

SECTION 01140 - POTABLE WATER PIPE AND FITTINGS

(Follow all instructions. If there are no instructions above a subsection, paragraph, sentence, or bullet, then include them in the project. The specifications may be modified to include project specific specifications, but all additions, deletions, or modifications must be sent to the ODOT Technical Resource and Senior Specifications Engineer for review and approval.)

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

01140.10 Materials - Replace this subsection, except for the subsection number and title, with the following:

Furnish materials meeting the following requirements:

Bolted, Sleeve-Type Couplings for Plain End Pipe.....	02475.60
Commercial Grade Concrete in Thrust Blocks	00440
Detectable Marking Tape and Wire.....	02470.60
Ductile Iron Pipe Fittings.....	02475.20
Ductile Iron Pipe	02470.20
Polyethylene Encasement	02470.50
Polyvinyl Chloride (PVC) Pipe fittings - 4" and larger	02475.40
Polyvinyl Chloride (PVC) Pipe fittings - under 4"	02475.45
Polyvinyl Chloride (PVC) Pipe - 4" and larger	02470.40
Polyvinyl Chloride (PVC) Pipe - under 4"	02470.45
Reinforcement	00530
Restrained Joints.....	02475.50
High Density Polyethylene Pipe	02470.31
High Density Polyethylene Pipe Fittings.....	02475.31

High Density Polyethylene (HDPE) pipe shall meet the requirements of ANSI/AWWA C906, Standard PE Code Designation PE 3408, minimum cell classification PE 334434C (ASTM D 3350). Pipe may also be PE 4710 in accordance with the pending revisions to ANSI/AWWA C906-07. Pipe shall be iron pipe size (IPS) outside diameter or ductile iron pipe size (DIPS) outside diameter. All HDPE pipe and fittings shall be of the dimension ratio (DR) as shown on the plans.

01140.11 Handling Pipe and Fittings - Replace this entire subsection, including subsections .11(a) and .11(b), with the following subsection:

01140.11 Handling Pipe and Fittings - Handle pipe and fittings to prevent damage to or contamination of the pipe, fitting, lining, or coating. Load and unload pipe and fittings using hoists and slings so as to avoid shock or damage, and under no circumstances allow them

to be dropped, skidded, or rolled against other pipe or fittings. If any part of the coating or lining is damaged, repair in a manner satisfactory to the Engineer. Damaged or contaminated pipe and fittings will be rejected. Immediately separate all damaged or contaminated pipe and fittings and remove from the project site.

If pipe requires temporary storage, store on cradles to prevent entry of dirt, other foreign material, or contamination. Keep the pipe or pipe joint free of dirt, other foreign material, or contamination during handling or laying operations. Remove, clean, and relay any pipe or fitting that has been installed with dirt, foreign material, or contamination in it. When pipe laying is not in progress, close the open ends of pipe with watertight plugs or by other approved means to ensure cleanliness.

01140.12 Cutting Pipe - Replace this entire subsection with the following subsection:

01140.12 Cutting Pipe:

(a) General - Whenever possible, use partial lengths of pipe supplied by the manufacturer to provide the proper spacing of valves, tees, or special fittings.

(b) Cutting Operation - Cut pipe with abrasive saws or with special pipe cutters. Square all pipe ends with the longitudinal axis of the pipe. Ream and smooth the interior edge and bevel the exterior edge of the cut ends. Flame cutting of ductile iron pipe will not be allowed.

01140.40(c) Extra Trench Excavation - Delete this subsection.

(Use the following subsection .40(d) when trench work is required.)

01140.40(d) Grade and Alignment Changes - Replace this subsection, except for the subsection number and title, with the following:

Excavate potholes to locate utilities. Allow enough time between excavating potholes and pipe installation to change alignment and grade of the pipeline to avoid conflicts. Obtain approval from the Engineer before using fittings to avoid conflicts.

01140.40(e) Installation in Paved Areas - Delete this subsection.

(Use the following subsection .41(b) when ductile iron pipe is required.)

