

SECTION 67

SERVICE CONNECTION SYSTEM

67.1 GENERAL

Building service connections for water and sewer shall be installed in accordance with these Specifications and/or approved Detailed Engineering Drawings.

67.2 MATERIALS

67.2.1 COPPER and COMPOSITE SERVICE PIPE

No	Manufacturer	Model/Type	Size (mm) ^a	Remarks
1	CERO	K	20 to 50	Third Party Certified to ASTM B88 and CSA HC7.6-1978
2	Halstead	K	20 to 50	Third Party Certified to ASTM B88 and CSA HC7.6-1978
3	IPEX	Blue Kitec	20, 25	CSA – B 137.10
4	Wolverine	K	20 to 50	Third Party Certified to ASTM B88 and CSA HC7.6-1978
5	Rheau	Munipex	20 to 75	Third Party ASTM F876, ASTM F877 and AWWA C904

a. Approvals are based on nominal diameter. Servicing Standards are based on internal diameter.

67.2.2 MAIN STOP (Corporation Stop)

Conforming to: AWWA C800 Mueller model H15008 (or equivalent) with compression type connections.

67.2.3 WATER SERVICE SADDLES

Robar type 2706 (bronze) or equivalent Double stainless steel straps.

67.2.4 CURB STOP (Curb Cock or CC)

Conforming to: AWWA C800 Mueller model H-15217 (or equivalent) with compression type connections.

67.2.5 SERVICE BOX

Service boxes shall be extension type for 2.1m to 2.7m bury or 2.4m to 3.0m bury, Trojan or approved equal.

The top box shall be 32mm, schedule 40 standard galvanized steel pipe complete with cap, 32mm brass pentagon head plug and 10mm set screw.

The casing shall be 25mm, schedule 40 standard galvanized steel pipe.

Bottom box shall be cast or ductile iron complete with a 10mm diameter stainless steel set screw. Casting shall have the manufacturer's name or identification marks distinctly cast upon them. The interior and exterior of the bottom box shall be epoxy coated in accordance with AWWA C 673. All coated elements shall carry a label identifying the name of the coating applicator.

The operating rod shall be a 12.7mm stainless steel rod for 20mm and 25mm curb stops, for 40mm and 50mm curb stops the operating rod shall be a 16.0mm stainless steel rod, AIST type 304, attached to manganese bronze clevis, SAE 34, with a 3.5mm brass or stainless steel rivet. The manufacturer shall supply and insert the brass cotter pin into the clevis and apply sufficient bending to prevent the cotter pin from falling out of the clevis.

67.2.6 SEWER SERVICE PIPE

Poly Vinyl Chloride (PVC) Type PSM, 100 mm dia. Minimum
Conforming to CSA B182.1 M1983
Standard Dimension Ratio 28
Bell and Spigot type joints.

67.2.7 SEWER SERVICE FITTINGS

Tee or wye fittings connecting sewer services to PVC sewer mains shall conform to:
CSA B182.2 M1983 Poly Vinyl Chloride (PVC) Type PSM
Standard Dimension Ratio 28
Bell and spigot type joints

67.2.8 INSULATED PIPE AND FITTINGS

Insulation for pipe and fittings shall be foam insulation a minimum of 50 mm in thickness. The insulation shall be Urecon insulated products or their equivalent. Kits to field insulate the fittings may be used as long as manufacturer's specifications are adhered to at all times.

As an alternative the Contractor may construct a Frost Box to the dimensions and materials shown on the Typical Detail Drawing 61-05, "Pipe Insulation Detail" in Section 61, Sanitary Sewer System.

67.2.9 BEDDING

For all open trench excavation services, such services shall be laid on granular bedding (B1) meeting the following gradation:

a) Specified

Granular (B1)

Granular bedding shall have an even gradation falling within the following limits:

Sieve Size (CGSB Spec.)	Allowable Passing (percent)
20,000	95 to 100
12,500	75 to 95
5,000	40 to 60
2,000	25 to 45
400	10 to 25
80	2 to 10

b) Optional

i) Sand

Sand bedding shall have an even gradation falling with the following limits:

Sieve Size (CGSB Spec.)	Allowable Passing (percent)
5,000	100
2,000	70 to 95
400	30 to 65
160	10 to 25
80	2 to 10

ii) Select Native Material

Shall be well graded soil selected by the Contractor from the excavated trench material. It shall contain no particles larger than 32 mm in its largest dimension. It shall contain no frozen soil, organics, roots or other objectionable material in quantities that might cause pipe damage, excessive settlement or inadequate compaction.

