



## **SPECIFICATIONS**

AusSpec	Asset Owner Specifications (Roadworks & Drainage)
AusSpec	Development Construction Specifications (Roadworks & Drainage)
PRSC 100	Roadworks Specifications
<b>PRSC 400</b>	<b>Water Supply Specifications</b>
PRSC 500	Sewerage Specifications

## **PRSC 400**

# **WATER SUPPLY SPECIFICATIONS**

- |            |  |
|------------|--|
| 401        | Water Main Pressure Pipeline Construction  |
| <b>402</b> | <b>Supply of Water Main Pressure Pipes, Valves, Fittings and Miscellaneous Items</b> |
| 403        | Plain and Reinforced Concrete Works for Water Supply                                 |

# PINE RIVERS SHIRE COUNCIL

## PRSC 402 - SUPPLY OF WATER MAIN PRESSURE PIPES, VALVES, FITTINGS AND MISCELLANEOUS ITEMS



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# PRSC 402 SUPPLY OF WATER MAIN PRESSURE PIPES, VALVES, FITTINGS AND MISCELLANEOUS ITEMS

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## **1.0.0 PURPOSE**

- 1.1.0 The purpose of this specification is to set down requirements for the manufacture, testing and supply of pressure pipes, fittings, valves, hydrants, bolts, and other miscellaneous items associated with water supply works.
- 1.2.0 This specification includes those materials required to be installed by the pipe-layer for property service connections.
- 1.3.0 The specification does not apply to materials for construction of property services, water services or private fire fighting services.

## **2.0.0 SCOPE**

- 2.1.0 This specification shall apply to materials supplied by contract, subcontract, or direct purchase.
- 2.2.0 This specification shall apply to materials being supplied directly to the Pine Rivers Shire Council or other authority or to a principal who will hand over the ownership of the constructed works to the Pine Rivers Shire Council or who will retain ownership.

### 3.0.0 REFERENCES

#### 3.1.0 The following shall apply:-

Sewerage and Water Supply Act 1949-1982 with Amendments

Standard Water Supply Law

Workplace Health and Safety Act 1995 and Regulations with Amendments

The Manual of Uniform Traffic Control Devices

AS 2124-1992 General Conditions of Contract

AS 3900 Quality Management and Quality Assurance Standards

ISO 9000 Quality Management and Quality Assurance Standards

#### 3.2.0 The following shall apply when the respective materials have been specified or approved for use. Where the editions listed have been superseded or replaced, then any later copy of the standards shall apply in their place:-

AS 1281-2001 Cement Mortar Lining of Steel Pipes and Fittings

AS 1345-1995 Identification of the Contents of Pipes, Conduits and Ducts

AS 1449-1994 Wrought Alloy Steels - Stainless and Heat Resisting Steel Plate, Sheet and Strip

AS 1462 Methods of Test for Unplasticised PVC (uPVC) Pipes and Fittings

AS/NZS 1477-1999 PVC Pipes and Fittings for Pressure Applications

AS 1554 Structural Steel Welding  
1554.1-2004 Welding of Steel Structures

AS 1565-1996 Copper and Copper Alloys - Ingots and Castings

AS 1579-2001 Arc Welded Steel Pipes for Water and Wastewater

AS 1627 Metal Finishing - Preparation and Pre-treatment of Surfaces  
1627.1-2003 Cleaning Using Liquid Solvents and Alkaline Solutions  
1627.2-2002 Power Tool Cleaning  
1627.4-2002 Abrasive Blast Cleaning  
1627.7-1988 Hand Tool Cleaning of Metal Surfaces  
1627.9-2002 Pictorial Surface Preparation Standards for Painting Steel Surfaces

AS 1628-1999 Water Supply - Copper Alloy Gate, Globe and Non-return Valves

AS 1646.1-2000 Elastomeric Seals for Waterworks Purposes – General Requirements

AS 1796-2001 Certification of Welders and Welding Supervisors

AS 1830-2002	Grey Cast Iron
AS 1831-2002	Iron Castings - Spheroid or Nodular Graphite Cast Iron
AS/NZS 2280-2004	Ductile Iron Pipes and Fittings
AS/NZS 2312-2002	Guide to the Protection of Iron and Steel against Exterior Atmospheric Corrosion
AS 2518-1992	Fusion-bonded Low-density Polyethylene Coating for Pipes and Fittings
AS/NZS 2544-1995	Grey Iron Pressure Fittings
AS 2638.2-2002	Gate Valves for Waterworks Purposes – Resilient Seated
AS 2837-1986	Wrought Alloy Steels - Stainless Steel Bars and Semi-finished Products
AS 3571-1989	Glass Filament Reinforced Thermosetting Plastics (GRP) Pipes - Polyester Based - Water Supply, Sewerage and Drainage Applications
AS 3572-2002	Plastics - Glass Filament Reinforced Plastics (GRP) - Methods of Test
AS 3578-1993	Cast Iron Non-Return Valves for General Purposes
AS 3680-1989	Polyethylene Sleeving for Ductile Iron Pipelines
AS 3952-2002	Water Supply Spring Hydrant Valve for Waterworks Purposes
AS 3972-1997	Portland and Blended Cements
AS 3996-1992	Metal Access Covers, Road Grates and Frames
AS/NZS 4020	Testing of Products for Use in Contact With Drinking Water
AS 4041-1998	Pressure Piping
AS 4087-2004	Metallic Flanges for Waterworks Purposes
AS/NZS 4130-2003	Polyethylene (PE) Pipes for Pressure Applications
AS/NZS 4158-1996	Thermal-bonded Polymeric Coatings on Valves and Fittings for Water Industry Purposes
AS 4321-2001	Fusion-bonded Medium-density Polyethylene Coating and Lining for Pipes and Fittings
AS/NZS 4441-2003	(Int.) Oriented PVC (OPVC) Pipes for Pressure Applications
AS/NZS 4765-2000	(Int.) Modified PVC (PVC-M) Pipes for Pressure Applications
AS 4680-1999	Hot-dip Galvanised (Zinc) coatings on Fabricated Ferrous Articles

- 3.3.0 Where materials not covered by this specification are specified or approved for use as part of water supply works, the relevant Pine Rivers Shire Council specifications shall apply. Where no Pine Rivers Shire Council specification is available, a product approved by the Water Services Association of Australia (WSAA) and endorsed for use by the General Manager Pine Water shall apply. Alternatively an appropriate Pine Rivers Shire Council approved product or other specification approved by the General Manager Pine Water may apply.



## 4.0.0 DEFINITIONS

4.1.0 For the purpose of this specification the following definitions shall apply:-

- ❖ **Water Main** - any conduit used for carrying, distribution, or reticulation of potable water, which is not a property service, water service or private fire service
- ❖ **Rigid Pipe** - pipe manufactured from mild steel, ductile iron or cast iron
- ❖ **Flexible Pipe** - pipe manufactured from the family of polyvinyl chloride (PVC), polyethylene (PE), glass filament reinforced thermosetting plastics (GRP), or acrylonitrile butadiene styrene (ABS)
- ❖ **PVC Pipe / Fittings** – the family of PVC pipes including PVC-M (Modified PVC), OPVC (Optimised PVC) and uPVC (unplasticised PVC) pipes approved for use in water supply pipelines.
- ❖ **Pipe Layer** - the Company or individual retained for carrying out construction
- ❖ **Consulting Engineer** - the registered professional engineering company or registered professional engineer engaged by the principal to carry out the investigation and design of the water supply works to be constructed by the principal. When engaged for the construction phase, the company or engineer shall act as superintendent for the purpose of works carried out by contract.
- ❖ **Contract, Contractor, Principal and Superintendent** - as defined in AS 2124 retained for supply of goods and materials in accordance with this specification
- ❖ **Supplier** - See contractor
- ❖ **Manufacturer** - person or company that makes or produces goods. May also be the supplier or contractor
- ❖ **General Manager Pine Water** - the person occupying that position within the Pine Rivers Shire Council, or their nominated representative
- ❖ **Manager Electrical and Mechanical Services** - the person occupying that position within the Pine Rivers Shire Council, or their nominated representative
- ❖ **Pine Rivers Shire Council engineer** - the engineer employed by the Pine Rivers Shire Council to approve, supervise or inspect the works, or their nominated representative

## **5.0.0 SPECIFICATION**

### **5.1.0 INFORMATION SUPPLIED TO THE CONTRACTOR**

- 5.1.1 The principal or pipe-layer shall supply to the contractor sufficient details by way of drawings, specifications and schedules to allow the contractor to supply the materials essential for construction of the works by the pipe layer to the principal's requirements.

