1 REFERENCES

1.1 WS-SPEC, WATER SERVICES SPECIFICATION

This project specification references the current issue of WS-SPEC, including any Addenda, but neither is included herein. WS-SPEC is available from Standards Australia, Customer Services Centre, GPO Box 5420, Sydney NSW 2001, telephone: 1300 654 646 and e-mail: sales@standards.com.au". The addenda are available as a free download from the website www.standards.com.au, noting that the keywords "water services specification" must be used, as WS-SPEC is not recognised. Tenderers shall make their own arrangements to obtain a copy.

STRATEGIC PRODUCTS

The following Sections of the ***WS-SPEC*** form part of this specification:

Section	SP1	Steel Pipes and Fittings
Section	SP2	Ductile Iron Pipes and Fittings
Section	SP3	Grey (Cast) Iron Fittings
Section	SP4	PVC Pipes and Fittings
Section	SP6	Polyethylene Pipes and Fittings
Section	SP15	Elastomeric Seals
Section	SP20	Sluice Valves Metal Seated
Section	SP21	Sluice Valves Resilient Seated
Section	SP27	Air Valve

2 PIPES AND FITTINGS

2.1 GENERAL

Pipes and fittings shown on contract drawings are based on PVC pipes and fittings (adopted DICL fittings when PVC fittings is not available).

The following nominated materials and classes are suitable for this project.

Pipes and fittings:

- RRJ (rubber ring joints) SCL (Steel Cement Lined) pipes and fittings shall be external FBPE coating system with minimum 5 mm wall thickness.
- Welded joints SCL pipes and fittings shall be external FBPE coating system with minimum 5 mm wall thickness. Welded joints shall be butt joint with collar (minimum 5 mm thickness plate). Wall thickness of pipeline and encasing pipe for roadway/highway crossings refer to drawings.
- Socket DICL (Ductile Iron Cement Lined) pipes and fittings Class K9 or flange class pipes in accordance with Appendix H, Figure H1 of AS/NZS 2280:2004.
- Flanged DICL pipes and fittings Class K12.
- PVC pipes and fittings shall be minimum PN12, Series 2.
- PE pipes and fittings shall be minimum PN 16 for PE 80B SDR 9 or PN 16 for PE 100 SDR 11 with butt-welded joints. PE pipes and fittings internal diameter to be similar to PVC and/or DICL pipes and fitting's internal diameter.

Flanges:

- Flanges for Ductile Cast Iron pipes and fittings to be Class 16 Table C.
- Flanges for Steel and Grey Cast Iron fittings to be Class 14 Table C.

Bolts, nuts and washers for flanged joints, shall comply with Clause ***MATERIALS*** on ***SECTION TR13*** of the ***WS-SPEC***.

For alternative proposal the above nominated material(s) and class(es) shall be used.

2.2 STEEL PIPES AND FITTINGS

STEEL PIPES AND FITTINGS: To ***SECTION SP1*** and the following:

ITEM	PROJECT REQUIREMENTS (* See Practices Table of Sections SP1 & SP15)
Application (water: potable/non-potable, sewerage, pressure/non-pressure)	*Potable water, pressure*
Pipes - Nominal size(s) (to Table C1, AS 1579) - Wall thickness and steel grade - Length (exact or random) - Joint type(s) - Coating and lining	*Refer to Clause **PIPES AND FITTINGS** (at this section), Contract Drawings and Schedule of Rates and Lump Sum Items* - *FBPE coating or equivalent, Cement mortar lining*
Fittings - Nominal size(s) (to Table C1, AS 1579) - Type(s) and jointing - Coating and lining	*Refer to Clause **PIPES AND FITTINGS** (at this section), Contract Drawings and Schedule of Rates and Lump Sum Items* - *FBPE coating or equivalent, Cement mortar lining*
Welded collar (banded) joints	*Required*
Flanged joint bolting selection (excluding valves)	*Required*
Flange gaskets, O-rings and lubricants	*Required*
Elastomeric seal material and lubricant	** EPDM*
Bactericidal lubricant	*Required*
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Certificate of Compliance, to Section SP1	Manufacturer to supply

2.3 DI PIPES AND FITTINGS

DI PIPES AND FITTINGS: To ***SECTION SP2*** and the following:

