Engineering

Technical Standard

TS 0500 – Authorised Products – Water & Sewer Maintenance

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Government of South Australia

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Application & Interpretation of this Document

It is the responsibility of the users of this Standard to ensure that the application of information is appropriate and that any designs based on this Standard are fit for SA Water's purposes and comply with all relevant Australian Standards, Acts and regulations.

Users of this Standard accept sole responsibility for interpretation and use of the information contained in this Standard. Users should independently verify the accuracy, fitness for purpose and application of information contained in this Standard.

Only the current revision of this Standard should be used which is available for download from the SA Water website.

Significant/Major Changes Incorporated in This Edition

This revision updates the April 2016 edition of TS 0500 Authorised Products - Water and Sewer Maintenance. The clause numbers described below identify changes from version 2.0

Clauses 1
Introduction text updated.
Clauses 1.1
Purpose text updated.
Clause 1.4
Definitions table updated.
Clause 2.1
New clause added - Safety in Design.
Clause 3.1.2.1
Sizes updated.
Clause 3.1.2.6
Valve anchoring bars added.
Clause 3.1.8.2
Manufacturer name change – **Civilmart.**
Clause 4.7.1.1
Manufacturer name change – **Civilmart.**
Clause 4.7.1.2
Manufacturer name change – **Civilmart.**
Clause 4.7.2
Manufacturer name change – **Civilmart.**

Document Controls

Revision History

Revision	Date	Author	Comments
1.0	31 March 2016	R Pearce	
2.0	10 January 2022	K Claridge	Refer Pg 2 and 3 for identified changes in this revision
3.0	15 March 2022	K Claridge	Refer Pg 2 and 3 for identified changes in this revision

Template: Technical Standard Version 5.00, 01/03/2016

Approvers

Role	Signature and Date
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Reviewers

Role	Name	Revision	Review Date

Contents

1 Introduction

SA Water is responsible for operation and maintenance of an extensive amount of engineering infrastructure.

This standard has been developed to assist in the design, maintenance, construction, and management of this infrastructure. This Document lists technically conforming products approved for installation within SA Water's infrastructure networks.

The products listed have been approved after their evaluation based upon the SA Water product appraisal procedure.

Approved products shall only be obtained from the listed manufacturer or their authorised agent.

In line with the Australian Drinking Water Guidelines (ADWG),

"*The products used in water systems should be subjected to an audited system of quality control. The effectiveness of preventive measures is highly dependent upon the design and implementation of associated process control programs. To consistently achieve a high-quality water supply, it is essential to have effective control over the processes and activities that govern drinking water quality (ADWG)*.

In addition, the ADWG outlines that:

"*Contaminants may also be introduced when water comes into contact with materials such as filter media, protective coatings, linings and liners, joining and sealing products, pipes and fittings, valves, meters and other components*".

Approved products shall only be obtained from the listed manufacturer or their authorised agent.

All products intended for contact with drinking water, shall be tested for compliance with AS/NZS 4020 (2018). Compliance with this standard must also be verified at any change of material composition, change of design, or every 5 years - whichever occurs first.

1.1 Purpose

The purpose of this standard is to detail minimum requirements to ensure that assets covered by the scope of this standard are constructed and maintained to consistent standards and attain the required asset life.

This document provides confirmation of products SA Water has authorised, based on their technical merits. Design Consultants and Construction Contractors should use the information presented within this document for confirmation of products SA Water has authorised for use.

Product Manufacturers, suppliers and other stakeholders may also use the information as reference material.

SA Water personnel should source items from the Store. If not stocked they should procure by means of:

- utilising the relevant SA Water Period Contract or Standing Offer Arrangement,
- where an item is not covered under a Contract or Standing Offer Arrangement, contacting a relevant Stores or Procurement Officer.

1.1.1 Compliance Requirements

All products intended for contact with drinking water, shall be tested for compliance with the standards listed in this document, including AS/NZS 4020 (2018). Compliance with this standard must also be verified at any change of material composition, change of design, or every 5 years - whichever occurs first.