### **5.2.0 MATERIALS**

- 5.2.1 The contractor shall supply all the materials required to complete the works in accordance with the issued drawings, specifications, schedules and orders. The materials supplied shall comply with relevant Australian standards and this specification and where necessary, shall be approved for use by the General Manager Pine Water.
- 5.2.2 All materials supplied shall be new and unused and entirely suitable for use for the purposes intended.
- 5.2.3 All materials shall be suitable for use and contact with drinking or potable water. Materials which are unsuitable for this use will not be accepted.
- 5.2.4 Materials which do not comply with this specification or which, in the opinion of the superintendent and / or a Pine Rivers Shire Council engineer, are defective shall be immediately removed from the works site by the contractor. Such materials shall be replaced at the contractor's cost by materials which comply with this specification.

### **5.3.0 TESTS, TESTING AND STANDARDS MARKS**

- 5.3.1 Where the manufacturer of materials covered by this specification has an accredited quality system in accordance with AS 3900 or ISO 9000 in place, all products shall be branded or marked accordingly.
- 5.3.2 Where the manufacturer has a standards mark license, all products covered by that license shall be inspected and tested in accordance with the relevant standard and branded or marked accordingly.
- 5.3.3 Unless the manufacturer has an approved quality system in place, or standards mark license, all manufactured items shall be inspected and tested at the place of manufacture by an independent appropriately accredited inspecting and testing authority in accordance with the relevant standard(s).
- 5.3.4 All products shall wherever possible, bear the mark or name of the manufacturer.
- 5.3.5 The superintendent and / or a Pine Rivers Shire Council engineer shall be free to make inspections at the manufacturer's works at any stage of the contract.
- 5.3.6 The manufacturer or contractor shall not release items for delivery until test certificates have been issued by the appropriate testing authorities. Certificates shall state that physical tests on the representative samples or, on each individual item where required, have been completed and satisfactory results achieved. Copies of test certificates shall accompany each load or specific item delivered.

- 5.3.7 The superintendent and / or a Pine Rivers Shire Council engineer reserves the right to inspect and/or test the articles at their own expense on delivery to the site.

If an article fails to stand any such site inspection or test it shall be rejected and shall be replaced by another without additional charge. Site inspection and testing shall include damage during delivery, off-loading and stacking, or due to modification by the contractor or manufacturer subsequent to any previous tests.

- 5.3.8 The contractor shall be responsible for replacement of, or repair of any defective materials or items discovered and recorded during the inspection mentioned in clause
- 5.3.9. The contractor shall also make good any materials found during laying or placement of the materials, to be defective due to faulty manufacture or workmanship.
- 5.3.10 Fees and costs associated with inspection and testing shall be the responsibility of the manufacturer.

#### **5.4.0 CARTAGE AND DELIVERY**

- 5.4.1 The contractor shall load, deliver, unload and place the materials at the work site(s). The contractor shall supply all machinery and personnel required for the purpose of unloading, and the supply and placement of all materials required as props etc. for supporting of pipes or other materials necessary for their stable storage.
- 5.4.2 The contractor shall give the superintendent and / or a Pine Rivers Shire Council engineer at least two working days notice of the expected time and date for delivery. So as not to create a noise nuisance, off-loading generally and the use of machinery for the off-loading of materials, shall be limited to between the hours of 7.00am and 6.00pm Monday to Friday and 7.00am to 12 noon Saturday.
- 5.4.3 Unless specified otherwise, the contractor shall expect the principal has provided the contractor a suitably level site fit for the purpose of off-loading and stacking of materials, including access to and permission to use that site for that purpose.
- 5.4.4 The contractor shall employ persons experienced in the delivery, handling and off-loading of the various materials for these operations.
- 5.4.5 The contractor shall be responsible for the provision and placement of all road safety signage and flagmen that may be necessary during delivery and off-loading. Signage shall be in accordance with the Manual of Uniform Traffic Control Devices.
- 5.4.6 In handling pipes during transporting, delivery or any other process, the greatest care shall be exercised to avoid damage to the pipe and/or coating. Under no circumstances shall a pipe be lifted by unprotected slings, levered or moved by implements without protecting pads. Slings shall be of a broad webbing material, selected in accordance safe lifting requirements, and be of a width so as to adequately support the pipe without damaging any protective coatings. Where special lifting devices or methods are recommended by manufacturers, these shall be adhered to. Lifting forks shall not be permitted.

Where pipes are lowered on to the ground, they shall rest on padded bolsters, padded ramps or on padded cradles. Mounds of sand or soft earth as supports may be acceptable, subject to approval from the superintendent and / or a Pine Rivers Shire Council engineer. Any damage occurring to the pipe coating shall be made good by the contractor.

- 5.4.7 Fittings with protective coatings are to be treated similar to Clause 5.4.6 in this specification. Under no circumstances are fittings to be dropped from trucks or allowed to collide with one another when rolled down skids.
- 5.4.8 All items must be delivered in a sound condition so as the materials or items conform to the various sections of this specification. Inspection of the materials at time of delivery shall not relieve the contractor of any responsibility in this regard.
- 5.4.9 In the distribution of any pipes, fittings or other materials along streets, roadways or easements, care shall be taken not to cause any blockage or hindrance to drainage or traffic of any sort, and the site(s) shall not be left in an unsafe condition.
- 5.4.10 Where required by the superintendent or a Pine Rivers Shire Council engineer or pipe-layer, a joint inspection of the materials shall be undertaken by the contractor and the superintendent / Pine Rivers Shire Council engineer / pipe-layer at the time of delivery. A record shall be made of any damaged or defective materials found during the inspection.

## **5.5.0 PIPES**

- 5.5.1 The pipe materials and their structural requirements shall be as set out in the specifications and drawings. Pipes shall be provided with flexible joints in accordance with the relevant Australian standards unless otherwise stated.

- 5.5.2 Pipes shall be classified as either rigid or flexible.

Pressure pipe materials which shall be classified as rigid are ductile iron, cast iron, and steel. Pressure pipe materials which shall be classified as flexible are the family of polyvinyl chloride (PVC), glass filament reinforced thermosetting plastics (GRP), high and medium density polyethylene (HDPE and MDPE).

## **5.6.0 PIPE AND FITTING MATERIALS**

- 5.6.1 Ductile iron pressure pipes and fittings shall be manufactured, tested and supplied in accordance with AS/NZS 2280. Unless specified otherwise, ductile iron pipes shall be Class PN20 or PN35, except that flanged pipes and pipes fitted with thrust or weep flanges shall be Class K12 or Flange class to AS/NZS 2280. All pipes and fittings shall be lined with a sulphate resisting cement mortar using Type SR cement in accordance with AS 3972.

Ductile Iron pipes Class K9 and K12 are also accepted.

