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FOR  
OR99W: GAARDE/MCDONALD WATERLINE CROSSING**

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**PROFESSIONAL OF RECORD CERTIFICATION(s):**

 <p style="margin-top: 10px;">EXPIRES: <u>12-31-2015</u></p>	<p>I certify the Special Provision Section(s) listed below are applicable to the design for the subject project for OR99W Gaarde/McDonald Waterline Crossing. Modified Special Provisions were prepared by me or under my supervision.</p> <p style="margin-top: 20px;">Section 00210, Section 00220, Section 00225, Section 00294, Section 00330, Section 00405, Section 00406, Section 00510</p>
<p>Date Signed: <u>1-22-2015</u></p>	

**PROFESSIONAL OF RECORD CERTIFICATION(s):**

 <p>RENEWS 6-30-15</p>	<p>I certify the Special Provision Section(s) listed below are applicable to the design for the subject project for OR99W Gaarde/McDonald Waterline Crossing. Modified Special Provisions were prepared by me or under my supervision.</p> <p>Section 00210, Section 00220, Section 00225, Section 00280, Section 00305, Section 00330, Section 00405, Section 00442, Section 00495 Section 01140, Section 01150,</p>
<p>Date Signed: <u>1-22-2015</u></p>	

## **SPECIAL PROVISIONS**

### **WORK TO BE DONE**

The Work to be done under this Contract consists of the following on the OR99W and SW: Gaarde/McDonald Streets in Washington County:

1. Boring a casing approximately 120 linear feet under Oregon State Highway 99W at the intersection of SW Gaarde/McDonald Streets including furnishing and installing 16-inch diameter ductile iron carrier pipe, complete with spacers, grout fill and all work required to complete the waterline highway crossing as shown;
2. Furnish and install approximately 130 linear feet of 16-inch diameter and 315 feet of 8-inch diameter ductile iron trench installed and buried waterline including valves, fittings, and connections to existing waterlines;
3. Disposal of contaminated media from excavations;
4. Provide traffic control, surface restoration, erosion control, and all work required to complete the waterline crossing;
5. Coordinate with others working adjacent to project including the ODOT's OR99W/Gaarde/McDonald highway improvements project.
6. Perform additional and incidental Work as called for by the Specifications and Plans.

### **APPLICABLE SPECIFICATIONS**

The Specification that is applicable to the Work on this Project is the 2008 edition of the "Oregon Standard Specifications for Construction" with all waterline materials and work complying with City of Tigard Water Distribution System Standards.

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 Sections and subsections contained in these Special Provisions in their entirety.

### **COMPLETION TIME LIMIT**

All Waterline Work under the Contract shall be substantially complete, including surface restoration, within 30 calendar days after issuance of Notice to Proceed.

## SECTION 00210 - MOBILIZATION

Comply with Section 00210 of the Standard Specifications.

## SECTION 00220 - ACCOMMODATIONS FOR PUBLIC TRAFFIC

Comply with Section 00220 of the Standard Specifications.

## SECTION 00225 - WORK ZONE TRAFFIC CONTROL

Comply with Section 00225 of the Standard Specifications modified as follows:

**00225.80 Measurement** Work covered under this section shall be by Lump Sum

**00225.90 Payment** Work covered under this section shall be paid by Lump Sum amount for the item "Traffic control and flagging".

## SECTION 00280 - EROSION AND SEDIMENT CONTROL

Comply with Section 00280 of the Standard Specifications modified as follows:

**00280.80 Measurement** Work covered under this section shall be by Lump Sum

**00280.90 Payment** Work covered under this section shall be paid by Lump Sum amount under the item "General clean up, erosion control and surface restoration of non-paved surfaces".

## SECTION 00294 - CONTAMINATED MEDIA

Section 00294, which is not a Standard Specification, is included in this Project by Special Provision.

### Description

**00294.00 Scope** - In addition to the requirements of Section 00290 and these specifications, this work consists of the following:

- Excavate, transport, and dispose of contaminated soils from the launch pit excavation and portions of the pipeline trench between the launch pit and SW McDonald Street and along the 8-inch waterline between the launch pit and Station "A-W" 2. Soils along the bored pipeline should also be assumed contaminated with low levels of petroleum hydrocarbons. Soils at the receiving pit should not be assumed contaminated.

- Payment for excavation, transport, and disposal of contaminated soils from the launch pit excavation is part of Special Provision 00510.
- Pump, test, treat, and dispose of contaminated groundwater inflows encountered in the launch pit and pipeline trench during installation of the trenchless crossing and pipeline construction. Prepare a Health and Safety Plan (HASP) for work within the contaminated areas of the Project.

The ODOT reports, titled *Level II Hazardous Materials Assessment; OR 99W: Gaarde St./McDonald St. Intersection Improvement, Tigard, Oregon dated February, 2013*, and *Supplemental Level II Hazardous Materials Assessment; OR 99W: Gaarde St./McDonald St. Intersection Improvement, July 2013*, documenting the contaminated media identified within the Project is available from the Engineer.

When additional testing of contaminated soil or groundwater is required to characterize the material for reuse, recycle, or disposal, conduct the tests according to 00290.20(c).

**00294.03 Submittals** - Submit the following documents:

- A site specific HASP at least 5 Calendar Days before the pre-construction conference.
- Modifications to the HASP that are requested by the Engineer within three Calendar Days of the request.
- Current employee training certificates and medical surveillance information before beginning work within the contaminated areas.
- Within 48 hours of removal of contaminated media:
  - Permits, permit applications, and documentation of compliance.
  - All reuse, recycled, and disposal receipts.
  - Final quantities of soil and groundwater reused, recycled, and disposed and their final location.
  - All analytical test results.

**00294.05 Health and Safety Plan** - Prepare a site specific HASP that meets or exceeds the requirements of 29 CFR 1910.120 and include a personnel and equipment decontamination plan that details how decontamination media will be contained and disposed.

Maintain a copy of the HASP on site at all times and readily available to employees and inspectors during construction activities. If additional information becomes available regarding the site specific conditions, revise the HASP and submit the revised version it to the Engineer. Review of the HASP by the Engineer does not indicate that the HASP is fully compliant with State or federal requirements. Compliance is the responsibility of the Contractor. Review by the Engineer will not impose liability upon the City or relieve the Contractor of responsibilities under the Contract.