ITEM	PROJECT REQUIREMENTS (* See Practices Table of Sections SP2 & SP15)
Application (water: potable/non-potable, sewerage, pressure/non-pressure)	*Potable water, pressure*
Pipes - Nominal size(s) - Class(es)	- *Refer to Clause **PIPES AND FITTINGS** (at this section), Contract Drawings and Schedule of Rates and Lump Sum Items*
- Jointing	- *Socketed and/or flanged joints*
- Coating and lining	- ** Cement lined, polyethylene sleeved*
Fittings - Nominal size(s) - Class(es)	- *Refer to Clause **PIPES AND FITTINGS** (at this section), Contract Drawings and Schedule of Rates and Lump Sum Items*
- Type and jointing	- *Socketed and/or flanged joints*
- Coating and lining	- ** Cement lined, polyethylene sleeved*
Series 1 (metric) or Series 2 (cast iron OD)	*Series 2*
Elastomeric seal material	** EPDM*
Bactericidal lubricant	*Required*
Polyethylene sleeving	*Required*
Adhesive tape, straps	*Required*
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Certificate of Compliance, to Section SP2	Manufacturer to supply

2.4 CI FITTINGS

CI FITTINGS: To ***SECTION SP3*** and the following:

ITEM	PROJECT REQUIREMENTS (* See Practices Table of Sections SP3 & SP15)
Application (water: potable/non-potable, sewerage, pressure/non-pressure)	*Potable water, pressure*
Fittings - Nominal size(s) - Class(es) - Type(s) and jointing - Coating and lining	 - *Refer to Clause **PIPES AND FITTINGS** (at this section), Contract Drawings and Schedule of Rates and Lump Sum Items* - *Socketed and/or flanged joints* - ** Cement lined, polyethylene sleeved*
Series 1 (metric) or Series 2 (cast iron OD)	*Series 2*
Flanged joint bolting selection (excluding valves)	*SS 316*
Flange gaskets and lubricant	*Required*
Elastomer seal material	** EPDM*
Bactericidal lubricant	*Required*
Hydrostatic testing of fittings	** Required*
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Certificate of Compliance, to Section SP3	Manufacturer to supply

2.5 PVC PIPES AND FITTINGS

PVC PIPES AND FITTINGS: To ***SECTION SP4*** and the following:

ITEM	PROJECT REQUIREMENTS (*See Practices Table of Sections SP4 & SP15)
Application (water: potable/non-potable, sewerage, pressure/non-pressure)	*Potable water, pressure*
Series 1 (metric) or Series 2 (cast iron OD)	*Series 2*
Pipes - Nominal size(s) - Class(es)	- *Refer to Clause **PIPES AND FITTINGS** (at this section), Contract Drawings and Schedule of Rates and Lump Sum Items*
Fittings	*PVC, DICL/CICL fittings*
Elastomer seal material	* *Natural rubber*
Bactericidal lubricant	*Required*
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Certification of Compliance, to Section SP4	Manufacturer to supply

2.6 ELASTOMERIC SEALS

ELASTOMERIC SEALS: To ***SECTION SP15*** and the following:

ITEM	PROJECT REQUIREMENTS (* See Practices Table of Section SP15)
Elastomers - Material - Type - Hardness - Profile	- * - - To pipe and fitting manufacturer's details -
Root inhibitor	Not required
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Certificate of Compliance, to Section SP15	Manufacturer to supply

ADDITIONAL REQUIREMENTS: EPDM is also acceptable for DI pipes.

2.7 PE PIPES AND FITTINGS

PE PIPES AND FITTINGS: To Section SP6 and the following:

ITEM	PROJECT REQUIREMENTS (*See Practices Table of Sections SP6 & SP15)
Application (water: potable/non-potable, sewerage, pressure or non-pressure)	*Potable water, pressure*
Pipes - Nominal size(s) - Class(es) - Polymer type	 - *Refer to Clause **PIPES AND FITTINGS** (at this section), Contract Drawings and Schedule of Rates and Lump Sum Items* - Manufacturer to nominate
Fittings - Type (EF, mech., butt) - Nominal size(s) - Class(es) - Polymer type	 - *Butt* - *Refer to Clause **PIPES AND FITTINGS** (at this section), Contract Drawings and Schedule of Rates and Lump Sum Items* - Manufacturer to nominate
Elastomeric seal material and lubricant	*
Bactericidal lubricant	Manufacturer to supply for potable water
Backing rings - Material - Bolting selection (excluding valves)	 - Galvanised steel with external *coating **SYSTEM W2-G** as specified in **SECTION TR20.*** - *Stainless Steel 316*
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Certificate of Compliance, to Section SP6	Manufacturer to supply

3 VALVES

3.1 GENERAL

All valves shall be suitable for the function intended and shall be in accordance with the following requirements.

All valves shall be supplied in accordance with the appropriate Australian Standard or the requirements of the ***WS-SPEC*** if an Australian Standard does not exist.

