employees, and subconsultants.

00170.72 Indemnity/Hold Harmless - Add the following paragraph and bullets to the end of this Subsection:

Extend indemnity and hold harmless to the Agency and the following:

- Clackamas County and its officers, agents, and employees
- Clackamas County Board of Commissioners
- AKS Engineering & Forestry, LLC and its officers, agents, employees, and subconsultants.

END OF SECTION

SECTION 00180 – PROSECUTION AND PROGRESS

Comply with Section 00180 of the Standard Specifications supplemented and/or modified as follows:

00180.06 Assignment of Funds Due Under the Contract - Delete first bulleted item.

00180.21 Subcontracting - Add the following to subsection (a):

All contracts with subcontractors or suppliers shall have provisions making the contract assignable to the County, at the option of the County, if the Contractor terminates, goes out of business, declares bankruptcy, or otherwise is unable to perform provided that the County gives the subcontractor notice of assignment within fourteen (14) days of learning of the inability of the Contractor to perform.

00180.40 Limitation of Operations - Add the following to subsection (a):

The Contractor must provide, at a minimum, a 24-hour notice to the Clackamas County Project Manager in order to perform any work on Saturdays.

00180.41 Project Work Schedules – Add the following:

A Type B schedule as detailed in the Supplemental Specifications is required on this Contract. In addition, a three-week look-ahead schedule shall be prepared by the Contractor on a weekly basis and submitted to the Engineer. It shall include all construction activities planned for the following three-week period. The three-week look-ahead schedule shall be in a format agreed upon by the Contractor and the Engineer.

00180.42 Preconstruction Conference - Add the following:

Submit the following during the preconstruction conference unless otherwise directed:

- The names, addresses, and telephone numbers of two or more persons employed by the Contractor who can be reached day or night to handle emergency matters.
- Subcontractor's list including contact list for each subcontractor with phone numbers and addresses and work to be performed.
- List of personnel authorized to sign change orders and receive progress payment warrants.
- DVD of private properties affected by construction per 00150.70.

A representative of each subcontractor shall be required to attend the pre-construction conference.

00180.43 Commencement and Performance of Work - Add the following bullet item:

- Conduct the work at all times in a manner and sequence that will ensure minimal interference with traffic. The Contractor shall not begin work that will interfere with work already started. If it is in the County's best interest to do so, the County may require the Contractor to finish a portion or unit of the project on which work is in progress or to finish a construction operation before work is started on an additional portion or unit of the project.

00180.50(h) Contract Time

Complete all Work to be done under the Contract not later than **October 31, 2017**.

00180.65 Right of Way and Access Delays - Add the following paragraph:

There are no anticipated ROW or Access Delays for the project.

00180.70 Suspension of Work - Add the following to the first bullet item:

If the Inspector has reason to believe that any safety provisions are not being adhered to, the Inspector will immediately notify the Contractor's site foreman and/or the appropriate person and the County Project Manager. The purpose of this discussion is to determine the validity of the alleged violation. This will also allow the Contractor a reasonable amount of time to correct or improve any of the provisions for the safety on this project. If the County Project Manager finds the problem still unresolved or uncorrected, they will notify the Contractor's Project Manager and the County's Risk Management Safety Analyst. If the County's Risk Management Safety Analyst finds that the job site contains any unresolved safety issues they will take appropriate action up to and including suspension of the Contractor's operations on all or part of the Work.

00180.85(b) Liquidated Damages - Add the following:

The liquidated damages for failure to complete the Work per Calendar Day is outlined below:

There shall be liquidated damages given in the following paragraphs (a) and (b):

(a) Complete all work to be done under the contract not later than **October 31, 2017**. The daily amount of liquidated damages will be $500.

Add the following subsection:

00180.85(c) Lane Closures and Road Closures - Lane closures and road closures beyond those approved by the Agency, will inconvenience the traveling public and will be a cost to the Agency.

(1) Lane Closures - It is impractical to determine the actual damages the Agency will sustain in the event traffic lanes are closed beyond the limits listed in 00220.40(e). Therefore, the Contractor shall pay to the Agency, not as a penalty, but as liquidated damages, $500 per 15 minutes, or for a portion of 15 minutes, per lane, for any lane closure beyond the limits listed in 00220.40(e). In addition to the liquidated damages, all added cost for traffic control measures, including flagging, required to maintain the lane closures beyond the allowed time limits, will be at no additional cost to the Agency. The required traffic control measures will be as determined by the Engineer.

The Engineer will determine when it is safe to reopen lanes to traffic. Assessment of liquidated damages will stop when all lanes have been safely reopened. Any liquidated damages assessed under these provisions will be in addition to those listed in 00180.85(b).

END OF SECTION

SECTION 00190 – MEASUREMENT OF PAY QUANTITIES

Comply with Section 00190 of the Standard Specifications supplemented and/or modified as follows:

00190.20 Contractor to Provide Vehicle Weigh Scales: Delete and replace subsection (g) with the following:

The Contractor must provide a weigh technician. The Agency will not provide one for the Contractor.

END OF SECTION

SECTION 00195 – PAYMENT

Comply with Section 00195 of the Standard Specifications supplemented and/or modified as follows:

00195.10 Payment for Changes in Material Costs - Delete and replace with the following:

No asphalt cement cost adjustment shall be used on this project.

00195.12 Steel Material Price Escalation/De-Escalation Clause - Modify as follows:

No steel material price escalation/de-escalations shall be used on this project. There is no option for Contractor participation.

00195.50 Progress Payments and Retained Amounts - Modify as follows:

00195.50 (b) Retainage - Delete the first paragraph and replace with:

The amount to be retained from progress payments will be 5.0% of the value of Work accomplished, and will be retained in one of the forms specified in Subsection (c) below. The County will withhold Retainage from all force account and change order work.

00195.50(c) Forms of Retainage - Delete first paragraph and replace with:

Forms of acceptable retainage are set forth below in Subsections (1) through (3). "Cash, Alternate A" or "Cash, Alternate B" are the Agency-preferred forms of retainage. Unless the Contractor notifies the County otherwise in writing, the County will automatically hold retainage per paragraph (2) "Cash, Alternate B (No Interest Earned). If the Agency incurs additional costs as a result of the Contractor's election to use "Bonds and Securities", the Agency may recover such costs from the Contractor by a reduction of the final payment.

Delete and replace paragraph (2) with the following:

> **(2) Cash, Alternate B (No Interest Earned)** - Retainage will be deducted from progress payments and held by the Agency until final payment is made in accordance with 00195.90, unless otherwise specified in the Contract.

00195.50(d) Reduction of Retainage - Add the following bullet item:

- When the Work is 50% completed and upon written application of the Contractor and written approval of the Surety, the Engineer may reduce or eliminate retainage on remaining progress payments if the Work is progressing satisfactorily.

END OF SECTION

SECTION 00196 – PAYMENT FOR EXTRA WORK

Comply with Section 00196 of the Standard Specifications

END OF SECTION

SECTION 00197 – PAYMENT FOR FORCE ACCOUNT WORK

Comply with Section 00197 of the Standard Specifications, modified as follows:

Add the following subsection:

00197.91 Force Account Work Allowance

The bid schedule of prices contains a bid item for a pre-determined amount of Engineer-ordered Force Account work. All bidders shall reflect this same amount in their total bid. No bidder shall presume in the preparation of the bid or in the course of contract work that there will be a certain payment under that item or a certain order for Force Account work.

The contractor must receive written approval from the Engineer or County Project Manager prior to start of any work to be paid as force account. Any work completed prior to receipt of written approval may not be eligible for compensation.

END OF SECTION

SECTION 00199 – DISAGREEMENTS, PROTESTS AND CLAIMS

Comply with Section 00199 of the Standard Specifications supplemented and/or modified as follows:

The Contractor must properly submit a claim as detailed in 00199.30.

00199.40 Claim Review Procedure - Delete the entire section and replace with the following:

The Engineer will, as soon as practicable, consider and investigate a Contractor's properly submitted claim for additional compensation. The Engineer will advise the Contractor of the decision to accept or reject the claim, and the reasons for rejecting any part of the claim.

The County intends to resolve claims at the lowest possible level.

Upon request by the Contractor, the Project Manager will review the Engineer's decision on the claim and advise the Contractor of the decision in writing. If the Project Manager finds the claim has merit, an equitable adjustment will be offered. It the Project Manager finds the claim has no merit, no offer of adjustment will be made and the claim will be denied.

If the Contractor does not accept the Project Managers decision, then the Contractor shall commence any suit or action to collect or enforce any claim filed in accordance with 00199.30 within a period of forty-five (45) days following the mailing of the decision or within forty-five (45) days following the date of "Second Notification", whichever is later. If said suit or action is not commenced in said forty-five (45) day period, the Contractor expressly waives any and all claims for additional compensation and any and all causes of suit or action for the enforcement thereof that he might have had.

END OF SECTION

SECTION 00210 – MOBILIZATION

Comply with Section 00210 of the Standard Specifications.

END OF SECTION

SECTION 00220 – ACCOMMODATIONS FOR PUBLIC TRAFFIC

Comply with Section 00220 of the Standard Specifications supplemented and/or modified as follows:

00220.02 Public Safety and Mobility - Add the following bulleted items:

- Maintain access to all properties at all times unless a temporary closure is approved by the Engineer.
- Steel plates must be available onsite to provide emergency access to any property at any time.
- All trenches must be filled at the end of each working day, or covered with approval from the Engineer.
- Provide proper signing for all bumps, plates, etc.

Delete the following bulleted item:

- Do not block driveways for more than 2 hours unless otherwise authorized in writing.

END OF SECTION

SECTION 00225 – WORK ZONE TRAFFIC CONTROL

Comply with Section 00225 of the Standard Specifications.

END OF SECTION

SECTION 00280 – EROSION AND SEDIMENT CONTROL

Comply with Section 00280 of the Standard Specifications supplemented and/or modified as follows:

00280.90 Payment - Delete the section beginning with “Partial payments for item (a) will be made as follows:” There will be no partial payments for erosion control.

END OF SECTION

SECTION 00290 – ENVIRONMENTAL PROTECTION

Comply with Section 00290 of the Standard Specifications supplemented and/or modified as follows:

00290.00 Scope - Add the following:

Groundwater depth is approximately 14 feet below existing surface and will vary seasonally. Dewatering of groundwater is not allowed due to contamination risk. Deep excavations must be planned accordingly and backfilled quickly to avoid costly complications.

00290.90 Payment - Delete and replace with the following:

No payment will be made for work performed under this section, as it is considered incidental to other bid items.

END OF SECTION

SECTION 00305 – CONSTRUCTION SURVEYING

Section 00305, which is not a Standard Specification, is included for this Project by Special Provision.

Description

00305.00 Scope - Provide construction survey work according to the current edition on the date of Advertisement, of the ODOT "Construction Surveying Manual for Contractors." This manual is available on the web at:

http://www.oregon.gov/ODOT/ETA/Pages/Manuals.aspx

Modify the "Construction Surveying Manual for Contractors" as follows:

Chapter 1 – General Information

1.5 Agency Responsibilities – Replace the bullets in this section with the following:

- Provide copies of plans and specifications, including digital linework
- Establish initial horizontal and vertical control stations in the proximity of the Project
- Provide horizontal and vertical alignment data in AutoCAD Civil3D 2014 format.
  - This typically refers only to road centerlines. It may include some utilities, walls or possibly other features, but the contractor should not assume that all linear features will have alignment data provided.
- Perform final "as constructed" measurements
- Indicate on the plans any survey monuments that are likely to be disturbed during construction

1.6 Contractor Responsibilities – After the first bullet, add the following:

- Utilize the construction plans and digital drawings to calculate and stake items which are not included with horizontal and vertical alignment data or provided with STA/OFF/ELEV data in the plans, as directed by the engineer. This will typically include items such as right-of-way, easements, clearing limits, curb returns, utility poles, light poles and/or other miscellaneous features shown within the construction limits.

1.8 Survey Work Records – Delete the third and fourth paragraphs in this section.

Chapter 2 – Electronic Data

2.2 File Formats for Digital Data Exchange – Delete this section and replace with the following:

2.2(a) Data Formats Provided by the Engineer:

- **CAD (graphics) Files** – AutoCAD Civil 3D 2014 format
- **Horizontal Control Coordinates** - ASCII Coordinate File format
- **Elevations** - ASCII Elevation File format
- **Horizontal Alignments** – AutoCAD Civil 3D 2014 format
- **Vertical Alignments** – AutoCAD Civil 3D 2014 format
- **Cross Section Data** – Cross Section or Station, Offset and Elevation (SOE) File Format

2.2(b) Data Formats Provided by the Contractor:

- **CAD (graphics) Files** - AutoCAD Civil 3D 2014 format
- **"As Staked" Coordinate Data** - ASCII Coordinate File format
- **Confidence Points** - ASCII Coordinate File format
- **Vertical Control Point Elevations** - ASCII Elevation File format
- **Coordinates of Miscellaneous Survey Points Set** - ASCII Coordinate File format

2.2(c) Data Format Details - Data exchanged between the Agency and the Contractor will be in the following formats as referred to in this subsection:

(1) ASCII Coordinate File Format:

Point ID Northing Easting Elevation Feature Description

- Point IDs are alphanumeric up to 8 characters long
- Coordinates/Elevations are decimal numbers in the units required by the Project
- Feature names are up to 8 character alphanumeric codes
- Descriptions may be up to 27 characters and may contain any combination of printable ASCII characters.

- Columns may be separated by spaces or commas
- Name all ASCII coordinate files with an extension of .CRD

Example: 105 216473.675 576231.905 102.562 SET_NTW (13 mm) iron rod

(2) ASCII Elevation File Format:

Point ID Elevation Description

- Point IDs are alphanumeric up to 8 characters long
- Elevations are decimal numbers in the units required by the Project
- Descriptions may be up to 27 characters and may contain any combination of printable ASCII characters
- Columns may be separated by spaces or commas
- Name all ASCII elevation files with an extension of .ELV

Example: 425 542.768 TBM12, n.w. bolt on lum.

Chapter 4 – Construction Staking

4.6 Pipes and Culverts – Delete the bullet which begins "Complete a Culvert Data Sheet…". Add the following to the end of this section:

Set a reference stake at a specified offset from the item. Set a guard stake in line with the offset reference with the following information written on it:

- Description of item (by plan number if applicable)
- Station and offset of the item
- Offset distance from reference stake to the item
- Cut or fill from reference state (and what point the cut or fill is to)
- Reference stake elevation (always)
- Intended elevation (if needed)

4.8 Manholes and Inlets – Delete the bullet which states "Center of structure elevation" and replace with the following:

- Center of structure elevation (manhole)

4.9 Stockpile Sites – Delete this section in its entirety.

Chapter 7 – The Pre-Construction Survey

Delete this section in its entirety.

End of “Construction Surveying Manual for Contractors” modifications.

Measurement

00305.80 Measurement - No measurement of quantities will be made for construction survey work.

Payment

00305.90 Payment - The accepted quantities of construction survey work will be paid for at the Contract lump sum amount for the item "Construction Survey Work".

Payment will be payment in full for furnishing all material, equipment, labor, and incidentals necessary to complete the work as specified.

No separate or additional payment will be made for all temporary protection and direction of traffic measures including flaggers and signing necessary for the performance of the construction survey work.

No separate or additional payment will be made for preparing surveying documents including but not limited to office time, preparing and checking survey notes, and all other related preparation work.

Progress payments will not be in excess of the reasonable value of the surveying work estimated by the Engineer.

Costs incurred caused by survey errors will be at the Contractor's expense. These costs include price adjustments for failure to meet requirements of the "Construction Surveying Manual for Contractors", repair or removal and replacement of deficient product, and over-run of material.

END OF SECTION

SECTION 00310 – REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Comply with Section 00310 of the Standard Specifications supplemented and/or modified as follows:

00310.00 Scope - Add the following:

This work shall include:

- Removal of chain link fence as referenced on the plans.

END OF SECTION

SECTION 00320 – CLEARING AND GRUBBING

Comply with Section 00320 of the Standard Specifications.

END OF SECTION

SECTION 00331 – SUBGRADE STABILIZATION

Comply with Section 00331 of the Standard Specifications.

END OF SECTION

SECTION 00340 – WATERING

Comply with Section 00340 of the Standard Specifications supplemented and/or modified as follows:

00340.90 Payment - Delete and replace with the following:

No payment will be made for work performed under this section, as it is considered incidental to other bid items.

END OF SECTION

SECTION 00350 – GEOSYNTHETIC INSTALLATION

Comply with Section 00350 of the Standard Specifications.

END OF SECTION

SECTION 00405 – TRENCH EXCAVATION, BEDDING, AND BACKFILL

Comply with Section 00405 of the Standard Specifications supplemented and/or modified as follows:

00405.12 Bedding - Delete the entire section and replace with the following:

Furnish the following material for bedding the pipe:

- Commercially available ¾" - 0 aggregate meeting ODOT/APWA Class 'B' gradation and compaction specifications.

00405.13 Pipe Zone Material - Delete the entire section and replace with the following:

For flexible and rigid pipes, backfill the pipe zone with bedding material as described in 00405.12.

00405.14(b) Class B Backfill - Delete and replace with the following:

Use granular material consisting of gravel or crushed rock meeting the requirements of Section 00641. Designated size shall be ¾" - 0.

00405.41(c) Trench Width - Replace the first sentence with the following:

For water pipes, minimum trench width shall be 18 inches greater than the inside diameter of the pipe, or as approved, but not less than 24 inches. For sanitary sewer pipes, minimum trench width shall be 12 inches greater than the outside pipe diameter, but not less than 24 inches.

00405.46(c)(2) Class A, B, C, or D Backfill - Replace the second paragraph with the following:

Compact backfill material to not less than 95 percent of maximum density.

00405.46(c)(3) Class E Backfill - Replace the last sentence in the paragraph with the following:

The surface of fill shall reach a strength to withstand the process of paving without displacement or disruption within 48 hours, regardless of weather conditions, temperature, or moisture content of the soil where placed. Additives such as calcium (1% or 2%), hot water, and/or a pozzilith (water reducer) are acceptable means to achieve this set.

00405.48(c) Pavement, Curb, and Sidewalk - Replace the first sentence of the second paragraph with the following:

Upon completion of backfill and just prior to pavement resurfacing, saw the surfacing on both sides of the trench a minimum of 12 inches wider than each top of the trench.

END OF SECTION

SECTION 00420 – SALVAGING PIPE

Comply with Section 00420 of the Standard Specifications supplemented and/or modified as follows:

00420.00 Scope - Delete and replace with the following:

Salvaging pipe will not be allowed.

END OF SECTION

SECTION 00440 – COMMERCIAL GRADE CONCRETE

Comply with Section 00440 of the Standard Specifications.

END OF SECTION

SECTION 00442 – CONTROLLED LOW STRENGTH MATERIALS

Comply with Section 00442 of the Standard Specifications supplemented and/or modified as follows:

00442.01 Definition - Add the following:

The terms “Controlled Low-Strength Materials” (CLSM) and “Controlled Density Fill” (CDF) are synonymous within these specifications and the associated construction documents.

00442.11 Fine Aggregates - Delete and replace with the following:

Furnish fine aggregates that contain aggregate no larger than 3/4 inch, and for trenches less than 12 inches in width, the aggregate shall be no larger than 3/8 inch. Copies of the CLSM batch weights must be submitted to the Engineer prior to ordering materials.

00442.12 Proportioning of CLSM Mixture - Add the following bullet item:

- Slump shall be 6 to 8 inches to ensure flowability and will fill all voids without requiring compaction efforts.

00442.13 Compressive Strength - Delete and replace with the following:

CLSM shall be excavatable and produced unconfined, compressive, 28-day strengths from 50 psi to a maximum of 150 psi.

END OF SECTION

SECTION 00445 – SANITARY, STORM, CULVERT, SIPHON, AND IRRIGATION PIPE

Comply with Section 00445 of the Standard Specifications supplemented and/or modified as follows:

00445.11 Materials - Add the following subsections:

00445.11(h) Detectable Caution Tape - Tape shall be green and permanently labeled "CAUTION BURIED SEWER LINE BELOW". Tape shall be a minimum of three (3) inches in width and shall meet APWA Standards for underground burial tape. Tape shall be metallic such that it can be located with a metal detector. Tape shall be acid and alkali resistant polyethylene constructed with a minimum 4.5 mil solid aluminum foil core with an imprinted warning legend that is completely encased to prevent ink rub-off.

00445.11(i) Potholing - The Contractor must pothole all utility crossings to confirm that there are no grade conflicts. If a grade conflict is found, the Contractor shall report immediately to the Engineer. Additionally, the Contractor shall be responsible for coordinating the relocation work with the specific utility company.

00445.40(b) Line and Grade - Delete and replace with the following:

Centerline and grade control will be provided by the Contractor.

Sanitary sewer pipe shall be laid in full lengths as manufactured and shall be laid on a constant grade and in a straight alignment from manhole to manhole, or cleanout. Pipe shall not be installed with elbows, bends, bows or bellies.

00445.42 Laying Pipe - Add the following to the second bullet:

PVC pipe is flexible in nature and may be out of grade and alignment through the middle of a pipe length even though each end is on grade and in alignment as evidenced by a laser beam or grade boards. To prevent the above situation from occurring, the Contractor shall check the elevation of the top of each length of PVC pipe laid at each end and at the midpoint. The midpoint elevation shall be within 0.01 foot of the average elevation of the two ends.

Use the laser beam method of maintaining grade and alignment of the pipeline unless another method is approved by the Engineer.

00445.48 Tracer Wire - Delete this section. Tracer wire is not required on sanitary sewer pipe.

00445.91 Payment - Add the following:

No separate or additional payment will be made for:

- Cleanouts and associated fittings.

END OF SECTION

SECTION 00470 – MANHOLES, CATCH BASINS, AND INLETS

Comply with Section 00470 of the Standard Specifications supplemented and/or modified as follows:

00470.11 Precast Concrete Manholes and Bases - Delete "42 inch" from the list of standard normal inside diameters.

00470.40(b) Pipe Connections – Delete the paragraph beginning with "Grout concrete pipe connections…"

Add the following to the end of subsection 00470.40(b):

Connect PVC pipe to concrete manholes by means of an approved coupling with an elastomeric gasket or flexible sleeve conforming to ASTM C923, (Kor-N-Seal or equal).

00470.41(b)(1) Sanitary Manholes - Delete and replace with the following:

Precast concrete sections for manholes shall be in one (1) foot to four (4) foot sections placed in such combinations as to achieve the finish grade shown on the Plans. The joints for the manhole sections shall be made watertight with the use of non-shrink grout or flexible material. The wall sections and flexible material used to join them shall be compatible. The walls shall be constructed true to line and grade as established by the Engineer. Ample non-shrink grout shall be placed into the groove of the lower section prior to placing the next barrel section. The entire joint shall be completely filled with non-shrink grout and trowelled to a smooth surface. Preformed gaskets may be used in lieu of non-shrink grout type joints and shall be RAM-NEK, manufactured by K.T. Snyder Company, Inc., Houston, Texas; KentSeal by Hamilton Kent, Kent, Ohio; or as approved. Manhole sections with a captive groove rubber gasket need not be grouted between sections.

00470.41(c) Grates, Frames, Covers and Fittings - Delete and replace with the following:

Install precast concrete grade rings on top of manhole cones so as to positively prevent all infiltration of surface or groundwater into manholes. Grade rings shall be laid straight and true and set in a bed of non-shrink grout with the grout carried over the frame. Grade rings shall be set so the tops of the frame is flush with the finish grade or grade of adjoining pavement, or six (6) inches above the finish grade in areas outside the right-of-way, or as otherwise indicated on the Plans. Extension rings shall be limited to achieve a maximum distance of twenty-eight (28) inches from the center point of the first step to the top of the frame. Precast rings shall be constructed so as to have an opening of no more or no less than twenty-five (25) inches.

00470.45 Steps and Ladders - Delete and replace with the following:

Steps shall be placed where there are no incoming or outgoing lines. Steps shall be placed a maximum of twelve (12) inches from the shelf and twenty-eight (28) inches from the top of the frame. Steps shall be twelve (12) inches on center. Steps shall extend from the manhole wall six (6) inches. Steps in a manhole shall be of the same type. Steps shall be installed straight and true. Loose steps shall be cause for rejection of that manhole cone or section. Manholes less than four (4) feet in depth do not require steps.

00470.71(a) Hydrostatic Testing - Delete this subsection. Hydrostatic testing is not required by Clackamas County Water Environment Services.

00470.71(b) Vacuum - Delete entire subsection and replace with the following:

- Manhole Vacuum Test (Adapted from ASTM C1244-93). The Engineer or designated inspector shall observe all testing and record and submit the results on the Sewer District testing forms which can be found in Appendix B of the CCSD#1 Sanitary Sewer Standards.
- Summary of Practice: Plug all lift holes and pipes entering the manhole. A vacuum will be drawn and the vacuum drop over a specified period of time is used to determine the acceptability of the manhole.
- Significance and Use: This is not a routine test. The values recorded are applicable only to the manhole being tested and at the time of testing.
- Preparation of the Manhole:
    - Plug all lift holes with an approved non-shrink grout.
    - Plug all pipes entering the manhole, taking care to securely brace the pipes and plugs from being drawn into the manhole. The manhole shall be set to finish grade and all paving (if applicable) completed.
    - Air testing of Storm Manholes will not be required.
    - Air testing of existing manholes that new mainline is being connected will not be required.
- Procedure
    - Place the test head at the inside of the top of the frame and the seal inflated in accordance with the manufacturer's recommendations.
    - Draw a vacuum of 10 inches of mercury, with the valve on the vacuum line of the test head closed, and the vacuum pump shut off. With the valves closed measure the time for the vacuum to drop to 9 inches.
    - The manhole shall pass if the time for the vacuum reading to drop from 10 inches of mercury to 9 inches meets or exceeds the values indicated below.
    - Utilizing the formulas that follow, the comparable times for a successful vacuum test for different size manholes are:

DEPTH* (ft)	TIME** (sec)		
	Manhole Diameter (ft)		
Depth of MH (ft)	4-ft	5-ft	6-ft
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

* Depth is measured from the top of the manhole to the lowest invert.
** Test times for manhole depths between those shown in this table may be calculated by interpolation.

- If the manhole vacuum test fails the initial test, make necessary repairs with a non-shrink grout after the vacuum has been released. Proceed with retesting until a satisfactory test is obtained.
- Subsequent Failure: Infiltration of groundwater, in any amount, following a successful vacuum or low pressure air test as specified, shall be considered as evidence that the original test was in error or that subsequent failure of the manhole has occurred. The Contractor will be required to correct such failures should they occur. The manhole that failed to pass the test(s) shall be repaired and retested.

END OF SECTION

SECTION 00490 – WORK ON EXISTING SEWERS AND STRUCTURES

Comply with Section 00490 of the Standard Specifications supplemented and/or modified as follows:

00490.41(d) Manhole Connections - Delete and replace the first two sentences with the following:

Core openings in the existing manhole base or barrel using the core drilling method. The use of a jackhammer or pneumatic devices is prohibited. Connect PVC pipe to concrete manholes by means of an approved coupling with an elastomeric gasket or flexible sleeve conforming to ASTM C923, (Kor-N-Seal or equal).

END OF SECTION

SECTION 00495 – TRENCH RESURFACING

Comply with Section 00495 of the Standard Specifications supplemented and/or modified as follows:

00495.80 Measurement – Replace this subsection with the following:

The accepted quantities of Trench Resurfacing will be based on a neat line calculation and will not be measured, unless changes are ordered by the County.

END OF SECTION

SECTION 00641 – AGGREGATE SUBBASE, BASE, AND SHOULDERS

Comply with Section 00641 of the Standard Specifications.

END OF SECTION

SECTION 00744 – ASPHALT CONCRETE PAVEMENT

Comply with Section 00744 of the Standard Specifications supplemented and/or modified as follows:

00744.90 Payment - Delete and replace with the following:

The accepted quantities of ACP incorporated into the project, whether or not recycled materials are used, will be paid for at the Contract unit price, per square yard, for the item "Level 3, 1/2 inch ACP Mixture".

Payment will be payment in full for furnishing and replacing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

Included under this pay item is the complete pavement section as referenced on the construction plans in the “General Pavement Restoration Detail”.

Aggregate Base shall be per Section 00641.

Subgrade Geotextile shall be per Section 00350.

The following items are considered incidental:

- Saw cut, excavation, haul-off of material, subgrade geotextile, and aggregate base.

No separate or additional payment will be made for:

- asphalt cement, mineral filler, lime, and anti-stripping or other additives

END OF SECTION

SECTION 00746 – CRACK SEALING ASPHALT FLEXIBLE PAVEMENTS

Comply with Section 00746 of the Standard Specifications.

END OF SECTION

SECTION 00850 – COMMON PROVISIONS FOR PAVEMENT MARKINGS

Comply with Section 00850 of the Standard Specifications.

END OF SECTION

SECTION 00855 – PAVEMENT MARKERS

Comply with Section 00855 of the Standard Specifications.

END OF SECTION

SECTION 01140 – POTABLE WATER PIPE AND FITTINGS

Comply with Section 01140 of the Standard Specifications supplemented and/or modified as follows:

01140.10 Materials through 01140.52 Disinfecting - Remove and replace entire sections with Clackamas River Water Technical Specifications Sections 02225 and 15100 (Appendix B).

01140.80(a) Pipe, Fittings and Couplings - In the first sentence, insert the words "to the nearest foot" after the words "…measured on the length basis". Delete the paragraph beginning with "In addition to measurement of the pipe,…"

01140.90 Payment - Delete the last sentence of the paragraph beginning with "In items (a) and (b),…" Add the following:

No separate or additional payment will be made for mechanical restraints.

END OF SECTION

SECTION 01150 – POTABLE WATER VALVES

Comply with Section 01150 of the Standard Specifications supplemented and/or modified as follows:

01150.10 Materials through 01150.52 Disinfecting - Remove and replace entire sections with Clackamas River Water Technical Specifications Section 15200 Valves, Hydrants, and Appurtenances (Appendix B).

END OF SECTION

SECTION 01160 – HYDRANTS AND APPURTENANCES

Comply with Section 01160 of the Standard Specifications supplemented and/or modified as follows:

01160.10 Materials through 01160.52 Disinfecting - Remove and replace entire sections with Clackamas River Water Technical Specifications Section 15200 Valves, Hydrants, and Appurtenances (Appendix B).

END OF SECTION

SECTION 01170 – POTABLE WATER SERVICE CONNECTIONS, 2 INCH AND SMALLER

Comply with Section 01170 of the Standard Specifications supplemented and/or modified as follows:

01170.10 Materials through 01170.51 Hydrostatic Testing - Remove and replace entire sections with Clackamas River Water Technical Specifications Section 15150 Water Service Connections (Appendix B).