Do not begin work in contaminated areas until the Engineer provides written acknowledgement of the HASP.

All personnel entering contaminated areas shall follow the requirements of the HASP.

## **Labor**

**00294.30 Personnel Qualifications** - Provide employees meeting the following requirements:

- A contractor with at least 2 years experience cleaning up and managing petroleum contaminated soil or groundwater in Oregon under DEQ rules.
- Hazardous Waste Operations and Emergency Response (HAZWOPER) trained workers (29 CFR 1910.120) that:
  - Have completed a 40 hour HAZWOPER training course.
  - Have completed an 8 hour HAZWOPER refresher training course within the last 12 months.
  - Participates in the HAZWOPER Medical Surveillance Program.
- A Supervisor that:
  - Has at least two years experience cleaning up and managing petroleum contaminated soil or groundwater in Oregon.
  - Meets the HAZWOPER training requirements plus completed an 8 hour HAZWOPER supervisor training course.

### **Construction**

**00294.40 Contaminated Soil Excavation** - Excavate and handle contaminated soil according to the following:

- Notify the Engineer 48 hours before beginning excavation activities within contaminated areas.
- Upon request, allow the City to collect soil and groundwater samples during excavation activities.
- Upon request, allow the City access to field screen soils for contaminants during excavation.
- Segregate non-contaminated soil from contaminated soil during excavation activities.
- Load contaminated soil directly into trucks and transport directly to the recycling or disposal facility or, when approved, temporarily store contaminated soil on-site in covered water tight containers or place contaminated soil on minimum 6 mil thick polyethylene sheeting that has an impermeable berm around the edge. Cover the contaminated soil with minimum 6 mil thick polyethylene sheeting. Do not allow rainwater to enter the excavated contaminated soil. Label all stored material with the type of material, the contaminants, and the dates of accumulation.
- Remove contaminated media from the exterior of all vehicles before they leave the Project Site
- Where over excavation is required, backfill the excavation according to 00330.42.

**00294.41 Contaminated Soil Management** - Reuse, recycle, or dispose of contaminated soil according to any of the following:

- **Landfill Disposal:**

- Obtain the Engineer's approval of the disposal facility before disposing of the contaminated soil.
- Transport the contaminated soil to a DEQ permitted municipal solid waste landfill or a permitted construction and demolition landfill for disposal. Dispose of temporarily stored contaminated soils within 30 days of beginning excavation work or before Second Notification, whichever occurs first.
- Complete and sign all manifests and bill-of-lading forms for handling, loading, transporting, and disposing of the contaminated soil.
- Pay all filing and permit fees.

**00294.43 Contaminated Groundwater Pumping** - Remove and handle contaminated groundwater as follows:

- Upon request, allow the City to collect groundwater samples during pumping activities and subsequent storage.
- Remove contaminated groundwater from the Project Site or, when approved, temporarily store, on-site, contaminated groundwater in water tight containers, compatible with the contaminants. Label each container with the contents and dates of accumulation.
- Dispose of stored contaminated groundwater within 30 days from the date of beginning generation of it or before Second Notification, whichever occurs first.

**00294.44 Contaminated Groundwater Management** - Recycle or dispose of contaminated groundwater according to one of the following:

- **Discharge to a Permitted Sanitary Sewer Facility:**

- Submit all groundwater analytical data, and proposed treatment information to the local sewer authority and obtain written permission or a permit to discharge the contaminated groundwater to the sanitary sewer system.
- Complete and sign the sewer permit application as the applicant and pay all associated fees.
- Comply with all permit requirements, and all other local sewer authority requirements.

- **Transport to an Off-Site Recycling or Disposal Facility:**

- Submit all groundwater analytical data to the receiving facility and obtain written acceptance from that entity.
- Complete and sign bill-of-lading forms, and all other documentation required by the receiving facility.
- Pay all permit fees.

### **Measurement**

**00294.80 Measurement** - No measurement of quantities will be made for health and safety plan.

No measurement of quantities will be made for contaminated soil and groundwater mobilization.

The quantities of contaminated soil removed from the bored pipeline and pipeline trench will be measured on the weight basis, based on the recycling or disposal facility weigh tickets.

The quantities of contaminated groundwater removed will be measured on the volume basis, per gallon, based on the receiving facility approved meter tickets or approved on-site meters.

### Payment

**00294.90 Payment** - The accepted quantities of work performed under this Section will be paid for at the Contract unit price, per unit of measurement, for the following items:

	<b>Pay Item</b>	<b>Unit of Measurement</b>
(a)	<i>Health and Safety Plan</i>	<i>Lump Sum</i>
(b)	<i>Contaminated Soil Removal</i>	<i>Ton</i>
(c)	<i>Contaminated Groundwater Mobilization</i>	<i>Lump Sum</i>
(d)	<i>Contaminated Groundwater Disposal</i>	<i>Gallon</i>

Item (b) includes all mobilization costs for soil removal work. Soil disposal costs are limited to costs in excess of clean soils excavation costs included in Special Provisions 00405 and 00406.

Item (d) includes obtaining all permits and furnishing all equipment and labor necessary to treat and store contaminated groundwater.

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

No separate or additional payment will be made for:

- Testing of soil and groundwater for contamination.
- Temporary storage or stockpiling of contaminated media.

### SECTION 00305 - CONSTRUCTION SURVEY WORK

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

#### Description

##### 00305.00 Scope

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

by the unnecessary loss or disturbance of such bench marks, reference points and stakes, and contractor shall re-establish the benchmark and complete all associated documentation.

**Measurement**

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

**Payment**

**00305.90 Payment** – No separate payment will be made for construction survey work. Construction survey work is considered incidental to the work.

**SECTION 00330 – EARTHWORK**

Comply with Section 00330 of the Standard Specifications modified as follows:

**00330.80 Measurement** - Replace this subsection, except for the subsection number and title, with the following:

Quantities of earthwork are measured for pay items specified under Section 00405, Trench Excavation, Bedding, and Backfill

**00330.90 Payment** - Replace this subsection, except for the subsection number and title, with the following:

Payment for earthwork will be made by volume basis for work specified under Section 00405, Trench Excavation, Bedding, and Backfill.