The information required by Appendix B of AS/NZS 2280 for Ductile Iron Pressure Pipes can be found in Appendix A of this specification.

- 5.6.2 Grey iron pressure fittings shall be manufactured, tested and supplied in accordance with AS/NZS 2544. All fittings shall be lined with a sulphate resisting cement mortar using Type SR cement in accordance with AS 3972.

The information required by Appendix A2 of AS/NZS 2544 for grey iron fittings can be found in Appendix B of this specification.

- 5.6.3 uPVC pressure pipes and pipe fittings shall be Class PN 16 minimum or as noted on the drawings and they shall be Series 2 (CIOD / DIOL compatible) manufactured and supplied in accordance with AS/NZS 1477, and tested in accordance with AS 1462. They shall have spigot and socket push-in type rubber ring joints unless noted otherwise in the job specification or on the drawings. uPVC pipes and fittings shall be coloured "light blue" unless approved otherwise by a Pine Rivers Shire Council engineer.

uPVC fittings supplied with integral flanges are to include the supply of one complete stainless steel backing plate for each flange. Flanges are to be drilled in accordance with Clause 5.8.5 of this specification. Backing plates are to be pre-drilled to suit the size, number and position of the flange's bolt holes.

- 5.6.4 O-PVC pressure pipes shall be Class PN 16 minimum or as noted on the drawings. They shall comply with AS 4441 and compatible with the dimensions of AS 1477 Series 2. Pipes shall be coloured "light blue" unless approved otherwise by a Pine Rivers Shire Council engineer.

- 5.6.5 PVC pressure pipes shall be Class PN 16 minimum or as noted on the drawings. They shall comply with AS 4765 and compatible with the dimensions of AS 1477 Series 2. Pipes shall be coloured "light blue" unless approved otherwise by a Pine Rivers Shire Council engineer.

- 5.6.6 Glass filament reinforced thermosetting plastic (GRP) pipe shall be manufactured and supplied in accordance with AS 3571 and tested in accordance with AS 3572.

Unless otherwise shown on the drawings or specified GRP pressure pipelines shall have a Pressure Class PN 12.5 and Stiffness Class SN5000.

GRP pipes shall be centrifugally cast formed within an external rotating mould and finished with a smooth bore.

- 5.6.7 All steel pipes and fittings shall be spiral welded pipe in accordance with AS 1579 unless otherwise approved by the superintendent and / or a Pine Rivers Shire Council engineer.

Unless noted otherwise on the drawings or in the job specification:-

- a. steel pipes and fittings shall have a fusion bonded external and internal protective coating of medium density polyethylene in accordance with AS 4321; or
- b. steel pipes and fittings shall have a fusion bonded external protective coating of medium density polyethylene in accordance with AS 4321, and be lined internally with a sulphate resisting cement mortar using Type SR cement in accordance with AS 3972, applied in accordance with AS 1281.
- c. The jointing system shall be spigot and socket rubber ring joint type unless specified otherwise in the drawings or job specification.

- 5.6.8 Ductile and cast iron fittings for use with PVC pipes shall have sockets which provide a minimum depth of entry past the seal in accordance with AS 2280 or AS 2544 as applicable.

## **5.7.0 POLYETHYLENE SLEEVING**

- 5.7.1 Polyethylene sleeving for use with DIOL or CIOL pipe and fittings shall be in accordance with AS 3680.

5.7.2 Where DICL pipes and fittings are specified, and supplied by the one contractor, the contractor shall supply an amount of polyethylene sleeving sufficient to sleeve all pipes and fittings supplied for the job.

5.7.3 Where DICL or CICL fittings are supplied alone and/or separate from pipes, sufficient polyethylene sleeving for wrapping of all fittings is to be supplied by the contractor supplying the fittings.

## **5.8.0 JOINTS**

5.8.1 All pipework and fittings shall typically be joined by push-in type spigot to socket rubber ring joints, or flanged joints unless detailed otherwise on the drawings, specifications or schedules. Mild steel pipe and fittings may have welded butt joints, spherical slip-in, ball and socket or split collar butt joints under special circumstances.

5.8.2 Under no circumstances are fittings to be supplied which depend on specially sized rings or gaskets to be compatible for jointing the above types of pipe, unless they are used solely for the purpose of adapting between dissimilar classes of pipe and have been called up or detailed for this purpose alone.

5.8.3 Socket ended pipes, fittings and valves shall incorporate sockets to the pipe or fitting of the manufacturer's design, and shall incorporate a rubber joint ring located in a specifically designed groove within the socket itself. The socket design shall provide an effective sealing length for all compatible size pipe materials under maximum permitted joint deflections, and manufactured within permissible tolerances.

5.8.4 Spigot ended pipes, fittings and valves shall incorporate spigots machined or finished over a length which will allow effective penetration and sealing into a compatible pipe or fitting socket and rubber joint ring (manufactured within permissible tolerances) and under maximum deflection. Spigots are to be marked with a circumferential witness mark a distance from the pipe or fitting end to indicate the depth of penetration required to form an effective joint.

5.8.5 Flanged end pipes, fittings and valves are to have flanges complying with AS 4087.

Unless specified otherwise on the drawings, specifications, or schedules, flanges shall conform with the following:-

- a. integrally cast flanges shall conform to Class PN 16 for ductile iron (Figure B5), or Class PN 14 for grey cast iron (Figure B2)
- b. screw-on flanges shall be manufactured from ductile iron and shall conform to Class PN 16 (Figure B5). The host pipe shall be DICL Flange Class to AS/NZS 2280, or Class K12. Flanges are to be sealed on to the pipe with a suitable epoxy approved for use with potable water. Screw on flanges shall be capable of leak free operation to a pressure of 1600 kPa. The complete and assembled pipe with flange(s) shall be hydrostatically tested to this pressure before leaving the works.
- c. welded-on flanges shall be manufactured of steel, and shall comply with Class PN 16 (Figure B7). Welding shall be Type SP carried out in accordance with AS/NZS 1554.1.

## **5.9.0 JOINT RINGS AND FLANGE GASKETS**

- 5.9.1 All joint rings and flange gaskets shall be manufactured of elastomeric materials complying with AS 1646, except as discussed in Clause 5.9.7 of this specification. The design of joint rings shall be to the manufacturers design to suit the pipe socket.

Either method acceptable under AS 1646 may be used for testing seal hardness and rate of compression. Hardness shall not exceed 65 IRHD. Materials the subject of provisional approval will not be accepted.

- 5.9.2 Joint rings incorporating devices designed to provide a degree of locking or positive retention of spigots may be used only with permission from the General Manager Pine Water.
- 5.9.3 Joint rings shall provide a positive seal with maximum permissible joint deflection while retaining the maximum pipeline test pressure without leakage. Unless noted otherwise, this shall be not less than 1200 kPa.
- 5.9.4 The contractor shall supply one joint ring for each pipe or fitting socket.
- 5.9.5 Flange gaskets shall have fabric reinforcing inserted between layers of elastomeric material. Gaskets shall have a total uncompressed thickness of not less than 3 mm. Gaskets shall be of the full-face type only, and are to be cleanly cut to size and shall include accurately punched holes for bolts to suit their number, size and position in accordance with Clause 5.8.5 of this specification.
- 5.9.6 The contractor shall supply one flange gasket for every two pipe or fitting flanges. Where odd numbers of flanges are involved, a gasket is to be provided for the odd flange unless called up otherwise in the schedule.
- 5.9.7 Where specified, composite fibre flange gaskets shall be supplied in place of elastomeric gaskets. Composite fibre gaskets shall be suitable for use in the jointing of metallic flanges for waterworks purposes where pipeline operating pressures exceed 1.0 MPa. Gaskets are to be a minimum of 1.5 mm uncompressed thickness. Gaskets shall be of the full-face type, cleanly cut to size and shall include accurately punched holes for bolts to suit their number, size and position in accordance with Clause 5.8.5 of this specification.