01170.90 Payment - Add the following:

Item (a) includes installation of a meter box at the terminus of the water service.

END OF SECTION

SECTION 02010 – PORTLAND CEMENT

Comply with Section 02010 of the Standard Specifications.

END OF SECTION

SECTION 02020 – WATER

Comply with Section 02020 of the Standard Specifications.

END OF SECTION

SECTION 02030 – MODIFIERS

Comply with Section 02030 of the Standard Specifications.

END OF SECTION

SECTION 02040 – CHEMICAL ADMIXTURES

Comply with Section 02040 of the Standard Specifications.

END OF SECTION

SECTION 02050 – CURING MATERIALS

Comply with Section 02050 of the Standard Specifications.

END OF SECTION

SECTION 02070 – BONDING AGENTS

Comply with Section 02070 of the Standard Specifications.

END OF SECTION

SECTION 02080 – GROUT

Comply with Section 02080 of the Standard Specifications.

END OF SECTION

SECTION 02320 – GEOSYNTHETICS

Comply with Section 02320 of the Standard Specifications.

END OF SECTION

SECTION 02415 – PLASTIC PIPE

Comply with Section 02415 of the Standard Specifications supplemented and/or modified as follows:

02415.50 Polyvinyl Chloride Pipe - Delete and replace the second paragraph with the following:

Furnish PVC sanitary, storm, culvert, siphon, and irrigation pipe and fittings with 2 feet or more cover that have a minimum pipe stiffness of 46 psi and a minimum SDR of 35 and meet the requirements of sewer pipe ASTM D 3034. Joint type shall be elastomeric gasket conforming to ASTM D 3212.

END OF SECTION

SECTION 02440 – JOINT MATERIALS

Comply with Section 02440 of the Standard Specifications.

END OF SECTION

SECTION 02450 – MANHOLE AND INLET MATERIALS

Comply with Section 02450 of the Standard Specifications.

END OF SECTION

SECTION 02470 – POTABLE WATER PIPE MATERIALS

Comply with Section 02470 of the Standard Specifications supplemented and/or modified as follows:

02470.10 General through 02470.70 Acceptance - Remove and replace entire sections with Clackamas River Water Technical Specifications Section 15100 Waterlines and Appurtenances (Appendix B).

END OF SECTION

SECTION 02475 – POTABLE WATER FITTING MATERIALS

Comply with Section 02475 of the Standard Specifications supplemented and/or modified as follows:

02475.10 General through 02475.70 Acceptance - Remove and replace entire sections with Clackamas River Water Technical Specifications Section 15100 Waterlines and Appurtenances (Appendix B).

END OF SECTION

SECTION 02480 – POTABLE WATER VALVE MATERIALS

Comply with Section 02480 of the Standard Specifications supplemented and/or modified as follows:

02480.10 General through 02480.80 Acceptance - Remove and replace entire sections with Clackamas River Water Technical Specifications Section 15200 Valves, Hydrants, and Appurtenances (Appendix B).

END OF SECTION

SECTION 02485 – HYDRANT AND APPURTENANCE MATERIALS

Comply with Section 02485 of the Standard Specifications supplemented and/or modified as follows:

02485.10 General through 02485.80 Acceptance - Remove and replace entire sections with Clackamas River Water Technical Specifications Section 15200 Valves, Hydrants, and Appurtenances (Appendix B).

END OF SECTION

SECTION 02490 – POTABLE WATER SERVICE CONNECTION MATERIALS, 2 INCH AND SMALLER

Comply with Section 02490 of the Standard Specifications supplemented and/or modified as follows:

02490.10 General through 02490.90 Acceptance - Remove and replace entire sections with Clackamas River Water Technical Specifications Section 15150 Water Service Connections (Appendix B).

END OF SECTION

SECTION 02560 – FASTENERS

Comply with Section 02560 of the Standard Specifications.

END OF SECTION

SECTION 02630 – BASE AGGREGATE

Comply with Section 02630 of the Standard Specifications.

END OF SECTION

APPENDIX A – GEOTECHNICAL BORING LOGS

Geotechnical boring logs and other data are provided to assist the bidder in understanding the subsurface conditions and preparing bids appropriately. Bidder is responsible for any interpretation or conclusion Bidder draws from any technical date and or information contained in such reports.

LEGEND

Approximate Designation and Location of Boring

N W E S

0 50 100 200 Feet

SE 115th Utility Extension Project
Clackamas, Oregon

SITE AND EXPLORATION PLAN

July 2017 24-1-04158-001

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 2

Document Path: T:\Projects\24-1\4158 115th and Jennifer\Avmxd\SitePlan.mxd 7/5/2017 ath

Shannon & Wilson, Inc. (S&W), uses a soil identification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following pages. Soil descriptions are based on visual-manual procedures (ASTM D2488) and laboratory testing procedures (ASTM D2487), if performed.

S&W INORGANIC SOIL CONSTITUENT DEFINITIONS

CONSTITUENT[2]	FINE-GRAINED SOILS (50% or more fines)[1]	COARSE-GRAINED SOILS (less than 50% fines)[1]
Major	***Silt, Lean Clay, Elastic Silt,*** or ***Fat Clay***[3]	***Sand*** or ***Gravel***[4]
Modifying (Secondary) Precedes major constituent	30% or more coarse-grained: ***Sandy*** or ***Gravelly***[4]	More than 12% fine-grained: ***Silty*** or ***Clayey***[3]
Minor Follows major constituent	15% to 30% coarse-grained: ***with Sand*** or ***with Gravel***[4]	5% to 12% fine-grained: ***with Silt*** or ***with Clay***[3]
	30% or more total coarse-grained *and* lesser coarse-grained constituent is 15% or more: ***with Sand*** or ***with Gravel***[5]	15% or more of a second coarse-grained constituent: ***with Sand*** or ***with Gravel***[5]

[1]All percentages are by weight of total specimen passing a 3-inch sieve.
[2]The order of terms is: *Modifying Major with Minor*.
[3]Determined based on behavior.
[4]Determined based on which constituent comprises a larger percentage.
[5]Whichever is the lesser constituent.

MOISTURE CONTENT TERMS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

STANDARD PENETRATION TEST (SPT) SPECIFICATIONS

Hammer:	140 pounds with a 30-inch free fall. Rope on 6- to 10-inch-diam. cathead 2-1/4 rope turns, > 100 rpm
Sampler:	10 to 30 inches long Shoe I.D. = 1.375 inches Barrel I.D. = 1.5 inches Barrel O.D. = 2 inches
N-Value:	Sum blow counts for second and third 6-inch increments. Refusal: 50 blows for 6 inches or less; 10 blows for 0 inches.

NOTE: Penetration resistances (N-values) shown on boring logs are as recorded in the field and have not been corrected for hammer efficiency, overburden, or other factors.

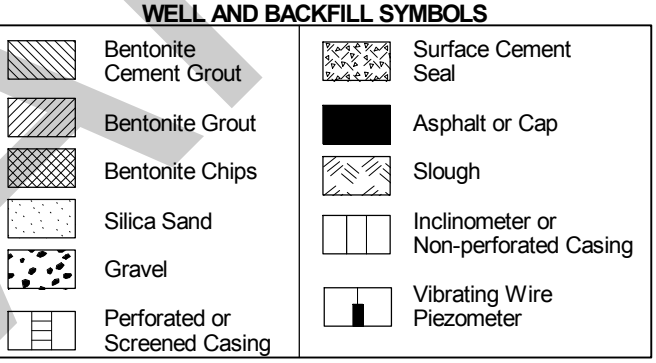
PARTICLE SIZE DEFINITIONS

DESCRIPTION	SIEVE NUMBER AND/OR APPROXIMATE SIZE
FINES	< #200 (0.075 mm = 0.003 in.)
SAND	
Fine	#200 to #40 (0.075 to 0.4 mm; 0.003 to 0.02 in.)
Medium	#40 to #10 (0.4 to 2 mm; 0.02 to 0.08 in.)
Coarse	#10 to #4 (2 to 4.75 mm; 0.08 to 0.187 in.)
GRAVEL	
Fine	#4 to 3/4 in. (4.75 to 19 mm; 0.187 to 0.75 in.)
Coarse	3/4 to 3 in. (19 to 76 mm)
COBBLES	3 to 12 in. (76 to 305 mm)
BOULDERS	> 12 in. (305 mm)

RELATIVE DENSITY / CONSISTENCY

COHESIONLESS SOILS		COHESIVE SOILS	
N, SPT, BLOWS/FT.	RELATIVE DENSITY	N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
< 4	Very loose	< 2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
> 50	Very dense	15 - 30	Very stiff
		> 30	Hard

WELL AND BACKFILL SYMBOLS



PERCENTAGES TERMS [1, 2]

Trace	< 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

[1]Gravel, sand, and fines estimated by mass. Other constituents, such as organics, cobbles, and boulders, estimated by volume.

[2]Reprinted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

SE 115th Utility Extension Project
Clackamas, Oregon

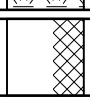
SOIL DESCRIPTION AND LOG KEY

July 2017 24-1-04158-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A1
Sheet 1 of 3

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(Modified From USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488)

MAJOR DIVISIONS			GROUP/GRAPHIC SYMBOL		TYPICAL IDENTIFICATIONS
COARSE-GRAINED SOILS *(more than 50% retained on No. 200 sieve)*	Gravels *(more than 50% of coarse fraction retained on No. 4 sieve)*	Gravel *(less than 5% fines)*	GW		Well-Graded Gravel; Well-Graded Gravel with Sand
			GP		Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Silty or Clayey Gravel *(more than 12% fines)*	GM		Silty Gravel; Silty Gravel with Sand
			GC		Clayey Gravel; Clayey Gravel with Sand
	Sands *(50% or more of coarse fraction passes the No. 4 sieve)*	Sand *(less than 5% fines)*	SW		Well-Graded Sand; Well-Graded Sand with Gravel
			SP		Poorly Graded Sand; Poorly Graded Sand with Gravel
		Silty or Clayey Sand *(more than 12% fines)*	SM		Silty Sand; Silty Sand with Gravel
			SC		Clayey Sand; Clayey Sand with Gravel
FINE-GRAINED SOILS *(50% or more passes the No. 200 sieve)*	Silts and Clays *(liquid limit less than 50)*	Inorganic	ML		Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
			CL		Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay
		Organic	OL		Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
	Silts and Clays *(liquid limit 50 or more)*	Inorganic	MH		Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
			CH		Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay
		Organic	OH		Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
HIGHLY-ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT		Peat or other highly organic soils (see ASTM D4427)
FILL	Placed by humans, both engineered and nonengineered. May include various soil materials and debris.				The Fill graphic symbol is combined with the soil graphic that best represents the observed material

NOTE: No. 4 size = 4.75 mm = 0.187 in.; No. 200 size = 0.075 mm = 0.003 in.

NOTES

1. Dual symbols *(symbols separated by a hyphen, i.e., SP-SM, Sand with Silt)* are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the *CL-ML* area of the plasticity chart.
2. Borderline symbols *(symbols separated by a slash, i.e., CL/ML, Lean Clay to Silt; SP-SM/SM, Sand with Silt to Silty Sand)* indicate that the soil properties are close to the defining boundary between two groups.
3. The soil graphics above represent the various USCS identifications (i.e., *GP*, *SM*, etc.) and may be augmented with additional symbology to represent differences within USCS designations. *Sandy Silt (ML)*, for example, may be accompanied by the *ML* soil graphic with sand grains added. Non-USCS materials may be represented by other graphic symbols; see log for descriptions.

SE 115th Utility Extension Project
Clackamas, Oregon

SOIL DESCRIPTION AND LOG KEY

July 2017 | 24-1-04158-001

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FIG. A1
Sheet 2 of 3

GRADATION TERMS

Poorly Graded	Narrow range of grain sizes present or, within the range of grain sizes present, one or more sizes are missing (Gap Graded). Meets criteria in ASTM D2487, if tested.
Well-Graded	Full range and even distribution of grain sizes present. Meets criteria in ASTM D2487, if tested.

CEMENTATION TERMS[1]

Weak	Crumbles or breaks with handling or slight finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

PLASTICITY[2]

DESCRIPTION	VISUAL-MANUAL CRITERIA	APPROX. PLASITICTY INDEX RANGE
Nonplastic	A 1/8-in. thread cannot be rolled at any water content.	< 4%
Low	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.	4 to 10%
Medium	A thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.	10 to 20%
High	It take considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.	> 20%

ADDITIONAL TERMS

Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

PARTICLE ANGULARITY AND SHAPE TERMS[1]

Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width/thickness ratio > 3.
Elongated	Length/width ratio > 3.

ACRONYMS AND ABBREVIATIONS

ATD	At Time of Drilling
approx.	Approximate/Approximately
Diam.	Diameter
Elev.	Elevation
ft.	Feet
FeO	Iron Oxide
gal.	Gallons
Horiz.	Horizontal
HSA	Hollow Stem Auger
I.D.	Inside Diameter
in.	Inches
lbs.	Pounds
MgO	Magnesium Oxide
mm	Millimeter
MnO	Manganese Oxide
NA	Not Applicable or Not Available
NP	Nonplastic
O.D.	Outside Diameter
OW	Observation Well
pcf	Pounds per Cubic Foot
PID	Photo-Ionization Detector
PMT	Pressuremeter Test
ppm	Parts per Million
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
rpm	Rotations per Minute
SPT	Standard Penetration Test
USCS	Unified Soil Classification System
q_u	Unconfined Compressive Strength
VWP	Vibrating Wire Piezometer
Vert.	Vertical
WOH	Weight of Hammer
WOR	Weight of Rods
Wt.	Weight

STRUCTURE TERMS[1]

Interbedded	Alternating layers of varying material or color with layers at least 1/4-inch thick; singular: bed.
Laminated	Alternating layers of varying material or color with layers less than 1/4-inch thick; singular: lamination.
Fissured	Breaks along definite planes or fractures with little resistance.
Slickensided	Fracture planes appear polished or glossy; sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Homogeneous	Same color and appearance throughout.

[1]Reprinted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.
[2]Adapted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

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SOIL DESCRIPTION AND LOG KEY

July 2017 24-1-04158-001

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FIG. A1
Sheet 3 of 3

Total Depth:	15 ft.	Northing:	~	Drilling Method:	Rotosonic	Hole Diam.:	5 in.
Top Elevation:	~	Easting:	~	Drilling Company:	Cascade Drilling	Rod Type:	~
Vert. Datum:		Station:	~	Drill Rig Equipment:	DB-320	Hammer Type:	Automatic
Horiz. Datum:		Offset:	~	Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between soil types, and the transitions may be gradual.

Brown, *Poorly Graded Sand with Gravel and Silt (SP-SM)*; moist; fine, rounded to subangular gravel; fine to coarse sand; nonplastic fines.

FILL

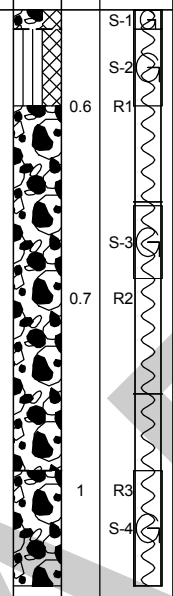
Dark Brown, *Silt (ML)*; moist; trace fine gravel; trace to few, fine to coarse sand; low plasticity.

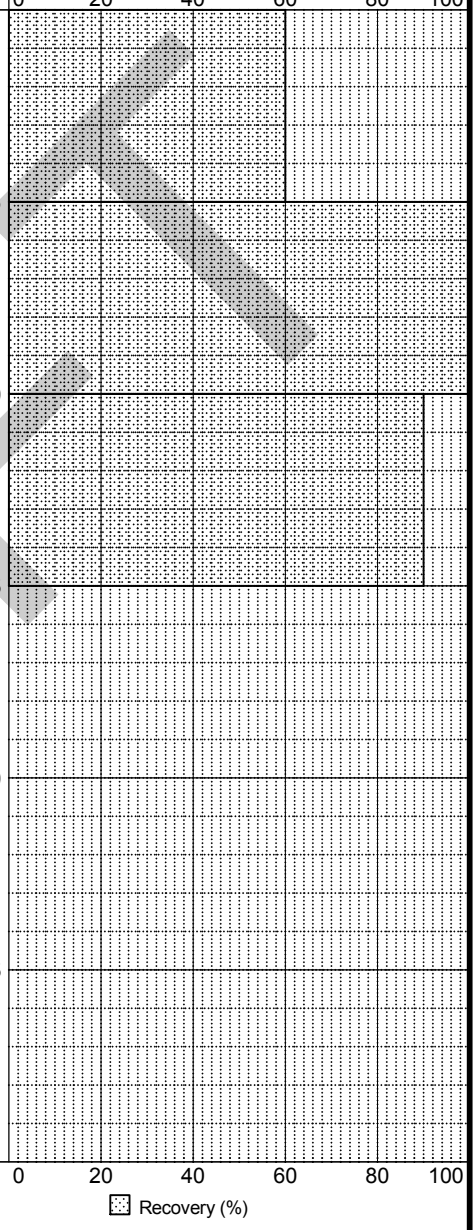
Brown and Gray, *Poorly Graded Gravel with Silt and Sand, with Cobbles (GP-GM)*; dry to moist; fine to coarse, rounded to subangular gravel; fine to coarse sand; nonplastic fines.

TERRACE DEPOSITS

Yellow-Brown, *Poorly Graded Gravel with Silt and Sand, with Cobbles (GP-GM)*; dry to moist; fine to coarse, rounded to subangular gravel; fine to coarse sand; nonplastic fines; gravel clasts remold to sand.

Completed: June 13, 2017





LEGEND

- Soil Core - Sonic
- Grab Sample

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations, and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. Group symbol is based on visual-manual identification and selected lab testing.
4. The hole location and elevation should be considered approximate.

SE 115th Utility Expansion Project
Clackamas, Oregon

LOG OF BORING B-1

July 2017 24-1-04158-001

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FIG. A2

REV 3

Total Depth:	*20 ft.*	Northing:	~	Drilling Method:	*Rotosonic*	Hole Diam.:	*5 in.*
Top Elevation:	~	Easting:	~	Drilling Company:	*Cascade Drilling*	Rod Type:	~
Vert. Datum:		Station:	~	Drill Rig Equipment:	*DB-320*	Hammer Type:	*Automatic*
Horiz. Datum:		Offset:	~	Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines represent the approximate boundaries between soil types, and the transitions may be gradual.

Brown, *Poorly Graded Gravel with Silt and Sand, with Cobbles (GP-GM)*; moist; fine, rounded to subangular gravel; fine to coarse sand; nonplastic fines.

FILL — 3.0

Dark Brown, *Lean Clay (CL)*; moist; trace, fine gravel; trace to few, fine to coarse sand; low plasticity. — 3.5

Brown and Gray, *Poorly Graded Gravel with Silt and Sand, with Cobbles (GP-GM)*; dry to moist; round cobbles; fine to coarse, rounded to subangular gravel; fine to coarse sand; nonplastic fines.

TERRACE DEPOSITS

Completed: June 12, 2017 — 20.0

Elev. Depth (ft.)	Symbol	PID, ppm	Samples	Ground Water	Depth, ft.
3.0		0	S-2, R1, S-3		5
3.5		0	R2, S-4		10
		0.7	R3		15
		0	R4	During Drilling ▽	20
20.0					25

PENETRATION RESISTANCE, N (blows/ft.)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*

0 20 40 60 80 100

Recovery (%)

● % Water Content

Plastic Limit ⊢—⊣ Liquid Limit

LEGEND

- Soil Core - Sonic
- Grab Sample
- ▽ Groundwater Level ATD

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations, and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. Group symbol is based on visual-manual identification and selected lab testing.
4. The hole location and elevation should be considered approximate.

SE 115th Utility Expansion Project
Clackamas, Oregon

LOG OF BORING B-2

July 2017 — 24-1-04158-001

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FIG. A3

REV 3

Total Depth:	25 ft.	Northing:	~	Drilling Method:	Rotosonic	Hole Diam.:	5 in.
Top Elevation:	~	Easting:	~	Drilling Company:	Cascade Drilling	Rod Type:	~
Vert. Datum:		Station:	~	Drill Rig Equipment:	DB-320	Hammer Type:	Automatic
Horiz. Datum:		Offset:	~	Other Comments:			

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between soil types, and the transitions may be gradual.

Brown, *Poorly Graded Sand with Gravel and Silt (SP-SM)*; moist; fine to coarse, rounded to angular gravel; fine to coarse sand; nonplastic fines.

FILL

Dark Brown, *Silt (ML)*; moist; trace fine gravel; trace, fine to coarse sand; low plasticity.

Brown and Gray, *Poorly Graded Gravel with Silt and Sand, with Cobbles (GP-GM)*; dry to moist; round cobbles; fine to coarse, rounded to subangular gravel; fine to coarse sand; nonplastic fines.

TERRACE DEPOSITS

Completed: June 12, 2017

Elev. Depth (ft.)
1.0
1.5
25.0

Symbol | Samples: S-1, S-2, R1, S-3, R2, R3, R4, S-4, R5 | Ground Water: 6/28/2017 | Depth, ft.: 5, 10, 15, 20, 25

PENETRATION RESISTANCE, N (blows/ft.)

▲ Hammer Wt. & Drop: *140 lbs / 30 inches*

0 20 40 60 80 100

0 20 40 60 80 100 Recovery (%)

● % Water Content

Plastic Limit ⊢——⊣ Liquid Limit

LEGEND

Soil Core - Sonic

Grab Sample

Groundwater Level on Date Shown

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations, and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. Group symbol is based on visual-manual identification and selected lab testing.
4. The hole location and elevation should be considered approximate.

SE 115th Utility Expansion Project
Clackamas, Oregon

LOG OF BORING B-3

July 2017 24-1-04158-001

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FIG. A4

REV 3

APPENDIX B – CLACKAMAS RIVER WATER TECHNICAL SPECIFICATIONS

SECTION 02225

TRENCH EXCAVATION AND BACKFILL

PART 1 – GENERAL

1.01 SUMMARY

A. This section describes trench excavation and backfilling for pipe and pipeline accessories.

B. For additional information, refer to CRW Standard Details with the Contract Drawings (referenced herein as "Drawings").

1.02 REFERENCE SPECIFICATIONS

A. AASHTO T89, T91 – Determining Liquid and Plastic Limits of Soils

B. AASHTO T99, T180 – Moisture Density Relationships of Soils

C. ASTM C136 – Sieve Analysis of Fine and Coarse Aggregates

D. ASTM D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort

E. ASTM D2216 - Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

F. ASTM D2434 - Permeability of Granular Soils

G. ASTM D2922 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods

H. ASTM D3017 - Water Content of Soil and Rock in Place by Nuclear Methods

I. ASTM D4318 - Liquid Limit, Plastic Limit, and Plasticity Index of Soils

J. Clackamas County Roadway Standards (latest revision)

K. Oregon Department of Transportation (ODOT) Standard Specifications (latest revision)

L. Oregon OSHA (OAR 437 Division 3) ; Federal OSHA (29 CFR 1926)

1.03 DEFINITIONS

A. *Clay Material*: Clay that is obtained from on-site or off-site sources and used for construction of clay capping placed around the pipeline in specific locations identified on the Drawings.

B. *Clear Width of Trench*: Width of trench as measured at the top of the pipe or conduit.

C. *Fine Grading Material*: Material placed at the bottom of the excavated trench prior to installation of pipe, conduit or pipeline accessories.

D. *Imported Material*: Fill material that is processed at an off-site facility, purchased by the Contractor and hauled to the site for use as backfill material.

E. *In-Place Density of Compacted Backfill*: Density determined in the field when tested in accordance with AASHTO T99, ASTM D2922 and ASTM D3017.

F. *Maximum Density* : Density determined in the laboratory when tested in accordance with ASTM D1557.

G. *Native Material*: Natural soils that exist below surface fill material, generally consisting of fine-grained silts and clays with medium to high plasticity.

H. *Pipe Bedding Depth*: The thickness of Bedding Material placed between the underside of the pipe and the trench bottom to uniformly support the barrel of the pipe.

I. *Pipe Zone*: The area from the top of the Pipe Bedding Material and extending above the pipe crown to the dimension indicated on the Drawings.

J. *Relative Compaction*: The ratio, in percent, of the in-place field dry density to the laboratory maximum dry density.

K. *Roadway Shoulders*: Paved areas and unpaved areas beyond the fog line of the roadway pavement and extending to the opposite edge of any roadside drainage features.

L. *Trench Backfill*: Material placed between the top of the pipe bedding material and the bottom of the pavement base rock, ground surface or other surface material to fill the trench excavation.

1.04 SUBMITTALS

A. Prepare and submit in accordance with Section 01300.

B. Material Data: For all proposed fine grading and pipe bedding material, clay material, Native Material, imported backfill material, and other soil materials, submit:

1. Material source.
2. Gradation.
3. Moisture-density curves.
4. Permeability tests (for Clay Material).

C. Testing laboratory name, lab qualifications and certifications.

1.05 QUALITY ASSURANCE

A. Initial Compaction Demonstration For All Backfill

1. Demonstrate adequacy of compaction equipment and procedures.

2. Compaction Sequence Requirements: When specified degree of compaction is achieved, proceed with trenching and backfilling activities using the established equipment and procedures.

B. Testing of Native Backfill

1. Frequency of sampling of native backfill material generated from trench excavations shall be as directed by the District.

2. Contractor shall obtain representative soil samples of material excavated from pipe trenches and scheduled to be used as backfill material after installation of the pipe.

3. Sampling and testing of native backfill shall be in accordance with jurisdictional agency's requirements.

C. Frequency of Sampling of Imported Material:

1 . Obtain representative samples of products from supplier.

2. After initial testing demonstrates that the proposed borrow material meets the specified requirements, obtain and test one additional sample for every 500 cubic yards of imported material.

PART 2 –PRODUCTS

2.01 GENERAL

A. Classes of backfill used for waterline trench backfill (within and apart from the pipe zone) are indicated in these specifications and on the Drawings. The District reserves the right to modify the use, location, and quantities of the various types of backfill during construction. General backfill classes correspond to those specified and designated by Clackamas County and ODOT (refer to reference documents in Part 1 above). Unless otherwise indicated, the following class definitions apply:

1. Class A – Native or common material that is approved to meet the characteristics required for the specific surface loading or other criteria of the backfill zone.

2. Class B – Imported granular material consisting of gravel or crushed rock meeting the requirements of this Section; typical designated size shall be 1”-0 or ¾”-0.

3. Class C – Clean sand with no particle size larger than ¼ inch. (USE ONLY AS REQUIRED).

4. Class D – Pit run or bar run material, well graded from coarse to fine; maximum dimension shall be 3 inches. (USE ONLY AS REQUIRED).

5. Class E – Controlled Density Fill (CDF) or Controlled Low-Strength Material (CLSM) conforming to the requirements of this Section. (USE ONLY AS REQUIRED).

B. Water for Moisture Conditioning of Fill Material: Use water from an approved source.

2.02. CLASS A BACKFILL – NATIVE

A. In general, Class A backfill will be used in unsurfaced areas where subsequent trench settlement must be held to a minimum.

1. When approved, Class A backfill may be used as trench backfill above the pipe zone or as otherwise specified.

B. Excavated (native) trench material shall be used. Remove all rocks and cobbles larger than 2 inches.

C. Soil excavated for the pipe trench shall be free of leaves, grass, roots, stumps, and other vegetable (organic) matter.

2.03. CLASS B BACKFILL – GRANULAR

A. The aggregate shall consist of uniform quality, clean, tough, durable fragments of rock or gravel, free from flat, elongated, soft or disintegrated pieces, and other objectionable matter occurring either free or as a coating on the stone.

1. Class B backfill will generally be limited to traveled roadways and crossings where final surfacing will be made shortly after backfilling and subsequent trench settlement must be held to a minimum.

2. Class B backfill shall be used as trench backfill above the pipe zone or as otherwise specified.

B. All rock shall be crushed gravel or rock meeting the following quality standards:

1. Abrasion (AASHTO): Maximum wear = 35 percent.

2. Fractured face: Minimum particles = 5 percent.

3. Liquid limit (AASHTO T89): Not greater than 30 percent.

4. Plastic index (AASHTO T91): Not greater than 6 percent.

C. Granular backfill for foundation stabilization, when required, shall be 1-½ inch-minus crushed rock, with reasonably uniform gradation from coarse to fine, and free from excessive dirt or other organic material.

D. Based on U.S. standard sieves, the gradation of the aggregates to be furnished shall be as indicated below:

Table 1: Class B (Granular) Backfill Gradations

Sieve Designation (Square Opening)	**Percent Passing by Weight**	
	1 ½ inch minus	*3/4 inch minus*
2 inch		100
1-1/2 inch	95 - 100	
1 inch	-	100
3/4 inch	60 - 80	90 - 100
3/8 inch	-	60 - 80
1/4 inch	35 - 50	40 - 60
No. 200	0 - 5	0 - 5

2.04. CLASS E BACKFILL – CONTROLLED DENSITY FILL (CDF)

A. Class E backfill will be used at road crossings and locations where paved roadway is removed, or as otherwise directed by the local jurisdiction.

B. Fluid mix of cement, aggregate, fly ash, and water, with a maximum unconfined compressive strength of 200 psi (1,100 psi compressive strength).

C. The water shall be free of oil, salts, and other impurities.

D. Controlled density backfill shall be thoroughly machine-mixed in a pug-mill or rotary drum and shall be placed in the designated location within 1-½ hours after mixing.

E. "Alternative Trench with Controlled Density Backfill" as specified by Clackamas County standard detail U270 will be considered by the District when applicable, and if standard CDF is not otherwise specified.

2.05. CLAY

A. For use when approved by the District.

B. Locate suitable on-site or off-site source of clay and import clay material to the site for construction of clay capping/check dam around the pipeline. Final approval of source by the District is required.

C. Permeability: Not greater than 1 x 10^{-6} cm/sec when tested in accordance with ASTM D2434.

PART 3 –EXECUTION

3.01 REMOVAL AND REPLACEMENT OF ASPHALT PAVEMENT

A. Refer to Section 01010 – General Requirements and to the applicable road jurisdiction specifications for excavation, trenching and surface restoration work within existing roadways.

3.02 TRENCH EXCAVATION

A. General

1. Excavate trenches and maintain excavation such that pipe and pipeline accessories are installed in an open trench.

2. Excavate to subgrade elevation and to trench width dimensions indicated on the Drawings.

3. De-watering Required:

a. At all times provide and maintain ample means and devices to promptly remove and dispose of all water entering the trench excavation during trench preparation for pipe laying, during the laying of the pipe, and until the the pipe zone has been completely backfilled. These provisions shall apply during the noon hour as well as overnight.

b. Trench water in the pipeline during construction is prohibited. Place a clean, properly-sized air bladder type expansion plug in the pipe between installations or for overnight protection.