67.2.9 RINK HYDRANT VALVE OPERATING ASSEMBLY

The valve casing is to be constructed of 100mm ABS pipe. The operating rod is to be constructed of 25mm square solid steel rod fitted with a 75mm steel clevis. The clevis is to be rectangular in shape with a 29mm X 66mm opening and welded to the operating rod. The top end of the rod is to be fitted with a 90mm diameter **rock guard bolted to the operating rod** with a 50mm square operating nut. The rock guard is to be bolted to the operating rod.

67.3 INSTALLATION

67.3.1 Service connections shall be installed along the alignment approved in the Detailed Engineering Drawings.

The Water and Sewer services shall be laid in a common trench unless otherwise specified.

67.3.2 AUGERING/TRENCHING

All services shall be open trenched across roadways. Augering may be allowed subject to written approval by Aquatera.

Where the water service is 50 mm or smaller in size, the water and sanitary services may be installed in a common trench or augered tunnel if approved by Aquatera.

67.3.3 BEDDING

All services in open cut trenches shall be laid on 75 mm of granular B1 Bedding, and shall have the bedding placed up to a level of 300 mm above the crown of the highest service in the trench. B1 bedding shall meet the same gradation as specified in this section.

Approved sand may be used with the approval of Aquatera provided the pipe diameter is less than 375 mm and the pipe has water tight joints.

67.3.4 WATER SERVICE CONNECTION

- a) Water service pipes shall be installed such that a minimum 2.75 metres cover is provided on the pipe at the property line.
- b) The main stop (corporation stop) shall be installed with a service saddle as specified in the Materials Section. Maximum service pipe sizes are 20mm for 150mm main and 25mm for 200mm main. This applies to direct tapping only. All main stops shall be at least 300 mm from the end of the water main joint. All main stops shall be at least 300 mm from another main stop and on a different plane. Main tapping shall be at an angle

of 45° from the horizontal as illustrated in the Typical Detail Drawings and shall in no case be made in the top 1/4 of the water main.

- c) Tapping and installation of the main stop shall be in accordance with the manufacturer's specifications.
- d) The service pipe, adjacent to the main stop shall be bent to form a gooseneck as illustrated in the Typical Detail Drawing and the bend shall be in the horizontal plane.
- e) Curb stops and service boxes shall be installed in the designated location at or below the maximum elevation. The curb stops shall be placed on a preserved wood block or brick with a washed rock sump of same aggregate gradation as fire hydrant sump and of dimensions 1m x 0.5m x 0.30m. A 50mm x 100mm, 2000mm long, marker stake painted blue shall be placed at all service boxes.
- f) Curb stops shall be installed at the locations shown on the drawings or as directed by Aquatera. Generally, curb stops shall be located 300mm from property line in front street serviced areas and 500mm from property line in areas service from PUL's.
- g) Water services are to be extended onto private property such that they are a minimum of 150mm beyond the outer limit of the gas easement and properly crimped or plugged/capped.

67.3.5 SEWER SERVICE

- a) All sewer service connections to PVC sewer mains shall be made using in-line tee or wye fittings as specified in the Material Specifications. Inserta tees may be used for sanitary connections to large diameter sewers (375 mm or greater) subject to written approval by Aquatera.
- b) Sewer Service pipes shall be installed such that a minimum of 2.6m of cover is provided on the pipe.
- c) Where required by Aquatera, sewer service connections to deep sewer mains shall be made using risers as shown in the Typical Detail Drawings. Service Risers shall be put on all services where the main is deeper than 4.00m , as measured from the final grade to the obvert of the pipe.
- d) The sewer line shall be kept free of soil, mortar and other foreign material during installation of the sewer service. Upon completion of installation the end of the sewer pipe shall be plugged with an approved plug.

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- e) Sewer services shall be extended to 1.85m into property or where shallow bury utilities exist or are proposed 150mm from the back of the an easement boundary, whichever is greater, and shall be properly capped.
 - f) When the sewer services are required to connect to mains in excess of 4.00m, as measured from finished ground elevation to the crown of the main, risers shall be installed to within 3.00m of finished surface elevation at the property line.
 - g) A 50mm and 100mm, 2000mm long marker stake painted green shall be placed at the plug.
 - h) Sewer service connections may be connected directly to manholes, if approved by Aquatera, dependant on the size of manhole and number of main connections to a manhole, the maximum number of services connected to a manhole shall be four (4). Flow transition from sewer service lines into the main flow channel is to be made in the same manner as intersecting sewer mains. In general, the service pipe is to be extended to the main channel, matching pipe obverts, the top half of the service pipe removed and cemented into the benching.