**SECTION 00405 – TRENCH EXCAVATION, BEDDING AND BACKFILL**

Comply with Section 00405 of the Standard Specifications modified as follows:

**Measurement**

**00405.81 Rock Excavation and Boulder Excavation** – The quantities of rock and boulder excavation will be measured as specified in Section 00405 of the Standard Specifications

**00405.82 Trench Foundation** - Quantities of unsuitable trench foundation will be measure on the volume basis.

**Payment**

**00405.90** – Payment for rock and boulder excavation and trench foundation will be paid for at the Contract unit price, per unit of measurement, for the following pay items:

**Pay Item**

**Unit of Measure**

- (a) Trench overexcavation and select backfill for unsuitable trench foundation Cubic Yard

No separate payment will be made for common trench excavation and backfill as specified in Section 00405 of the Standard Specifications and is considered incidental to pipeline installation as specified in Section 01140. Soils impacted by petroleum hydrocarbons are addressed in Special Provision 00294.

## **SECTION 00406 - TUNNELING, BORING, AND JACKING**

Replace this Section, except for the Section number and title, with the following:

### **Description**

**00406.00 Scope** – This work consists of furnishing and installing a 126-foot long, 16-inch water pipeline beneath Highway 99W at its intersection with SW Gaarde and SW McDonald. Boring, jacking, or ramming are acceptable methods. Other methods may be used if approved by the Engineer, provided the Contractor can provide documentation showing they will have equivalent performance to boring, jacking, or ramming.

The work also consists of installing and removing the necessary machinery, line and grade control, removing and disposing of spoils, and removing obstructions, if applicable. Work associated with excavation, construction and removal of the launching and receiving facilities is covered under specification 00510.

Geological, geotechnical and hazardous materials information are available from \_\_\_\_\_ in the “Report of Geotechnical Engineering Services, Tasks 8.1 and 8.2 – Geotechnical Engineering Evaluation, OR 99W: Gaarde/McDonald Intersection” and in the “Supplemental Level II Hazardous Materials Assessment, OR 99W: Gaarde St./McDonald St., Intersection Improvements”.

Soil and groundwater impacted by low levels of petroleum hydrocarbons are present along the eastern half of the trenchless pipeline alignment. See Special Provision 00294 for handling and disposal of contaminated soil and groundwater.

It is the Contractor’s responsibility to install the casing through the conditions identified in the referenced geotechnical information so the completed pipeline is installed at the location, grade, and profile shown on the plans. The installed pipeline must be structurally sound and have undamaged walls, joints, and ends. Acceptable casing installation tolerances are plus or minus 0.5 feet from the specified alignment at the pipeline ends.

### **00406.01 Descriptive Terms:**

**Tunneling** – Tunneling includes all methods by which an underground passageway is excavated and lining materials are brought in and placed.

**Boring** - Boring includes all methods by which a conduit, casing, pipe or sleeve is pushed or pulled into place and in which the excavation method precludes the stationing of a worker within the conduit without stopping or removing the excavation equipment.

**Jacking** - Jacking includes all methods by which a conduit, casing, pipe or sleeve is pushed or pulled into place with one or more workers inside to excavate and assist in keeping the conduit on the required grade and alignment.

**Ramming** - Ramming includes all methods by which a conduit, casing pipe or sleeve is pushed into place and in which the excavation method precludes the stationing of a worker within the conduit without stopping or removing the spoils from the conduit.

#### **00406.02 Submittals:**

- a) **Qualifications** – Submit no less than one (1) week prior to starting the work under this Section, satisfactory evidence of the experience and qualifications specified in subsection 406.30.
- b) **Reports and Certifications** – Submit no less than one (1) week prior to starting the work under this section.
  1. **Product Data** – Submit the manufacturer’s product data for equipment and materials that will be incorporated into the work.
    - Submit grout mix design for grout that will be used to fill the annular space between the carrier pipe and the casing pipe
    - Submit Material Safety Data Sheets for all materials that will be used.
  2. **Certifications** – Submit the following:
    - Manufacturer’s warranties, certificates of compliance, and guarantees that all materials incorporated into the work meet or exceed the requirements of the Plans and Specifications.
  3. **Shop Drawings** – Submit shop drawings for all fabricated equipment and materials, including the following:
    - Complete geometry, grade of materials, and dimensions of the jacking system, including all steel framing, welds, bolts, braces, hydraulic jacking equipment, lubricant equipment, and controls. Dimension drawings to scale and show the spatial relation of the complete fabrication with respect to the casing and jacking pits and profile.
- c) **Procedures** – Submit the following detailed Working Drawings and Method Statements no less than one (1) week prior to commencing the casing installation.
  1. **Casing Installation Work Plan**- Describe in detail the Contractor’s proposed work methods and approach to completing the Work.

- Provide design calculations and narrative to demonstrate the trenchless installation method will successfully install the casing including calculations to verify the installation equipment is the correct type and has sufficient energy to complete the drive.
- Provide design calculations which demonstrate that the proposed casing pipe will handle the anticipated jacking forces during installation.
- Provide design calculations which demonstrate that the trenchless installation method will not damage the excavation support system and that the excavation support system has adequate strength to handle anticipated jacking loads.
- Provide a planned schedule for the work. Include a narrative describing the critical path; planned work sequence, durations, and advance rates; and planned work hours, number of shifts per day, number of days worked per week, crew size and make-up.
- Provide description for means of directional control and details of lubrication system if used.
- Provide drawings showing the spatial arrangement of equipment and materials at the site.
- Provide specific details for protecting adjacent existing utilities.
- Provide narrative describing means and methods to backfill annular space between 16-inch product pipe and 36-inch casing. Include bracing details to prevent pipe shift and flotation as well as equipment for backfilling. Design calculations should be included to demonstrate that backfilling process will not damage the pipe.
- Provide a detailed plan to handle, stockpile, load, haul, and dispose of all excavated material.