Clause 6.8 of AS/NZS 4020 (2018), states that organic compounds must be within the values listed in the ADWG, which sets the limits for NDMA leaching at 100 ng/L. However, SA Water has the additional requirement that the testing of each compound, shall be undertaken in Chloraminated water and that the 9-day result, shall be < 30 ng/L, **for rubber seals intended for use in PVC pressure pipes (from 1st July 2021).**

1.1.2 Requirements for dual-reticulation infrastructure

In compliance with the Office of the Technical Regulator requirements, from 1st July 2021 it will be mandatory for all non-drinking water; valves, pipes and fittings, to be manufactured in a Purple/Lilac colour. For materials where this is not possible, they shall be powder-coated or epoxy painted, no darker than Jacaranda P24 or Purple P12 and no lighter than Lilac P23.

1.2 Glossary

The following glossary items are used in this document:

Term	Description
NDW	Non-Drinking Water
PVC	Polyvinyl Chloride
SA Water	South Australian Water Corporation
SS	Stainless Steel
TG	SA Water Technical Guideline
TS	SA Water Technical Standard
VC	Vitrified Clay

1.3 References

1.3.1 Australian and International

The following table identifies Australian and International standards and other similar documents referenced in this document:

Number	Title
AS 1432	Copper tubes for plumbing, gasfitting and drainage applications
AS 1646	Elastomeric seals for waterworks purposes
AS 1831	Ductile Cast Iron
AS 2345	Dezincification resistance of copper alloys
AS 2419.2	Fire hydrant installations - Fire hydrant valves
AS 3688	Water supply and gas systems - Metallic fittings and end connectors
AS 3996	Access covers and grates

Number	Title
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 4020	Products in contact with Drinking Water
AS/NZS 4129	Fittings for polyethylene (PE) for pressure applications
AS/NZS 4158.1	Polymeric coatings on valves and fittings for water industry purposes
AS/NZS 4456	Masonry units and segmental pavers
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage
WSA PS 270	Mechanical Couplings, Non-End Thrust Restraint for pressure applications

1.3.2 SA Water Documents

The following table identifies the SA Water standards and other similar documents referenced in this document:

Number	Title
TS 0503	Authorised Products for Water Systems

1.4 Definitions

The following definitions are applicable to this document:

Term	Description
SA Water's Representative	The SA Water representative with delegated authority under a Contract or engagement, including (as applicable): • Superintendent's Representative (e.g. AS 4300 & AS 2124 etc.) • SA Water Project Manager • SA Water Construction Technical Officer/Manager • Reticulation Networks Wastewater/Water Specialist • SA Water nominated contact person
Responsible Discipline Lead	The engineering discipline expert responsible for TS 0500 defined on page 3 (via SA Water's Representative)
Constructor	The organisation responsible for constructing and installing infrastructure for SA Water whether it be a third party under contract to SA Water or an in-house entity.
Designer	The organisation responsible for designing infrastructure for SA Water whether it be a third party under contract to SA Water or a Constructor, or an in-house entity

1.5 Disclaimer

- SA Water reserves the right to alter, amend or withdraw this document, at any time, without prior notice.
- SA Water does not give preference to any particular make or type of product listed herein. Manufacturers are presented in alphabetical order, not in any order of preference.
- All products listed may be subject to change by the manufacturer. In such circumstances manufacturers are required to notify SA Water of any changes in the design, materials or manufacturing process of any approved product. SA Water is reliant upon manufacturers providing such notification in a timely manner and takes no responsibility for any issue that may arise should a manufacturer fail to do so.
- It is the responsibility of the Designer/Constructor to ensure selected products are appropriate for the intended application, comply with the infrastructure category and meets the relevant Australian standards.
- It is the responsibility of the Constructor to ensure components do not exceed any expiry date.
- Product sizing may vary between manufacturers. Size ranges provided herein are a guide only and the Designer/Constructor shall refer to the manufacturer for the product size and availability. Information within this document is correct at time of publication. The date of publication of this document can be found on the front page and in the left hand corner of the footer on each subsequent page.

2 Scope

This document specifies products that are authorised for use during maintenance of the following water and sewer systems:

- Water reticulation systems up to a maximum size of DN 375,
- Gravity sewer systems up to a maximum size of DN 300,
- Pressure sewer systems (i.e. sewer pumping mains) up to a maximum size of DN 200.

2.1 Safety in Design

SA Water is committed providing safe workplaces for our people and safe services for our customers.

In keeping with this commitment, and to ensure the Supplier/Manufacturer has satisfied their legislated duties, the Supplier/Manufacturer shall provide information in accordance with the Work Health and Safety Act 2012 (SA) part 2 division 3, section 25. This may take the form of Operation and Maintenance manuals and/or SiD Hazard Registers (as specified by TS0101).