67.3.6 CLEANING WATER SERVICE

A sufficient flow of water shall be put through the curbstop to ensure proper cleaning of all pipes and fittings.

Water Services shall be subjected to the cleaning and testing imposed on the water mains to which they are connected.

67.3.7 CLEANING SEWER SERVICE

Sewer Services shall be subjected to the cleaning and testing imposed on the mains to which they are connected.

67.3.8 RINK HYDRANTS

Rink Hydrants are to be installed to the dimensions shown in the Typical Detail Drawings. The water tap, copper pipe and fittings are to be installed in accordance with the Service Connection Specifications. The valve casing is to be installed plumb. The operating rod is not to be pinned to the curb stop to facilitate removal of the rod from ground level.

67.4 **TESTING REQUIREMENTS OF THE CONTRACTOR**

Refer to Testing Section for details.

67.4.1 PRE-INSTALLATION

- a) Materials:

If bedding material is different from that used for the sanitary sewer and/or the watermain, the Contractor shall provide a sieve analysis of the material proposed to be supplied.

b) System: None required.

67.4.2 INSTALLATION

a) Materials: None required.

b) Systems:

Water and Sanitary Sewer service connections shall not be backfilled until inspected by **the Engineer**.

67.4.3 POST-INSTALLATION

a) Materials: None required

b) System:

The water service system will be tested in conjunction with the Water Distribution System. The sewer service is subject to the same test requirements as the sewer main it is connected to, including CCTV video inspection. The service is to be video inspected from the property line to the sewer main. Refer to Section 25 for details.

67.5 **PAYMENT**

Payment shall be full compensation for the procurement of all permits and processes, the supply and the installation of all materials, the supply and use of all equipment, the supply and use of all labour and supervision; all being necessary to complete the work to specification at the construction site.

67.5.1 AUGERING/TRENCHING

Augering/trenching is considered incidental to the Work and no separate payment shall be made.

67.5.2 BEDDING

Bedding is considered incidental to the Work and no separate payment shall be made.

67.5.3 WATER SERVICE

Payment will be made per lineal metre (L.M.) of water service pipe installed for the unit prices submitted on the Tender Form and shall include augering/trenching and bedding.

67.5.4 SEWER SERVICE

Payment will be made per lineal metre (L.M.) of sewer service pipe installed for the unit prices submitted on the Tender Form and shall include augering/trenching and bedding.

67.5.5 FITTINGS

Main stops, service saddles, curb stops, service boxes, plugs, tees, wyes and bends shall be paid for on a unit basis (No.) and such payment shall be full compensation for the supply and installation of the specified fittings.

67. 5.6 SERVICE RISERS

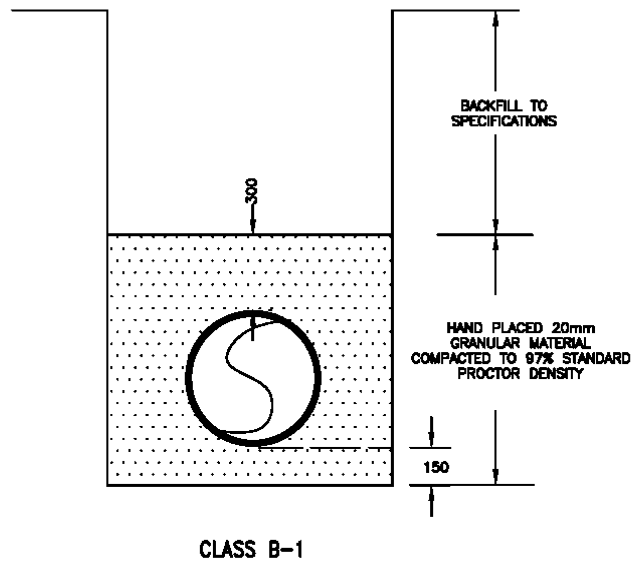
Service Risers shall be paid for on a vertical metre unit (V.M.) basis and such payment shall be full compensation for the supply and installation of the specified CSP, concrete, spacers, compacted sand and any other materials or labour above what is required for a standard sewer service.

67.5.7 CLEANING


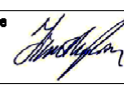
Cleaning shall be considered incidental to the work and shall not be paid separately.