All sluice gate valves shall be socket valves generally in accordance with AS 2638 Cast Iron Sluice Valves for waterworks purposes with Table C flanges, full face, a working pressure of 1400 kPa. All valves shall be works tested to a body hydrostatic test pressure of 2800 kPa and a working pressure of 1400 kPa. The test at the working pressure shall be a drop type test. For metal seated leakage shall be in accordance with the permissible leakage rate as per Table 5.2 of AS 2638. For resilient seated valves there shall be no leakage to occur tested from both sides. In addition there shall be a drop tight test at 200 kPa, this test shall be carried out as an open-end test. The leakage rates shall also apply to the 200 kPa test.

Stop Valves - Buried water service Sluice Valve to AS 2638 with resilient seats and nylon coated may be used up to 300 mm and metal seated for any size.

3.2 SLUICE VALVES METAL SEATED

Buried service valve shall have cast or forged steel guards fitted to the top of the spindles for operation with a valve key.

SLUICE VALVES METAL SEATED: To ***SECTION SP20*** and the following:

ITEM	PROJECT REQUIREMENTS (* See Practices Table of Sections SP20 & SP30)
Valve size(s), class(es) and flange class(es)	*Size refers to Contract Drawings and Schedule of Rates and Lump Sum Items.* *Flange class: Steel – Class 14, DI - Class 16.*
Materials: - Body and bonnet - Seal retainer - Wedge core - Seating rings - Stem - Gear box housing - Seat (body) - Seat (wedge) - Spindle Nut	 - *CI AS 1830/T220 / DI AS 1831 400-12 minimum* - *Gunmetal / AS 1565 C83600* - *CI AS 1830/5220* - *Required* - *Stainless steel ASTM A276 / SS 316 or 431 – AL Brace AS/NZS 486* - *Not required* - *GM AS 1565/83600* - *GM AS 1565/83600* - *GM AS 1565/83600*
Closure direction	*Clockwise*
Flanged joint bolting selection (fasteners)	*Not Required*
Coatings	** Thermal bonded*
Additional testing	*200 kPa*
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Flange gaskets	*Not Required*
Bactericidal lubricant	*Not Required*
Type Test Results	If no Aust. Std., manufacturer to supply
Certificate of Compliance, to Section SP20	Manufacturer to supply
Test Certificate of Results, obtained to establish compliance to Section SP20	*Required*

3.3 SLUICE VALVES RESILIENT SEATED

Resilient seated in accordance with AS 2638

SLUICE VALVES RESILIENT SEATED: To ***SECTION SP21*** and the following:

ITEM	PROJECT REQUIREMENTS (* See Practices Table of Sections SP21 & SP30)
Valve size(s), class(es) and flange class(es)	*Size refers to Contract Drawings and Schedule of Rates and Lump Sum Items.* *Flange class: Steel – Class 14, DI - Class 16.*
Materials: - Body and bonnet - Seal retainer - Wedge core (wedge encapsulation rubber AS 1646) - Stem - Gear box housing	 - *DI AS 1831 400-12 minimum* - *Gunmetal / AS 1565 C83600* - *DI AS 1831 400-12 or Gunmetal AS 1565 C83600* - *431 ASTM A276* - *Not required*
Closure direction	*Clockwise*
Flanged joint bolting selection (fasteners)	*Not Required*
Coatings	* *thermal bonded*
Additional testing	-
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Flange gaskets, O-rings and lubricants	*Not Required*
Bactericidal lubricant	*Not Required*
Type Test Results	If no Aust. Std., manufacturer to supply
Certificate of Compliance, to Section SP21	Manufacturer to supply
Test Certificate of Results, obtained to establish compliance to Section SP21	*Required*

3.4 AIR VALVES

AIR VALVES: To ***SECTION SP27*** and the following:

ITEM	PROJECT REQUIREMENTS (* See Practices Table of Sections SP27 & SP30)
Valve size(s), class(es) and flange class(es)	*DN 80, Class to suit working (operation) pressure 1200 kPa (120m)* *Flange Class: Steel – Class 14, DI - Class 16*
Materials: - Body - Cover - Float - Seats, rigid - Levers (small orifice valves) - Float guide (double air valves)	 *DI AS 1831 400-12 minimum* *DI AS 1831 400-12 minimum* *SS 316* *Gunmetal* *SS 316* *Gunmetal*
Flanged joint bolting selection (fasteners)	*SS 316 ASTM A276*
Coatings	** Thermal bonded (Thermosetting Epoxy)*
Additional testing	*Seat test at 1400 kPa, No leakage*
Acceptable Product Verification Report	Manufacturers without Product Cert. to supply
Flange gaskets, O-rings and lubricants	*Flange gaskets required*
Bactericidal lubricant	*Required*
Type Test Results	If no Aust. Std., manufacturer to supply
Certificate of Compliance, to Section SP27	Manufacturer to supply
Test Certificate of Results, obtained to establish compliance to Section SP27	*Required*