Designers that utilise products contained in this Standard shall apply SA Water Technical Standard TS0101 to incorporate the information provided by the Supplier/Manufacturer in the development of their design/s and transfer this to relevant parties.

3 Mains Water

(For NDW fittings not listed below, please refer to TS 0503)

3.1 Fittings

3.1.1 Brass

3.1.1.1 Flared

All Fittings Shall Comply With Australian Standard/s **AS 2345** **AS 3688** **AS/NZS 4020**	Adaptor - Tube to BSP Female 	Tapping Nipple or Adaptor - Tube to BSP Male 
	DN15 - 20	DN15 - 20
	Coupling Nipple 	Flared Nut 
	DN18 - 20	DN18 - 20
Manufacturers	**Autotherm**	**Autotherm**
	Wadham	**Wadham**

3.1.1.2 Couplings

All Fittings Shall Comply With Australian Standard/s **AS 2345** **AS 3688** **AS/NZS 4020**	BSP Female Hex 	BSP Female Tube 	Tube Assembly 	Inverted Nut 
	DN15 - 20	DN25 - 50	DN25 - 50	DN25 - 50
Manufacturers	**Autotherm**	**Autotherm**	**Autotherm**	**Autotherm**
	Wadham	**Wadham**	**Wadham**	

3.1.1.3 Plug, Nipple & Reducers

All Fittings Shall Comply With Australian Standard/s **AS 2345** **AS 3688** **AS/NZS 4020**	BSP Plug 	Hex Nipple 	Hex Reducer Male Male 	Oct Reducer Male Male 
	DN10 - 20	DN10 - 50	DN10 - 50	DN57 x 50
Manufacturers	**Autotherm**	**Autotherm**	**Autotherm**	**Autotherm**
	Wadham	**Wadham**	**Wadham**	**Wadham**

3.1.1.4 Unions & Compression Sleeve

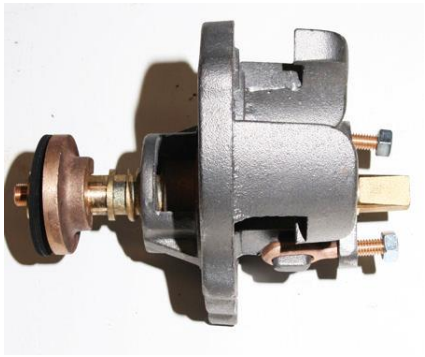
All Fittings Shall Comply With Australian Standard/s **AS 2345** **AS 3688** **AS/NZS 4020 (2018)**	Flat Gasket Seat UnionBSP Male to Female 	Tube to Female Pipe 	Compression Sleeve 
	DN10 x 16	DN20 - 25	DN25 – 50
Manufacturers	**Autotherm**	**Autotherm**	**Autotherm**

3.1.2 Valves

3.1.2.1 Angle Valve Head Assembly

All Fittings Shall Comply With Australian Standard/s **AS 2345** **AS 3688** **AS/NZS 4020 (2018)**	 DN15 – 50
Manufacturer	**Autotherm**
	Wadhams

3.1.2.2 Fireplug Head Assembly – Original EWS Style

All Fittings Shall Comply With Australian Standard/s **AS 2419.2** **AS/NZS 4087** **AS/NZS 4020 (2018)**	 DN50 - 300	
Manufacturer	**Tuff Tap**	
	Viadux	

3.1.2.3 Brass Ball Valve

All Fittings Shall Comply With Australian Standard/s **AS 2345** **AS 3688** **AS/NZS 4020 (2018)**	Brass body with Stainless Steel Ball and Stainless Steel handle. DN 25, 40, 50	 Series 1297
Manufacturers	**Refer TS 0503 Clause 7.2.2.1**	

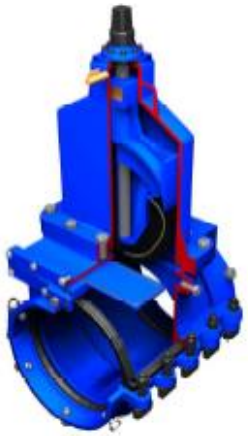
3.1.2.4 DN 20 x 90˚ Angle Valves

All Fittings Shall Comply With Australian Standard/s **AS 2345** **AS 3688** **AS/NZS 4020 (2018)**	Brass body with Stainless Steel Ball DN20 only	 One-Piece Valve	 with **Stainless Steel** handle
Manufacturers	**Refer TS 0503 Clause 7.2.2.2**		

