



Part 1 General

1.1 DESCRIPTION OF WORK

- .1 The work described herein shall consist of the construction of water service connections including the supply and installation of saddles, clamps, main (corporation) stops, couplers, curb stops complete with wood base and box, service connection pipe, and wood markers. Wetted surfaces of the water service connection shall be lead free.

1.2 CLASSIFICATION OF WORK

- .1 Water service connections and pipe shall be classified on the basis of the nominal inside diameter of the pipe and fittings (saddle, clamp, main stop, curb stop, couplers), and on the basis of whether the pipe and connection is insulated or not (if not specified, they shall be uninsulated).

1.3 STANDARDS

The following organizations publish Standards which have been referred to in this Section:

- .1 CSA International
178 Rexdale Boulevard
Etobicoke, ON M9W 1R3
- .2 ASTM – American Society for Testing and Material
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959 USA
- .3 CGSB – Canadian Government of Standards Board
Lac Du Portage 111, 6B
1 Laurier Street
Gatineau, QC K1A 1G6
- .4 AWWA – American Water Works Association
6666 West Quincy Avenue,
Denver, Colorado 80235 U.S.A

The Standards referred to shall be the most recent edition.

1.4 REFERENCED STANDARD DETAILS

- .1 SD-04 Service Connection Detail (Copper)

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- .2 SD-05 Service Connection Detail (HDPE)
- .3 SD-06 Service Connection Meter Detail

1.5 INSPECTION

- .1 Inspection of the work described in this Section shall be performed by the Engineer.

Part 2 Products

2.1 PIPE

- .1 Unless otherwise specified in Section 01 00 10, Special Provisions, the water service connection pipe shall be Type K (soft) copper, HDPE or Pex.
 - .1 COPPER shall be Type K (soft) copper conforming to the current AWWA Standard C800 Appendix of Collected Standards for Service Line Materials.
 - .2 HIGH DENSITY POLYETHYLENE (HDPE) shall be high density pipe PE4710 resin and in accordance with CSA B137.1 or NSF 61 with a minimum pressure rating of 700 kPa (100 psi) and DR17. Pipe shall be marked in accordance with the applicable manufacturing standard identified (ASTM 3035 or ASTM F714) or CSA International designation standard and polyethylene pipe certification logo for PE pipe. The Contractor shall supply all the necessary fittings, adaptors, compression connectors and stainless steel inserts when connecting to the service saddle or to a curb stop. High density polyethylene water service pipe shall be joined utilizing the thermal butt fusion or socket fusion method where applicable. With Engineer's approval HDPE pipe may be joined using installation-ready couplings consisting of two ductile housing segments designed for full installation at pad-to-pad contact on plain end HDPE pipe. Larger size pipe may be grooved in accordance with manufacturer standards with grooved joint connection.
 - .3 PEX shall be CTS (copper tubing sized) SDR 9 cross-linked polyethylene tubing suitable for potable water and third party certified and listed to AWWA C904, ASTM F876 / F877 / F 2023, SCA B137.5, NSF 14 & 51 and PPI TR-4.

2.2 SERVICE SADDLES

- .1 Water main or water pipeline service saddles shall consist of all stainless steel construction wide band type as approved by the Engineer. The saddle shall be

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complete with a rubber compression gasket. The saddle and the inlet of the main corporation stop when installed on a watermain shall have standard corporation threaded inlet connections. Water service saddles installed on water pipelines shall have national pipe thread threaded inlets.

- .2 The corporation stop (main stop for watermains), the couplings, and curb stop shall be lead free waterworks bronze or brass, suitable for in-ground bury application. The corporation (main) stop and all couplings and curb stop connections for water mains shall be compression type or copper to copper flare type.

2.3 CURB STOPS

- .1 The Contractor shall supply and install lead free curb stops at the locations shown on the plans or at the locations directed by the Engineer.
- .2 The curb stop shall be non-draining unless specified otherwise in Section 01 00 10 Special Provisions. The curb stop box shall be cast iron and shall be adjustable for a two to three metre cover. The curb stop box lid shall be cast iron tapped to receive a 25 mm brass plug. The plug is to have an Acme thread and a pentagon top 22 mm flat to point. The curb stop shall have a 16 mm diameter all stainless steel Type 304 stem or stationary rod. The rod or stem shall be 1.8 to 2.1 m in length. The upper end shall be forged to a 13 mm x 19 mm section to fit an operating key and shaped to position the rod in a central position in the box. The top forged section shall be parallel to the bottom yoke to provide a positive indication of the position of the curb stop ("off" or "on"). The bottom of the rod shall be provided with a yoke to fit all curb stops from 19 mm to 50 mm. The yoke shall be drilled to accept a 5 mm diameter brass cotter pin located centrally on the yoke and no more than 10 mm from the centre line of the hole to the extremity of the yoke.
- .3 All curb stop boxes shall be installed vertical (plumb) with the top of the curb stop box level with the existing ground.

