MUNICIPAL STANDARDS

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MUNICIPAL STANDARDS

SPECIFICATIONS

PART 5 - WATER RETICULATION

5.1 SCOPE OF WORK

This section includes the supply of materials, equipment, labour and services necessary for the construction of water reticulation.

5.2 STANDARDS

The following Australian Standards and Standard Drawings are referred to:

Australian Standards

AS 3578 Cast Iron Non-Return Valves for General Purposes
AS 3579 Cast Iron Wedge Gate Valves for General Purposes
AS 4087 Metallic Flanges for Waterworks Purposes
AS 3725 Loads on Buried Concrete Pipes
AS 3500 Part 1 National Plumbing and Drainage Code - Water Supply
AS 2638 Gate Valves for Waterworks Purposes
AS 2280 Ductile Iron Pressure Pipes and Fittings
AS 2033 Installation of Polyethylene Pipe Systems
AS 2032 Code of Practice for Installation of UPVC Pipe Systems
AS 1718 Water Supply - Copper Alloy Screw Down Pattern Taps
AS 1646 Elastomeric seals for waterworks purposes
AS 1628 Water Supply – Metallic gate, globe and non-return valves.
AS 1460 Fittings for use with Polyethylene Pipes
AS 1432 Copper Tubes for Plumbing, Gasfitting and Drainage Applications
AS 1289 Methods for Testing Soils for Engineering Purposes

Standard Drawings

SD-1002 - Service locations (Urban Subdivisions)
SD- 1011 - Rural Roads – Service Locations
SD-4001 - Lot Connection (Single Residential)
SD-4002 - Water Supply - Sluice and Scour Valves
SD-4003 - Water Supply - Fire Hydrants
SD-4004 - Water Supply - Thrust Block Details
SD-5001 - Typical Pipe Trench Details

5.3 MATERIALS

5.3.1 Pipes and Fittings

Pipes and fittings shall comply with the relevant Australian Standards and type of pipes used in the Contract shall be as shown on the Drawings unless otherwise approved by the Superintendent.

5.3.2 Storage and Handling

Materials shall be stored and handled in such a manner necessary to prevent their damage and deterioration. The Contractor shall employ adequate means to safely handle pipes, fittings and other materials.

PART 5 - WATER RETICULATION

5.3.3 Bedding and Haunching

Pipe bedding and haunching material will depend on the type of pipe installed as shown in the Standard Drawings SD 5001. It shall be clean sand, gravel or crushed rock, free from organic matter and clay lumps and conform to the grading given in Table 5.3.1.
Pipe bedding material shall also have a sand equivalent of at least 60.

Table 5.3.1

AS Sieve (mm)	Percentage Passing By Mass
9.5	100
2.36	25 - 100
0.425	0 - 60
0.075	0 - 10

Where referred to on the Standard Drawings alternative bedding material may be fine crushed rock in accordance with Clause 5.3.4 c).

5.3.4 Backfill

a) Select Fill
Select Fill shall comply with the requirements of AS 3725, Section 4, generally being sands or gravels or sand and gravel mixtures with fines of low plasticity obtained from excavation of the pipe trench or elsewhere with a particle size not greater than 75 mm.

b) Ordinary Fill
Shall comply with the requirements of AS 3725, Section 4, being material obtained from excavation of the pipe trench or elsewhere and containing not more than 20 per cent by mass of stones with a size between 75 mm and 150 mm and none larger than 150 mm.

c) Fine Crushed Rock
Fine crushed rock shall be material complying with the requirements of aggregate used for basecourse construction in accordance with the Municipal Standards Specifications Part 6, Material and Pavement Construction.

5.3.5 Concrete

Concrete for minor concrete structures shall be in accordance with the Municipal Standards Specifications Part 9, Construction of Minor Concrete Structures.