3.1.2.5 NDW Ball Valves

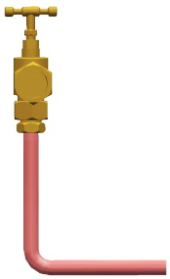
All Fittings Shall Comply With Australian Standard/s **AS 2345** **AS 3688** **AS/NZS 4020 (2018)**	Brass body with Stainless Steel Ball Solid Lilac/Purple colour for NDW Systems	 DN20	 DN 25, 40, 50
Manufacturers	**Refer TS 0503 Clause 7.2.2.3**		

3.1.2.6 Gate Valves

All Fittings Shall Comply With Australian Standard/s **AS/NZS 2638** **AS 4181** **AS/NZS 4020 (2018)**	Ductile Iron FBE Coated. Two-part clamp Systems. Resilient seated gate. **Note:** For use on live mains, where no shut-down is possible. S-Gate valve installation is only to be undertaken by trained personnel.	 DN 80 - 375
	Note: For anchoring to unrestrained pipe (e.g. AC, CI & PVC etc), use Akzo Nobel Resicoat R-4ES, mild steel restraining bars. To be attached using stainless steel bolts and in line with anchor block design shown in Table 1, of the WSCM drawing 4005-30003-07	 Length = 4 x pipe diameter Width 50 mm Thinkness 6 mm  Four restraining bars are to be secured using M16 bolts ≤ DN 200 M20 bolts ≥ DN 250
Manufacturers	**DAHSIAN (S-Gate Valve - PN 16)**	

3.1.3 Riser Assemblies

3.1.3.1 Inlet

All Fittings Shall Comply With Australian Standard/s **AS 1432** **AS 4809** **AS/NZS 4087** **AS/NZS 4020 (2018)**	20mm Right Angle Valve For Copper Water Connections 	20mm Right Angle Valve For 25mm PE Water Connections 	20mm Right Angle Valve For PE Transition Couplings 
	DN20 x (300 & 530)	DN25, 40, 50 x 530	DN20 x (300 & 530)
Manufacturer	**Autotherm**	**Autotherm**	**Autotherm** **Wadhams**

3.1.3.2 Outlet

All Fittings Shall Comply With Australian Standard/s **AS 1432** **AS 4809** **AS/NZS 4087** **AS/NZS 4020 (2018)**	Standard or 20mm Dual Check Meter (Female Male) 	(Male Male) 
	DN25, 32, 40 x 300 or DN20 x (150 & 300)	DN50 x 300
Manufacturer	**Autotherm**	**Autotherm**
	Wadhams	

3.1.4 Stainless Steel Repair Clamps

<table>
<tr><td rowspan="2">All Fittings Shall Comply With Australian Standard/s

AS 4181
AS/NZS 4020 (2018)</td><td>Not to be used for joining pipes together.

Only to be Provided in the full wrap clamp style.

Clamps may incorporate
20, 25, 40 or 50 mm BSP Tapped Boss</td><td colspan="5"> 
DN80 - 375</td></tr>
<tr><td rowspan="2">Manufacturers</td><td></td><td>AVK</td><td>Iplex</td><td>Viadux</td><td>Derwent</td><td>DAEMCO</td></tr>
<tr><td>Notes:</td><td colspan="4">Suitable for CICL, DICL, Steel, Copper, RC & AC Mains Only.</td><td>Suitable for PVC - O, PVC - M, PVC - U, GRP, DI, AC, Copper, Steel.</td></tr>
</table>

3.1.5 Multi Fit Mechanical Couplings

3.1.5.1 Straight Coupling

All Fittings Shall Comply With Australian Standard/s **AS/NZS 4158-1** **AS/NZS 4020 (2018)** **WSA PS 270**	Grade 316 Stainless Steel bolts having a life expectancy of over 50 years.	 DN50 – 375	 DN 50 - 375
Manufacturers	*Not to be used on Polyethylene pipes. Bitumen coated end clips shall not be used.	**AKV** (Model 601 Trim 4312, Supa Coupling) **Viking Johnson Maxifit** (Maxifit Coupling long sleeve preferred) **DAEMCO** – Reinoversal Couplings (barrel length 110, 178, 218)	**HAWLE** Synoflex For use on Polyethylene