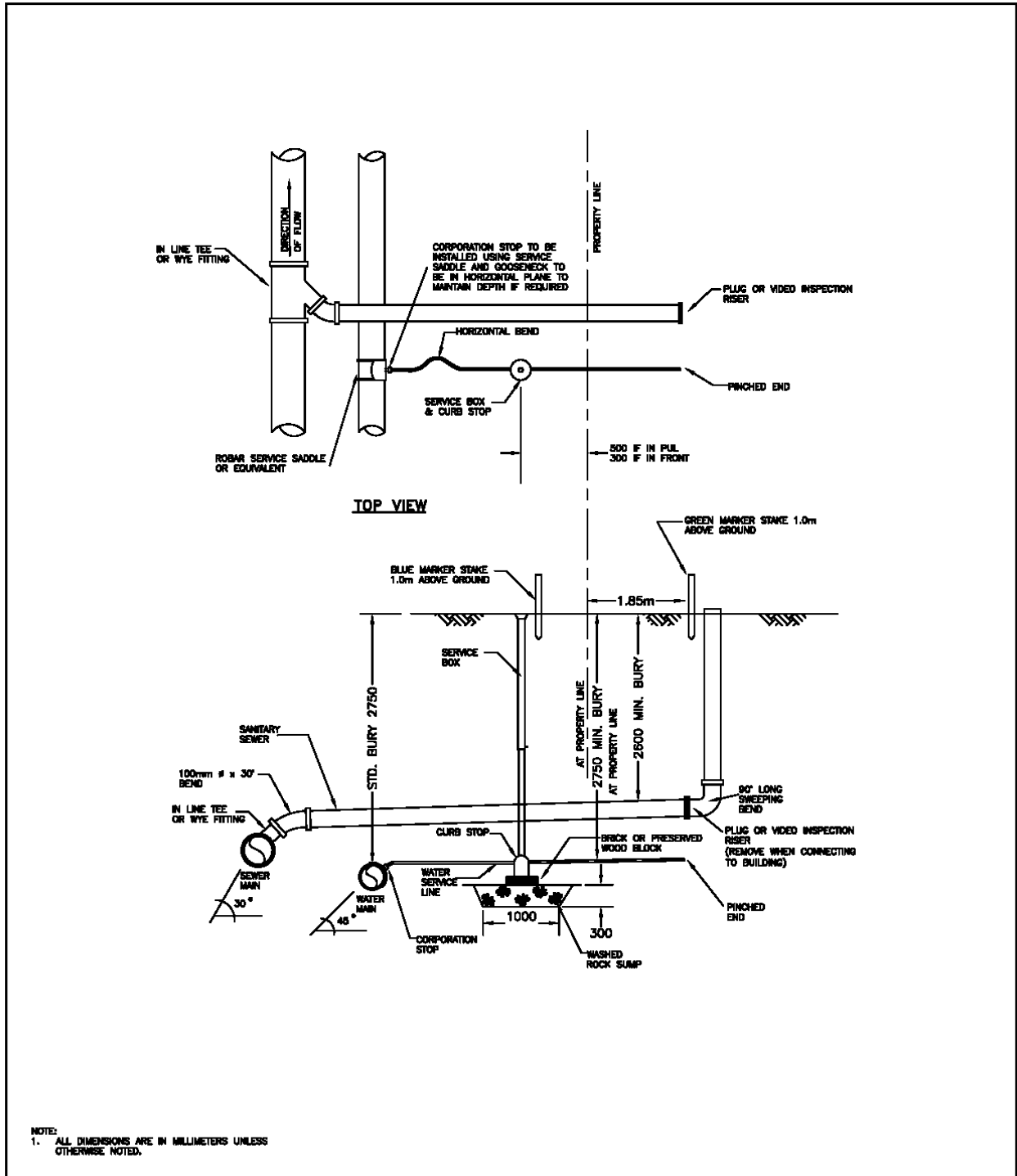
67.5.8 TESTING REQUIREMENTS OF THE CONTRACTOR

There shall be no payment for the testing requirements of the Contractor except for the closed circuit TV inspection which will be paid under the Sanitary Sewer System inspection.