5.3.6 Valves, Hydrants and Covers

a) Sluice Valves
Sluice valves shall be fitted with a C.I. cap and comply with AS 2638 - Cast Iron Sluice Valves for Waterworks Purposes. They shall have non-rising spindles forged from high tension bronze with inside screw thread. Spindle nuts shall be gun metal.

b) Gate Valves
Gate valves shall comply with AS 1628, Copper Alloy Gate Valves for General

Purposes or AS 3579 - Cast Iron Wedge Gate Valves for General Purposes and shall have a non-rising stem and hand wheel.

c) Fire Hydrants

Fire Hydrants shall be Spring Force closer type or Pillar ball (Type L) hydrant as per the standard drawings and as directed by the superintendent

d) Non-return and Air Valves

Valves shall be from an approved manufacturer and comply where applicable with AS 3578 - Cast Iron Non-Return Valves for General Purposes or AS 1628 - Copper Alloy Gate Valve and Non-Return Valves for use in Water.

e) Stop Taps

Stop taps shall be brass, fitted with screwed connections and comply with AS 1718 - Copper Alloy Screw Down Pattern Taps. All stop taps shall be supplied with a female threaded outlet.

f) Valve and Hydrant Covers

Valve and hydrant covers shall be to the requirements of the Superintendent.

g) Pressure Relief and Reducing Valves

Pressure relief and reducing valves shall be subject to the approval of the Superintendent.

5.4 EXCAVATION

5.4.1 General

Prior to excavation the Contractor shall note all existing surface features and locate all underground services.

5.4.2 Trenching

Trenches shall be excavated to the lines and levels shown on the Drawings with allowance being made for bedding. The dimensions of the trench shall comply with the relevant Standard Drawing. The Contractor shall excavate such chambers or recesses as are necessary to enable joints to be made, and shall trim the trench bottom so as to give even bedding to the pipe. The cost of such excavation will be deemed to be included in the schedule rate for laying and jointing.

The base of the excavated trench shall be trimmed neat and uniform for its full length. Boulders, roots and any other hard objects in the bottom of the trench shall be removed; soft areas in the bottom of the trench shall be taken out and filled to grade level with approved bedding material and compacted.

At any time the length of open trench shall not be more than 120 metres. The Contractor shall maintain all trenches in a safe condition for protection of people and property. The Contractor shall notify the Department of Infrastructure, Energy and Resources – Workplace Standards Tasmania of any excavation over 1.5 m deep and be responsible for carrying out the instructions of its officers.

5.4.3 Dewatering

During the progress of drainage works, the Contractor shall provide for effective diversion and disposal of surface and ground water and shall be responsible for all damage to any

portion of the works or surrounding properties due to inadequate drainage diversion of dewatering equipment.

5.4.4 Storage and Disposal of Material

Excavated material not required or not suitable for the works shall be removed from the site. No excavated material shall be placed against any fence or wall without the written consent of the owner and the approval of the Superintendent.
Material shall be placed a minimum of 1.0 m clear of the edge of the trench. Excavated materials, which are to be reused, shall be stockpiled separately on site.

5.5 LOCATION OF PIPES, VALVES, HYDRANTS ETC

All pipes, valves, hydrants etc. shall be located as shown on the Drawings unless otherwise approved by the Superintendent.

5.6 CONNECTION TO EXISTING MAINS

Arrangements shall be made with the Local Authority for connection to existing mains.

5.7 PIPE LAYING, JOINTING AND BACKFILLING

5.7.1 Trench Foundation

The trench foundation shall be finished to the approval of the Superintendent prior to placing of the bedding material.

5.7.2 Bedding

Bedding shall be compacted bedding material complying with Clause 5.3.3 and placed in accordance with the relevant Standard Drawing. Compaction shall be to 95 per cent standard compaction in accordance with AS 1289.

5.7.3 Laying

All pipes shall be laid straight and shall be free from dirt and foreign matter and in good condition and laid with manufacturing works visible. Pipes and fittings shall be laid with all branches, valves, fireplugs, bends and closer pipes in the positions shown on the Drawings or as directed.

5.7.4 Jointing

Jointing of pipes shall be in accordance with the manufacturers' specifications.

5.7.5 Haunching

Haunching shall be material complying with Clause 4.3.3. placed in accordance with the relevant Standard Drawing. Material shall be well tamped to the satisfaction of the Superintendent.

5.7.6 Backfilling

Backfilling material shall be as shown on the relevant Standard Drawing and shall be compacted in layers not exceeding 150 mm thick when compacted. The degree of compaction shall depend on the location of the trench.