3.1.5.2 Stepped Coupling

All Fittings Shall Comply With Australian Standard/s **AS/NZS 4158-1** **AS/NZS 4020 (2018)** **WSA PS 270**	Grade 316 Stainless Steel bolts having a life expectancy of over 50 years. Not to be used on Polyethylene pipes. Bitumen coated end clips shall not be used.	 DN 50 - 375
Manufacturers	For use on RC and PVC Pipe	**AKV** Model 602 Trim 4312, Supa Stepped Coupling **Georg Fischer** WAGA Multi-Joint 3000 Plus **Viadux** DN 100 – 150 (133 - 172 mm) Multigib Coupling & Vari-Gib Coupling
	For use on RC, PVC and PE Pipe	**HAWLE** Synoflex

3.1.5.3 Adaptor Flange Coupling

All Fittings Shall Comply With Australian Standard/s **AS/NZS 4158-1** **AS/NZS 4020 (2018)** **WSA PS 270**	Grade 316 Stainless Steel bolts having a life expectancy of over 50 years. Not to be used on Polyethylene pipes. Bitumen coated end clips shall not be used.	 DN 50 – 375	 DN 50 – 375
Manufacturer		**AKV** (Model 601 Trim 4312, Supa Adaptor Flange)	**HAWLE** Synoflex

3.1.6 Socket Leak Clamps

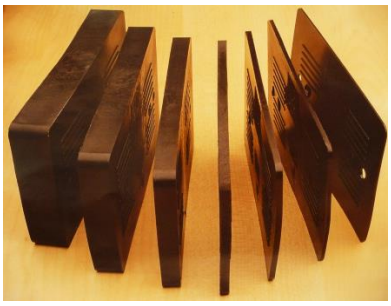
All Fittings Shall Comply With Australian Standard/s **AS 1831** **AS 1646** **AS/NZS 4020 (2018)**	To be installed in accordance with Manufacturers specifications. Complete fitting to be wrapped in Petrolatum Tape	  DN50 - 300
Manufacturer		**Viadux/Wang**

3.1.7 Polyethylene Transition Couplings

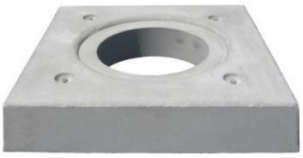
All Fittings Shall Comply With Australian Standard/s **AS/NZS 4129** **AS/NZS 4020 (2018)**	• Coppre to PE Straight Joiner • Copper to PE Elbow • Copper to Copper Double ended repair coupling	 
Manufacturers		**Philmac**
		Plasson
		Viega - Geopress K (Viega press gun required)

3.1.8 Street Box Assemblies

3.1.8.1 Packing Segments

All Fittings Shall Comply With Class D load ratings to Australian Standard/s **AS/NZS 4456**	 Concrete	 Plastic
	25 - 100 mm thick	1 - 20 mm thick
Manufacturers	**Bianco Precast**	**Tuff Tap**

3.1.8.2 Slab - Heavy Duty

All Fittings Shall Comply With Australian Standard/s **Class D minimum (trafficable) to AS 3996**	 800 x 800 x 150 thick 800 x 1200 x 125 thick
Manufacturer	**Bianco Precast**
	Civilmart

3.1.9 Field Welding Services

Authorised Contractors	**Contract Engineering SA**
	Lincoln Engineering
	N&A Mobile Welding Services
	Ferretti International (Aust)
	Water Engineering Technologies (SA Water Berri & Crystal Brook workshops)

4 Sewer

4.1 PVC Adaptors

4.1.1 Plain Wall

Note: The use of adaptors in the waste water system is permitted for repairs to existing pipes, however conditions do apply to their installation:

- Where an adaptor incorporating a rubber ring is used, the joint shall be wrapped in Petrolatum tape ensuring there are no voids
- The ends of the pipes shall be located as close together as the fitting allows
- Compaction shall be as shown in the Sewer Construction Manual with particular attention taken to ensure the joint does not move and the the Petrolatum wrap is not dammaged

All Fittings Shall Comply With Australian Standard **AS/NZS 1260**	PCV Spigot to VC Socket  DN100 - 300	PVC Socket to VC Spigot  DN100 - 300
Manufacturers		**Iplex**
		Key Plastics
	Vinidex	**Vinidex**