B. Trench Bottom

1. Excavate and shape trench bottoms to provide uniform subgrade for placement of Bedding Material.

2. Unsuitable Hard Trench Bottom: If bottom of excavation is found to consist of rock or any material that cannot be excavated to provide a uniform bearing surface:

    a. Notify Developer's Engineer and the District of the conditions encountered and obtain concurrence that an unsuitable trench bottom condition is present.
    b. Remove such rock or other material to a depth of not less than six (6) inches below the original design elevation of the bottom of the trench.
    c. Place approved Class B granular backfill (3/4"-0 typical), as specified herein, to restore the trench bottom to the original design elevation. Place material in a single lift and compact to 95 percent of maximum density.

3. Unsuitable Soft Trench Bottom: If bottom of excavation is found to consist of soft or unstable material which is incapable of properly supporting pipe:

    a. Notify Developer's Engineer and the District of the condition encountered and obtain concurrence that an unsuitable trench bottom condition is present.
    b. Remove such material to the depth and length determined by the Engineer and District.
    c. Place approved Class B granular backfill (1-½" foundation rock) as specified herein to restore the trench bottom to the original design elevation. Place in lifts not exceeding eight inches in uncompacted thickness and compact to 95 percent of maximum density.

E. Trench Widths

1. Excavate trench with vertical walls and with uniform width.

2. Minimum and maximum trench widths: As indicated in the Specifications.

3. Minimum width of unsheeted trenches in which pipe is to be laid shall be 18 inches greater than the inside diameter of the pipe, or as approved. Sheeting requirements shall be independent of trench widths.

3.03 ROCK EXCAVATION

A. Where the bottom of the excavation encounters ledge rock and/or boulders and large stones, these shall be removed to provide 12 inches of clearance on each side and below all structures, pipe and appurtenances.

B. Excavations below subgrade in rock shall be backfilled to subgrade with approved bedding material and thoroughly compacted.

C. The Contractor: 1) shall verify if local, county, and/or state rules and regulations allow for the use of explosives for excavation of rock on the project, and 2) is required to obtain all necessary permits as may be applicable.

3.04 BACKFILL IN PIPE ZONE

A. Pipe base and pipe zone backfill are to be ¾-inch minus, Class B granular backfill.

B. Place material within the Pipe Zone as follows:

1. First Lift

    a. Carefully place and compact Bedding Material around and under the pipe to a level even with the spring line of pipe.
    b. Place Bedding material in a single lift and compact to 95 percent of maximum density.

2. Second and Subsequent Lifts

    a. Place Pipe Zone material from the spring line of the pipe in lifts of approximately 8 inches in uncompacted depth and compact to 95 percent of maximum density.
    b. Provide compacted Pipe Zone material over the top of the pipe to a total depth as indicated on the Drawings.
    c. Total depth of pipe zone shall be no less than 12 inches above crown of pipe.

C. Pipe Displacement

1. Take necessary precautions in placement and compaction of backfill material to prevent displacement of piping.

2. In the event there is movement of the pipe, re-excavate, re-lay, and backfill the pipe.

D. Requests to use water-settling methods to consolidate fill material shall be submitted to and approved by the District.

3.05 TRENCH BACKFILL ABOVE PIPE ZONE

A. Class A Backfill

1. Backfill the trench above the pipe zone with excavated trench materials.

a. Determine the type of compaction equipment, method to use, and amount of compaction required to prevent subsequent settlement.

i. Compact the backfill with mechanical vibratory or impact tampers to a minimum of 90 percent relative compaction.

ii. Contractor shall comply with the following:
1) For lifts less than or equal to 8-inches, use of a mechanical (vibratory or impact), walk-behind compaction device is allowed.
2) For lifts greater than 8-inches, a hydraulic backhoe-compaction device ("hoe-pack") is allowed.
3) A 24-inch initial lift shall be followed by 12-inch subsequent lifts, as applicable.
4) A 3-foot initial lift prior to hoe-packing may be provided if authorized by the District.

2. Remove all cobbles and stones two (2) inches in diameter and larger from material used for backfill in the upper 12 inches of Class A backfilled trenches.

3. Where Class A backfill is specified in areas where topsoil conditions exist, replace topsoil in the top six (6) inches of the trench. Compact and rake to match the ground surface adjacent to the trench.

B. Class B Backfill:

1. Backfill the trench above the pipe zone with approved granular backfill in lifts not exceeding eight inches loose depth.

2. Compact each lift to a minimum of 95 percent of relative compaction with mechanical vibrating or impact tampers.

3. Contractor shall comply with the following:

a. For lifts less than or equal to 8-inches, use of a mechanical (vibratory or impact), walk-behind compaction device is allowed.

b. For lifts greater than 8-inches, a hydraulic backhoe-compaction device is allowed. A 24-inch initial lift shall be followed by 12-inch subsequent lifts, as applicable.

C. Class E Backfill (as required by road/utility permit):

1. Backfill within the pipe zone with approved Class B gravel backfill.

2. With District's approval, fill the pipe with water or provide adequate weight to prevent flotation of pipe.

3. Backfill above the pipe zone with controlled density material to the bottom of the existing asphalt.

4. Prior to placing Class E backfill around valves and other appurtenances, utilize plastic skirting and crushed rock to provide adequate protection of valves, bonnets, operating nuts, valve cans, and other devices. Contractor shall refer to Drawings for further information.

D. Maintain roads, shoulders, drainage ditches, and trenches to Clackamas County Specifications (or to the specifications of other governing jurisdiction, as applicable).

E. When backfill is placed mechanically, push the backfill material onto the slope of the backfill previously placed and allow to slide down into the trench. Do not push backfill into the trench in such a way as to permit free fall of the material until at least two feet of cover is provided over the top of the pipe.

F. Under no circumstances shall the Contractor allow sharp, heavy pieces of material to drop directly onto the pipe or the compacted material around the pipe.

G. Backfill voids that may form when removing shoring and bracing.

3.06 FIELD QUALITY CONTROL

A. Contractor's Compaction Testing Responsibilities

1. Accomplish specified compaction of trench backfill, utilizing standards as found in AASHTO T99 or as otherwise directed by the governing jurisdiction's standards.

    a. Typical compaction shall be 95% of maximum relative density, or as otherwise specified.

2. Control operations by compaction tests to verify that compaction work complies, and is complying at all times, with requirements specified in this Section concerning compaction, control, and testing.

3. Test Results:

    a. Contractor shall immediately notify District of any failing compaction tests, to ensure that these areas are identified and addressed for re-compaction and re-testing.
    b. Copies of written test results shall be submitted to the District within one week of testing.

B. Location and Frequency of Compaction Testing

1. At a minimum, compaction tests shall be made every 150 linear feet, or as otherwise directed by the District.
    a. Initial test shall be 3 feet above top of pipe.
    b. Subsequent tests, as required for deeper trenches, shall be completed for every additional 3 feet above initial test depth.

2. Follow compaction requirements as specified by jurisdictional road agency, when applicable.

C. Compaction Re-testing

1. If compaction fails to meet specified requirements, the Contractor shall perform remedial work by one of the following methods:
    a. Remove and replace backfill at proper density.
    b. Bring density up to specified level by other means acceptable to the District.

2. Re-testing
    a. For re-testing, the District shall select areas to be tested once Contractor has completed compaction and necessary preparation work.

D. District Confirmation Testing

1. At any time, the District may perform in-place density and moisture content testing by any one of the following methods: ASTM D2922, D2216, and/or D3017; including combinations of the above or other methods, as determined necessary.

2. These tests may be made by the District at the desired frequency and location to verify that compaction is meeting requirements previously specified.

3. The Contractor shall remove overburden above level at which the District wishes to test, and shall backfill and re-compact material after testing is completed.

END OF SECTION

SECTION 15100

WATERLINES AND APPURTENANCES

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers work necessary to furnish, install, and test all buried piping systems, as shown on the drawings and as specified herein.

1.02 REFERENCE SPECIFICATIONS

A. AWWA C104 – Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.

B. AWWA C105 – Polyethylene Encasement for Ductile-Iron Pipe Systems (as directed by the District).

C. AWWA C110 – Ductile Iron & Gray-Iron Fittings for Water.

D. AWWA C111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe & Fittings.

E. AWWA C115 – Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.

F. AWWA C151 – Ductile-Iron Pipe, Centrifugally Cast, for Water.

G. AWWA C153 – Ductile Iron Compact Fittings for Water Service.

H. AWWA C207 – Steel Pipe Flanges for Waterworks Service.

I. AWWA C600 – Installation of Ductile-Iron Water Mains & Their Appurtenances.

J. AWWA C606 – Grooved and Shouldered Pipe Joints.

J. AWWA C651 – Disinfecting Water Mains.

1.03 SUBMITTALS

A. Prepare and submit in accordance with Section 01300.

B. **Demonstrate full compliance with all aspects of this Specification Section, including, but not limited to complete manufacturers' data on all pipe material, fittings, and coatings.**

PART 2 – PRODUCTS

2.01 GENERAL

A. Pipe sizes are nominal inside diameter unless otherwise noted. All sizes of pipe shall be as called out on the drawings and specified herein. **All pipe and fittings delivered to the job site shall be clearly marked to identify the material, class, thickness, and manufacturer. All material shall be new and free of blemishes.**

B. Where only one type of pipe is called out, no substitutions shall be allowed.

C. Piping materials of like kind shall be the product of one manufacturer.

1. **All materials submitted shall be NSF approved and UL listed, and shall comply with the specifications of the respective standard as provided by the American Water Works Association (AWWA), latest revision, as referenced in this Section.**

2. **All products furnished shall be subject to on-site inspection by the District, and any materials not complying with any of the specifications herein shall be rejected at the discretion of the District representative.**

3. When requested by the District, the Developer/Contractor shall promptly provide written certification that the manufacturer's inspection and testing results comply with the applicable AWWA standard(s).

D. The Developer/Contractor is responsible for furnishing and installing all items necessary to construct a complete and workable piping system. This includes, but is not limited to, insulating couplings and gaskets, piping specialties, and all other items required within the nature and scope of the installation. All items, including those not specified herein but required by the installation, shall be of first quality, equal in grade to similar materials specified herein, and shall comply with all applicable reference standards listed herein.

2.02 CEMENT LINED DUCTILE IRON PIPE AND FITTINGS

A. PIPE

1. Ductile iron pipe shall be centrifugally cast from Grade 60-42-10 ductile iron and shall comply in all respects with AWWA C151 (ANSI A21.51).

2. Pipe delivered to the jobsite shall be clearly and legibly marked, complying with the pipe marking requirements as specified in AWWA C151, Section 4.6, Marking Pipe, as follows:

a. Weight, class or nominal thickness, AWWA standard and casting period shall be shown on each pipe.

b. Manufacturer's mark, country where cast, year pipe was produced, and the letters "DI" or "DUCTILE" shall be cast or metal stamped on the pipe.

c. Letters and numerals on pipe sizes 14-inch and larger shall be not less than ½ -inches in height.

3. Buried pipe shall be Class 52, cement-mortar lined, asphaltic-coated ductile iron.

B. FITTINGS

1. Fittings shall be of the same material and class as the pipe to which they are joined and shall be manufactured in accordance with AWWA C110 or AWWA C153. Where taps are shown on fittings, tapping bosses shall be used.

2. Fusion bonded epoxy-coated fittings shall be U.S. Pipe Permafuse or equal. Any fitting with marred interior or exterior coating will be rejected and repaired by a factory representative or replaced. Mortar lining for fittings shall be the same thickness as specified for pipe.

3. All fittings shall comply with marking requirements of AWWA C110/C153.

C. JOINTS

1. All connections shall be a minimum rating of 1-½ times the line pressure, as approved by the District.

2. All joints on ductile iron pipe shall be push-on joint, mechanical joint, or flanged joint, as specified.

3. Restrained joints shall be one of the following types, and as indicated on the Drawings and approved by the District:

a. Welded-On Retainer Ring Type: Single gasket push-on type joint meeting applicable requirements of ANSI/AWWA C111/A21.11, with restraint provided by a welded-on retainer ring.

i. Joints shall be U.S. Pipe TR Flex, American Lok-Ring, Clow Super-Lock, or equal.

b. Mechanical Joints with Joint Restraint: Joint restraint shall be utilized in place of thrust blocking as shown on the Drawings or as approved by the District. Install restraints in accordance with manufacturer's recommendations. The following are District-approved restrained joint systems:

i. Romac Grip Ring or RomaGrip, Romac Industries, Inc.,
ii. Megalug, EBAA Iron Inc.;
iii. LocTyte, Pacific States Cast Iron Pipe Co.;
iv. TR Flex or Field-Lok, U.S. Pipe and Foundry Co.;

c. Restraining Gaskets shall be US Pipe Field-Lok or equal.

d. Bell Restraint System shall be used only when approved by the District, and equal to Romac 611 or EBAA Series 1500TD.

e. Lubricant for push-on joint piping shall be the pipe manufacturer's standard and NSF 61 approved.

f. Flanged joints for ductile iron pipe shall be as indicated in AWWA C115, in sections 2.03 and 2.07 of these specifications, or as otherwise indicated on the drawings.

g. Deflection of restrained joint pipe shall follow Manufacturer's recommendations.

D. LINING AND COATING

1. All ductile iron pipe and fittings shall have a standard cement mortar lining seal-coated with asphaltic material in accordance with AWWA C104 (ANSI A21.4).

2. Surface repair coatings for tar-coated pipe shall be 3M Spray-on Rubberized Undercoating, or equal.

a. Provide appropriate cloth wrapping between multiple repair coatings as directed by the District and manufacturer's specifications.

E. POLYETHYLENE ENCASEMENT

1. When required, the surfaces of all buried ductile iron pipe and fittings, including those that are fusion epoxy coated, shall be encased with one sheet of 8-mil minimum thickness polyethylene to form a continuous and

all-encompassing layer of polyethylene between the piping and surrounding earth or backfill material. All polyethylene shall be secured in place with 10-mil polyethylene tape. Installation shall conform to requirements of ANSI/AWWA C105/A21.5 and manufacturer's specifications. Excess slack width in the polyethylene tube shall be taken up to make a snug (but not tight) fit around the pipe barrel and secured with adhesive tape in a fold on the top of each pipe length at the quarter points. Any rips, punctures or other damage to the polyethylene sleeve shall be repaired with adhesive tape or a short length of polyethylene tube cut open, wrapped around the pipe and secured in place.

2.03 STEEL PIPE

A. PIPE

1. Steel pipe and fittings shall be manufactured and furnished in accordance with ASTM A53, and shall be seamless or electric resistance welded.

2. Minimum wall thickness of steel shall be 3/8 inch for pipe 12 to 24 inches in diameter. Pipe less than 10 inches in diameter shall be Schedule 40 minimum. Pipe shall be rated for a minimum of 1-½ times the system line pressure as approved by the District..

B. FITTINGS

1. All fittings shall have a minimal pressure and loading rating equal to the pipe to which they are connected.

2. Fittings for steel pipe shall be steel with butt weld, flanged, or mechanical grooved ends and couplings conforming to AWWA C606.

C. JOINTS

1. All joints on steel pipe shall have butt weld, flanged, or mechanical grooved ends.

2. All flanged joints shall be full or raised face, as specified on the drawings. Flanges shall be in accordance with AWWA C115 (ANSI A21.15) and AWWA C207, and faced and drilled to ASME B16.1, class 125 flange standards.

3. Grooved ends shall be the flexible radius type. Grooved end couplings shall conform to AWWA C606 and shall be Victaulic Style 31 or equal.

2.04 COPPER PIPE

A. Follow the specifications as set forth in Section 15150 – Service Connections, for furnishing and installation of copper pipe and tubing.

2.05 BOLTS, NUTS, WASHERS, AND GASKETS – GENERAL REQUIREMENTS

A. Unless otherwise specified, bolts and nuts for exposed flanges and fittings shall be as follows:

1. For buried pipe, bolts shall be carbon steel, ASTM A307 grade B, with ASTM A563 grade A heavy hex head nuts for class B and D flanges.

2. For restrained joint or mechanical joint use NSS Cor-Ten bolts for buried service.

3. Bolts and nuts may be furnished from equivalent strength stainless steel if precautions are taken to prevent galling of threads during tightening. Use an approved anti-sieze compound for all stainless steel bolts to prevent galling of bolt threads.

4. Washers shall be of the same material as the bolts.

B. Unless otherwise specified, gaskets shall be as follows:

1. Gasket material shall be oil resistant synthetic rubber or neoprene free from corrosive alkali or acid ingredients and suitable for use in potable water service. Gaskets shall be one piece, full face or cut ring, with holes to pass bolts.

2. Gaskets for mechanical joint (MJ) connections shall meet the requirements of AWWA C111, including characteristics, dimensions and marking requirements.

3. Gaskets for full faced flanged joints shall be 1/8 in. thick, sheet rubber conforming to AWWA C111, C115 and C207.

4. Use cut ring gaskets for raised face (RF) flanges.

5. Gaskets for push-on joints shall be oil resistant synthetic rubber, nitrile or neoprene, suitable for use in potable water service, conforming to AWWA C111.

6. Bell gaskets shall be made by the same manufacturer of the pipe.

7. Full face gaskets shall be used when insulation kits are required, unless specified otherwise on the drawings.

8. Nitrile gaskets, for use in special circumstances (i.e. contaminated soils, etc.) shall be used only as specified by the District.

2.06 PIPING CONNECTIONS

A. PIPE COUPLINGS

1. Flexible couplings shall be Romac 501, Smith-Blair 411, or equal, with the stop removed from the middle ring. Flexible reducing couplings shall be Romac RC501 or equal.

2. Flange Adapters

   a. When required, flange adapters shall be Romac FCG or RFCA, Smith-Blair Series 900, or equal.

   b. When approved by the District, Insulating Flange Coupling Adapters shall be as specified in "2-a." above, or as indicated on the drawings, with rubber insulating boot, low alloy steel bolts and nuts conforming to AWWA C111.

3. Transition Couplings

   a. Transition couplings shall be epoxy-coated steel or ductile iron couplings with rubber rings and high strength low alloy steel bolts and nuts conforming to AWWA C111, with an insulating boot at the smaller diameter end of the coupling. If the pipes are the same diameter put the insulating boot on the OD Steel pipe. Coupling shall be Romac 501 or equal.

   b. For connections involving OD steel pipe, install the coupling with a District-approved restraint system as shown on the Drawings.

4. Termination ("end-cap") couplings shall be as follows:

   a. End cap couplings for steel pipe shall be ROMAC EC501, or equal.

   b. Termination couplings for ductile and cast iron shall be a Mechanical Joint cap or plug.

   c. Termination couplings for bell joints shall be a Tyton plug.

5. Mechanical couplings, not a part of the pipe itself, shall be ductile iron couplings with rubber rings and high strength low alloy bolts and nuts conforming to AWWA C111. Couplings shall be Smith-Blair No. 441 or equal.

B. DIELECTRIC ISOLATION

1. General

a. All piping shall be dielectrically isolated from piping or other materials that are constructed from dissimilar metals.

2. Flange Insulation Kits

a. Flange insulation kits shall consist of a manufacturer approved gasket, two insulating washers and two steel washers for each bolt, and one full-length mylar insulating sleeve.

b. Flange insulation kits shall have an ANSI rating equal to that of the flange.

c. The flange shall be tape-wrapped with 10-mil butyl rubber polyethylene-backed adhesive tape to provide a seal between the two flanges.

d. Bolts for flange insulation kits shall be 1/8-inch undersized, ASTM A193, Grade B7 alloy stud bolts and ASTM A194, Grade 2H carbon steel heavy hex nuts.

e. Insulating flange gaskets shall be full face, 1/8-inch rubber. For raised face flanges, use cut ring gaskets as specified.

f. Flange insulation kits shall be as manufactured by Calpico Inc., San Francisco, CA; Pacific Seal, Inc., Burbank, CA; or Central Plastics Co., Shawnee, OK, or approved equal.

2.07 PRESSURE TAPS ("HOT" OR "WET" TAPS)

A. GENERAL

1. The tapping Developer/Contractor and waterline Developer/Contractor must be licensed and bonded to do business in Oregon.

2. Hot-tap welders shall be qualified as prescribed in AWS D1.1, Sec 5, Parts C, D, and E or under ASME Boiler and Pressure Vessel Code, Sec. IX, QW-201, QW-301 all positions. All welding shall comply with the requirements of AWWA C207 section 4.3, unless otherwise specified.

3. The welder must provide three previous pressurized thin wall pipe welding references (Ameron 14 gauge type).

4. The tapped hole in the main shall be undersized a maximum of ½ inch as measured across the diameter of the pipe.

5. All sleeves will have a test plug for a compressed air test between 25-35 psi. Prior to testing, a mixture of soap and water is to be sprayed onto the sleeve at all welds, seams, valves and contact points with the pipe to inspect for air leakage. No leakage will be accepted.

6. All taps will be thrust blocked and have a concrete block supporting the tapping valve.

7. Contractor is required to test the approved tapping valve and sleeve integrity prior to installation/tap.

B. STEEL PIPE TAP – SPECIAL CONSIDERATIONS

1. Tapping sleeve for OD steel pipe size-on-size shall be weld-on, JCM 416 Type 4, or equal, with Insulation Kit. Sleeve shall be fabricated from minimum 3/16-inch steel.

2. Unless otherwise specified, flanges used on the tapping neck shall be steel, flat or raised face, class 125 drilling, and Class D (150 psi rated) according to AWWA C207.

3. Both the sleeve and the exposed metal around the tap shall be tar coated. Taps smaller than the main require a JCM 422 stainless steel sleeve, or equal.

C. DUCTILE IRON PIPE TAP – SPECIAL CONSIDERATIONS

1. Tapping sleeves shall be full circle, stainless steel JCM 432 or 452, Mueller H-304-SS, or approved equal.

D. CAST IRON PIPE TAP – SPECIAL CONSIDERATIONS

1. Tapping sleeves shall be full circle, stainless steel JCM 432 or 452, Mueller H-304-SS, or approved equal.

E. CONCRETE CYLINDER PIPE TAP – SPECIAL CONSIDERATIONS

1. Tapping sleeves will be weld-on JCM 416 Type 4 concrete pipe type sleeves, or approved equal.

2. Weld-o-lets may be used upon approval of the District.

3. Refer to the drawings and section 3.02-E.4 below for further requirements when working with concrete cylinder pipe.

2.08 WATERLINE CASING

A. STEEL CASING

1. Steel casing pipe, spacers and accessories for casing waterlines shall be as specified on the drawings.

2. Casing pipe shall be Schedule 40 steel, manufactured of steel plate to the requirements of ASTM A1011 or A1018.

3. Casing spacers, end caps and other accessories shall be as manufactured by Calpico, Inc., San Francisco, CA, or equal.

2.09 TRACER WIRE

A. Tracer wire for locating purposes shall be No. 12 THHN or TWU standard solid copper wire with blue colored Type UF insulated jacket.

PART 3 – EXECUTION

3.01 PREPARATION AND HANDLING OF PIPE

A. The District will inspect each pipe and fitting before the buried pipe or fitting is lowered into the trench, or the exposed pipe or fitting is installed (as applicable). The interior and exterior protective coatings shall be inspected, and all damaged materials shall be removed from the project site and replaced with new, undamaged material.

1. The Developer/Contractor shall clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after laying.

2. The District reserves the right to reject any damaged materials it determines unfit for installation.

B. Use proper tools and equipment for the safe and adequate protection of the pipe. Carefully handle pipe in such a manner as to avoid any physical damage, in accordance with AWWA C600. Do not drop or roll pipe into trenches.

C. Before tapping, all materials and devices which will make contact with the potable water system must be clean and bacteria-free. All installations will comply with CRW Technical Specifications, Oregon Health Authority

requirements, manufacturer's requirements, and American Water Works Association (AWWA) Standards, as referenced herein.

D. As applicable, all exposed **steel piping**, fittings and related hardware shall be prepared as follows:

1. Prepare surfaces with SSPC-SP5 "White Metal Blast Cleaning". Only when directed by the District will -SP1, -SP2 or -SP3 be allowed.

2. Interior and exterior coatings shall be a potable grade polyamide epoxy approved for potable water contact which conforms to NSF Standards 60 and 61, unless cement lining conforming to AWWA Standards is specified. Apply the coating in 3 coats at 3 mils each, dry test at 9 mils minimum, to the manufacturer's recommendations. (Refer to Section 09900, "Paints and Coatings", if applicable.)

3.02 INSTALLATION OF PIPING

A. GENERAL

1. All pipe shall be carefully placed and supported at the proper lines and grades and, sloped where possible to permit complete drainage. Piping runs shown on the drawings shall be followed as closely as possible, except for minor adjustments to accommodate field conditions. Major field relocations/realignments require prior District approval.

a. Pipe depth may vary depending on location of other utilities and status of line(s) (abandoned or live). The Developer/Contractor may be required to remove abandoned waterlines for the purpose of installation of new lines in same trench, or to support communication or other utility lines for new alignments.

2. Piping shall be installed without springing or forcing the pipe in a manner which would set up stresses in the pipe, valves, or connected equipment. (See table 1 below).

a. Contractor shall complete the assembly of each length of piping before laying the next length in the trench, including pushing pipe in place and completing joint connections.

3. Straight runs of piping upstream and downstream of flow measuring devices shall be smooth for the required lengths per manufacturer's recommendations, as applicable.

4. Unless otherwise directed, lay pipe with bell end facing in the direction of the laying. For lines on an appreciable slope, face bells upgrade at the discretion of the District.

5. Wherever it is necessary to deflect pipe from a straight line to avoid obstructions, either in the vertical or horizontal plane, or where long-radius curves are permitted, the amount of deflection allowed shall not exceed the values in the following table:

Table 1 – Maximum Allowed Deflection of Ductile Iron Pipe.

Maximum Deflection*† Permitted in 18-Ft **Mechanical Joint** Ductile Iron Pipe (AWWA C600)			Maximum Deflection*† Permitted in 18-Ft **Push-on Joint** Ductile Iron Pipe (AWWA C600)		
Pipe Diameter in Inches	Max. Deflection in Degrees	Max. Deflection in Inches	Pipe Diameter in Inches	Max. Deflection in Degrees	Max. Deflection in Inches
4 - 12	2.5	10	4 - 12	2.5	9.5
14 - 24	1.5	5.5	14 - 36	1.5	5.5

** Maximum deflection shall be whichever is less between the above value and the manufacturer's recommendation.*

† Deflection for Restrained Joint Pipe shall follow Manufacturer's Recommendations.

6. All pipe flanges shall be set level, plumb, and aligned. All flanged fittings shall be true and perpendicular to the axis of the pipe. All bolt holes in flanges shall match mating flange alignment, bolt pattern, thickness and pressure requirements.

7. For pipes passing from concrete foundations or footings to soil, a flexible pipe coupling, as approved by the District, shall be installed within 1 foot of the foundation, or as otherwise indicated on the drawings. Particular care shall be taken to ensure full support of the pipe in the soil between and beyond the joints.

    a. Flexible couplings shall be flexible expansion joint type, as manufactured by EBAA Iron, Inc., or approved equal. (Refer to the drawings, as applicable.)

8. Alignment: Pipelines intended to be straight shall not deviate from the straight line at any joint in excess of 1 inch.

9. Do not lay pipe in water or when, in the opinion of the District, trench conditions are unsuitable.

B. UTILITY SEPARATION REQUIREMENTS

1. Horizontal separation between waterlines and sanitary sewer shall be 10 feet. **For water crossings over or under sanitary sewer, follow the stipulations of OAR 333-061-0050.**

2. Waterlines near utilities (other than sewer) require minimum separation as follows:

   a. Horizontal separation: 3 feet.

   b. Vertical separation (at crossing): 18 inches.

   c. Separation distances may be modified on a case-by-case basis after review and approval by the District and applicable local jurisdiction/other utility owner.

C. CLEANING PIPE AND FITTINGS

1. Remove all lumps, blisters, and excess coal-tar coating from the bell-and-spigot ends of each pipe. Wire brush the outside of the spigot and the inside of the bell and wipe clean, dry, and free from oil and grease before the pipe is laid.

2. Wipe the ends of mechanical joint pipe and fittings and of rubber gasket joint pipe and fittings clean of all dirt, grease, and foreign matter.

3. Do not allow foreign material to enter the pipe when placing in the trench.

4. Push-on Joint Pipe: After the first length of push-on joint pipe is installed in the trench, secure pipe in place with approved backfill material tamped under and along sides to prevent movement. During placement, keep ends clear of backfill. After each section is jointed, immediately place backfill as specified.

D. CUTTING PIPE

1. Cut pipe for inserting valves, fittings, or closure pieces in a neat and workmanlike manner without damaging the pipe or lining. Leave a smooth end at right angles to the axis of the pipe.

2. Cut ductile iron pipe with milling type cutter or saw. Do not flame cut.

3. Dress cut end of pipe to remove sharp edges or projections that may damage the rubber gasket. Dress cut ends of push-on joint pipe by beveling, as recommended by the manufacturer.

E. WELDING PIPE

1. Where applicable and otherwise required, all pipe welding shall be done by a certified welder meeting all qualification requirements of section 2.07.A of these specifications.

F. SPECIAL INSTALLATION CONSIDERATIONS FOR BURIED PIPE

1. General

a. All buried pipe shall be prepared as specified and shall be laid on the prepared granular base and bedded to ensure uniform bearing. Take all precautions necessary to prevent uplift and floating of the pipe prior to backfilling. Place a same size clean expansion sewer plug or air bladder type plug in the pipe between installations or for overnight protection.

b. Since pipe, joints, and fittings vary slightly between manufacturers, lay and join all materials in strict accordance with the manufacturer's recommendations.

c. Adhere to Section 02225 – Trench Excavation and Backfill – for trench grading, preparation, and backfilling for pipe placement.

d. At the location of each joint, dig bell joint holes of ample dimensions in the bottom of the trench and at the sides where necessary to permit the joint to be made properly and to permit easy visual inspection of the entire joint.

2. Special Connections

a. Provide special piping connections for dissimilar pipe types in accordance with the project drawings.

b. Thrust restraint, insulated connections, and protection of existing pipe's integrity shall be accomplished in accordance with the drawings and specifications.