**2. Contingency Plan-** Prepare a detailed contingency plan that outlines contingency procedures to be employed in the event of:

- Obstruction or impediment encountered.
- Means and methods to maintain specified line and grade tolerances should casing steering not be sufficient to meet the specified requirements.
- Surface settlement.
- Unexpected or excessive groundwater inflow.
- Over-excavation or running ground.
- Equipment breakdowns

### **Materials**

**00406.10 Pipe Bedding and Pipe Zone Material** – Furnish pipe bedding and pipe zone material meeting the requirements of Section 00405. Stone embankment and subgrade stabilization aggregate can be used in the pipe zone.

**00406.11 Pipe** – Furnish pipe materials meeting the strength, class, and type specified or shown.

**00406.12 Casing** – Furnish casing of a size to permit proper construction to the required lines and grades. Furnish welded steel pipe with a 1/2 inch minimum wall thickness with joints that do not increase the pipe diameter and is suitable for the purpose intended.

The specified casing material and thickness is based on superimposed loads and expected corrosion. It does not consider the stresses resulting from the jacking, boring, or ramming operations. Any increase in casing strength to withstand installation loads shall be the responsibility of the Contractor. Contractor must show that the casing material will be adequate to withstand superimposed loads, expected corrosion, the construction process, and an appropriate factor of safety in the judgment of the engineer.

**00406.13 Grout** - Furnish grout for filling the annular space between the carrier pipe and the casing pipe of one part Portland cement, five parts sand, and seven parts 3/8 inch maximum size rounded aggregate by volume, or as approved.

**00406.14 Field Welded Joints** - Furnish full penetration butt-welded joints without backup rings conforming to AWS D1.1. All welds shall be ground smooth and flush with the pipe surface. No other means of joining the pipes will be allowed unless requested in writing and approved prior to use. A certified, independent weld inspection shall be provided by the Contractor in accordance with AWS D1.1. An inspector may monitor quality assurance. The Contractor shall place equipment so the Inspector has ready access.

**00406.15 Lubrication** - Furnish lubrication as needed on the inside and the outside of the pipe.

### **Labor**

**00406.30 Personnel Qualifications** – Provide resumes, a description of relevant experience, and contact information for Owners or Engineers that can verify the specified qualifications for each of the following entities and key individuals. Upon approval, Contractor shall not substitute or replace any entity or individual without express written approval from the Engineer.

- a) **Contractor** – The Contractor responsible for the trenchless casing installation shall have a minimum of five (5) years history and experience in trenchless casing installation and pipeline construction, and shall have constructed and satisfactorily completed a minimum of two (2) projects of similar (or greater) size and scope prior to award of this Project.
- b) **Superintendent and Operating Engineer** - Provide a full time superintendent and one or more operating engineers who are experienced with the pipe installation method and the equipment the Contractor will use. The Superintendent and Operating Engineer shall have successfully completed a minimum of five (5) projects of similar length and diameter using the proposed method. At least one shall have been installed in the past year.
- c) **Welders** - Use certified welders qualified to AWS Section D1.1 Section 4 for the position, process, and pipe diameter on the job.

### **Construction**

**00406.40 Boring and Jacking** - Jack, bore, or ram the casing in one continuous length to the required line and grade following the construction sequence outlined on the Drawings. The leading section of the casing pipe shall be equipped with a cutting shoe. The cleaning auger flights shall not project or excavate beyond the cutting shoe face.

Should loss of surrounding material occur during the boring, jacking, or ramming operations, backpack or grout the voids before completion of the shift. Fill or backpack all voids with grout or granular material as approved. Restore displaced or damaged structures, roadway surface, shoulders, or embankment.

Field verify the line and grade prior to installation. Do not proceed with the work until line and grade are approved by the Engineer. Monitor the line and grade, at least once in every 20 feet of installation length and report the results to the Engineer. Stop work if the line or grade has, or is expected to, deviate from the specified tolerances. Submit a proposed solution to the Engineer. Do not resume work until the corrective measures are approved.

**00406.41 Steel Casing** - Join sections of steel casing to be jacked, bored, or rammed by welding the joints with a continuous weld for the full circumference, or by other approved means. Provide joints capable of resisting the jacking, boring, or ramming forces.

**00406.42 Removal of Obstructions** - Obstructions halting or deflecting the pipe during ramming or boring may be removed by entry. The pipe should be cleared of spoils and water prior to entry. All activities must conform to applicable Confined Space regulations. Entry should be avoided if other options are available, such as increasing the pushing or ramming force. The Engineer must concur that entry is the appropriate procedure before it is undertaken.

**00406.42 Installation of Carrier Pipe in Casing** – Ductile iron piping shall be installed in accordance with AWWA C900 and City of Tigard Public Improvement Standards. Install ductile iron pipe with casing insulators with plastic skids to centralize carrier pipe within the casing at the design grade as shown on the drawings.

**00406.44 Placing Grout in Casing** - Completely fill the annular space between the pipe and the casing with approved grout as specified or approved. Brace pipe installed in casing to prevent shifting or flotation and pour or pump the grout from the receiving pit. Complete grouting in a continuous operation without stopping and without damaging the pipe.

**00406.45 Pressure Testing and Disinfection** – Pressure test and disinfect the pipeline as specified in subsection 01140 and as outlined in the Construction Sequence Notes on the Drawings.

**00406.50 Site Cleanup** – Remove and restore launching pit and receiving pit as directed by the Engineer.

### **Instrumentation**

**00406.60 Monitoring Installation** – Install utility monitoring points at locations shown on the plans.

**00406.70 Monitoring Schedule** – Take baseline readings prior to initiating casing installation work. Monitor utility monitoring points as described on the drawings. Provide daily monitoring reports to the Engineer.

## Measurement

**00406.80 Measurement** – No measurement of quantities will be made for work performed under this section.

Where tunneling, boring, jacking, or open trench excavation is used at the Contractor's option in lieu of another specified method; measurement will be made as originally bid.

## Payment

**00406.90 Payment** – The accepted quantities of work performed under this section will be paid for at the Contract lump sum amount for the item "Install Casing Pipe".