01140.41(b) Ductile Iron Pipe - Replace this entire subsection with the following subsection:

01140.41(b) Ductile Iron Pipe - Install ductile iron pipe according to AWWA C600 and the manufacturer's recommendations.

(1) Curves - Lay horizontal and vertical long radius curves with standard pipe by deflecting the joints. Use standard fittings and standard pipe lengths, unless otherwise shown. If shorter pipe lengths are required, the maximum allowable pipe lengths will be shown. Do not exceed 80 percent of the manufacturer's recommendations for the amount of deflection at each pipe joint when pipe is laid on a horizontal or vertical curve.

Where field conditions require deflection or curves not shown, the Engineer will determine the methods to be used.

(2) Pipe Laying Procedure - When ductile iron pipe is laid on a curve, join the pipe in a straight alignment and then deflect it to the curved alignment. Widen trenches on curves for this purpose as allowed or directed.

01140.41(d) Steel Pipe - Delete this subsection.

(Use the following subsection .41(e) when PVC pipe is required.)

01140.41(e) Polyvinyl Chloride Pipe - Replace this entire subsection, including subsections .41(e-1) and .41(e-2), with the following subsection:

01140.41(e) Polyvinyl Chloride (PVC) Pipe - Install PVC pipe according to AWWA C605 and the manufacturer's recommendations.

Lay horizontal and vertical curves in pipe, as shown, with standard pipe by deflecting the joints. Use standard fittings and standard pipe lengths unless otherwise shown. If shorter lengths of pipe are required, the maximum allowable pipe lengths will be shown. Do not exceed 80 percent of the manufacturer's recommendations for the amount of deflection at each pipe joint when pipe is laid on a horizontal or vertical curve. Where field conditions require deflection or curves not shown, the Engineer will determine the methods to be used. Do not bend PVC pipe segments.

01140.41(f) Water and Sanitary Sewer Separation - Replace this subsection, except for the subsection number and title, with the following:

Comply with OAR 333-061-0050 governing horizontal and vertical separation between water and sanitary sewer facilities for installation of new water lines and appurtenances. Submit all proposals for variance in writing. The proposal shall include the reason for the variance, type of material and condition of the sewer line, and location of the water and sewer facilities, including horizontal and vertical skin-to-skin clearances. Proposals will be reviewed by the Engineer and approved, approved as noted, or returned for correction. Each variance will be addressed on a case-by-case basis.

Add the following subsection:

01140.41(g) Other Utilities - Maintain a minimum vertical clearance of 12 inches between installed pipe and other utilities. Maintain a minimum horizontal clearance of 24 inches between installed pipe and other utilities. Engineer's approval and additional protection is required for any pipe installation that does not maintain the specified minimum clearances.

01140.42(a) General - Replace the paragraph that begins "Mark pipe not..." with the following paragraph:

For pipe not furnished with a depth mark, mark pipe with a depth mark before joint assembly.

01140.42(b) Steel Pipe under 6 Inches - Delete this subsection.

(Use the following lead-in and subsection .42(c) when HDPE pipe is required.)

Add the following subsection

01140.42(c) HDPE Pipe:

(1) Joints and Fittings - Join pipes and fittings using the thermal butt fusion method according to ASTM D 3261. HDPE fittings shall be of the same class as the HDPE piping.

(2) Connections with Other Pipe Types - Connect HDPE pipe to other pipe types using manufactured fittings, as approved.

(Use the following subsection .43(a) when polyethylene encasement is required.)

01140.43(a) Installation - Replace the sentence that begins "The polyethylene encasement need..." with the following sentence:

The polyethylene encasement is not required to be watertight, but do not expose any part of the pipe, fittings, or coupling to the backfill.

(Use the following subsection .45(a) when the project requires pipe to be laid.)

01140.45(a) Installation - Replace the sentence that begins "Secure to the top of the pipe..." with the following sentence:

Use cable ties to secure the copper wire to the top of the pipe at a maximum spacing of 10 feet.

(Use the following subsection .47 when connection to existing mains is required.)