3. Piping Anchorage

a. Mechanical joint restraints shall be installed as shown on the drawings. For all other situations, District approval is required to install mechanical joint restraints. Properly engineered lengths of restraint for fitting type and pressures are required, and shall follow manufacturer's recommendations. Mechanical joint

restraints will not be used on plain end fittings due to tapered ends.

b. Thrust blocks, in lieu of piping joint restraint systems, shall be used only as directed by the District.

c. Provide reaction or thrust blocking as indicated on the drawings, or as directed by the District.

i. Concrete for thrust/collar blocks shall have a 28-day compressive strength of 3,000 psi minimum.

ii. Place the blocking so that the pipe, fittings and joints will be accessible for disassembly and repairs, unless otherwise indicated.

iii. Wrap all pipe and fittings that will contact concrete with 4-mil plastic sheeting. Refer to CRW standard details with the Drawings.

iv. Allow concrete to cure a minimum of 5 days prior to filling or testing the waterline.

v. A high-early concrete mix may be used if approved by District. Developer/Contractor must submit mix design per Section 01300, and provide documentation that the proposed high-early mix will yield an average 3-day strength of 1,200 psi at 50 ºF cure temperature.

d. Securely anchor piping by approved restraint systems or suitable thrust blocking at all tees, plugs, caps, and other locations where unbalanced forces exist, as shown on the Drawings and as directed by the District.

e. For restraint of existing piping, a metal harness of adequate restraint design may be used in conjunction with concrete gravity blocking only when approved by the District. Use a stainless steel metal harness or furnish with comparable corrosion protection, as approved by the District.

f. For collar blocks, Developer/Contractor shall adhere to the following procedure:

i. A District approved retainer gland (Romac 612 or equal) shall be secured to the pipe at the collar block location.

ii. Cut the undisturbed soil on the sides and bottom of the trench, and perpendicular to the pipe. The dimensions of the collar block will be determined by the design engineer and approved by the District.

iii. Place a No.5 rebar mat, 12-inch on center, around the pipe at the retainer gland and into the cut. Restrain all pipe from the gland to the valve or fitting with the approved restraint system. Place concrete in 12-inch lifts consolidating each lift to fill all possible voids. The concrete shall be a minimum of 12-inches above and below the pipe.

iv. Unless directed otherwise by the District, a minimum of 7 feet of undisturbed soil shall separate the collar block from any fitting or valve placed downstream of the block. No additional joints shall exist between the collar block and restrained fitting or valve unless a District-approved restraint has been installed on the intermediate joint.

4. Working with Concrete Cylinder Pipe (CCP)

a. Any steel rod wrap that is cut will be tack welded back to the pipe and permanently welded back to the flange.

b. Using an approved mortar, grout all exposed exterior piping surfaces to manufacturer's recommendations.

c. For applications when quick-set interior repairs are required on CCP, instead of mortar use a thin layer of quick-cure coating such as Tnemec Epoxoline Series FC22, touch-up kit, or equal; apply heat for rapid curing.

5. Tracer Wire

a. Tracer wire shall be attached to the top and along the centerline of the pipe.

b. Tracer wire shall be routed through all valve boxes as shown on the drawings. Run tracer wire from the pipe up the outside of the valve box riser and inside the valve box top to prevent binding of the operating nut.

c. All locations of tracer wire intersections shall be soldered to provide electrical continuity, and protected from adverse soil

conditions with the use of shrink tubes or other approved waterproof connector devices.

d. Leave 1 foot of slack tracer wire in mainline at each valve and at each service tap to facilitate splicing, soldering and waterproofing.

6. Casing

a. Welding of casing shall conform to the welding requirements as stated in section 2.07A of these specifications.

i. Contractor shall provide continuous seam welding for all casing joint connections.

ii. Handling, storage and transport of steel casing pipe shall conform with manufacturer's recommendations.

b. Install carrier pipe in casing pipe using approved casing spacers, end caps and other accessories, as shown on the drawings and in accordance with casing spacer manufacturer recommendations.

3.03 PIPELINE CLEANING, TESTING AND DISINFECTION

A. GENERAL

1. Pipelines shall be subject to acceptance tests as specified herein. The Developer/Contractor shall provide all necessary labor and equipment for testing, and shall dispose of all waste, including water, in an acceptable and authorized manner. All tests shall be conducted in the presence of the District.

2. Testing and disinfection for ductile iron pipe shall be in accordance with latest AWWA standards, Oregon Health Authority-Drinking Water Program, and as otherwise specified in this section.

3. Pressure testing of all other pipe material shall follow applicable AWWA standards, but shall generally conform to the requirements of this section.

4. The Developer/Contractor shall furnish all required equipment and materials for cleaning, testing and disinfection, including temporary blow-offs, valves, hydrants, air releases and sampling points as necessary.

B. CLEANING

1. The interior of all pipelines shall be thoroughly cleaned of all debris prior to testing and prior to making connections.

    a. Cleaning shall be accomplished by flushing with water at a velocity of 2.5 ft/s and, if necessary, by pulling a tightly-fitting cleaning ball or swab through the pipe.

    b. No test shall commence until the pipeline is completely cleaned to the satisfaction of the District. As applicable, pump suction lines shall be cleaned prior to operation of pumps.

C. TESTING – GENERAL

1. The Developer/Contractor shall notify the District at least 48 hours in advance of scheduled pipeline testing.

    a. All piping, fittings, valves, services, thrust blocks, and other appurtenances (as applicable) shall be in place and properly set prior to issuance of the testing notice to the District.

        i. Typically, 5 days minimum is required for proper curing of concrete. If an approved high-early concrete is used for thrust blocks, Developer/Contractor may provide a shorter cure time (i.e. 3 days minimum) upon District's approval. Refer to Execution- Piping Anchorage above for further information on using high-early concrete.

    b. Sections of pipeline to be tested shall be completely backfilled or partially backfilled as approved by the District.

    c. Developer/Contractor shall not start a test unless the District's representative is present, or District's pre-approval has been otherwise obtained.

2. If leakage in excess of allowable values occurs in any section of pipe, the Developer/Contractor shall promptly locate and repair all leaks and retest the line until the leakage has been eliminated. All costs of repairs and retests shall be borne by the Developer/Contractor.

3. The Developer/Contractor shall take all necessary precautions to prevent any joint infiltration or inflow while the lines and their appurtenances are being tested; and shall, at his own expense, repair any damage to the lines and their appurtenances, or to any other structures, resulting from or caused by these tests.

4. Newly constructed pipe shall be isolated from existing pipe and shall satisfactorily pass the test specified herein prior to connection of that pipe to any existing piping or valves, unless otherwise indicated on the Drawings.

    a. As applicable, backflow prevention devices shall be utilized as required to isolate new waterlines, including temporary protection during testing activities.

5. Potable water shall be used for all hydrostatic tests. The Developer/Contractor may obtain test water from the District's water distribution system from a point or points approved by the District.

    a. The Developer/Contractor shall follow the District's policies and procedures for obtaining testing water. Refer to Section 01500, Construction Facilities and Utilities, for further information.

6. Care shall be exercised to isolate equipment which is not rated for the specified test pressure to avoid damage to the equipment.

7. The District will provide written acceptance of pressure testing to the Developer/Contractor.

D. HYDROSTATIC LEAK TEST

1. Slowly fill the pipe with water and allow to stand for 24 hours prior to pressure testing. Expel all air from the pipe. Apply and maintain the specified test pressure for the entire test period.

    a. The test pressure shall be calculated at the point of highest elevation for the section of line being tested, or as specified by the District. The test pressure shall be as shown on the Drawings or 1-½ times the working pressure, but not less than 150 psi.

    b. The pump suction shall be in a barrel or similar device, or metered so that the amount of water required to maintain the pressure may be measured accurately.

2. The duration of each pressure test shall be 2 hours with the water loss formula test or, at the inspector's discretion, a 30 minute no-loss test may be given. The length of each test may vary to ensure that the system is acceptable to the District.

3. Leakage shall be defined as the quantity of water necessary to hold the specified test pressure for the duration of the test period. No pipe

installation will be accepted if the leakage is greater than the allowable rate, as determined by the following formula:

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

In the above formula:

L = Allowable leakage, in gallons per hour
N = Number of joints in the length of pipe tested
D = Nominal diameter of pipe, in inches
P = Average test pressure during the test, in pounds per square inch

4. Regardless of the allowable leakage calculations, no visible leaks will be allowed on bridge sections or exposed piping systems.

E. DISINFECTION

1. A District representative shall operate any system valves associated with waterline testing.

2. All potable water pipelines shall be disinfected in accordance with Method 2 or 3 of AWWA C651 prior to being placed in service, as referenced and amended herein.

3. Disinfection Solution:

   a. Sodium hypochlorite solution shall be within a concentration range of 5% to 15% and shall have a free chlorine residual of 40 to 50 parts per million (ppm) in the pipe after injection.

   b. When approved by the District, a solution strength of 300 ppm shall be used for swabbing pipe and fittings on short pipe sections, waterline repairs, tie-ins and hydrant installations. The solution will be thoroughly swabbed on each pipe component and fitting. Per AWWA C651-4.7.4, this solution shall sit for a minimum of 15 minutes prior to flushing to allow for adequate contact time.

   c. Allowable forms of chlorine for disinfection are:

      i. Method 2 – Sodium hypochlorite solution (5-15%)
      ii. Method 3 – Calcium hypochlorite – dry granules only **(no tablets shall be used)**.

3. Disinfection Procedure

a. Use an approved solution-feed chlorinating device which provides adequate backflow prevention.

b. Method 2: Dilute the sodium hypochlorite solution with water to obtain a 1 percent solution. Approximate ratio is 1 gallon of 5.25% sodium hypochlorite to 4.25 gallons of water. 5.25% hypochlorite is comparable to commercial bleach such as Clorox or equal.

c. Method 3: Mix calcium hypochlorite granules with water to make a thick paste, then thin to approximately 1 percent solution (10,000 ppm chlorine).

d. Inject the chlorine solution into the pipeline to be chlorinated at the beginning of the line through an approved corporation stop (Ford or equal), C.C. thread or approved tap in the top of the pipeline.

i. Water from the existing system or other District-approved source shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the pipe that the combined mixture shall contain 40 to 50 ppm of free available chlorine.

ii. Valves shall be manipulated so that the strong chlorine solution in the line being chlorinated will not flow back into the line supplying the water. Use check valves if necessary.

e. Retention Period

i. Chlorinated water shall be retained in the pipeline long enough to destroy all non spore-forming bacteria. With proper flushing and the specified solution strength, 24 hours is required. At the end of the 24-hour period, the disinfection mixture shall have a strength of at least 10 ppm of chlorine. If the mixture is less than 10 ppm, flush the line and repeat the disinfection procedure.

ii. During disinfection and under District direction, operate all valves, hydrants, and other appurtenances to assure

that the disinfection solution is dispersed into all parts of the line, including dead ends, new services, and similar areas that otherwise may not receive the chlorinated water.

iii. Do not place concentrated quantities of the disinfectant in the line before it is filled with water. **Use of chlorine tablets is prohibited.**

iv. After chlorination, flush until the water through the line is equal in chemical and bacterial quality to the permanent source of supply.

f. After chlorination and flushing, the water shall remain in the pipe for an additional 24 hours before bacterial sampling. After bacterial tests have been performed and accepted by the District, the Developer/Contractor shall replace the test corp with a solid bronze plug that has C.C. type threads. Galvanized plugs will not be accepted.

g. Dispose of chlorinated water in an approved manner. Do not allow chlorinated water to flow into a waterway without using a satisfactory method of reducing chlorine concentrations to a safe level as determined by the U.S. Environmental Protection Agency and Oregon State Department of Environmental Quality.

F. SUMMARY OF TESTING AND DISINFECTION PROCEDURE

1. The District's procedures for waterline testing and disinfection as described above follows the typical timeline as follows:

   a. Waterline filling, release excess air, and allow filled waterlines to sit for 24 hours.

   b. Conduct pressure testing as specified.

   c. Disinfect waterlines and allow to sit for 24 hours.

   d. Flush waterlines, fill and allow to sit for 24 hours.

   e. Sampling (typically by District), results available in 24 hours.

   f. Connect and activate waterlines as specified.

END OF SECTION

SECTION 15150

WATER SERVICE CONNECTIONS

PART 1 – GENERAL

1.01 SUMMARY

A. This section covers work necessary to furnish, install, and test all water service connections as shown on the drawings and as specified herein.

1.02 REFERENCE SPECIFICATIONS

A. AWWA C800 – Water Service Line Valves and Fittings

B. ASTM B88 – Standard Specification for Seamless Copper Water Tube

C. Refer to Section 15100 – Waterlines and Appurtenances

1.03 SUBMITTALS

A. Prepare and submit in accordance with Section 01300.

B. Demonstrate full compliance with all aspects of this Specification Section, and shall include, but not be limited to, complete manufacturers' data on all pipe material, fittings, and coatings.

PART 2 – PRODUCTS

2.01 GENERAL

A. Pipe sizes are nominal inside diameter unless otherwise noted. All sizes of pipe shall be as called out on the drawings and specified herein. **All pipe and fittings delivered to the job site shall be clearly marked to identify the material, class, thickness, and manufacturer. All material shall be new and free of blemishes.**

B. Where only one type of pipe is called out, no substitutions shall be allowed.

C. Piping materials of like kind shall be the product of one manufacturer.

1. **All materials submitted shall be NSF approved and UL listed, and shall comply with the specifications of the respective standard as provided by the American Water Works Association (AWWA), latest revision, as referenced in this Section.**

2. **All products furnished shall be subject to on-site inspection by the District, and any materials not complying with any of the specifications herein shall be rejected at the discretion of the District representative.**

3. When requested by the District, the Developer/Contractor shall promptly provide certification that the manufacturer's inspection and testing results comply with the applicable AWWA standard(s).

D. The location and size of service connections will be as shown on the drawings.

E. All pipe dope, cutting paste and other incidental service materials will be NSF-approved for potable water, as specified in Section 15100.

F. As required by U.S. Senate Bill S.3874, all service connection materials, including brass or bronze valves and fittings, shall be certified "lead-free" or "no-lead (NL)" to meet the following requirements:

1. Not containing more than 0.2 percent lead when used with respect to solder and flux.

2. Not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures.

3. For the purposes of these specifications, allowed exemptions to the "lead-free" requirement include:

a. Pipes, plumbing fixtures, or fittings (including backflow preventers) used exclusively for non-potable services.

b. Service saddles or water distribution main gate valves that are two inches diameter or larger.

2.02 SERVICE CONNECTION COMPONENTS

A. All components of a service connection shall be the same size as the nominal designation of the service connection pipe.

2.03. SERVICE PRESSURES

A. Compression or grip fittings may be used where working pressures are less than 100 psi.

B. High pressure ball-type corporation and angle meter stops shall be used where working pressures are equal to or greater than 100 psi. An A-24 Ford meter reducer or equal is to be installed to connect ¾-inch meters.

C. No quick joint (Ford "Q") style connections shall be used- use onlygrip joint (Ford "G") style connections.("G" style connections include a standard rubber gasket and threaded connection.; "Q" style connections include a stainless steel ring and compression spring assembly- **"Q" style shall not be accepted.**)

2.04. TAPPING MATERIALS

A. Developer/Contractor shall provide all necessary equipment and materials for making service taps and connections, including incidental items such as cutting paste and similar materials.

B. Before tapping, all materials and devices making contact with the potable water system will be clean and bacteria free. Disinfecting of all installations will comply with Section 15100 of these specifications, the Oregon Health Authority, manufacturer's recommendations and AWWA Standards (as referenced).

2.05 SERVICE MATERIALS: STANDARD DOMESTIC ¾ - 1 INCH SERVICE

A. CORPORATION STOPS

1. In general, typical service connections to ductile iron or cast iron watermains shall be ¾-inch or 1-inch, "lead-free" corporation stops that are direct-tapped* at a 45º angle upward.
*(No saddle required)

2. Corp stops shall be Ford F1000-4-G-NL (grip joint) style or equal. **No Q (quick joint) style corp stops shall be used.**

a. For high pressure applications (100-300 psi) use Ford FB1000-4-G-NL corp stop or equal.

3. Corporation stops for ¾-inch and 1-inch services shall have a CC-threaded inlet and a compressive or grip connection for a copper pipe outlet.

B. SERVICE SADDLES

1. Service saddles shall be as follows:

a. For ¾" or 1" service connections to OD steel, PVC or transite watermain, use double-strap "lead-free" brass or stainless steel service saddles, with CC-threaded outlet.

b. Saddles shall be Ford F202B-NL, Romac 202S, or equal.

C. SERVICE COUPLINGS

1. Copper-to-copper couplings shall be Ford C44-XX-G-NL or equal.

D. MISCELLANEOUS FITTINGS

1. Reducers and adapters shall be Ford, Mueller or equal.

E. ANGLE METER STOPS

1. Angle meter stops shall have a copper inlet and inside IP outlet with swivel nut and padlock wing.

2. Angle stops shall be Ford KV43-444W-G-NL (grip joint) style or equal. **No Q (quick joint) style corp stops shall be used.**

   a. For high pressure applications (100-300 psi) use Ford BA43-444W-G-NL angle stops.

F. COPPER TUBING

1. Copper tube used for ¾- and 1-inch service connections shall be Type K, soft seamless conforming to ASTM B88.

2. Flared fittings, when required, shall conform to ANSI B16.26.

G. METERS

1. The District will furnish and install an approved meter.

   a. Meters shall be Badger Recordall Disc series, lead-free alloy, model 55, or equal.

H. METER BOXES

1. Meter boxes for standard ¾" or 1" services shall be as follows:

   a. Armorcast, Model A6001946PCX12, 13" x 24" x 12", heavy wall polyethylene with cast iron reader lid; or equal.

2.06 SERVICE MATERIALS: 1-½ - 2 INCH SERVICE

A. GATE VALVE

1. 1-½ and 2-inch service connections to ductile iron or cast iron water mains shall be a 2-inch CC-threaded, double-strap service saddle that is tapped perpendicular and horizontal to the main.

    a. For locations where conditions merit and as directed by the District (existing utility conflicts, etc.), the service connection may be tapped at a 45º angle and the gate valve installed at a specified distance from the main line connection.

2. Gate valves for 1-1/2 and 2-inch service connections shall be resilient seat, 2-inch size, with approved connections to both the service saddle (or tee) and the copper service line. Refer to specification section 15200 for valve requirements.

B. SERVICE CONNECTION TO MAIN

1. Service saddles shall be utilized on all connections to existing water mains as follows:

    a. For 1-½-in or 2-in service connections to existing ductile iron or cast iron watermain, use double-strap “lead-free” brass or stainless steel service saddles with 2-inch CC-threaded outlet.

    b. Saddles shall be Ford F202B-NL, Romac 202S, or equal.

2. For connections to new water mains, an approved tee will be required unless otherwise directed by the District.

C. SERVICE COUPLINGS

1. Copper-to-copper couplings shall be Ford C44-XX-G-NL or equal.

D. MISCELLANEOUS FITTINGS

1. Reducers and adapters shall be Ford, Mueller or equal.

E. COPPER TUBING

1. Copper tube used for 2-inch services shall be Type K, hard drawn copper conforming to ASTM B88. (Soft copper shall be used only by District approval.)

F. METERS AND SETTERS

1. The District will furnish and install an approved 1-½ or 2-inch meter.

   a. 2-inch meters shall be as specified and provided by the District.

   b. 2-inch meter shall be radio-read capable, equipped with antenna and register, as specified by the District.

2. Meter setter assemblies shall be Ford 70 Series Coppersetter, model VBH77-95035-003-NL, or equal, and shall include:

   i. Flanged angle ball valve and flanged angle single check valve with ¾" test port, for flanged meter connection;
   ii. 1-inch dedicated bypass line with inline bypass ball valve and single check valve;
   iii. CC-threaded (FIP) inlet and outlet brass elbows;
   iv. Other components as required by District specifications, and included in the meter setter assembly, or equal.
   v. As applicable and if available, the District may supply the meter setter for installation, at cost.

G. METER BOXES

1. Meter boxes for 1-½ or 2-inch services shall be as follows:

   a. The District will specify each meter box to be provided by the Developer/Contractor. Typical meter box shall be concrete with metal lid, equal to Oldcastle H-Series 2436-30 meter box with Uni-Half or steel cover as approved, concrete polymer meter box with cast iron or steel lid, or equal.

   b. Additional criteria, including dimensions and traffic loading rating, will be specified as required for each application.

PART 3 – EXECUTION

3.01 PREPARATION AND HANDLING

A. Excavation and backfill shall conform to the requirements of Section 02225.

B. Follow preparation and handling procedures as specified in Section 15100 for all service connection piping and materials.

3.02 INSTALLATION

A. PLACEMENT OF SERVICE

1. Prior to making the service connection, clean dirt and foreign matter from exterior of water main to ensure integrity of the completed connection.

a. Do not place the service connection within 18 inches of pipe joint or other tap, or as otherwise directed by the District.

B. SERVICE TAPS

1. Taps shall be made by experienced workmen using approved equipment with the proper adapters for the size of main being tapped.

C. PREPARATION OF TRENCH

1. Follow procedures for trench preparation as specified in Section 02225.

D. COPPER TUBING

1. Using a tubing cutter, cut copper tubing with square ends, ream and clean all burrs.

2. Care shall be taken to prevent the tube from kinking or buckling on short radius bends. The Developer/Contractor shall remove and replace kinked or buckled sections of copper tube at his expense.

E. SERVICE CROSSINGS OF ASPHALT-SURFACED ROADS

1. Service connection piping under asphalt-surfaced roads shall be bored or jacked.

2. Open cutting of asphalt roads requires prior written approval by the governing roadway jurisdiction.

3. The service connection pipe shall be installed so that it has a minimum cover of 2½ feet (30 inches) with a slight positive grade sloping away from the water main. (Ref. Clackamas County ordinance 7.03, 170-B)

4. Paved road crossings shall comply with any additional stipulations as shown on the Drawings and as may be required by local road jurisdiction (city, county, state, etc), including jurisdictional requirements referenced in these specifications.

F. PRESSURE TESTING AND DISINFECTION OF SERVICES

1. Service connections shall be pressure tested and disinfected in accordance with Section 15100 and as specified below.

2. Test service connections and service connection pipe at the normal working pressure after successful installation of the water main. Services may be tested and disinfected in conjunction with water main testing. In no case shall service connection piping be tested before water main testing is completed.

   a. Connect the service to the water main.
   b. Visually inspect for leaks and repair any leaks before backfilling.
   c. Duration of the pressure test shall be at least 15 minutes.

3. Prior to connecting new copper tubing to existing copper tubing or meter stop, douse with 500 ppm chlorine solution.

   a. Flush new copper tubing by fully opening corp stop/gate valve and allowing water to run for 2 minutes.

   b. Close corp stop/gate valve and meter stop and allow to stand for a minimum of 30 minutes prior to opening meter stop.

G. BACKFLOW PREVENTION

1. When required, backflow prevention devices will be indicated on the Drawings.

2. The Developer/Contractor shall coordinate selection and installation of an approved backflow prevention device with the District's cross connection specialist.

a. The Developer/Contractor shall follow Section 01300 when submitting for approval.

b. The Developer/Contractor shall follow Oregon Health Authority requirements for backflow prevention.

c. The Developer/Contractor shall ensure that the selected backflow preventer is compatible with metering/radio read requirements as required by the specific metering application.

3. The Developer/Contractor's water trucks, hoses, and related appurtenances used for obtaining and applying temporary water for construction purposes shall be inspected by the District. When applicable, the District will require backflow prevention devices for the Developer/Contractor's temporary water service during construction, as stated in Section 01500.

4. Residential water services:

a. Service lines supplying an irrigation system will include a Double Check Valve Assembly installed immediately downstream of the point where the irrigation line ties into the domestic water supply line.

b. Service lines supplying a non-potable fire protection system will include an approved Double Check Detector Assembly installed immediately downstream of the point where the fire line ties into the domestic service line.

c. Service lines exclusively supplying a non-potable fire protection system will include a secondary control valve at or near the property line, as approved, with an approved Double Check Detector Assembly installed immediately downstream.

d. For properties with an auxiliary water supply (i.e. domestic well or other supply), District and Oregon Health Authority backflow and cross-connection requirements must be followed, including recommendations from the District cross connection specialist.

5. Commercial water services:

a. Service lines that provide water for commercial use will include the installation of a Double Check Valve Assembly immediately

downstream of the water meter and prior to any other service connection.

b. Service lines supplying a non-potable fire protection system will include a secondary control valve at or near the property line, as approved, with an approved Double Check Detector Assembly installed immediately downstream.

6. For all installations involving high hazard water use as defined by the Oregon Health Authority, a Reduced Pressure Backflow Assembly will be installed immediately downstream of the water meter and prior to any other connection.

END OF SECTION

SECTION 15200

VALVES, HYDRANTS AND APPURTENANCES

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. This section covers all work necessary to furnish, install and test piping appurtenances, valves and special items as shown on the drawings, specified herein and as referenced in Section 15100 - Piping and Appurtenances.

1.02 REFERENCE SPECIFICATIONS

A. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe & Fittings

B. AWWA C502 - Dry-Barrel Fire Hydrants

C. AWWA C504 - Rubber-Seated Butterfly Valves

D. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service

E. AWWA C512 – Air Release, Air/Vacuum, and Combination Air Valves for Waterworks Service

F. AWWA C515 – Reduced Wall Resilient Seated Gate Valves for Water Supply Service

G. AWWA C550 - Protective Interior Coatings for Valves & Hydrants

H. AWWA C600 - Installation of Ductile-Iron Water Mains & Their Appurtenances

I. AWWA C605 - Underground Installation of PVC Pressure Pipe & Fittings for Water

J. Clackamas County Roadway Standards, latest revision

K. Clackamas County Fire District #1 Standards, latest revision

1.03 SUBMITTALS

A. Prepare and submit in accordance with Section 01300.

B. **Demonstrate full compliance with all aspects of this Specification Section, including, but not limited to complete manufacturers' data on all valves, hydrants, and related appurtenances.**

PART 2 – PRODUCTS

2.01 GENERAL

A. **All materials delivered to the job site shall be clearly marked to identify the material, class, thickness, and manufacturer. All material shall be new and free of blemishes.**

B. Valves, hydrants and related materials of like kind shall be the product of one manufacturer. Where only one type of product is called out, no substitutions shall be allowed.

1. **All materials submitted shall be NSF approved and UL listed, and shall comply with the specifications of the respective standard as provided by the American Water Works Association (AWWA), latest revision, as referenced in this Section.**

2. **All products furnished shall be subject to on-site inspection by the District, and any materials not complying with any of the specifications herein shall be rejected at the discretion of the District representative.**

3. When requested by the District, the Developer/Contractor shall promptly provide certification that the manufacturer's inspection and testing results comply with the applicable AWWA standard(s).

C. As required by U.S. Senate Bill S.3874, all service connection materials, including brass or bronze valves and fittings, shall be certified "lead-free" or "no-lead (NL)" to meet the following requirements:

1. Not containing more than 0.2 percent lead when used with respect to solder and flux.

2. Not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures.

3. For the purposes of these specifications, allowed exemptions to the "lead-free" requirement include:

a. Pipes, plumbing fixtures, or fittings (including backflow preventers) used exclusively for non-potable services.

b. Service saddles or water distribution main gate valves that are two inches diameter or larger.

D. Valves (General Requirements for all Valves in this Specification)

1. All valves shall be complete with all necessary operating components required for the proper completion of the work included under this section.

2. Operating torque to operate any valve shall not exceed 40 ft-lb. Unless otherwise indicated, the direction of rotation of the wheel, operating nut or lever to open the valve shall be counterclockwise. Each valve body or operator shall have cast thereon the word "OPEN" and an arrow indicating the direction to open.

3. Actual length of valves shall be within 1/16 inch (plus or minus) of the specified or catalog length except where installed adjacent to flexible or mechanical pipe couplings, where different lengths of a replacement can be accommodated.

4. Flanges shall meet the requirements of ANSI B16.1.

5. Valve boxes and extended stems shall be provided for all buried valves, as specified below.

6. Valve-to-pipe joint materials, including gaskets, bolts and nuts, shall be ductile iron pipe mechanical joints and shall meet the requirements of AWWA C111.

7. Gate Valves shall be furnished in accordance with section 2.02 below, at full line size unless specifically called out to be of reduced size.

8. Butterfly Valves shall be furnished in accordance with section 2.03 below.

9. Unless otherwise specified, valves shall be rated for **250 psi working pressure** minimum.

2.02 GATE VALVES

A. Gate valves shall be 250 psi-rated, class 125 drilling, cast ductile iron body, bronze-mounted, resilient seated, NRS valves with O-ring seals, and meeting the requirements of AWWA C515.

B. Unless otherwise shown, valves shall have 2-inch square operating nut.

C. The valves shall be full-port and fusion epoxy-coated (internal and external surfaces).

1. Coating shall meet the requirements of AWWA C550.

D. Gate valves shall be M&H/Kennedy 7000 series, Clow 2638, American Flow Control (AFC) 2500, or equal.

E. Tapping Valves

1. Tapping gate valves shall be flange by mechanical joint, shall conform to the above specifications unless stated otherwise, and as recommended by the manufacturer for use with the tapping sleeve supplied.

2. Valves shall be cast ductile iron body, resilient seated NRS tapping valves with 2-inch square operating nut, fusion epoxy coated inside and outside, meeting the requirements of AWWA C509.

3. Valves for O.D. Steel weld-on taps will be installed with insulation kits for flanged (or other) connections between dissimilar metals. Install tracer wire to either side of transition, and bring up both ends of tracer wire in a valve box for continuity purposes. (Follow basic valve box installation.)

2.03 BUTTERFLY VALVES

A. Butterfly valves shall be generally used on 14-inch diameter pipe and greater, unless otherwise specified on the drawings.

B. Butterfly valves shall be Class 150B short body type and meeting AWWA C504.

1. The valve must have factory-installed operators, with 2-inch square operating nut.

2. The valve components shall withstand environmental conditions in contact, including epoxy coatings and casting that comply with the referenced standards, to provide continuous trouble-free service.

3. High-pressure butterfly valves must be able to withstand 1½ times the main pressure or as approved by the District.

4. Butterfly valves shall be Clow, Mueller, M&H 4500, or equal.

5. Class 250B butterfly valves shall be used when specified or required by the District.

2.04 AIR RELEASE AND COMBINATION AIR RELEASE VALVES

A. Air release valves (ARV) automatically vent air from pipelines. Combination air release valves (CARV) vent air from and relieve vacuum pressure in pipelines. **For the purposes of these specifications, "ARV" shall be used collectively for both ARV and CARV assemblies, unless otherwise indicated. Specific devices required will be indicated on the drawings.**

1. Valve body and cover shall be ASTM A126 GR.B cast iron. Internal linkage, stem, and float shall be Type 304 stainless steel.

2. Air release valves shall be NSF 61 certified and meet the requirements of AWWA C512.

B. The ARV shall be designed to operate under working pressures of 150 psi and shall have been tested at a pressure not less than 300 psi.