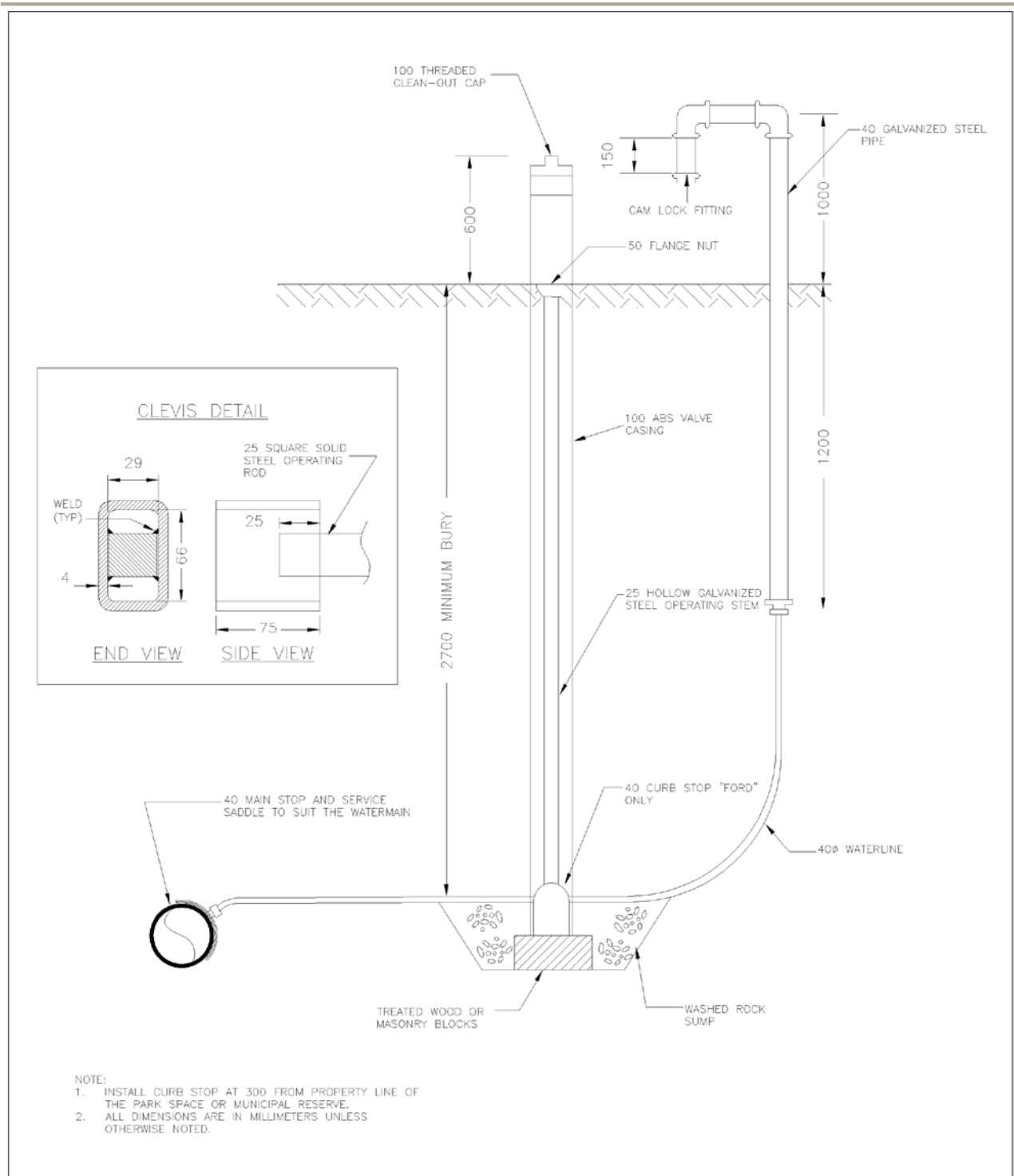


- NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
 2. SAND MAY BE ALLOWED ON PIPE SIZES LESS THAN OR EQUAL TO 375mm DIAMETER PROVIDING THE PIPE HAS WATER TIGHT JOINTS.

Revisions				BEDDING DETAILS			Standard Detail 67-01
Date	Details	Drawn		Approved by Timothy Lau, P.Eng.	Authorized Signature 		
			Permit Number P09242	Checked by Norman Kyle, P.L.(Eng.)	Scale N.T.S.	Date 11/02/03	File Number C10065
				Drawn by B. Shervey			



Revisions			SERVICE CONNECTION		Standard Detail
Date	Details	Drawn			67-02
					Approved by Timothy Lau, P.Eng. Checked by Norman Kyle, P.L.(Eng.)
			Permit Number PO8242	Drawn by B. Shervey	Scale N.T.S.
					Date 11/02/03
					File Number C10068



Revisions				RINK HYDRANT DETAIL			Standard Detail 67-05
Date	Details	Drawn		Approved by Timothy Lau, P.Eng.	Authorized Signature		
			Checked by Norman Kyle, P.L.(Eng.)				
			Drawn by B. Shervey	Scale N.T.S.	Date 11/01/31	File Number C10055	
			Permit Number P09242				

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