## **5.10.0 PIPE FITTINGS**

- 5.10.1 Scour tees shall be supplied with a flanged off-take of a diameter specified to suit the required scour characteristics of the main. The off-take shall be at the invert of the through pipe. Materials and configuration of the fitting shall comply with Section 5.6.0 of this specification.
- 5.10.2 Air valve tees and hydrant tees shall be supplied with an 80 mm diameter flanged off-take. The off-take shall be located along the centreline of the through pipe. Materials and configuration of the fitting shall comply with Section 5.6.0 of this specification.

## **5.11.0 SLUICE VALVES**

- 5.11.1 Sluice valves shall be of the resilient seated type suitable for a working pressure of 1600 kPa and conforming to AS 2638.2.

- 5.11.2 The information required by Appendix B of AS 2638.2 can be found in Appendix C of this specification.
- 5.11.3 The stem material shall be stainless steel of either Grade 431, Grade 316 or Grade 630, in accordance with AS 2837, AISI, or UNS Grades S31600, S43100 or S17400. Stems shall have an integral thrust collar.
- The stem seal shall be made by a minimum of two “O” rings which are able to be replaced under full working pressure.
- 5.11.4 The direction of closing shall be anti-clockwise.
- 5.11.5 Sluice valves shall be supplied with an extension spindle or hand wheel where specified in the schedule. Extension spindles shall be a galvanised steel shaft of solid rod or hollow section tube, and of sufficient diameter and wall thickness to resist torsion under actuation, and flex between support brackets. The extension shaft shall be capable of being positively fixed and retained on to the spindle cap as indicated on the Pine Rivers Shire Council standard drawings.
- 5.11.6 The wedge shall be cast in ductile iron and totally encapsulated in an approved synthetic rubber conforming to AS 1646. Partially coated wedges are not acceptable.
- 5.11.7 The valve body, bonnet and top castings shall be manufactured from ductile iron and fully enveloped with a thermally bonded polymeric coating, applied by the fluidised bed technique, conforming to AS/NZS 4158. Alternatively, components may be manufactured from an approved corrosion resistant material without protective coatings.
- 5.11.8 All fasteners shall be stainless steel, complying with Section 5.21.0 of this specification.
- 5.11.9 Sluice valves shall be supplied with either flanged, spigot, or socket joints in accordance with Section 5.8.0 of this specification, as called for in the drawings and schedules.
- 5.11.10 Sluice valves used as scour valves may be supplied as either a regular flange-flange valve, or a flange-socket valve for use with regular spigot-socket pipework.
- 5.11.11 Lifting lugs shall be provided on all valves weighing in excess of 50 kg.

## **5.12.0 BUTTERFLY VALVES**

- 5.12.1 Butterfly valves shall be of the flanged or lugged body type. Flanged and lugged body valves shall be drilled to suit the pipework mating flanges. The body type shall be specified by the consulting engineer in the drawings and/or specifications.
- Wafer body valves shall not be used in general applications. They shall only be used in special circumstances and with approval of a Pine Rivers Shire Council engineer.
- 5.12.2 Lugged or flanged body valves shall be capable of being retained within the pipeline by one face alone and of maintaining a differential of the full working pressure across the valve when used in an end of line service.



- 5.12.3 Valves shall be heavy duty waterworks type with a resilient seat. The body of each valve shall be made of cast or ductile iron. The disc shall be corrosion resistant, of bronze, aluminium-bronze or stainless steel. The shaft shall be one piece stainless steel of Grades 316, 431 or 630 to either AS 2837 or AISI, or UNS Grades S31600, S43100 or S17400 with corrosion resistant bearings and shaft seals. All bolts and studs shall be stainless steel complying with Section 5.21.0 of this specification.
- 5.12.4 The sealing surfaces of the valve body shall be designed to seal on to the metal faces of pipework flanges specified. If the valve sealing surface does not seal on to the metal faces, the valve supplier shall also supply two 10 mm thick Grade 316 stainless steel insertion rings and two flange gaskets with each valve.
- 5.12.5 Valve actuation shall be anti-clockwise to close. Unless specified otherwise, actuation shall be by hand wheel at the valve or, by standard valve keys where extension shafts are provided for actuation remote to from the valve. An indicator is to be provided showing clearly the status of the valves' position.
- Butterfly valves shall be supplied with an extension spindle or hand wheel as specified in the schedule. Extension spindles shall be a galvanised steel shaft of solid rod or hollow section tube and of sufficient diameter and wall thickness to resist torsion under actuation and flex between support brackets. The extension shaft shall be capable of being positively fixed and retained on to the spindle cap as indicated on the Pine Rivers Shire Council standard drawings.
- 5.12.6 All butterfly valves of 300 mm diameter and greater are to include a gearbox. Unless specified otherwise, the gearbox ratio shall be selected to suit manual operation for the particular valve diameter. Gearboxes shall be mounted at the valve. Gearbox ratios are to be submitted to and approved by the superintendent and / or a Pine Rivers Shire Council engineer prior to supply of the valve.
- 5.12.7 All mounting bolts and cover bolts are to be stainless steel in accordance with Section 5.21.0 of this specification. Gearboxes shall be of a weatherproof type suitable for installation in a closed pit.
- 5.12.8 Lifting lugs shall be provided on all complete valve and gearbox assemblies weighing in excess of 50 kg.
- 5.12.9 Protective coatings shall be factory applied to all external surfaces of the valve body and gearbox. Surface preparation shall be carried out in accordance with AS 1627. Coatings shall be an approved two-pack epoxy coating, in accordance with Clause 5.23 of this specification.
- 5.12.10 Butterfly valves shall meet the following minimum test specifications unless specified otherwise, and shall be works tested to the following pressures:-
- a working pressure of 900 kPa
  - works test pressure on the disc of 1200 kPa
  - works test pressure on the valve body of 1800 kPa

The tests shall include:-

- a demonstration the valve will operate correctly from fully closed to fully open, and return to fully closed

- b. a disc test with pressure applied on one side - no leakage is permitted. The operation of the actuator is to be checked under this condition
- c. a body test with the disc partly open - no leakage is permitted

### 5.13.0 AIR VALVES

- 5.13.1 Air valves shall be Glenfield Kennedy "APEX" Figure 1272 or approved equivalent double acting vacuum and air release valves.
- 5.13.2 Alternative air valves are to be approved for use by the Manager Water Supply Services.
- 5.13.3 The body and covers of the air valve if not manufactured from non corrosive materials shall be fully enveloped with a thermally bonded polymeric coating, applied by the fluidised bed technique, conforming to AS/NZS 4158.
- 5.13.4 All air valves shall be supplied with a resilient seated butterfly valve. The butterfly valve shall be attached to the flange and air valve by a bolted flange or threaded fitting in a manner which will allow removal of the air valve without affecting attachment of the butterfly valve to the water main pipework.
- 5.13.5 Butterfly valves shall generally comply with Section 5.12.0 of this specification, however, hand lever actuation is preferred. The butterfly valve shall be of the same diameter as the air valve.

### 5.14.0 PRESSURE REDUCING VALVES

- 5.14.1 Pressure reducing valves shall be selected from a range of products which comply with Table 5.0 or equivalent as approved by the Manager Electrical/Mechanical Services.