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

No separate or additional payment will be made for:

- Furnishing and installing a 36-inch minimum diameter by 126 foot long steel casing.
- Furnish and install 16-inch ductile iron waterline as shown on Drawings.
- Furnish and install 8-inch ductile iron waterline as shown on Drawings. Disposal of non-contaminated soils removed from excavation.
- Disposal of non-contaminated water removed from excavation.
- Monitoring existing utilities
- Repair of damages occurring during installation, if any.
- Site restoration.
- Other items as listed on the bid schedule

Disposal of contaminated media is covered in Section 00294.

## SECTION 00442 – CONTROLLED LOW STRENGTH MATERIALS

Comply with Section 00442 of the Standard Specifications modified as follows:

### Payment

**00442.80 Payment** - No separate payment will be made for furnishing and placing CLSM and will be considered incidental to trench installed waterline as specified herein.

## SECTION 00495 - TRENCH RESURFACING

Comply with Section 00495 of the Standard Specifications modified as follows:

**00495.00 Scope** - Add the following paragraph at the ending of this subsection:

Pipe trenches, bore pit and all other waterline and exploratory excavations shall be resurfaced as specified in the paving schedule outlined on Sheet C-1 of the drawings.

**00495.80 Measurement** - Replace this subsection, except for the subsection number and title, with the following:

Work covered under this section shall be measured by weight in tons of asphalt concrete installed.

**00495.90 Payment** - Replace this subsection, except for the subsection number and title, with the following:

Work covered under this section shall be paid by the ton of asphalt concrete installed for the item "AC Resurfacing". Saw cutting of existing paved surfaces is considered incidental to the work and will not be paid separately.

Payment for resurfacing of unpaved areas disturbed during the work is covered under Section 00280.

## **SECTION 00510 - STRUCTURE EXCAVATION AND BACKFILL**

Comply with Section 00510 of the Standard Specifications modified as follows:

### **Description**

**00510.01 Scope** - Add the following paragraph between the first and second paragraphs in this subsection:

This work includes design, installation, and removal of the temporary shoring required for construction of the launch and receiving pits, compatible with the Contractor's means and methods for construction of the new waterline beneath OR 99W. Contaminated soil and groundwater are present at the launch pit location. Shoring shall be designed to minimize soil and groundwater disposal costs

Information regarding contaminated media is covered in Section 00294.

The ODOT report, titled Report of Geotechnical Engineering Services, *Tasks 8.1 and 8.2 Geotechnical Engineering Evaluation: OR 99W: Gaarde St./McDonald St. Intersection Improvement, Tigard, Oregon dated February 24, 2014* is available from the Engineer.

Add the following subsection:

**00510.05 Additional Submittals for Temporary Work at Launch and Receiving Pit:** In this subsection, "temporary work" constitutes the temporary shoring at the launch and receiving pits required to install the steel casing by trenchless methods beneath OR 99W.

**(a) Procedures** - Submit the following detailed Working Drawings and Method Statements no less than 15 days prior to commencing the work under this Section.

**1. Work Plan for Installation of Temporary Shoring for Launch and Receiving Pits -**  
Describe the Contractor's approach to completing the work, including the following details, at a minimum..

- Provide a narrative describing the Contractor's proposed work sequence, clearly identifying the activities associated with shoring installation.
- Soil and groundwater within the launch pit area are impacted with low levels of petroleum hydrocarbons (Spec 00294). Work plan shall include a detailed discussion regarding handling, storage and disposal of soil and groundwater removed from the launch pit.
- Provide a narrative describing the Contractor's proposed shoring installation methods, equipment and sequences to protect adjacent utilities.

**Measurement**

**00510.80 Measurement** - Replace this subsection, except for the subsection number and title, with the following:

No measurement of quantities will be made for work performed under this Section.

**Payment**

**00510.90 Payment** - Replace this subsection, except for the subsection number and title, with the following:

The accepted quantities of work performed under this Section will be paid for at the Contract lump sum amounts for the following items:

(a) Launch Pit Excavation and Temporary Support .....	Lump Sum
(b) Receiving Pit Excavation and Temporary Support .....	Lump Sum

Actual quantities of structure excavation, shoring, and granular structure backfill will vary depending on the Contractor's means and methods for constructing this Project. As such, estimated quantities are not provided for the above items.

Item (a) includes Contractor's design, installation, and removal of temporary support of excavation for the launch pit to accommodate the Contractor's means and methods for constructing the work. Item also includes all structure excavation and disposal of non-contaminated and contaminated soils and structure backfill quantities required in the pit area.

Item (b) includes Contractor's design, installation, and removal of temporary SOE for the receiving pit to accommodate the Contractor's means and methods for constructing the work. Item also includes all structure excavation, disposal of excavated material, and structure backfill quantities required in the pit area.

No separate or additional payment will be made for the following:

- Bedding.
- Disposal of non-contaminated water removed from excavations.

When the Contract Schedule of Items does not indicate payment for other work under this Section, no separate or additional payment will be made. Payment will be included in payment made for the appropriate items under which this work is required.

### SHORING DESIGN CHECKLIST

**Instructions** - This shoring design checklist was developed to facilitate the design, review, and erection of shoring to be used for ODOT bridge construction projects. This checklist is intended to act as a reminder to design or check for specific important aspects of this construction. It is not a substitute for plan and/or design criteria or specification requirements.

The Checklist is to be completed and signed by the shoring design engineer. Answer every question. Attach to the Checklist an explanation of any negative responses.

Submit the Checklist according to 00510.05.