01140.47 Connection to Existing Mains - Replace this entire subsection with the following subsection:

01140.47 Connection to Existing Mains - Make necessary arrangements with the Engineer a minimum of 7 calendar days before making connections to existing water mains. Assemble all materials, equipment, and labor necessary to properly complete the work before starting.

(a) Notification - If the connection to the existing system involves temporary water system shutoff, provide written notices to the residents affected by the shutoff a minimum of 72 hours before the shutoff. Submit a draft written notification to the Engineer for approval 5 calendar days before providing written notice to the affected residents. The Engineer will advise which property owners are to be notified.

(b) Permission - The work to perform the connection may need to be carried out during times other than normal working hours. Do not operate any valves on the existing system without specific permission of the Engineer.

(c) Connection Assemblies - Excavate potholes to expose existing piping at connection points before constructing the connection. If existing piping is different than

shown, provide measurements of depth and a detailed sketch of existing piping configuration and alignment to the Engineer not less than two weeks before the expected construction.

(d) Uninterrupted Service - Once work is started on a connection, proceed continuously without interruption, and as rapidly as possible until completed. Schedule main shutoffs to ensure that mains do not remain shut off overnight, on Fridays, over weekends, or on holidays.

(e) Cutting Main Lines - Cut existing water mains according to 01140.12. Remove the portions of pipe to provide for the installation of the required fittings at the points of connection. Determine the exact length of the existing water main that is to be removed. Bevel pipe ends to prevent damage to the transition coupling gasket during installation of the coupling. Clean the exterior of the existing pipe end to a sound, smooth finish before installing the coupling.

(Use the following subsection .50(c) when flushing of pipes is required.)

01140.50(c) Disposal of Treated Water - Replace this subsection, except for the subsection number and title, with the following:

Dispose of treated water flushed from mains. To protect aquatic life, de-chlorinate the waste water before disposing of water into any natural drainage channel. Dispose of disinfecting solution to the satisfaction of the Engineer and local authorities. If approved by the Engineer and the sanitary sewer Utility, disposal may be made to an available sanitary sewer, provided the rate of disposal will not overload the sewer.

(Use the following lead-in and subsection .51(e) when installation of HDPE water mains is required.)

Add the following subsection:

01140.51(e) Hydrostatic Testing of High Density Polyethylene Water Mains - Conduct the following hydrostatic tests on all HDPE pipe:

(1) Above-Grade Test - Before placing the pipe but after the pipe is butt fused and ready for installation, conduct an above-grade test. Before beginning the test, fill the pipeline with water, pressurize to the test pressure according to 01140.51(a), and allow to stand without makeup pressure until the pressure reaches equilibrium. Equilibrium will usually occur within 2 to 4 hours.

After equilibrium has been reached, test the pipe according to 01140.51(a). Visually inspect the pipe for leaks during the test. Repair all leaks before installing the pipe in the trench or pulling the pipeline into the borehole. Repair leaks at fusion joints by cutting out the leaking fusion joint, re-fusing the joint, and conducting a new above grade test. Successful completion of the above-grade test requires approval from the Engineer. Do not place the pipe in the trench or pull the pipe into place before successfully completing the above-grade test.

(2) In-Place Test - Conduct an in-place test after the pipe is placed in the trench or pulled into place. Before beginning the test, fill the pipeline with water, pressurize to the

test pressure according to 01140.51(a), and allowed to stand without makeup pressure until the pressure reaches equilibrium. Equilibrium will usually occur within 2 to 4 hours.

01140.52(b-1) Gaseous Chlorine - Delete this subsection.

(Use the following subsection .52(g) when connection to existing water mains is required.)

01140.52(g) Chlorinating Connections to Existing Water Mains - Replace this subsection, except for the subsection number and title, with the following:

Follow the chlorinating procedure specified in AWWA Standard C651. Liberally treat the exterior of the existing main at the connection point with hypochlorites. Swab or spray the interior of the pipe and all closure fittings with a 1 percent hypochlorite solution. Disinfect the 5 feet of existing main adjacent to the connection point with a 100 ppm chlorine solution and then thoroughly flush the line.

(Use the following lead-in and subsection .60 when trench work is required.)