**Table 5.0**

VALVE SIZE	VALVE MAKE
80 mm	Cla-Val or Parkway
100 mm	Parkway
150 mm	Cla-Val or Parkway
200 mm	Cla-Val or Parkway
250 mm	Parkway
300 mm	Cla-Val

- 5.14.2 The valve shall be capable of maintaining a constant downstream pressure regardless of changing inlet pressure or flow rate.
- 5.14.3 Pressure reducing valves shall be of a pilot operated automatic globe or angle type diaphragm valve. They shall be fluid actuated, and have a single moving diaphragm assembly incorporating a precision machined stem guided by upper and lower bearings. There shall be no pistons operating the valve or controls. All internal valve components shall be removable and repairable while the valve remains in line. Packing glands or stuffing boxes are not permitted. The valve is to be fitted with a position indicator calibrated to show percent of travel.

- 5.14.4 The valve body, cover, disc retainer and top diaphragm shall be manufactured from cast iron or ductile iron in accordance with AS 1830 or AS 1831.
- 5.14.5 The stem, disc guide and main valve seat shall be stainless steel, Grade 316 to AS 2837.
- 5.14.6 The valve body and cover shall be fully enveloped with a thermally bonded polymeric coating, applied by the fluidised bed technique, conforming to AS/NZS 4158, or painted with a two-part high build epoxy paint system approved for use with potable water. Paint shall be applied in accordance with Section 5.23.0 of this specification.
- 5.14.7 All fasteners shall be stainless steel in accordance with Section 5.22.0 of this specification.

#### **5.15.0 CHECK (REFLUX, OR NON RETURN) VALVES**

- 5.15.1 Check valves for use in general service shall be JOHN "Type 4205", or STOCKHAM "TILT-CHEK", or equivalent as approved by the Manager Electrical/Mechanical Services.
- 5.15.2 The valves shall be of the wafer type tilting disc configuration where the disc opens into the adjoining pipeline. The valve body may be supplied as either wafer body or flanged body type. All valves shall be supplied with a counter weight.
- 5.15.3 Valves shall be capable of reliable operation at pressures of up to 1600 kPa.
- 5.15.4 The valve body shall be manufactured from cast iron or ductile iron in accordance with AS 1830 or AS 1831.
- 5.15.5 The valve body shall be fully enveloped with a thermally bonded polymeric coating, applied by the fluidised bed technique, conforming to AS/NZS 4158.
- 5.15.6 The disc shall pivot on a pin located through the upper third of the disc diameter. The disc shall be manufactured from gunmetal or stainless steel Grade 316 to AS 2837. The hinge pin shall be manufactured from Grade 316 or 431 stainless steel to AS 2837.
- 5.15.7 Where pipeline conditions have been assessed by the General Manager Pine Water as being susceptible to water hammer, a nozzle type check valve shall be installed. This shall be a STOCKHAM "NOZ-CHECK" or equivalent as approved by the Manager Electrical/Mechanical Services.
- 5.15.8 Nozzle type check valves shall be generally conform with the requirements of Clauses 5.15.3 to 5.15.6 of this specification.
- 5.15.9 All fasteners shall be of stainless steel in accordance with Section 5.22.0 of this specification.

#### **5.16.0 PRE-TAPPED PROPERTY SERVICE FITTINGS**

- 5.16.1 Pre-tapped property service fittings are to be supplied as socket-socket fittings with two ¾" (nominal 20 mm) diameter BSP tappings each side at 75° to vertical. Fittings are to be supplied with a threaded plug for each tapped port, capable of withstanding a working pressure of 1600 kPa.
- 5.16.2 Pre-tapped fittings are to have a full fusion bonded polymeric coating applied by the fluidised bed technique in accordance with AS/NZS 4158.

## **5.17.0 GLOBE (BALL) VALVES AND OTHER PROPERTY SERVICE CONNECTION ITEMS**

- 5.17.1 Globe (ball) valves shall comply with AS 1628, and shall have a maximum working pressure not less than 1600 kPa.
- 5.17.2 Globe valves for use on pre-tapped property service fittings shall be a full bore straight through globe valve with  $\frac{3}{4}$ " (nominal 20 mm) diameter BSP thread, of male iron - female iron configuration. The valve body and ball shall be manufactured of bronze or de-zincification resistant copper alloy in accordance with AS 1565. The ball shall be PTFE coated. The seat shall be a resilient seat of nitrile rubber, PTFE or approved equivalent. Valves shall have a short tab type handle. Each valve shall be supplied with temporary protective end caps.
- 5.17.3 Nipples shall be  $\frac{3}{4}$ " (nominal 20 mm) diameter male iron - female iron, with BSP threads. Nipples shall be manufactured of brass or de-zincification resistant copper alloy in accordance with AS 1565.
- 5.17.4 A polyethylene or nylon insulating bush is required for installation between the nipple and globe valve. The bush is to have a male iron - female iron configuration with  $\frac{3}{4}$ " (nominal 20 mm) diameter BSP threads.

## **5.18.0 HYDRANTS**

- 5.18.1 Spring hydrants shall be 80 mm diameter and comply with AS 3952. The body and yoke shall be of either grey cast iron or ductile iron. The spring head or dome shall be manufactured of brass or gunmetal.
- 5.18.2 The internal and external surfaces of the hydrant body and yoke shall be coated with a thermal bonded polymeric coating applied by the fluidised bed technique in accordance with AS/NZS 4158.
- 5.18.3 All fasteners shall be stainless steel complying with Section 5.22.0 of this specification.

## **5.19.0 HYDRANT AND AIR VALVE RISERS**

- 5.19.1 All fittings used for attachment of hydrants and air valves to water mains are to be flange joint fittings.
- 5.19.2 Whilst not detailed in either AS/NZS 2280 or AS/NZS 2544, Hydrant bends shall comply generally with the requirements of these standards, and Section 5.6.0 of this specification. Hydrant bends shall be compatible with other fittings and pipes manufactured in accordance with these standards.
- The bends shall taper from 80 mm diameter at the position for the hydrant, to either 100 or 150 mm diameter maximum where the fitting joins with the pipeline.
- 5.19.3 Where hydrant or air valve tees are supplied with 100 mm off-takes, suitable tapered risers shall be used.
- 5.19.4 Risers shall be cast from ductile iron to AS/NZS 2280 or cast iron to AS/NZS 2544.

## **5.20.0 THRUST FLANGES AND WEEP FLANGES**

- 5.20.1 Thrust flanges may be cast integrally with a pipe as a special casting. The fitting and thrust flange shall be capable of withstanding thrusts generated by operations under the full test pressure of the pipeline as a dead end fitting without weakening or failure. Unless specified otherwise, the test pressure shall be 1200 kPa.

Cast-on thrust flange dimensions and configuration shall be not less than required for joint flanges as described in AS 4087 and Clause 5.8.0 of this specification.

Castings shall comply generally with AS/NZS 2280 or AS/NZS 2544 depending on material used.

- 5.20.2 Thrust flanges may be formed by mating a puddle flange to a length of ductile iron pipe. Pipes or pipe sections accepting puddle flanges shall be ductile iron, Class K12 or Flange Class in accordance with AS/NZS 2280. Puddle flanges used as thrust flanges shall comply with, or be not less than as required by AS/NZS 2280.

The pipe section shall be prepared by machining a groove in the outside surface of the pipe barrel and machining the puddle flange to match, providing an interference fit between these two components. A suitable epoxy shall be used between the flange and pipe during assembly. Machining and assembly shall be carried out only by the manufacturer. Stainless steel fasteners complying with Section 5.22.0 of this specification shall be used to assemble the two halves of the flange sections.

Fittings assembled in this manner shall only be accepted from manufacturers with an accredited quality system in place in accordance with AS 3900 or ISO 9000.