	YES	NO	N/A
<b>A. Contract Plans, Specifications, Permits, etc.</b>			
1. Are the shoring plans prepared, stamped, and signed by an engineer registered to practice in Oregon?	_____	_____	_____
2. Have three copies (five copies if railroad approval is required) of the complete design calculations accompanied the shoring drawings submittal?	_____	_____	_____
3. Are shoring plans in compliance with the requirements of the construction plans general notes?	_____	_____	_____
4. Are shoring plans in compliance with contract plan structural details?	_____	_____	_____
5. Are shoring plans in compliance with the requirements of the Oregon Standard Specifications for Construction, subsection 00150.35?	_____	_____	_____
6. Are all existing, adjusted or new utilities in proximity with the proposed shoring shown on the shoring plans and is protection of these utilities addressed?	_____	_____	_____
7. Are clearance requirements satisfied and shown on the shoring plans?	_____	_____	_____
<b>B. Loads</b>			
1. Are the magnitude and location of all loads, equipment and personnel that will be supported by the shoring shown or noted on the shoring plans?	_____	_____	_____

- 2. Are design loads and material properties used to determine design stresses shown for each different shoring member shown on the shoring plans? \_\_\_\_\_
- 3. Does the shoring design assume water saturated soil pressure acts on the full height of the shoring? \_\_\_\_\_
- 4. Has percolation into the excavation been addressed? \_\_\_\_\_

**C. Allowable Stresses**

- 1. Have the design loads used for shoring design of all members been noted in the design calculations? \_\_\_\_\_
- 2. Are the allowable stress and the calculated stress listed in the summary for each different shoring member? \_\_\_\_\_

**D. Timber Construction**

- 1. Are timber grades consistent with material to be delivered to the construction site and noted on shoring drawings and in accompanying calculations for all timber shoring material? \_\_\_\_\_
- 2. If "rough" lumber is specified for shoring by the shoring designer are the actual lumber dimensions used in calculations shown? \_\_\_\_\_

**E. Steel Construction**

- 1. Are steel structural shapes and plates identified by ASTM number on the shoring plans and in the calculations? \_\_\_\_\_
- 2. Have steel beams been checked for bending, shear, web crippling and buckling of the compression flange? \_\_\_\_\_

**F. Compression Members, Bracing, Members and Connections**

- 1. Has general buckling been evaluated for all compression members? \_\_\_\_\_
- 2. Has bracing been provided at all points of assumed support for compression members? \_\_\_\_\_
- 3. Is bracing strength and stiffness sufficient for the intended purpose? \_\_\_\_\_
- 4. Have all connections been designed and detailed? \_\_\_\_\_

\_\_\_\_\_  
Designer's Signature

\_\_\_\_\_  
Date

## SECTION 01140 - POTABLE WATER PIPE AND FITTINGS

Comply with Standards Section 01140 of the Standard Specifications modified as follows:

**01140.00 Scope** – Add the following sentence to the end of the paragraph:

All waterline work shall comply with City of Tigard Water Distribution System Standards.

**01140.10 General** – Replace the subsection after the first sentence ending “meeting the following requirements” to read as follows:

### **(a) Water Pipes**

Pipe shall be push-on joint ductile iron pipe except where specifically shown or detailed otherwise. Fitting joints shall be mechanical joint ends, except where specifically shown or detailed otherwise. Push-on joint ductile iron pipe shall be cement-mortar lined and conform to ANSI/AWWA C151/A 21.51 and ANSI A21.11. The type and thickness class shall be 52. The rubber ring gaskets shall conform to ANSI A21.11, be suitable for the specified pipe sizes and pressures, and shall be furnished with the pipe. A non-toxic vegetable soap lubricant shall be supplied with the pipe in sufficient quantities for installing the pipe furnished.

### **(b) Pipe Fittings**

**(1) Mechanical Joint Fittings:** Mechanical joint cast iron fittings shall conform to ANSI/AWWA C104/A21.4 and shall be of class at least equal to that of the adjacent pipe. Mortar lining for fittings shall be the same thickness specified for pipe. Bolts shall be domestic Cor-Ten or ductile iron tee-head bolts.

**(2) Flanged Cast Iron Fittings:** Flanged fittings shall conform to ANSI B16.12 and shall be faced and drilled 125-pound ANSI. The fittings shall be cement-mortar lined to same thickness specified for pipe, and shall meet ANSI/AWWA C110/A21.11 for all other aspects.

**(3) Gaskets:** Unless otherwise noted, gasket material for flanged joints in cast iron pipe shall be cloth-inserted sheet rubber gaskets conforming to AWWA/ANSI C207/B16.21, 1/8-inch thick. The gasket shall be full-cut, with holes to pass bolts. Gasket material shall be free from corrosive alkali or acid ingredients.

All gaskets used on this project for push on, mechanical joint, restraint systems, and flanged joints shall be Nitrile Butadiene Rubber gaskets.

**(4) Non-buried Mechanical Couplings:** Mechanical couplings, not a part of the pipe itself, shall be cast iron couplings with rubber rings and ductile iron bolts and nuts. Couplings shall be Dresser, Smith-Blair, or as approved in writing by the City Engineer.

**01140.40 (b) Bedding and Pipe Zone** – Replace paragraph with following:

Pipe bedding and pipe zone dimensions and material shall comply with City of Tigard Public Improvement Standards and Standard Drawing 180. When within ODOT roadway, trench backfill material shall comply with ODOT standards and specifications.

**01140.41 (b) Ductile Iron Pipe** – Replace sentence with the following:

Ductile iron piping shall be installed in accordance with AWWA C900 and City of Tigard Public Improvement Standards. Ductile iron piping shall be installed within the casing as specified in Section 00406.

**01140.41 (b) Ductile Iron Pipe** – Add the following paragraph:

Permissible Deflection of Joints: Wherever it is necessary to deflect pipe from a straight line either in a 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:

**Maximum Deflection Permitted\*  
18-Foot Length Pipe**

Diameter Inches	MECHANICAL JOINT** Maximum Deflection		PUSH ON JOINT Maximum Deflection	
	Angle Degrees - Minutes	DEFLECTION Inches	Angle Degrees	Deflection Inches
4	8-18	31	5	19
6	7-07	27	5	19
8	5-21	20	5	19
10	5-21	20	5	19
12	5-21	20	5	19
16	3-30	13.5	3	11

\*The maximum deflection shall be whichever is less - the table or that recommended by the pipe manufacturer.

\*\*Safe deflection for 150 pounds pressure. For higher pressure, reduce tabulated deflection proportionally ten (10) percent for each 150 pounds added pressure.

**01140.44 (a) Concrete Thrust Blocks** – Replace the first sentence as follows:

Install concrete thrust blocks only at the locations shown on the plans and as approved by the Engineer. If a mechanical joint restraint is not possible and after coordination with the Engineer, place concrete thrust blocking as required.

