

CITY OF TORONTO

TORONTO WATER

**MATERIAL/MANUFACTURER SPECIFICATIONS FOR
DISTRIBUTION
WATER MAINS AND APPURTENANCES**

ORIGINATED: June, 2003

REVISED: July, 2004

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MATERIAL SPECIFICATIONS

T.S. 1 GENERAL

Materials incorporated in the finished work and used during construction shall be in accordance with Standards, or the latest revisions thereof, specified in this Section. Alternate materials will not be permitted without written consent of the Commissioner of Works & Emergency Services.

Abbreviations

The following abbreviations will be used through these specifications:

CSA	Canadian Standards Association
ASTM	American Society for Testing Materials
MTO	Ministry of Transportation of Ontario
MOEE	Ministry of the Environment and Energy
AWWA	American Water Works Association
OPSU	Ontario Provincial Standards Committee
ULC	Underwriters Laboratories of Canada
UNI-B	Uni-Bell PVC Pipe Association

Approved suppliers are to meet AWWA/CSA specifications where applicable.

T.S. 2 PIPE

- T.S. 2.1 Ductile iron pipe shall be thickness Class 52 in sizes up to and including 300 mm diameter, manufactured to AWWA/ANSI specification C151/A21.51.96 and supplied with standard thickness cement lining to AWWA/ANSI specification C104/A21.4-95. Ductile iron pipe shall be supplied with push-on joints complete with bonding straps or lock wedges for maintaining electrical continuity. Ductile Iron Class 53 pipe to the above specifications must be used in 400 mm and 600 mm diameter sizes.
- T.S. 2.2 All polyvinyl chloride (PVC) pipe, ranging in size from 100 mm through 300 mm in diameter, shall be Class 150, SDR 18 and manufactured in accordance to AWWA specification C900-97 and shall have the cast iron outside diameter dimensions. All PVC pipe, ranging in size from 300 mm through 600 mm in diameter, shall be Class 150, SDR 18 and manufactured in accordance to AWWA C905-88 standard and shall have the cast iron outside diameter dimensions.

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T.S. 3 SPECIAL FITTINGS

- T.S. 3.1 Ductile iron compact fittings according to AWWA/ANSI specification C153/A21.53-00. Fittings shall be supplied with mechanical joint or push-on joint type ends conforming with AWWA/ANSI specification C111/A21.11-00. All special fittings shall be cement lined in accordance with AWWA/ANSI specification C104/A21-95.
- T.S. 3.2 PVC fittings shall conform to AWWA specification C907-91. PVC fittings to be used with PVC pipe only, having cast iron outside diameter dimensions, DR18, Class 150. PVC fittings shall be supplied with push-on rubber gasketed joints in nominal sizes 100 mm, 150 mm and 200 mm.

T.S. 4 TRANSITION COUPLINGS (100 MM AND OVER)

Transition couplings shall conform to AWWA specification C219-01.

All couplings must be coated with fusion bonded epoxy in accordance with AWWA specification C213-96 and supplied with stainless steel nuts, bolts and non-corrosive washers. Transition couplings shall be supplied with rubber gaskets conforming to AWWA/ANSI specification C111/A21.11-00.

T.S. 5 FLANGED TRANSITION COUPLING ADAPTERS (100 MM AND OVER)

Flanged transition coupling adapters shall conform to AWWA specification C219-01.

All flanged coupling adapters must be coated with fusion bonded epoxy in accordance with AWWA specification C213-96 and supplied with stainless steel nuts, bolts and non-corrosive washers. Flanged coupling adapters shall be supplied with rubber gaskets conforming to AWWA/ANSI specification C111/A21.11-00.