2.4 INSULATION

- .1 Pre-Insulated Pipe and Fittings: Insulation of pipe and fittings shall consist of closed cell rigid urethane foam, having a "K" (thermal conductivity) factor of 0.032 kJ/hr/m²/°C/mm, bonded by adhesive water repellent rubber sealant to a high density polyethylene outer jacket. Insulation collars with heat shrink sleeves shall be used at joints. Minimum insulation thickness shall be 50 mm unless otherwise specified in Section 01 00 10, Special Provisions.
- .2 Sheet Insulation: In areas of shallow trench it may be necessary to provide insulation over the top and sides of the pipe. The required insulation shall

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conform to current CGSB-51-GP-20M or CAN/ULC S701 type 4 rigid polystyrene foam HI-40 (blue in colour) as manufactured by DOW chemical or approved equal with a compression strength of 275 kPa. A typical pipe insulation detail is shown in SD-18 in the Standard Construction Drawing Appendix. In the case of two pipes insulated in a common trench the insulation shall envelope both pipes.

Part 3 Execution

3.1 GRADE AND ALIGNMENT

- .1 The water service pipe shall be installed at the location staked out on the ground by the Engineer, and in accordance with SD-04 and SD-05 Service Connection Details in the Standard Construction Drawing Appendix, or as shown on the Plans.

3.2 EXCAVATION BEDDING AND BACKFILL

- .1 This portion of the work shall be undertaken in accordance, with Section 02 21 80, Pipeline Excavation, Bedding and Backfill.

3.3 WATERMAIN OR PIPELINE SERVICE CONNECTION

- .1 **Wet Tapping PVC and Polyethylene Pipe:** The water pipe shall be completely exposed by careful excavation in the location at which the water service connection is to be installed. The pipe shall be cleaned around its entire circumference in the zone within 250 mm on either side of the location at which the saddle is to be installed. The service saddle shall be placed on the pipe and shall be secured to ensure a tight fit but shall not be so tight that pipe deformation is caused. The main stop threads shall be wrapped with Teflon tape and shall be threaded into the saddle prior to wet tapping the pipe. A wet tapping tool, compatible with the type of pipe and approved by the Engineer, shall be used to drill and tap a hole (through the saddle and corporation stop) into the wall of the watermain or pipeline. The tapping tool complete with pipe wall coupon shall be removed, and the water service line pipe shall be connected to the main stop. The appropriate wedge shall be used to flare the copper pipe for making copper-to-copper connections. Compression fittings may be used for copper and High Density Polyethylene connections. Note - A service saddle is not required when wet tapping PVC AWWA C900 pipe unless required by the Engineer (for 25 mm service or smaller services, but larger services will require a saddle).
- .2 **Dry Tapping PVC and Polyethylene Pipe:** The water pipe shall be completely exposed by careful excavation in the location at which the water service

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connection is to be installed. The pipe shall be cleaned around its entire circumference in the zone within 250 mm on either side of the location at which the saddle is to be installed. The service saddle shall be placed on the pipe and shall be secured to ensure a tight fit but shall not be so tight that pipe deformation is caused. When a main stop is required by the Engineer, the threads shall be wrapped with Teflon tape and shall be threaded into the saddle. A tapping tool, compatible with the type of pipe and approved by the Engineer shall be used to drill and tap a hole (through the saddle and main stop) into the wall of the watermain or pipeline. The tapping tool complete with pipe wall coupon shall be removed, and the water service line pipe shall be connected to the main stop. When a corporation stop is not specified in the contract (i.e. in the case of rural pipeline service connections then the hole in the wall of the pipe shall be drilled through the head of the saddle. The appropriate wedge shall be used to flare the copper pipe for making copper-to-copper connections. Compression fittings may be used for copper and High Density Polyethylene connections.

- .3 The completed connection (watermain or pipeline to the curb stop) shall be flushed and pressure tested in conjunction with pressure testing for watermain or pipeline at a minimum 700 kPa for water pipeline or 1000 kPa (for watermain using copper or polyethylene service pipe) for two hours. If any leakage is observed, the cause shall be located and corrected and the procedure repeated until the connection passes the test.

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