4.1.2 Structured Wall

4.1.2.1 Vinidex Ultra Rib

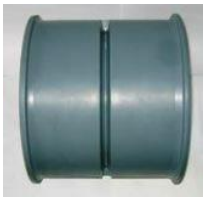
Note: This pipe was only used in limited applications, the following maintenance requirements still apply:

- Two rubber Rings shall be used on the Ultra Rib
- Where an adaptor incorporating a Rubber Ring is used, the joint shall be wrapped in petrolatum tape ensuring there are no voids
- The ends of the pipes shall be located as close together as the fitting will allow
- Compaction shall be as shown in the Sewer Construction Manual with particular attention taken to ensure the joint does not move and the petrolatum wrap is not damaged

4.1.2.2 PVC and PP Couplings

Note: The following maintenance requirements apply:

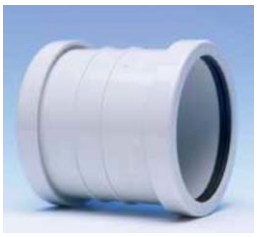
- One (1) Rubber sealing ring per joint is required – placed in the 1st or 2nd trough nearest the leading edge of the pipe spigot (to manufacturers requirements)
- Where two or more consecutive ribs are broken, the section of damaged pipe is to be replaced
- All cuts in Polypropylene Structured Wall Pipe are to be made in the centre of two consecutive ribs

All Fittings Shall Comply With Australian Standard **AS/NZS 5065**	Soc (PP) to Soc (Plain PVC SWJ) 	Soc (PP) to Soc (PVC RRJ) 	PP to PP 
	DN100 - 300		
Manufacturers	**Iplex**	**Iplex**	**Iplex**
	Vinidex	**Vinidex**	**Vinidex**

4.1.3 Slip Couplings

Note: The following maintenance requirements apply for Couplings and Slip coupling:

- Where a slip coupling incorporating a Rubber Ring is used , the joint shall be wrapped in petrolatum tape ensuring that there are no voids
- The ends of the pipes shall be located as close together as the fitting will allow
- Compaction shall be as shown in the Sewer Construction Manual with particular attention taken to ensure the joint does not move and the petrolatum wrap is not damaged

All Fittings Shall Comply With Australian Standard/s **AS/NZS 1260** **AS/NZS 5065**	Plane Wall 	Structured Wall 
	DN100 - 300	DN150 - 375
Manufacturers	**Iplex Pipelines**	
	Plastec	
	Vinidex	**Vinidex**

4.2 PVC Expansion Fitting

Note: The following maintenance requirements apply for PVC Expansion Fittings:

- Where Expansion Fittings is used, the Rubber Ring joint shall be wrapped in petrolatum tape ensuring that there are no voids
- Both end connections shall be a solvent cement joint
- Ensure joint does not move and Petroleum wrap is not damaged during compaction, follow Sewer Construction Manual guidelines

All Fittings Shall Comply With Australian Standard **AS/NZS 1260**	 DN100 - 300
Manufacturers	**Iplex**
	Plastec
	Storm Plastics

4.3 PVC Saddles

Note: PVC Saddles come in two Configurations:

- Solvent welded for use on existing PVC sewer Pipe
- Gasket and seal for use on existing VC and structured wall Pipes

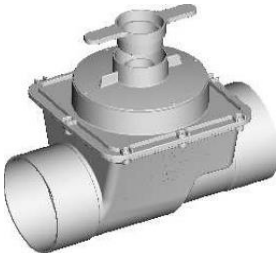
Saddles shall be secured to the host pipe by the use of large diameter 316 Stainless Steel adjustable hose clamps or 316 Stainless Steel screws (for structured wall pipes only)

The following maintenance requirements apply for PVC Saddles:

- The saddles are to be installed in accordance with manufacturer's installation recommendations
- The exterior of the host pipe shall be cleaned and checked for structural damage before installation of the saddle
- The entry hole into the main is cut prior to the installation of the saddle
- The ends of the pipes shall be located as close together as the fitting will allow
- Compaction shall be as shown in the Sewer Construction Manual with particular attention taken to ensure the joint does not move and the petrolatum wrap is not damaged
- PVC saddles used on structured wall pipes are to have a sealing rubber with a profile which matches the external surface of the pipe

All Fittings Shall Comply With Australian Standard **AS/NZS 1260**		
Manufacturers	**Iplex**	**Iplex**
	Vinidex	**Vinidex**

4.4 Reflux Valve

All Fittings Shall Comply With Australian Standard/s **AS/NZS 3500.2** **WSA 02-2014**	 DN100 - 150
Manufacturers	**Plastec**

4.5 Flexible Couplings (Metal Banded)

Note: Metal Banded Flexible Couplings are authorised for **REPAIR** purposes **ONLY**.

