



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.

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
 Toronto, 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, 6B1
 11 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 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 01001, Special Provisions, the water service connection pipe shall be (either) Type K (soft) copper (or HDPE).
 - .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 PE 3608 or PE4710 resin and in accordance with CSA B137.1 or NSF 61 with a minimum pressure rating of 700 kPa (100 psi) and DR17. 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. 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.

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 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 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 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 01001 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 WOOD

- .1 The wood base supporting the curb stop shall be 38 mm x 191 x 300 spruce lumber, all surfaces of which shall be pressure treated with wood preservative.

2.5 DRAIN

- .1 Curb stop drain sumps where required shall be filled with a minimum of 0.06 cubic metres of crushed rock or coarse gravel.

2.6 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 $0.032 \text{ kJ/hr/m}^2/\text{°C/mm}$, 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 01001, 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 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 on pipe insulation detail of Section 027060, Pressure Pipelines. 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 the Typical Detail of a Water Service Connection, Pages 7 and 8 of this Section, 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 022180, 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 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.

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.

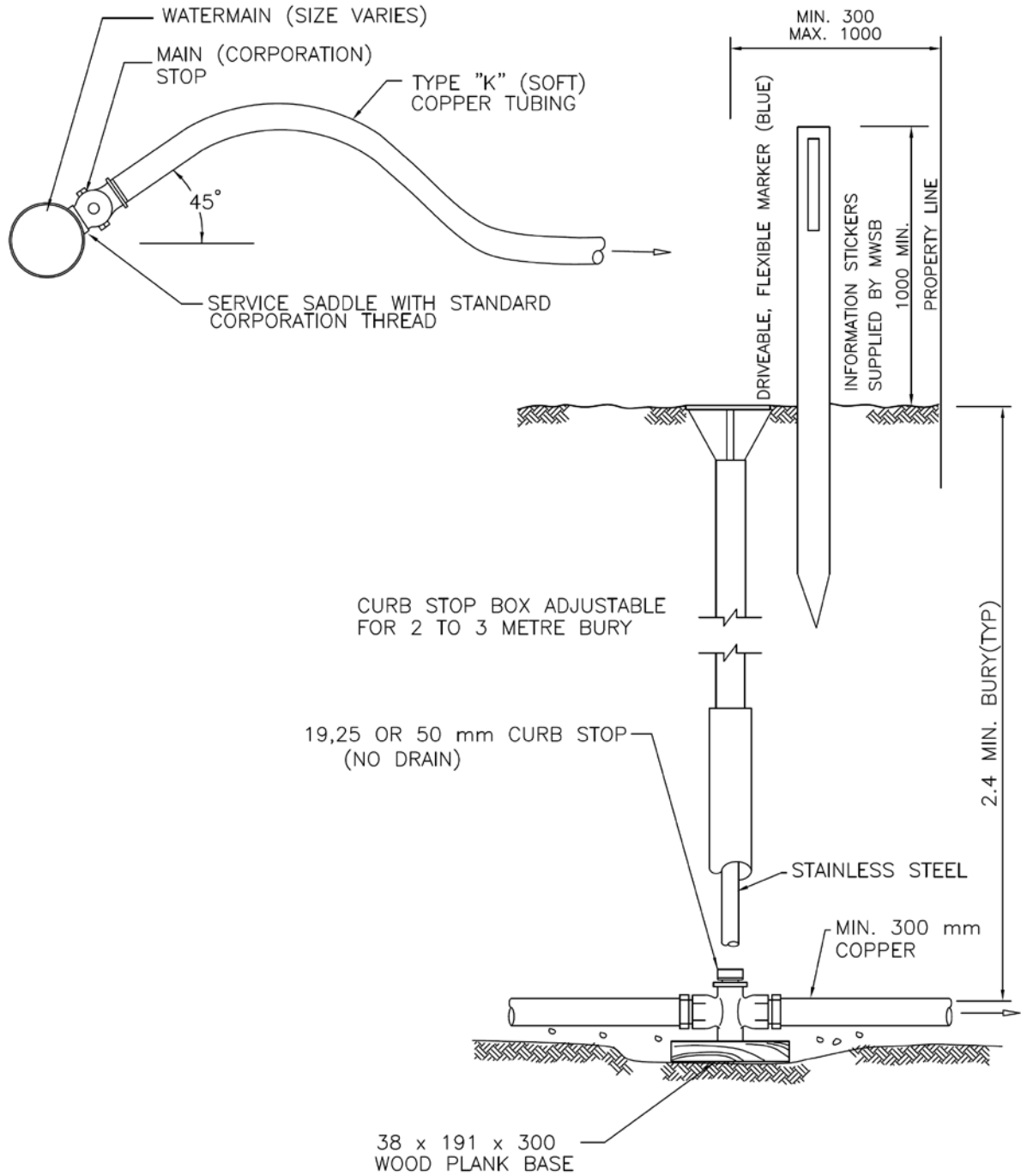
3.4 EXEMPTION

- .1 Certain water service connections may be made by tapping directly into certain water mains without a service saddle assembly. The following is a list of cases where this is permissible.