Add the following subsection:

01140.60 Surface Restoration - Restore trench surfaces according to Section 00495.

01140.80 Measurement - Replace this entire subsection with the following subsection:

01140.80 Measurement - The quantities of potable water pipe and fittings will be determined as follows:

(a) Pipe, Fittings and Couplings - The quantities of pipe of the various kinds, types, sizes and backfill classes will be measured on the length basis and will be horizontal measurement along the top of the finished trench, with no deduction for fittings, valves, and couplings.

(Use the following paragraph when PVC pipe fittings 4 inches or greater are required.)

For PVC fittings 4 inches or greater, in addition to measurement of the pipe, an allowance of 12 pipe diameters will be made for each factory-fabricated bend, sleeve, reducer or coupling, and an allowance of 18 pipe diameters of the larger diameter pipe will be made for each factory-fabricated tee or cross. The allowance will be added to the quantity for pipe of the same diameter.

(Use the following paragraph when ductile iron pipe fittings are required.)

Ductile iron pipe fittings will be measured on the unit basis.

(b) Extra Trench Excavation - The quantities of removal and backfill of extra trench excavation will be measured on the volume basis for each backfill class. The backfill classes are defined in Section 00405. When the pipeline grade is lowered in excess of 12 inches below the grade shown, or when pipeline horizontal alignment is changed by more than 12 inches after the original trench has been excavated, all additional

excavation and backfill, outside the limits of the original trench, that is required to construct the change will be classified as extra trench excavation. The depth will be the actual depth removed for the changed line or grade as directed. The width will be the actual width removed for the changed line or grade, but in no case will the measured width exceed the allowable widths specified in 00405.41(c).

(c) Blowoff Assemblies - The quantities of blowoff assemblies will be measured on the unit basis.

(d) Connections to Existing Mains - The quantities of connections to existing mains will be measured on the unit basis.

Trench resurfacing will be measured according to 00495.80.

Installation under pavement by tunneling, jacking, or boring methods will be measured according to 00406.80.

01140.90 Payment -

(Use the following pay item language when adding pay items for ductile iron pipe.)

[Begin pay item language.]

(Delete pay items from the list that do not apply, but do not change the alpha characters next to the pay items. Delete the "(s)" or parentheses from the word "item(s)" as appropriate.)

Add the following pay item(s) to the pay item list.

- (f) _____ Inch Ductile Iron Pipe with Class _____ Backfill Foot
- (g) _____ Inch Ductile Iron Pipe with Restrained
Joints and Class ____ Backfill Foot
- (h) Ductile Iron Pipe Tees, _____ Inch Each
- (i) Ductile Iron Pipe Wyes, _____ Inch Each
- (j) Ductile Iron Pipe Slip Joints, _____ Inch Each
- (k) Ductile Iron Pipe Cross, _____ Inch Each
- (l) Ductile Iron Pipe Bend, _____ Inch Each
- (m) Ductile Iron Pipe Coupling, _____ Inch Each
- (n) Ductile Iron Pipe Reducer, _____ Inch Each

(Delete the "(s)" or parentheses from the word "paragraph(s)" as appropriate.)

Add the following paragraph(s) after the paragraph that begins "In item (e)...":

(Use the following paragraph if pay items (f) or (g) are included in the pay item list. Delete pay item letters that are not included in the list above. Delete the parentheses or "(s)" from the word "item(s)" and the word "and" as necessary.)

In item(s) (f) and (g), the nominal diameter of pipe will be inserted in the first blank. The class of backfill will be inserted in the second blank.

(Use the following paragraph if any of pay items (h) through (n) are included in the pay item list. Delete pay item letters that are not included in the list above. Delete the parentheses or "(s)" from the word "item(s)" and the word "and" as necessary.)

In item(s) (h), (i), (j), (k), (l), (m), and (n), the nominal diameter of the fittings or couplings will be inserted in the blank.

[End pay item language.]

Delete the paragraph that begins "Valves will be paid..."

In the paragraph that begins "No separate or additional payment...", add the following bullets to the end of the bullet list:

- PVC fitting under 4 inch
- HDPE fittings