- 5.20.3 Thrust flanges on mild steel pipelines shall consist of a flange welded on to the pipe. The flange shall conform to the requirements of Clause 5.8.5 of this specification as a minimum. Welding shall be Type SP in accordance with AS 1554.1.

- 5.20.4 Weep flange configurations shall be similar to the requirements of 5.20.1 to 5.20.3 inclusive of this specification.

## **5.21.0 GIBAULTS AND COUPLINGS**

- 5.21.1 Gibaults and loose flange couplings shall be designed and manufactured suitable for use in a water reticulation pipeline, and capable of leak-proof operation at pressures up to 1200 kPa unless specified otherwise.

- 5.21.2 Gaskets and joint rings shall comply with Section 5.9.0 of this specification.

- 5.21.3 Bolts shall comply with Section 5.22.0 of this specification.

## GIBAULTS

- 5.21.4 All gibaults shall be of cast iron accordance with AS 1830, or ductile iron in accordance with AS 1831. Gibaults shall be supplied with an elongated barrel or sleeve of a 200 mm nominal length. Sleeves or barrels shall not be less than 180 mm long.

Barrels or sleeves shall be lined with a sulphate resisting mortar using Type SR cement in accordance with AS 3972. Alternatively the barrel may be coated with a fusion bonded polymeric coating in accordance with AS 4158, or painted with a 2 part high build epoxy paint suitable for use with potable water, in accordance with Section 5.23.0 of this specification. Collars or rings may also be so coated.

- 5.21.5 Gibaults shall have a number and size of bolts not less than those in the Table 5.1

**Table 5.1**

<b>Pipe Dia.</b>	100	150	200	225	250	300	375	450	500	525	600	750
<b>No. of Bolts</b>	3	3	4	4	4	6	6	8	8	8	12	12
<b>Bolt Dia. (mm)</b>	16	16	16	16	16	16	20	20	20	20	20	20

- 5.21.6 Preference shall be given to gibaults approved by the Water Services Association of Australia (WSAA).

- 5.21.7 Gibaults which include a collar designed to accept and prevent rotation of bolt heads, thus allowing assembly with a single wrench, are the preferred choice for gibaults up to and including 250 mm diameter.

Where these gibaults use other than hex head bolts e.g. cup head square neck, or purpose formed bolts these products will only be accepted provided the fasteners meet all other requirements of Section 5.22.0 of this specification, especially those relating to bolt strength grades.

- 5.21.8 Bolt lengths, and threaded sections of bolts shall be selected and supplied so as:-

- there is a minimum bolt projection equivalent to 1½ times the nut height clear beyond the external face(s) of the assembly when loosely assembled prior to tightening; and
- when gibaults are assembled and installed in accordance with accepted industry practice, there shall be a minimum of 10 mm thread remaining under the washer(s).

Alternatively, lengths of threaded rod with an additional nut and washer may be used in place of bolts, provided the rod is of a strength grade equivalent to that specified for bolts in Section 5.22.0 of this specification. A manufacturer's strength certificate shall be required for rod. The above minimum overall length of rod shall provide the minimum projection applicable to each face.

- 5.21.9 Where bolts have been made up from threaded rod and a welded on nut, the welds shall be TIG welds made by a welder qualified in that process. The finished article shall be pickled after welding to remove all scale.

### LOOSE FLANGE COUPLINGS

- 5.21.10 Loose flange couplings may be used as a dismantling joint where there is insufficient space for installation of a gibbault. Loose flange couplings may be of the non-thrust or thrust type.
- 5.21.11 On non-thrust type loose flange couplings, where flanges have raised faces or protrusions for the purpose of locating the sealing ring, a nut shall be included between the two loose flanges to secure the central flange against the flanged fitting.
- Where loose flanges have parallel sides without a raised section, and the seal ring is included in a chamfer section in one ring, the joint may be secured against the outer flange faces.
- 5.21.12 Thrust type loose flange couplings shall be secured in the same manner as described in Clause 5.21.7 of this specification for the loose end. The central flange on the fitting barrel shall be secured with a nut against each face of the flange.
- 5.21.13 Loose flange couplings which rely on attachment to pipe barrels with set screws shall not be permitted unless specifically approved by the Manager Water Supply Services.

### COUPLINGS

- 5.21.14 PVC, ductile iron and cast iron sliding collars are permitted for use to join sections of pipeline. PVC fittings shall comply with the relevant Australian Standard for PVC pipes and fittings. Ductile iron fittings shall comply with AS 2280 and Cast Iron fittings with AS 2544. The coupling shall be of a length of not less than the depth of two socket ends plus 20mm.

## **5.22.0 FASTENERS**

- 5.22.1 All fasteners shall be stainless steel of Grades 316 or 304 to either AS 1449, or AISI 316 or 304 (American Iron and Steel Institute) or UNS S31600 or S30400 as detailed in Clauses 5.22.2 to 5.22.9. This includes bolts, nuts, washers, studs, screws, masonry anchors and threaded items used for joining flanges, mounting equipment, or in the assembly of valve bodies and other components.
- 5.22.2 All stainless steel bolts, nuts, studs, masonry anchors and washers shall be marked in accordance with either the ISO 3506 or the AISI marking standards as appropriate. Products not marked in accordance with either of these standards shall be accompanied with a manufacturer's certificate indicating the grade and strength, and general authenticity of the products compliance with the requirements of this section.
- 5.22.3 All bolts, nuts, studs and masonry anchors up to and including 24 mm dia. shall be Class 70, having a minimum tensile strength of 700 MPa. Fasteners greater than 24 mm dia. may be Class 50, with a strength of 50 MPa.
- 5.22.4 Threads shall generally be cut in accordance with DIN 933 or DIN 931.
- 5.22.5 Bolts shall be metric series, hexagonal head. Studs shall be either hexagonal head, or where used in the assembly of components, may be socket head type. Bolts and studs shall be manufactured from Grade 316 stainless steel.
- 5.22.6 Nuts shall be metric series normal type, hexagonal nuts. Nuts shall be manufactured from Grade 304 stainless steel.

- 5.22.7 Washers shall be normal series washers manufactured from Grade 316 stainless steel.
- 5.22.8 Bolt and stud lengths shall be chosen and supplied such that when used to assemble materials supplied in accordance with this specification, there shall be a minimum of 10 mm thread remaining under the washer when the articles are assembled and, a minimum bolt projection of 10 mm clear beyond the external face of the nut.
- 5.22.9 Where products (such as valves) do not comply with standard flange dimensions described in Clause 5.8.5 of this specification or do not have any standard dimensions, and where the supplier of that product is responsible for supply of fasteners for use with that fitting, the supplier shall take these things into account when choosing and supplying the fasteners for use with that fitting.  
Where the supplier described above is not responsible for supply of associated fasteners, the supplier shall bring to the attention of the principal and/or superintendent, the variation between their product and the standard flange dimensions from Clause 5.8.5 of this specification.

## **5.23.0 COATING OF VALVES, PIPEWORK, FITTINGS AND FABRICATED ARTICLES**

- 5.23.1 All fabricated items not manufactured of all stainless steel, or supplied with a thermally bonded polymeric coating, and which are to be located above ground or in pits or chambers shall be painted, or hot dip galvanised.

5.23.2 Pipes, valves, fittings, fabricated items and other components which have not been coated with a thermal bonded polymeric coating, and which have been identified as requiring hot dip galvanising or painting by the manufacturer or supplier, shall be prepared and coated in accordance with Clauses 5.23.3 to 5.23.6 inclusive of this specification. An approved DENSO coating system or equivalent may be accepted by a Pine Rivers Shire Council engineer.