1. For operating pressures over 150 psi, install a District-approved CARV with a 300 psi operating pressure.

C. Air release valves shall be as follows:

1. CARV shall be APCO Series 143C (1") or 145C (2");

2. ARV shall be APCO Series 142;

3. As manufactured by APCO Valve and Primer Corporation, Schaumburg, IL, or equal.

D. ARV Mainline Connection

1. ¾-inch to 1-inch connections shall be direct-tapped with C.C. thread corporation stop.

2. 2-inch connections shall be via a double-strap service saddle with C.C. thread corporation stop, tap, and neoprene gaskets.

3. Service saddles shall be adequate for use with the size, type, and class of the water pipe.

a. Saddles shall be Ford F202, Romac 202S or equal.

E. Angle Valve

1. The angle valve for 2-inch shall be bronze body, plug disc.

2. Valves shall have threaded connection and shall be Hammond 1B454T or equal.

a. For 1-inch use an angle meter stop with reducer as specified in Section 15150, when approved by the District, and sized to fit the ARV.

F. ARV Miscellaneous Fittings

1. Miscellaneous fittings, including reducers and adapters shall be brass and of domestic origin; Ford, Mueller, or equal.

2. Brass nipples shall conform to Federal Specification WW-P-460 for brass or bronze threaded pipe fittings.

G. Copper Tubing

1. Copper tubing for 1-inch shall be Type K, soft, seamless, conforming to ASTM B88.

2. Tubing for 2-inch shall be hard Type K, conforming to ASTM B88.

H. Corporation Stop

1. The corporation stop shall be as specified in Section 15150.

I. ARV Vault

1. The vault enclosure for the air release valve assembly shall be one length of 24-inch diameter bell-and-spigot, reinforced concrete sewer pipe conforming to ASTM C76, Class II.

2. As approved by the District, an alternate ARV vault may be allowed as follows:

a. The 1-in ARV vault may be formed by stacking two plastic meter boxes (sized for 1 ½ inch service).

b. The 2-in ARV vault may be formed by stacking two plastic meter boxes (sized for 2 inch service- Oldcastle H Series 2436 x 30" with Uni-half lid, or equal).

c. Meter boxes shall be manufactured by Armorcast, Model A6001946PCX12 or approved equal, installed by District approval only.

3. The vault ring and cover shall be cast iron with machined bearing surfaces. 24-inch rings and covers shall conform to ODOT requirements for HS-20 loading.

a. Covers and lids shall be cast iron and marked with "W" or "WATER", with holes symmetrically placed.

J. Mortar

1. To set the ARV vault, ring and cover, use premixed mortar conforming to ASTM C387.

2. Alternate mortar/grout mixes require prior District approval.

K. Gravel and Backfill

1. Furnish and install as specified in Section 02225.

2.05 VALVE APPURTENANCES

A. Valve Boxes

1. Valve box (VB) tops shall be cast iron, “Vancouver Style 910”, minimum 6-inch diameter and 3/16 inch wall thickness, a standard 18 inches long, and bituminous varnish coated.

a. Valve box top shall be VBT91018D as manufactured by East Jordan Iron Works, or approved equal.

2. Valve box lids shall be cast iron, Vancouver Style 910 with ”W” or “WATER” designation cast thereon. All parts shall be bituminous varnish coated.

b. Valve box lids shall be VBL910WD as manufactured by East Jordan Iron Works, or approved equal.

3. Valve can or bottom material and valve box extensions shall be 6-inch diameter, white plastic pipe.

a. VB bottom material shall be white Schedule 40 PVC or equal.

b. PVC extensions shall be 6-inch diameter by 24 inches long, SDR-35 SWR Valve Can Riser, and cut to fit within 4 inches of the top.

c. PVC extensions shall be used when there is less than 6 inches of adjustment available between the PVC top and the Vancouver bottom. Extensions shall be glued in place according to manufacturer’s installation procedures.

d. The District’s pre-approval of extension is required before installation.

4. A minimum of 4 inches of vertical separation shall be maintained between finished grade of the valve box top and the top edge of the valve box bottom, to prevent damage from the valve box lid bearing on the PVC valve box bottom.

5. A bell reducer shall be installed at the valve operation bonnet on all gate valves 8 inches and larger.

   a. Reducers shall be 8-inch x 6-inch, rubber gasketed SDR-35 bell-by-bell Concentric Reducer.

   b. The gasket shall be left in place on the 6-inch side for securing and sealing the valve can.

B. Extension Stems for Buried Valve Operators

1. When the centerline depth of the valve is more than 6 feet below grade, operating extension stems shall be provided to raise the operating nut within 3-4 feet below grade and/or box cover. Extension stems shall be constructed of steel and shall be complete with 2 inch square operating nut.

2.06 FIRE HYDRANTS AND FIRE SERVICE PIPING

A. Hydrants

1. Hydrants shall be of the break-flange or safety-top type, rated for 250 psi working pressure, cast ductile iron and conform to AWWA C502.

2. Nominal 5-1/4-inch main valve opening with 6-inch bottom connections.

3. Equip with two 2-1/2-inch hose nozzles and one 4-1/2-inch pumper nozzle.

4. Operating nut shall be 1-1/2-inch National Standard Pentagon nut.

5. The main valve shall be equipped with O-ring seals and shall open counterclockwise.

6. Nozzle threads shall be American National Standard. Inlet connection shall be mechanical joint.

7. The District will only accept submittals for and usage of the following hydrant brands:

   a. Mueller Super Centurion A-423

   b. Clow Medallion

   c. M&H 129

d. U. S. Pipe Style 94 Metropolitan 250

e. Waterous Pacer, WB-67-250.

B. Hydrant Base Block

1. Solid pre-cast concrete pier blocks having nominal dimensions of 8-inch thickness by 16-inch square base.

C. Hydrant Drainage Rock

1. Gravel for drainage shall be washed 1-1/2-inch drainage gravel and shall be free of organic matter, sand, loam, clay, and other small particles.
2. Drainage rock shall be covered with geotextile fabric prior to installation of hydrant plumbing.

D. Thrust Lugs (For New Construction)

1. Mega-lug as manufactured by EBAA Iron Sales, Inc., Eastland, Texas, or equal.

2. Romac Grip Ring or RomaGrip, Romac Industries Inc.

E. Thrust Rods or Split “Mega-Lug” (For Existing Hydrants, as Required by District)

1. Thrust rods, nuts and washers shall be nickel or stainless steel coated and used only when approved by the District.

F. Restrained Joint Systems (As Required)

1. Required for hydrants and fire service piping, as directed by the District.

2. Restrained joint shall be Flanged spools, Field Lock Gaskets (bell joints only), Romac Grip Rings, Mega Lugs or approved equal.

G. Fire Service Vault

1. Vaults for fire services shall be as constructed by Oldcastle Precast Inc., Wilsonville, OR, or equal.

2. Vault size and dimensions shall comply with the following table:

Table 1 – Fire Service Vault Sizing

Backflow Device Nominal Size	FDC Tee Inside Vault	FDC Tee Outside Vault
	Oldcastle Vault No.	
4-inch	676-LA or 776-LA-7	577-LA
6-inch	687-2-LA or 5106-1-LA	676-LA or 776-LA-7
8-inch	5106-1-LA	687-2-WA or 5106-1-LA
10-inch	5106-1-LA or 612-3-LA	5106-1-LA
>10-inch	Consult District	

3. Provide a standard galvanized ladder with aluminum extension, sized to fit specific vault, mounted for access clear of vault hatch. Ladder shall be as manufactured by Oldcastle Precast, or equal.

4. Vault hatch/doors shall be supplied precast into the vault lid, and shall be non-skid, aluminum diamond-plate spring-assisted doors, as manufactured by East Jordan, Syracuse, Bilco, or equal.

PART 3 – EXECUTION

3.01 GENERAL

A. Trench excavation and backfill shall conform to Section 02225.

B. Before installation, all valves shall be thoroughly cleaned of all foreign material, and shall be exercised and inspected for proper operation, and verified that the valves seat properly.

C. All valves shall be installed so that the stems are vertical.

D. Jointing shall conform to AWWA C600 or AWWA C605, whichever is applicable.

1. Joints shall be tested with the adjacent pipeline.

2. If joints leak under test, valves shall be disconnected and reconnected, and the valve and/or the pipeline re-tested.

E. Piping on either side of inline valves will follow “dead-end” valve restraint requirements.

F. Faces of flanges shall be cleaned thoroughly before flanged joint is assembled.

1. After cleaning, the gasket shall be inserted and the nuts tightened in a uniform star pattern around the flange.

2. If flanges leak under test, the nuts shall be loosened, the gasket reset or replaced, the nuts retightened, and the valve and/or pipeline retested.

G. Valve Support

1. All valves 8-inches or larger installed via hot taps or tie-ins to existing systems will be supported with a concrete pier block on compacted gravel base in accordance with AWWA C600 section 4.3.6.2.

H. Testing of Valves, Hydrants and Appurtenances

1. Valves shall be tested at the same time that the adjacent pipeline is tested. Joints shall show no visible leakage under test. Joints that show signs of leakage shall be repaired prior to final acceptance. If there are any special parts of control systems or operators that might be damaged by the pipeline test, they shall be properly protected. The Developer/Contractor shall be held responsible for any damage caused by the testing.

2. Pressure testing and disinfection, including water services and mains, shall be as stipulated in Section 15100 and 15150.

3.02 BUTTERFLY VALVES

A. The butterfly valve operating nuts shall be installed on the opposite side of the pipe as the lateral valve, if possible.

B. All butterfly valves will be pressure tested above ground and witnessed by a District Inspector prior to installation.

3.03 AIR RELEASE AND COMBINATION AIR RELEASE VALVES

A. Tapping Pipe

1. Pipe taps 1-inch and smaller shall be direct tapped, CC Thread corporation stops and installed by experienced workmen using tools in good repair with proper adapters for size of main being tapped.

2. Install service saddles on 2-inch taps and larger, and install all material as recommended by the manufacturer.

3. Developer/Contractor shall proceed as indicated on the drawings and consult with the District for connections involving non-standard existing mains or laterals (AC, PVC, OD steel, GI, CCP) to ensure that proper

saddles and other materials are used to complete the tapped connection.

B. Piping

1. Cut pipe with sharp tools and ream ends of all cut sections.

2. Apply NSF 61-approved joint compound to all pipe threads, fittings, and valves prior to joining.

3. Maintain slight positive slope from tap to ARV, and from ARV to above-ground vent, per drawings.

C. ARV Vault

1. Compact the pipe zone and bedding for the vault in accordance with Section 02225, and set the concrete vault in place.

2. Provide Class B gravel bedding and backfill in accordance with Section 02225.

3. The vault shall be placed off center and the air valve oriented for easy access to the valve operator.

4. Grout the vault ring in place as shown on the drawings.

a. The ring shall have continuous and uniform bearing on the concrete pipe.

b. The vault cover shall not contact the vent piping in any position.

5. Extend the ARV vent outlet with properly sized galvanized piping and fittings from the vault to the above-ground air relief vent as shown on the drawings.

6. Install “mushroom cap” tee vent with bug screen on vent outlet.

7. Secure vent outlet piping to 4”x4” treated wood post using galvanized metal strap, as shown on the drawings.

3.04 VALVE APPURTENANCES

A. Center the valve box level and plumb over the valve operating nut.

1. Set valve boxes so that they do not transmit shock or stress to the valves.

2. Set the valve box covers flush with the surface of the finished pavement as shown on the drawings.

3. Cut PVC box extensions to the proper length so that the valve box lid does not ride on the PVC extension when set at grade.

B. Backfill shall be the same as specified for the adjacent pipe, per Section 02225.

1. Place backfill around the valve boxes and thoroughly compact to a density equal to that specified for the adjacent trench and in such a manner that will not damage or displace the valve box from proper alignment or grade.

2. Misaligned valve boxes shall be excavated, plumbed, and backfilled at the Developer/Contractor's expense.

3. In landscaped or off-road areas install an asphalt or concrete pad, 1.5-foot square by 4-inches thick, around the valve box lid, as shown on the drawings or as directed by the District.

3.05 FIRE HYDRANTS, FIRE SERVICE PIPING, AND BACKFLOW PREVENTION

A. General Location and Placement

1. Installation shall conform to provisions of AWWA C502, except where otherwise specified, and to Clackamas County Fire District #1 Standards.

2. Depth of bury shall be as indicated on the plans and as approved by the District.

3. Locate as shown to provide accessibility and minimize possibility of damage from vehicles or injury to pedestrians. Improperly located hydrants shall be disconnected and relocated at the Developer/Contractor's expense.

B. Hydrant Barrel Placement

1. In general, place hydrant so that clearance on all sides of the hydrant barrel is a minimum of 3 feet from any obstacle or feature (i.e. tree, fence, pole, post, etc.).

a. Provide a minimum horizontal clearance of 5 feet from any power pole.

2. When placed behind the curb, set hydrant barrel so that no portion of the pumper nozzle or hose nozzle cap is less than 3 feet from the gutter face of the curb.

3. When set in lawn space between curb and sidewalk, or between sidewalk and property line, no portion of the hydrant or nozzle cap shall be within 12 inches of the sidewalk.

4. To provide adequate clearance for bolts and nuts, set hydrants so that the bottom of the safety flange is spaced as follows above finished grade or sidewalk level:

    a. 3 to 9 inches above finished grade for installations in concrete or asphalt pavement areas.

    b. 3 to 9 inches above finished grade for landscaped areas, or as otherwise directed by the District.

5. Any deviations to the above placement requirements must be approved by the District prior to installation.

6. Hydrants and related appurtenances must be installed to accommodate handicap clearance requirements as stipulated by ADA and/or County standards, and in cases of conflict the Contractor shall consult with the District prior to installation.

C. Excavation

1. Excavate in accordance with specification Section 02225.

2. For hydrant piping and base block, refill over-excavated areas with gravel and hand tamp to provide firm foundation.

D. Hydrant Base Block

1. Place concrete pier block on firm, level subgrade to assure uniform support.

E. Hydrant and Fire Service Piping Placement

1. All hydrant service valves shall be flanged to the tee and MJ outlet.

a. If the hydrant is more than 40 feet from the service valve, a second MJ X MJ service valve may be placed at the hydrant, as directed by the District.

2. Carefully set hydrant to prevent the base block from breaking.

3. Ductile iron pipe jointing procedures shall conform to specification Section 15100 and Section 3.4 of AWWA C600.

a. All hydrant and fire service piping shall be restrained joint.

b. After the hydrant is in place and connected to the pipeline, place temporary blocks to maintain the hydrant in a plumb position during subsequent work.

c. All fire service piping will have a service valve at the main and at the property line.

4. Hydrants not in service will be covered or bagged.

F. Hydrant Drainage Rock

1. Place drainage rock around the base block and hydrant bottom as specified in AWWA C600.

2. Maintain the hydrant in a plumb position during backfilling.

G. Thrust Lugs

1. Unless otherwise specified, provide restrained mechanical joints for all joints between the fire hydrant and the tee.

2. All hydrant tees will be restrained 18 feet each side with no bell joints closer than 10 feet on main piping run.

3. Fittings shall be restrained with Mega-lug, Grip Ring or approved equal.

H. Fire Service Vault

1. Fire service vaults shall be installed in accordance with CRW standard details and OAR 333-061-0071.

2. No outlets or connections (including hydrants) will be permitted on fire service lines prior to the backflow assembly without District approval.

3. All piping preceding the backflow assembly will be constructed of potable water-approved materials. Installation will conform to section 15100.

4. For fire department connections (FDC), install ball drip valves at the check valve and route drain piping to floor drain, as indicated on the drawings.

I. Backflow Prevention

1. For backflow prevention, the District will evaluate the degree of hazard and determine which type of device, if any, is appropriate.

   a. Developer/Contractor shall coordinate selection and installation of backflow prevention device with the District's cross connection specialist.

   b. Devices will be Double Check Detector Assembly or Reduced Pressure Detector Assembly as approved by the District.

   c. Selection of an appropriate backflow prevention device shall be in accordance with the current listing of the Foundation for Cross-connection Control and Hydraulic Research – University of Southern California, and as approved by the State of Oregon. (Go to http://www.usc.edu/dept/fccchr/list.html for further information)

   d. Devices shall have manufacturer-installed valves and bypass meter with backflow device.

      i. The bypass meter shall be an appropriate make and model that is approved by the District prior to installation.

      ii. The Developer/Contractor (or property owner) shall provide a radio meter read interface, Neptune R900i pit version or equal, which will be installed by CRW. The assembly shall come with 20 feet of coaxial cable for optional through-the-lid antenna installation.

   e. The Developer/Contractor will provide and coordinate testing of the backflow device with the District's cross connection specialist.

      i. For new installations, the Developer/Contractor shall request activation of the line when ready for testing.

ii. For existing/retrofit installations, the Developer/Contractor shall provide notice to the District and coordinate testing within 3 business days after activation of the service.

iii. Test reports are to be submitted to the District.

iv. Failure to submit backflow test results will be cause for termination of service.

f. Install backflow prevention assemblies and piping in accordance with Clackamas River Water details and specifications.

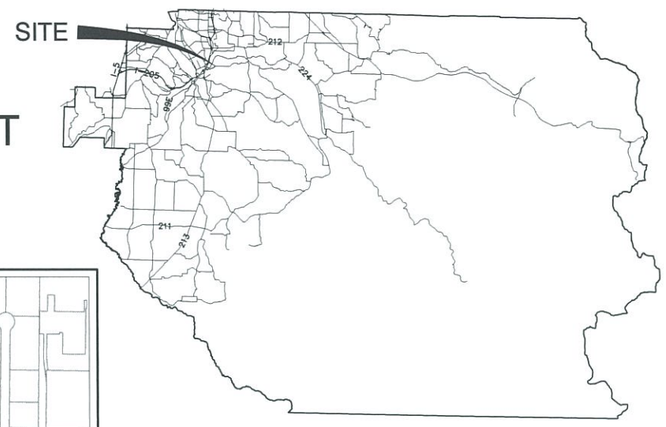
END OF SECTION

CLACKAMAS COUNTY
DEVELOPMENT AGENCY

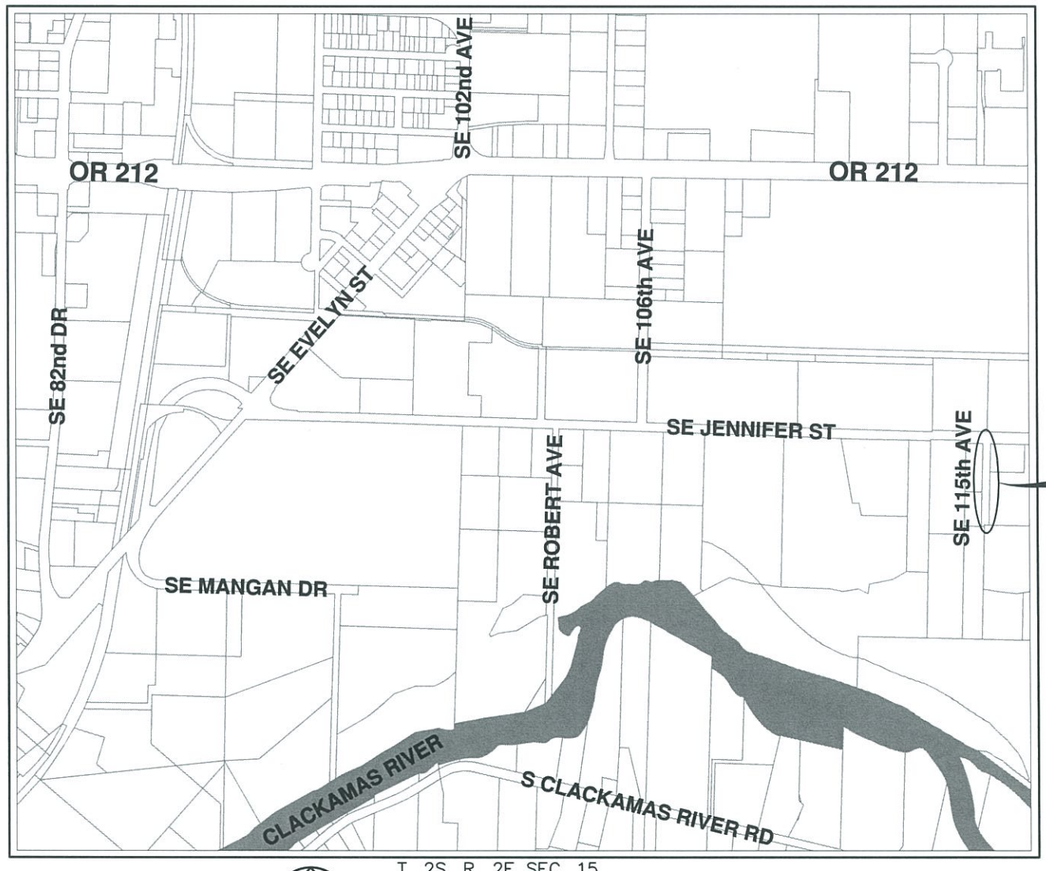
PLANS FOR PROPOSED PROJECT
WATER, SANITARY SEWER, AND PAVING

SE 115th AVENUE UTILITY EXTENSION PROJECT

CLACKAMAS COUNTY OREGON



INDEX OF SHEETS	
1	COVER SHEET
2	GENERAL NOTES
3	WES SANITARY SEWER NOTES
4	LEGEND
5	EXISTING CONDITIONS PLAN
6	EROSION & SEDIMENT CONTROL PLAN
7	SANITARY SEWER PLAN & PROFILE
8	WATER PLAN
9	STREET RESTORATION PLAN
10	SANITARY SEWER DETAILS
11	SANITARY SEWER DETAILS
12	SANITARY SEWER DETAILS
13	SANITARY SEWER DETAILS
14	SANITARY SEWER DETAILS
15	WATER DETAILS
16	WATER DETAILS
17	WATER DETAILS
18	PAVEMENT MARKING DETAILS



T. 2S, R. 2E SEC. 15

VICINITY MAP
NOT TO SCALE

HORIZONTAL DATUM:
A LOW DISTORTION PROJECT PORTLAND ZONE DERIVED FROM TRIMBLE VRS NOW NETWORK NAD83 (2011) EPOCH 2010.0000.

VERTICAL DATUM:
ELEVATIONS SHOWN ARE NAVD88 DERIVED FROM THE TRIMBLE VRS NOW NETWORK. NETWORK DERIVED ELEVATION WAS CHECKED AGAINST THE PUBLISHED DATA SHEET VALUES FOR NGS BENCHMARK PID QE1491.

ATTENTION !
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 952-001-0100. YOU MAY OBTAIN COPIES OF THE RULES FROM THE CENTER OR ANSWERS TO QUESTIONS ABOUT THE RULES BY CALLING (503) 232-1987.

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REGISTERED PROFESSIONAL ENGINEER
76382PE
OREGON
JUNE 29, 2009
JOHN P. CHRISTIANSEN
RENEWAL DATE: 12/31/17

COVER SHEET
SE 115th AVENUE
UTILITY EXTENSION PROJECT
DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045
M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN | DRAFTED BY: KDH | CHECKED BY: JPC

REVISIONS

NO	DATE:

Sheet No. 1

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GENERAL NOTES

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DOCUMENTS ASSOCIATED WITH THE PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR THE RELATIVE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DOCUMENTS AND IN FULL COMPLIANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS AND CODES.
2. THE LOCATIONS, DEPTHS, AND DESCRIPTIONS OF EXISTING UTILITIES SHOWN ARE COMPILED FROM AVAILABLE RECORDS AND/OR FIELD SURVEYS. THE PROJECT ENGINEER OR UTILITY COMPANIES DO NOT GUARANTEE THE ACCURACY OR THE COMPLETENESS OF SUCH RECORDS. ADDITIONAL UTILITIES MAY EXIST WITHIN THE WORK AREA.
3. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND SHOWN FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR SHALL HAVE ALL UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. NOTIFY PROJECT ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST.
4. NOTIFY THE UTILITY PROVIDER IMMEDIATELY OF ALL UTILITIES EXPOSED. UNIDENTIFIED UTILITIES SHALL NOT BE DISRUPTED OR CUT UNTIL THE UTILITY PROVIDER HAS APPROVED THE CUT OR DISRUPTION. UTILITIES OR INTERFERING PORTIONS OF UTILITIES THAT ARE ABANDONED IN PLACE SHALL BE REMOVED BY THE CONTRACTOR TO THE EXTENT NECESSARY TO ACCOMPLISH THE WORK.
5. CONTRACTOR MUST VERIFY ALL EXISTING UTILITIES FOR BOTH VERTICAL ELEVATION AND HORIZONTAL LOCATION PRIOR TO COMMENCING CONSTRUCTION (POTHOLE BEFORE DIGGING IF NECESSARY). NOTIFY ENGINEER IF CONFLICTS ARISE.
6. THE CONTRACTOR SHALL MAINTAIN BENCHMARKS, PROPERTY CORNERS, MONUMENTS, AND OTHER REFERENCE POINTS. IF SUCH POINTS ARE DISTURBED OR DESTROYED BY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AND PAY FOR THEIR REPLACEMENT BY EMPLOYING A PROFESSIONAL LAND SURVEYOR TO RESET PROPERTY CORNERS AND OTHER SUCH MONUMENTS.
7. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AND ALL APPLICABLE JURISDICTIONS FORTY-EIGHT (48) HOURS PRIOR TO ANY STAGED INSPECTION.
8. A COPY OF THE PERMIT WITH ALL ATTACHMENTS, A COPY OF THE APPROVED CONSTRUCTION PLANS, AND ALL AMENDMENTS SHALL BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. ALL WORK SHALL CONFORM TO THE PERMIT TERMS, CONDITIONS/PROVISIONS, APPROVED CONSTRUCTION PLANS, APPROVED PLAN AMENDMENTS, AND THESE GENERAL CONDITIONS. CHANGES TO ANY OF THE AFORESAID MUST BE APPROVED BY THE PROJECT ENGINEER AND APPLICABLE JURISDICTION, IN ADVANCE OF WORK PERFORMANCE.
9. THESE PLANS AND SPECIFICATIONS ASSUME "DRY WEATHER" CONSTRUCTION. ADDITIONAL MEASURES MAY BE REQUIRED FOR "WET WEATHER" CONSTRUCTION.
10. EXISTING LANDSCAPING MATERIALS, IRRIGATION, APPURTENANCES, AND STRUCTURES, WHICH ARE NOT TO BE REMOVED, SHALL BE PROTECTED FROM DAMAGE AT ALL TIMES. DAMAGE CAUSED BY CONSTRUCTION OPERATIONS SHALL BE REPLACED OR REPAIRED TO EXISTING OR BETTER CONDITION AT NO ADDITIONAL COST TO THE OWNER.
11. PROPERTY AND RIGHT-OF-WAY LINES SHOWN ARE APPROXIMATE. THESE PLANS ARE NOT MEANT TO SERVE BOUNDARY SURVEY PURPOSES.
12. THERE SHALL BE NO ALTERATION OR VARIANCE FROM THE APPROVED PLANS WITHOUT APPROVAL OF THE PROJECT ENGINEER.
13. CONTRACTOR SHALL CONFORM TO OSHA REQUIREMENTS AT ALL TIMES.
14. CONTRACTOR IS RESPONSIBLE FOR SITE JOB SAFETY NECESSARY TO PROTECT THE PUBLIC FROM AREAS OF CONSTRUCTION AND CONSTRUCTION ACTIVITY.
15. THE PROJECT ENGINEER IS NOT RESPONSIBLE FOR REVIEWING THE CONTRACTOR'S SAFETY PRECAUTIONS OR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK.
16. CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND OBTAINING ALL REQUIRED TESTING AND INSPECTIONS FOR THE PROJECT.
17. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT ALL REQUIRED OR NECESSARY INSPECTIONS ARE COMPLETED BY AUTHORIZED INSPECTORS PRIOR TO PROCEEDING WITH SUBSEQUENT WORK WHICH COVERS OR THAT IS DEPENDENT ON THE WORK TO BE INSPECTED.
18. ANY INSPECTION/OBSERVATION BY THE PROJECT ENGINEER OR PROJECT INSPECTOR SHALL NOT IN ANY WAY RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM THE WORK IN COMPLIANCE WITH THE APPLICABLE CODES, REGULATIONS, STANDARDS, PLANS, SPECIFICATIONS, AND PROJECT CONTRACT DOCUMENTS.
19. DEBRIS AND TRASH SHALL NOT BE BURIED OR STOCKPILED ON THE SUBJECT SITE. ALL DEMOLITION WASTES AND DEBRIS SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS. THE CONTRACTOR SHALL MAINTAIN RECORDS TO DEMONSTRATE PROPER DISPOSAL ACTIVITIES, TO BE PROVIDED TO THE OWNER OR PROJECT ENGINEER UPON REQUEST.
20. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS AND APPROVALS FOR OFF SITE DISPOSAL FACILITIES AND SUPPLY A COPY OF APPROVALS TO THE OWNER'S REPRESENTATIVE UPON REQUEST.
21. ALL FACILITIES SHALL BE MAINTAINED IN-PLACE BY THE CONTRACTOR UNLESS OTHERWISE SHOWN OR DIRECTED. CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO SUPPORT, MAINTAIN, OR OTHERWISE PROTECT EXISTING UTILITIES AND OTHER FACILITIES AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR SHALL LEAVE EXISTING FACILITIES IN AN EQUAL OR BETTER-THAN-ORIGINAL CONDITION.
22. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT "REDLINE DRAWINGS" TO THE PROJECT ENGINEER. "REDLINE DRAWINGS" DOCUMENT ALL DEVIATIONS AND REVISIONS TO THE APPROVED PLANS; THEY ALSO RECORD A DESCRIPTION OF CONSTRUCTION MATERIALS ACTUALLY USED (PIPE MATERIAL, ETC).
23. THE CONTRACTOR SHALL KEEP RECORDS OF ALL CONSTRUCTION THAT DIFFERS FROM THE APPROVED PLANS AND SHALL MAINTAIN "RECORD DRAWINGS" DURING THE CONSTRUCTION PERIOD. "RECORD DRAWINGS" SHALL BE SUBMITTED TO THE ENGINEER AT THE END OF THE PROJECT.
24. IF GROUND WATER SPRINGS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE MEASURES TO ENSURE THAT THE WATER IS NOT CONVEYED THROUGH UTILITY TRENCHES, AND THE NATURAL FLOW PATH OF THE SPRING IS ALTERED AS LITTLE AS PRACTICABLE.
25. CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER AND OWNER OF ANY SEPTIC TANKS, WELLS, OR FUEL TANKS ENCOUNTERED DURING CONSTRUCTION.
26. PAVING OF STREETS SHALL NOT BE ALLOWED UNTIL AFTER COMPLETION OF ALL REQUIRED TESTING AND INSPECTION OF NEW WATER, SEWER AND STORM DRAIN LINES UNDER PAVED AREAS, AND REVIEW AND APPROVAL OF THE PRIVATE (FRANCHISE) UTILITY PLANS BY THE COUNTY ENGINEER.