For trenches clear of trafficked areas the layers shall be compacted to a minimum density of 95 per cent standard compaction in accordance with AS 1289. For trenches under trafficked areas the layers shall be compacted to comply with the pavement requirements as shown in Table 5.7.1.

Table 5.7.1

Pavement Layer	Characteristic Density in accordance with AS 1289.
Sub-grade	95% standard compaction
Sub-base	95% modified compaction
Base	98% modified compaction

The ground surface shall be reinstated to its original condition or as shown on the Drawings and to the satisfaction of the Superintendent.

5.7.7 Cutting of Pipes

Where pipes are cut the ends shall be left neat and regular.

5.7.8 Cables in Common Trench

Where services are laid in a common trench the trench size, depth and backfill shall be in accordance with requirements of the relevant authority.

5.7.9 Property Connections

Property connection points for house connections shall be laid in accordance with the Standard Drawings and located as shown on the Drawings.

5.7.10 Ends of Pipework

The open ends of all pipework shall be kept covered to prevent dirt, stones and other debris from entering.

5.8 VALVES AND HYDRANTS

Valves, air valves, hydrants and covers shall be installed as shown on the Drawings.

5.9 THRUST AND ANCHOR BLOCKS

The Contractor shall construct thrust and anchor blocks as required at bends, tees, dead ends and valves. The concrete shall conform to Part 9 of this specification. Thrust and anchor blocks shall be seated onto solid ground against which the thrust is to be taken and anchor blocks shall extend into the trench wall for a depth of 150 mm as shown in the Standard Drawings unless otherwise directed by the Superintendent.

5.10 VALVE AND FIREPLUG INDICATORS

Shall be in accordance with the Institute of Public Works Engineering, Australia – Tasmania Division– Fire Hydrant Guidelines – May 2000

PART 5 - WATER RETICULATION

5.11 INSPECTIONS

Unless otherwise required by the Superintendent inspections shall be arranged at the following stages of the work:

a) Completion of trench excavation prior to placement of bedding material.

b) Completion of bedding material prior to actual laying of pipes.

c) Completion of pipe laying prior to any backfilling.

d) Testing of pipelines.

e) Stages of backfilling.

f) Completion of work at Practical Completion.

g) Final inspection after Defects Liability Period.

Twenty four (24) hours notice is required for any of the above inspections. Work shall not proceed unless each stage of work has been inspected and passed by the Superintendent.

5.12 TESTING

5.12.1 Cost of Testing

All tests required by the Superintendent shall be at the Contractor's expense.

5.12.2 Testing of Bedding, Haunching and Backfill Material

The Superintendent may request a sample of bedding or backfill material to be taken and tested by registered N.A.T.A. testing laboratory in order to determine whether the material complies with this specification. Any material, which is found not to comply with the requirements, shall not be used for bedding or backfill.

5.12.3 Pipeline Inspection and Testing

a) Disinfection

The pipeline is to be disinfected prior to connection to existing mains.

Ensure the pipeline is watertight, i.e. all valves etc. are shut and ends sealed. Sodium or calcium hyperclorite is to be used for disinfection. The sodium or calcium hyperchlorite will be premixed in a water tanker to between 15-20mg per litre, then pour into the pipeline. The concentration of the disinfecting chemical will be such that the free chlorine residual will be at least 10mg per litre after 12 hours.

The maximum dosage of the chemical will be 20mg per litre.

After the pipeline has been disinfected, and after the pipeline has been pressure tested, the water in the pipeline will be pumped out of the pipeline and removed from the site and suitably disposed of.

The Contractor shall be responsible for all costs involved with the disinfection of the pipeline (including testing of water) and discharge of the used water.

b) Pipeline Testing

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All lines shall be tested in the presence of the Superintendent to a pressure of 1.5 times the working pressure in accordance with the appropriate Australian Standard.

Each line shall be tested after it has been laid and jointed and sufficient filling has been placed over the centre of each pipe to hold it in position except at the joints.

No line shall be tested less than forty eight (48) hours after construction of all thrust blocks and anchors.

The Contractor shall provide a 20 mm tapping and ferrule tap or other suitable approved means for connecting the line to be tested. Such tapping shall be provided, where directed, for each section of water main to be separately tested.