The superintendent shall provide the manufacturer or supplier with sufficient information to ensure the correct paint system is used. Where the requirements for preparation and painting exceed those in Clauses 5.23.4 to 5.23.6 of this specification the superintendent shall supply a detailed specification for the treatment required.

- 5.23.3 Hot dip galvanising shall be carried out in accordance with AS 4680, after final fabrication of the component.
- 5.23.4 Before painting, components shall be treated externally by abrasive blast cleaning followed by painting with an approved system as detailed in AS/NZS 2312, reference LP1-A or LP2-A as appropriate to the installation location.

### **5.23.5 ABRASIVE BLAST CLEANING**

- i. The surfaces to be blast cleaned shall be dry abrasive blast cleaned to a metal finish in accordance with AS 1627-Part 4 and AS 1627-Part 9 using one of the following methods:-
  - ❖ grit blasting using compressed air nozzles
  - ❖ grit blasting using centrifugal wheels
  - ❖ sand blasting using compressed air nozzles



- ii. The articles shall be cleaned by abrasive blast to a surface standard at least equal to Class 2½ as defined by AS 1627 - Part 4.
- iii. Metallic abrasive, where used, shall comprise cast iron, cut wire or grit and shall be hard, sharp and free from dust. The maximum particle size shall be not larger than that passing through 1.18 mm Australian standard sieve.
- iv. Non-metallic, silica free and silica material shall not be reused in the blasting operation.
- v. All free oil and moisture shall be effectively removed from the air supply lines of all blasting equipment using adequate filters and driers.
- vi. After blasting, the surface shall be brushed or blown down with clean dry air (using driers and oil mist filters in air lines), or vacuum cleaned to remove all blast products and abrasives from the entire surface including pockets and corners.
- vii. Blast cleaning operations shall not be performed on objects which have a surface temperature which is less than 3<sup>0</sup> C above the dew point of the ambient temperature, or when the humidity is calculated using a hygrometer, the wet bulb temperature differs from the dry bulb temperature by less than 7½% of the dry bulb temperature.
- viii. The cleaned surfaces shall be kept free of all contamination before painting and shall not be touched by bare hands or other bare parts of the body.
- ix. Any areas which become contaminated shall be immediately solvent cleaned in accordance with AS 1627 - Part 1.
- x. Any surface which has been abrasive blast cleaned shall be coated within four hours or less of blasting depending on climatic conditions.
- xi. All reference to the standard surface preparation shall be to AS 1627 - Part 4 Section 1.4 and AS 1627 - Part 9.

## 5.23.6

PAINING

- i. Where fabricated articles are not specified or shown on the drawings to be galvanized or hot dip galvanized, they shall be painted.
- ii. Proposed paint systems shall be submitted to the superintendent and/or a Pine Rivers Shire Council engineer for approval before use. Full details of the paint manufacturer's specifications, which shall include details of methods of application, dry film thickness, pot life, drying time, recoating time, thinners and compatibility between primer and top coats shall be submitted.
- iii. For wetted surfaces, the paint system shall be suitable for continuous immersion and, in the case of potable water, shall be approved by the Government Paint Committee for that purpose. The metalwork shall be painted with an approved system as detailed in AS 2312, reference LP1-A i.e. primed with an inorganic zinc silicate with a minimum dry film thickness of 65 microns and maximum of 75 microns, followed by two coats of high build catalysed epoxy paint, the two coats being different shades or colours. Total dry film thickness shall be not less than 325 microns. Micaceous iron oxide may be incorporated into the first of the two coats to assist bonding.

- iv. For other surfaces, the steelwork shall be painted with an approved system as detailed in AS 2312, reference LP2-A i.e. primed with an inorganic zinc silicate with a minimum dry film thickness of 65 microns and maximum of 75 microns, followed by two coats of high build catalysed epoxy micaceous iron oxide paint, the two coats being different shades or colours. Total dry film thickness shall be not less than 325 microns.
- v. The final external colour of painting on pipework and fittings shall be those called for in AS 1345, according to the use of the pipeline. The paint colour proposed for items other than pipework and fittings shall be submitted to and approved by the Pine Rivers Shire Council engineer before application or specified by the consulting engineer.

#### **5.24.0 CAST IRON COVERS AND FRAMES**

- 5.24.1 Unless detailed otherwise, covers and frames for valve and air release chambers and other structures shall be grey iron or ductile iron to the details shown on project drawings or the Pine Rivers Shire Council standard drawings, unless otherwise approved by a Pine Rivers Shire Council engineer. Multi-part cover systems with removable beams which provide a full opening are permitted.
- 5.24.2 Cast iron covers used in roadways or other areas subject to vehicular traffic shall be heavy duty covers generally complying with Class D of AS 3996.
- 5.24.3 Cast iron covers used in areas not subject to vehicular traffic shall comply with Class B of AS 3996.
- 5.24.4 All covers shall be of a type which when installed to the manufacturers specifications, provides a watertight installation and joint system.
- 5.24.5 Covers shall be supplied with one plastic insert for each lifting rebate in order to prevent entry of soil or concrete.

#### **5.25.0 VALVE KEY INSERT BOXES**

- 5.25.1 Valve key insert boxes used for creation of valve-key holes in chamber roofs and covers shall be of the twist-locking type only. Boxes and covers shall be manufactured of cast iron in accordance with AS 1830.

Screw down peep-eyes shall not be accepted.

#### **5.26.0 HYDRANT AND VALVE INSPECTION BOXES AND MARGIN SETTS**

- 5.26.1 Hydrant and valve inspection boxes supplied shall be in accordance with the Pine Rivers Shire Council standard drawing or other product approved for use as a hydrant or valve inspection box by the Manager Water Supply Services.
- 5.26.2 Margin setts for use with hydrant and valve boxes shall be matched to the inspection boxes. The margin sett shall fit with the inspection box in accordance with the requirements of the Pine Rivers Shire Council standard drawing.

## **5.27.0 PAYMENT UNDER A SCHEDULE OF RATES CONTRACT**

- 5.27.1 This section of the specification is intended primarily for Pine Rivers Shire Council projects. It may also be applied to other projects as described in the job specification and schedules.
- 5.27.2 This section of the specification identifies the obligations of the contractor and the items in the schedule of rates under which it is expected that a competent contractor would make a cost allowance to meet these obligations. The contractor shall not be entitled to any additional payment in meeting obligations set out in this specification or to be implied from the description of works to be carried out but not specifically referred to in this Section. The clause numbers listed in the clauses below are as found in this specification.
- 5.27.3 The contractor's obligations under Sections 5.2.0 to 5.6.0 inclusive shall be allowed for in the individual rates for items relating to supply of pipes, fittings, valves and other things generally.
- 5.27.4 The contractor's obligations under Section 5.7.0 shall be allowed for in the individual rates for items relating to supply of pipes and fittings, unless listed separately.
- 5.27.5 The contractor's obligations under Section 5.8.0 and Section 5.9.0 (Clauses 5.9.1, to 5.9.4 inclusive) shall be allowed for in the individual rates for items relating to supply of pipes, fittings, and valves.
- 5.27.6 The contractor's obligations under Section 5.10.0 shall be allowed for in the rates for items relating to supply of those individual fittings.
- 5.27.7 The contractor's obligations under Section 5.11.0 shall be allowed for in the rates relating to supply of sluice valves.
- 5.27.8 The contractor's obligations under Section 5.12.0 shall be allowed for in the rates for items relating to supply of butterfly valves.
- 5.27.9 The contractor's obligations under Section 5.13.0 shall be allowed for in the rates for items relating to supply of air valves.
- 5.27.10 The contractor's obligations under Section 5.14.0 shall be allowed for in the rates for items relating to supply of pressure reducing valves.
- 5.27.11 The contractor's obligations under Section 5.15.0 shall be allowed for in the rates for items relating to supply of reflux or check or non-return valves.
- 5.27.12 The contractor's obligations under Section 5.16.0 shall be allowed for in the rates for items relating to supply of pre-tapped property service fittings.
- 5.27.13 The contractor's obligations under Section 5.17.0 shall be allowed for in the rates for items relating to supply of globe (ball) valves, nipples and insulators (or sets of these) for property service connections.
- 5.27.14 The contractor's obligations under Section 5.18.0 shall be allowed for in the rates for items relating to supply of hydrants.
- 5.27.15 The contractor's obligations under Section 5.19.0 shall be allowed for in the rates relating to supply of risers.