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REGISTERED PROFESSIONAL ENGINEER
76382PE
OREGON
JUNE 29, 2009
JOHN P. CHRISTIANSEN
RENEWAL DATE: 12/31/17

GENERAL NOTES

SE 115th AVENUE
UTILITY EXTENSION PROJECT

DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN
DRAFTED BY: KDH
CHECKED BY: JPC

REVISIONS

NO.	DATE:

Sheet No. 2

WATER ENVIRONMENT SERVICES (CCSD#1)
SANITARY SEWER CONSTRUCTION NOTES

1. THE ENGINEER IS REQUIRED TO HAVE AN INSPECTOR ON SITE AT ALL TIMES DURING CONSTRUCTION OF THE SANITARY SEWER. THE CONTRACTOR SHALL GIVE THE ENGINEER AT LEAST 48 HOURS NOTICE PRIOR TO BEGINNING WORK AT THE START OF CONSTRUCTION OR AFTER AN INTERVAL OF NOT WORKING ON THE SANITARY SEWER.

INSTALLATION:

2. EACH SERVICE CONNECTION SHALL BE PLUGGED WITH A RUBBER RING PLUG. A 2 X 4 MARKER PAINTED GREEN SHALL BE PLACED AT THE END OF EACH SERVICE CONNECTION, AND SHALL EXTEND FROM THE END OF THE PIPE TO A POINT ONE FOOT (1') ABOVE THE SURFACE OF THE GROUND. A DETECTABLE GREEN MAGNETIC TAPE ("THORDURATEC SAFETY GREEN SANITARY SEWER RIBBON OR EQUAL") WITH THE WORD "SEWER" AT REGULAR INTERVALS SHALL BE PLACED ALONG THE SERVICE CONNECTION FROM THE MAINLINE TEE TO THE GROUND SURFACE.
3. IN EASEMENT AREAS ALL MANHOLES SHALL HAVE TAMPER-PROOF LIDS PER CCSD#1 SPECIFICATIONS, OR APPROVED EQUAL. CAUTION: NOT ALL TAMPER-PROOF LIDS MEET CCSD#1 SPECIFICATIONS. THE FRAME AND COVER SHALL BE SIX INCHES (6") ABOVE FINISH GRADE.
4. IN AREAS USED BY VEHICLES (PAVED OR UNPAVED STREETS) THE MANHOLE RIM ELEVATION SHALL MATCH THE FINISHED GRADES. IN OTHER AREAS THE HEIGHT OF THE MANHOLE RIM WILL NORMALLY BE SIX (6) INCHES ABOVE FINISHED GRADE, HIGH-WATER MARK, OR ABOVE TOP OF FUTURE FILL AREAS.
5. THE CONTRACTOR SHALL AT ALL TIMES PROVIDE AND MAINTAIN AMPLE MEANS AND DEVICES TO REMOVE AND DISPOSE OF ALL WATER ENTERING THE TRENCH EXCAVATION DURING THE PROCESS OF LAYING THE PIPE. WATER AND DEBRIS SHALL NOT ENTER INTO THE DISTRICT'S SEWER SYSTEM. WATER AND DEBRIS SHALL BE DISPOSED OF IN AN APPROVED MANNER.
6. VERTICAL DATUM: ELEVATIONS ARE BASED ON TRIMBLE VRS NOW NETWORK, AND CHECKED INTO NGS BENCHMARK QE1491, LOCATED AT INTERSECTION OF STATE HIGHWAY 224 AND LAKE ROAD, ELEVATION = 102.14 FEET (NAVD 88).
7. THE PROJECT ENGINEER SHALL VERIFY ALL SERVICE LATERALS IN THE PUBLIC RIGHT-OF-WAY OR PUBLIC EASEMENT PRIOR TO PLACEMENT OF BACKFILL.
8. THE CONTRACTOR SHALL KEEP RECORDS OF ALL CONSTRUCTION THAT DIFFERS FROM THE APPROVED PLANS AND SHALL MAINTAIN "RECORD DRAWINGS" DURING THE CONSTRUCTION PERIOD. "RECORD DRAWINGS" SHALL BE SUBMITTED TO THE ENGINEER AT THE END OF THE PROJECT.
9. IN ADDITION TO THE OTHER TESTS NOTED, ALL SANITARY SEWER MAINS SHALL BE LAMP TESTED. THESE TESTS SHALL BE CONDUCTED AFTER THE PIPES HAVE BEEN FLUSHED AND CLEANED.
10. PIPE SLOPES LISTED ARE BASED ON HORIZONTAL LENGTHS FROM CENTER OF STRUCTURE (E.G. MANHOLE) TO CENTER OF STRUCTURE (E.G. MANHOLE). INVERT ELEVATIONS (IES) LISTED AT STRUCTURES ARE BASED ON THE "THEORETICAL" IE AT THE CENTER OF THE STRUCTURE.
11. SEWER LINES SHALL BE LAID IN A STRAIGHT ALIGNMENT AND A UNIFORM GRADE BETWEEN MANHOLES AND CLEANOUTS. SEWER LINES SHALL BE INSTALLED SO THAT THE PIPE BELL IS POSITIONED AT THE UPSTREAM END OF THE SEWER LINE AND THE PIPE SPIGOT IS POSITIONED AT THE DOWNSTREAM END OF THE SEWER LINE.

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WES SANITARY SEWER NOTES

SE 115th AVENUE
UTILITY EXTENSION PROJECT

DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
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OREGON CITY, OR 97045

M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN
DRAFTED BY: KDH
CHECKED BY: JPC

REVISIONS

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Sheet No. 3

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REGISTERED PROFESSIONAL ENGINEER
76382PE
OREGON
JUNE 29, 2009
JOHN P. CHRISTIANSEN

RENEWAL DATE: 12/31/17

VEGETATION

	EVERGREEN TREE		HEDGE
	DECIDUOUS TREE		

SYMBOLS

EXISTING		PROPOSED
	MAIL BOX	
	TELEPHONE RISER	
T	TELEPHONE MANHOLE	
U	UNIDENTIFIED UTILITY VAULT	
T	TELEPHONE VAULT	
P	POWER VAULT	
	UTILITY POLE, GUY ANCHOR	
	GB 2/GB-1 CATCH BASIN/CURB INLET	
D	DRAINAGE MANHOLE	D
S	SANITARY MANHOLE	S
	SANITARY CLEANOUT	
G	GAS METER	
G	GAS VALVE	
	FIRE HYDRANT	
W	WATER METER	W
W	WATER VALVE	
	WATER BLOWOFF ASSEMBLY	

EXISTING		PROPOSED
	DETECTOR LOOP	
	JUNCTION BOX	
	SIGNAL CONTROLLER	
	SIGNAL HEAD	
	VIDEO DETECTION	
	SIGNAL POLE BASE	
	STREET LITE 2	
	STREET LITE 1	
	PUSHBUTTON PED POLE	
	SINGLE SUPPORT SIGN	

LINETYPES

EXISTING		PROPOSED
	CONCRETE SURFACE	
	TRENCH PATCH	
	EDGE OF UNPAVED SURFACE	
	EDGE OF PAVED SURFACE	
	FENCE LINE	
	GUARDRAIL	
	EASEMENT LINE	
	CENTERLINE	
	ROAD RIGHT OF WAY	
	STORM PIPE	
	DITCH LINE	
W W	PUBLIC WATER LINE	W W
SS SS	SANITARY SEWER LINE	SS SS
FO FO	FIBER OPTIC LINE	
T T	UNDERGROUND TELEPHONE LINE	
UP UP	UNDERGROUND POWER LINE	
CATV CATV	CABLE TELEVISION LINE	
G G	GAS LINE	
HG HG	HIGH PRESSURE GAS	
	SIGNAL CONDUIT	
	SAWCUT	

ABBREVIATIONS

CB	CATCH BASIN (INLET)	NE	NORTHEAST	EMB	EMBANKMENT	Sq Ft	SQUARE FEET
CL	CENTERLINE	NW	NORTHWEST	EQUA	EQUATION	STD	STANDARD
CTR	CENTER	No.	NUMBER	EXC	EXCAVATION	STA	STATION
COMP	COMPACTED	OBL	OBLITERATE	EXTG	EXISTING	STL	STEEL
CONC	CONCRETE	OH/P/T/C	OVERHEAD///UTILITIES	FH	FIRE HYDRANT	ST	STREET
CONST	CONSTRUCT	P	POWER	FL	FLOW LINE	STRM	STORM
CONT	CONTINUOUS	PP	POWER (UTILITY) POLE	FND	FOUND	STR, STRUCT	STRUCTURE
COR	CORNER	PPL	POWER POLE W/ LIGHT	FDTN	FOUNDATION	SURF	SURFACING
Cu.Yd.	CUBIC YARD	PER	PERPENDICULAR	FT	FEET	T(1-3)	TOWNSHIP
CULV	CULVERT	PL	PLATE	GA	GAGE	T, TEL	TELEPHONE
DIA	DIAMETER	R(1-7)	RANGE	GALV	GALVANIZED	TEMP	TEMPORARY
DIST	DISTANCE	REM	REMOVE	G V	GAS VALVE	THKN	THICKNESS
DLC	DONATION LAND CLAIM	RT	RIGHT	GAR	GARAGE	TYP SECT	TYPICAL SECTION
DWG	DRAWING	R/W, ROW	RIGHT OF WAY	GEN	GENERAL	VAR	VARIABLE
DR	DRIVE	SAN	SANITARY	HT	HEIGHT	VERT	VERTICAL
DWY	DRIVEWAY	SECT	SECTION	HWY	HIGHWAY	W M	WILLAMETTE MERIDIAN
EA	EACH	SEW	SEWER	HORIZ	HORIZONTAL	WAT	WATER
E	EAST	SL	SLOPE	IE	INVERT ELEV	WAT M	WATER METER
EASE	EASEMENT (ALL PURPOSES)	S	SOUTH	IN PL	IN PLACE	WV	WATER VALVE
ELECT	ELECTRICAL	SE	SOUTHEAST	INST	INSTALL	W	WEST
ELEV	ELEVATION	SW	SOUTHWEST	IR	IRON ROD		

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REGISTERED PROFESSIONAL ENGINEER
76382PE
OREGON
JUNE 29, 2009
JOHN P. CHRISTIANSEN

RENEWAL DATE: 12/31/17

LEGEND

SE 115th AVENUE
UTILITY EXTENSION PROJECT

DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

CLACKAMAS COUNTY

DIRECTOR
M. BARBARA CARTMILL

DESIGNED BY: JRN
DRAFTED BY: KDH
CHECKED BY: JPC

REVISIONS

NO.	DATE:

Sheet No. 4

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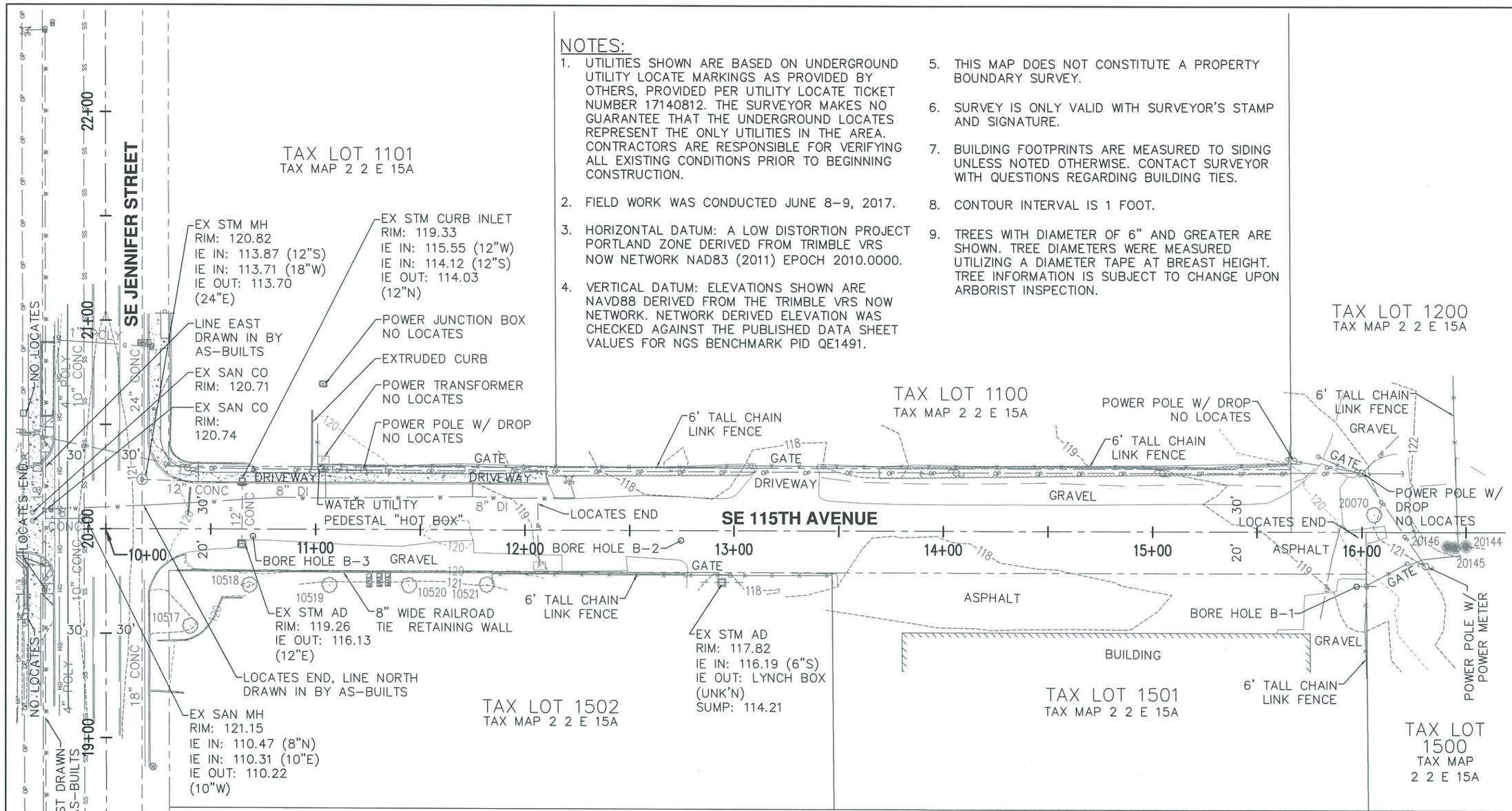

NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBER 17140812. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. FIELD WORK WAS CONDUCTED JUNE 8–9, 2017.
3. HORIZONTAL DATUM: A LOW DISTORTION PROJECT PORTLAND ZONE DERIVED FROM TRIMBLE VRS NOW NETWORK NAD83 (2011) EPOCH 2010.0000.
4. VERTICAL DATUM: ELEVATIONS SHOWN ARE NAVD88 DERIVED FROM THE TRIMBLE VRS NOW NETWORK. NETWORK DERIVED ELEVATION WAS CHECKED AGAINST THE PUBLISHED DATA SHEET VALUES FOR NGS BENCHMARK PID QE1491.
5. THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
6. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
7. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
8. CONTOUR INTERVAL IS 1 FOOT.
9. TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE MEASURED UTILIZING A DIAMETER TAPE AT BREAST HEIGHT. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.

TREE TABLE		
TREE NUMBER	SPECIES	DBH (INCH)
10517	DECIDUOUS	14, 15
10518	DECIDUOUS	12, 13
10519	DECIDUOUS	8, 9, 9, 10
10520	DECIDUOUS	9, 12, 15
10521	DECIDUOUS	8
20070	DECIDUOUS	12
20144	CONIFEROUS	6, 6, 10, 12
20145	CONIFEROUS	10
20146	CONIFEROUS	12, 14, 14

0 50 100
25 75
SCALE: 1"=50'

EXISTING CONDITIONS PLAN
SE 115th AVENUE UTILITY EXTENSION PROJECT

DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
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M. BARBARA CARTMILL, DIRECTOR

DESIGNED BY:
DRAFTED BY: ZJG
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REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 9, 2007
NICK WHITE
70652LS
RENEWS: 6/30/18

Sheet No. 5

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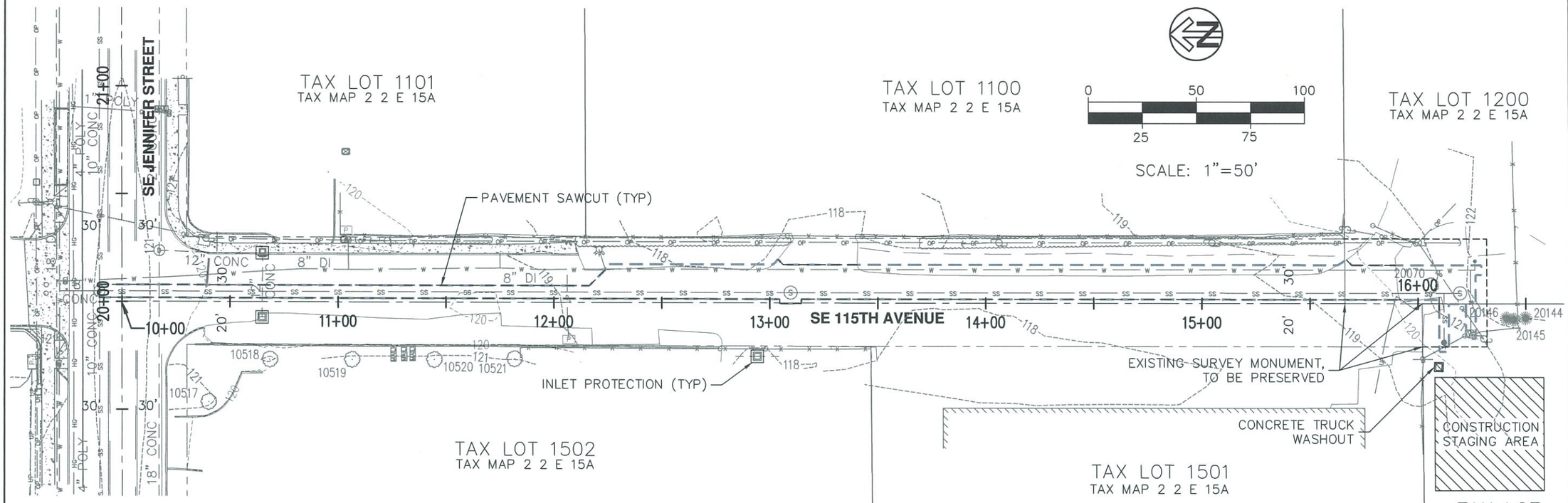
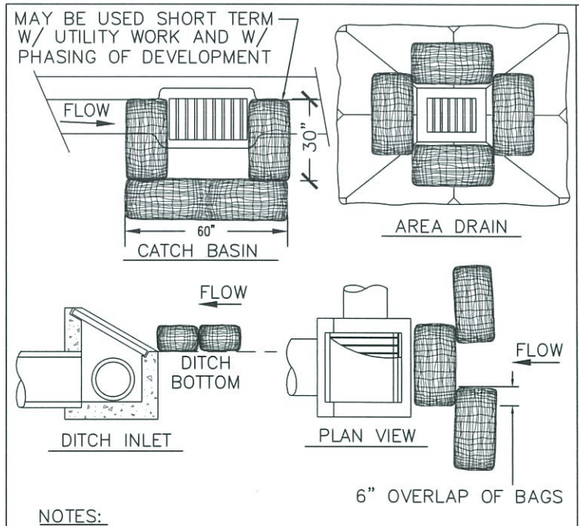
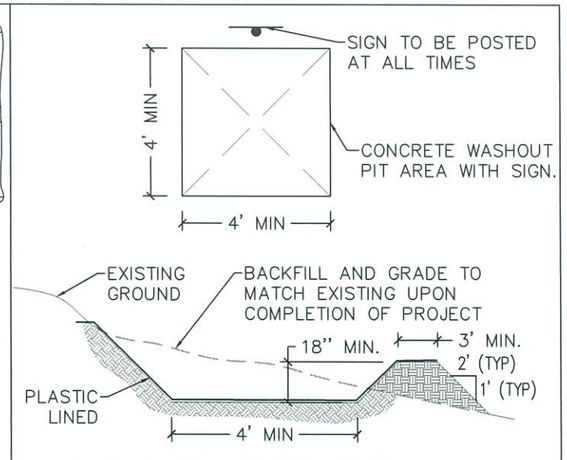




NOTES:
1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.
2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2"WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO-BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

INLET PROTECTION
NTS



NOTE: CONTRACTOR SHALL TAKE PRECAUTIONS SO AS TO NOT OVERFLOW PIT.

NOTES:
1. REMOVE AND LEGALLY DISPOSE OF WASTE MATERIAL WHEN IT ACCUMULATES TO 2/3 OF WET STORAGE CAPACITY OF PIT.
2. CONCRETE WASHOUT AREA TO BE REPAIRED AND/OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE.
3. UPON COMPLETION OF CONSTRUCTION ACTIVITIES REQUIRING CONCRETE WASHOUT, THE WASHOUT SHALL BE REMOVED AND THE AREA RESTORED TO FINISH GRADE AND EXISTING CONDITION.

CONCRETE TRUCK WASHOUT
NTS

LEGEND

EXISTING GROUND CONTOUR (1 FT)	119
EXISTING GROUND CONTOUR (5 FT)	120
CATCH BASIN/INLET PROTECTION	
CONCRETE TRUCK WASHOUT	
LIMITS OF DISTURBANCE	

SEE SHEETS # & # FOR EROSION & SEDIMENT CONTROL CONSTRUCTION NOTES

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RENEWAL DATE: 12/31/17

EROSION & SEDIMENT CONTROL PLAN
SE 115th AVENUE
UTILITY EXTENSION PROJECT
DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
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DIRECTOR
M. BARBARA CARTMILL

DESIGNED BY: JRN
DRAFTED BY: KDH
CHECKED BY: JPC

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Sheet No. 6

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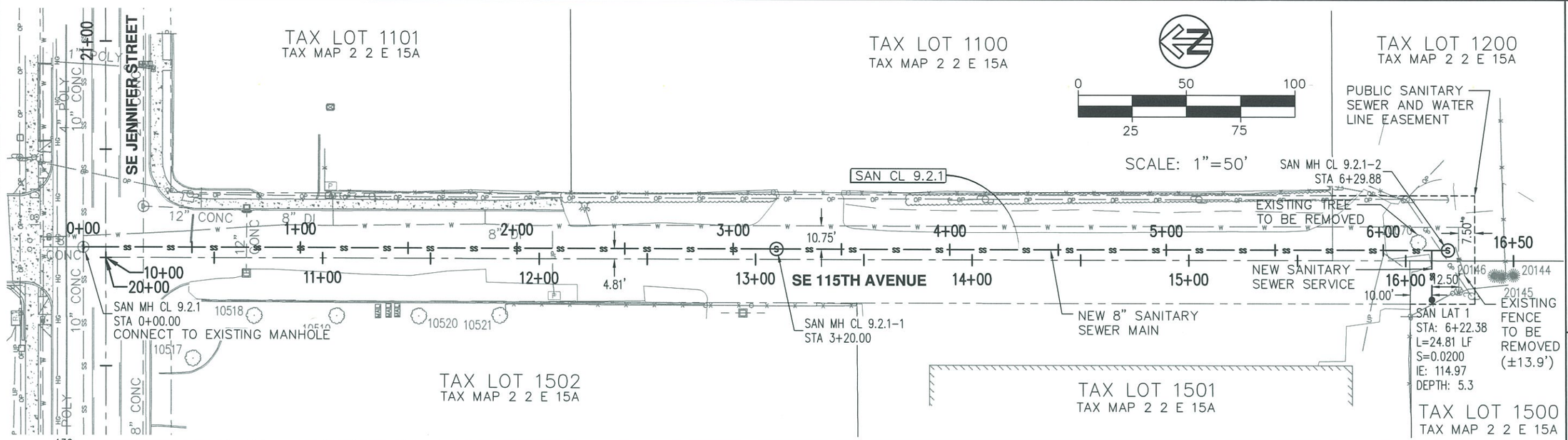

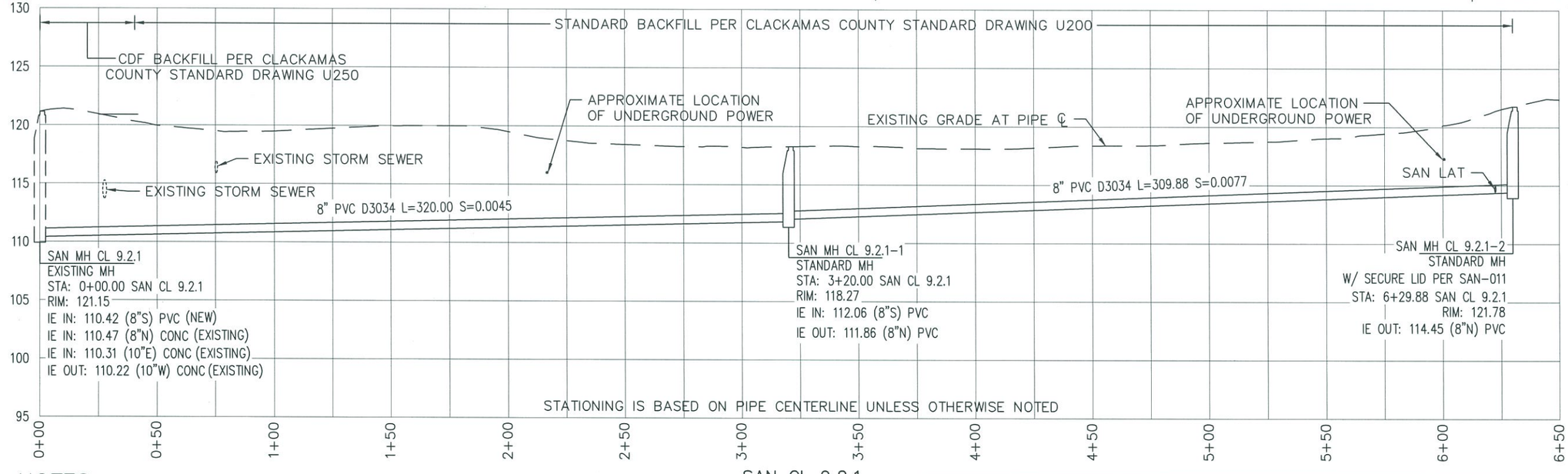

NOTES

1. ALL SANITARY SEWER PIPE SHALL BE PVC ASTM 3034 SDR 35 UNLESS OTHERWISE NOTED.
2. ALL SANITARY SEWER LATERALS SHALL BE 6" UNLESS OTHERWISE NOTED. A CLEANOUT SHALL BE INSTALLED ON EACH SERVICE LATERAL PER WES STANDARD DWG. SAN-018.
3. THE MINIMUM SLOPE FOR SANITARY SEWER LATERALS IS 0.0200 UNLESS OTHERWISE NOTED.
4. ALL MANHOLES SHALL BE STANDARD 48" PER WES STANDARD DWG. SAN-004 UNLESS OTHERWISE NOTED.
5. SANITARY SEWER LATERALS SHALL CONFORM TO THE OREGON PLUMBING SPECIALTY CODE.
6. ALL SANITARY SEWER CONSTRUCTION SHALL BE PER THE CONSTRUCTION NOTES AND DETAILS.
7. CONTRACTOR SHALL PROTECT ALL EXISTING PUBLIC AND FRANCHISE UTILITIES.
8. THE EXISTING MANHOLE SAN MH CL 9.2.1 SHALL BE CORE DRILLED ONLY IF NO STUB OUT IS FOUND.

SAN CL 9.2.1
HOR: 1"= 50'
VERT: 1"= 10'

POTHOLING – THE CONTRACTOR MUST POTHOLE ALL UTILITY CROSSINGS TO CONFIRM THAT THERE ARE NO GRADE CONFLICTS. IF A GRADE CONFLICT IS FOUND, THE CONTRACTOR SHALL REPORT IMMEDIATELY TO THE ENGINEER. ADDITIONALLY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE RELOCATION WORK WITH THE SPECIFIC UTILITY COMPANY.

SEE SHEET 3 FOR SANITARY SEWER CONSTRUCTION NOTES

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JOHN P. CHRISTIANSEN
RENEWAL DATE: 12/31/17

SANITARY SEWER PLAN & PROFILE
SE 115th AVENUE
UTILITY EXTENSION PROJECT
DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
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OREGON CITY, OR 97045
CLACKAMAS COUNTY
M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN
DRAFTED BY: KDH
CHECKED BY: JPC

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Sheet No. 7

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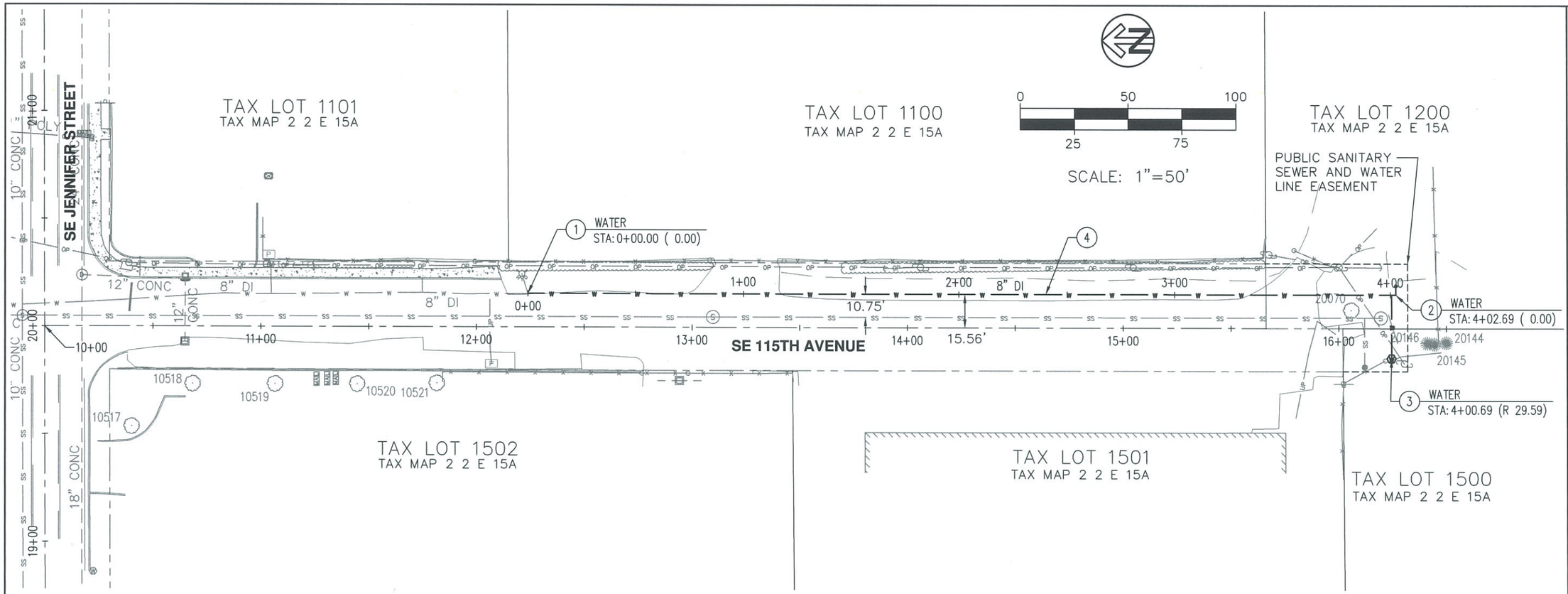

POTHOLING – THE CONTRACTOR MUST POTHOLE ALL UTILITY CROSSINGS TO CONFIRM THAT THERE ARE NO GRADE CONFLICTS. IF A GRADE CONFLICT IS FOUND, THE CONTRACTOR SHALL REPORT IMMEDIATELY TO THE ENGINEER. ADDITIONALLY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE RELOCATION WORK WITH THE SPECIFIC UTILITY COMPANY.