Metal Banded Flexible Couplings are also available with a wide, centrally places, Stainless Steel shear band in-lieu of the two internal Stainless Steel clamps. These are the preferred option and should be used if available

All Fittings Shall Comply With Australian Standard **AS/NZS 4327**	PVC Spigot to VC Spigot 	PVC Spigot to PVC Spigot 
	DN100 - 300	DN100 - 300
Manufacturers	**Jenco**	**Jenco**
	(Leap) Flex Seal	**(Leap) Flex Seal With Shear Band & Bush**

4.5.1 Flexible Fitting (PVC)

Note: To be used for connecting to Maintenance structure bases only.

All Fittings Shall Comply With Australian Standard **AS/NZS 1260**	 DN 100, 150, 225
Manufacturers	**Plastec** – Flexitec Coupling

4.6 Stainless Steel Clamps, Couplings & Branches

Note: Stainless Steel Clamps (Couplings and Branches) are authorised for **REPAIR** purposes **ONLY**.

Clamps are available for both Plain wall and Structured wall pipe.

Clamps are to be manufactured from Grade 316 Stainless Steel.

Stainless Steel clamps used on structured wall pipes are to have a sealing rubber with a profile which matches the external surface of the pipe.

All Fittings Shall Comply With Australian Standard AS 4181	
Not to be used for joining pipes together. Only to be Provided in the full wrap clamp style. Suitable for CICL, DICL, Steel, Copper, RC & AC Mains Only.	  
Manufacturers	**Iplex**
	Tyco Wang
	Derwent

4.7 Maintenance Hole Covers & Frames

4.7.1 Trafficable

4.7.1.1 Heavy duty

All Fittings Shall Comply With Australian Standard AS3996:2019		
Class D and E 	**Bellmouth** 	**No 5** 
Bianco Precast - Class D	**Bianco Precast**	**Bianco Precast**
Civilmart - Class D		
Webforge - Class D		
Ducast - Class D and E		
EJ - Class D and E		

4.7.1.2 No. 5 Replacement Cover

All Fittings Shall Comply With Australian Standard AS3996:2019		
Notes	Used for replacement of damaged or noisy No. 5 Covers located in Trafficable areas. Concrete Support Slab together with Cover & Frame.	
Manufacturers	**Bianco Precast**	**Civilmart**

4.7.2 Non Trafficable

All Fittings Shall Comply With Australian Standard AS3996:2019	 **Class B**	 **Aluminium Cover**
Notes		**Only approved for use in Easements.** Used in lieu of No 5 Cast Iron Meter Box Cover.
Manufacturers	**Bianco Precast**	
	Civilmart	**Civilmart**
	Webforge	

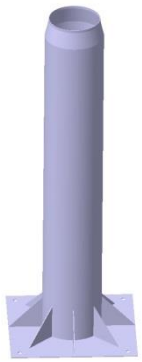
4.7.3 M/H Increment Risers (Expanded Polyproylene)

All Fittings Shall Comply With The Following Standard/s **WSA-PS 345** and loading to **Class D (AS3996:2019)**	
Notes **To be joined only with Chem Link M1 Universal Adhesive**	**Cretex Pro-Ring** 19 - 152 mm thick
Manufacturer	**ISC Pty Ltd**

4.8 Vents

4.8.1 Educt Vent

4.8.1.1 Base

Steel (300mm x 2.1m)	
Manufacturer	**Ferretti International**

4.8.1.2 Shaft

Steel or GRP (300mm x 15m)			
Manufacturers	**Ferretti International (Steel)**	**RPC Technologies (GRP)**	**Novafast (GRP)**

4.8.1.3 Birdstop

Manufacturer	**Cronin Wire Products**

4.8.2 Induct Vent

	
Manufacturer	**Ferretti International**