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T.S. 6 RESTRAINED JOINT DEVICES

T.S. 6.1 Joint restraints used on PVC pressure pipe, which conforms to AWWA specification C900-97 or C905-97 must adhere to UNI-B-13-92 (Recommended Performance Specifications for Joint Restraint Devices for Use with Polyvinyl Chloride (PVC) Pipe) and ULC standard testing procedures. Approved manufacturers are:

Uni-Flange Series 1300-C, 1350-C, 1390-C
 Ebba Iron Series 1600, 2000PV, 2500
 Romac Grip Ring

T.S. 6.2 Joint restraints used on ductile iron Class 52 pressure pipe, which conforms to AWWA/ANSI specification C151/A21.51-96, must adhere to ULC standard testing procedures. Approved manufacturers are:

Uni-Flange Series 1300, 1390, 1400
 Ebba Iron MegaLug Series 1100, 1700
 Romac Grip Ring

T.S. 6.3 Adapter flanges used on PVC pressure pipe, which conforms to AWWA specification C900-97 or C905-97 must adhere to UNI-B-13-92 and ULC standard testing procedures. Approved manufacturers are:

Uni-flange Series 900-C
 Ebba Iron Series 2100

T.S. 6.4 Adapter flanges used on ductile iron Class 52 pressure pipe, which conforms to AWWA/ANSI specification C151/A21.51-96 must adhere to ULC standard testing procedures. Approved manufacturers are:

Uni-Flange Series 800, 1400
 Ebba Iron Series 1000, 2100
 Robar 7404/7506
 Romac FCA 501
 Smith Blair 912

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T.S. 7 GATE VALVES 100 MM TO 400 MM

- T.S. 7.1 All valves shall be manufactured in conformance with AWWA specification C509-01. Approved manufacturers for valves in sizes 100 mm to 400 mm inclusive, shall be:

Mueller Resilient Seat Gate Valve A2370
Clow Resilient Seat Gate Valve
AVK Resilient Seat Gate Valve
Clow McAvity II – Figure 20075

All Valves are to have inside screw non-rising spindle, complete with mechanical or push-on joint ends. Valves specified to open right must be supplied with “Toronto Operating Nut” and valves specified to open left must be supplied with 50 mm square operating nut.

All Valves must be coated with fusion bonded epoxy in accordance with AWWA specification C550-90. All unprotected nuts and bolts used in the bonnet and valve stem assembly shall be made of stainless steel. All 100 mm diameter valves must be supplied with a stainless steel stem.

- T.S. 7.2 Valve tie downs to be pre-fabricated as manufactured to City of Toronto specifications, as approved by the Engineer.

Valve tie downs to be galvanized and supplied with stainless steel nuts and bolts.

T.S. 8 TAPPING SLEEVES & VALVES FOR DUCTILE IRON CAST IRON, PVC & AC

- T.S. 8.1 All valves to be manufactured in conformance with AWWA specification C509-01. All valves are to have inside screw non-rising spindle, 50 mm square operating nut, complete with mechanical joint ends. Direction open to be specified by Engineer. All valves must be coated with fusion bonded epoxy in accordance with AWWA specification C550-90. All unprotected nuts and bolts, used in the bonnet and valve stem assembly shall be made of stainless steel. All 100 mm diameter valves must be supplied with stainless steel stem.

Approved manufacturers for tapping valves shall be:

Mueller Resilient Seat Gate Valve – T2360
Clow Resilient Seat Gate Valve
AVK Resilient Seat Gate Valve
Clow McAvity II – 20695

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T.S. 8.2 Tapping sleeves for ductile iron, cast iron, PVC and asbestos cement pipe shall be:

Robar 6606
Ford All Stainless Steel (FAST)
Romac SST 304
Mueller H615

All Tapping Sleeves shall be stainless steel and supplied with stainless steel nuts and bolts and non corrosive washers. Size off size tapping sleeves must provide a full seal around the outside circumference of the pipe. Size off size tapping sleeves must have a longer body as specified by the Engineer.

T.S. 9 AIR VALVES

Air valves are to be 25 mm and shall be:

Valmatic 15 A.3

Note: Mueller A206 main stop must be used.

All air valves must be coated with fusion bonded epoxy in accordance with AWWA specification C550-90 on both interior and exterior surfaces and supplied with a ring check valve T480Y – 13 mm pressure tested to 250 psi.