CLACKAMAS RIVER WATER STANDARD CONSTRUCTION NOTES

1. ALL WORK SHALL BE COMPLETED IN CONFORMANCE TO CURRENT CLACKAMAS RIVER WATER STANDARD SPECIFICATONS AND DETAILS.
2. ALL MATERIALS, WORKMANSHIP, AND PROCEDURES FOR PUBLIC WATER FACILITIES SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF CLACKAMAS RIVER WATER, OREGON HEALTH DIVISION ADMINISTRATIVE RULES, AND AWWA STANDARDS.
3. CLACKAMAS RIVER WATER SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO ANY WATERLINE CONSTRUCTION AND COORDINATE INSPECTION.
4. OPERATION OF VALVES OR ANY OTHER COMPONENT OF THE PUBLIC WATER SYSTEM SHALL ONLY BE PERFORMED BY CRW PERSONNEL.
5. EXISTING WATERLINES SHALL REMAIN IN SERVICE UNTIL NEW WATERLINE IS ACCEPTED.
6. SELECTION OF AN APPROPRIATE BACKFLOW PREVENTION DEVICE SHALL BE IN ACCORDANCE WITH THE CURRENT LISTING OF FOUNDATION FROM CROSS CONNECTION CONTROL AND HYDRAULIC RESEARCH – UNIVERSITY OF SOUTHERN CALIFORNIA, AND AS APPROVED BY THE STATE OF OREGON.
7. CONTACT CLACKAMAS RIVER WATER, DAMON BAILEY AT 503-723-2564 FOR QUESTIONS AND INFORMATION REGARDING BACKFLOW PREVENTION.

① WATER CONSTRUCTION KEYED NOTES

1. CONNECT TO EXISTING MAIN. REMOVE EXISTING PLUG ON 8"x6" TEE.
2. INSTALL BLOWOFF ASSEMBLY PER DETAIL 106A, SHEET 15. MECHANICALLY RESTRAIN 65 FEET (NORTH)
3. INSTALL 1" WATER SERVICE PER DETAIL 108, SHEET 15.
4. INSTALL 430 L.F. 8" DI WAT. RESTRAIN ALL JOINTS AND FITTINGS.

ADDITIONAL WATER CONSTRUCTION NOTES

1. THE MAXIMUM ALLOWABLE JOINT DEFLECTION SHALL NOT EXCEED TEN (10) INCHES PER EIGHTEEN (18) FEET OF LAYING LENGTH.
2. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND DEPTH OF EXISTING UTILITIES.
3. CONTRACTOR IS RESPONSIBLE FOR ALL WATER CONSTRUCTION SHOWN ON PLANS UNLESS OTHERWISE NOTED.

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JUNE 29, 2009
JOHN P. CHRISTIANSEN
RENEWAL DATE: 12/31/17

WATER PLAN
SE 115th AVENUE
UTILITY EXTENSION PROJECT
DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045
DIRECTOR
M. BARBARA CARTMILL

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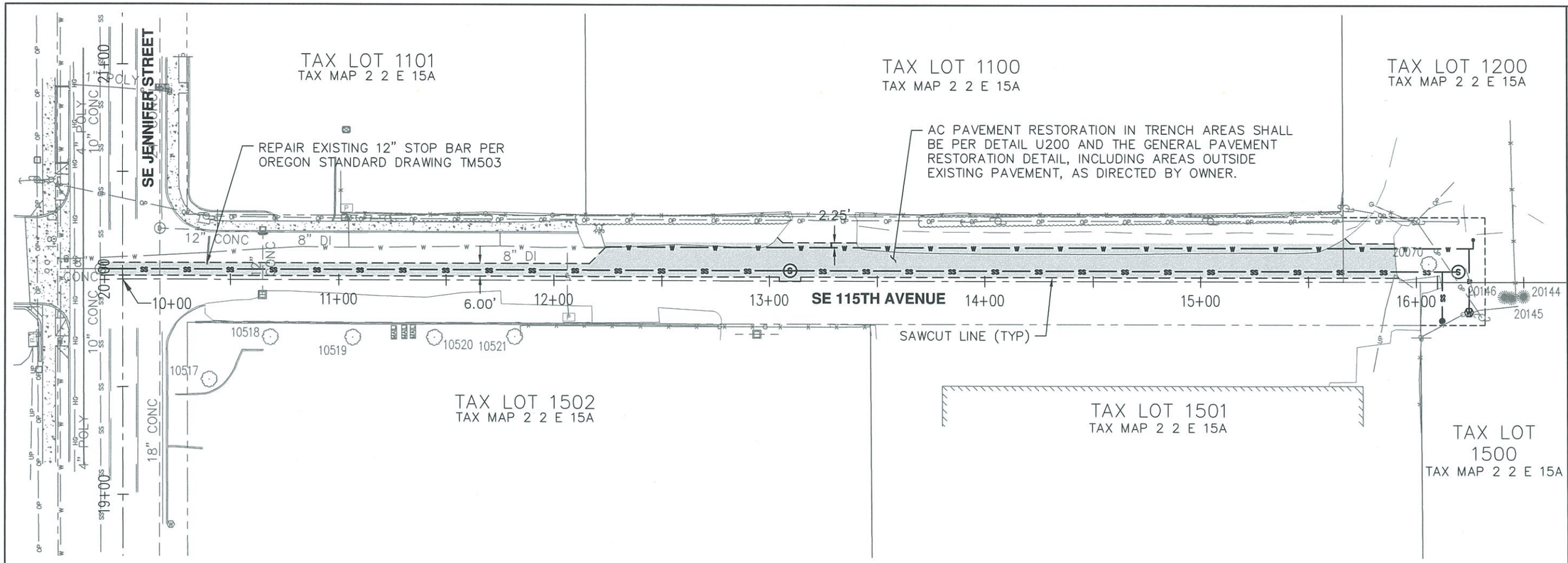
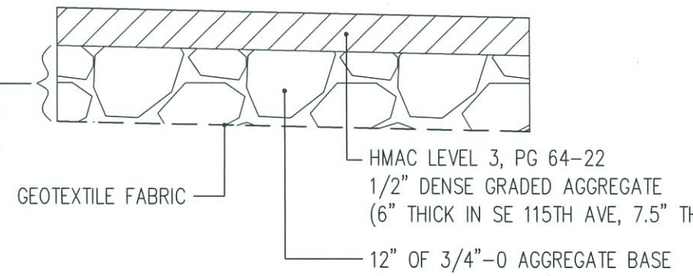


STREET CONSTRUCTION NOTES

1. ALL STREET WORK AND MATERIALS SHALL CONFORM WITH THESE PLANS AND THE APPLICABLE PROVISIONS OF THE CLACKAMAS COUNTY ROADWAY STANDARDS AND THE OREGON DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS AND STANDARD SPECIFICATIONS.
2. ALL MANHOLE LIDS, VALVE BOXES, AND MONUMENT BOXES SHALL BE ADJUSTED TO FINISH GRADE.
3. SAWCUT STRAIGHT LINES WITH CLEAN EDGES TO MEET EXISTING PAVEMENT WITH NEW PAVEMENT. SAND AND SEAL JOINTS.
4. FINAL SAWCUT LINE LOCATION SHALL BE VERIFIED BY THE COUNTY AND THE PROJECT ENGINEER PRIOR TO SAWCUTTING. FINAL SAWCUT LINES SHALL BE INSPECTED BY THE COUNTY AND THE PROJECT ENGINEER PRIOR TO PAVING.
5. FIELD GRADE WHERE MATCHING EXISTING AC PAVEMENT TO ENSURE POSITIVE DRAINAGE AND SMOOTH TRANSITION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING THE NECESSARY ARRANGEMENTS FOR COMPACTION TESTING AND FOR SUPPLYING THE RESULTS TO THE PROJECT ENGINEER.
7. TRENCH LINES IN SE JENNIFER STREET THAT ARE NOT PARALLEL TO THE ROADWAY SHALL BE BACKFILLED WITH CDF PER CLACKAMAS COUNTY STANDARD DRAWING U250 AND U260, SHEET 10. 12 INCHES OF AGGREGATE BASE SHALL BE PLACED BETWEEN THE TOP OF CDF BACKFILL AND THE BOTTOM OF HMAC PAVEMENT, PER GENERAL PAVEMENT RESTORATION DETAIL, THIS SHEET.

- SEE DETAIL U250 FOR CDF BACKFILL IN SE JENNIFER STREET
- SEE DETAIL U200 FOR STANDARD BACKFILL IN SE 115TH AVENUE



GENERAL PAVEMENT RESTORATION DETAIL

NOT TO SCALE

LEGEND

AC PAVEMENT RESTORATION

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JUNE 29, 2009
JOHN P. CHRISTIANSEN
RENEWAL DATE: 12/31/17

STREET RESTORATION PLAN

SE 115th AVENUE
UTILITY EXTENSION PROJECT

DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

M. BARBARA CARTMILL, DIRECTOR

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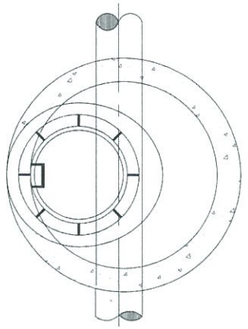
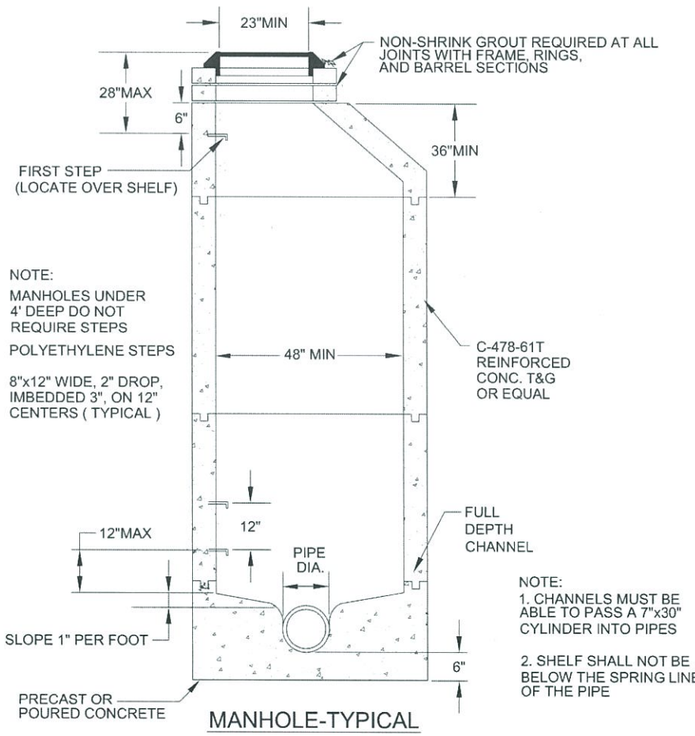


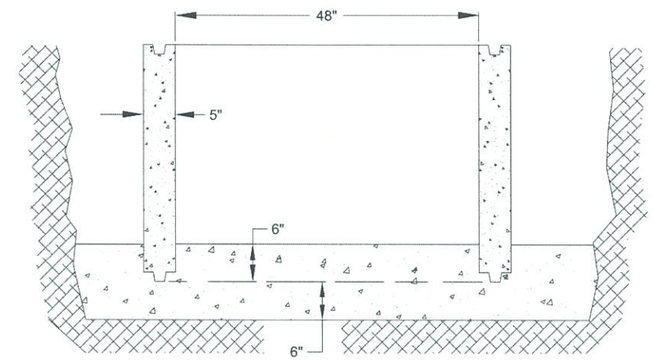
NOTE:
MANHOLE LID TO BE FLUSH WITH ROADWAY OR 6" ABOVE FINISH GRADE IN EASEMENTS



NOTE:
1. CHANNELS MUST BE ABLE TO PASS A 7"x30" CYLINDER INTO PIPES

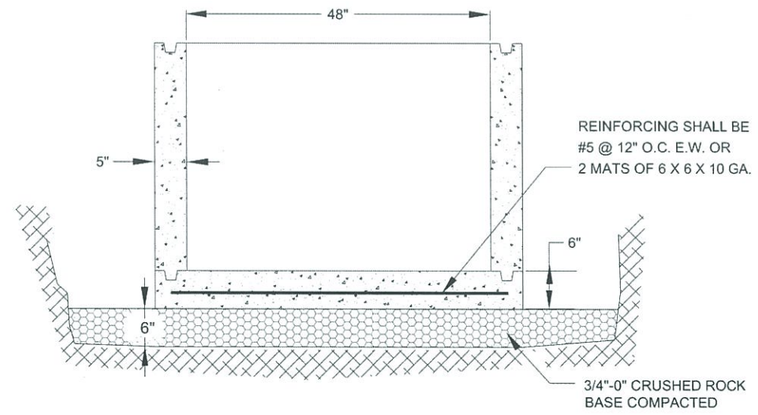
2. SHELF SHALL NOT BE BELOW THE SPRING LINE OF THE PIPE

MANHOLE-TYPICAL



POURED IN PLACE MANHOLE-BASE

NOTE:
CONCRETE TO EXTEND 12" OUTSIDE OF MH WALL AND 6" ABOVE THE BOTTOM OF THE BASE SECTION



PRECAST MANHOLE-BASE

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WATER ENVIRONMENT SERVICES www.co.clackamas.or.us/wes	CLACKAMAS COUNTY 150 BEAVERCREEK ROAD OREGON CITY, OR 97045	APPROVAL DATE: 2013 SCALE: N.T.S. MANHOLE-BASE	STANDARD DRAWING SAN-007

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RENEWAL DATE: 12/31/17

SANITARY SEWER DETAILS

SE 115th AVENUE
UTILITY EXTENSION PROJECT

DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

CLACKAMAS COUNTY

M. BARBARA CARTMILL DIRECTOR

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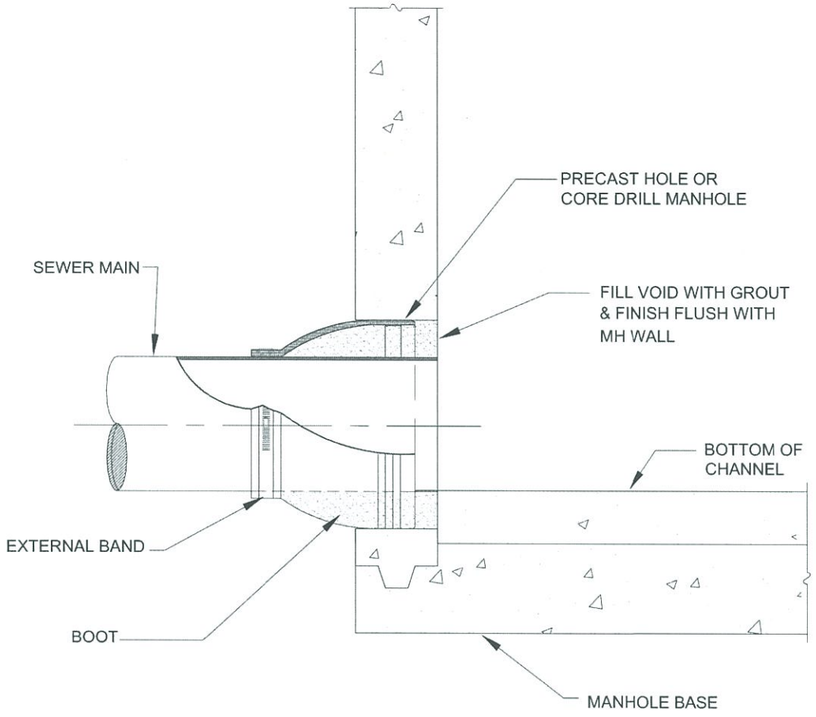
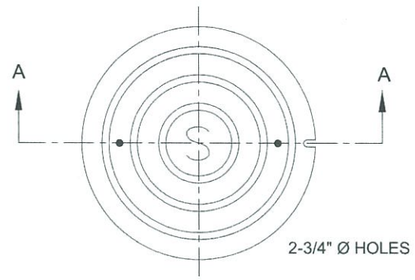
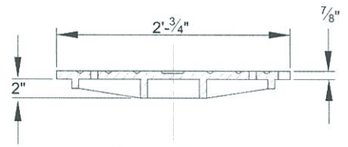


MANHOLE-CONNECTION FLEXIBLE
(KOR-N-SEAL OR EQUAL)

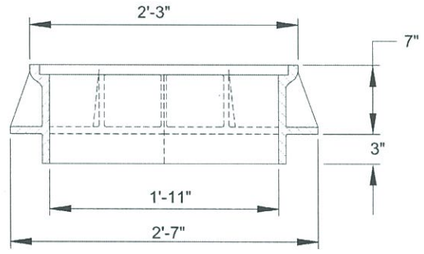
WATER ENVIRONMENT SERVICES www.co.clackamas.or.us/wes	CLACKAMAS COUNTY 150 BEAVERCREEK ROAD OREGON CITY, OR 97045	APPROVAL DATE: 2013 SCALE: N.T.S. MANHOLE-CONNECTION FLEXIBLE	STANDARD DRAWING SAN-008

STANDARD





SECTION A-A



FRAME & COVER STANDARD

NOTES:
1. STANDARD FRAME AND COVER TO BE USED ON COLLECTOR, ARTERIAL, AND INDUSTRIAL STREETS OR AS NOTED ON CONSTRUCTION PLANS.

2. SANITARY COVER WILL HAVE 2 - 3/4" Ø HOLES.

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REGISTERED PROFESSIONAL ENGINEER 76382PE OREGON JUNE 29, 2009 JOHN P. CHRISTIANSEN
RENEWAL DATE: 12/31/17

SANITARY SEWER DETAILS
SE 115th AVENUE
UTILITY EXTENSION PROJECT
DATE: 08/23/2017 PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045
M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN
DRAFTED BY: KDH
CHECKED BY: JPC

REVISIONS
NO. DATE:

Sheet No. 11

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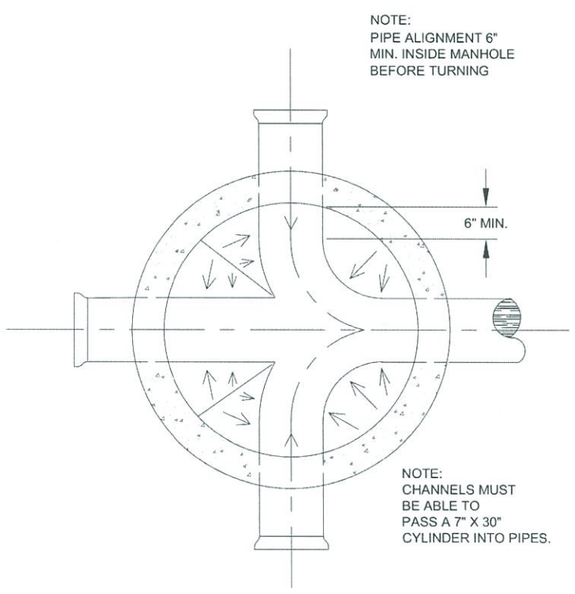
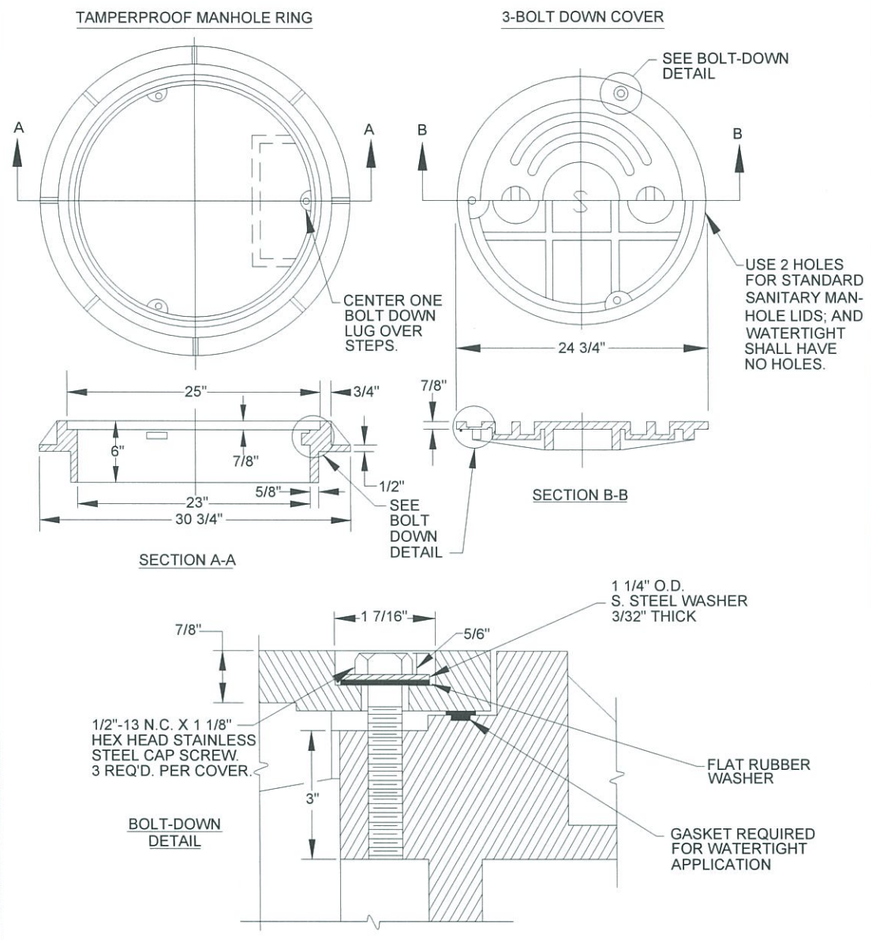


CHANNEL-INTERSECTION

WATER ENVIRONMENT SERVICES www.co.clackamas.or.us/wes	CLACKAMAS COUNTY 150 BEAVERCREEK ROAD OREGON CITY, OR 97045	APPROVAL DATE: 2013 SCALE: N.T.S. CHANNEL-INTERSECTION	STANDARD DRAWING SAN-012



FRAME & COVER SECURE / WATERTIGHT

NOTE: COVER AND FRAME SHALL BE OF GRAY CAST IRON A.S.T.M. A-48 CLASSS 30.

WATER ENVIRONMENT SERVICES www.co.clackamas.or.us/wes	CLACKAMAS COUNTY 150 BEAVERCREEK ROAD OREGON CITY, OR 97045	APPROVAL DATE: 2013 SCALE: FRAME & COVER SECURE/WATERTIGHT	STANDARD DRAWING SAN-011

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REGISTERED PROFESSIONAL ENGINEER
76382PE
OREGON
JUNE 29, 2009
JOHN P. CHRISTIANSEN
RENEWAL DATE: 12/31/17

SANITARY SEWER DETAILS

SE 115th AVENUE
UTILITY EXTENSION PROJECT

DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

M. BARBARA CARTMILL, DIRECTOR

DESIGNED BY: JRN
DRAFTED BY: KDH
CHECKED BY: JPC

REVISIONS

NO.	DATE:

Sheet No. 12

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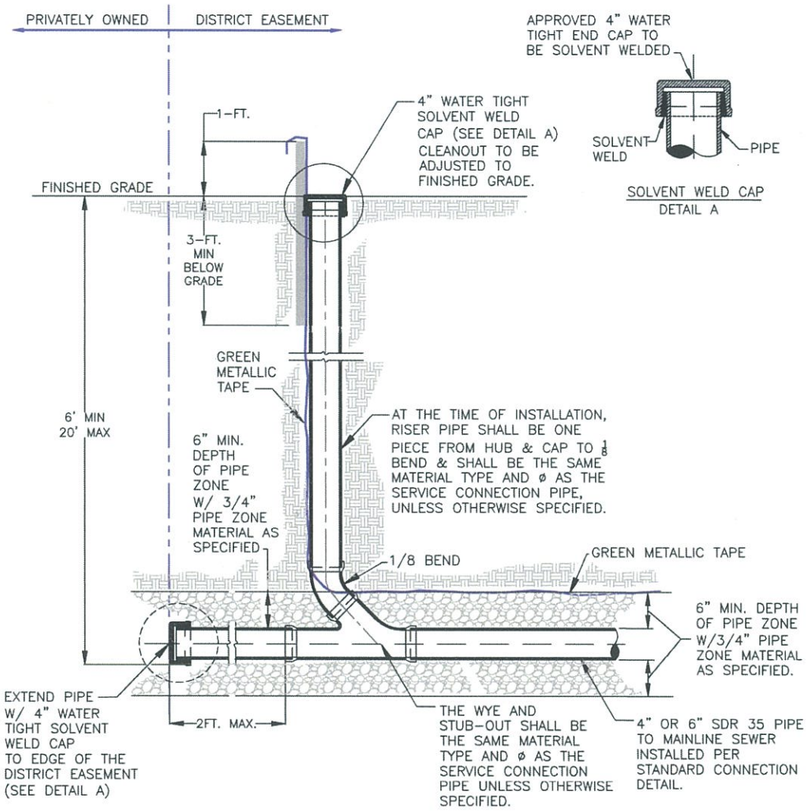
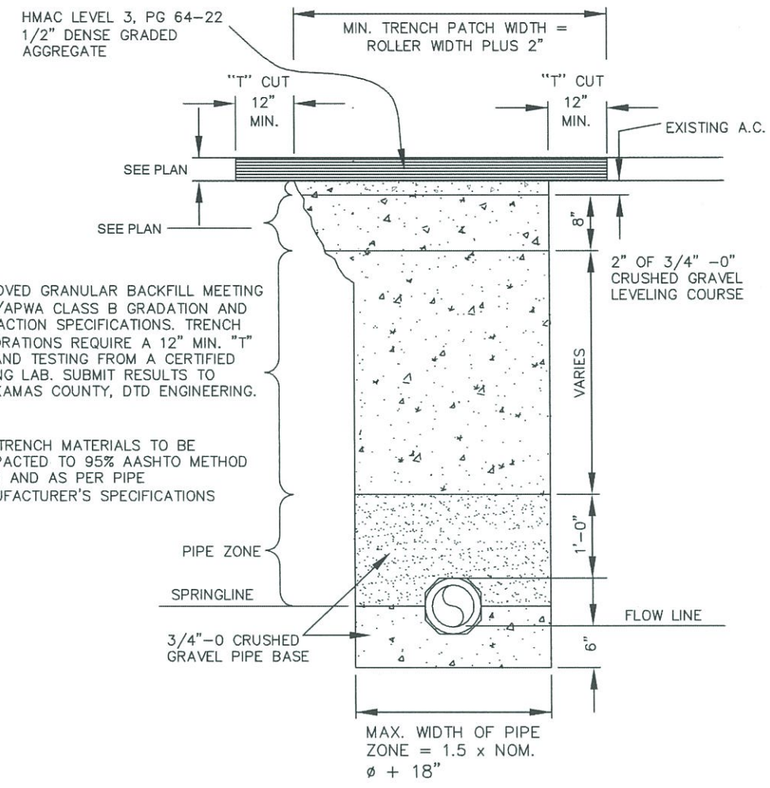


NOTES:
1. ALL PIPE AND FITTINGS SHALL BE ASTM D-3034, SDR 35.
2. ON LOTS WITH EXISTING HOMES, CONTRACTOR SHALL INSTALL APPROVED HUBS AND CAPS FLUSH WITH FINISHED GRADE.
3. CLEANOUTS SHALL NOT BE CONSTRUCTED SO THE CLEANOUT CAP WILL END UP IN SIDEWALKS, STEPS OR DRIVEWAYS.
4. EVERY PROPERTY SHALL HAVE A SEPARATE SERVICE LATERAL CONNECTED DIRECTLY TO THE MAINLINE, UNLESS OTHERWISE APPROVED BY THE DISTRICT. SHARED SERVICES ARE NOT ALLOWED.
5. THE SERVICE CONNECTION LOCATION SHALL GENERALLY BE LOCATED TEN FEET (10') OFFSET FROM THE PROPERTY LINE ON THE LOW SIDE OF LOT.
6. TEES FOR SERVICE CONNECTIONS SHALL BE LOCATED NO CLOSER THAN FIVE FEET (5') TO MANHOLES. SEPARATION BETWEEN WATER LINE, SANITARY SERVICE CONNECTION AND STORM SERVICE CONNECTION SHALL GENERALLY BE TEN FEET (10') WITH A MINIMUM OF FIVE FEET (5').
7. ANY OTHER PROPOSED LOCATION SHALL BE AT THE DISCRETION OF THE DISTRICT ON CASE BY CASE BASIS.