TABLE 1

MAXIMUM PERMISSIBLE NOMINAL I.D. OF SERVICE LINE FOR DIRECT TAPPING					
Nom. I.D. of Water Main	PVC AWWA C900		DUCTILE IRON		
	CLASS 150	CLASS 200	CLASS 50	CLASS 51	CLASS 52
100 mm	19 mm	19 mm	0	13 mm	19 mm
150 mm	19 mm	25 mm	13 mm	13 mm	19 mm
200 mm	25 mm	25 mm	19 mm	19 mm	15mm
250 mm	25 mm	25 mm	19 mm	25 mm	38 mm
300 mm	25 mm	25 mm	25 mm	32 mm	38 mm
350 mm	25 mm	25 mm	38 mm	50 mm	50 mm
400 mm	25 mm	25 mm	50 mm	50 mm	50 mm

The corporation (main) stop shall be threaded into the pipe wall no less than 3 full threads.



STANDARD CONSTRUCTION SPECIFICATIONS
THE MANITOBA WATER SERVICES BOARD
 PROVINCE OF MANITOBA

TYPICAL DETAIL
WATER SERVICE CONNECTION
(COPPER)



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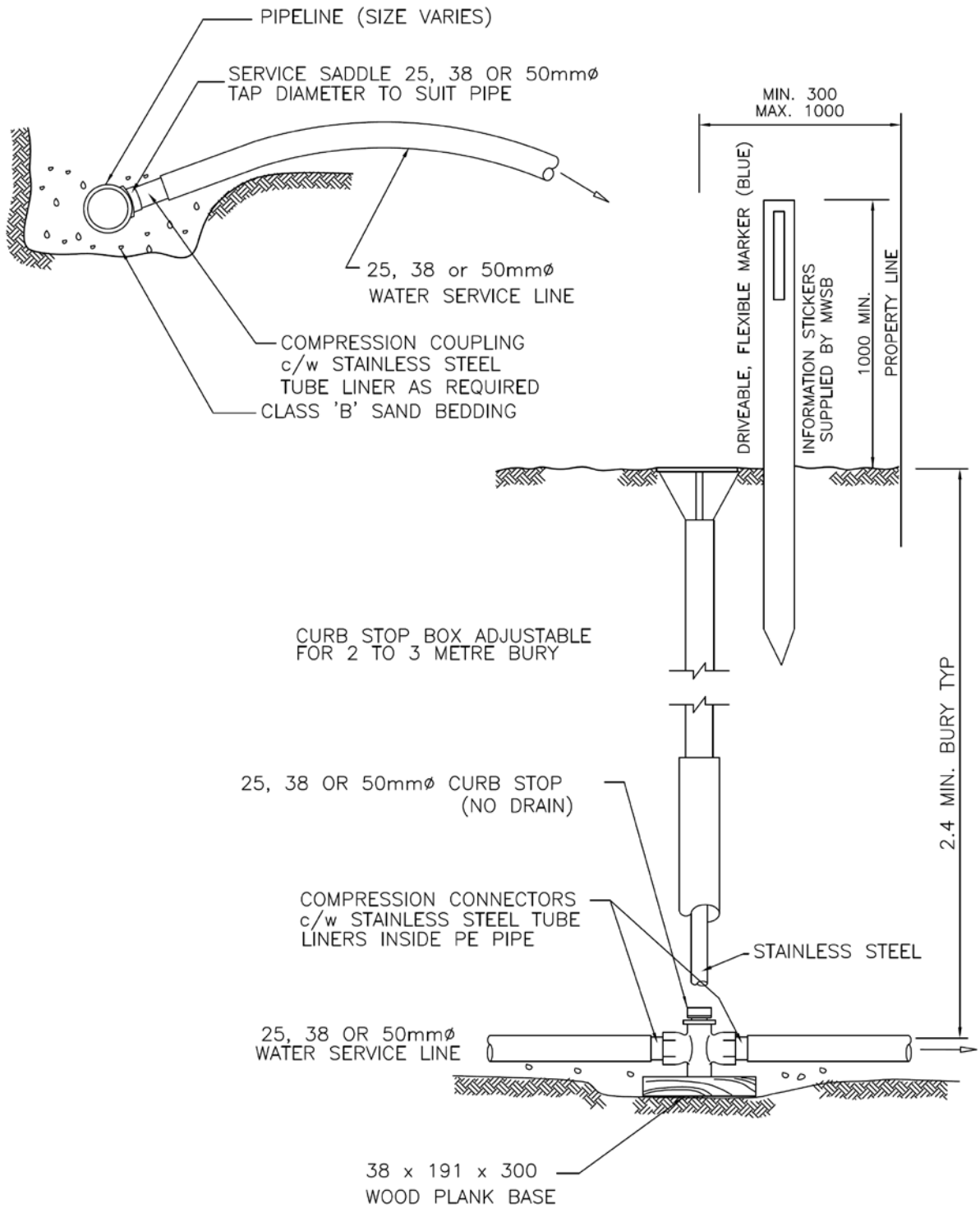
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STANDARD CONSTRUCTION SPECIFICATIONS
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TYPICAL
HIGH DENSITY POLYETHELENE
SERVICE CONNECTION