- 5.27.16 The contractor's obligations under Section 5.20.0 shall be allowed for in the rates for items relating to supply of pipe specials with attached thrust or weep flanges.
- 5.27.17 The contractor's obligations under Section 5.21.0 shall be allowed for in the individual rates for items relating to supply of gibaults and / or loose flange couplings or couplings generally.
- 5.27.18 The contractor's obligations under Section 5.22.0 shall be allowed for in the rates for items relating to supply of bolts, nuts and washers, or sets of these components.
- 5.27.19 The contractor's obligations under Section 5.9.0 (Clauses 5.9.1, and 5.9.5 to 5.9.7 inclusive) shall be allowed for in the rates for items relating to supply of gaskets.
- 5.27.20 It is common for bolts, nuts, washers and flange gaskets to be ordered as a set for jointing flanged pipes. Where such sets are specified, the contractor's obligations under Clauses 5.27.18 and 5.27.19 shall be combined for that item.
- 5.27.21 The contractor's obligations under Section 5.23.0 shall be allowed for in the rates for supply of individual articles specified as requiring treatment by the manufacturer or supplier in accordance with that section.
- 5.27.22 The contractor's obligations under Section 5.24.0 shall be allowed for in the rates for items relating to supply of covers and frames.
- 5.27.23 The contractor's obligations under Section 5.25.0 shall be allowed for in the rates for items relating to supply of valve key insert boxes.
- 5.27.24 The contractor's obligations under Section 5.26.0 shall be allowed for in the rates for items relating to supply of hydrant and/or valve inspection boxes and margin setts.

# APPENDIX A

## INFORMATION REQUIRED BY APPENDIX B OF AS 2280 PURCHASING GUIDELINES

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### **Section B 2.1      Spigot and socket Pipes**

- (a) Nominal size of pipe and classification  
*Refer to job specification, drawings, schedule of rates or bill of quantities as appropriate*
- (b) Required effective length of individual pipes  
*5.5 m except that up to 10% may be 5.0 m long*
- (c) Coating and lining required  
*As in Section 2 of AS 2280, or described in this specification, or the job specification, drawings, schedule of rates or bill of quantities*
- (d) Whether a proof stress test is required  
*A proof stress test is not required*

### **Section B 2.2      Fittings and flanged Pipe**

- (a) Required nominal size and type of fitting and classification  
*Refer to job specification, drawings, schedule of rates or bill of quantities as appropriate.  
Fittings to be Class PN 20 minimum or Flange Class for pipes to be fitted with flanges.*
- (b) Classification of Flanges  
*Flanges to be Class PN 16*
- (c) Coating and lining required  
*As in Section 2 of AS 2280, or described in this specification, or the job specification, drawings, schedule of rates or bill of quantities*
- (d) Alternative flanges, if required  
*Refer to job specification and drawings, for details of alternative flanges*
- (e) Length and configuration of flanged pipes  
*Refer to drawings, schedule of rates or bill of quantities as appropriate*
- (f) Position of any bolt-on puddle flanges  
*Refer to drawings, schedule of rates or bill of quantities as appropriate*
- (g) Whether a proof stress test is required  
*A proof stress test is not required*
- (h) *Material and outside diameter of pipe to be used with fittings  
In accordance with AS 1477 Series 2 and / or AS 2280, unless specified otherwise in the drawings, schedule of rates or bill of quantities as appropriate. Special elastomeric joins rings shall not be used to adapt fittings designed for another range of pipe sizes to suit pipes in the size range specified*

## APPENDIX B

### INFORMATION REQUIRED BY APPENDIX A2 OF AS 2544 PURCHASING GUIDELINES

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- (a) Required nominal size and type of fitting  
*Refer to job specification, drawings, schedule of rates or bill of quantities, as appropriate*
- (b) Method, extent and location of repairs  
*As in Clause 2.3.2 of AS 2544*
- (c) Whether fittings are to be works hydrostatically tested under free-end or bulkhead conditions  
*Fittings may be tested under either free-end or bulkhead condition*
- (d) Tolerance to be allowed for ovality if other than specified in Clause 5.2.3  
*As specified in Clause 5.2.3 of AS 2544*
- (e) Type of joints required  
*Refer to job specification, drawings, schedule of rates or bill of quantities, as appropriate*
- (f) Dimensions of spigots, if other than specified in Table 5.1  
*As specified in Table 5.1 of AS 2544*
- (g) Coating or lining materials required  
*As in Section 6 of AS 2544*
- (h) Whether lifting lugs are to be provided  
*Lifting lugs are to be provided on all fittings with a mass greater than 50 kg*

## APPENDIX C

### INFORMATION REQUIRED BY APPENDIX B OF AS 2638.2 PURCHASING GUIDELINES

#### Section B2

Size (DN)	Refer to job specification, drawings, schedule of rates or bill of quantities as appropriate
Number of this Standard	AS 2638.2
Direction of Closure	Anticlockwise to close
Design type	Non rising spindle
End connections	<i>Refer to Sections 5.11.0 and 5.8.0 of this specification, and to the job specification, drawings, schedule of rates or bill of quantities</i>
Materials	<p><i>Wedge to be of ductile cast iron fully encapsulated in rubber complying with AS 1646; partially encapsulated wedges are not acceptable</i></p> <p><i>Stem shall be stainless steel Grade 431, 316, or 630 to AS 2837, or UNS Grade S31600, S43100 or S17400 in accordance with clause 5.11 of this specification</i></p> <p><i>Bolts, gland bolts and fasteners shall be stainless steel in accordance with Section 5.22.0 of this specification</i></p>
Actuation	<p>Refer to job specification, drawings, schedule of rates or bill of quantities as appropriate</p> <p>Connection flanges to be in accordance with Section 5.8.0 of this specification</p> <p>A position indicator will not be required</p> <p>The differential pressure will be the maximum operating pressure for the class of valve</p>
Installation	<i>Valves will be placed vertically unless indicated otherwise on the project drawings</i>
Application	Waterworks purposes
Frequency of Operation	Subject to the needs of the installed location
Additional marking	<i>Only those markings specified as standard in AS 2638.2 are required</i>
Special requirements	packing <i>The gate shall be closed for despatch</i>
Testing	The principal / superintendent / Pine Rivers Shire Council engineer reserves the right to witness tests
Additional tests	<i>Only those tests specified as standard in AS 2638 are required</i>
Type test certificate	A Type test certificate will be required if the supplier does not have an accredited Quality system in accordance with ISO 9000 / AS 3900 in place

Production test certificate

*A test certificate shall be forwarded to the superintendent and/or a Pine Rivers Shire Council engineer for each and every valve*

## **APPENDIX C**

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### **Section B4**

Socket profile details

Socket profiles meeting the test requirements of AS 2280 Section 4, and of suitable depth for use with non-metallic pipes as provided for in WSA TN2

Details of guide liners for valves installed in other than the vertical position

Supplier to provide details for approval from the General Manager Pine Water

External coating for gearboxes

Gearboxes to be coated in accordance with Section 5.23 of this specification