WATER ENVIRONMENT SERVICES www.co.clackamas.or.us/wes	CLACKAMAS COUNTY 150 BEAVERCREEK ROAD OREGON CITY, OR 97045	APPROVAL DATE: 2013 SCALE: N.T.S. SERVICE CONNECTION EASEMENT	STANDARD DRAWING SAN-018



NOTES
1. THE EXISTING A.C. SHALL BE SAWCUT THROUGH ENTIRE A.C. SECTION PRIOR TO EXCAVATION.
2. BACKFILL IN PIPE ZONE SHALL BE PLACED IN MAXIMUM 6" LIFTS AND COMPACTED.
3. TRENCH BACKFILL SHALL BE PLACED IN MAXIMUM 12" LIFTS TO 95% DENSITY.
4. THE USE OF CONTROL DENSITY FILL SHALL BE DETERMINED BY CLACKAMAS COUNTY, REFER TO STANDARD DRAWING U-250.
5. SAWCUT EDGES TO BE TACKED WITH HOT LIQUID ASPHALT.
6. WORK RESULTING IN IRREGULAR TRENCH WIDTHS OR INCIDENTAL DAMAGE TO THE ROADWAY SURFACE WILL REQUIRE ANOTHER SAWCUT AND SUBSEQUENT REMOVAL OF A.C. THE SAWCUT LINE SHALL BE APPROVED BY CLACKAMAS COUNTY PRIOR TO THE PERMANENT A.C. REPAIR.
7. SEE STREET RESTORATION PLAN FOR PAVEMENT SECTION, PLACE A.C. IN MAXIMUM 2" LIFTS.
8. A.C. JOINTS/SEAMS SHALL BE SEALED WITH HOT LIQUID ASPHALT, OR APPROVED EQUAL, AND SANDED.
9. CLACKAMAS COUNTY SHALL BE NOTIFIED FOR INSPECTION.

MODIFIED

REVISION	DATE	BY

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

CLACKAMAS COUNTY

APPROVAL DATE: 1/1/10 SCALE: N.T.S.
STANDARD TRENCH AND BACKFILL
STANDARD DRAWING U200

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SANITARY SEWER DETAILS
SE 115th AVENUE
UTILITY EXTENSION PROJECT
DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN | DRAFTED BY: KDH | CHECKED BY: JPC

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REGISTERED PROFESSIONAL ENGINEER 76382PE OREGON JUNE 29, 2009 JOHN P. CHRISTIANSEN
RENEWAL DATE: 12/31/17

Sheet No. 13

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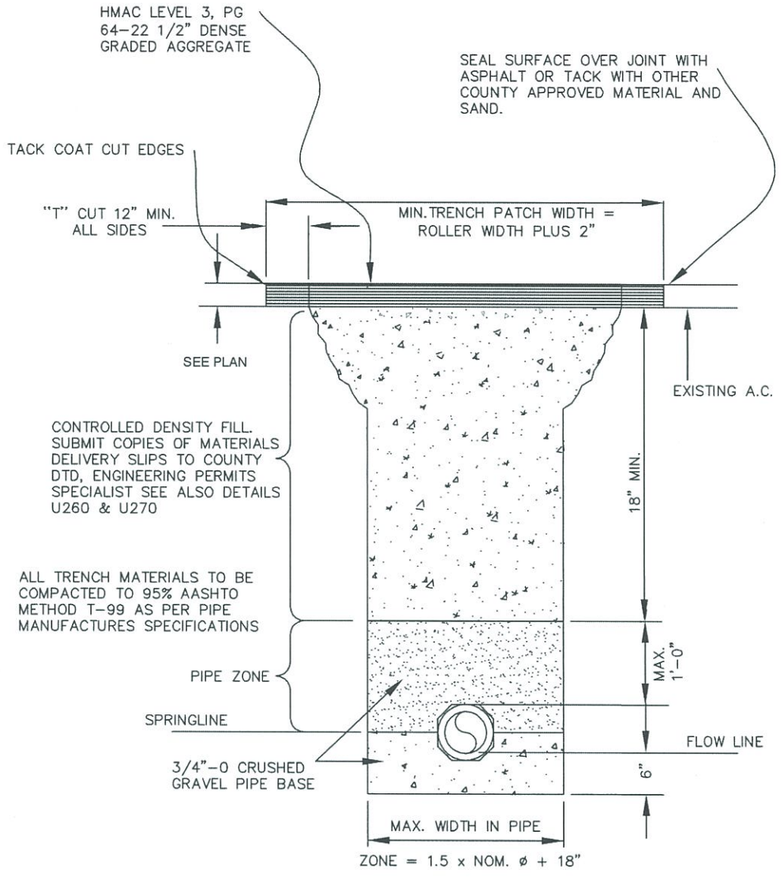

SEE U260 FOR NOTES

MODIFIED

REVISION	DATE	BY

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

CLACKAMAS COUNTY

APPROVAL DATE: 1/1/10 SCALE: N.T.S.

STANDARD TRENCH WITH CONTROLLED DENSITY BACKFILL

STANDARD DRAWING U250

NOTES

1. THE EXISTING A.C. SHALL BE SAWCUT THROUGH ENTIRE A.C. SECTION PRIOR TO EXCAVATION.
2. BACKFILL IN THE PIPE ZONE SHALL BE PLACED IN MAXIMUM 6" COMPACTED LIFTS.
3. TRENCH BACKFILL SHALL BE CONTROL DENSITY FILL (CDF).
4. CDF SHALL BE A LOW STRENGTH, HIGHLY FLOWABLE MIXTURE OF PORTLAND CEMENT, POZZOLAN (FLY ASH), FINE AGGREGATES, WATER AND ADMIXTURES, IF NECESSSARY, WHICH RESULTS IN A HARDENED, DENSE NON-SETTLING, HAND EXCAVATABLE FILL. THE CDF SHALL NOT CONTAIN AGGREGATE LARGER THAN 3/8" IN TRENCHES LESS THAN 12" WIDE.
5. PORTLAND CEMENT, POZZOLAN, FINE AGGREGATES, WATER, AND ADMIXTURES SHALL CONFORM TO ODOT/APWA SECTION 212, EXCEPT THAT PORTLAND CEMENT SHALL BE TYPE I-II OR II.
6. CDF MIX SHALL BE DESIGNED TO ENSURE THAT THE MATERIAL PLACED HAS A 7-DAY COMPRESSIVE STRENGTH OF BETWEEN 50 PSI AND 100 PSI.
7. WHEN REQUIRED, THE COMPRESSIVE STRENGTH SHALL BE TESTED USING 4-INCH MORTAR CUBES PER AST C 109.
8. WITHIN 24 HOURS THE MATERIAL SHALL BE CAPABLE OF SUPPORTING VEHICULAR TRAFFIC WITH RUTTING PER AST C 109.
9. TRENCHES SHALL BE PROTECTED WITH STEEL PLATING CAPABLE OF CARRYING A MINIMUM OF H-20 LOADING. EACH PLATE SHALL BE SECURED IN PLACE WITH APPROACH RAMPS OF COLD MIX A.C. LIGHTED BARRICADES SHALL BE MOUNTED WITH BUMP AND CONSTRUCTION AHEAD SIGNS. REFLECTIVE SHEETING FOR NIGHT VISION SHALL BE PLACED AHEAD OF AND ADJACENT TO THE PLATING.
10. WORK RESULTING IN IRREGULAR TRENCH WIDTHS OR INCIDENTAL DAMAGE TO THE ROADWAY SURFACE WILL REQUIRE ANOTHER SAWCUT AND SUBSEQUENT REMOVAL OF THE A.C. THE SAWCUT LINE SHALL BE APPROVED BY CLACKAMAS COUNTY PRIOR TO THE PLACEMENT OF PERMANENT SURFACE REPAIR.
11. ALL PAVING SHALL BE COMPLETED WITHIN 24 HOURS OF COMPLETING THE BACKFILL PROCESS UNLESS OTHER ARRANGEMENTS ARE MADE WITH THE INSPECTOR.
12. ALL PLATING & SIGNS SHALL REMAIN IN PLACE UNTIL PERMANENT SURFACE REPAIR PAVING OPERATIONS ARE UNDERWAY.
13. TRAFFIC CONTROLS FOR THE WORK SITE SHALL CONFORM TO THE CURRENT M.U.T.C.D.
14. SUBMIT COPIES OF CDF MATERIAL DELIVERY SLIPS TO CLACKAMAS COUNTY, DTD, ENGINEERING PERMITS SPECIALIST WITHIN 10 DAYS OF PLACEMENT.
15. TRAFFIC SIGNAL DETECTOR LOOPS IN SIGNALIZED INTERSECTIONS, DAMAGED AS A RESULT OF WORK DONE UNDER THE PERMIT, SHALL BE REPLACED IN THEIR ENTIRETY. NO SPLICING OF TRAFFIC LOOPS IS ALLOWED. ANY TRAFFIC LOOP THAT IS TUNNELED UNDER WILL REQUIRE A FULL DEPTH TRENCH BACKFILL WITH FLUID 150 PSI MAXIMUM STRENGTH CDF (CONTROLLED DENSITY FILL) A MINIMUM WIDTH OF 18" ON EACH SIDE OF THE TRAFFIC LOOP WIRE. ANY TRAFFIC LOOP WORK DONE UNDER THIS PERMIT WILL BE WARRANTED FOR A PERIOD OF TWO YEARS FROM THE DATE OF SUCH WORK.
16. TRENCH COMPACTION SHALL BE 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT IN THE UPPER THREE FEET. COMPACTION EQUIPMENT MUST BE ON THE JOB SITE BEFORE EXCAVATION IS STARTED. COMPACTION EQUIPMENT, AS DEFINED IN ODOT SPECIFICATIONS, MUST BE CAPABLE OF COMPACTION WITHIN THE TRENCH WIDTH LIMITS TO PREVENT BRIDGING CAUSED BY STRADDLING THE DITCH.
17. A TEMPORARY PATCH OF COLD OR HOT MIX ASPHALT SHALL BE PLACED ON ALL HARD SURFACE CUTS IMMEDIATELY AFTER BACK FILLING HAS BEEN COMPLETED, PRIOR TO ALLOWING TRAFFIC OVER IT. GRAVEL WILL NOT BE CONSIDERED AS MEETING THE COUNTY STANDARDS FOR A TEMPORARY PATCH.
18. IMMEDIATELY PRIOR TO PLACING THE FINAL ASPHALT WEARING SURFACE, THE EXISTING PAVEMENT SHALL BE CLEANED, CLEARED OF ALL LOOSE MATERIAL, AND COATED WITH HOT LIQUID ASPHALT TO ENSURE A BOND WITH THE NEW ASPHALT SURFACE. THE RESTORED PAVEMENT SHALL BE FINISHED TO A SMOOTH RIDING SURFACE AND TO THE GRADE OF THE SURROUNDING UNDISTURBED PAVEMENT. THE FINAL PAVEMENT JOINTS ARE TO BE SEALED AND SANDED.

REVISION	DATE	BY
NOTE 6 TO 100 PSI	1/1	RN

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

CLACKAMAS COUNTY

APPROVAL DATE: 1/1/13 SCALE: N.T.S.

NOTES FOR CONTROLLED DENSITY BACKFILL

STANDARD DRAWING U260

SANITARY SEWER DETAILS

SE 115th AVENUE
UTILITY EXTENSION PROJECT

DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN | DRAFTED BY: KDH | CHECKED BY: JPC

REVISIONS

NO.	DATE:

Sheet No. 14

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REGISTERED PROFESSIONAL ENGINEER
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JUNE 29, 2009
JOHN P. CHRISTIANSEN

RENEWAL DATE: 12/31/17

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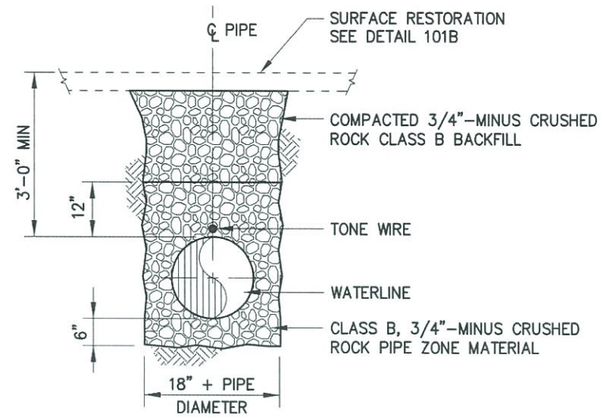
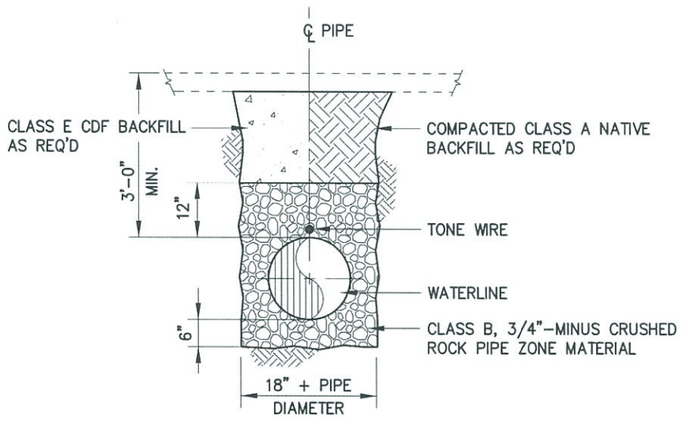


TYPICAL TRENCH DETAIL



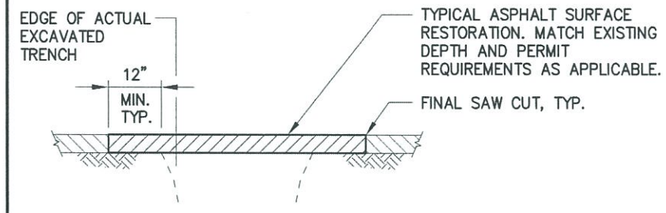
ALTERNATE TRENCH DETAIL
(AS DIRECTED BY DISTRICT)

NOTES:

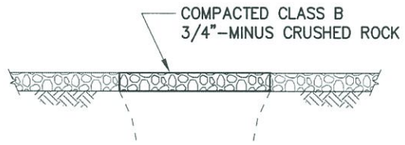
1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 02225.
2. ALL CRUSHED ROCK AND NATIVE BACKFILL SHALL BE COMPACTED TO 95% MAXIMUM RELATIVE DENSITY, UNLESS OTHERWISE SPECIFIED.
3. PROVIDE PROPER SHORING FOR EXCAVATIONS OVER 5' DEEP. COMPLY WITH OREGON OSHA REGULATIONS.

Clackamas River Water

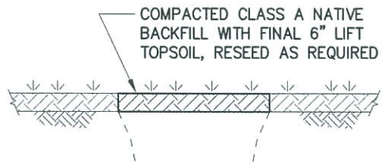
NO	REVISION	TRENCH DETAILS		
		SCALE: N.T.S.	DATE: October 2015	101A
		DRAWING: CRW.STD.DTL101.dwg		



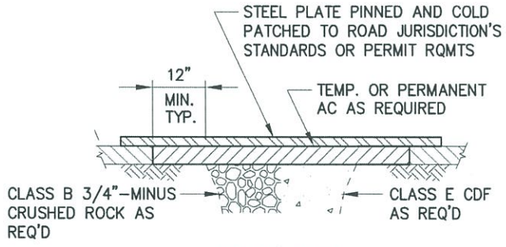
ASPHALT
SURFACE RESTORATION



GRAVEL
SURFACE RESTORATION



NATIVE
SURFACE RESTORATION



TEMPORARY
SURFACE RESTORATION

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 02225.
2. ALL CRUSHED ROCK AND NATIVE BACKFILL SHALL BE COMPACTED TO 95% MAXIMUM RELATIVE DENSITY, UNLESS OTHERWISE SPECIFIED.

Clackamas River Water

NO	REVISION	SURFACE RESTORATION DETAILS		
		SCALE: N.T.S.	DATE: October 2015	101B
		DRAWING: CRW.STD.DTL101.dwg		

WATER DETAILS
SE 115th AVENUE
UTILITY EXTENSION PROJECT
DATE: 08/23/2017 | PROJECT NO.: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

M. BARBARA CARTMILL, DIRECTOR

DESIGNED BY: JRN | DRAFTED BY: KDH | CHECKED BY: JPC

REVISIONS

NO	DATE:

Sheet No. 15

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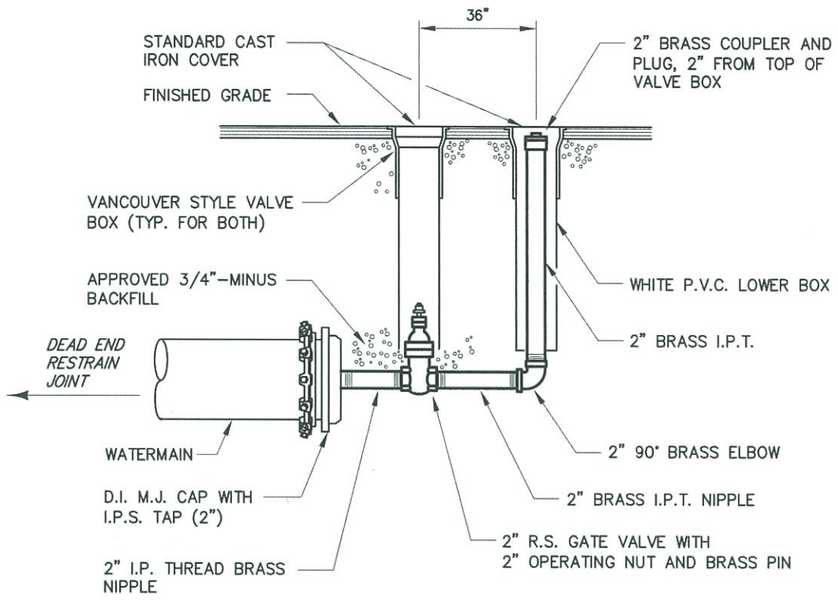


NOTES:

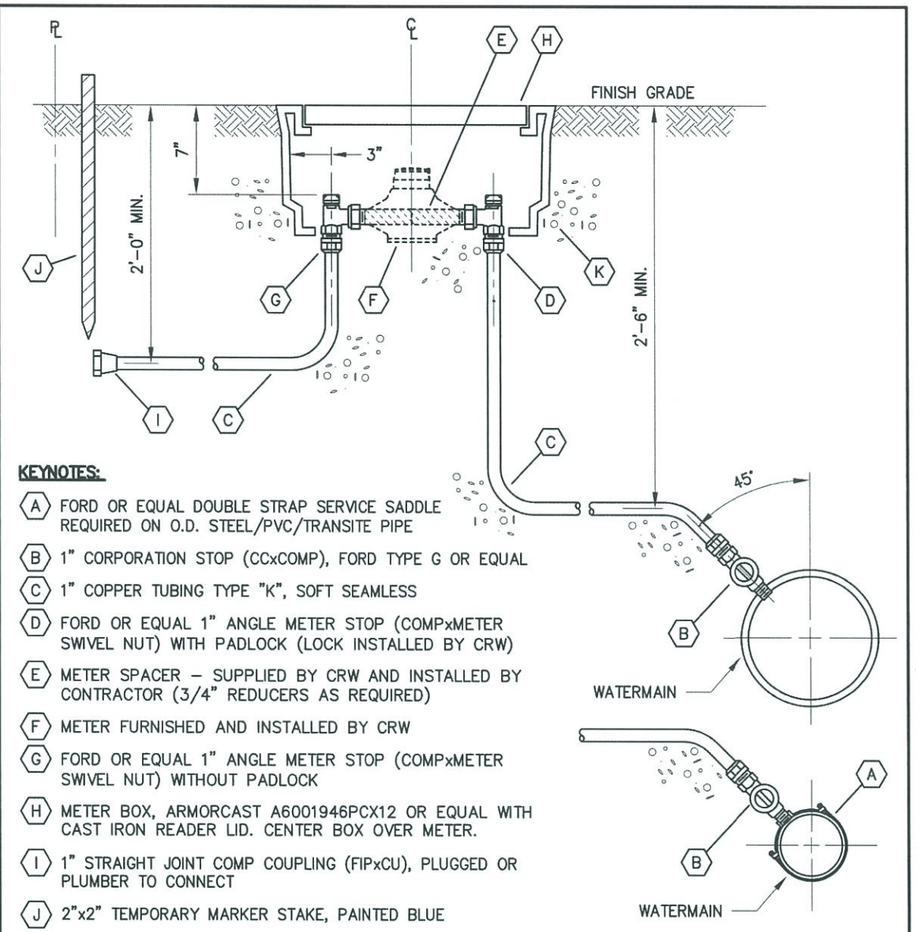
1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15100.
2. BLOW–OFF SHALL NOT BE LOCATED IN GUTTER OR DITCH.
3. FITTINGS AND PIPE BETWEEN MAIN AND 2" R.S. GATE VALVE SHALL BE I.P. THREAD BRASS.

TEMPORARY BLOWOFF NOTES:

1. VALVE BOXES NOT REQUIRED WITH OPEN TRENCH SITUATIONS.
2. ALL 2" PIPING MATERIAL MAY BE GALVANIZED PIPE.
3. OPEN TRENCHES SHALL BE PROTECTED PER CONSTRUCTION PERMIT (COUNTY ROAD OPENING PERMIT OR OTHER AS APPLICABLE).
4. REMOVE ALL BLOW–OFF RELATED MATERIALS FOR FINAL TIE–INS.

Clackamas River Water

NO	REVISION	BLOW-OFF ASSEMBLY - TYPE I		
		SCALE: N.T.S.	DATE: October 2015	106A
		DRAWING: CRW.STD.DTL106.dwg		



KEYNOTES:

(A) FORD OR EQUAL DOUBLE STRAP SERVICE SADDLE REQUIRED ON O.D. STEEL/PVC/TRANSITE PIPE

(B) 1" CORPORATION STOP (CCxCOMP), FORD TYPE G OR EQUAL

(C) 1" COPPER TUBING TYPE "K", SOFT SEAMLESS

(D) FORD OR EQUAL 1" ANGLE METER STOP (COMPxMETER SWIVEL NUT) WITH PADLOCK (LOCK INSTALLED BY CRW)

(E) METER SPACER – SUPPLIED BY CRW AND INSTALLED BY CONTRACTOR (3/4" REDUCERS AS REQUIRED)

(F) METER FURNISHED AND INSTALLED BY CRW

(G) FORD OR EQUAL 1" ANGLE METER STOP (COMPxMETER SWIVEL NUT) WITHOUT PADLOCK

(H) METER BOX, ARMORCAST A6001946PCX12 OR EQUAL WITH CAST IRON READER LID. CENTER BOX OVER METER.

(I) 1" STRAIGHT JOINT COMP COUPLING (FIPxCU), PLUGGED OR PLUMBER TO CONNECT

(J) 2"x2" TEMPORARY MARKER STAKE, PAINTED BLUE

(K) CLASS B 3/4"–MINUS COMPACTED BACKFILL

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15150.
2. ALL SERVICE MATERIALS SHALL COMPLY WITH "LEAD–FREE" REQUIREMENTS OF THE SPECIFICATIONS.
3. INSTALL SERVICE BRANCHES AT RIGHT ANGLES TO THE MAIN, EXCEPT IN CUL–DE–SACS.
4. 18" MINIMUM SEPARATION BETWEEN SERVICE TAPS.
5. UPSTREAM ANGLE BALL METER VALVE TO REMAIN LOCKED UNTIL CRW REMOVES SPACER PIPE AND ACTIVATES SERVICE. (LOCK INSTALLED BY CRW).
6. FINAL LOCATION OF SERVICE ASSEMBLY REQUIRES CRW APPROVAL.

Clackamas River Water

NO	REVISION	3/4" OR 1" SERVICE ASSEMBLY		
		SCALE: N.T.S.	DATE: October 2015	108
		DRAWING: CRW.STD.DTL108.dwg		

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M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN
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CHECKED BY: JPC

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NO	DATE:

Sheet No. 16

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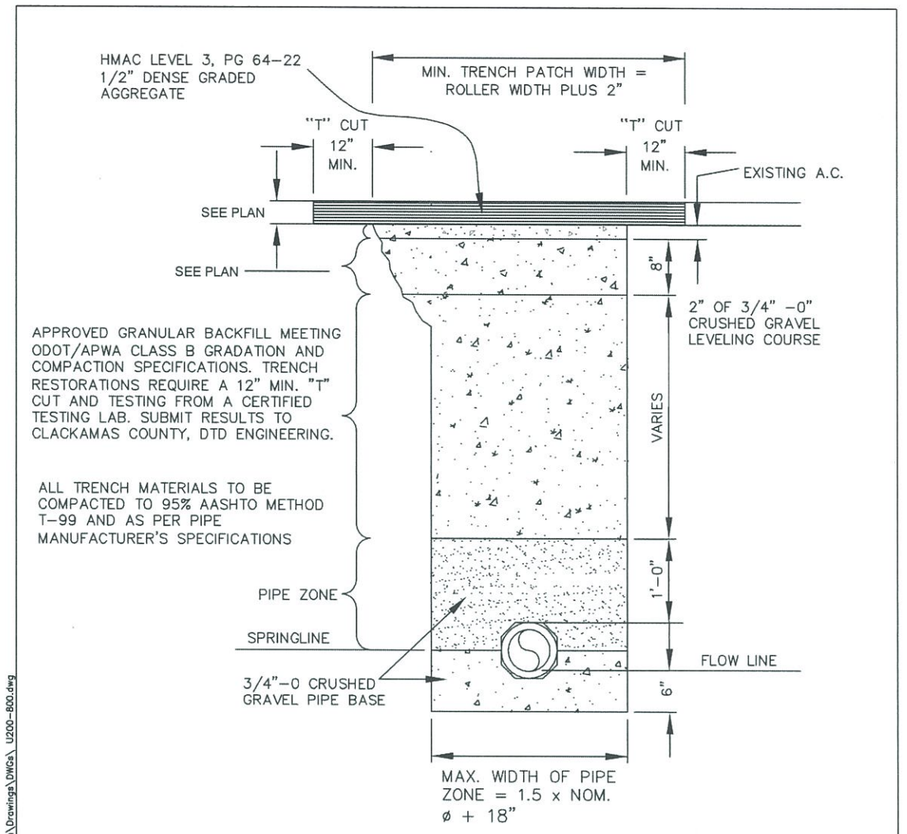

NOTES

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8. A.C. JOINTS/SEAMS SHALL BE SEALED WITH HOT LIQUID ASPHALT, OR APPROVED EQUAL, AND SANDED.
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MODIFIED

REVISION	DATE	BY

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

CLACKAMAS COUNTY

APPROVAL DATE: 1/1/10 SCALE: N.T.S.

STANDARD TRENCH AND BACKFILL

STANDARD DRAWING U200

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WATER DETAILS

SE 115th AVENUE
UTILITY EXTENSION PROJECT

DATE: 08/23/2017 PROJECT NO: 6050

CLACKAMAS COUNTY
DEPT. OF TRANSPORTATION AND DEVELOPMENT
150 BEAVERCREEK ROAD
OREGON CITY, OR 97045

M. BARBARA CARTMILL DIRECTOR

DESIGNED BY: JRN
DRAFTED BY: KDH
CHECKED BY: JPC

REVISIONS

NO	DATE:

Sheet No. 17

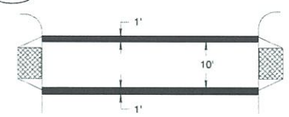
AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD STE 100
TUALATIN, OR 97062
P: 503.563.6151
F: 503.563.6152
aks-eng.com

ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

REGISTERED PROFESSIONAL ENGINEER
76382PE
OREGON
JUNE 29, 2009
JOHN P. CHRISTIANSEN

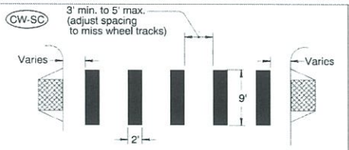
RENEWAL DATE: 12/31/17

CW



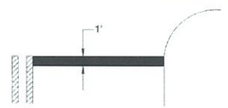
STANDARD CROSSWALK
TWO 1' WHITE BARS
Install per Standard Drawing TM530

CW-SC



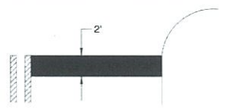
STAGGERED CONTINENTAL CROSSWALK
2' WHITE BARS
Install per Standard Drawing TM530

S



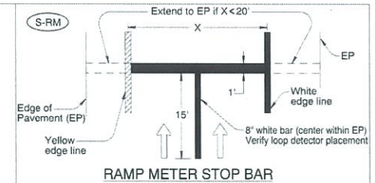
STOP BAR
1' WHITE BAR
Install per Standard Drawing TM530

S-2



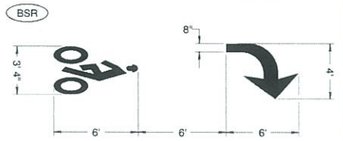
STOP BAR - LARGE
2' WHITE BAR
Install per Standard Drawing TM530

S-RM



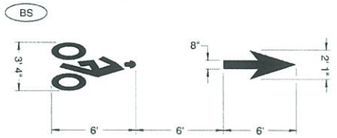
RAMP METER STOP BAR
1' & 8" WHITE BARS
For multi-lane ramp meter applications

BSR



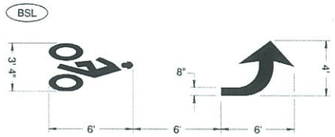
BIKE RIGHT TURN STENCIL (white)
Center marking within lane width
For proportion details, see current version of Standard Highway Signs

BS



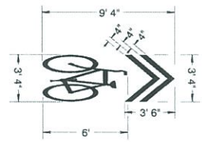
BIKE LANE STANDARD STENCIL (white)
Center marking within lane width
For proportion details, see current version of Standard Highway Signs

BSL



BIKE LEFT TURN STENCIL (white)
Center marking within lane width
For proportion details, see current version of Standard Highway Signs

SLM



SHARED LANE MARKING (white)
Center marking within lane width or as shown
For proportion details, see current version of Standard Highway Signs

BUS

BUS (white)
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

SCH

SCHOOL (white)
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

SCH-LG

SCHOOL - LARGE (white)
Center marking within width of two lanes
For letter proportion details, see current version of Standard Highway Signs

CRS-LG

CROSSING - LARGE (white)
Center marking within width of two lanes
For letter proportion details, see current version of Standard Highway Signs

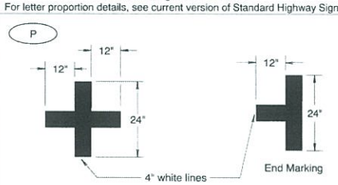
XNG

X-ING (white)
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

ON

ONLY (white)
Center marking within lane width
For letter proportion details, see current version of Standard Highway Signs

P



ON-STREET PARKING DETAIL (white)

General Note:

1. Arrow, letter, and bike symbol dimensions nominal.

LEGEND

Direction of Travel

CALC. BOOK NO. N/A

BASELINE REPORT DATE 07/01/2015

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

PAVEMENT MARKING
STANDARD DETAIL BLOCKS
2015

DATE	REVISION DESCRIPTION
07/2015	Added SLM detail.

TM503

Effective Date: June 01, 2017 - November 30, 2017

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PAVEMENT MARKING DETAILS

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