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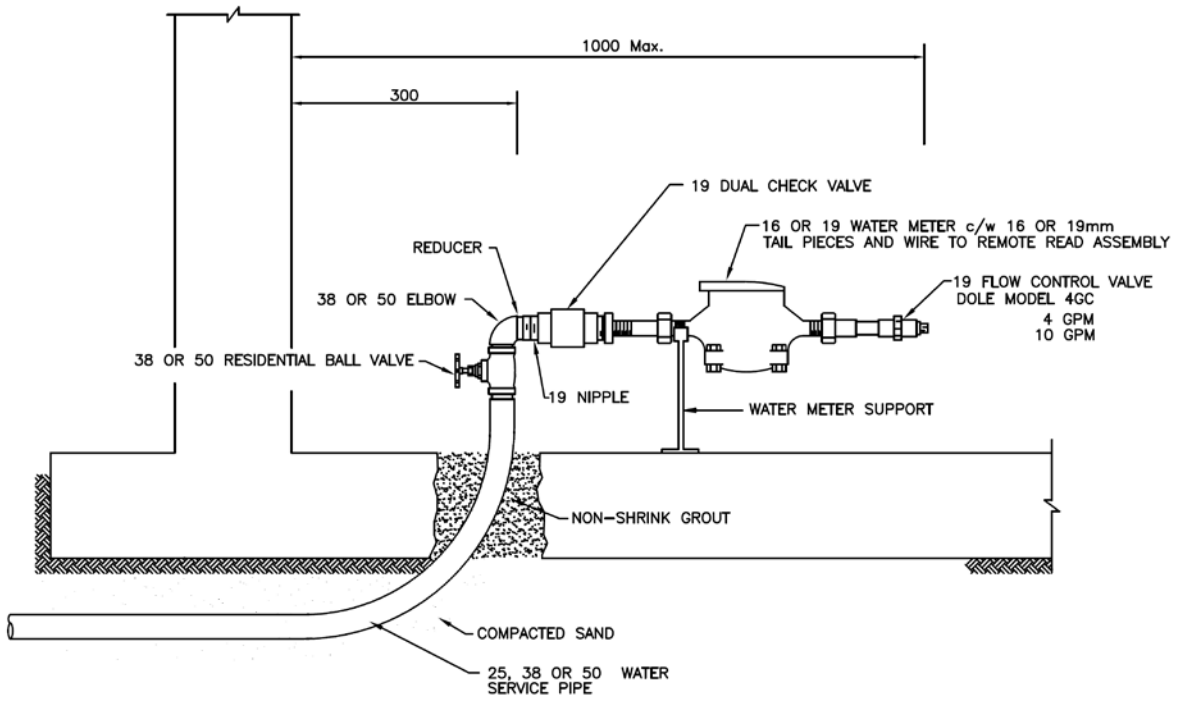
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DETAIL: HOUSE SERVICE CONNECTION
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STANDARD CONSTRUCTION SPECIFICATIONS THE MANITOBA WATER SERVICES BOARD PROVINCE OF MANITOBA				TYPICAL RURAL RESIDENTIAL SERVICE CONNECTION		
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