**01140.44 (b) Restrained Joints** – Add the following:

The following is the approved list of restrained joint systems for this project:

- a. Wedge type restraint systems such as “Megalug” from EBAA Iron, Inc.

- b. "Thrust Lock", McWane Cast Iron Pipe Company.
- c. "MJ-TJ" pipe with "Megalugs", Pacific States Cast Iron Pipe Company.
- d. "Flex-Ring", American Cast Iron Pipe Company.
- e. "TR Flex", United States Pipe and Foundry Company.
- f. "Snap-Lok", Griffin Pipe Products.

Push on restraint systems, such as US Pipe "Field Lok", shall be allowed on buried piping only. Piping within casing shall be restrained with mechanical systems as listed above.

**01140.50 Filling and Flushing:** Add the following to the end of the first paragraph:

A one-foot air gap between the discharge point and the receiving point must be maintained during flushing operations.

**01140.51 Hydrostatic Testing:** Change this subsection to read as follows:

**(a) General**

Make pressure and leakage tests on all newly laid pipe, including mainline pipe, valves, blowoffs, fire hydrant and other appurtenances. Furnish all necessary equipment and material, make all taps in the pipe as required, and conduct the tests. The Engineer will monitor the tests. If concrete thrust blocks are used, the Engineer will indicate that the thrusting blocks have obtained the needed strength to resist the pressures obtained during the hydrostatic test. Furnish the following equipment and materials for the tests:

<u>Amount</u>	<u>Description</u>
2	Approved graduated containers.
2	Pressure gauges (maximum 2 psi increments).
1	Hydraulic force pump approved by the Engineer. Suitable hose and additional equipment as required.

Conduct the tests after the trench has been backfilled. Where any section of pipe is provided with concrete reaction blocking, do not make the pressure tests until at least five days have elapsed after the concrete thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be cut by two days or as permitted by the Engineer.

Conduct pressure tests in the following manner, unless otherwise approved. After the trench has been backfilled or partially backfilled as specified herein, fill the pipe with water, expelling all air during the filling. The minimum test pressure shall be 150 pounds per square inch (psi). For lines working with operating pressures in excess of 100 psi, the minimum test pressure shall be one and one-half times the operating pressure, with the same loss allowances.

**(1) Duration:** The duration of each pressure test shall be 60 minutes, unless otherwise directed by the Engineer.

**(2) Test:** Fill the pipe with water and apply the specified test pressure by pumping, if necessary. Then valve off the pump and hold the pressure in the line for the test period. At the end of the test period, operate the pump until the test pressure is again attained. If the line pressure drops more than five (5) psi during the test, repeat the test (again for 60 minutes each time) until the drop in line pressure is five (5) psi or less, and then measure the leakage amount. The pump suction shall be in a clean barrel or similar device approved prior to filling with clean water, or metered so that the amount of water required to restore the test pressure may be measured accurately.

**(3) Leakage:** Leakage shall be defined as the quantity of water necessary to restore the specified test pressure at the end of the test period. No pipe installation will be accepted if the leakage corresponding to a pressure drop of 5 psi or less is greater than the number of gallons per hour calculated by the following formula:

$$L = \frac{SD(\sqrt{P})}{532,800}$$

In the above formula:  $L$  = Allowable leakage, in gallons per hour for a 1-hour test.

$S$  = Length of pipe to be tested.

$D$  = Nominal diameter of pipe, in inches.

$P$  = Average test pressure during the leakage test, in pounds per square inch.

**(4) Correction of Excessive Leakage:** Should any test of pipe laid exhibit leakage greater than that allowed or a loss in pressure greater than five (5) psi during the pressure test, locate and repair the defective joints, pipe or other leaking water system component(s) until the leakage and pressure loss of a subsequent test are within the specified allowance.

**(5) Isolation of Existing Systems Prior to Testing:** Existing water pipelines shall be protected from contamination during the testing process for new construction.

**01140.52 Disinfecting:** Replace this subsection, except the heading with the following:

**(a) General** - Pipeline intended to carry potable water shall be sterilized before placing in service. Sterilizing procedures shall conform to AWWA C-651 as hereinafter modified or expanded.

**(1) Flushing:** Before sterilizing, flush all foreign matter from the pipeline. Provide hoses, temporary pipes, ditches, etc. as required to dispose of flushing water without damage to adjacent properties. Disposal site and method shall be approved by the City Engineer prior to use. Flushing velocities shall be at least 2.5 feet per second (fps). For large diameter pipe where it is impractical or impossible to flush the pipe at 2.5 fps, clean the pipeline in place from the inside by brushing and sweeping, then flush the line at a lower velocity.

After waterline flushing and prior to sterilization, coordinate with City staff to obtain water samples for total hydrocarbon testing. Testing will be performed using DEQ approved laboratory analytic methods by an approved laboratory selected by the City. If petroleum based products are detected in the samples, further testing may be required to determine type of petroleum products present followed by additional flushing, then followed by further testing. Flushing and testing is repeated until detected contaminant is flushed out.

**(2) Sterilizing Mixture:** Sterilizing mixture shall be chlorine-water solution having a free chlorine residual of 40-50 ppm. The sterilizing mixture shall be prepared by injecting (1) a liquid chlorine mixture, or (2) a calcium hypo chlorite or sodium hypo chlorite and water mixture into the pipeline at a measured rate while fresh water is allowed to flow through the pipeline at a measured rate so that the chlorine-water solution is of the specified strength.

The liquid chlorine gas-water mixture shall be applied by means of an approved solution feeding chlorination device. Dry chlorine gas shall be fed through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of the chlorine or the gas itself must provide means for preventing the backflow of water into the chlorine cylinder.

If the calcium hypo chlorite procedure is used, first mix the dry powder with water to make a thick paste, then thin to approximately a one percent solution (10,000 ppm chlorine). If the sodium hypo chlorite procedure is used, dilute the liquid with water to obtain a one percent solution. The following proportions of hypo chlorite to water will be required.