T.S. 10 VALVE BOXES

Valve boxes shall be 100 mm diameter, sliding type with guide plate.

T.S. 11 REPAIR CLAMPS

Repair clamps shall be:

Cambridge Brass Series #425 Teck-Clamp
Clow Concord D-76R All Stainless
Mueller Full-Seal Series 520
Smith Blair 261/256 Full Circle
Robar Style 5636 – Style 1
Romac SS1
Ford FS1 Style
EZ – Max 4000

All repair clamps to be all stainless steel and be supplied with stainless steel nuts with passified bolts. Body length to suit repair as per manufacturers installation instructions.

All repair clamps will provide a full rubber seal around entire outside diameter of the pipe to be repaired.

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T.S. 12 SERVICE SADDLES

All service saddles shall be made of a stainless steel band fastened with a minimum double bolt mechanism. The saddles shall be supplied with stainless steel nuts, bolts and non-corrosive washers.

For cast iron, ductile iron and asbestos cement pipe, service saddles are only necessary for 32 mm, 40 mm and 50 mm diameter main stops (all tapped AWWA threads).

On PVC pipe, service saddles must be used for 20 mm, 25 mm, 32 mm, 40 mm and 50 mm diameter main stops (all tapped AWWA threads).

Approved manufacturers are:

Romac 306
Smith Blair 372
Mueller Servi-Seal 521 to 529 Series
Ford FS 303
Cambridge Brass Series, Teck Series 403
Robar 2616DB
Robar 2706

**T.S. 13 MATERIAL SPECIFICATIONS
FOR 20 MM, 25 MM, 32 MM, 40 MM & 50 MM WATER SERVICES**

T.S. 13.1 Copper pipe shall be ASTM B88 Type "K" soft copper.

T.S. 13.2 Plastic Water Services - Reserved for future

T.S. 13.3 All main stops shall have a compression joint and approved manufacturers are:

Cambridge Brass Series 102
A.Y. McDonald 4701T
Ford F-1000 & F-600
Mueller H15008

T.S. 13.4 All curb stops shall have a compression joint and approved manufacturers are:

Cambridge Brass Century Ball Valve
Ford Ball Valve B-44 Series
Mueller H15209
A. Y. McDonald 6100 T Ball Valve

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T.S. 13.5 All couplings shall have a compression joint and approved manufacturers are:

Cambridge Brass Series 118
Ford C-44
Mueller H15403
A.Y. McDonald 4758T

T.S. 13.6 Service boxes shall be made of cast iron and shall suit the respective curb stop. The boxes shall be adjustable from 1800 mm to 2100 bury.

The rods shall be 1125 mm long, made of passivated #304 stainless steel with M5 x 70 mm brass cotter pins.

The plug must be brass and screw type.

Where further extension is required for the box because of extra depth, the extension and the coupling must be of threaded type. If the final grade is more than 1000 mm above the top of the rod, then the rod must be replaced with one which is made of continuous passivated #304 stainless steel.

Box top to be stamped "water".

T.S. 13.7 Self draining Stop & Drain approved manufacturers are:

Emco Series – 15790
Mueller – H15219

T.S. 14 HYDRANTS

Hydrants shall be:

Canada Valve – Century
Clow-McAvity Brigadier M67
AVK – Model 2780
Mueller Modern Centurion

All hydrants are to have two fire nozzles at 180 degrees, 150 mm end connection, 1800 mm minimum depth of bury, with threads and operating nut supplied to Province of Ontario Standard, open counter clockwise, have mechanical joint end, bronze to bronze seat casing and one 100 mm Storz coupling nozzle at 90 degrees to the two fire nozzles. The storz coupling shall comply with ULC S543 and must be tested and labelled by ULC.

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Hydrant extensions required to adjust the length of the hydrant barrel are to be obtained from the hydrant manufacturer or approved supplier.

Hydrant anti-tamper devices shall be manufactured according to City of Toronto Specifications, as approved by the Engineer.