<u>Product</u>	<u>Quantity</u>	<u>Water</u>
Calcium Hypo chlorite (1) (65-70 percent Cl)	1 lb.	7.5 gal.
Sodium Hypo chlorite (2) (5.25 percent Cl)	1 gal.	4.25 gal.

1. Comparable to commercial products known as HTH, perchloron, and pitchlor.
2. Known as liquid laundry bleach, Clorox, Purex.

**(3) Point of Application:** Inject the chlorine mixture into the pipeline to be treated at the beginning of the line through a corporation stop or suitable tap in the top of the pipeline within three (3) feet of the water source filling the line. Water from the existing system or other 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 40-50 ppm of free available chlorine. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Use check valves if necessary. At no time will dry chlorine be introduced into the pipeline.

**(4) Retention Period:** Retain treated water in the pipeline long enough to destroy all nonspore-forming bacteria. With proper flushing and the specified solution strength, 24 hours is adequate. At the end of the 24-hour period, the sterilizing mixture shall have a strength of at least ten (10) ppm of chlorine throughout the system.

Operate all valves, hydrants, and other appurtenances during sterilization to assure that the sterilizing mixture is dispersed into all parts of the line, including dead ends, new services, and similar areas that otherwise may not receive the treated water.

Do not place the concentrated quantities of commercial sterilizer in the line before it is filled with water.

After chlorination, flush the water from the line and let the line sit for a minimum of 24 hours before calling the City for sampling. The chlorine residual shall be brought down to between 0.2 and 1.0 ppm in the line and shall match the City system in the affected area. Under no circumstance shall pressure testing occur while chlorine solution is in the line.

**(5) Disposal of Sterilizing Water:** Dispose of sterilizing water to an approved discharge point. This can be into a water truck to use for dust control purposes or, into the sanitary sewer system with prior approval from Clean Water Services (CWS). CWS requires 48-hour advance notice. Upon notification by the Contractor to do so, the City will notify CWS and verify CWS approval. Do not allow sterilizing water to flow into a waterway without adequate dilution or other satisfactory method of reducing chlorine to a safe level. Dechlorination procedures are to be approved by the City Project Engineer prior to flushing system.

**(6) Sampling:** Upon notification by the Contractor, the City staff will obtain water samples for a microbiological analysis and deliver the samples to a certified laboratory. Results of the analysis are typically available 2 working days after sample delivery.

**(7) Activation of new water line:** After the sampling is approved, the City staff will activate the new line and make service connections at the meter. City staff shall witness the removal of all chlorination taps and the installation of a brass plug prior to activation.

**(8) Disinfection of Water Main End Connections and Tie-Ins:** Disinfection and pressure testing of potable water piping and appurtenances at end connections which are required to remain in service due to restrictions in allowable shutdown time shall be pressure tested and disinfected as described below:

**a.** Prior to connecting new potable water piping and appurtenances with existing piping and appurtenances, the interior of all new pipe, fittings, valves and appurtenances shall be swabbed or sprayed with a 1% to 5% percent calcium hypochlorite solution.

**b.** Following the disinfection procedures described above, connection of the new piping and appurtenances to the existing water system shall be made. During the system startup, the Engineer and Contractor shall visually inspect all new fittings, piping, valves and appurtenances for evidence of leakage. Any leakage observed during this period shall be promptly repaired by the Contractor, at Contractor's expense as required by the Engineer.

**01140.53 Utility Crossings:** Add this subsection:

Vertical clearance between the new pipe and existing utilities shall be 12 inches minimum unless otherwise noted on the plans or specified.

**Water Lines Crossing Sewer Lines** - Wherever possible, the bottom of the water line shall be 1.5 feet or more above the top of sewer pipe and one full length of the water line pipe shall be centered at the crossing. For clearances less than 1.5 feet or when water line must cross under sanitary sewer piping, the Contractor shall replace the existing sewer pipe with HDPE SDR 17, Class 52 ductile iron, or C900 pressure pipe of equal size for a minimum of 9 feet on both sides of crossing. Concrete encasement of existing sewer pipe is not allowed.

**Water Lines Crossing Gas Lines** - Whenever water lines or water services cross steel gas lines within 6 inches, Contractor shall install a fiberglass sheathing material provided by NW Natural or a half section of PVC pipe between the gas line and the waterline for a distance of 18 inches on each side of the gas line.

In addition, the waterline or water service shall be wrapped and taped in an 8 mil polyethylene encasement for a distance of 20 feet each side of the gas line.

**01140.90 Payment** – Add the following:

**Pay Item**

**Unit of Measurement**

(a) Modifications and connections to existing 16-inch water main on McDonald Street	Lump Sum
(b) Modifications and connections to existing 16-inch water main on Gaarde Street	Lump Sum
(c) Furnish and Install Buried 16-inch and 8-inch Class 52 Ductile Iron Pipe	Linear feet
(d) Furnish and Install Cast or Ductile Iron Fittings	Pound
(e) Testing and Disinfection	Lump Sum

Item (a) includes all work shown and specified as shown on McDonald Street Connection detail for 16-inch diameter DI on sheet W-4B.

Item (b) includes all work shown and specified as shown on Gaarde Street Waterline Connection detail for 16-inch diameter DI on sheet W-4B.

Item (c) includes trench excavation, backfill, compaction, CLSM pavement base, joint restraint system, and all work and materials required to install trench installed piping system.

Item (d) unit of measurement used for payment will be the nominal weights listed in AWWA Standard C110 for the actual Class and type of fitting specified and shown on the plans. Fitting accessories including glands, bolts, and gaskets shall not be included in the fitting weight and shall be considered incidental in the fitting weights for payment.

Item (e) shall include furnishing, installing and removing temporary blowoff piping and chlorine taps including miscellaneous piping, valves, fittings and thrust restraint. The City shall provide off-site laboratory analysis. Payment for any retesting shall be paid by the Contractor.

Add to the last paragraph:

- Corp Stops
- Removal of existing pipe, valves, and fittings
- Connections to existing 8 and 12-inch diameter waterlines
- Abandonment and filling of existing water lines
- Existing water service reconnections

**SECTION 01150 - POTABLE WATER VALVES**

Comply with Section 01150 of the Standard Specifications and the City of Tigard Standards.